



EU funded research on livestock production: from HORIZON 2020 to HORIZON EUROPE

*Feed-a-Gene final Conference,
Rennes, 22-23 January 2020*

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Agriculture
and Rural
Development

*The presentation shall neither be binding nor construed as constituting
commitment by the European Commission*

Outline

- *The current EU framework Programme for R&I: Horizon 2020*
- *Strategic approach to EU agriculture research & innovation*
- *Livestock production research: portfolio of H2020 projects (terrestrial animals)*
- *Multi-Actor Approach*
- *Insight into Horizon Europe*

THE EU FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

HORIZON 2020

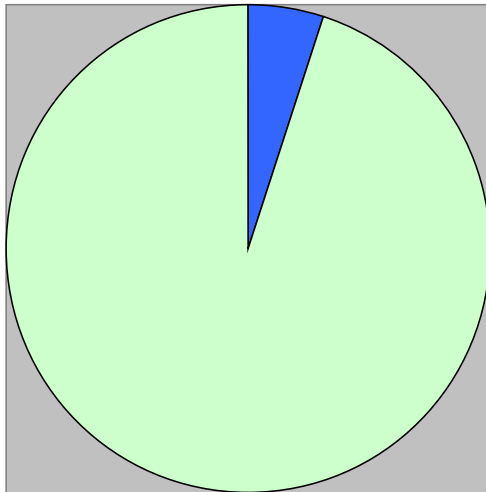
HORIZON 2020



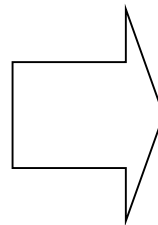
Budget €79 000 million
(current prices)

Duration 2014-2020

What is the EU Framework funding for research?



■ EU 27 ■ National (public + private)



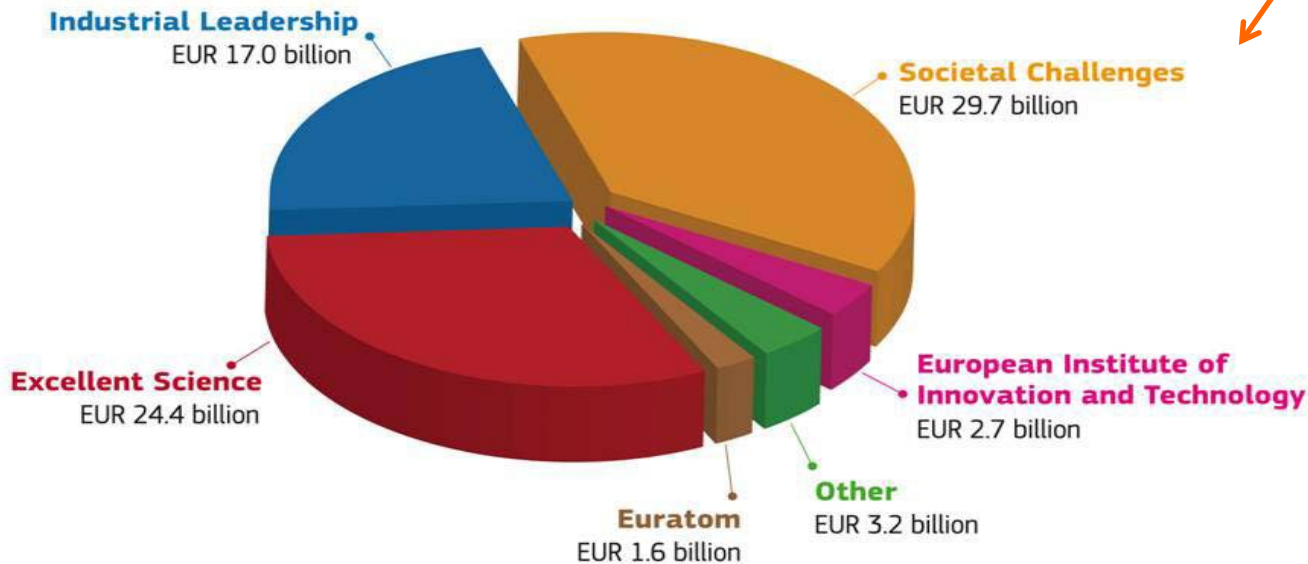
EU research funding has been crucial for:

- Transnational scientific collaboration
- Integration, pooling of resources
- Transfer of know-how, mobility of researchers and training

THE EU FRAMEWORK PROGRAMME FOR RESEARCH AND INNOVATION

HORIZON 2020

HORIZON 2020 BUDGET (EUR 78.6 billion, current prices)



Budget for SC2:
> €3,8 billion
around double
of FP7 budget

Biggest EU investment in Research and Innovation

Research and
Innovation



Structure of Horizon 2020

Part I Excellent Science

1. European Research Council
2. Future and Emerging Technologies
3. Marie Skłodowska-Curie Actions
4. Research Infrastructures

Part II Industrial Leadership

1. Enabling & Industrial Technologies
 - 1.1 Information and communication technologies
 - 1.2 Nanotechnologies
 - 1.3 Advanced materials
 - 1.4 Biotechnology
 - 1.5 Advanced manufacturing
 - 1.6 Space
2. Access to Risk Finance
3. Innovation in SMEs

Part III Societal Challenges

1. Health and wellbeing
- 2. Food security, sustainable agriculture, marine research and the bioeconomy**
3. Secure, clean and efficient energy
4. Smart, green and integrated Transport
5. Climate Action, Environment, Resource Efficiency
6. Inclusive, innovative and reflective societies
7. Secure societies

Spreading excellence and widening participation

Science with and for Society

European Institute of Innovation and technology

Agriculture
and Rural
Development

Euratom

Joint Research Centre

SC2 activities:

