A strategic approach to EU agricultural research and innovation
Beyond Horizon 2020

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Why do we need a strategic approach to agricultural research and innovation?

Features of current agriculture

Agriculture: Unique human activity, meeting basic needs, driving development and communities in rural areas, shaping landscapes, and delivering public goods

→ Agricultural land: more than half of EU area (with forestry about 85%). Ways in which the land is managed have significant, wide impact.

The nexus between Food Systems and other sectors (e.g. Bioeconomy, Health); starting point for major industries (food/non-food)

→ Agriculture: employs more than 10 million farmers in EU; Europe's agri-food industry with 46 million jobs in 15 million businesses (many SMEs)

Agriculture at the centre of global challenges: In terms of problems – and solutions (e.g. food security, natural resources, climate)

→ Agriculture based on high resource consumption: ca. 70% of fresh water worldwide (e.g. 1000 l for 1 kg of cereal grain, 43,000 l for 1 kg of beef);

Emissions from agriculture, forestry, fisheries have nearly doubled over past fifty years

Crucial to achieve major policy goals

↓

Future of agriculture? A role for research

Main challenge for future of agriculture: Interface between production and environment

Requires thorough understanding of trade-offs between productivity and sustainability

→ From maximisation to optimisation (e.g. upgrade from yield to income, welfare and ecosystems services)

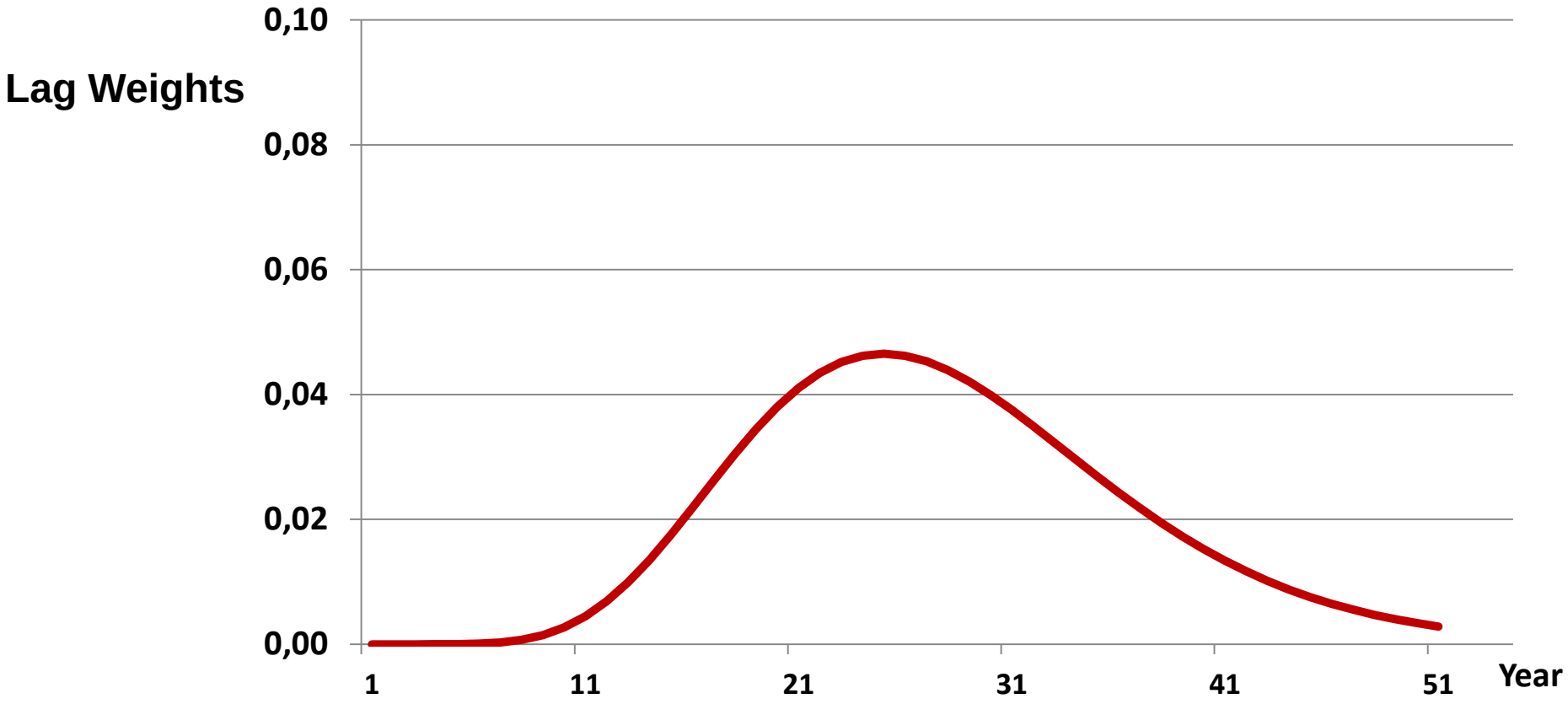
→ AGRI strategy taking resources (natural, human) as starting point for developing optimisation approaches

