Horizon Europe research program for agriculture

- *Special focus on Digital and Data technologies* -

AgEng Conference
5 July 2021

Dr. Doris Marquardt, European Commission
DG AGRI – Unit B2, Research and Innovation

Selected framing conditions for digital transformation in agriculture in the EU
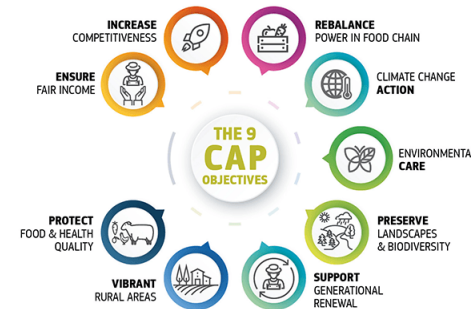
Code of Conduct on agricultural data sharing (2018)

Digital Declaration (2019)

A European Strategy for Data (2020)

Common Agricultural Policy post 2020

Green Deal & Farm to Fork

Digitalisation and R&I are key enablers…

| -50% | -50% | -50% | 25% | +10% | +3 bln | -55% | 100% |

From strategy to action: achievements so far

✓ **315 projects** – EUR 1,9 billion under Horizon 2020

✓ **190 H2020 multi-actor project**s (EUR 1 billion), including **29 thematic networks**; 50% newcomers

✓ 27 Member States implementing the EIP; over **2000** out of 3200 **OGs** already running

