THEROS Project Overview

THEROS

THEROS Key Facts

- **Project Title:** An integrated toolbox for improved verification and prevention of adulterations and non-compliances in organic and geographical indications food supply chain
- **Call identifier:** HORIZON-CL6-2022-FARM2FORK-01-04
- **Topic:** “Innovative solutions to prevent adulteration of food bearing quality labels: focus on organic food and geographical indications”
- **Duration:** 01.01.2023 - 31.12.2025 (36 months)
- **Funding scheme:** IA – Innovation Action
- **EU contribution:** EUR 3,999,961.00
- **Coordinated by:** Institute of Communication and Computer Systems (ICCS), Greece

Funded by the European Union

THEROS Consortium

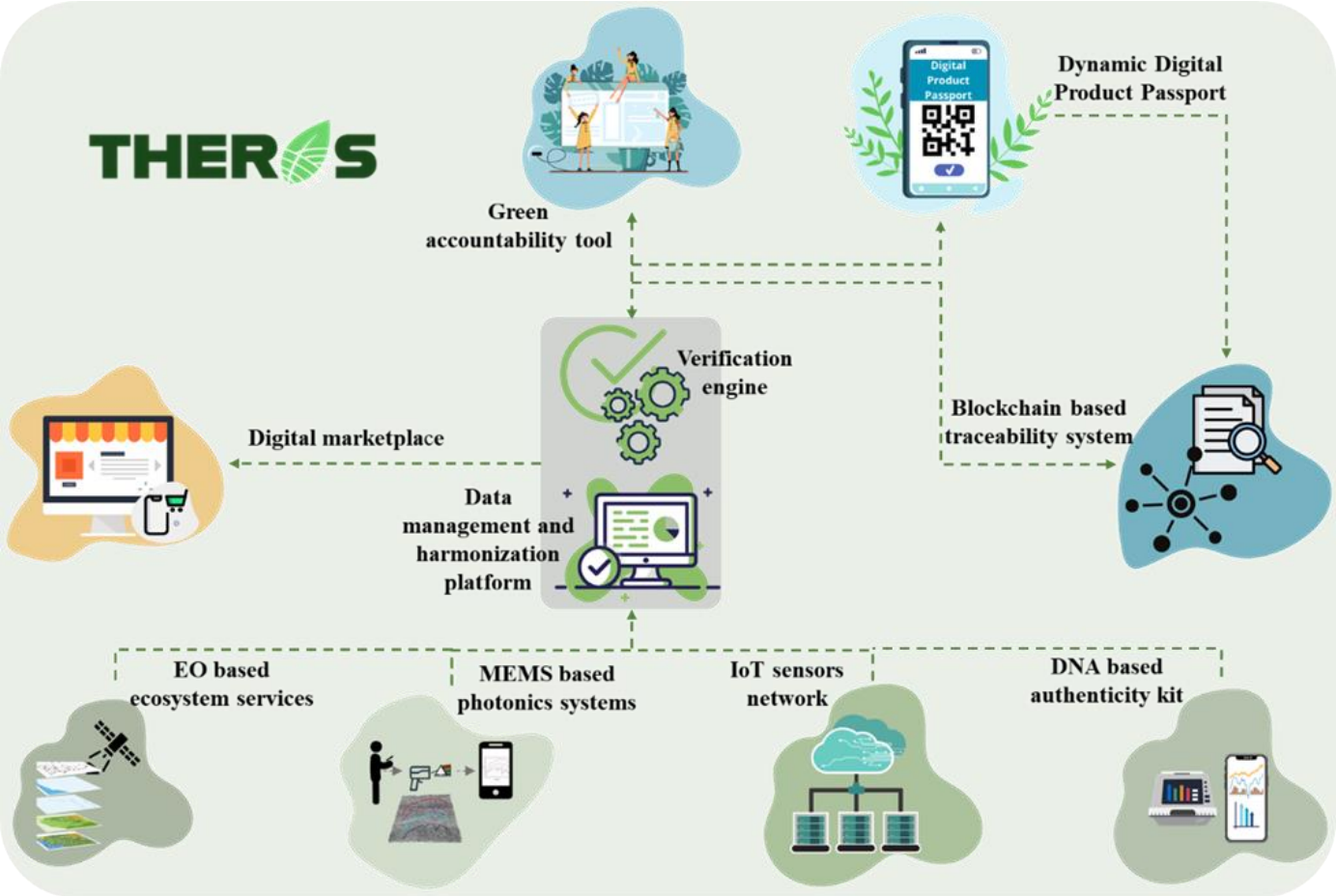
- **4 Research Institutes & Technology Organizations** (ICCS, AUTH, JSI, CERTH)
- **4 Control and Certification Bodies / Authorities** (ELGO, OCS, KIWA, BIO-HELLAS)
- **5 Large Enterprises & SMEs** (NTT DATA, SINERGISE, EBOS, SEABILITY, WRLS)
- **1 Regulatory Council for a DPO** (MEXILLON)
- **2 Retailers / Wholesalers** (UNIVER, SUMAVA)
- **1 Cooperative and Producer Association** (BIO-NET)

