The background of the slide is an aerial photograph of an olive grove. The trees are green and arranged in rows, with reddish-brown soil visible between them. A large, semi-transparent white circle is centered over the image, containing the main text.

Smart farming practices safeguarding the environment and the quality of olive products.

The example of gaiasense

Vasilis Pyrgiotis
Expert on olive sector and R&I

"CDG ON AGRICULTURAL MARKETS – OLIVES" - 11 July 2023

The background of the slide is a photograph of an olive tree with green leaves and small olives, partially obscured by a semi-transparent white rounded rectangle.

GAIA EPICHEIREIN IN A NUTSHELL

In 2014 a pioneering scheme was launched in Greece



PRIMARY SECTOR

72 agricultural cooperatives
Livestock Breeders Association



PIRAEUS BANK

BANKING SECTOR

Subsidiary "Exelixa S.A"



NEUROPUBLIC IT SECTOR

Leading informatics &
Technology company



AGROTIKI KAINOTOMIA

Largest Agricultural
advisory service providers

SERVICES



Direct payments



Rural Development Programme (RDP)



Business Development / Export orientation



Cooperation



Smart Farming

EU & NATIONALLY FUNDED PROJECTS



EDITIONS



The background of the slide is a photograph of an olive grove. Two workers are visible: one in the foreground on the left, wearing a light blue cap and dark clothing, and another on the right, wearing a dark jacket and a cap, using a long-handled tool. The scene is brightly lit, with a large lens flare in the center. The entire image is framed by a white rounded rectangle.

THE GREEK OLIVE SECTOR

The cultivation of olives for the production of olive products is one of the main sectors of Greek agriculture, estimated by :

- the extent of the spread and the large area occupied by the cultivation,
- from the significant contribution to the employment
- from the positive contribution to the trade balance of the agricultural products of the country,
- from a number of other secondary activities and services.

What does Greece mean for world olive oil production:

- 132 million producing olive trees
- Yearly average production: 350 thousand metric tons (16% of world production)
- Greece is the largest producer of Extra Virgin Olive Oil worldwide
80% of its production is Extra Virgin olive oil
- Its value amounts to 1.4 billion Euros
(subsidies from EU included)

The background of the slide is a photograph of olive trees in a field, with sunlight filtering through the leaves, creating a bokeh effect. The image is slightly blurred to make the text stand out.

DIGITAL TRANSFORMATION OF THE AGRICULTURAL SECTOR IN THE CONTEXT OF THE NEW CAP 2023-2027

In the international and European political agenda, the priority of the digital transformation of the agricultural sector is inextricably linked to the need to address a series of important challenges that have :

- **Economic dimension**

- Boosting productivity to ensure food supply for an ever-growing global population
- Shielding food security against geopolitical shocks and the effects of climate change on production
- Need to ensure a competitive agricultural sector, which will guarantee a fair income for producers


- **Environmental-climatic dimension**

- **Adaptation** to the strong and intensifying impact of climate change on production
- Contribution to the **mitigation of climate change**, through the reduction of greenhouse gas emissions
- Reduction of the impact of the production process on natural resources (soil, water, air, biodiversity)

- **Social dimension**

- Need to respond to the increasingly high demands of society/consumers for safe, healthy, quality and traceable food
- Ensuring the "vitality" of rural areas where farmers live and work

UN's Sustainable Development Goals

A large, light blue curved arrow on the left side of the slide, pointing from the first paragraph down to the second paragraph.

The Agricultural sector is of great importance in the field of planning and implementation of public policies as it is closely related to:

- The management of natural resources and ecosystems.
- The wider agri-food sector, through their systemic relationship within the food supply chain.

The design and implementation of policies related to the digital transformation of the primary sector, **far exceed its "narrow" economic and social impact,** acquiring a **key dimension in the mix of policies** implemented by each government scheme.

EU GREEN DEAL

The **European Green Deal** is the European Union's political response to the UN's Sustainable Development Goals as well as its new development strategy for the coming decades, which aims to achieve the sustainability of the European economy and society, through the transformation of climate and environmental challenges (green transformation) to opportunities in all policy areas.

