



European
Commission



Agriculture
and Rural
Development

Strategic approach to EU agricultural research and innovation

**PLENARY MEETING OF THE ADVISORY GROUP ON THE FOOD CHAIN AND
ANIMAL AND PLANT HEALTH**

Brussels

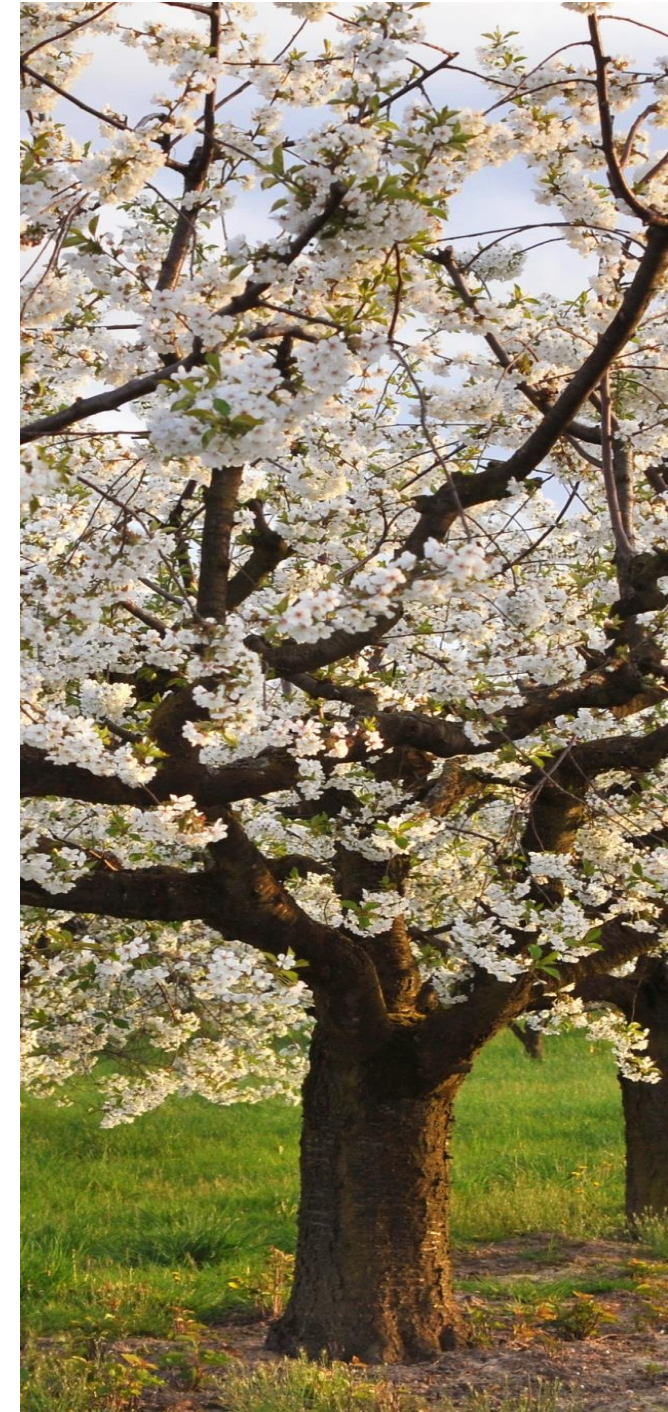
26 November 2018

Jean-Charles CAVITTE
DG Agriculture and Rural Development
European Commission

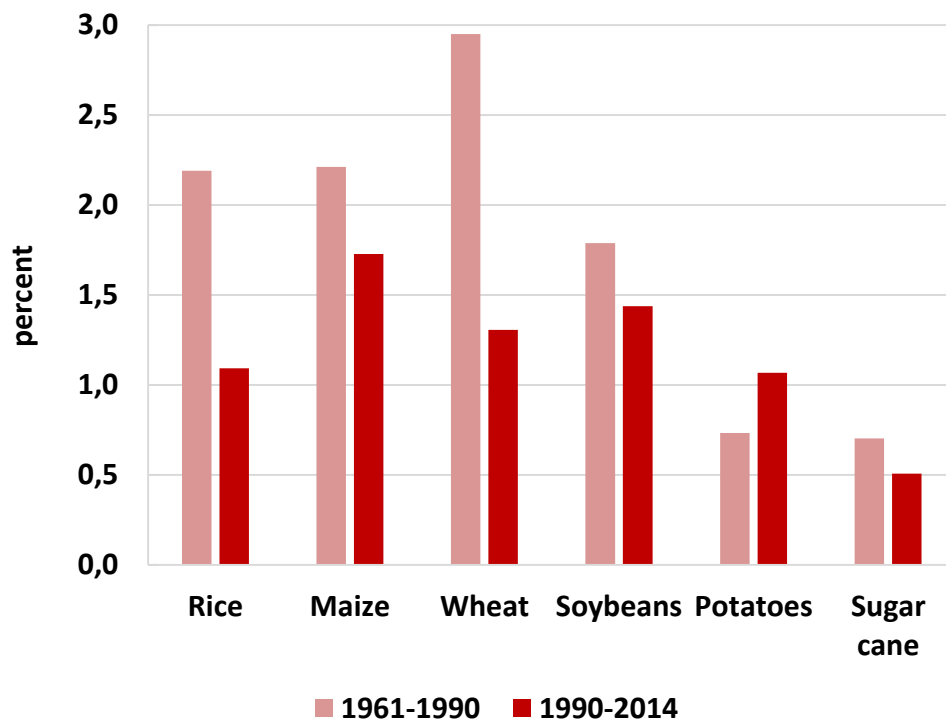


Contents

1. Agricultural research in Europe – are we up to the challenges?
2. Strategic approach to agricultural research and innovation and its implementation under Horizon 2020
3. Proposals for Horizon Europe



No reason for complacency on research ...



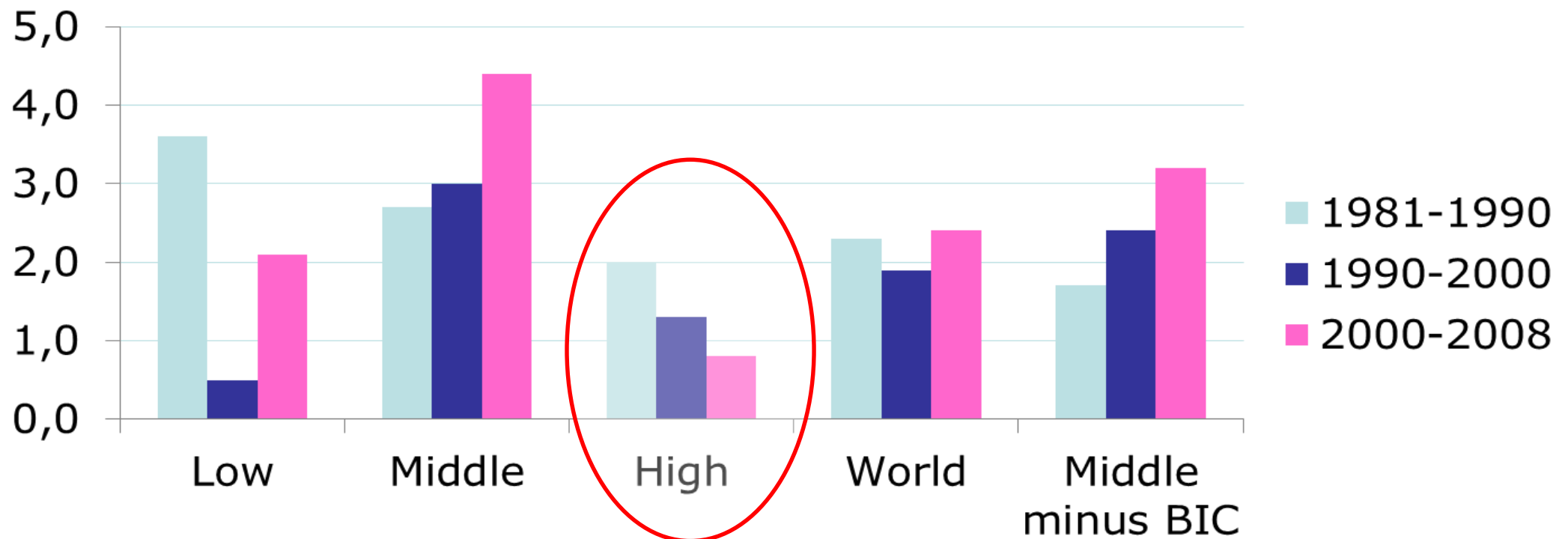
+

- 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

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

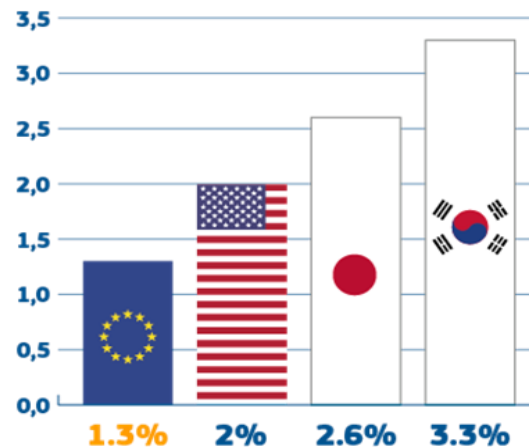


Source: ASTI-IFPRI (2012)

While benefiting from world-class research and strong industries...

