



Open-Source solutions for agriculture

The case of the OpenAgri project

<https://www.greensupplychain.eu/>

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GreenSupplyChain DIH Profile



- ✓ A Digital Innovation Hub (DIH) focusing on the digital transformation of all actors involved in the agri-food supply chain

Expertise

- ✓ Digital Agriculture enabled by IoT, EO, Big Data & AI
- ✓ Semantic enabled interoperability
- ✓ Cloud and Edge computing
- ✓ Resource and energy optimisation
- ✓ Environmental & Biodiversity Monitoring
- ✓ Governance, Codes of conduct
- ✓ Sustainable Innovation

Collaborative Partnerships and funding acquisition



Founded in 2021

Offices in the Netherlands and Greece

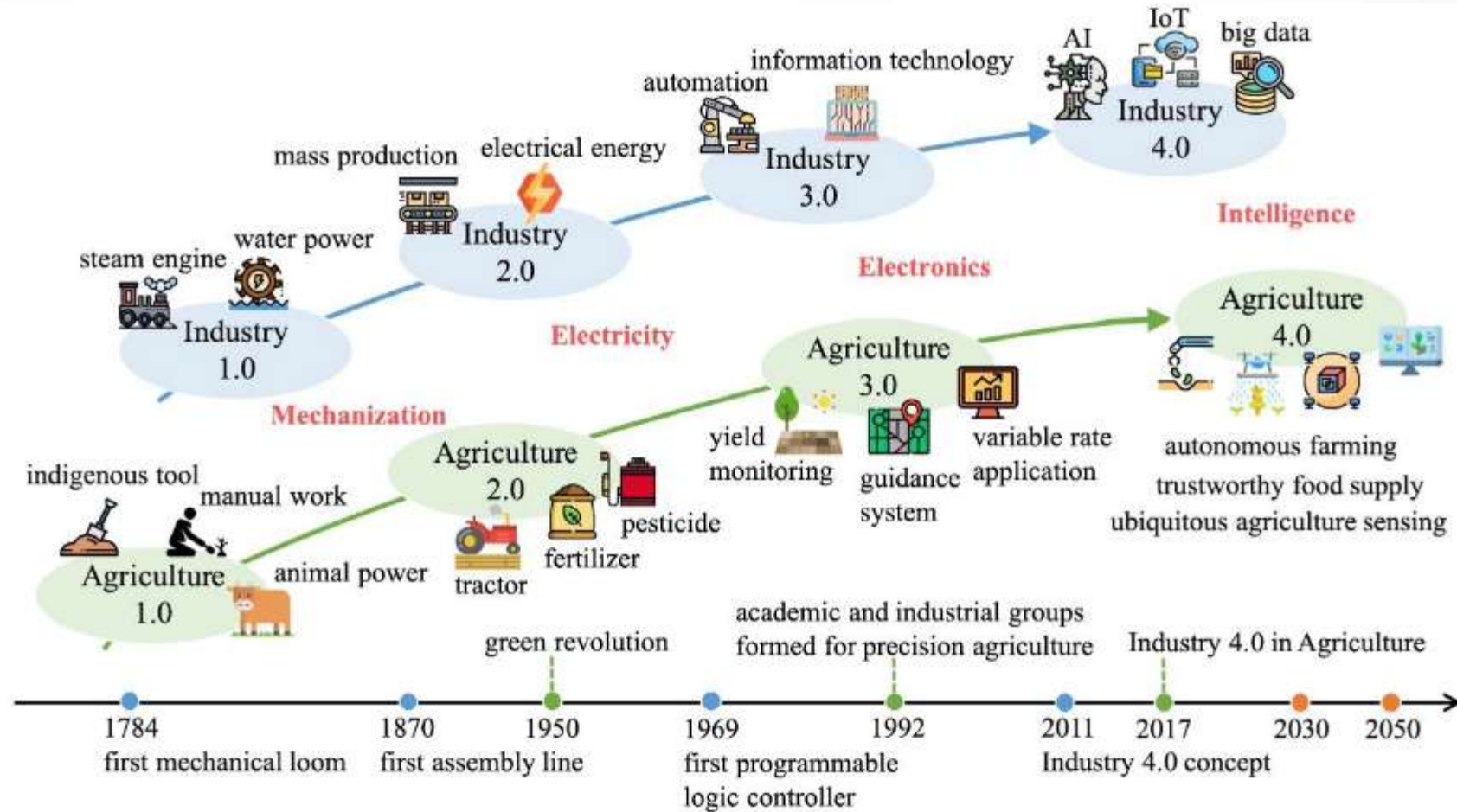
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GreenSupplyChain EU Research projects