In particular, it aims to:

- a climate-neutral Europe with zero net greenhouse gas emissions by 2050
- the decoupling of economic development from the use of resources
- to a just and inclusive transition for all.



Reduce by 50% the overall use and risk of chemical pesticides and reduce use by 50% of more hazardous pesticides by 2030



Achieve at least 25% of the EU's agricultural land under organic farming and a significant increase in organic aquaculture by 2030



Reduce nutrient losses by at least 50% while ensuring no deterioration in soil fertility; this will reduce use of fertilizers by at least 20 % by 2030



Reduce sales of antimicrobials for farmed animals and in aquaculture by 50% by 2030



Bring back at least 10% of agricultural area under high diversity landscape features by 2030

EU GREEN DEAL & DIGITAL TRANSFORMATION

A key driver for achieving the desired green transformation for the entire European economy and society, including the primary sector, is **the digital transformation**.

As characteristically stated in the European Commission's announcement

"The European Green Deal" [5], "it is necessary to review [among other things] the policies [...] food and agriculture. To achieve these goals, it is necessary to increase the value placed on the protection and restoration of natural ecosystems, the sustainable use of resources and the improvement of human health. This is where transformation is most needed and where it can deliver the greatest benefits for the EU's economy, society and natural environment.

The EU should also promote and invest in the necessary digital transformation and digital tools, as they are important levers of change".

In order to achieve the green and digital transformation of the primary sector in the direction defined by the European Green Deal, the European Commission has launched the implementation of policies which must interconnect and be increasingly coordinated in the coming years:

- The Farm to Fork Strategy and the Biodiversity Strategy
- The reformed Common Agricultural Policy (CAP) 2023-2027
- The digital policy

NEW CAP 2023-2027

The reformed **Common Agricultural Policy (CAP) 2023-2027**, sets clear and specific objectives regarding the strengthening of economic, environmental-climate and of the social sustainability of the European primary sector, **promoting knowledge, innovation and digitization as a catalyst for their achievement.**

At the same time EU producers are invited to focus on the **environmental and climate dimension** of agricultural activity and to contribute to the ambitious horizontal pan-European targets having at their disposal support for the shift to solutions based on **knowledge, innovation and digitization.**

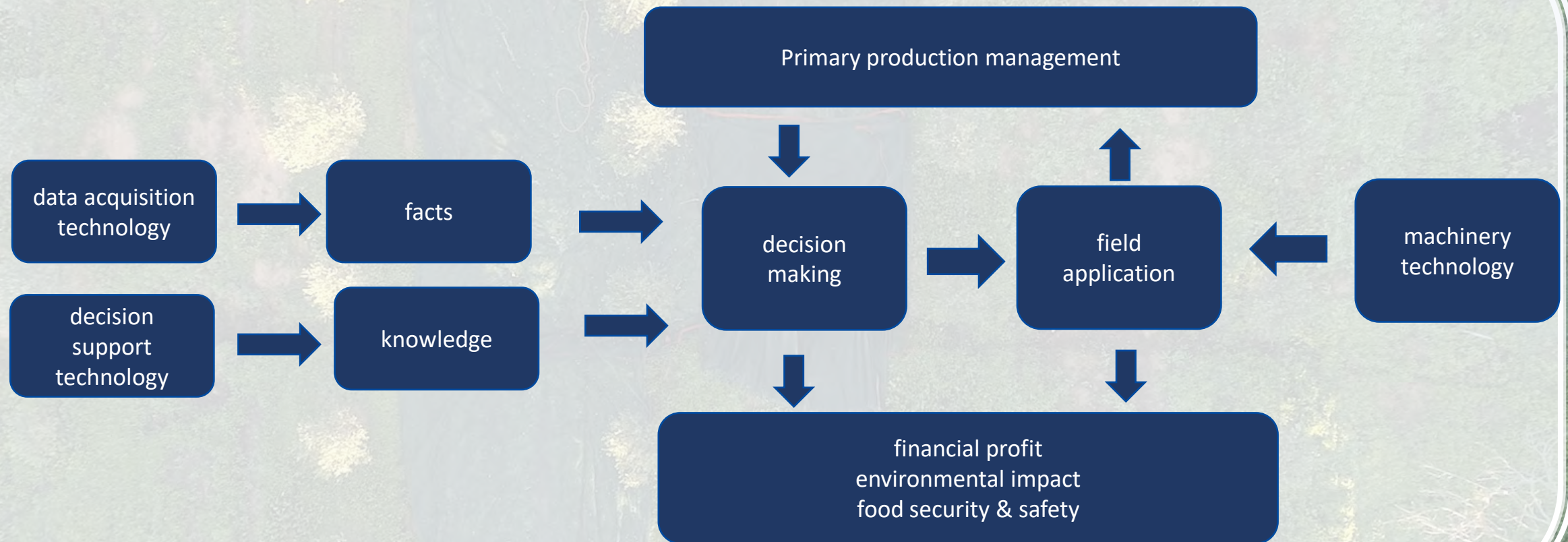
EU producers are also being obliged to **comply with specific environmental-climate regulatory commitments** in order to receive support or compensation for the implementation of practices with a positive environmental-climate impact, which go beyond their regulatory commitments