Co-management DG RTD - DG AGRI



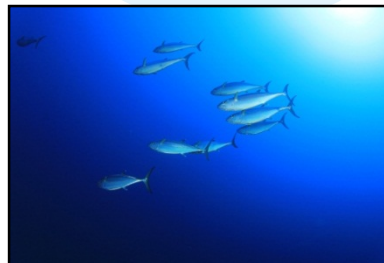
2.1
Agriculture
and forestry

2.2 Agri-food
sector for a
safe and
healthy diet

2.3 Aquatic
living
resources

2.4 Bio-
based
industries
and
bioeconomy

2.5 Marine
and
maritime
research



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Strategic approach to EU agricultural R&I



O B J E C T I V E S



ensure food and nutrition security in the long term

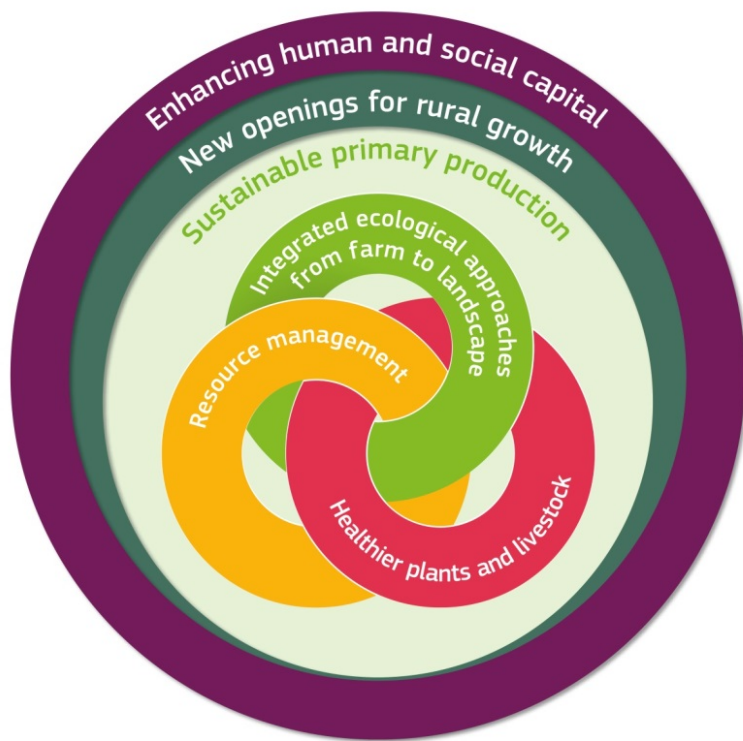


address the environmental sustainability and resilience of competitive land-based primary production for food and non-food systems

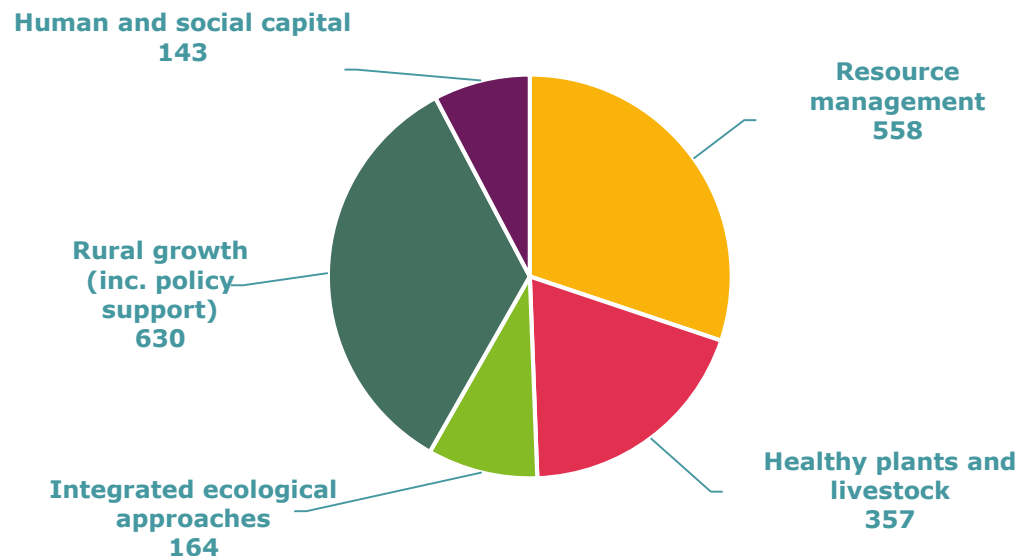


boost the sustainable growth of rural territories

Strategic R&I priorities



Distribution of budget over priorities
(EUR million - 2014-2020)



315 projects – 1,9 M€ under Horizon 2020

From strategy to action: 12 big themes under H2020

https://ec.europa.eu/agriculture/research-innovation/documents-links_en



Update June 2019

Livestock : preliminary statements

- 1. European agriculture is characterised by its diversity: landscape, production systems, farm size, livestock vs crop production, food cultures, standard of living...**
 - **No single challenge, no single solution**
- 2. Animal agriculture/industry is part of a complex and dynamic production system, part of an economy, part of a territory, part of society: influences, challenges and opportunities depend on many drivers, global and local ones**
 - **Multifacted challenges**
- 3. EU is a large exporter of food products, still most of the production is consumed in EU: living with two strands...**

A safe operating space for Livestock? (RISE Foundation report)

#balancedlivestock

Adjustment on two fronts

1. Reduce negative impacts of livestock production

- Resource efficiency: feed, water, animal health and welfare
- Manure management, processing and reuse
- Reducing density and concentration of livestock
- Large scope for innovation in: breeding, nutrition, housing, pollution, waste capture & reuse