Examples of trade-offs

- income/labor
- yield/cost
- quantity/quality
- yield/price
- resilience/speculation
- farm/post farm share

Agricultural research: Why the long run matters

R&D Investments → **Farm Productivity Growth**



By P. Pardey

A long-term strategy will improve consistency, efficiency and impact

- Challenges are long-term and research takes time - Need for continuous investment to cope with major challenges in the long-run
- Better articulation of research policy with CAP and other EU policies (climate, environment, energy, health, international development)
- Better articulation with activities of Member States
- Better use of various instruments: more impact
- Enhance the role of Europe as a key global player in a field on which attention is increasing (UN, G20 etc.)

How did we get there?

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

- Around 300 experts involved
- 2 consultations

Three chapters

Why?

- Challenges
- Links to policy

What?

- Cross-cutting issues
- Creating value from land: sustainable primary production
- Enhancing rural innovation

How?

- Six dimensions regarding implementation

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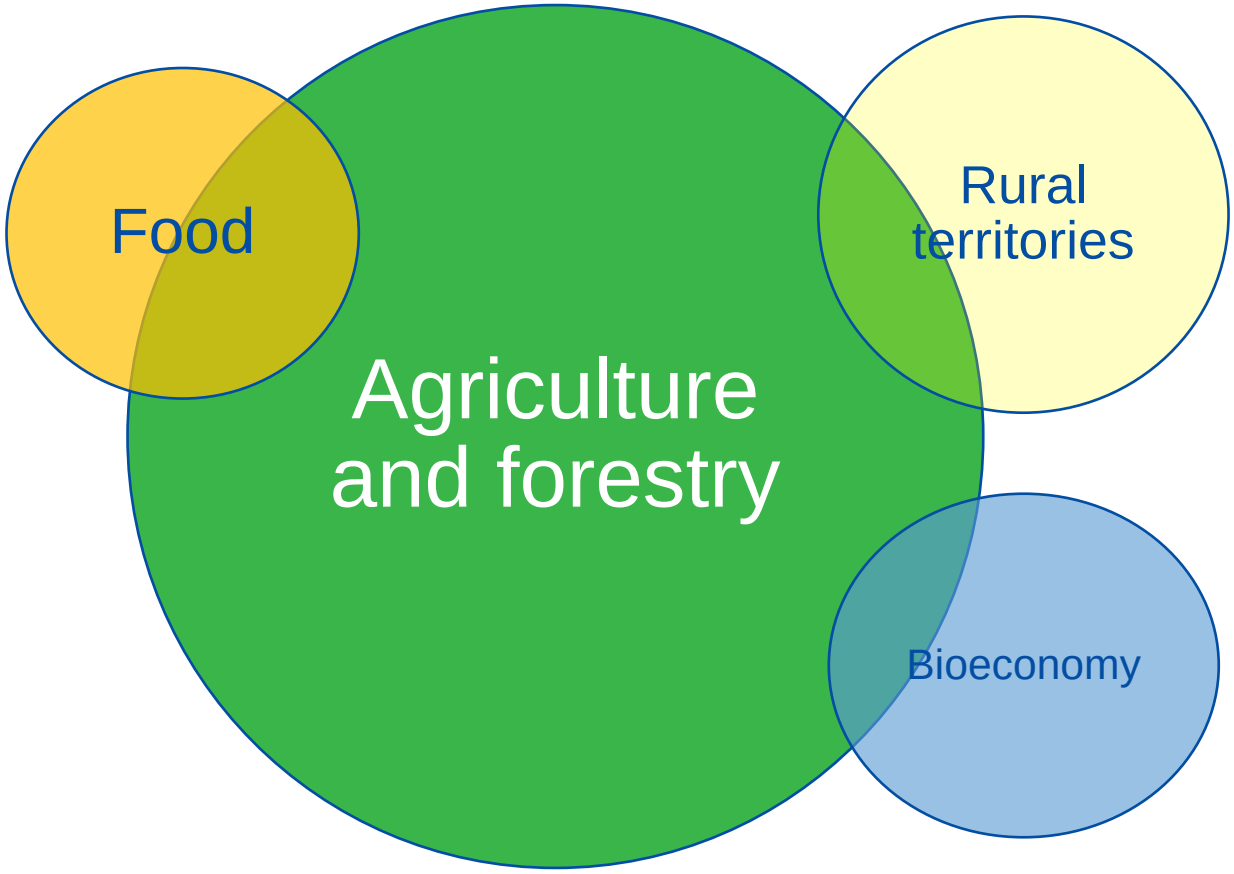
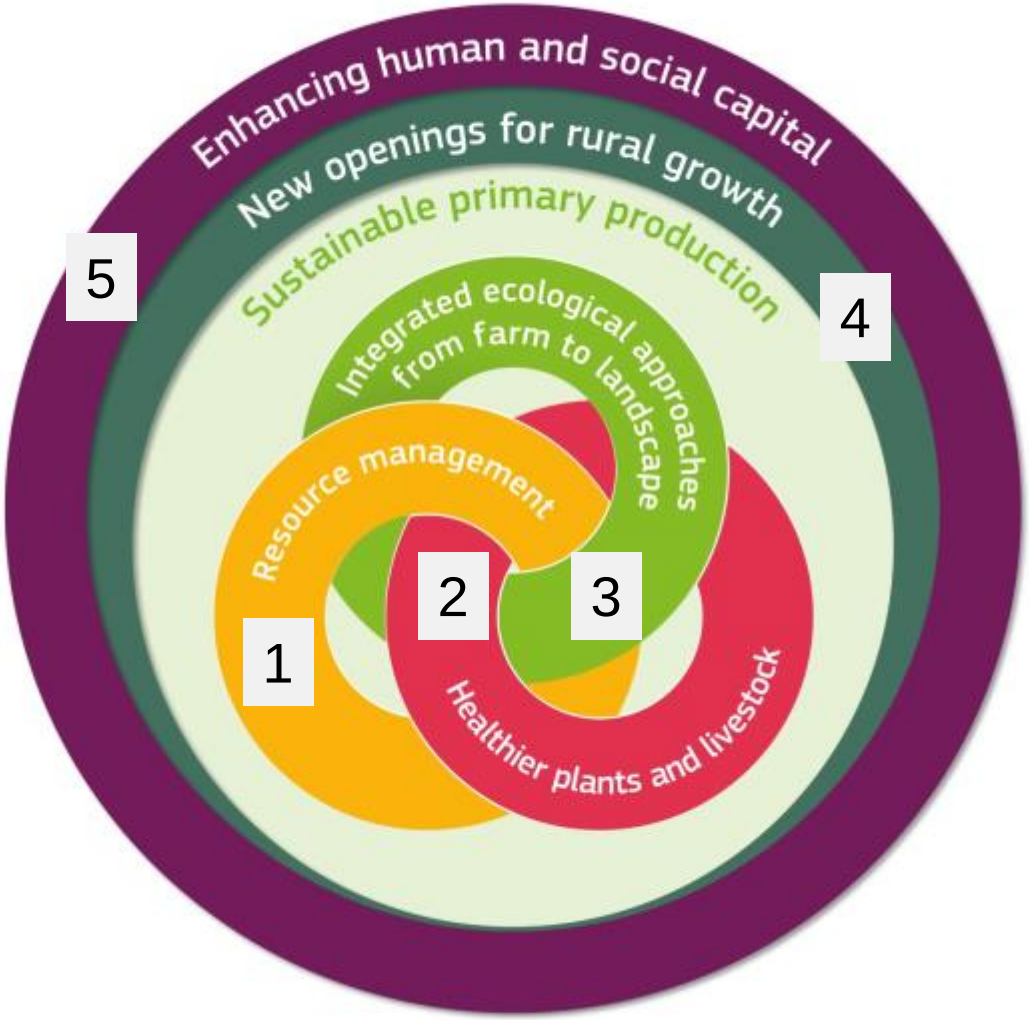
What priorities for agricultural research and innovation?