The **main axes of the CAP 2023-2027 related to digital transformation** are :

- Data-driven decision-making
- Precision agriculture
- Farm management systems
- Agricultural research and innovation

An aerial photograph of an olive grove, showing rows of olive trees and several workers in the field. The image is used as a background for the title slide.

WHAT SMART FARMING and PRECISION AGRICULTURE IS ALL ABOUT?



BENEFITS OF SMART FARMING SERVICES

Production cost

fertilizer

water - energy

pesticides

Production risks

parasitic diseases

non-parasitic

post-harvesting

Product quality

residuality

organoleptic

fruit size

preservability

Product value

traceability

environmental footprint

Environmental risks

desertification

drought

Biological imbalance

Yield

$$= \text{Financial benefit} + \text{Environmental benefits}$$

The background of the slide is a photograph of an olive grove with rows of olive trees under a clear sky. A semi-transparent rounded rectangle with a double border is centered over the image, containing the title text. In the bottom left corner of the image, there is a small orange flag with the 'gaia sense' logo.

THE GAIASENSE SF SOLUTION

WHAT IS GAIASENSE

integrated approach for the management of agricultural activities

Innovative smart farming system combining different data sources

adjustable to different regions, type of soils, microclimate and crops

zero investment in equipment - financially viable

accessible to every single EU farmer regardless farm size

sustainable model in countries with fragmented land ownership

dynamic, extensible platform for further agricultural research and innovation





