



AGRI RESEARCH FACTSHEET EU AGRICULTURAL RESEARCH AND INNOVATION IN A NUTSHELL

From strategy to action

Developing a long-term view on agricultural research and innovation (R&I) needs, fosters the overall consistency, sequencing and impact of R&I activities. A strategic approach helps to ensure synergies between R&I activities and other EU policies and set a common direction with Member States and for international research cooperation. The strategic coordination with Member States is crucial as the resources devoted to agricultural research and innovation at EU level still represent only about 10% of Member States public investments in the same area. The strategic approach to EU agricultural research and innovation developed in 2015-2016 aims to harness EU investments to ensure food and nutrition security in the long term, address the environmental sustainability and resilience of land-based primary production and related food and non-food systems and to boost the sustainable growth of rural areas. The strategy is implemented through a synergistic approach mobilising both Horizon 2020 and the Common Agricultural Policy (CAP) under the umbrella of the European Innovation Partnership 'Agricultural productivity and sustainability' (EIP-AGRI). The EIP-AGRI aims to develop a comprehensive R&I ecosystem covering all aspects of knowledge creation, exchange and use by all concerned actors in agriculture, food and non-food value chains.

The implementation of the strategy mobilises a variety of Horizon 2020 instruments, covering the full spectrum of R&I

from basic research to innovation (one quarter of resources are directed to innovation actions). To increase and accelerate innovation impact, the so-called 'multi-actor approach', through which end-users, such as farmers and advisers, are involved in R&I from design to implementation of solutions, is used in around two-thirds of the projects. The strategy aims also to enhance synergies with Member States (in particular through European Joint Programmes) and, beyond EU borders, to boost coordination on priority themes at the global level (through the establishment of international research consortia). The use of a systems approach in about one-third of the projects reflects the will to carry out agricultural research in close connection with the wider societal context and challenges¹. Close links have been established with other parts of Horizon 2020 to achieve higher impact. In particular, strong synergies have been developed with Leadership in enabling and industrial Technologies (LEIT) on Information and Communication Technologies (ICT), with which a number of large projects on digital transformation have been co-funded.

This factsheet² outlines the main features of strategy implementation through the already selected 150 Horizon 2020 projects of interest to agriculture, forestry and rural areas (calls 2014-2017) and the still expected projects under current and future calls (2018-2020).

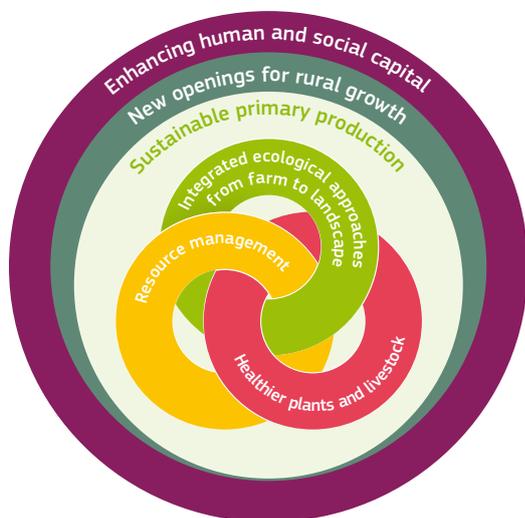
¹ It is also expected that relevant parts of EU agricultural R&I will contribute to the implementation of Food 2030 (SWD(2016)319 final).

² Statistics are based on topics of interest to agriculture, forestry and rural development, partly or fully funded by Horizon 2020 Societal Challenge 2 (2014-2020). Each grant is allocated to only one of the main five priorities. Only collaborative projects are covered (the SME instrument and Articles 185 and 187 initiatives are not counted). Financial contribution from other Horizon 2020 parts is included where relevant.

What has been implemented?

