

AGRICULTURE

#VARIABLE RATE APPLICATION #PRECISION IRRIGATION #CROP YIELD FORECASTING #SOIL CONDITION MONITORING #ENVIRONMENTAL IMPACT MONITORING

"To ensure global food security, agriculture needs earth observation to increase productivity and reduce environmental impacts"



WHERE ARE WE NOW?

The current state-of-play in the sector. Maturity of EO and its contribution to addressing the challenges of the sector.

- The global food system is expected to feed a population that will likely grow from 8 billion people today, to nearly 10 billion by 2050.
- Due to increased food demand, as well as soil degradation or scarcity, the global food system has developed a substantial environmental footprint and has become a major contributor to climate change.
- ∉ Agriculture is one of the pillars of the European economy contributing 1.3% to EU's GDP and 4.2% of employment in 2020.

Main relevant policies and initiatives:

- Common Agricultural Policy (CAP)
- 🗧 European Green Deal
- 🗧 EU Farm to Fork Strategy



- € Revenues from EO data and service sales in agriculture are expected to grow from €337 million in 2021 to €652 million by 2031.
- € Earth Observation is widely used in crop yield forecasting, vegetation monitoring, soil condition monitoring, CAP monitoring, variable rate application and precision irrigation.
- The EO data and services market for agriculture is mature and still expected to grow steadily.

R&D

- R&D in agriculture is changing rapidly due to several factors, including the changing climate, new crop varieties, more advanced machinery, new scientific insights and changing policies.
- *e* "Carbon Farming" is a relatively new term that refers to the monitoring and management of increased CO₂ absorption in farm soil. EO technologies are being used extensively to monitor this.
- EO technologies have the potential to enable efficient, cheap, rapid and accurate certification of organic agricultural practices.

WHERE DO WE WANT TO BE?

Guiding aims and priorities for the future as defined through the FIRE consultation process with sectoral users and EO professionals.

WIDESPREAD ADOPTION OF EO IN SUPPORT OF CAP

- CAP and Farm to Fork
 Strategy make explicit
 reference to the use of EO
 in support of activities.
- € CAP Paying Agencies are adopting EO-based solutions, however, the uptake is slow.
- *e* **"Eco-schemes"** within CAP present new opportunities for the adoption of EO.

UPTAKE OF EO IN NEW INITIATIVES RELATED TO AGRICULTURE

- Support should be given to the significant momentum behind carbon farming.
- Regenerative agriculture and management of plant growth regulators offer scope for development of smart EO-based solutions.
- Artificial Intelligence and Machine Learning should be exploited in conjunction with EO solutions.

THE TRANSPARENCY AND STRENGTHENING OF AGRICULTURAL SUPPLY CHAINS

- Transparency and traceability in agricultural value chains has become imperative due to increasing consumer awareness
- and regulatory developments.
 Further efforts are needed to develop EO-based solutions and develop the associated market for supply chain monitoring services.

UPSCALING OF EO UPTAKE INSIDE AND BEYOND THE EU

Anny EO start-ups or young SMEs serving the agricultural sector have not managed to scale up and expand their offering across borders yet. Support should be given to help achieve sustainable expansion.

STRENGTHENING THE CAPACITY OF THE DEMAND SIDE

 Farmers and other value chain actors can lack fundamental awareness of what is possible with EO,

and moreover do not possess the technical tools necessary to integrate EO services in their operational workflows.

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Selected actions to be taken by the community of practitioners (both EO and non-EO) to achieve the envisaged future.

PROMOTE WIDER ADOPTION OF EO SOLUTIONS IN SUPPORT OF CAP

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STREAMLINE THE USE EO FOR CARBON FARMING

> EMPOWER USERS TO MAKE THE MOST OF EO-BASED

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RELYING ON EO FOR GLOBAL FOOD SECURITY MONITORING

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INTERNATIONALISATION AND UPSCALING OF EO COMPANIES IN THE AGRICULTURAL SECTOR This action focusses on the upscaling of EO solutions in support of established CAP-related applications and the piloting of EO solutions for new aspects of CAP. The primary aims are to expand the use of EO for the management of subsidy claims and to focus on eco-schemes as the main innovation in the green architecture of the new CAP 2023-2027.

- Increased adoption of EO solutions for established CAP-related activities
- Uptake of EO solutions for eco-schemes under the new CAP Optimised use of public funds





users

academia



MID-TERM

2-5 years

IMPACT

HIGH

HIGH

MEDIUM

MEDIUM

End users

Multipliers

EO service providers

Governance actors

Selected actions to be taken by the community of practitioners (both EO and non-EO) to achieve the envisaged future.

02 STREAMLINE THE USE EO FOR CARBON FARMING

Considering the EC have published a technical handbook and associated guidelines on how to set up and implement carbon farming in the EU, **this action should support the streamlining of EO-based solutions for Carbon Farming**.