Scope of the strategy



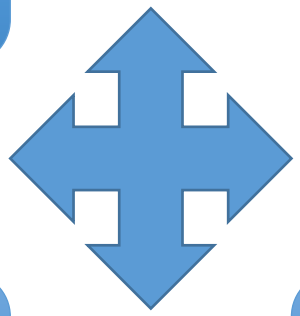
Five building blocks



Cross-cutting issues

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

Encouraging efficient resource management

Issues of scale

Resource management

- Safeguard long-term productivity and reduce impact on ecosystems
- Climate change: support strategies for adaptation and resilience
- Optimise resource flows, use of residues and by-products in a circular economy
- Improve soil fertility and functions
- Reduce water consumption and pollution
- Preserve and make better use of genetic resources

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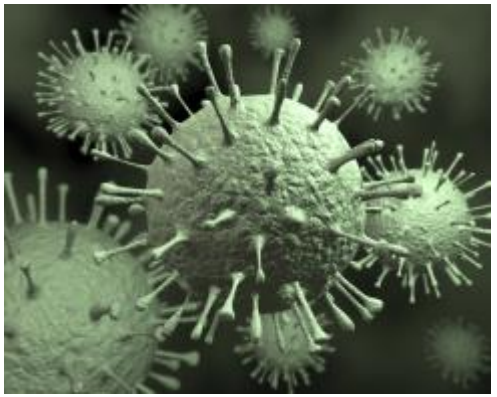
Making animals and plants healthier

Links between management, animal welfare and plant/animal health

Healthier plants and livestock

- Systems-based approach
- Operationalise One-Health approaches
- Disease prevention
- Tools to control pests and diseases
- Alternative approaches to pesticides / antimicrobials
- Emerging risks



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Adopting integrated ecological approaches

Accounting of ESS; optimisation of systems

Ecological approaches at farm and landscape levels

- Encourage better use of ecosystem services to strengthen sustainability and support productivity
- Explore functional role of biodiversity
- Support organic and mixed farming systems
- Research at various levels

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Fostering rural growth

Territorial and value chain approaches

New openings for rural growth

- Understand territorial dynamics and modernise policies
- Organise sustainable food and non-food value chains
- Better reward the provision of public goods
- Take advantage of the digital revolution

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Boosting skills and innovation systems

Conditions for knowledge creation, sharing and use

Enhancing human and social capital in rural areas

- Develop skills, education and training
- Boost knowledge and innovation systems
- Provide a conducive environment to participatory approaches