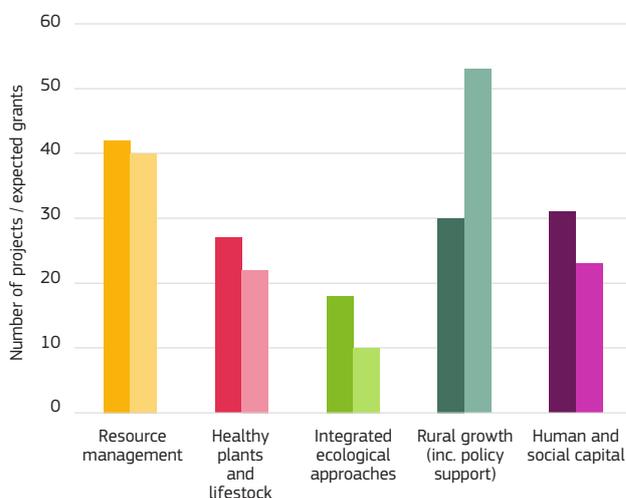
Strategic priorities and sectors

Five strategic priorities



Nb of selected projects and expected grants per strategic priority

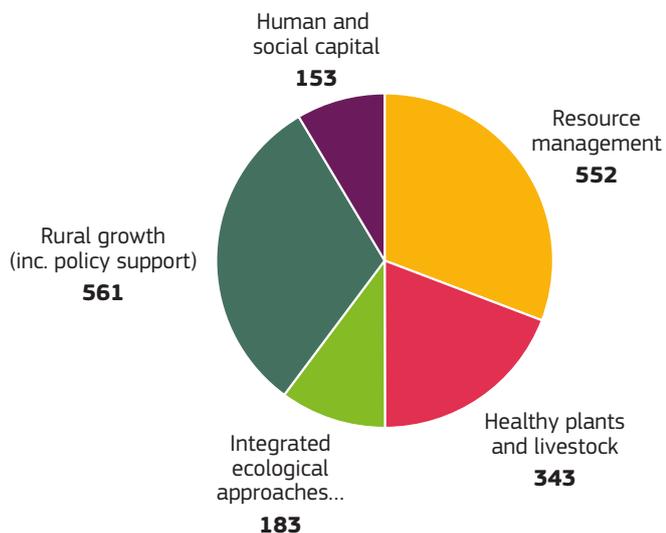
(left column: 2014-2017 - right column: 2018-2020)



Around 150 projects already selected, out of 300 expected in total

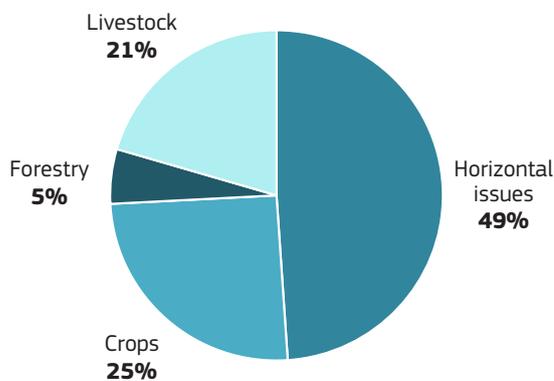
Distribution of budget over priorities

(EUR million - 2014-2020)



Balanced efforts between sustainable primary production and wider rural innovation

Distribution of budget between sectorial and horizontal themes



Balanced efforts between crops, livestock and Horizontal activities

Cross-cutting approaches



Systems approaches

1/3 of grants follow a systems approach
Food systems, land-use systems, innovation systems, integrated ecological approaches



Socio-economic research

30% of grants flagged SSH
2/3 of the grants following a value chain approach
Business models, policies, social innovation



Enabling sciences and infrastructures

EUR 33 million in Agri-aqua labs
Genomics, plant energy biology

Thematic clusters

Around 150 already selected projects (2014-2017) and 150 expected grants emerging from the 2018-2020 calls have been allocated to **one or more** thematic cluster. Twelve thematic fiches outline the projects and expected grants belonging to these clusters. Although these clusters can be al-

located to one main strategic priority, several of them have a cross-cutting nature and contribute to several priorities simultaneously, such as ecological approaches and digital transformation.