2. Shift and reduce consumption of livestock products

- Changing the species balance of consumption
- Substituting new protein sources: insect, algal, cultured
- Changing diets to less protein and plant based protein

**The indications are that route 1 alone is not sufficient.
Acting on current consumption is unavoidable.**

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H2020 projects on livestock production

At least 30 specialised projects (2014-2020)

Around 200 M€ contribution (2014-2020); mostly from SC2

Key themes

Animal production systems

Genetic resources/breeding; nutrition

Animal Welfare

Digital transformation

Sustainable circular and innovative value chain

Thematic Networks



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The Multi-Actor Approach

« *The value of an idea lies in the using of it* »

Thomas Alva Edison – inventor of the light bulb



Key elements of the Multi-actor approach

The most important **interactive innovation principles** are (as in EIP OGs):

1. To **focus on end-users' problems/opportunities** and develop innovative solutions which cover **real needs**. End-users like farmers, foresters or businesses will be more motivated to use the project results, because they were incorporated in generating them and therefore feel "**co-ownership**".
2. To bring together the **most relevant partners with the needed complementary type of knowledge** which helps solving problems and tackling opportunities e.g.: farmers, advisors, researchers, suppliers, processors, agencies and/or other actors.

Key elements of the Multi-actor approach

3. Partners **co-operate** and co-innovate **in project activities from the beginning till the end (co-decision)**. **End-users (OF THE PROJECT RESULTS)** and practitioners are to be involved, not as a study-object, but in view of using their entrepreneurial skills and tacit knowledge for developing solutions. **Building blocks for innovation are expected to come from practice as well as from science** and intermediaries. **End-users' co-ownership** of results **speeds up the acceptance and dissemination of new ideas**
4. The project should result in practical knowledge made easily understandable and accessible, which **feeds into the existing dissemination channels most consulted by end-users in countries**.

Key elements of the Multi-actor approach

5. For **EU wide communication**, this knowledge should also be assembled into a substantial number of '**practice abstracts**' in the **EIP common format**
6. **Connect with** regional and national innovative projects "**EIP Operational Groups**" working on similar topics. You can find them with the help of the EIP website:
<https://ec.europa.eu/eip/agriculture/en/publications/eip-agri-operational-groups-assessment-2018> (600 OGs in an Excel-file)

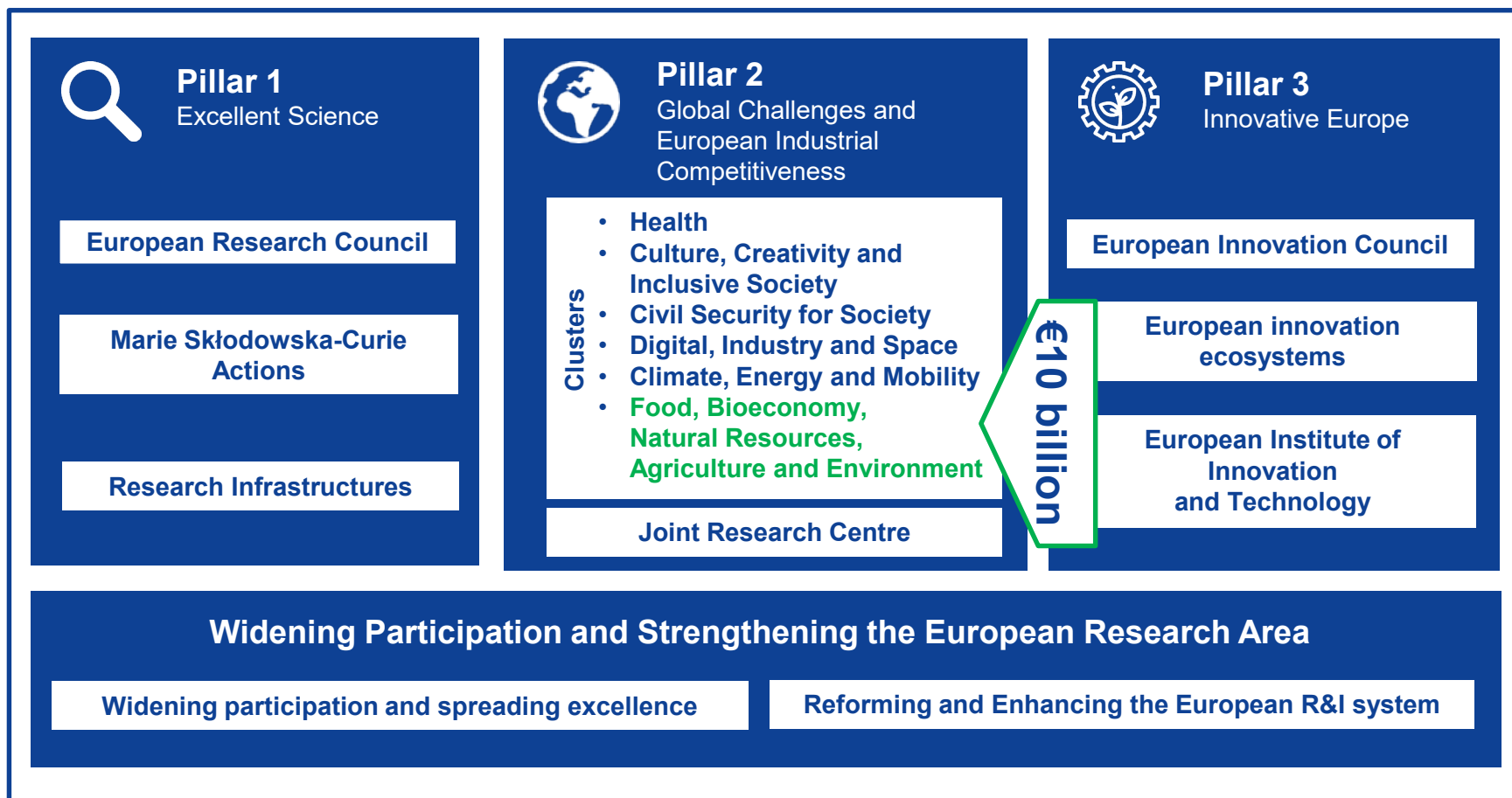
EIP-AGRI brochure on multi-actor projects:

<https://ec.europa.eu/eip/agriculture/en/publications/eip-agri-brochure-horizon-2020-multi-actor>

Outline

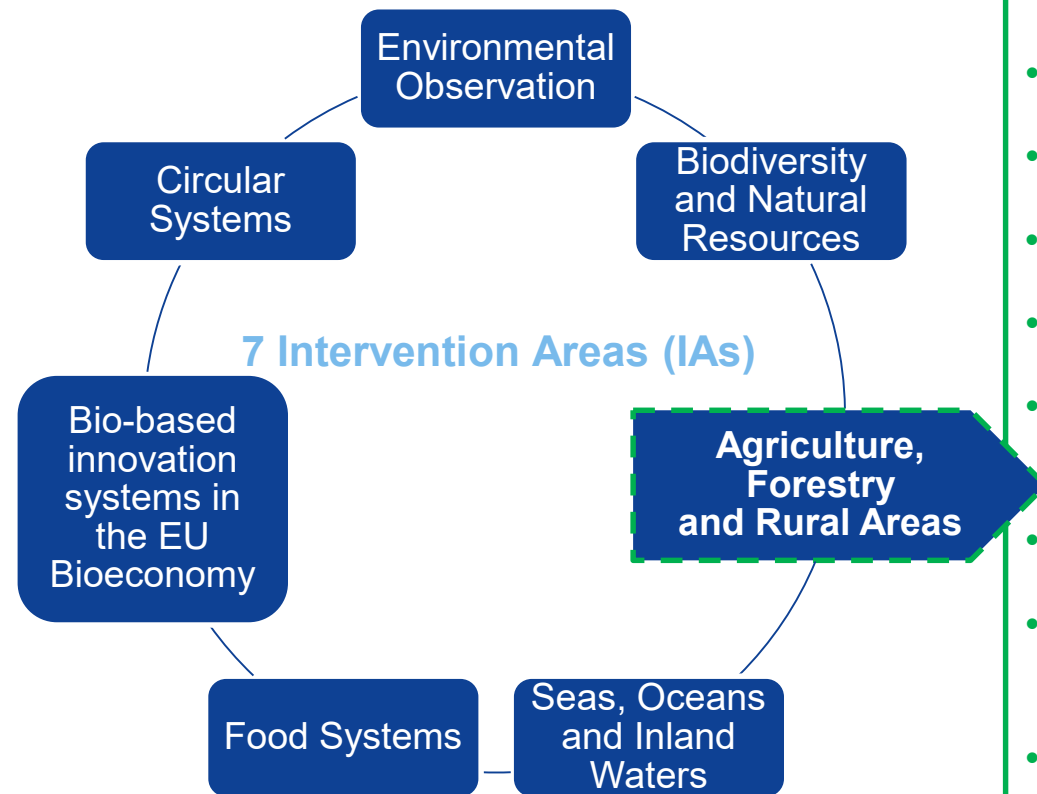
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Horizon Europe: structure



Proposed overall budget: €100 billion; around 50% on Pillar 2

What is in it?



- Sustainable management and efficient use of natural resources
- Climate mitigation and adaptation
- Plant health
- Animal health and welfare
- Use and delivery of ecosystem services
- Sustainable forest management
- EU plant protein production
- Sustainable land use, rural development and territorial linkages
- Digital innovations
- AKIS; advice, building skills, participatory approaches and information sharing
- International partnerships for sustainable agriculture for food and nutrition security

Challenges: six cross-cutting long-term impacts



Environmental Observation

Biodiversity and Natural Resources

Agriculture, Forestry and Rural Areas

Seas, Oceans and Inland Waters

Food Systems

Bio-based innovation systems in the EU Bioeconomy

Circular Systems

Priorities: short- & medium term impacts



Environmental
Observation

Biodiversity
and Natural Resources

**Agriculture, Forestry
and Rural Areas**

Seas, Oceans
and Inland Waters

Food Systems

Bio-based innovation
systems in the EU
Bioeconomy

Circular Systems

**Short-
& medium-term
impacts**

short- & medium-term impacts



- **climate- and environmentally-friendly practices in farming** and forestry systems
- “de-fossilisation” of land-based primary production
- LULUCF activities in the mitigation of climate change
- forest management
- **diversity in farming** and forestry systems
- **better-adapted** crop varieties and **animal breeds**
- climate neutral and resilient rural communities
- **resource use efficiency** in agriculture and forestry and alternatives to scarce resources
- circular economy: better linking rural and urban resource flows, small-scale bio-based solutions, innovations at the interface between agriculture, aquaculture, forestry

short- & medium-term impacts



- farming and forestry systems that protect, restore and enhance agrobiodiversity, wild biodiversity and ecosystem services across a range of scales
- **implementation and upscaling of agro-ecological approaches in primary production**, including organic and mixed farming or agroforestry