**DATA-DRIVEN
DECISION-MAKING
SMART FARMING
SYSTEM**

remote



eye



data

field

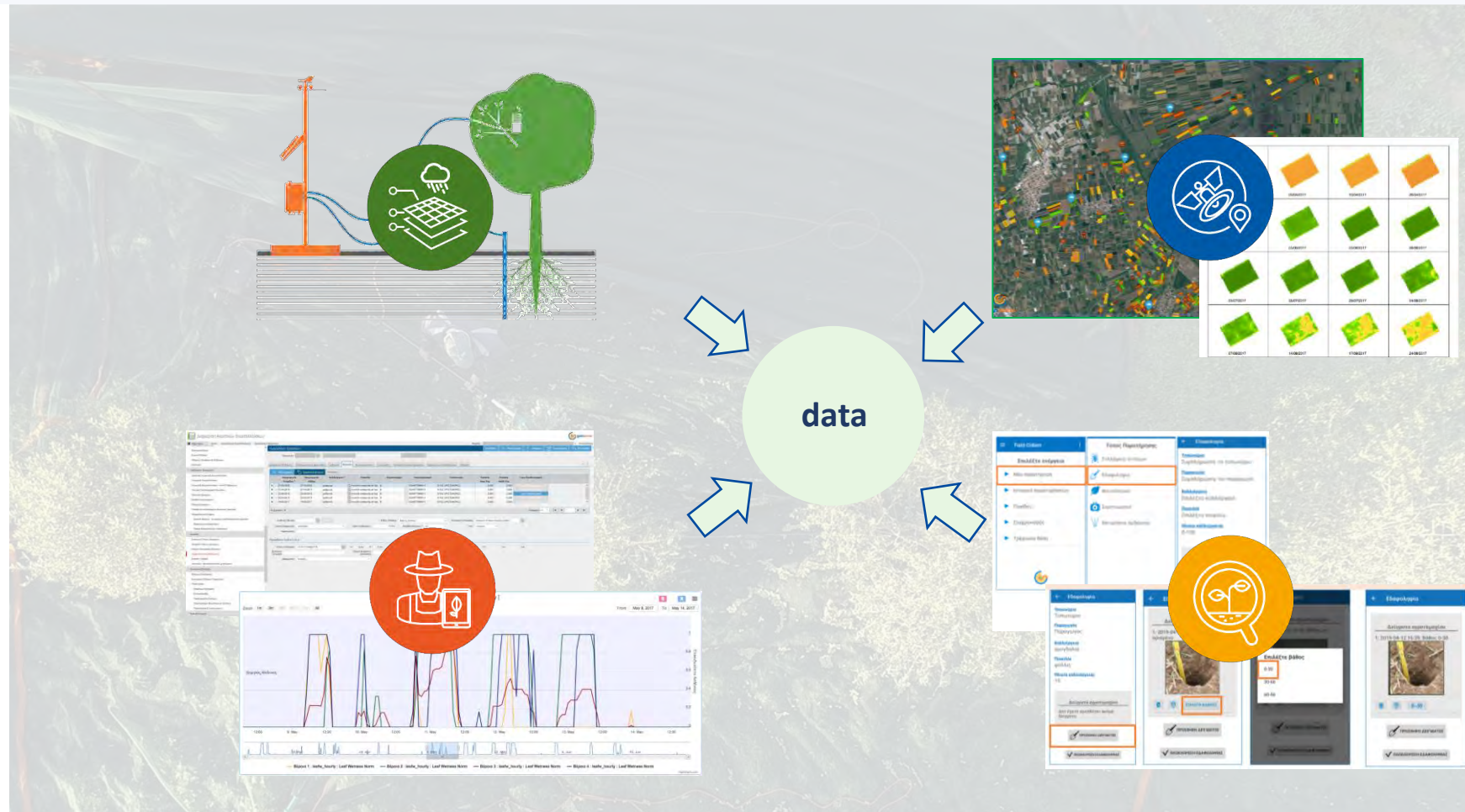


farm



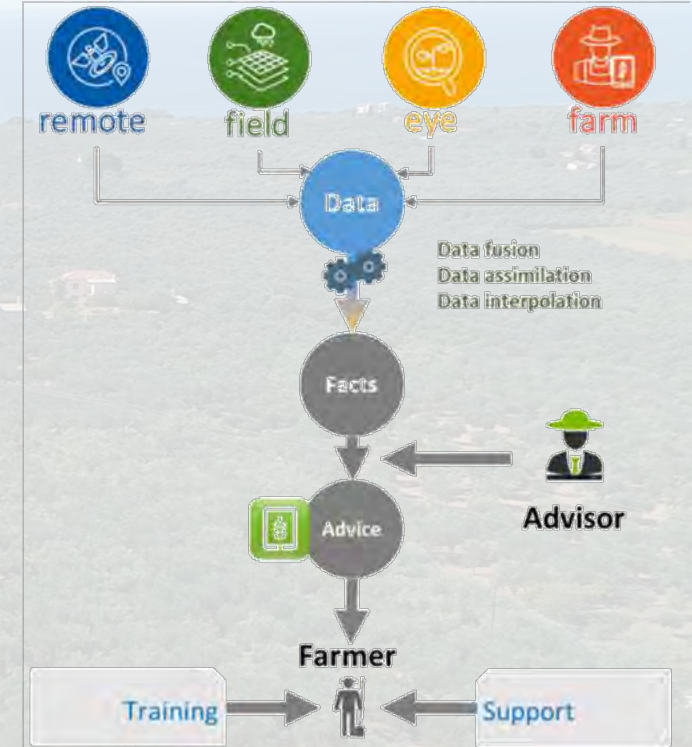
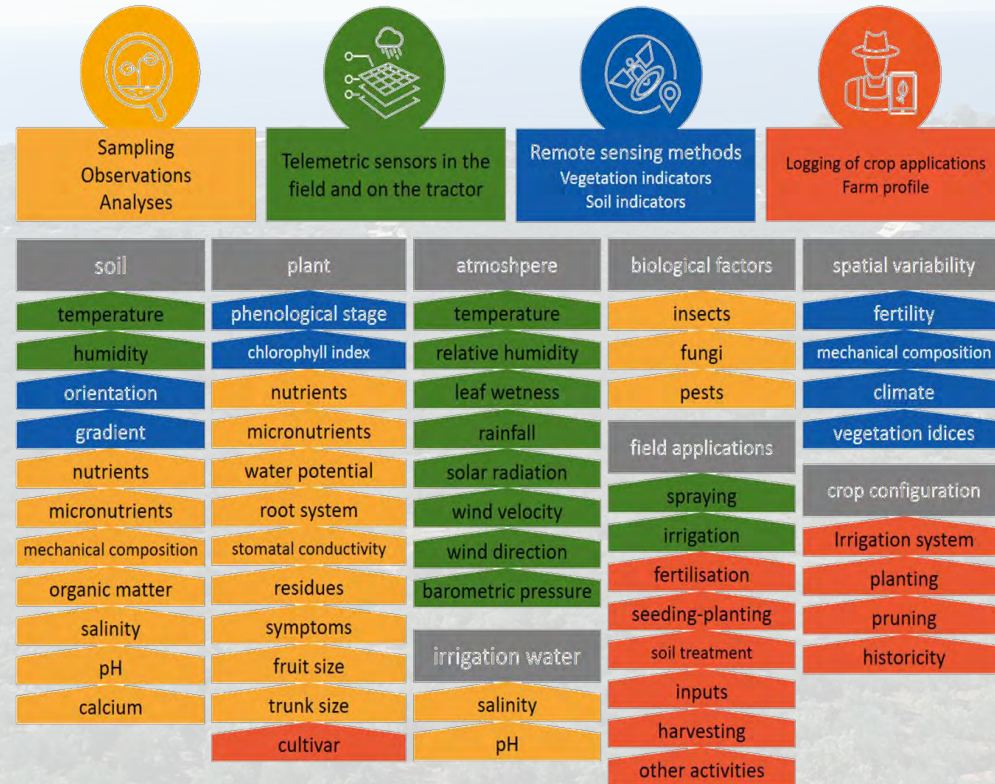


DATA-DRIVEN DECISION-MAKING SMART FARMING SYSTEM





DATA-DRIVEN DECISION-MAKING SMART FARMING SYSTEM





FROM DATA
COLLECTION
TO SMART
FARMING
SERVICES



Irrigation SF advice

- ✓ To identify the appropriate time and the optimal amount of water for irrigation
- ✓ Calculation of the optimal irrigation dose



Crop management SF advice

- ✓ Agricultural warnings
- ✓ Diagnosis of diseases and recognition of entomological infections
- ✓ Pest control



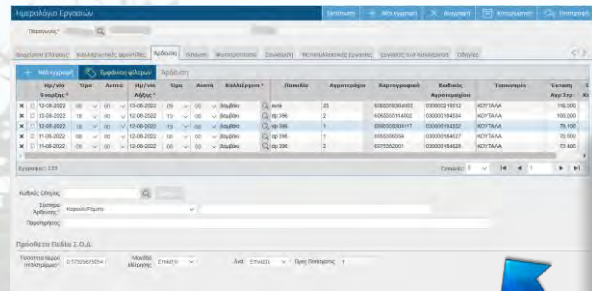
Fertilization SF advice

- ✓ Accurate determination of plant's nutrient needs
- ✓ Avoidance of over-fertilization & under-fertilization