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

How is the strategy implemented? Highlights

Programming and improving the science-policy interface



- The development of the strategy helped to programme activities in a structured and sequenced way, building **clusters** of projects, facilitating **follow-up** and use of results and building a more efficient **science-policy interface** all along the programming cycle.
- Links with agricultural, environment, health, digital or circular economy policies were strengthened through inclusive programming and **co-funded calls** e.g. on digital farming.
- Streams of work in which projects build on one another, with several instruments used in synergy have been developed on e.g. demonstration farms, animal health or soil research.

Encouraging synergies with Member States research and innovation activities



- Beyond the EU investment of EUR 72 million in 11 European Research Area Networks (ERA-NETs), a novelty in agricultural R&I is the use of **European Joint Programmes** (EJP) which allow concentrating resources to structure research efforts and foster complementarities and synergies between the EU and Member States and between Member States.
- The **EUR 45 million EJP One Health** started operations in 2018. An **EJP on agricultural soil management in the context of climate change** is under preparation for 2019.
- Overall, **EUR 157 million** of EU investment will trigger an additional effort from the Member states worth **EUR 196 million**, plus better alignment and complementarities (2014-2020).

Joining forces to address climate change

Climate change is a global challenge that requires pooling resources and building synergies at European and international levels. The **Joint Programming Initiative on Agriculture, Food security and Climate Change** (FACCE-JPI - www.faccejpi.com), brings together 22 countries committed to build the European Research Area in this scientific domain. In addition to the supporting coordination action FACCE-Evolve, several actions enhance their work by providing co-funding from the EU on joint calls:

- The **ERA-Net FACCE SURPLUS** (2015-2020) works on sustainable and resilient agriculture for food and non-food systems. It organised two joint calls through which 22 projects have already been selected, with EUR 5 million of EU contribution adding up to the EUR 10 million invested by national funders. facceturplus.org

- The **ERA-NET FACCE ERA-GAS** works in a similar way with similar resources on Monitoring and Mitigation of Greenhouse Gases from Agri- and Silvi-Culture (2016-2021). www.eragas.eu

The **European Joint Programme on Agricultural soil management** foreseen under Horizon 2020 calls 2019 (SFS-20-2019) will trigger the further investment of EUR 80 million (half financed from the European Union). An additional ERA-Net on climate change and food systems will also be funded, bringing the total joint investment from EU and Member States in this area to EUR 150 million.

Building on a stronger European Research Area in soil research, an initiative aiming at moving towards the creation of an **International Research Consortium** on soil research is being explored by the project **CIRCASA**.

Developing international cooperation



- A key initiative in international cooperation has been the development of the **European Union – African Union partnership on food and nutrition security and sustainable agriculture** with an EU contribution in the range of **EUR 140 million** (FNSSA).
- A stream of activities has also been co-funded by the European Union and China as part of the **Food, Agriculture and Biotechnology (FAB) Task Force** with an EU contribution of **EUR 51 million**.
- Cooperation at the multilateral level is pursued in particular with the establishment of **international research consortia** (IRC) which allow coordination of global efforts in specific areas. The STAR-IDAZ IRC on animal diseases was launched in 2016. The cumulative intended commitment of its 25 members (including the European Commission) from most continents is over **two billion US\$**.
- **PRIMA** is a ten-year joint programme (based on Article 185 of the TFEU³) financed by Horizon 2020 (Societal Challenges 2, 5 and LEIT) and participating countries. It is focused on the development of solutions for food systems and water resources in the Mediterranean basin. www.prima-med.org

The EU and Africa working in Partnership

Several projects are on-going in the context of the EU-AU partnership on FNSSA. Examples include:

- The **ERA-NET LEAP-AGRI** is a partnership between nine African countries and nine European countries. It deals with sustainable intensification, nutrition and health and agricultural markets and trade.

- **INNOAFRICA** focuses on integrated innovation processes in smallholder agriculture to achieve food and nutrition security.

More information on EU-AU cooperation on Science and technology:

ec.europa.eu/research/iscp/index.cfm?pg=africa

The EU China FAB Flagship Initiative

The EU China research and innovation flagship initiative on food, agriculture and biotechnologies (FAB) is a comprehensive research and innovation cooperation programme to tackle sustainable agriculture, food security and safety in the EU and China.