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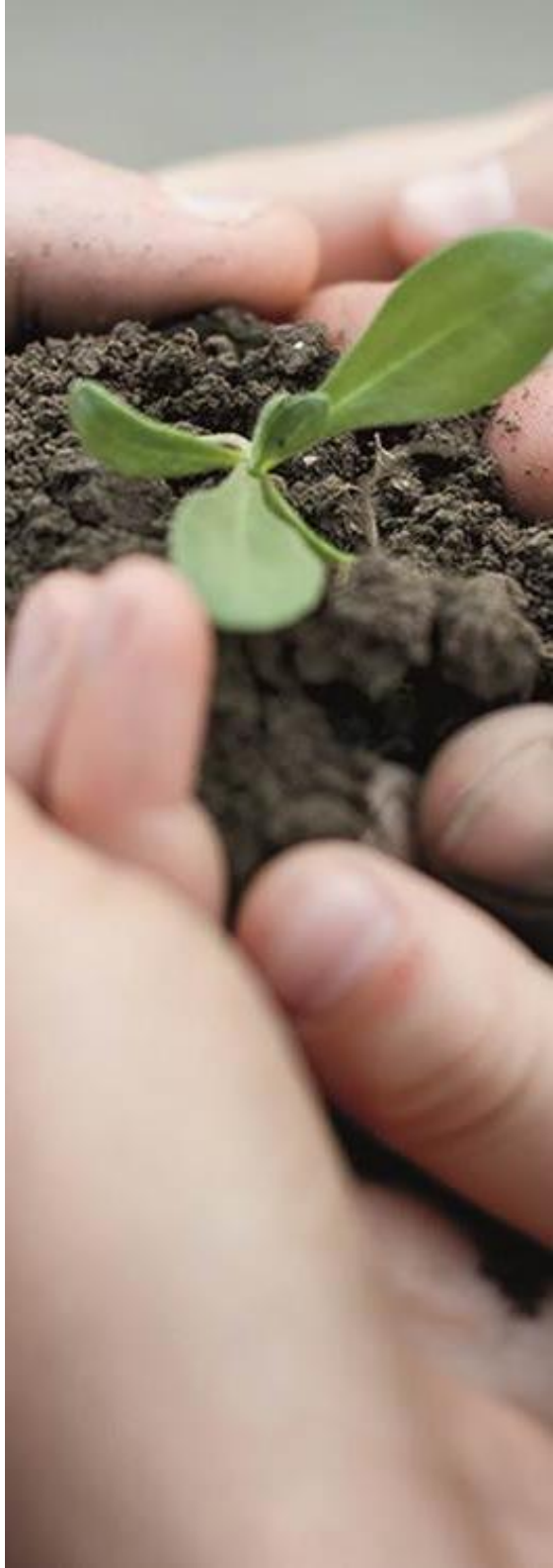
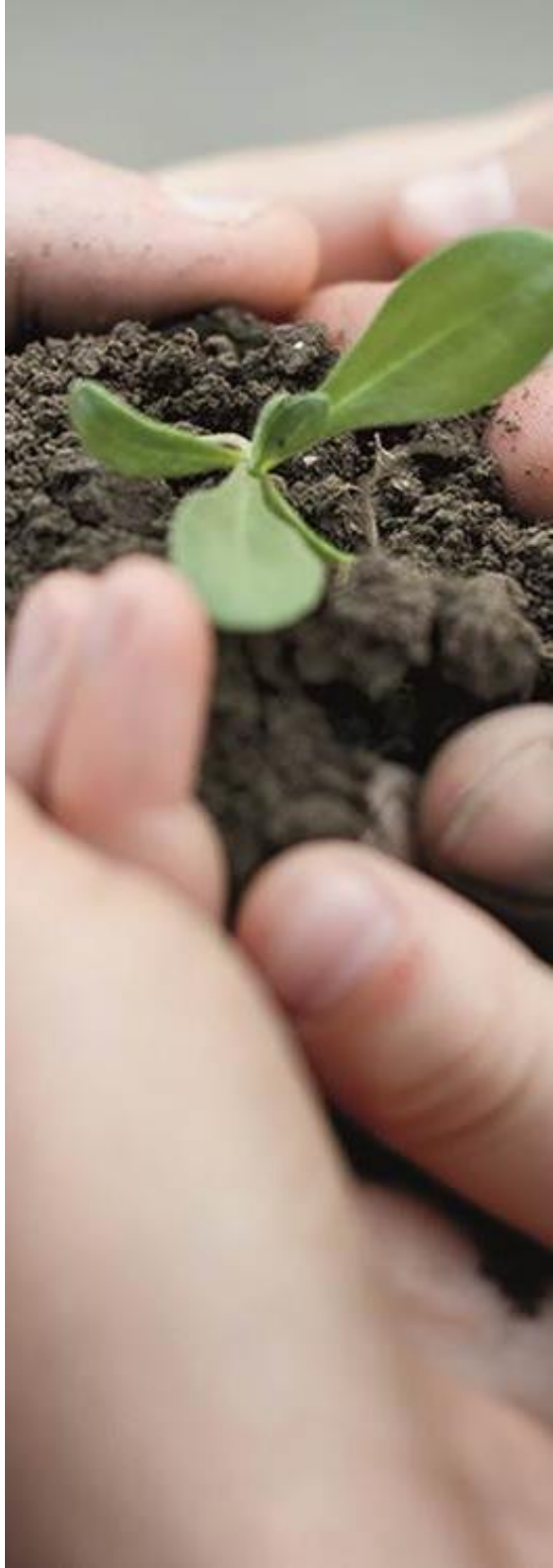
How will the strategy be implemented?