- conservation, management and use of agrobiodiversity
- impacts of primary production on biodiversity, identify the ecological boundaries of the bioeconomy
- nature-based solutions to enhance biodiversity
- **prevent, monitor and control animal and plant pests and diseases including emerging risks, and to address antimicrobial resistance**



- safe and environmentally friendly methods for plant protection and weed control that substantially reduce the use of contentious pesticides
- **improved animal health and welfare**



short- & medium-term impacts



- **sustainability-oriented redesign of food and non-food value chains,**
- fairer distribution of value added and better balanced power relations,
- reconnected producers, consumers and nature,
- revalued environmental, health and socio-economic impacts
- strategies and policies to describe and close the divide between rural and urban areas and benefit rural dwellers and workers and generational renewal in farming and rural communities, with special attention to vulnerable groups
- digital services and skills, co-created with and for rural people
- social networks, social capital and social innovation processes and allow for innovations in rural communities that support the sustainability agenda locally



short- & medium-term impacts



- **data, knowledge base and impact measurements** for improving monitoring and evaluation of EU policies addressing agriculture, forestry, related value chains and rural areas in the period 2021-2027 and beyond
- observation networks of European forests
- Agricultural knowledge and innovation systems (AKIS)
- place-based innovations, strengthening synergies with other EU Funds in particular smart specialisation strategies, reinforcing the multi-actor approach and establishing a network of living-labs in agro-ecology
- ICT as an enabler, allowing to build an open digital environment and supporting bottom-up innovation in agriculture, forestry, related value chains and rural areas

Towards the first Horizon Europe Work Programme 2021-2022



**Summer
2019**

Early involvement and exchanges with Member States,
Online consultation with stakeholders and the public at large,
Establishment of Mission Boards

**Autumn
/ winter
2019/2020**

Co-creation at Research & Innovation Days 24 – 26 September,
Exchanges with the new European Parliament,
Envisaged endorsement by new Commission of Strategic Plan

**Spring
/summer
2020**

Drafting of Horizon Europe Work Programme 2021-2022
on the basis of the Strategic Plan

**November
2020**

Pre-publication of Work Programme 2021-2022
Opening of first 2021 calls

**December
2020**

Formal adoption of Work Programme 2021-2022



***"The best way to predict the future
is to create it"***
A. Lincoln

Thank you for your attention!

More about agricultural research and innovation:

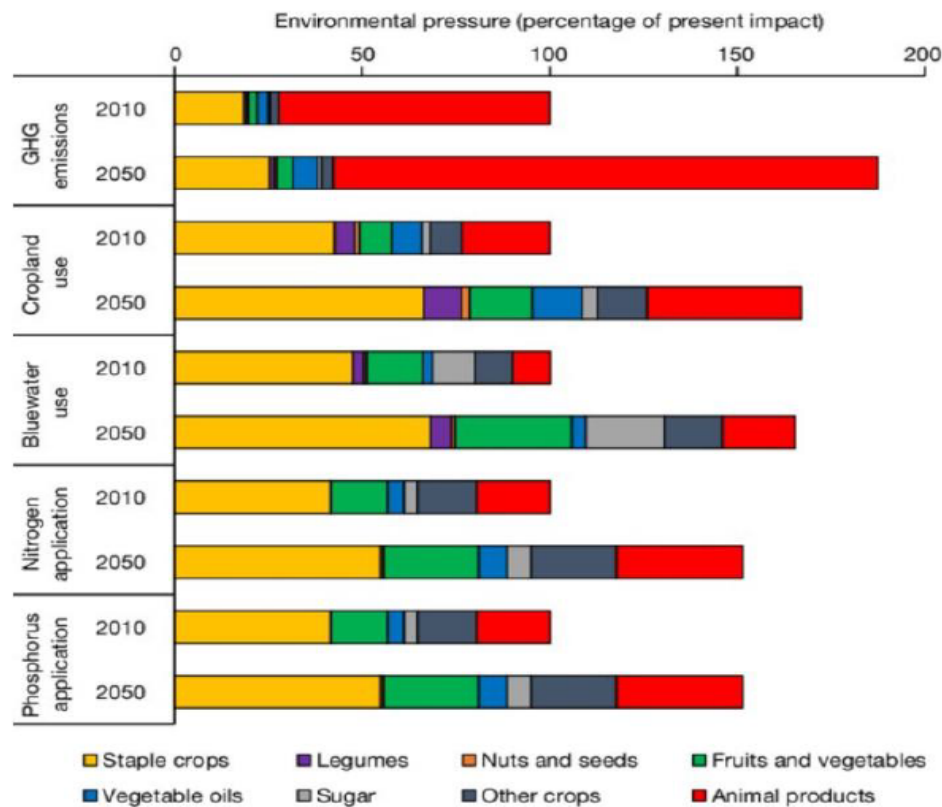
http://ec.europa.eu/agriculture/research-innovation/index_en.htm

www.eip-agri.eu



Additional information

A SIGNIFICANT CONTRIBUTION TO GLOBAL ENVIRONMENTAL ISSUES



Springmann et al., 2018

A safe operating space for Livestock? (RISE Foundation report)

Benefits and negative impacts of livestock

| | Benefit | Negative |
|---|-------------------------------|---------------------------------|
| 1 Human nutrition and health | Hi quality nutrients | Overconsumption |
| 2 Utilisation of pastures & by-products | Cultural landscape | Over-grazing |
| 3 Culture and livelihoods | We enjoy it! Provides jobs | |
| 4 Climate harm | | GHG emissions |
| 5 Nutrient cycles | Manure Agro-Eco | Water & air pollution |
| 6 Biodiversity | HNV systems | Simplification & specialisation |
| 7 Land use and soil degradation | | Pressure for feed |
| 8 AMR and Zoonoses | | Dangers for human health |
| 9 Animal welfare | Looking after animals | Treatment, housing, transport |