Several topics are co-funded by China and the EU through Horizon 2020 work programmes on R&I themes of common interest. This has resulted in 13 co-funded ongoing projects and 7 more are planned to be co-funded by the

end of Horizon 2020. For instance, the project **EU-China-Safe** deals with food safety while the **EUCLEG** project focuses on breeding of forage and grain legumes. The project **SiEUGreen** will soon start and promote urban agriculture in Chinese and EU innovative green and smart cities.

More information on the FAB Flagship:

ec.europa.eu/research/iscp/pdf/policy/eu-china_research_in_fab.pdf

3. Decision (EU) 2017/1324 of the European Parliament and of the Council.

Boosting the implementation of research and innovation

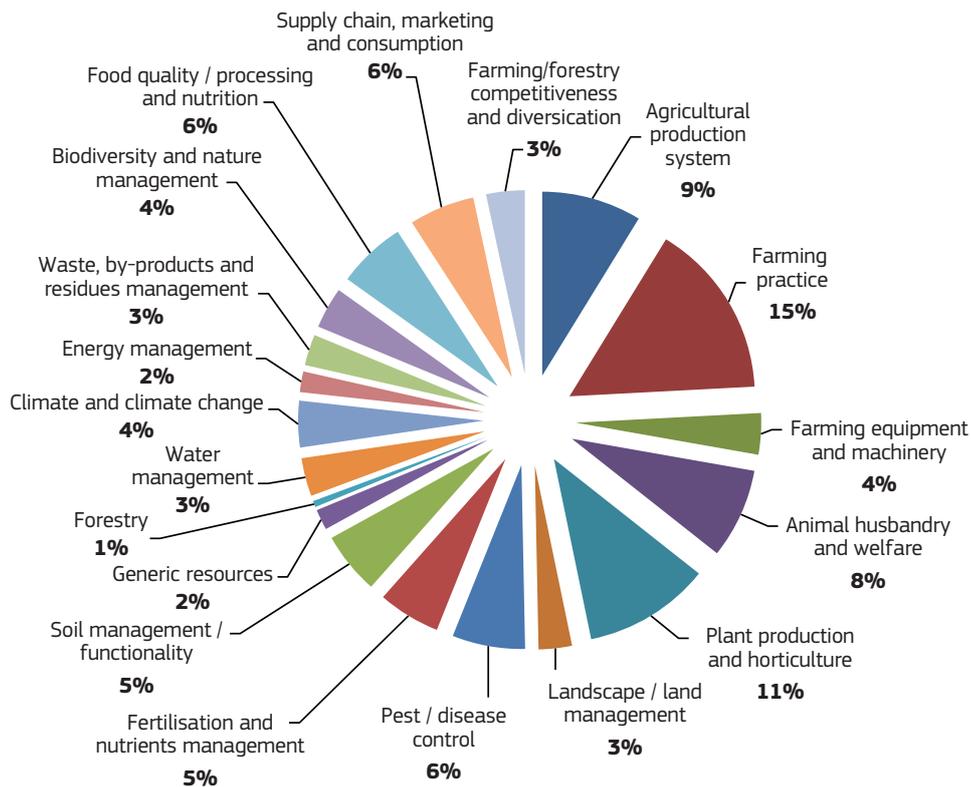


- With the EIP-AGRI, the interactive innovation model is set in motion by a variety of measures and instruments: **180 multi-actor projects** (including 40 thematic networks) worth **EUR 1 billion of EU contribution** programmed under Horizon 2020; **600 running operational groups** implementing innovation projects under the rural development programmes, many **'focus groups'** (expert groups) on a variety of subjects, **workshops** and **seminars** organised through the EIP AGRI network.
- The proportion of newcomers **was found to be 20% higher in multi-actor projects** than in projects funded under non-multi-actor topics. **One participant out of two in multi-actor projects is a newcomer** to the EU framework programme for research and innovation. Newcomers are in general farming or farm advice organisations, technical institutes, local authorities or development groups or other organisations closely related to the field.
- EIP-AGRI **'focus groups'** and **networking activities** have contributed to raise the number and diversity of newcomers participating in Horizon 2020 projects, while thematic networks and operational groups boost innovation uptake on the ground. Several EIP-Focus groups, e.g. on high-nature value farming or on new entrants into

farming contributed to form multi-actor communities which then successfully applied to Horizon 2020 calls.