Our knowledge and skills are our main resources.

- **7%** of the world's population
- **20%** of global R&D
- **1/3** of all high-quality scientific publications

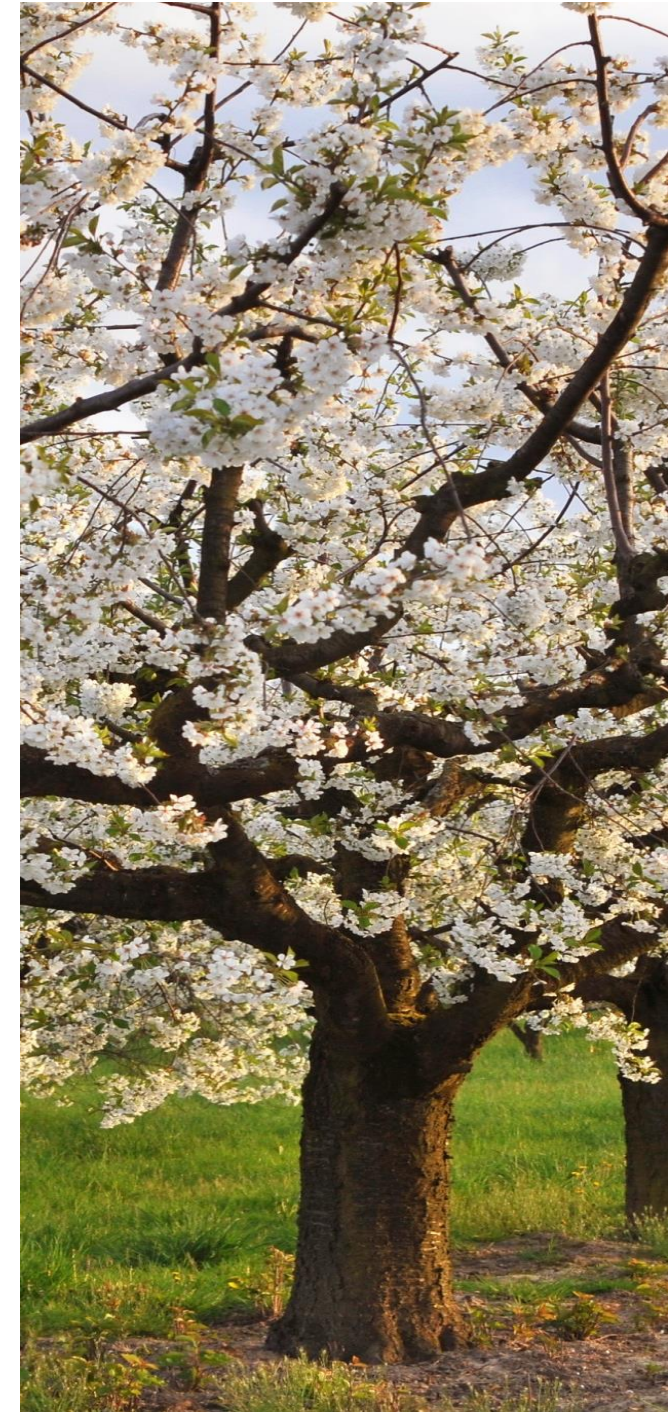


1.3%
EU business
R&D
investment

...Europe fails to transform leadership in science into leadership in innovation and entrepreneurship

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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

Three chapters

Why?

- Challenges
- Links to policy

What?

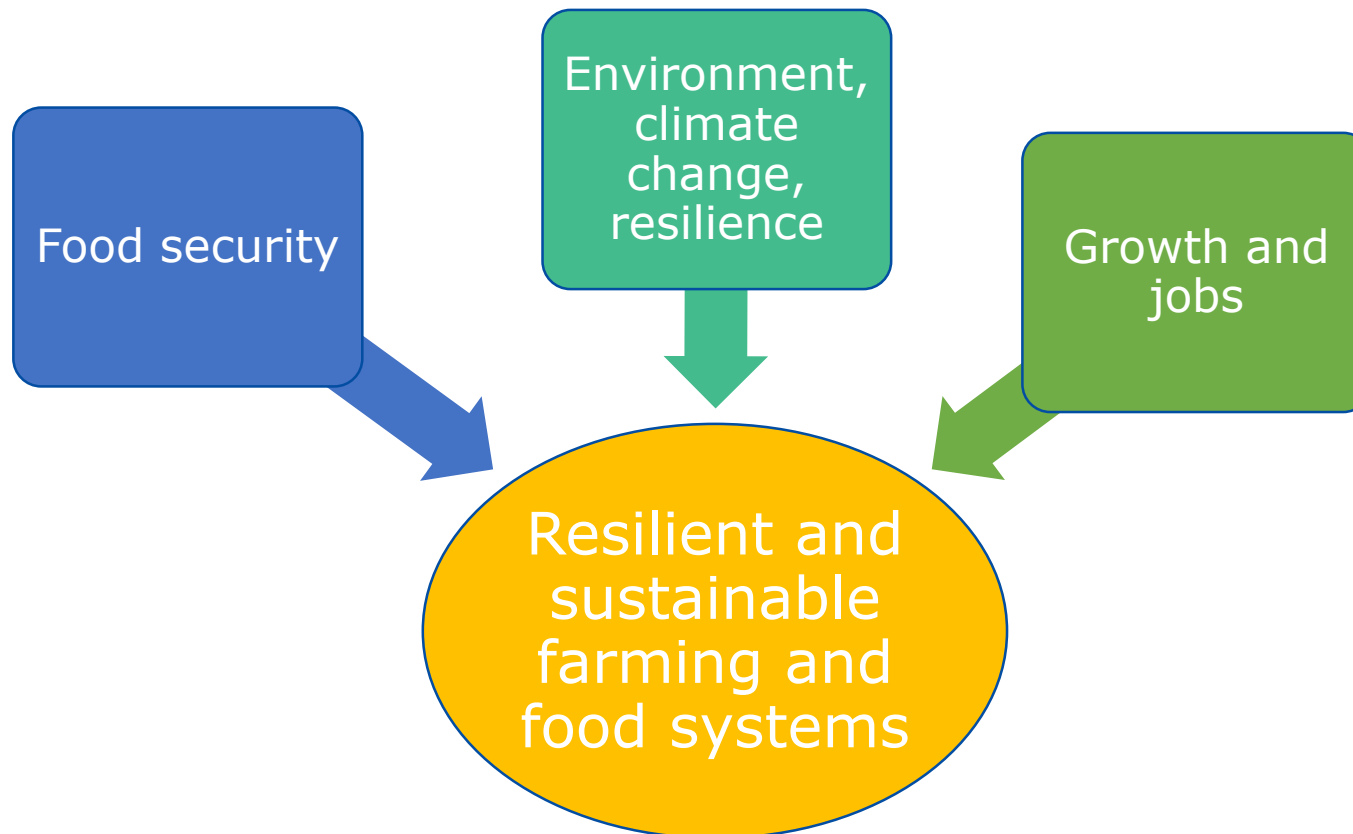
- Creating value from land: sustainable primary production
- Enhancing rural innovation
- Cross-cutting issues

How?