6 Participating Countries

17 Partners

Funded by the European Union

THEROS Vision & Concept



THEROS aims to implement an integrated toolbox being capable to modernize the process of verifying organic and geographical indications food products and preventing adulterations and non-compliances, while demonstrating enhanced traceability, security and transparency in the supply chain, through the use of various technologies and innovations

that leverage *Earth Observation, photonics, internet of things (IoT), DNA metabarcoding, blockchain, digital interfaces and product passport, advance analytics, machine learning, artificial intelligence and business models*.

At the same time, efficient mechanisms will be employed in order to ensure interoperability with existing control systems, as well as improved accessibility and sharing of data through harmonized and standardized means, whilst also demonstrating their uptake by relevant stakeholders for improved decision-making.

Funded by the European Union

THEROS Objectives

- Improve detection of adulterations and non-compliances in the organic and GI food products including efficient monitoring of quality and sustainability parameters through low-cost, digital & scalable solutions.
- Enhance traceability in the quality labelled food supply chain via novel technologies and approaches that will ensure secure and transparent data governance across the whole value chain.
- Ensure efficient management and harmonization of data collected from the different stages of the supply chain, enable their uptake for improved decision making and assure interoperability and integration with existing systems.
- Assess and formulate new business-oriented models and approaches towards preventing quality labelled food adulteration as well as increasing awareness and quality assurance.
- Validate and demonstrate the effectiveness of the THEROS integrated toolbox through 4 validation campaigns that will pave the way for rapid uptake of the proposed systemic innovations.

Funded by the European Union

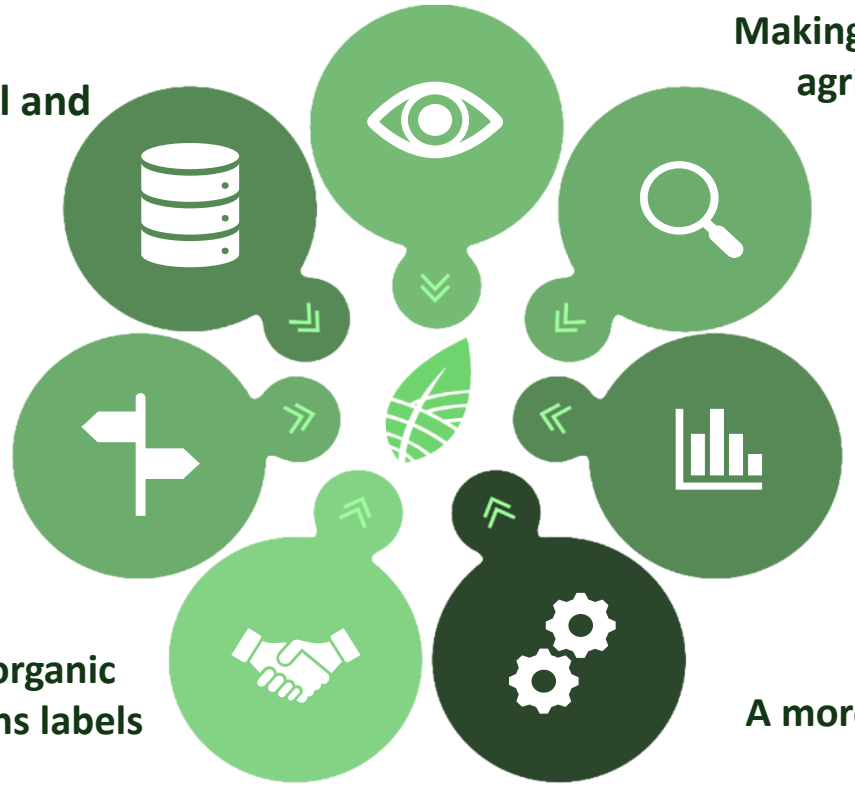
What THEROS Project brings to you?