6 dimensions

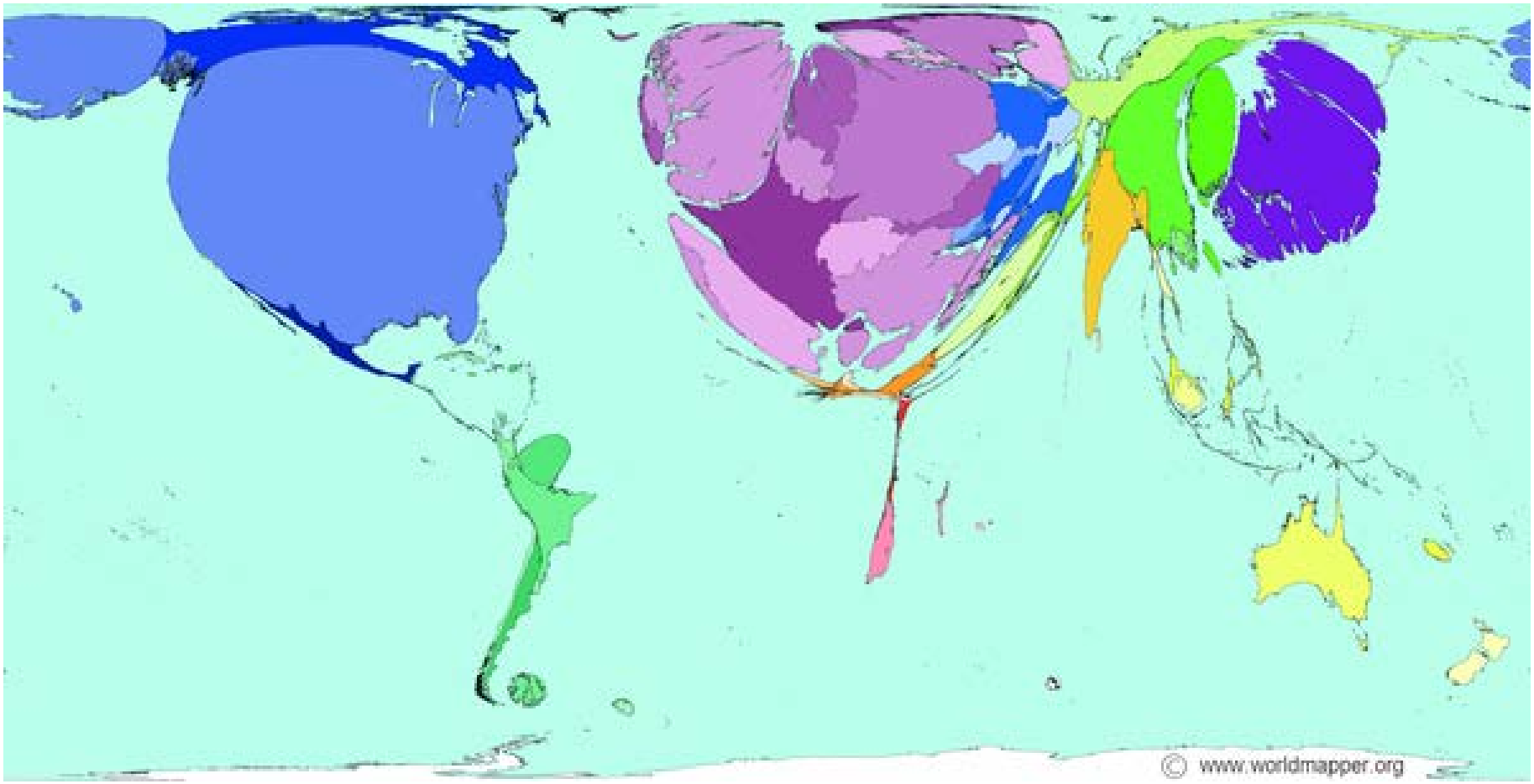
- *Being strategic about programming*
- *Encouraging synergies with Member states*
- *Developing International cooperation*
- *Boosting implemenation of R&I*
- *Leaving more space for new approaches*
- *Developing synergies with the private sector*