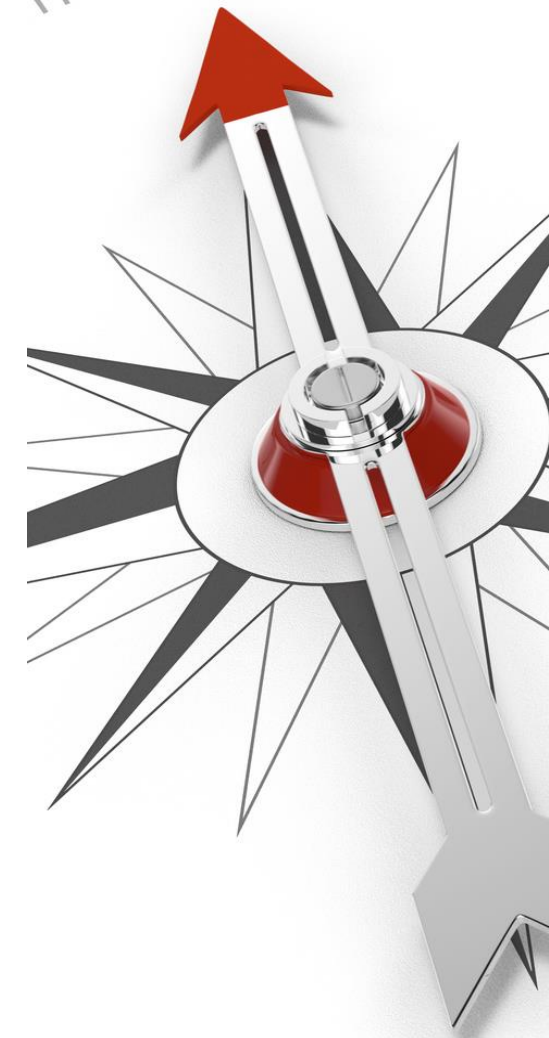
- Six dimensions regarding implementation



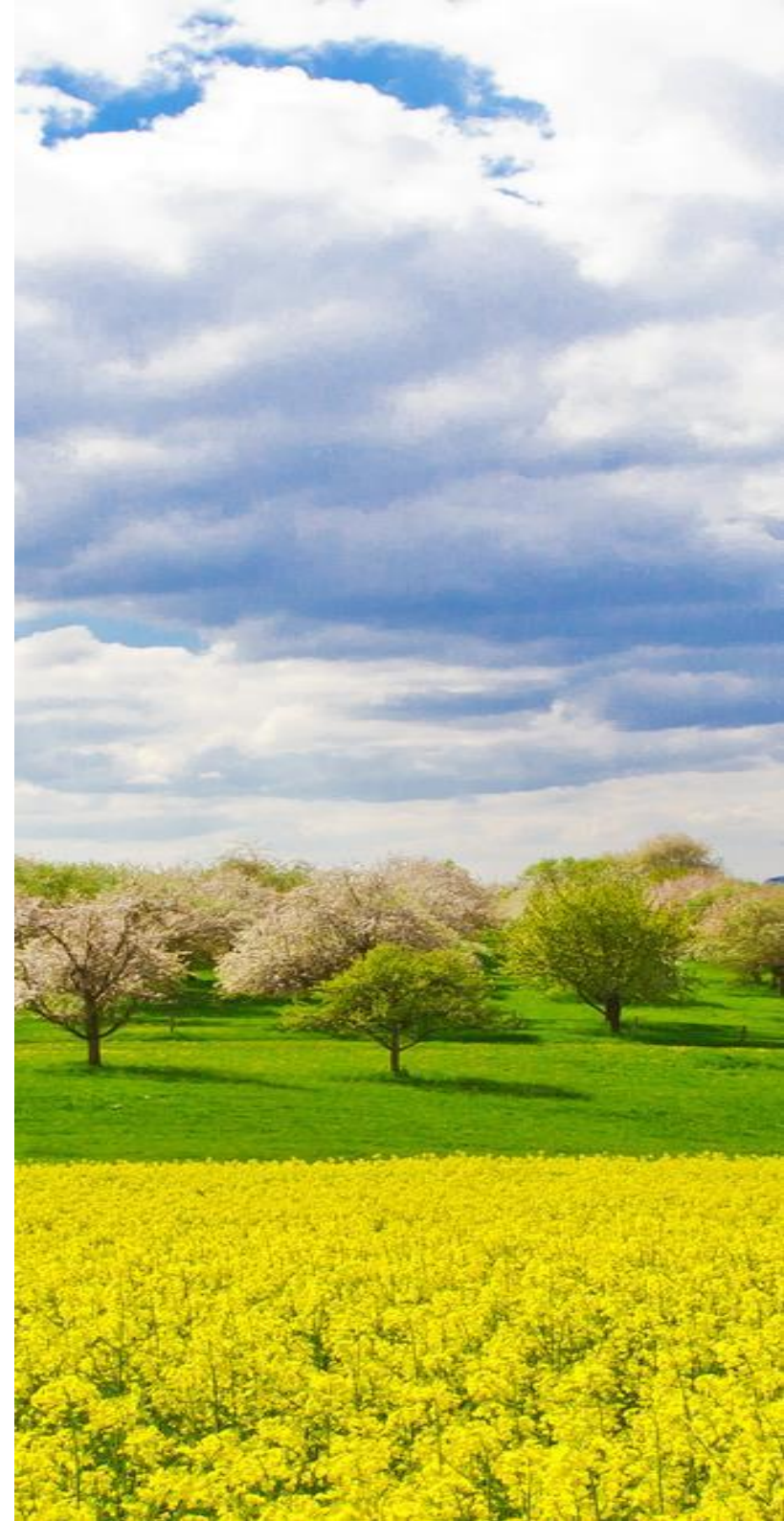
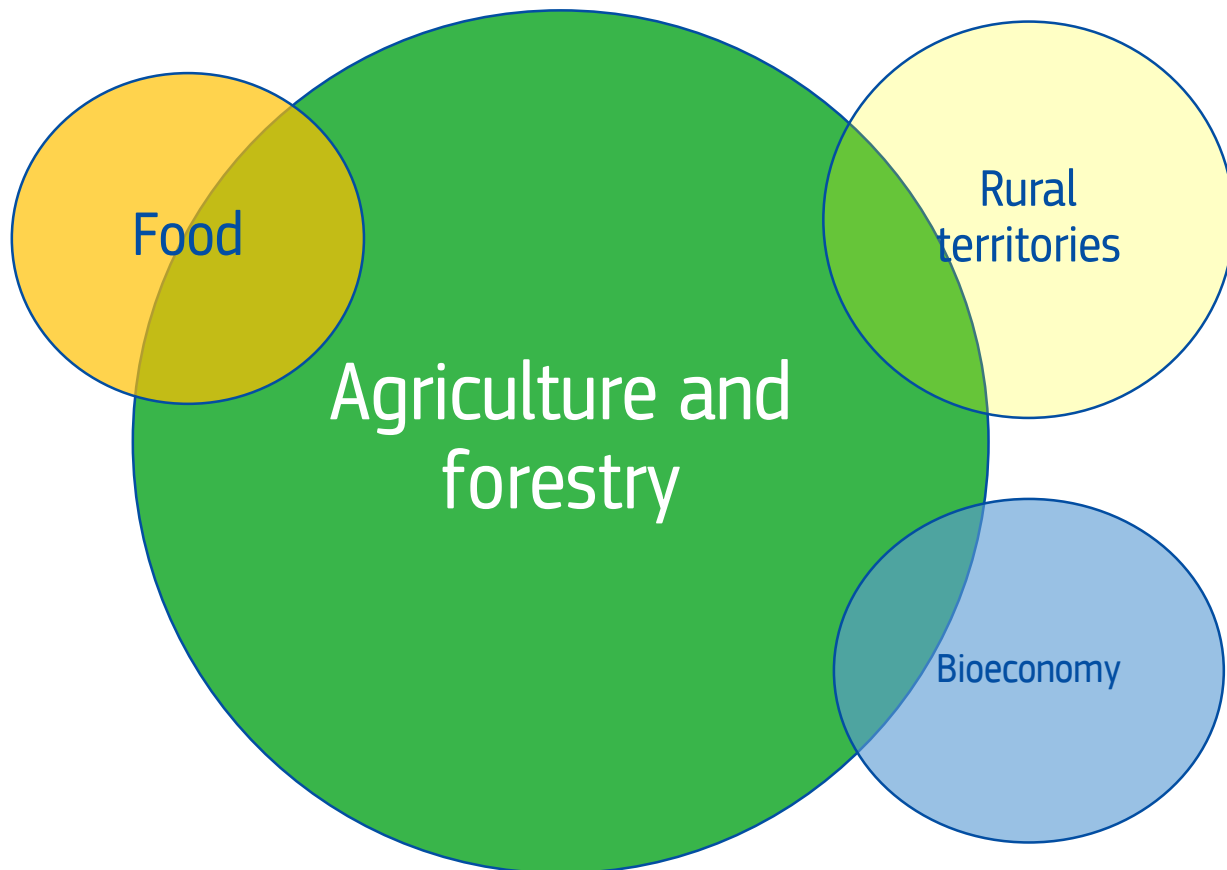
Challenges facing the agricultural sector