If you're Food authority or Control/Certification Body

Increase system's analytical and preventive capacity

Real-time control with simultaneous location tracking as well as automated and orchestrated data feed processing

Promote and secure the organic and geographical indications labels



Making possible to monitor organic agricultural parcels of 0.1HA

Prevent food fraud

Improve functioning and effectiveness of control and inspection systems (>25%)

A more simplified certification process

Funded by the European Union

What THEROS Project brings to you?

If you're EC institution or Policy Maker

Tools for improved monitoring performance of the organic and GI food supply chains

More accurate and reliable environmental impacts assessment

Funded by the European Union

What THEROS Project brings to you?

If you're a Supply Chain Actor

Reduce complexity in the organics and GIs supply chain

Ensure business logic towards addressing claims

Increase transparency, traceability, trust and security in the organics and GIs supply chain

Funded by the European Union

What THEROS Project brings to you?

If you're a Consumer

A game-changing innovation that will provide sustainability of organic farming systems and ensure rapid and cost-effective verification of organic and geographical indications food products

Funded by the European Union

THEROS Innovation potential

Detection of adulterations and non-compliances, monitoring of quality and sustainability parameters

Data management & harmonisation, interoperability, verification and green accountability

Traceability, transparency, security and trust

Funded by the European Union

THEROS Pilot Demonstrations

Pilot 1: Serbia

The pilot demonstration will focus on the employment of THEROS toolbox components in order to facilitate efficient large-scale monitoring of organic food assets.

EO based ecosystem services, MEMS based photonics systems, Green accountability tool, Dynamic Digital Product Passport, Blockchain based traceability system, Verification engine, and Data management and harmonization platform

Pilot 2: Greece

The pilot demonstration will focus on the verification of organic production practices.

IoT sensors network, Blockchain based traceability system, Verification engine, Digital marketplace, and Data management and harmonization platform

Pilot 3: Czech Republic

The pilot demonstration will focus on the design and validation of an extended innovative business model aimed primarily at supporting the availability of organic food.

DNA based authenticity kit, Dynamic Digital Product Passport, Blockchain based traceability system, Verification engine, and Data management and harmonization platform

Pilot 4: Spain

This pilot demonstration will define and engage a group of supply chain participants, aiming to cover 100% of the value chain, including initial harvesting, aggregation, transformation, shipping, packaging and selling events.