COMPLETE FARM MANAGEMENT SYSTEM

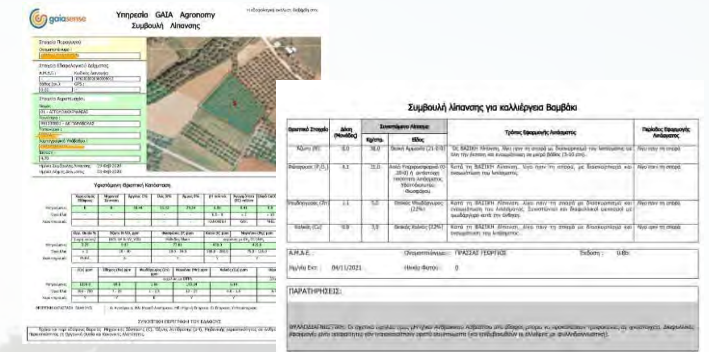
- Farm calendar**



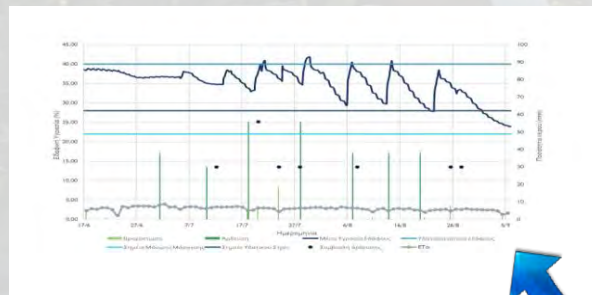
- SF dashboard for pest management**



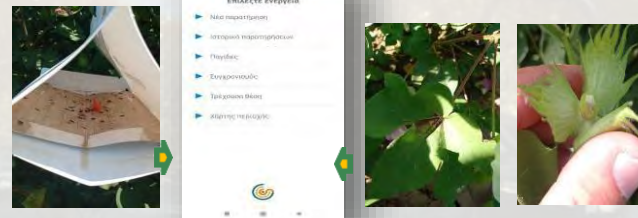
- Notification via email for fertilization SF advices**



- SF dashboard for irrigation advices and sms notification system**



- Mobile app for trap and phenology stages recording**



- SF dashboard for DSS and sms notification**



GEOGRAPHICAL AND SECTORIAL COVERAGE



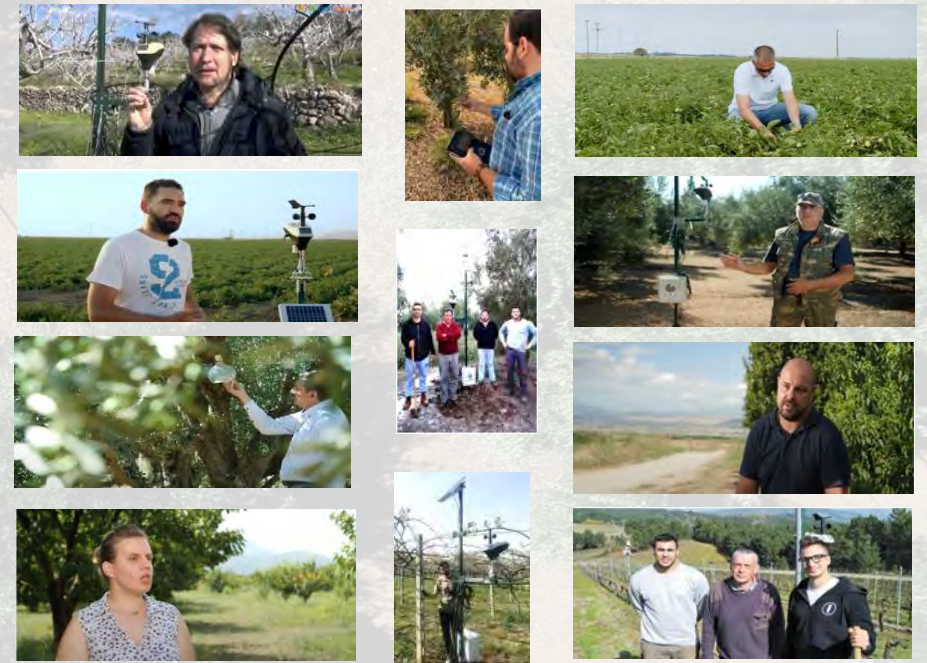
TOTAL NUMBERS

200+ projects
400+ gaiatrons
7 countries
26 crops
>1.500.000 ha

OLIVE SECTOR

60 projects
110 + gaiatrons
3 countries

TRANSNATIONAL AGRICULTURAL KNOWLEDGE AND INNOVATION SYSTEM





lifegaia sense

INNOVATIVE SMART FARMING SERVICES SUPPORTING CIRCULAR ECONOMY IN AGRICULTURE

Total budget: €2.979.291 € // Duration: 01 July 2018 - 30 June 2022 (48 months)