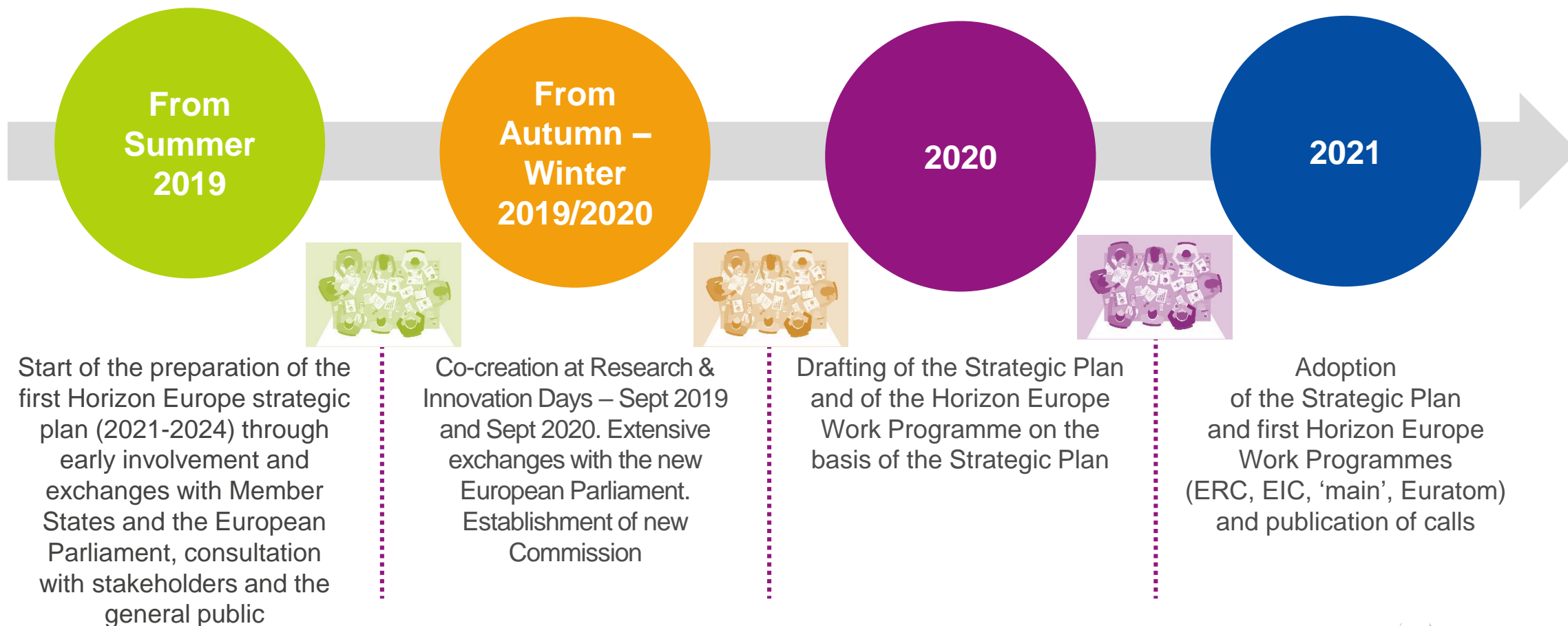✓ A growing and thriving **network** and increasing volume of practice-oriented knowledge and innovations
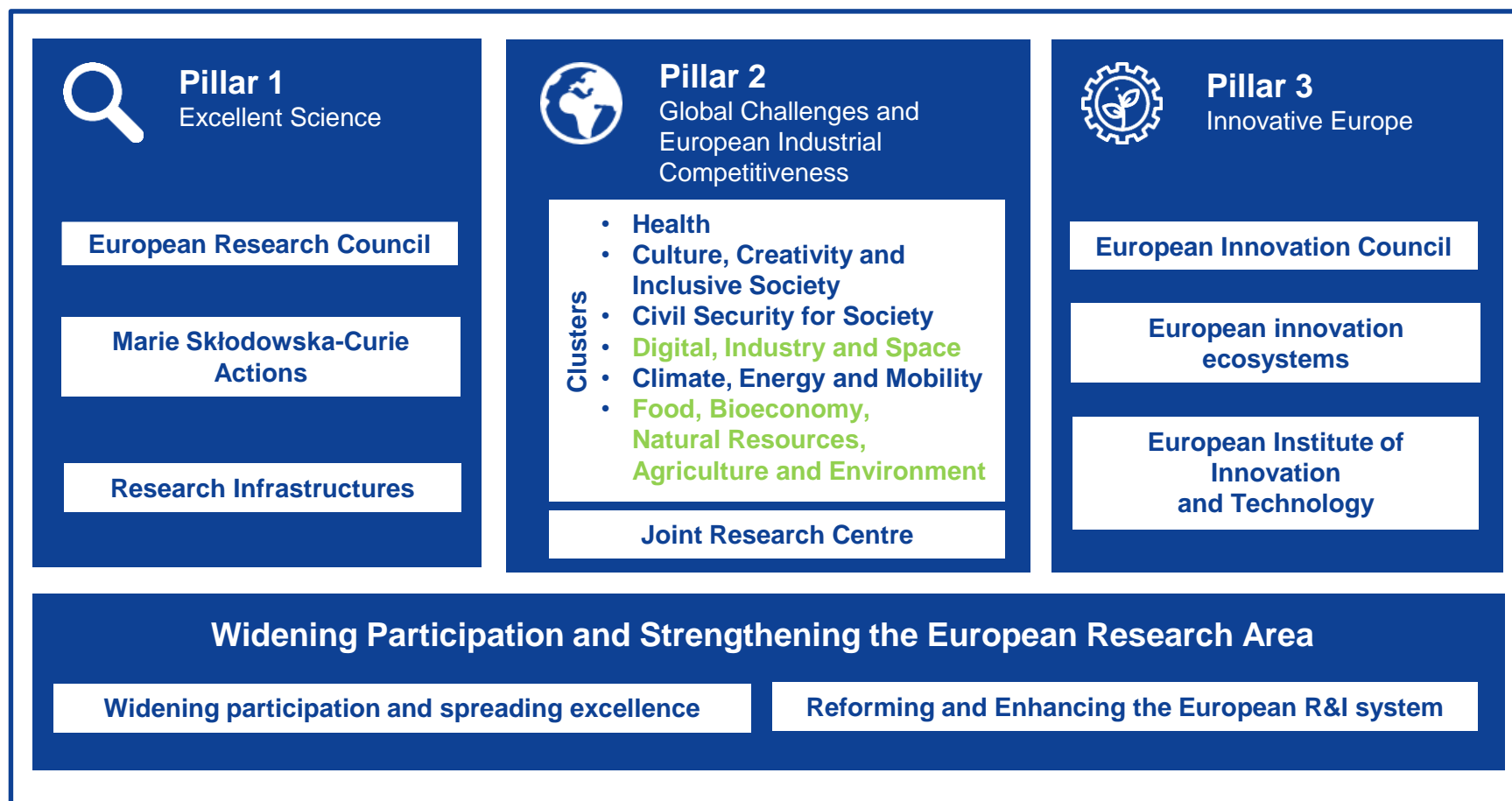