- ✓ **AMBROSIA (2024-2027)**: Bridging Knowledge, Communication, and Action for Food Safety in a Changing Climate
- ✓ **O-CEI (2025-2028)**: Open CloudEdgeIoT Platform Uptake in Large Scale Cross-Domain Pilots
- ✓ **OpenAgri (2024-2026)**: Democratising digital farming through tailored open source & open hardware solutions
- ✓ **STELLA (2024-2027)**: Digital technologies for plant health, early detection, territory surveillance and phytosanitary measures
- ✓ **Farmtopia (2023-2026)**: SME designing custom-made hardware-based biotech solutions, which support multiple applications in health agrifood sector
- ✓ **Climate Farm Demo (2022-2029)**: A European-wide network of pilot farmers implementing and demonstrating climate smart solutions for a carbon neutral Europe

Development roadmap of industrial and agricultural revolutions



(Liu et al., 2021)

Agricultural Digital Solutions - fundamental concepts



Digital Technologies

- Telecomm
- Sensors - Actuators
- UAVs - UGVs
- Satellites
- Image analytics
- Modern Tractors

Farm management Information systems

- Current status of the crop
- Alerts for extreme conditions
- Irrigation advice
- Fertilisation advice
- Pesticides application advice
- Support for other farming operations (planting, harvesting, etc.)



Potential key benefits:

- Optimisation of inputs
- Reduction of labour effort
- Reduction of energy footprint
- Improved quality of crops
- Biodiversity preservation
- Soil quality protection
- And more...

The farmer/advisor remains the most important actor in the decision support process

Many challenges are still unresolved

- Agricultural Digital Solutions (ADSs) is seen as an immense opportunity to improve the sustainability performance and competitiveness of the agricultural sector.
 - ADSs are in many cases **too expensive** and economic benefits are **doubtful**, especially for **small farmers**, while most of the business models of ADS providers focus on **large farms and large-scale crops**
- Farmers have **low trust** in ADSs and **data sharing**, due to:
 - a) fear that their data will be used **against them or misused**,
 - b) the “**black box**” phenomenon of ADSs,
 - c) the lack of transparency in the development of **algorithms**, and
 - d) the risk of **vendor lock-ins**.
- Geographical remoteness, **network connectivity**, and **limited electrical energy sources**. Farms in remote areas experience problems with weak network connectivity that affect the performance of the ADS



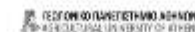
The Need for Open Source in Agriculture

- ❑ **Close the gap** → tools farmers *can actually use* 
- ❑ **Trust by design** → open code, open data, no black boxes 
- ❑ **Reach the remote** → lightweight, energy-efficient, connectivity-friendly 
- ❑ **Co-create with farmers** → built with them, not just for them 

The OpenAgri project



<https://horizon-openagri.eu/>



OpenAgri's main objective

Democratise digital farming by enabling the development and deployment of innovative cost-effective energy-efficient Open-Source software and Open hardware-based ADSs that can operate at a high performance even in remote areas with weak connectivity (edge computing).

How will it be achieved?

Co-create ADSs with farmers via participatory prototyping activities.

Provide reusable open-source software for edge computing.

Conduct 14 Pilots across Europe on agricultural tech.

OpenAgri's main objective

By promoting open-source software and hardware, collaborative business models, and tailored edge computing solutions, OpenAgri is tackling these challenges with the following strategies:

High costs that exclude small farms.



Reduce costs & increase accessibility for all farmers.

Concerns about data privacy & lack of transparency.



Enhance transparency & build trust through open systems.

Connectivity limitations in remote areas.