Consortium:



NEUROPUBLIC



LIFE Programme of the European Union under contract number LIFE17 ENV/GR000220



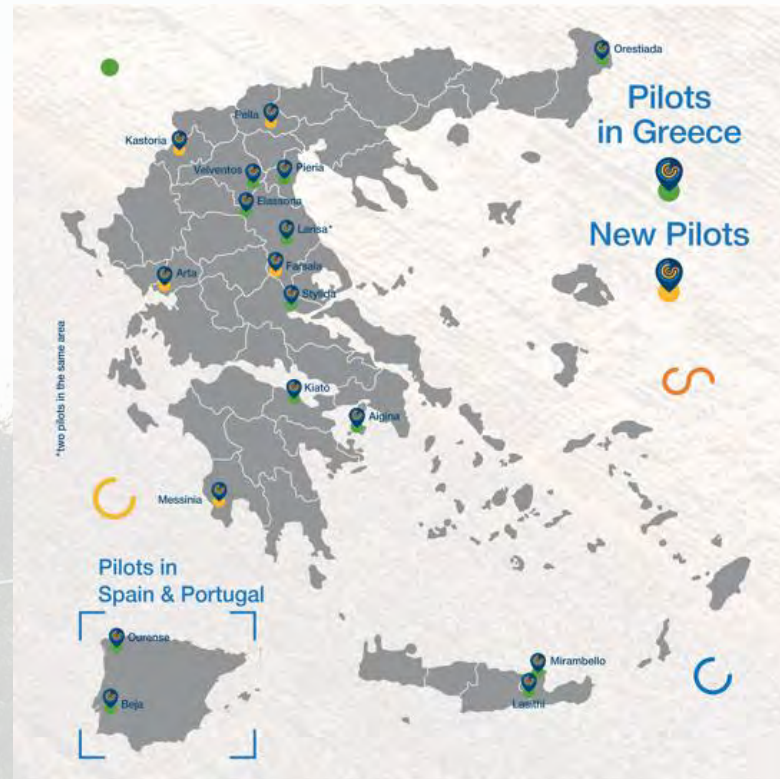
THE PROJECT

Objectives

- Setup and establish a large scale SF infrastructure for data collection and analysis
- Establish a network of scientists and professionals and engage them in adapting the SF services and models to the specific needs of each demonstrator and each crop.
- Apply the results to the field and measure the rate of decline of inputs on selected crops and correlate between the GAIA Sense results' and the targets set as policy by EU over the CE.
- Measure the impact of gaia sense on soil, water and air quality.
- Form policy making proposals

Use of gaia sense

- Demonstrate gaia sense, a SF solution in order to reduce natural resources, protect the environment and support Circular Economy models.
- Demonstrate an innovative technology-based method, affordable to every single AgriCooperative no matter the size of it
- Demonstrate how the producer will be able to decide either to use or avoid inputs in a most efficient way, without risking the annual production