2014   2016   Today

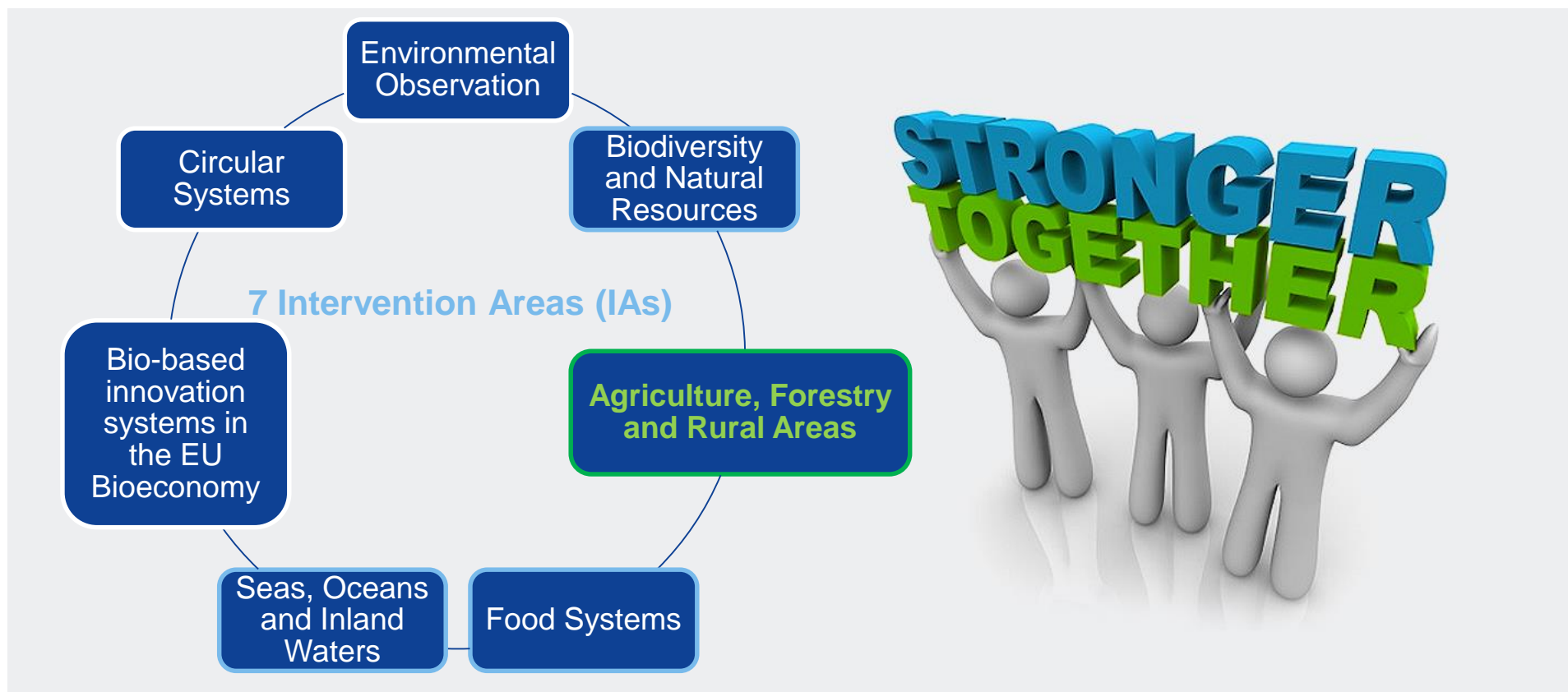# Steps towards the first Horizon Europe Work Programme

From Summer 2019

From Autumn – Winter 2019/2020

2020

2021

Start of the preparation of the first Horizon Europe strategic plan (2021-2024) through early involvement and exchanges with Member States and the European Parliament, consultation with stakeholders and the general public

Co-creation at Research & Innovation Days – Sept 2019 and Sept 2020. Extensive exchanges with the new European Parliament. Establishment of new Commission

Drafting of the Strategic Plan and of the Horizon Europe Work Programme on the basis of the Strategic Plan

Adoption of the Strategic Plan and first Horizon Europe Work Programmes (ERC, EIC, 'main', Euratom) and publication of calls