H2020 projects on livestock production

At least 30 specialised projects (2014-2020); around 190 M€ contribution (2014-2020); mostly from SC2

Key themes and *projects* (calls 2014-2019)

Animal production systems

- **SusAn ERA-NET** Sustainable Animal production 5M Euc (Mar. 2016 – Feb. 2021)
- **iSAGE** Innovation for Sustainable Sheep and Goat Production in Europe 7M Euc (Mar. 2016-Feb. 2020)
- **Microbiome: HoloFood** Holistic solution to improve animal food production through deconstructing the biomolecular interactions between feed, gut microorganisms and animals in relation to performance parameters 9.5M Euc (Jan. 2019 – Dec. 2022) Chicken&Salmon; also **CIRCLES** (6 food systems incl. poultry, pigs, aquaculture), **MASTER** (incl. rumen)
- **SUPER-G** Developing Sustainable PERmanent Grassland systems and policies 10M Euc (Jun2018 – May 2023)
- **CORE Organic Cofund ERA-NET: Organic Food and Farming Systems Cofund** 5M Euc (Dec.2016-Nov.2021)
- **RELACS: Replacement of Contentious Inputs in organic farming Systems (plants&animals):** e.g. reduce copper, mineral oil, manure from conventional farms, AMU in dairy cattle, provide alternatives to excessive use of anthelmintics in small ruminants



H2020 projects on livestock production

Key themes *and projects* (calls 2014-2019)

Genetic resources/breeding (/nutrition):

- **GenTORE** *Tools to Optimise Resilience and Efficiency Genomic management* 7M EUC (Jun. 2017- May 2022)
- **Treasure** *Diversity of local pig breeds and production systems for high quality traditional and sustainable pork chains* 3,4M EUC (Apr.2015-Mar.2019)
- **Feed-a-Gene** *Adapting the feed, the animal and the feeding techniques to improve the efficiency and sustainability of monogastric livestock production systems* 9M EUC (Mar.2015-Feb.2020)
- **Image** *Innovative Management of Genetic Resources* 7M EUC (Mar.2016-Feb.2020)
- **BovReg** *Identification of functionally active genomic features relevant to phenotypic diversity and plasticity in cattle* 6M EUC (Sept.2019-Aug.2023)
- **SMARTER** *SMAll RuminanTs breeding for Efficiency and Resilience* 7M EUC (Nov. 2018-Oct.2022)
- **GENE-SWitCH** *The regulatory GENomE of SWine and CHicken: functional annotation during development* 6M EUC (Jul.2019-Jun.2023)
- **GenRes Bridge**: *Joining forces for genetic resources and biodiversity management* 3 M Euc (Jan.2019-Dec.2021)



H2020 projects on livestock production

Key themes *and projects* (calls 2014-2019)

Digital transformation:

- **SmartCow** Integrated infrastructure for increased research capability and innovation in the European cattle sector 5M EUc (Feb. 2018 - Jan. 2022)
- **SmartAgriHubs** Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector 20M EUc (Nov. 2018-Oct. 2022).
- **IoF2020** Internet of Food and Farm 2020 30M EUc (Jan. 2017-Dec. 2020)



Sustainable circular and innovative value chain

- **Nutri2Cycle** Transition towards a more carbon and nutrient efficient agriculture in Europe 7M EUc (Oct. 2018 – Sep. 2022)
- **Fertimanure** Innovative nutrient recovery from secondary sources – Production of high-added value FERTILisers from animal MANURE 8M EUc (Jan. 2020- Dec. 2023)
- **NOAW** No Agro-Waste 6,9 M Ecc (Oct. 2016 – Sep. 2020); also **VALUEWASTE** or **WaysTUP!** (urban biowaste into food&feed, biobased fertilisers etc)
- **AGRIFORVALOR** Bringing added value to agriculture and forest sectors by closing the research and innovation divide 2M EUc (Mar.2016 - Aug. 2018)

Bees: B-GOOD; (POSHBEE)

H2020 projects on livestock production

Key themes and *projects* (calls 2014-2019)

Animal Welfare

- **PPILOW** Poultry and PIg Low-input and Organic production systems' Welfare 10M EUc (Sep 2019-Aug2024)
- **Clearfarm** Co-designed Welfare Monitoring Platform for Pig and Dairy Cattle 6M EUc (Nov. 2019- Sept. 2023)



Thematic Networkk (2M EUc each):

- **Hennovation**: laying hens and welfare (Jan. 2015 – Aug. 2017)
- **EURODAIRY**: sustainable dairy production (Feb. 2016 – Jan. 2019)
- **4D4F**: precision-dairy farming (Mar. 2016 – Aug. 2018)
- **EU Pig**: pig production (Nov. 2016 – Oct. 2020)
- **SheepNet**: sheep productivity (Nov. 2016 – Oct. 2019)
- **OK-NET EcoFeed**: monogastric animal feed (Jan. 2018 – Dec. 2020)
- **Bovine**: beef innovation (Jan. 2020 – Dec. 2022)
- **Inno4Grass**: grasslands (Jan. 2017 – Dec. 2019)

Animals and health under Horizon 2020 / SC2

24 SC2 projects (2014-2020); around 200 M€ contribution (2014-2020)

Key themes and *projects* (calls 2014-2019)

Vaccines/vaccinology :

- **SAPHIR:** *Strengthening Animal Production and Health through the Immune Response*
- **PARAGONE:** *vaccines for animal parasites (helminths and ectoparasites of ruminants&poultry)*
- **VACDIVA:** *A safe DIVA vaccine for African Swine Fever control and eradication*