 Increased adoption of EO solutions for established Carbon Farming initiatives

 Improved scientific and technical solutions feeding into Carbon Farming aspects (e.g. EO-based approaches for monitoring, reporting and verification)

> Comprehensive evaluation of current practices, operational issues and technological developments within carbon farming



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Researchers, academia

Regional/national authorities

MID-TERM

2-5 years

IMPACT

MEDIUM

HIGH

MEDIUM

MEDIUM

End users

Multipliers

Launch of R&D&I activities

to support the piloting

and operationalisation of EO-based

carbon farming solutions

EO service providers

Governance actors

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PROMOTE WIDER ADOPTION OF EO SOLUTIONS IN SUPPORT OF CAP

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FOR CARBON FARMING

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-04 Strengthen solutions relying on eo for global

FOOD SECURITY MONITORING

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SUPPORT INTERNATIONALISATION AND UPSCALING OF EO COMPANIES IN THE AGRICULTURAL SECTOR

Selected actions to be taken by the community of practitioners (both EO and non-EO) to achieve the envisaged future.

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03 **EMPOWER USERS TO MAKE** THE MOST OF EO-BASED SOLUTIONS

RELYING ON EO FOR GLOBAL FOOD SECURITY MONITORING

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INTERNATIONALISATION AND UPSCALING OF EO COMPANIES IN THE AGRICULTURAL SECTOR

Among the most frequently quoted challenges for the adoption of EO-based solutions in agriculture are awareness, technological savviness, reluctance for paradigm changes, access to the necessary underlying infrastructure and interoperability problems (i.e. hardware-software). Thus, strengthening the capacity of users and empowering them to make the most of EO is essential.

- Increased adoption of EO solutions across applications
- in the agriculture sector

A capacity building

programme should

distinguish between

the different user segments

(and by application) and

the different capacity-

related issues.

Optimised use of public funds and investments

For each of these issues best practices should be documented and replicated through the mobilisation of relevant networks.

The programme would act as the connecting tissue between ongoing, planned or brand-new actions funded through various means, yet assessed against clear KPIs and expected impacts in a comprehensive manner.

End users

Multipliers

EO service providers

Governance actors

MID-TERM

2-5 years

IMPACT

HIGH

MEDIUM

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PROMOTE WIDER ADOPTION IN SUPPORT OF CAP

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Selected actions to be taken by the community of practitioners (both EO and non-EO) to achieve the envisaged future.

O4 STRENGTHEN SOLUTIONS RELYING ON EO FOR GLOBAL FOOD SECURITY MONITORING

For years now EO has been used to monitor global food security with focus on early warnings for potential shortfalls and associated disruptions along the supply chain. This has unfortunately become even more urgent following recent geopolitical events. **Strengthening the capabilities of EO-based monitoring systems in this regard is therefore essential**.

Increased adoption of EO solutions for global food security monitoring

- Improved scientific, technological and data governance solutions

enabling actors across the value chain to gain access to insights generated by EO solutions

It should focus on strengthening monitoring
systems connected to GEOGLAM but
also regional monitoring capabilities(such as those activated for Ukraine following
the agricultural supply chain crisis
triggered by the war).

g Best practices around data governance and transparency such as those exhibited in national or regional solutions

EO service providers

Governance actors



MID-TERM

2-5 years

IMPACT

MEDIUM

MEDIUM

MEDIUM

MEDIUM

End users

Multipliers



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This action should be

implemented through

RIA or IA actions

supported by Horizon

Europe and/or other

instruments.

EU institutions

EO service providers





- 02 STREAMLINE THE USE EC FOR CARBON FARMING

IN SUPPORT OF CAP

PROMOTE WIDER ADOPTION

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FOOD SECURITY MONITORING

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SUPPORT INTERNATIONALISATION AND UPSCALING OF EO COMPANIES IN THE AGRICULTURAL SECTOR

Selected actions to be taken by the community of practitioners (both EO and non-EO) to achieve the envisaged future.

05 SUPPORT INTERNATIONALISATION AND UPSCALING OF EO COMPANIES IN THE AGRICULTURAL SECTOR

Several EO companies have developed strong propositions for the agriculture sector in the past years (especially since the advent of the Sentinels era). At this point, a comprehensive effort to help them scale and internationalise is needed, allowing the growth and export of innovative EU solutions.

- Increased revenues for EO service providers with a strong value
- ¥HW proposition in the agriculture sector

Industrial growth and technological leadership for the EU



PROMOTE WIDER ADOPTION IN SUPPORT OF CAP

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SUPPORT **INTERNATIONALISATION** AND UPSCALING **OF EO COMPANIES IN** THE AGRICULTURAL SECTOR

7 - 🥏 FIRE - AGRICULTURE

MID-TERM

2-5 years

IMPACT

LOW

HIGH

MEDIUM

LOW

End users

Multipliers

EO service providers

Governance actors