European Commission

Horizon Europe: structure & resources

Pillar 1
Excellent Science

European Research Council

Marie Skłodowska-Curie Actions

Research Infrastructures

Pillar 2
Global Challenges and European Industrial Competitiveness

Clusters
- **Health**
- **Culture, Creativity and Inclusive Society**
- **Civil Security for Society**
- **Digital, Industry and Space**
- **Climate, Energy and Mobility**
- **Food, Bioeconomy, Natural Resources, Agriculture and Environment**

Joint Research Centre

Pillar 3
Innovative Europe

European Innovation Council

European innovation ecosystems

European Institute of Innovation and Technology

Widening Participation and Strengthening the European Research Area

Widening participation and spreading excellence

Reforming and Enhancing the European R&I system

EUR 9 billion under Horizon Europe
for Cluster 6 "Food, Bioeconomy, Natural Resources, Agriculture and Environment"

European Commission

Cluster 6: structure & co-creation

We work with…

Environmental Observation

Circular Systems

Biodiversity and Natural Resources

7 Intervention Areas (IAs)

Bio-based innovation systems in the EU Bioeconomy

Agriculture, Forestry and Rural Areas

Seas, Oceans and Inland Waters

Food Systems

…and across clusters

European Commission

Expected impacts shape the WP destinations

Strategic Plan

Work Programme

IA3: Agriculture, Forestry and Rural Areas

Impact 1 Climate neutrality and adaptation to climate change

- Destination 5: Land, oceans and water for climate action

Impact 2 Preservation and restoration of biodiversity and ecosystems

- Destination 1: Biodiversity and ecosystem services

Impact 3 Sustainable and circular management of natural resources; tackling pollution; bioeconomy

- Destination 3: Circular economy and bioeconomy sectors
- Destination 4: Clean environment and zero pollution

Impact 4 Food and nutrition security for all from sustainable food systems from farm to fork

- Destination 2: Fair, healthy and environmentally-friendly food systems from primary production to consumption

Impact 5: Balanced development of rural, coastal and urban areas

- Destination 6: Resilient, inclusive, healthy and green rural, coastal and urban communities

Impact 6: Innovative governance models enabling sustainability, environmental observation

- Destination 7: Innovative governance, environmental observations and **digital solutions** in support of the Green Deal

Key R&I priorities for agriculture, forestry and rural areas

Destination 7 Governance, environmental observations and digital solutions in support of the Green Deal

- Innovative tools and methods to support effective **CAP Strategic Plans**
- EU agriculture within a **safe and just operating space**

- **<u>Digitalisation and Data technologies as enablers</u>**

- An EU-wide interactive **knowledge reservoir**
- Thematic & advisory **networks**

Note, digital technologies are also fostered in other Destinations to address specific subjects, e.g. R&I on digital tools for small farms is fostered under Destination 2

European Commission

Elaboration of topics in the field of Digital and Data technologies

<u>Scope</u>

- **Use of digital and data technologies for the digital transformation of Agriculture & Rural areas** (incl. support to policy implementation)
- Building on achievements, e.g. large-scale pilot projects supported under Horizon 2020 → targeted calls

- Need- not technology-driven (e.g. at farm and sectoral level)
- Technical focus supplemented by actions related to e.g.

  - Market research and business models

  - R&I on governance structures and socio-cultural aspects

- Supplementary to privately funded research

Digital and data technologies as enablers for sustainability transition in agriculture and food systems

Selected calls from the Cluster 6 Work programme 2021/22

2021

- Smart XG, last-mile and edge solutions for remote farming, forestry and rural areas
- Research & innovation roadmap for blockchain technologies in the agri-food sector
- Potential of drones as multi-purpose vehicle – risks and added values
- Assessing the impacts of digital technologies in agriculture – cost, benefits and potential for sustainability gains
- Development of the markets and use of digital technologies and infrastructure in agriculture – state of play and foresight: digital and data technologies for the agricultural sector in a fast changing regulatory, trade and technical environment
- Data economy in the field of agriculture – effects of data sharing and big data

2022

- Smart solutions for the use of digital technologies for small- and medium-sized, farms and farm structures
- Upscaling (real-time) sensor data for EU-wide monitoring of production and agri-environmental conditions

Supporting the digital transformation of agriculture, rural communities and policy systems

European Commission

HORIZON-CL6-2021-COMMUNITIES-01-03

SCOPE

Smart XG, last-mile and edge solutions for remote farming, forestry and rural areas

- Assessing the s**ocio-economic and environmental effects of innovative and existing 5G/4G/3G provision options** (at regional-, community-, and farm-level) and making them feasible for non-scientists

- **Developing innovative cost-effective and environmentally friendly solutions** to 5G-and last-mile provision in remote areas

- **Assessing the socio-economic and environmental effects** of **innovative and existing edge technology option**.