- **Links between operational groups and Horizon 2020 projects are developing fast.** Several thematic networks such as EURODAIRY have triggered applications to calls for operational groups from rural development managing authorities. If approved, these operational groups are well placed to exploit the knowledge emerging from these thematic networks. The process can work also the other way round: the creation of the SHEEPNET thematic network for example was initiated by the pre-existing operational group Robustagno in France.
- Other EU programmes also contribute to the strengthening of the innovation ecosystem such as **INTERREG, LIFE, ERASMUS** or the **European institute of technology** with its knowledge and innovation communities. The European Regional Development Fund (ERDF) also helps strengthening R&I capacities. The creation of the **Smart Specialisation Platform on Agri-Food** helps regional authorities move towards joint investment in cross-regional activities. Strengthening synergies to improve impact is an important challenge.

What are EIP-AGRI operational groups working on?



Source: SFC, March 2018 (based on 364 OGs). Each OG can fall under several categories.

Leaving more space for new approaches



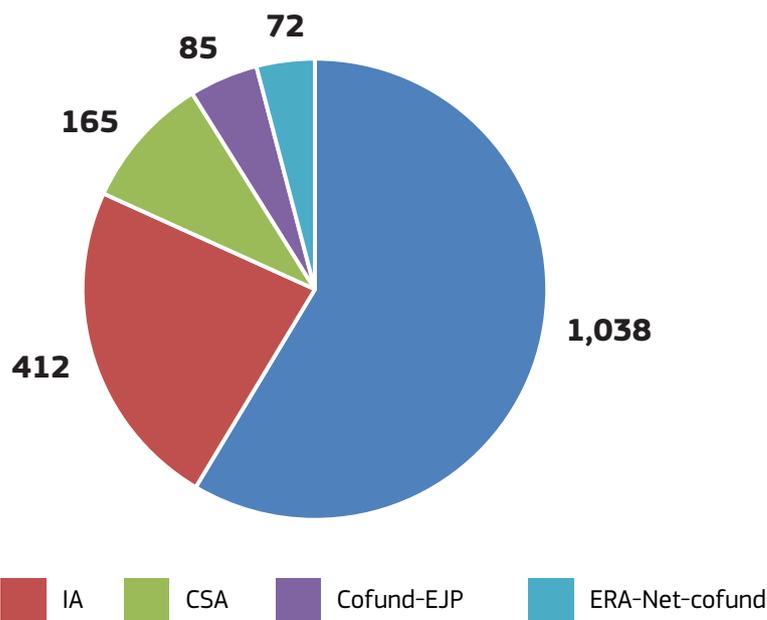
- Among other topics, **Agri-Aqua Labs**, from the work programme 2018-2020 provides funding for more fundamental research needs (EU contribution: EUR 33 million).
- New approaches to innovation (social innovation, new business models, new value chain organisational modes) have been supported in various projects.
- The use of **cascading calls** (for instance digital innovation hubs in agriculture) allows for the multiplication of bottom-up solutions in specific areas.

Developing synergies with the private sector



- EUR **412 million** have been invested in closer to market **innovation actions** (around 25%).
- The use of the multi-actor approach, which fosters participation of SMEs and other private companies in R&I activities, boosts participation of the private sector.
- A stream of activities developed in the call Rural Renaissance aiming at supporting **food and non-food value chains** leaves ample room for participation of private actors.
- Private for profit entities (excluding education establishments) represent **23% of participants** in SC 2 Horizon 2020 projects.
- 90 M€ from SC2 has been invested in the SME instrument in 2014-2017. In addition, a thematic investment platform on the circular bioeconomy is set up in 2018 (100 M€, half of which from SC2).

Distribution of SC2 H2020 budget between instruments (EUR million)



RIA: Research and innovation action
 IA: Innovation action
 CSA: Coordination and support action
 CO-Fund EJP: European Joint Programme Co-Fund
 ERA-Net-cofund: European Research Area Network co-fund