Additional issues addressed at conference

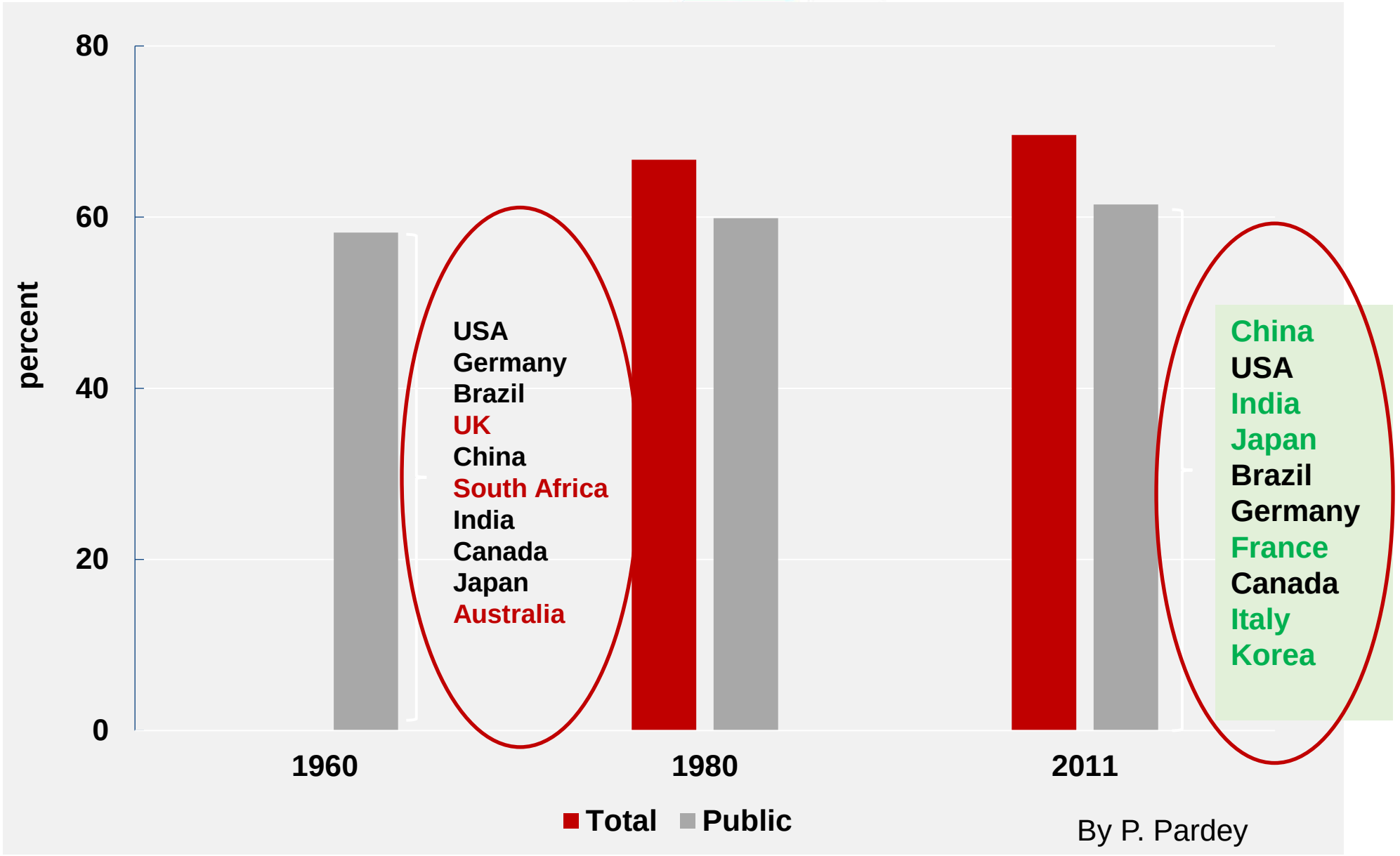


Global Inequalities in production of scientific knowledge

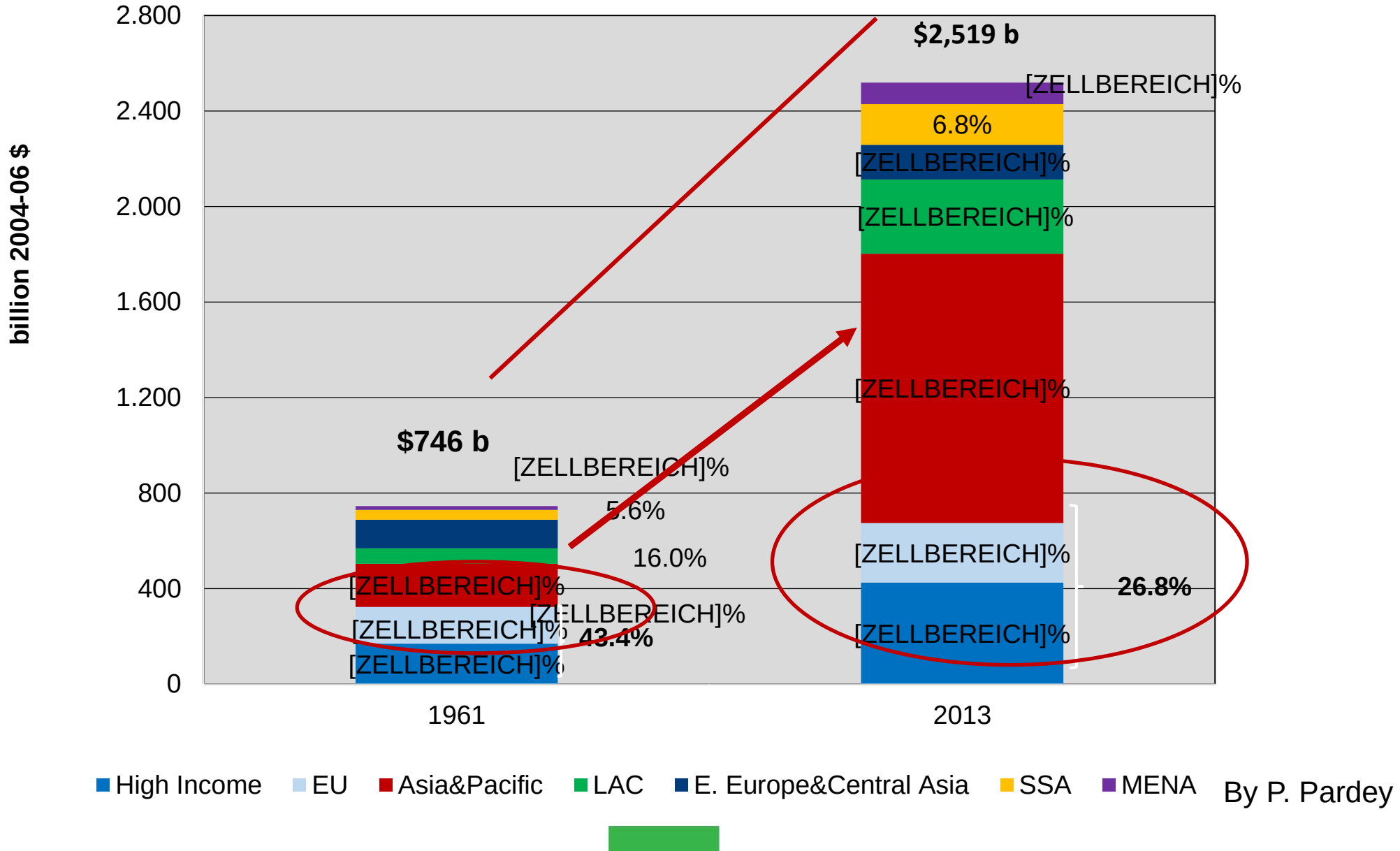


Output of world scientific research papers indexed in web of science (2013);
Source: Worldmapper--Countries re-sized according research output

Spatial Concentration
Top 10 Country Share



Changing Location of World Agriculture, 1961 vs 2013



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Behind R&D numbers

- Agricultural R&D spending still highly concentrated spatially
- But big changes in the (rank order) of top 10 spenders
- Shift to more private performance
- But private spending is mainly concentrated in the rich (58.2%) and faster growing middle income countries (BIC 35.7%
- Geographic disconnect between regions where knowledge is generated and where it is most needed (demand for productivity increases)
- Governance and exchange of knowledge crucial
- Move towards open data

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What next?

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

April 2016 Update of AGRI strategy

Work Programme 2018 – 2020 and beyond

Thank you for your attention

More about agricultural research and innovation:

http://ec.europa.eu/agriculture/research-innovation/index_en.htm