- **Developing innovative cost-effective and environmental friendly edge solutions** tailored to the needs of communities, farms and forestry, including an energy balance at system level.

- **Developing innovative business models** (including at systemic level and cross-sectoral approaches)

INDICATIVE BUDGET

5 mln EUR per project (**10 mln EUR** in total)

Important!

Multi-actor approach

More than one sector to be covered

European Commission

HORIZON-CL6-2021-FARM2FORK-01-07

SCOPE

Research & innovation roadmap for blockchain technologies in the agri-food sector

- **mapping and assessing existing blockchain technologies**, related European and international R&I activities and promoting their coordination in the field of agri-food;

- **assessing the extent of application** of blockchain technologies in the agri-food sector in the EU and globally

- **analysing the needs for R&I** on blockchain technologies in agri-food

- identifying gaps, priority areas and types of action for intervention

- **proposing methodologies to monitor and review** a portfolio of blockchain technologies related R&I activities in the field of agri-food

Funded activities are expected to **increase capacities** (technical, organisational) for implementing a major R&I programme on blockchain technologies in the agri-food sector, including

- a roadmap for R&I on blockchain technologies in the agri-food sector

- improved coordination with existing activities in Europe and globally

- informed development of policies, supported development of policies

INDICATIVE BUDGET

3 mln EUR per project
(**3 mln EUR** in total)

Important!

Legal entities established in non-associated third countries may exceptionally participate

European Commission

HORIZON-CL6-2021-GOVERNANCE-01-19

SCOPE

Development of the markets and use of digital technologies and infrastructure in agriculture – state of play and foresight: digital and data technologies for the agricultural sector in a fast changing regulatory, trade and technical environment

- **Development of innovative approaches to assess the uptake of digital technologies and digital infrastructure** (including platforms) in the agricultural sector;

- Development of innovative approaches to **forecast the markets and the uptake of digital technologies and digital infrastructure** under consideration of **fast-changing regulatory framing conditions** in the fields of data-, digital and machinery technologies and of agricultural policies;

- Demonstration of the **qualitative and quantitative implications for the use of digital and data technologies by farmers and other actors along the supply chain** in a way that demonstration results can be steadily adapted to changing framing conditions and allow for the reflection of scenarios.

INDICATIVE BUDGET

2 - 4 mln EUR per project
(**4 mln EUR** in total)

Important!

Multi-actor approach

European Commission

HORIZON-CL6-2021-GOVERNANCE-01-20

SCOPE

Data economy in the field of agriculture – effects of data sharing and big data

- **Quantitative and qualitative analyses of the effects of various data sharing and marketing and use options** for the actors along the agri-food supply chain and the development of scenarios for the data economy.

- **Implications of the ongoing policy-making process** at EU level including the development of relevant legislation.

- **Effects of multi-level governance systems in the EU** under consideration of the situation and conditions in various Member States as well as effects of international (trade) relations.

- **Consideration of multiple data-sharing business- and governance approaches and technical solution** in data sharing in the agricultural sector.

- **Consideration of climate adaptation and reducing administrative burden** in the assessment of the potential of agricultural data sharing for the sector and the society.

INDICATIVE BUDGET

2 - 4 mln EUR per project
(**4 mln EUR** in total)

European Commission

HORIZON-CL6-2021-GOVERNANCE-01-21

SCOPE

Potential of drones as multi-purpose vehicle – risks and added values

- **Stock-taking of innovation in the use of drones** as multi-purpose vehicle in agricultural production, forestry and the development of rural communities globally

- **Development of innovative approaches to use drones** and other remotely piloted aircraft systems as multi-purpose vehicle

- Assessment of the potential of drones in the agricultural sector and **socio-economic and environmental effects** under consideration of different **regulatory scenarios**

- Development of **business models to the use of drones** in agriculture, which may include agriculture / forestry / community development interlinkages

- Development of innovative approaches to assess **and reduce the risks related to the use of drones** in the agricultural sector, especially in the **context of spraying**

INDICATIVE BUDGET

6 mln EUR per project
(**12 mln EUR** in total)

Important!