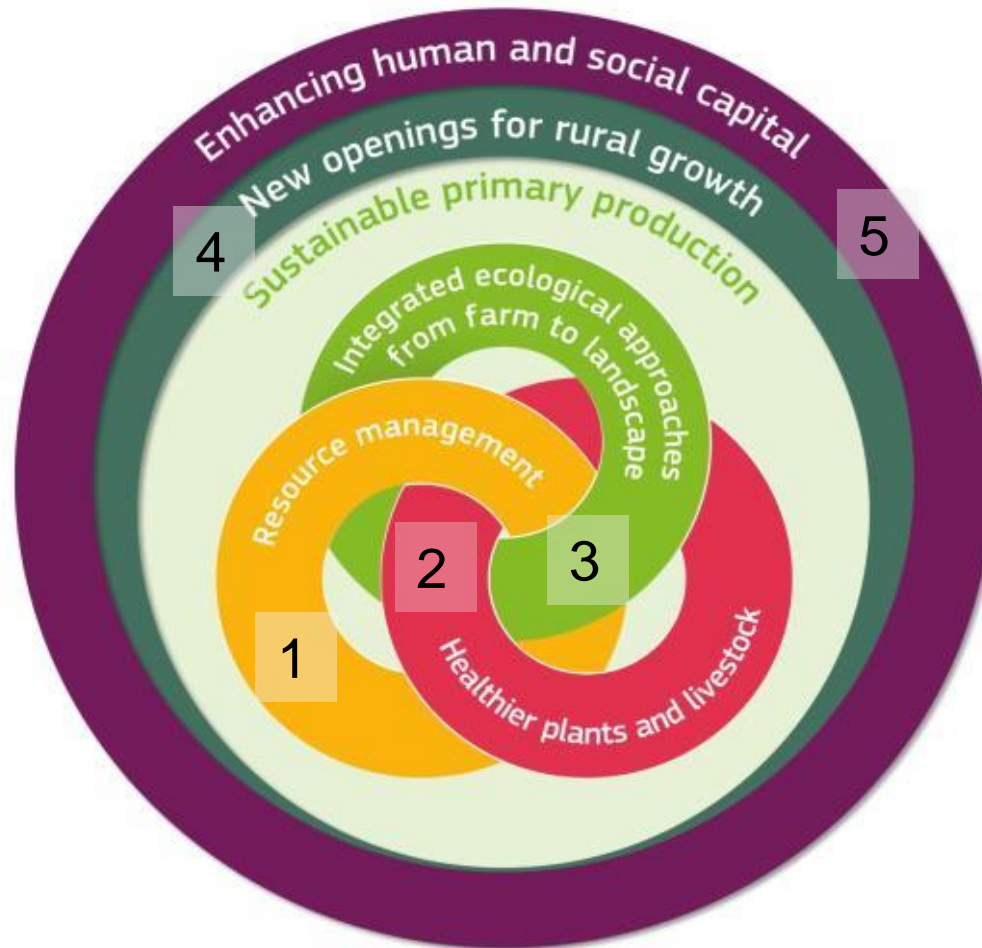
ALLENGE



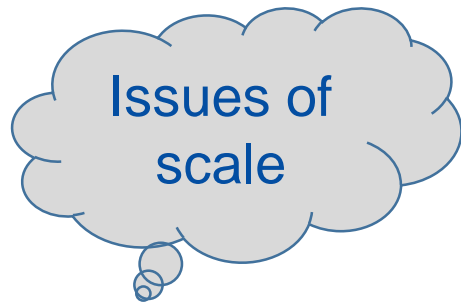
Scope of the strategy



Five building blocks



Encouraging efficient resource management



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



Making animals and plants healthier



Healthier plants and
livestock

Systems-based
approach

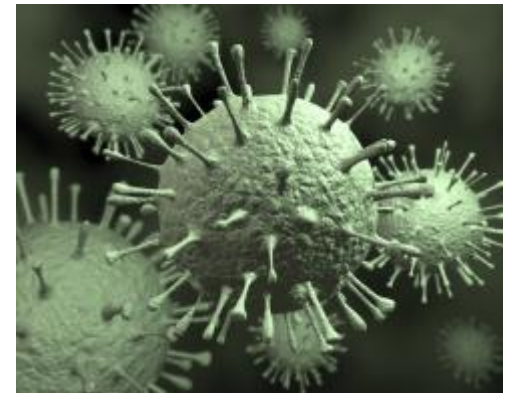
Operationalise One-
Health approaches

Disease prevention

Tools to control pests
and diseases

Alternative approaches
to pesticides /
antimicrobials

Emerging risks



Adopting integrated ecological approaches

Optimisation of systems, etc.

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



Fostering rural growth

Territorial and
value chain
approaches

Understand territorial dynamics and
modernise policies

Organise sustainable food and non-
food value chains

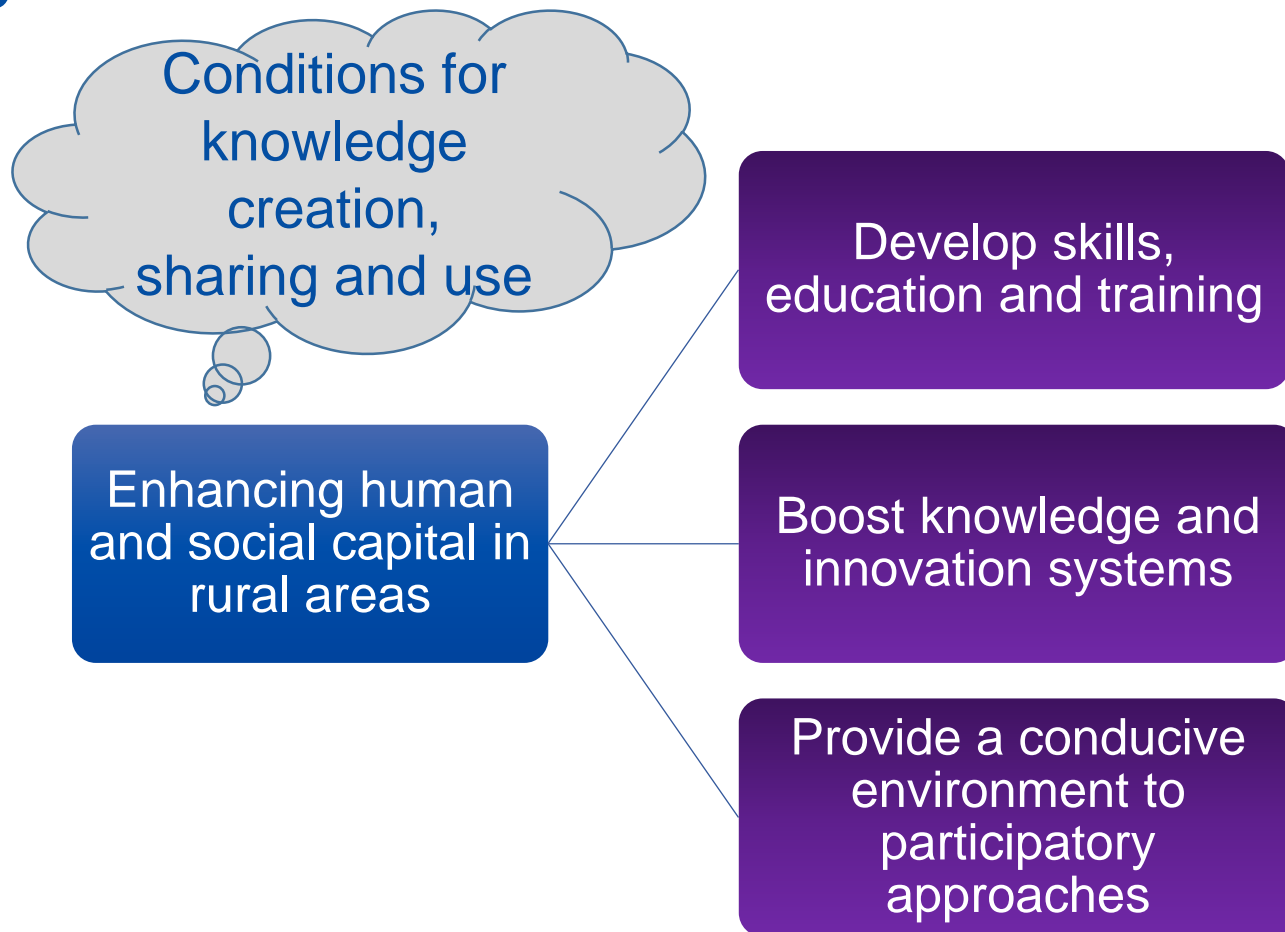
Better reward the provision of public
goods