Pilot Scope

Use of THEROS innovations

Funded by the European Union

THEROS pilot Serbia

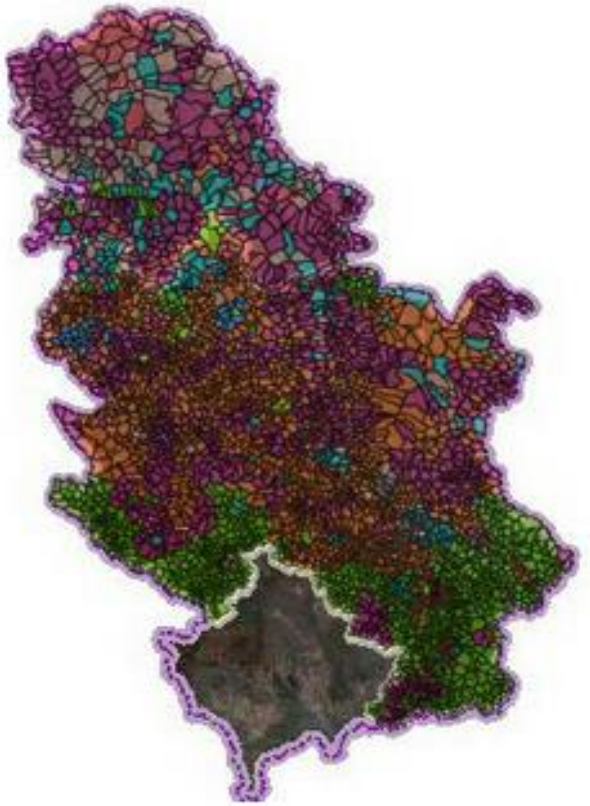
- Pilot project in Serbia covers the entire country except Kosovo due to lack of data;
- Climatic conditions vary across Serbia, Vojvodina (Northern Serbia) is suitable for tillage crops like wheat, sunflower, soybean, and corn and Central and Southern Serbia is better suited for fruit cultivation such as raspberry, sour cherry, apple, and plum;
- Project focuses on organic wheat flour and organic sunflower oil from Univerexport, which is involved in primary production, processing, distribution, and trading;
- OCS will oversee Univerexport's products from farm to fork, as well as products from other organic producers, including apple juice;
- The project includes both organic and non-organic products, leveraging sufficient relevant data;

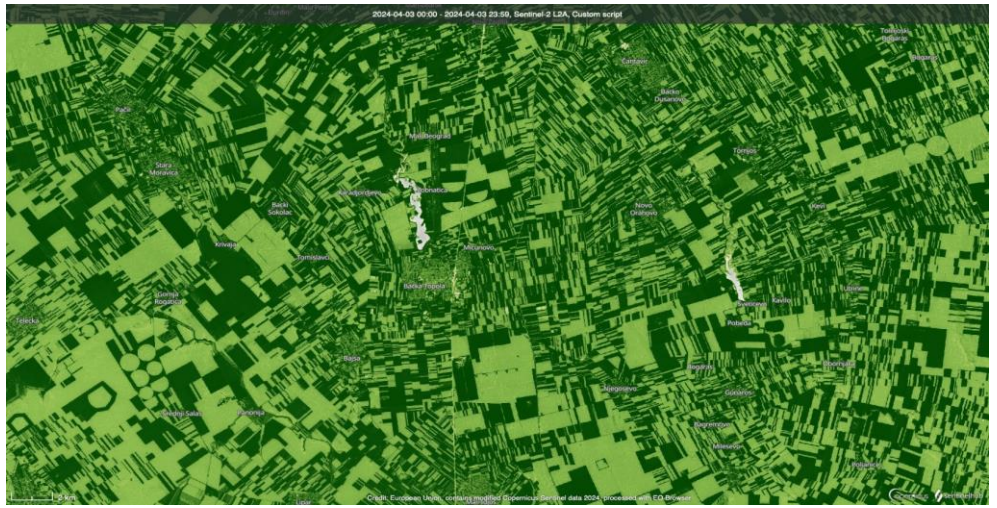
Funded by the European Union

THEROS pilot Serbia - EO-Based Ecosystem Services

- OCS has previous experience with Earth Observation (EO) from the HORIZON project ENVISION, enabling faster data preparation and avoidance of past project development issues.

- Regarding EO-Based Ecosystem Services, OCS collect data from farmer and sent to the Synergise who validate campaigns for markers to ensure the accuracy of crop classification through market observations. OCS then provide on-spot inspections and validation of crop classifications, with the importance of verifying the information provided by farmers.