Support to third parties possible

European Commission

HORIZON-CL6-2021-GOVERNANCE-01-22

SCOPE

Assessing the impacts of digital technologies in agriculture – cost, benefits and potential for sustainability gains

- **Demonstration of the costs and benefits for farmers/farms** of the use of digital technologies for individual production steps and for following a "whole-farm approach" under real testing conditions and with quantitative and qualitative assessments.

- **Analyses and developed assessment approaches** representative for the EU and several types of farms and farmers under consideration of different business models.

- Stock-taking of results of Horizon 2020 projects.

- **Provision of innovative decision-making support** on the selection and use of digital technologies.

- Generation of information and knowledge for the **design of policy measures.**

- **Recommendations, under which conditions/ in which way digital technologies deliver best results**.

INDICATIVE BUDGET

7.5 mln EUR per project (**15 mln EUR** in total)

Important!

Multi-actor approach

The JRC may participate as member of the consortium

European Commission

Horizon EU - Cluster 6 Work Programme 2021-2022 15 June

CHECK THIS OUT!

wp-9-food-bioeconomy-natural-resources-agriculture-and-environment_horizon-2021-2022_en.pdf (europa.eu)

EN

Horizon Europe

Work Programme 2021-2022

9. Food, Bioeconomy, Natural Resources, Agriculture and Environment

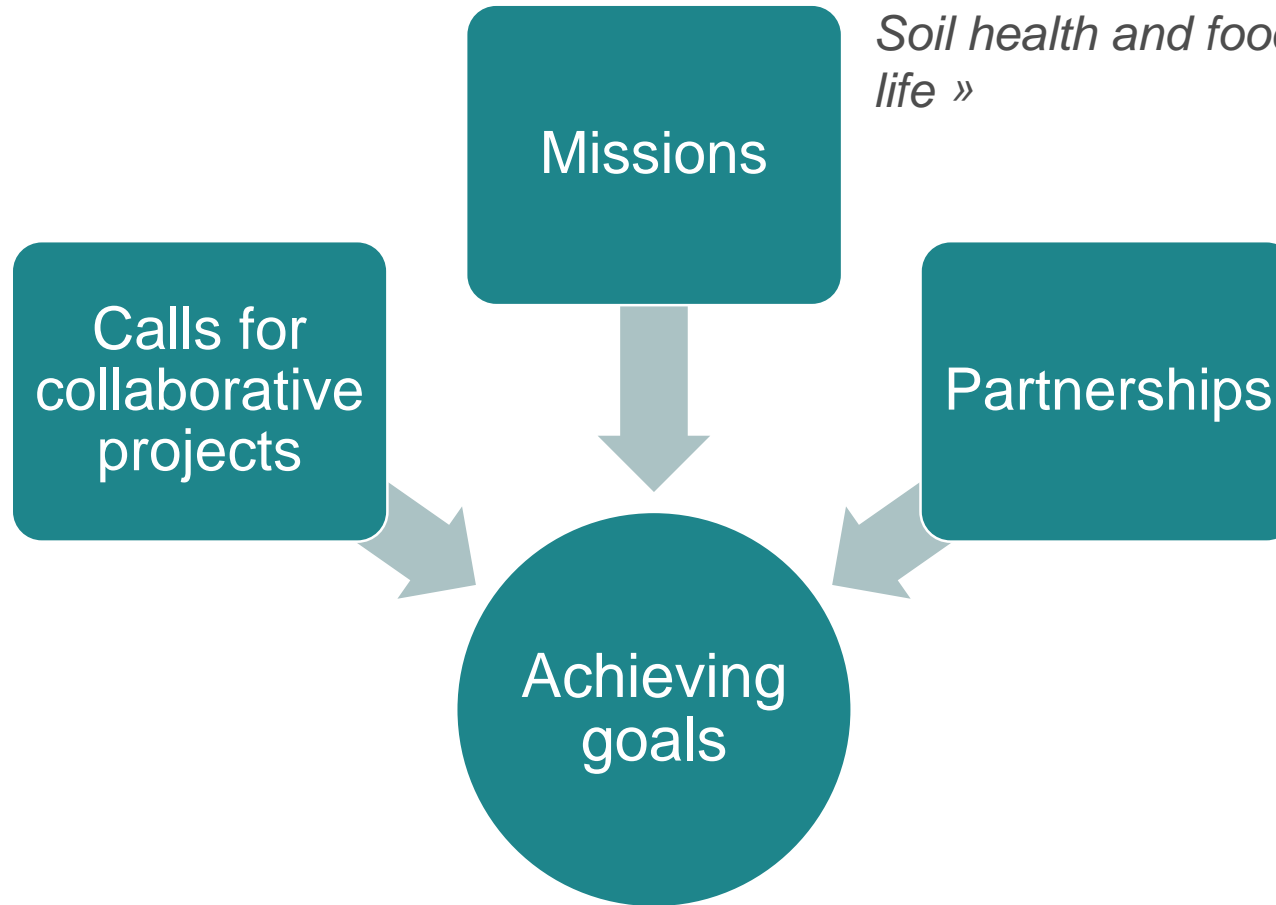*(European Commission Decision C(2021)4200 of 15 June 2021)*