Take advantage of the digital
revolution

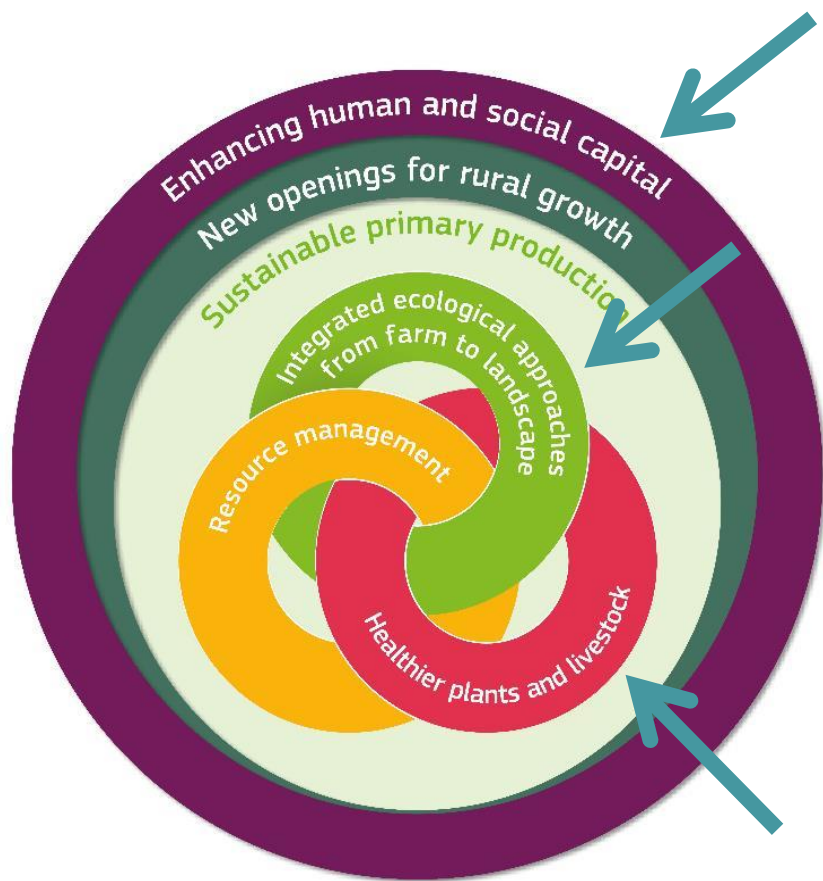
New openings for rural
growth



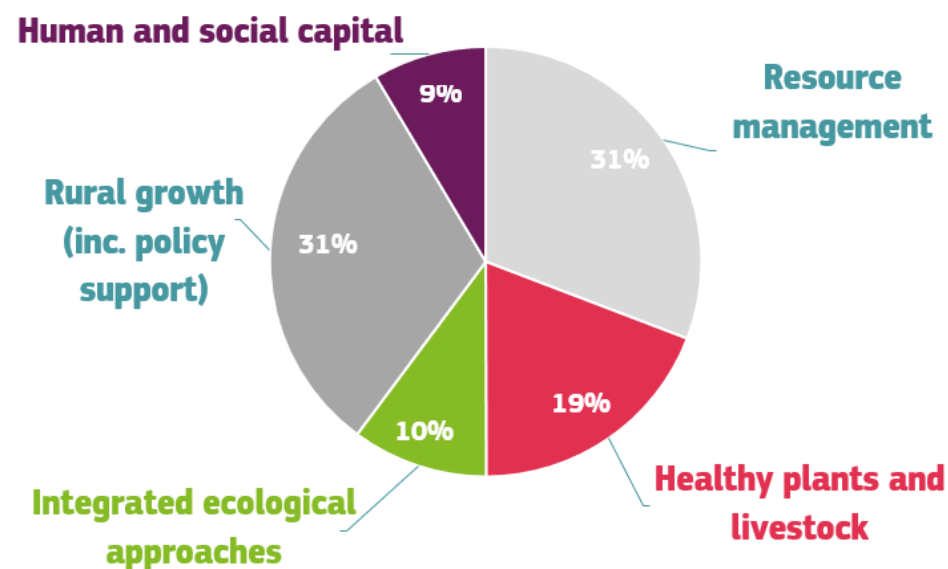
Boosting skills and innovation systems



Healthy plants, animals and ecosystems for healthy people: Which strategy's priorities are we looking at?

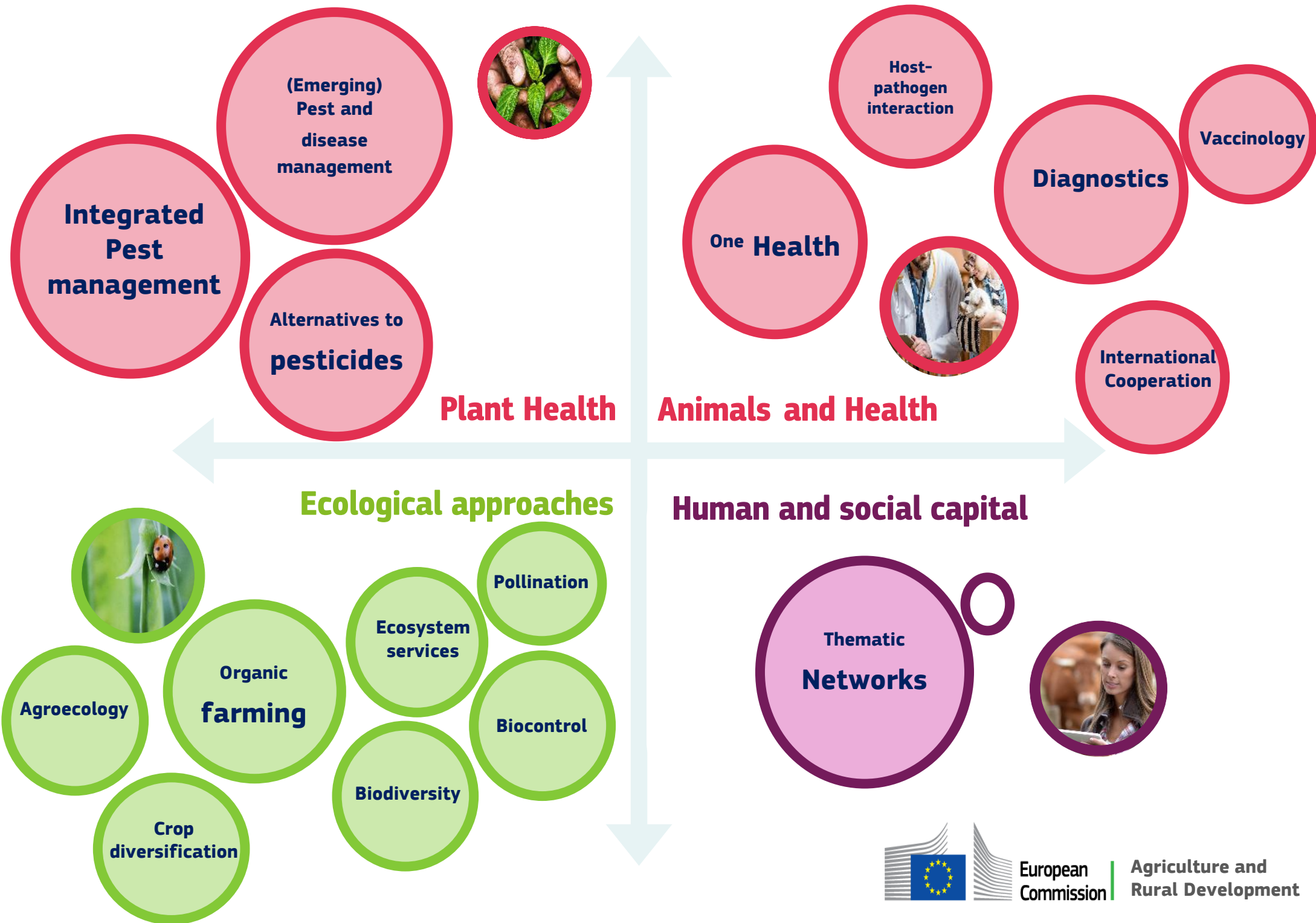


**Distribution of H2020 SC2 budget
over priorities**
(~1,8bn EUR million - 2014-2020)



European
Commission

Agriculture and
Rural Development



Animals and health under Horizon 2020 / SC2

21 Projects or expected contracts	179 M€ Contribution UE 2014-2020	246 Participations in selected projects
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Key themes *and projects (calls 2014-2017)*

