AGRIRESEARCH FACTSHEET

DIGITAL TRANSFORMATION IN AGRICULTURE AND RURAL AREAS

Why do research and innovation on digitalisation in agriculture and rural areas matter?

Digital and data technologies have the potential to revolutionise agriculture by helping farmers work more precisely, efficiently and sustainably. Data-driven insights can improve decision-making and practices and help increase environmental performance while making the job more attractive to younger generations. Digital technologies also have the potential to offer consumers greater transparency as to how their food is produced. They offer opportunities to renew business models in value chains by connecting producers and consumers in innovative ways. Beyond farming, digital technologies are key to make rural communities more attractive, smart and sustainable, reducing problems related to remoteness and improving access to services. Research and innovation are vitally important to facilitate and accelerate digital transformation in agriculture and rural areas for the benefit of European citizens and businesses. The EU has been active in the last years undertaking R&I activities laying the ground for digitalised and data-empowered European agriculture and rural areas. Strategic interventions support the uptake of digital technologies, increased R&I investments to develop new digital solutions and the crucial assessment of the socio–economic impacts of digitalisation.

Digital transformation in agriculture and rural areas under Horizon 2020 and Horizon Europe

CORDIS search keywords
digitalisation, digital transformation, digital technologies, digital solutions

Nb of projects
7 Horizon 2020
15 Horizon Europe

EU contribution
€ 63 million
€ 75 million

Figures comprise Horizon 2020 Societal Challenges 2 and Horizon Europe Cluster 6 projects, including Work Programme 2023-2024 expected projects / Selection of a few projects logos

Success stories dedicated to digital transformation in agriculture and rural areas

Smart solutions for agriculture

Several projects have developed innovative digital solutions in support of sustainable agricultural production, focussing of Internet of Things technologies, automation, robotics and decision-making support. An overview provides the use case catalogue set-up under the project **IoF2020** and taken over by the project **SmartAgriHubs**. The projects **ROMI** and **Pantheon** have developed robotic and decision-making support solutions for microfarms and hazelnut productions. The projects **ICAERUS**, **SPADE**, and **CHAMELEON** will explore the use of drones as multi-purpose vehicles, including for agriculture

The projects **CODECS** and **Quantifarm** aim at assessing the impact of digital technologies in agriculture.

Sustainable digitalisation in Rural areas

Boosting rural economies through digital platforms is the ambitions followed by the projects **Auroral** and **dRural**. They focus on multi-sectoral digital services, including .g. in health, energy, agriculture and tourisms. The projects **ICAERUS**, **SPADE**, and **CHAMELEON** will explore the use of drones as multi-purpose vehicles, including for rural areas. A precondition for the digitalisation in rural areas is connectivity. The projects **Xgain** and **COMMECT** develop and assess innovative connectivity solutions and their cost-effectiveness.

To achieve a sustainable digital transformation of rural areas, it is important to assess the impacts of digitalisation. The project **DESIRA** has developed approaches to assess the status of digitalisation in rural areas, as well as the socio-economic effects of digitalisation and elaborated a policy roadmap.

Capitalizing Data

Data is a key determinant of the effectiveness of many digital technologies. At the same time, digital technologies generate huge amounts of data. Through the application of data technologies, such as Artificial Intelligence (AI), “Big data Sets” can be further capitalised. To use the potential of data, it has to be systematically collected, stored and shared. The projects **DEMETER** and **ATLAS** have developed interoperability solutions in agriculture, allowing to link data from different sources and us it in different applications, e.g. decision making support tools for farmers. The project Divine will explore the application of the principles of the data economy in agriculture, and demonstrate e.g. the added value of data sharing in the sector. The projects **ScaleAgData**, **CrackSense**, and **AgriDataValue** will add value to locally generated data, e.g. farm data, through the upscaling of data to higher levels with regard to the geospatial outreach.

Horizon 2020 and Horizon Europe collaborative projects on digital transformation in agriculture and rural areas

Follow the CORDIS link for more information on the start-end date, EU contribution, coordinator and results.