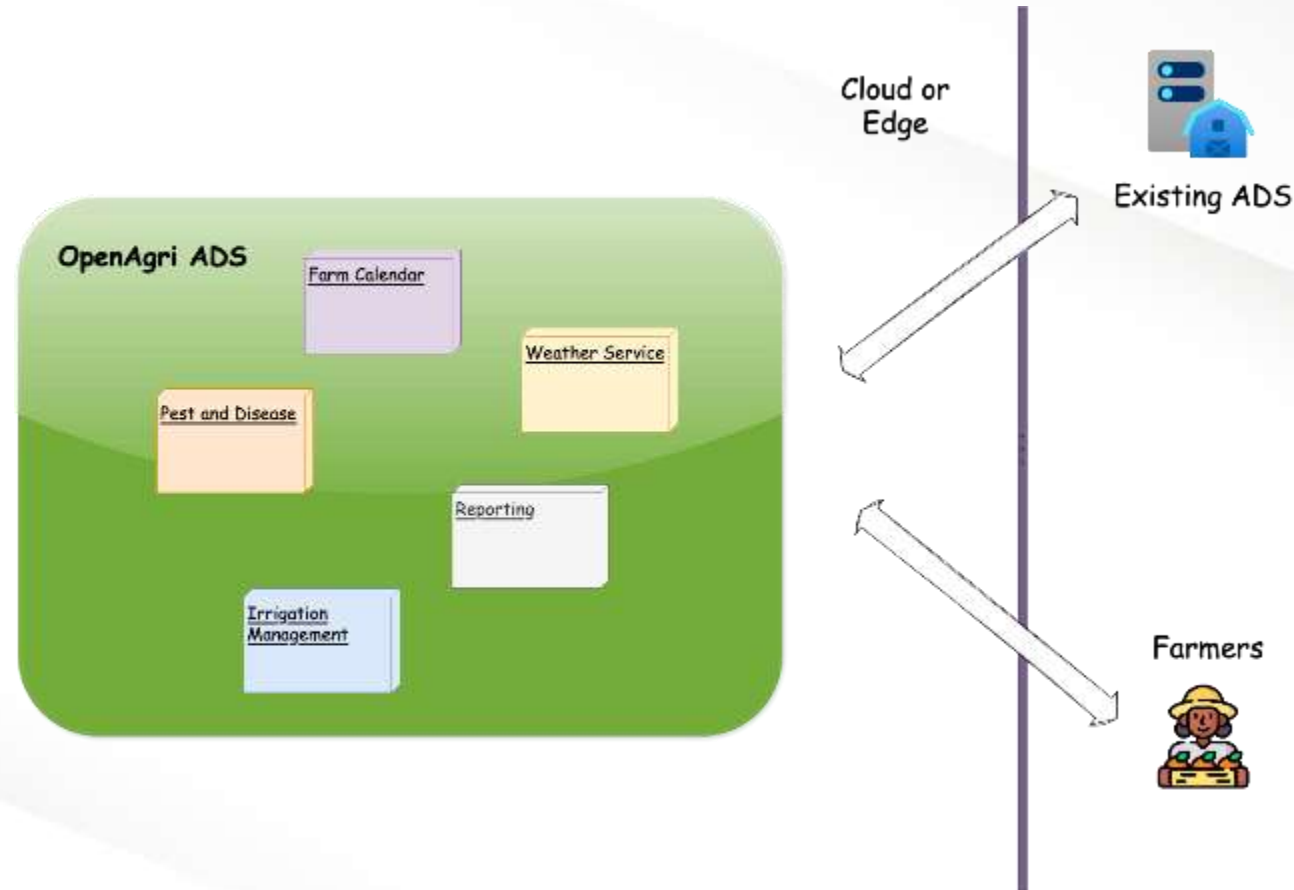


Enable the use of ADSs even in remote areas with weak connectivity.

OpenAgri – Technical approach

OpenAgri (OA) services

- Reusable building blocks for developing integrated solutions
- Follow the microservices software architectural design
- Services are self-contained implementing a single business capability
- APIs: well-defined, standards-based
- Support complementary use of OA Services



What thriving OS projects usually do

Transparent governance & roadmap

Active community channels (Matrix, Slack, Discourse)

Clear contribution guidelines

“Good first issue” labels for newcomers

Documentation & onboarding guides

Inclusive Code of Conduct

Recognition & visibility for contributors



GreenSupplyChain

Our current OS practices

Hosted under **Linux Foundation AgStack**

Public repos with **README & Roadmap**

GitHub **issues & pull requests** for collaboration

Contribution guide

All code licensed under **EUPL**

Open discussions about project evolution with Linux Foundation

Collaborate with other AgStack repos (cross-contribution)

Growing the OpenAgri community

Launch a Matrix channel for real-time dialogue

Open Community Discussions for broader input

Develop wiki pages & tutorials

Publish a living roadmap

Showcase real-world use farmers & pilots

Share more stories (blogs, LinkedIn, short videos)

Online Hackathons with AgStack or universities.



GreenSupplyChain



Open-Source is a catalyst for digital farming

Join the community

Reuse

Collaborate

OpenAgri Weather service: <https://github.com/agstack/OpenAgri-WeatherService>

All repositories on Agstack: <https://github.com/agstack>



Thank you for your attention

Find us

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