Funded by the European Union

THEROS pilot Serbia - MEMS based photonics systems

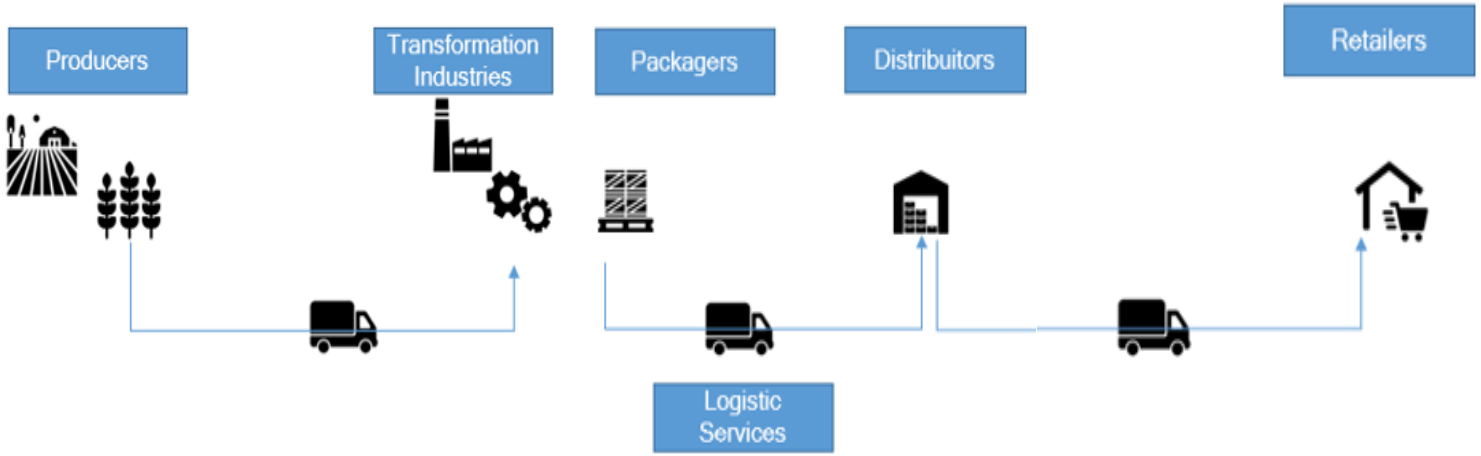
- OCS as organic control body, and Univerexport as wholesaler will be able to use THEROS portable MEMS based photonics systems, and the respective mobile application for detection of falsified labels. In that purpose, pilot will follow and test organic wheat flour from Univerexport and organic apple juice from other organic certified producer by OCS.

Funded by the European Union

THEROS pilot Serbia - The blockchain-based traceability system

- The last one, the block chain-based traceability system is following product organic sunflower oil, produce from Univerexport and certified by OCS.

- Sunflower oil production begins with soil cultivation by PG Univerexport in Lipar, followed by outsourcing threshing and transportation to a dislocated warehouse for pressing. Bački Dukat Odžaci handles storage, pressing, and packaging before transferring the oil to Univerexport's central warehouse. Univerexport then distributes the product to Multiple Point of Origin (MPO), ensuring traceability with SSCC codes and Intermediate Storage Documents. At MPO, goods are checked, documented, and sold under the ORGANA brand, guaranteeing full traceability via fiscal invoices.



Funded by the European Union

THEROS Key Expectations

- **Uptake and utilization of THEROS toolbox** solutions by other relevant stakeholders;
- **Increasing awareness to consumers** while directly engaging with supply chain operators at the pilots;
- High use of **THEROS knowledge base and adoption of best practices** by relevant control and monitoring systems;
- **Promotion of THEROS tools** and approaches **to control and certification bodies and inspection authorities**;
- High use of the **scientific publications** and research data of THEROS from the scientific community;
- **Achieve sustainability** for the project's results and prepare the ground for market entry.

Funded by the European Union

THEROS Impact

Establish sustainable supply chains with commercial value and targeted client communities

Create an integrated system that tries to minimize shortcomings/limitations

Providing needed business support to short supply chains of quality labelled food that increase efficiency

Establish sustainable supply chains with innovative technology

Lead to new or improved products, processes or services on the market

Funded by the European Union

www.theros-project.eu

THEROS_project

@THEROS_project

THEROS_project

Thank you for your attention!

THEROS Consortium

Funded by the European Union

This project has received funding under grant agreement No 101083579. It is funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or the European Research Executive Agency (REA). Neither the European Union nor the granting authority can be held responsible for them.