Host-Pathogen Interaction, epidemiology : *DELTA-FLU ; PALE-Blu, PIGSs*

Vaccinology : *SAPHIR, PARAGONE*

Diagnostics : *Swinostics, Vivaldi*

Emerging threats : *DEFEND (LSD&ASF)*

One Health: *OneHealth EJP*

AMR: *HealthyLivestock*

Bees: *POSHBEE*

International cooperation : *SIRCAH (=secretariat of STAR-IDAZ IRC)*

ERA-NET: *SusAn (marginally); CORE Organic cofund (partly)*

Thematic networks: *EuroDairy, EU PIG*

Plant health under Horizon 2020 / SC2

29

Projects or expected
contracts

161 M€

Contribution UE
2014-2020

370

Participations in selected
projects

Key themes and projects (calls 2014-2017)

Breeding for resistance: *NEURICE*

Integrated pest/weed management : *nEUROSTRESSPEP, EUCLID, TROPICSAFE, IWMPRAISE*

Diagnostics : *VALITEST*

Emerging pests and diseases : *PoNTE; XF-ACTORS (X. fastidiosa), HOMED, RUSTWATCH*

Alien/tropical pests/diseases: *EMPHASIS, MUSA*

Mycotoxins: *My Toolbox; MycoKey*

Innovations in plant protection: *VIROPLANT, SUPERPESTS, OPTIMA*

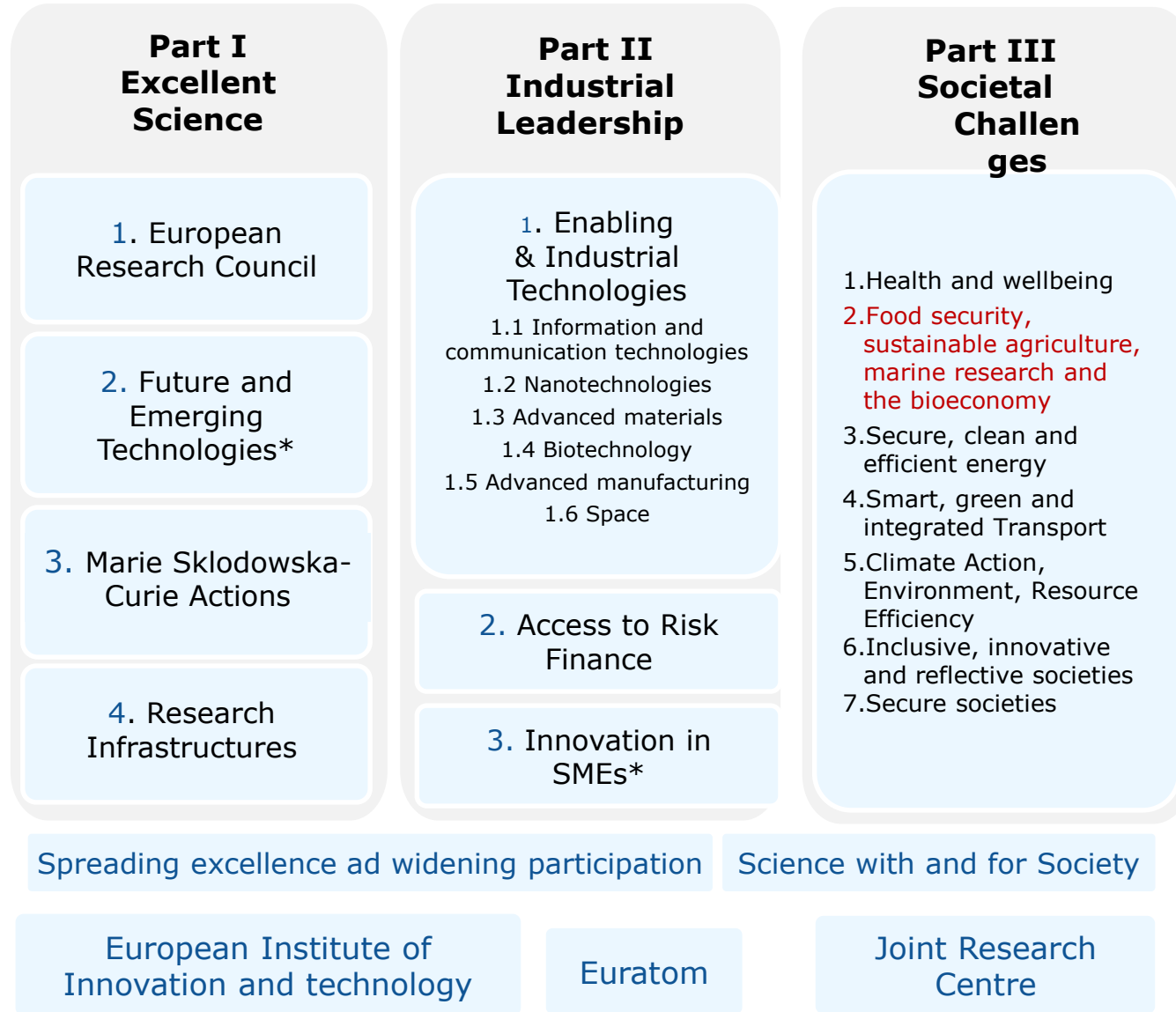
Thematic networks: *WINETWORK, INNOSETA*

ERA-NETs: *CORE Organic cofund (partly); SusCrop (partly)*

Organic farming (covering animals as well): *RELCAS, Organic-Plus*

Horizon 2020 beyond SC2

- ✓ Marie-Curie (*bottom up approach*), e.g.
IF: PYANO; RISE : Ochravine control; ITN : Bingo
 - ✓ Infrastructures
VetBioNet , Transvac2, Infravec2, MIRRI, EVA
 - ✓ LEIT
ICT: e.g. *Phasmafood (Portable photonic smart system for on-the-spot food quality sensing)*
 - ✓ SME projects e.g.
Phase 1: Zoonomarks (SC1); SAL ETHVI (SC2) *LacDetect (SC2); SAFEMILK (SC2) etc*
Phase 2: *PanaMast (SC2); ProDairyWelfare (SC2) etc*
 - ✓ Other Societal challenges
COMPARE (SC1-SC2)
- Other parts
- ✓ EIT (*entrepreneurship and innovation*)
EIT Health; EIT Food
 - ✓ COST actions, e.g.
Animal&health: *ASF-STOP, NEOH, Euro-FBP, PiGutNet, COREMI, COMBAR etc*
Plant health: *NGS for the study and diagnosis of plant viral diseases in agriculture (FA1407); interactions between plants, microbes and arthropods to enhance crop protection and production (FA1405)*



*: FET Open and SME are part of EIC pilot from 2018, together with FTI and EIC Horizon Prizes

Expected projects and budget until end of Horizon 2020 (2014-2020)



Plant health

- 29 projects
- 161 M€



Animals & health

- 21 projects
- 179 M€



Why do research and innovation on plant health matter?