Host-Pathogen Interaction, epidemiology :

- **DELTA-FLU :** *Dynamics of avian influenza in a changing world*
- **PALE-Blu:** *Understanding pathogen, livestock, environment interactions involving bluetongue virus*
- **PIGSs :** *Program for Innovative Global Prevention of Streptococcus suis*

Control/Emerging threats :

- **DEFEND:** *Addressing the dual emerging threats of African Swine Fever and Lumpy Skin Disease in Europe*

Diagnostics :

- **Swinostics :** *Swine diseases field diagnostics toolbox*
- **Vivaldi :** *Veterinary Validation of Point-of-Care Detection Instrument*

Animals and health under Horizon 2020 / SC2

Key themes and *projects* (calls 2014-2019)

One Health/ AMR:

- **OneHealth EJP co-fund:** *Promoting One Health in Europe through joint actions on foodborne zoonoses, antimicrobial resistance and emerging microbiological hazards; €45mio EUC; Jan2018 – Dec2022*
- **HealthyLivestock:** *Tackling Antimicrobial Resistance through improved livestock Health and Welfare;*
- **ROADMAP:** *Rethinking Of Antimicrobial Decision-systems in the Management of Animal Production; Jun2019 – May2023*
- **AVANT:** *Alternatives to Veterinary ANTImicrobials - Jan2020-Dec2024*
- **RELACS:** *Replacement of Contentious Inputs in organic farming Systems (plants&animals)*
- **DISARM (TN):** *Disseminating Innovative Solutions for Antibiotic Resistance Management*

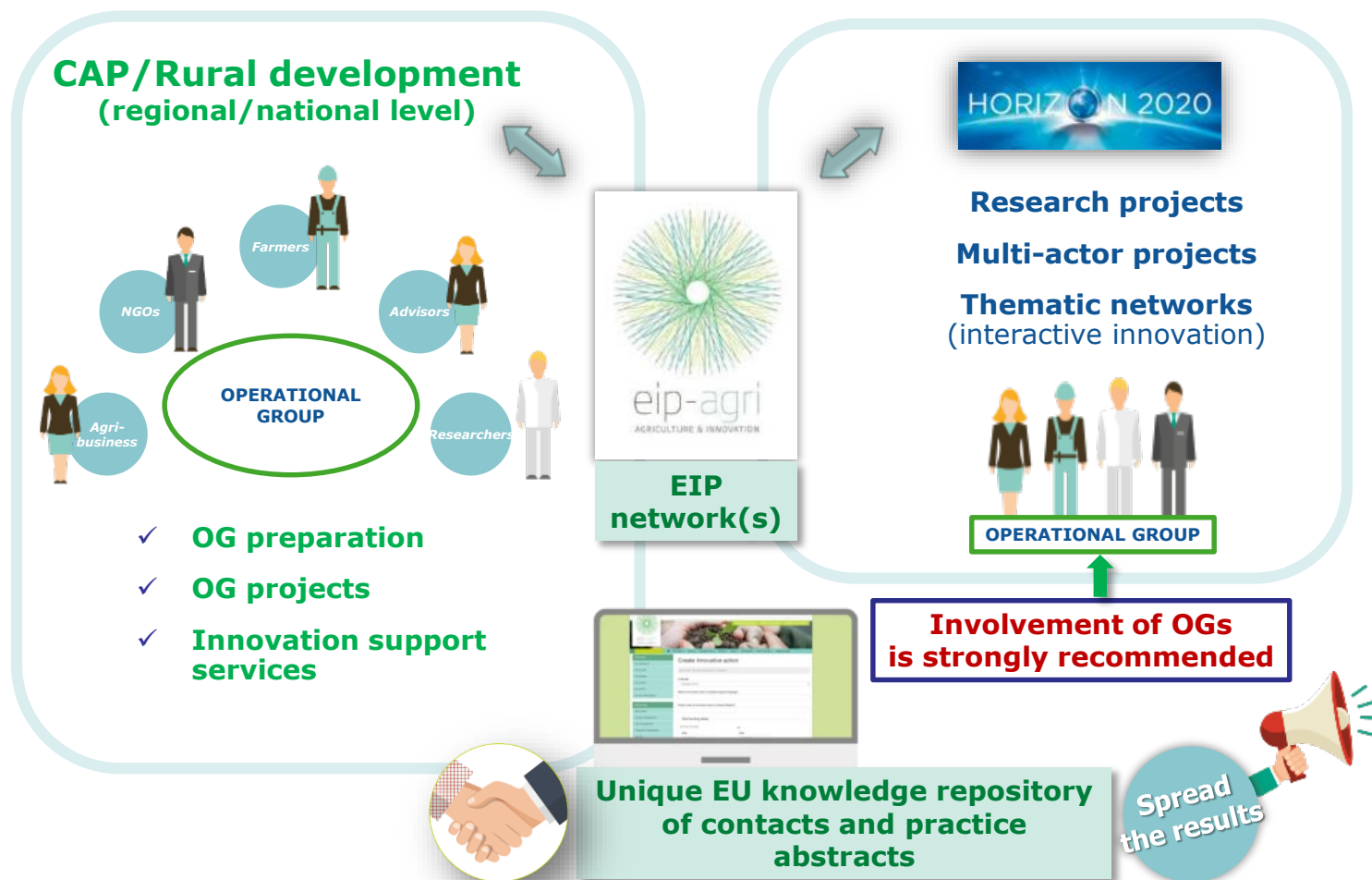
Bee health: POSHBEE; B-GOOD

International cooperation: SIRCAH (=secretariat of STAR-IDAZ International Research Consortium)