Website	Project	CORDIS
DESIRA	Digitisation: Economic and Social Impacts in Rural Areas	818194
SmartAgriHubs	Connecting the dots to unleash the innovation potential for digital transformation of the European agri-food sector	818182
IOF	Internet of Food and Farm 2020	731884
NIVA	New IACS Vision in Action	842009
SmartAKIS	European Agricultural Knowledge and Innovation Systems (AKIS) towards innovation-driven research in Smart Farming Technology	696294
FAIRshare	Farm Advisory digital Innovation tools Realised and Shared	818488
4D4F	Data Driven Dairy Decisions 4 Farmers	696367
AfriCultuReS	Enhancing Food Security in AFRIcan AgriCULTUral Systems with the Support of REmote Sensing	774652
DEMETER	Building an Interoperable, Data-Driven, Innovative and Sustainable European Agri-Food Sector	857202
ATLAS	Agriculture Interoperability and Analysis System	857125
PANtHEOn	Precision faming of Hazelnut Orchards	774571
ROMI	RObotics for MIcrofarms	773875
dRural	Providing access to digital services throughout rural Europe	101017304
Auroral	Architecture for Unified Regional and Open digital ecosystems for smart communities and wider Rural Areas Large scale application	101016854
TRUSTyFOOd	Stakeholders-driven pathways for blockchain implementation in the agri-food sector	101060534
ScaleAgData	Scaling Agricultural Sensor Data for improved Monitoring of Agri-Environmental Conditions	101086355
CrackSense	Cracking the data to combat Fruit cracking	101086300
AgriDataValue	Smart Farm and Agri-environmental Big Data Value	101086461
Divine	DemonstratIng Value of agri data sharIng for boostiNg data Economy in agriculture	101060884
COMMECT	Bridging the digital divide and addressing the need of Rural Communities with Cost-effective and Environmental-Friendly Connectivity Solutions	101060881
Xgain	Enhancing Competitiveness, Resilience and Sustainability of Remote farming, Forestry and Rural areas through holistic assessment of Smart XG, Last mile and Edge solutions' gains	101060294
CHAMELEON	A Holistic Approach to Sustainable, Digital EU Agriculture, Forestry, Livestock and Rural Development based on Reconfigurable Aerial Enablers and Edge Artificial Intelligence-on-Demand Systems.	101060529
ICAERUS	Innovation and Capacity building in Agricultural Environmental and Rural Uav Services	101060643
SPADE	Multi-purpoSe Physical-cyber Agri-forest Drones Ecosystem for governance and environmental observation	101060778
CODECS	Maximising the CO-benefits of agricultural Digitalisation through conducive digital ECoSystem	101060179
Quantifarm	Assessing the impact of digital technology solutions in agriculture in real-life conditions	101059700

Relevant sources of information supporting digital transformation in agriculture and rural areas

Other instruments and other programs, like the 'European Innovation Partnership for Agricultural productivity and sustainability' (**EIP-AGRI**), Partnerships and EU missions also help maximise the adoption and development of digital transformation in agriculture and rural areas.

Digital transformation in agriculture and rural areas under EIP-AGRI activities

A number of EIP-AGRI Operational Groups are already developing solutions based on digital technologies to address practical problems or opportunities in the farming sector. Currently available data show that around 10% of Operational Groups work on precision farming or on aspects related to the digital transformation more generally. At EU level, a number of initiatives for the exchange of experiences are organised, including

- EIP-AGRI Focus Group on **Precision farming**
- EIP-AGRI Focus Group on **Digital tools for sustainable nutrient management**
- **New skills for digital farming**
- Data revolution: emerging new business models in agri-food
- **Digital Innovation Hubs**: mainstreaming digital agriculture
- **Multi-level strategies for digitising agriculture and rural areas**
- **Data Sharing**: ensuring a fair sharing of digitisation benefits in agriculture

Digital transformation in agriculture and rural areas

Activities under the Digital Europe Programme

The Digital Europe Programme is a new policy instrument introduced with the funding period 2021 – 2027. It supports – among others – the upscaling and deployment of innovative digital solutions across sectors. Measures, which are of particular relevance for supporting digitalization in the agriculture and rural areas, include **Testing and Experimentation Facilities for AI in agri-food, European Digital Innovation Hubs (EDIHs)**, including EDIHs in agri-food, Common European **Data Spaces in the fields of Agriculture** and **Smart Communities**.

In the pipeline and future funding opportunities

- HORIZON-CL6-2022-FARM2FORK-02-04-two-stage: Smart solutions for the use of digital technologies for small- and medium-sized, farms and farm structures MA
- Horizon Europe candidate partnership Agriculture of Data: The objective of the Partnership Agriculture of Data is to exploit the potential of data and data technologies in support of sustainable agricultural production and policy monitoring. The partnership is expected to develop innovative data-based solutions, e.g. as input for precision farming applications or harvest forecasts, following a Europe-wide approach building on private and public data. It will interlink related Horizon projects and capitalise their results.
- HORIZON-CL6-2023-GOV-01-15: Digitalisation in agriculture and forestry: markets for data, and digital technologies and infrastructure – state of play and foresight in a fast changing regulatory, trade and technical environment
- HORIZON-CL6-2023-GOV-01-14: Digital and data technologies for livestock tracking
- HORIZON-CL6-2023-GOV-01-13: Open source solutions for edge, cloud and mixed model applications to strengthen production and administrative capacities in agriculture
- HORIZON-CL6-2024-GOV-01-7: Enhancing working conditions and strengthening the work force through digital and data technologies – the potential of robotics and augmented reality in agriculture

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