Olive groves in Greece



Spain

&



THE RESULTS

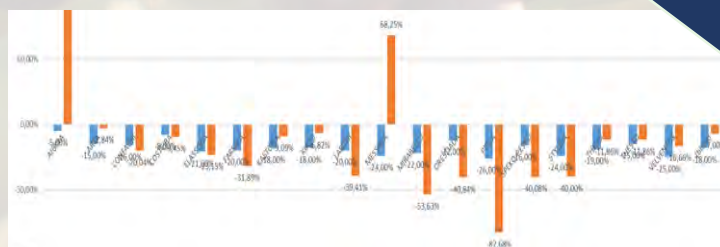
Irrigation costs

Achieved
reduction
20,23%



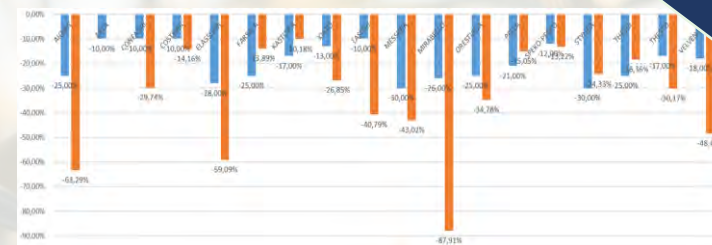
Fertilisation costs

Achieved
reduction
21,89%



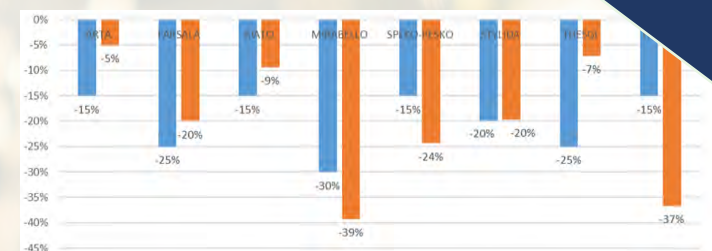
Crop management costs

Achieved
reduction
33,72%



Energy consumption costs

Achieved
reduction
33,72%



The logo for QuantiFarm, featuring a stylized blue circuit-like icon on the left, the word 'Quanti' in blue, and 'Farm' in green, followed by a green leaf-like icon on the right.

ASSESSING THE IMPACT OF DIGITAL TECHNOLOGY SOLUTIONS IN AGRICULTURE
IN REAL-LIFE CONDITIONS

Total budget: 7,723,539 EUR € & Total funding: 7,397,382.50 € // Duration: 01 July 2022 – 31 December 2025 (42 months)
Consortium: A total of 32 partners from 20 countries!



QuantiFarm has received funding from EU's programme HORIZON under GA 101059700



THE PROJECT

Objectives

- To support the further deployment of DATs as key enablers for enhancing the sustainability (economic, environmental and social) performance and competitiveness of the agricultural sector, by
- establishing an assessment framework for assessing the impact and effectiveness of DATs in agriculture and
- developing innovative tools, services and recommendations for farmers, advisors and policy makers.

Use of gaiasense

Having established gaiasense in olive groves in Greece and Cyprus and providing advice on fertilisation, pest management and irrigation, the project will assess the benefits, costs and environmental impact of the smart farming service.

Assessed benefits include a potential improvement in the quality of olive products and the financial sustainability of the farm and the reductions of the environmental footprint.



PLOUTOS

DATA-DRIVEN SUSTAINABLE AGRI-FOOD VALUE CHAINS

Total budget: 8.518.950,00 € & Total funding: 6.998.523,75 € // Duration: 01 October 2020 – 30 September 2023 (36 months)
Consortium: 33 partners from 10 countries!



PLOUTOS has received funding from EU's programme H2020 under GA 101000594



THE PROJECT

Objectives

Help rebalance the agri-food value chain and enhance its sustainability (economic, environmental and social) by establishing a Sustainable Innovation Framework that is powered by an innovative combination of behaviour change, collaborative business model innovation and data driven technological services

Use of gaiasense

In the context of Sustainable Innovation Pilot No1 (SIP1) a Smart Farming solution, gaiasense, has been established in the area of Proodos (a Farmers Union), helping the farmers to reduce the application of inputs (water, fertilisers, pesticides), thus reducing costs, improving the fruit quality, while reducing the smaller environmental footprint of the production.

Furthermore, connecting the gaiasense digital farm log and the systems of Alterra food processing company, with the Ploutos traceability solution, enables the collection of all the needed data/proof to secure certification and sustainability related labels.

The background of the slide is an aerial photograph of an olive grove. A large, semi-transparent white circle is centered over the image, containing the main text and contact information. The olive trees are green and their shadows are cast on the brownish ground.

Thank you for your attention

Vasilis Pyrgiotis

Expert on olive sector and R&I

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www.c-gaia.gr // www.gaiasense.gr