EUROPEAN UNION

#HorizonEU

CLUSTER 6
FOOD, BIOECONOMY,
NATURAL RESOURCES,
AGRICULTURE & ENVIRONMENT

INFO DAYS
7-8 July
BROKERAGE
9 July

THE EU RESEARCH & INNOVATION PROGRAMME 2021 – 2027

R&I programme for 2021-2027 « Horizon Europe »
Various instruments to power the transition

Work programme for 2021-2022
15 June 2021

Large-scale portfolio of coordinated actions to reach a bold and inspirational objective, e.g.
Soil health and food: « Caring for soil is caring for life »

Missions

Calls for collaborative projects

Partnerships

Concerted R&I efforts with EU and Associated countries and/or private sector, foundations or stakeholders
→ *Agriculture of data*

Achieving goals

European Commission

Horizon Europe Candidate Partnership Agriculture of Data

Principle objective:

- Using the possibilities offered by data technologies in the field of Environmental Observation to

  - provide support to improve the sustainability performance of agriculture;

  - improve the capacities for policy monitoring and evaluation.

Timeline:

- Planned for the Horizon Europe work programme 2023/24

- Elaboration of the Implementation Plan and Strategic Research and Innovation Agenda with Member States and stakeholders in 2021/22.

- Series of webinars in April and May 2021.

European Commission

Horizon Europe components and the Digital Europe Programme (DEP)

Guiding distinction between components *(not legally defined)*

Cluster 4

Basic horizontal research on digital and data technologies relevant for all sectors/ several fields of application

Cluster 6

Addressing sector-/area specific needs with digital- and data technologies

Possible: Uptake of Cluster 4 results to be adapted to specific context

DEP

Pick up of research and innovation results close to market/ end-user-uptake (high level of maturity)

<u>Example:</u> Research **on AI** in Cluster 4, contextual research **with AI** in Cluster 6, Testing **of AI-based** innovation under DEP

Complementarity of EU programmes – Examples related to Innovation in Digital and Data technologies

Policy instrument/ Programme	Scope	Examples	Comments
Horizon Europe	**Research & Innovation**	Dedicated calls Partnership Agriculture of Data	Under Horizon Europe, especially Clusters 4 and 6 are relevant
Digital Europe Programme	**Innovation & Deployment** Capacity building	Digital Innovation Hubs Testing and Experimentation Facilities for AI Common Agriculture Data Space Advanced digital skills	Network of Digital Innovation Hubs in agri-food expected to establish links to network of EIP OGs
Common Agricultural Policy	**Application** Capacity building Innovation	Advisory services Training Investment support AKIS EIP AGRI	Link to Horizon through EIP-AGRI

European Commission

Information for (potential) applicants

- Horizon Europe Cluster 6 Work Programme

- Horizon Europe Cluster 6 Info Days (7 and 8 July)

- For any questions related to the preparation of proposals, National Contact Point or the Research Enquiry Service might be contacted.

- Horizon Europe candidate partnership Agriculture of Data

European Commission

Thank you