Plant health is under mounting pressure due to the increasing number and frequency of new and re-emerging pests resulting from intensification, globalisation, trade development and climate change, which increase their potential to establish themselves and spread. The introduction and spread of plant pests are a serious threat that can have far-reaching economic, social and environmental consequences. European agriculture and forestry need to be granted sufficient means to cope with

the above-mentioned threats to ensure their vital functions, avoid trade disruptions and ensure consumer confidence in food by mitigating the potential risks to plant health. Tackling numerous and highly dynamic biotic threats requires integrated approaches and the development of a wide range of tools for prevention, monitoring, control and management of pests and diseases along with risk management strategies. This includes seeking alternatives to contentious pesticides.

Plant health under Horizon 2020 societal challenge 2



Key themes
 Integrated pest management – Emerging diseases – alternative to pesticides – ecosystem services

Why do research and innovation on animals and health matter?

Animal production is under constant pressure due to new and re-emerging pathogens resulting from globalisation, trade development and climate change. Transmissible animal diseases can have devastating impacts on agricultural sustainability as they entail production losses (up to 20% according to OIE), generate trade disruptions and affect the whole economy, as experienced with epidemic diseases like foot-and-mouth disease, avian influenza, African swine fever or endemic diseases (e.g. bovine tuberculosis). These pathogens can have a serious impact on human health and food safety: zoonoses (i.e. diseases that can be transmitted between animals and humans); antimicrobial resistance (estimated to be responsible for 25,000

deaths per year in the EU alone) and makes One Health an important approach. Diseases are detrimental to animal welfare and their control is key to improving overall production efficiency. Honeybee health is critical not only for apiculture but also for ecosystem services (pollination). European agriculture needs sufficient means to fight diseases and develop practices that would prevent their occurrence in the first place. It requires integrated approaches and the development of a range of tools for prevention, monitoring, control along with risk management strategies. This includes ensuring prudent use of anti-microbials and seeking alternatives to anti-microbials.

Animals and health under Horizon 2020 Societal challenge 2



Key themes
 Host-pathogen interaction; Vaccinology; One Health; anti-microbial resistance; International cooperation



And additional factsheets



Why do research and innovation on animal production matter?

Growing population, rising income and global shifts towards consumption patterns which are richer in animal proteins will further increase pressures on agricultural resources. Research and innovation will tackle the various dimensions of resource use, looking at approaches at the level of animals, of agro-ecosystems and throughout value chains. Implementation of circular economy principles will lead to better ways of valorising and using residues and by-products by farms e.g. feed for livestock, fertiliser from manure. It is also expected to change farm management and result in a reduction of natural resource inputs. The knowledge and tools developed will serve to decrease the role of livestock sector in the depletion of natural resources. In the livestock sector, the relationship between animal feed and feeding and health needs to be further investigated. In addition, the possibilities for improving animal welfare, e.g. through more appropriate management (including human-animal relationship in farming), need to be further explored.

Animal production under Horizon 2020 Societal challenge 2



Why do R&I on sustainable, circular and innovative value chains matter?

Sustainable, diverse and resilient value chains are a prerequisite for sustainable rural growth, for food security and for the sustainable use of biological resources. Food and non-food supply chains operate in an increasingly complex and dynamic environment characterised by new consumer demands, new and sometimes game-changing technologies, changing structures and cooperation modes. The use of new and innovative business models can generate higher income for producers while keeping consumer prices affordable and improving the delivery of environmental and social benefits. Research has a role to play in unravelling the links between the complexity of food systems and their efficiency, resilience and sustainability. It needs to help understanding food chain dynamics and the interaction between them and non-food chains. Farmers and foresters have for a long-time produced non-food products. The need to decarbonise the energy sector to meet climate change goals is compounded with considerations of resource efficiency, and an increasing interest in green chemicals, green growth and circular economy. R&I in this area addresses low-carbon, short-chain or circular delivery systems for innovative bio-based applications, using a systems approach for the provision of biomass for all uses, whilst preserving the delivery of ecosystem services.

Sustainable, circular and innovative value chains under Horizon 2020 Societal challenge 2

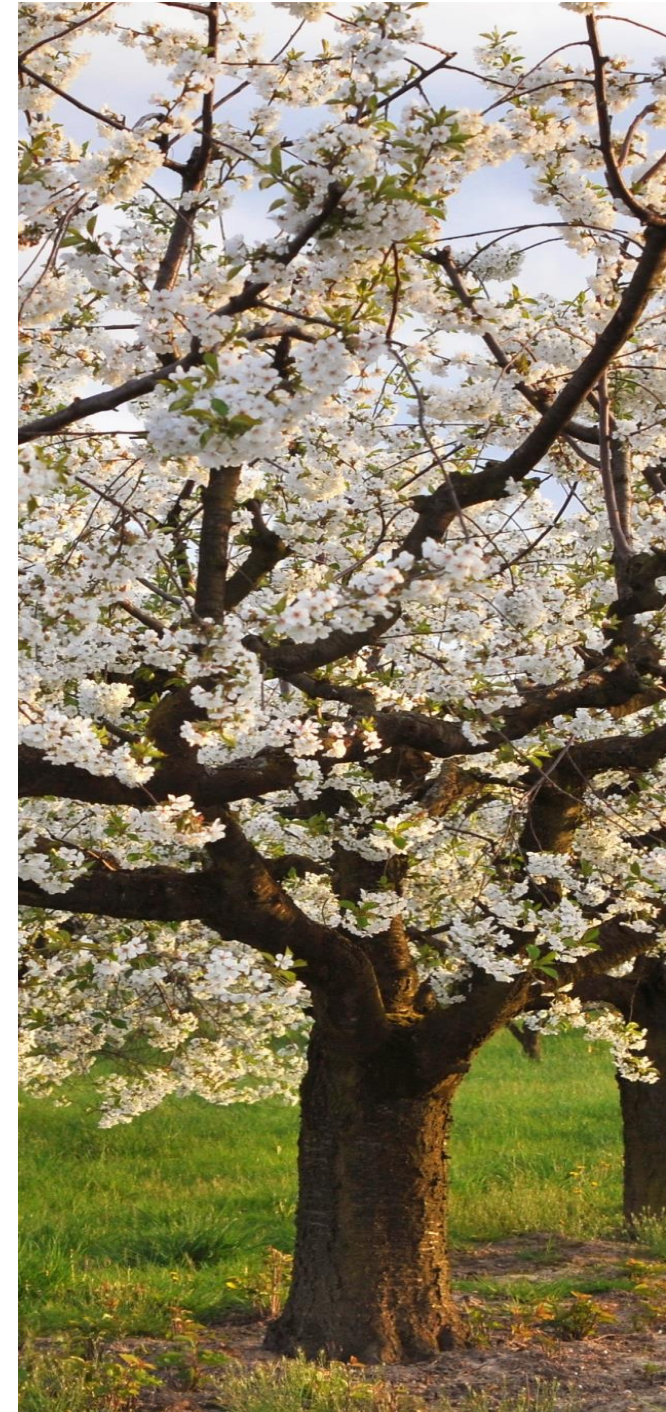


Soils 26 projects EUR 197 million <i>Soil functions; Soil water resources; Soil-improving cropping systems; Carbon sequestration</i>	Water, nutrients and waste 26 projects EUR 182 million <i>Water management; nutrient recycling; fertigation; waste valorisation; bioeconomy</i>	Plant health 29 projects EUR 161 million <i>Alternatives to pesticides; Ecosystem services; Emerging diseases; Integrated pest management</i>	Animal health 21 projects EUR 179 million <i>Host-pathogen interaction; Vaccinology; One Health; anti-microbial resistance; International cooperation</i>
Genetic resources and breeding 33 projects EUR 189 million <i>Biodiversity strategies; Genebanks; Landraces and value chains; Diversifying agriculture and forestry</i>	Animal production systems 22 projects EUR 132 million <i>Animal welfare; Feeding sustainability; Efficiency; Economic performance; Resource use</i>		
Ecological approaches and mixed farming 36 projects - EUR 213 million <i>Agroecology; Organic Farming; Biodiversity; Ecosystem Services; Landscape; Agriculture; Agroforestry; pollination; biocontrol; diversification; mixed farming; permanent grassland</i>			
Understanding dynamics and modernising policies 23 projects EUR 107 million <i>Food and nutrition security policies; Social innovation; Business models; Rural-urban relations; Generational renewal; Foresights; Modelling</i>	Public goods from agriculture and forestry 24 projects EUR 139 million <i>Biodiversity; Carbon sequestration; Drinking water; Governance and business models; Land management</i>	Sustainable, circular and innovative value chains 54 projects EUR 367 million <i>Integrated biomass logistics; food chain sustainability; food safety / quality / authenticity; short food chains</i>	
Taking advantage of the digital revolution 17 projects - EUR 163 million <i>Internet of things; Precision agriculture; Robotics; Services in rural areas</i>			
Human and social capital and innovation systems 53 projects - EUR 151 million <i>Agricultural knowledge and innovation systems (AKIS); Education and training; Advice; On-farm Demonstration; Networks; Knowledge exchange</i>			