ERA-NET co-fund: ICRAD (*international coordination of research on infectious animal diseases*)

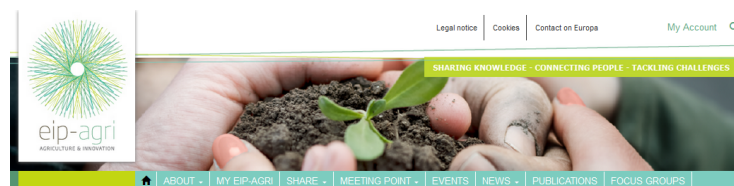
Additionally, in other parts of H2020: e.g.SC1 (e.g. COMPARE, IMI-2 : ZAPI); Infrastructures (e.g. VetBioNet); MSCA (e.g. Treat2ReUse- animal waste treatment to reduce GHG); COST (e.g. ASF-STOP, NEOH, Euro-FBP, PiGutNet, COREMI) ...

Connecting policies: the bigger EIP picture



The EIP common format & practice abstracts

- set of basic elements characterising the project includes one (or more) "practice abstract"(s)
- Two main objectives:
 - enable contacting partners and exchange knowledge
 - disseminate results to practitioners in a concise and easy understandable way
- Can be used to provide information all along the life-cycle of the project:
 - Start: explain what you are going to do
 - Mid-term: update
 - End: disseminate results
- Counts as a "deliverable"



European Commission > EIP-AGRI > EIP-AGRI common format

EIP-AGRI common format

The interactive innovation approach under the European Innovation Partnership Agricultural Productivity and Sustainability (EIP-AGRI) fosters the development of demand-driven innovation, turning creative new ideas into practical applications thanks to interactions between partners, the sharing of knowledge and effective intermediation and dissemination.

Read more about the EIP-AGRI Common format for interactive innovation projects
Click here to Complete the EIP-AGRI Common format for interactive innovation projects

The EIP common format consists of a set of basic elements characterising the project and includes one (or more) "practice abstract"(s). The format was developed with two main objectives:

1. to enable contacting partners and incentivise efficient knowledge exchange, and
2. to disseminate the results of the project in a concise and easy understandable way to practitioners.

The common format allows providing information all along the life-cycle of the project. The content of the common format can be updated at any moment when useful, for instance in an intermediate phase of the project. Project information should at least be available at the beginning (describing the situation at the start of the project, including project title and objectives) and at the end of the project (describing the results/recommendations resulting from the project, including a final project report and one or more practice abstracts).

| Attachment | Size |
|---|----------|
|  eip_common_format_16_oct_2016.xls | 770.5 KB |

<https://ec.europa.eu/eip/agriculture/en/eip-agri-common-format>

- **Short and easily understandable title (native and English) (one key sentence, max 150 char.)**
- **Short practice info in easily understandable language (max 1500 char.)**
= 'practice abstracts' (PAs):
 - Objective of the project in English and native language
 - Short summary for practitioners in native language on the outcomes (1000-1500 characters) (in English optional but preferred)
 - Main results/outcomes of the activity (expected or final)
 - The main practical recommendation(s)
- **Contact data:** Project coordinator (+ contact details), text editor, project partners (+ address, e-mail, telephone), geographical location, project period, funding source & budget, link to project website and to a website where info stays long-term available

R&I Missions are...

Portfolios of actions
across disciplines

intended to achieve a bold,
inspirational and measurable
goal within a set timeframe

with **impact** for society and
policy making as well as
relevance for a significant part of
the European population and
wide range of European citizens.



Adaptation to climate
change, including societal
transformation



Healthy
oceans,
seas,
coastal and
inland
waters



**5 Mission
areas**



Cancer

Climate-neutral
and smart cities



Soil health
and food



New approach to European partnerships: overview

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

Key features

- Simple architecture and toolbox
- Common set of criteria
- 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



Portfolio of candidates for European Partnerships (44)

HEALTH

EU-Africa Global Health
Innovative Health Initiative
Chemicals Risk Assessment
Fostering an ERA for Health research
Large-scale innovation and transformation of health systems in a digital and ageing society
Pre-clinical / clinical health research
Personalised Medicine
Rare Diseases

DIGITAL, INDUSTRY AND SPACE

High Performance Computing
Key Digital Technologies
Smart Networks and Services
AI, data and robotics
Photonics Europe
Clean Steel - Low Carbon Steelmaking
European Metrology
Made in Europe
Carbon Neutral and Circular Industry
Global competitive space systems

PILLAR III AND CROSS-PILLAR

EIT Climate KIC
EIT Health
EIT Manufacturing
EIT Food
EIT InnoEnergy
EIT Manufacturing
EIT Raw Materials
EIT Digital
EIT Urban Mobility

Innovative SMEs

European Open Science Cloud (EOSC)

CLIMATE, ENERGY AND MOBILITY

Transforming Europe's rail system
Integrated Air Traffic Management
Clean Aviation
Clean Hydrogen
Built environment and construction
Towards zero-emission road transport
Mobility and Safety for Automated Road Transport
Batteries
Clean Energy Transition

FOOD, BIOECONOMY, NATURAL RESOURCES, AGRICULTURE AND ENVIRONMENT

Accelerating farming systems transition
Animal health: Fighting infectious diseases
Environmental Observations for a sustainable EU agriculture
Rescuing biodiversity to safeguard life on Earth
A climate neutral, sustainable and productive Blue Economy
Safe and Sustainable Food System for People, Planet & Climate
Circular bio-based Europe
Water4All: Water security for the planet

4 additional partnerships (requests from Member States), including
OH AMR (Cluster 1)