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Horizon Europe: investing in R&I to shape our future

- The vision:
" a Europe that protects,
a Europe that empowers,
a Europe that defends"
Jean-Claude Juncker
- Tackling **climate change**
(35 % budgetary target)
- Helping to achieve **Sustainable Development Goals**
- Boosting the Union's
competitiveness and growth



Lessons Learned

from Horizon 2020 Interim Evaluation

Key Novelties

in Horizon Europe



Support breakthrough innovation



European Innovation Council



Create more impact through mission-orientation and citizens' involvement



R&I Missions



Strengthen international cooperation



Extended association possibilities



Reinforce openness



Open science policy



Rationalise the funding landscape



New approach to Partnerships



New approach to European Partnerships

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- **Simple architecture and toolbox**
- **Coherent life-cycle approach**
- **Strategic orientation**

Co-programmed

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe

Co-funded

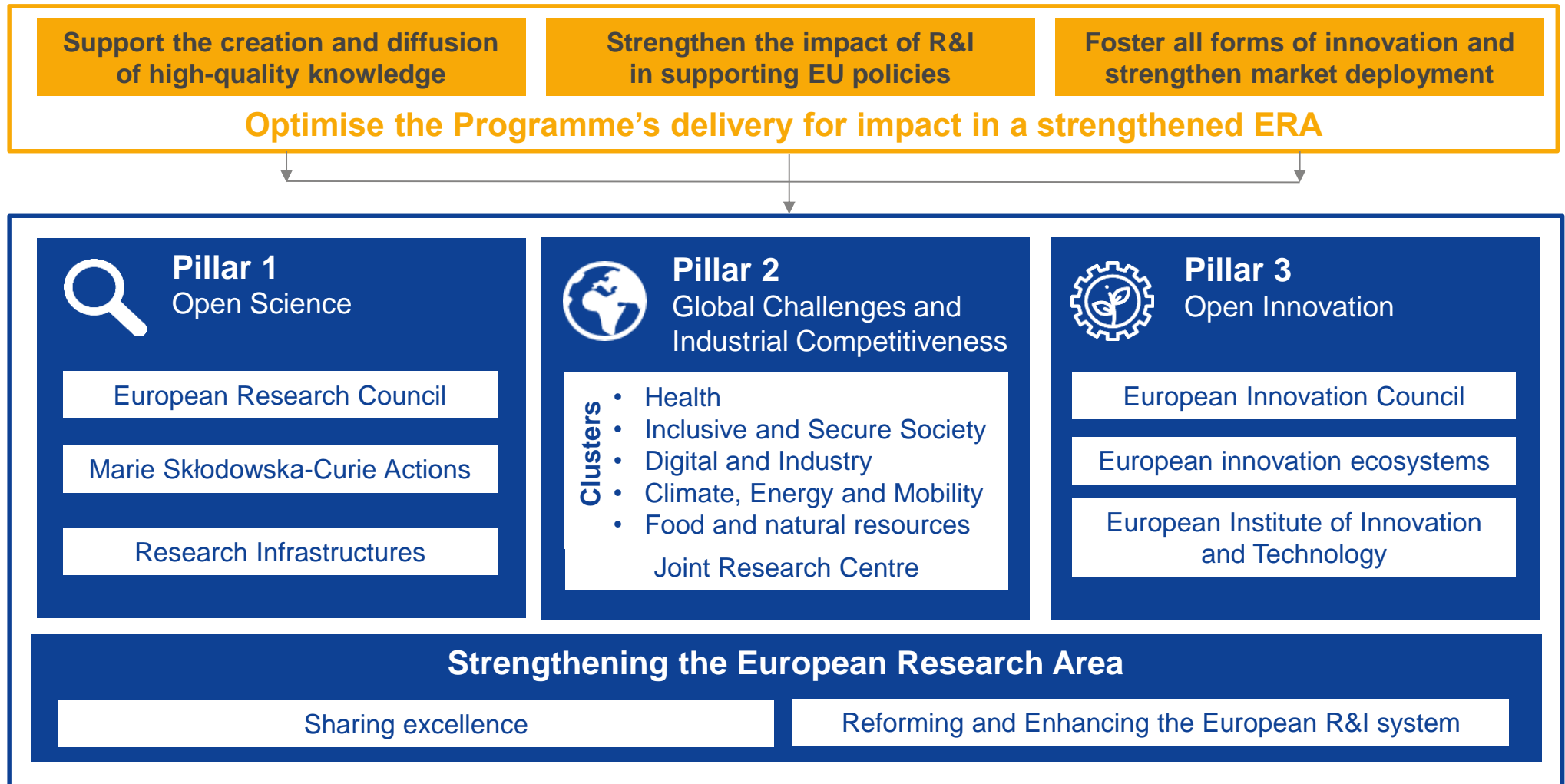
Based on a joint programme agreed by partners; commitment of partners for financial and in-kind contributions & financial contribution by Horizon Europe

Institutionalised

Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by Horizon Europe

Horizon Europe: evolution not revolution

Specific objectives of the Programme



Pillar 2

Global Challenges & Industrial Competitiveness:

boosting key technologies and solutions underpinning EU policies & Sustainable Development Goals

Clusters implemented through usual calls, missions & partnerships	Budget (€ billion)
Health	€ 7.7
Inclusive and Secure Societies	€ 2.8
Digital and Industry	€ 15
Climate, Energy and Mobility	€ 15
Food and Natural Resources	€ 10
Joint Research Centre supports European policies with independent scientific evidence & technical support throughout the policy cycle	€ 2.2

Clusters in 'Global Challenges and Industrial Competitiveness'

Clusters	Areas of intervention	
Health	<ul style="list-style-type: none"> * Health throughout the life course * Non-communicable and rare diseases * Tools, technologies and digital solutions for health and care 	<ul style="list-style-type: none"> * Environmental and social health determinants * Infectious diseases * Health care systems
Inclusive and Secure Societies	<ul style="list-style-type: none"> * Democracy * Social and economic transformations * Protection and Security 	<ul style="list-style-type: none"> * Cultural heritage * Disaster-resilient societies * Cybersecurity
Digital and Industry	<ul style="list-style-type: none"> * Manufacturing technologies * Advanced materials * Next generation internet * Circular industries * Space 	<ul style="list-style-type: none"> * Key digital technologies * Artificial intelligence and robotics * Advanced computing and Big Data * Low carbon and clean industry
Climate, Energy and Mobility	<ul style="list-style-type: none"> * Climate science and solutions * Energy systems and grids * Communities and cities * Industrial competitiveness in transport * Smart mobility 	<ul style="list-style-type: none"> * Energy supply * Buildings and industrial facilities in energy transition * Clean transport and mobility * Energy storage
Food and Natural Resources	<ul style="list-style-type: none"> * Environmental observation * Agriculture, forestry and rural areas * Food systems * Circular systems 	<ul style="list-style-type: none"> * Biodiversity and natural capital * Sea and oceans * Bio-based innovation systems

Pillar II: GLOBAL CHALLENGES AND INDUSTRIAL COMPETITIVENESS

Cluster 5: Food and Natural Resources (10 milliards €)

Intervention area 5.2.3 (one of 7) : Agriculture, Forestry and Rural Areas

Broad lines: e.g.

– Plant pests and diseases and animal health and welfare; alternatives to the use of contentious pesticides, antibiotics and other substances; – Antimicrobial resistance and threats from biological and agrochemical hazards as well as chemical contaminants tackling the links between plant, animal, ecosystems and public health from One-Health and Global-Health perspectives; ...

Intervention area 5.2.5: Food Systems

e.g. - Sustainable and healthy diets for people's well-being across their lifespan;
- Modern food safety and authenticity systems, enhancing consumer confidence in the food system; - Environmentally sustainable, circular and resource efficient food systems from land and sea, towards zero food waste throughout the entire food system, through reuse of food and biomass, recycling of food waste, new food packaging, demand for tailored and local food; ...

**Thank you for your
kind attention!**

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