3 European Research Projects:

- Energy transition - INTENSSS PA
- Carbon footprint estimation - COFORMIT
- Data for CAP post 2020 - OPEN IACS

NATIONAL RURAL NETWORK
RURAL DEVELOPMENT PROGRAMME OF GREECE

3 GREEK NRN MEMBERS - EUROPEAN PARTNERS

ΑΝΑΠΤΥΞΙΑΚΗ ΚΑΡΔΙΤΣΑΣ
ΑΝΑΠΤΥΞΙΑΚΗ ΑΝΩΝΥΜΗ ΕΤΑΙΡΙΑ ΟΣΤΑ.

DEVELOPMENT AGENCY OF KARDITSA

ELGO - DIMITRA
HELLENIC AGRICULTURAL ORGANIZATION - DIMITRA

HELLENIC AGRICULTURAL ORGANISATION – DEMETER, ELGO DIMITRA

PAYMENT AND CONTROL AGENCY FOR GUIDANCE AND GUARANTEE COMMUNITY AIDS (O.P.E.K.E.P.E)

GREEK PAYING AGENCY, OPEKEPE

EU SUSTAINABLE ENERGY WEEK

Regional Living Lab of Karditsa

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ΣΕΜΠΧΠΑ

LEAD THE CLEAN ENERGY TRANSITION

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SUSTAINABLE ENERGY WEEK 04-08 JUNE 2018

An initiative of the European Commission

Regional Living Lab of Karditsa

LEAD THE CLEAN ENERGY TRANSITION

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Planning Process Results

Stakeholders ambitions

- Revitalize mountainous zone
- Use of the local resources to generate growth
- Sustainable Employment
- Respect physical environment

10
initial projects/ actions were detected and analyzed

Impacts

Strong socioeconomic spin-off expected:
- *2467 new jobs*
- *2021 households living under energy poverty will be benefited*
- *87,05 million Euros expected added value*

Strong environmental impact expected:
- *36375 ktoes expected reduction of CO2 emissions*

Institutional impact expected:
- *32 stakeholders will be involved*
- *Multilevel governance achieved, given that public-private-social stakeholders will collaborate in a single structure, equally represented in decision-making*

The appropriate institutional framework was detected and analyzed: *3 Energy Communities around different biomass sources will be established (Wood-Land-Urban pruning biomass)*

ADDED VALUE-NEXT STEPS

INTENSSS-PA introduced a new strategic energy planning concept to "fill" the administrative gaps, in local level. The "core" is the RLL. Basic innovative elements are:

- Through a constant and interactive way, the private-societal stakeholders co-shaped the planning concept in collaboration with the public authorities.
- A structured co-planning concept was placed, easily to be replicated in other field affecting the local development.
- The successful pilot implementation of an energy-spatial planning practice, coordinating by a 4P partnership constituting by the local stakeholders will contribute to the change of the centralized approach prevailing in the strategic planning issues in Greece.

Local stakeholders decided to continue the operation of the RLL of Karditsa by signing a Memorandum of Understanding, in order to:

- Coordinate the actions of the Strategic Plan.
- Pursue new pathways for the fulfillment of their ambitions about the future energy system.
- Maintain a platform to exchange ideas/plans about energy-spatial planning in local level.
- Upgrade their capacity in the energy-spatial planning, through synergies and joint-actions.

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Contribution of the plantations of the Lignite Center of Western Macedonia to environmental protection and climate change mitigation - COFORMIT

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Objectives of the project

Estimation of the carbon footprint and environmental footprint of the forest plantations established during the last 30 yrs at restored fields of former lignite mining activity.

- ✓ Determination of C stocks in the 5 carbon ecosystem pools: aboveground, belowground, litter, deadwood and soil.
- ✓ Determination of CO_2 fluxes, based on an eddy covariance tower and other long-term monitoring equipment.

Carbon stocks

Forest plantations inventory and estimation of carbon stocks in above and belowground pools

The biometric traits (height and diameter at breast height - DBH) of restoration plantations with *Robinia pseudacacia* have been measured by applying a systematic sampling plot approach (Fig. a) in order to estimate the distribution of DBH categories (Fig. b). Based on this distribution, and with the use of an allometric equation that will be established, we will calculate the total aboveground biomass of the plantations (Fig. c). Standing and lying deadwood has also been recorded. The coarse root system of selected trees will be excavated for the determination of belowground biomass (Fig. d). The fine root biomass and turnover will be assessed with soil coring and ingrowth cores installation.

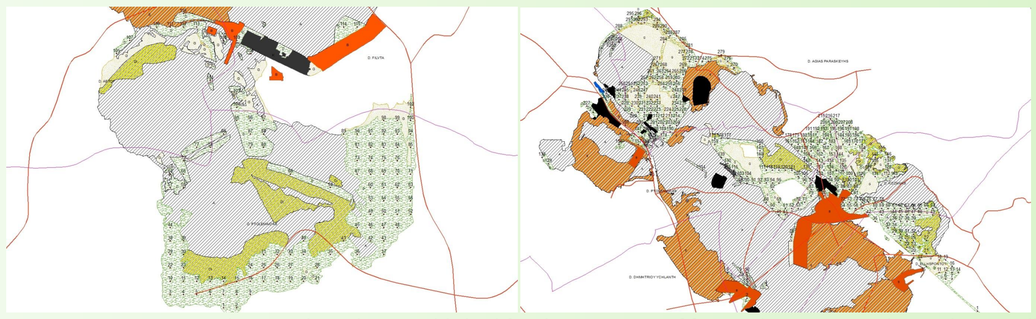

Figure a: A map presenting the sampling plots established for the inventory of forest plantations in the study areas (left: Amyntaio, right: main and south fields of Ptolemaida).

Figure b: Determination of height and DBH – distribution of DBH classes across the sampling plots of the study areas

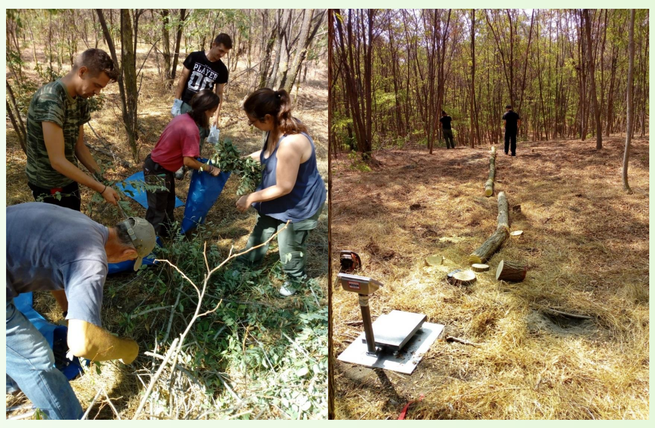

Figure c. Harvesting of black locust trees for the establishment of an allometric equation between aboveground biomass and DBH.

Figure d. Root excavation and standing biomass of fine roots sampling.

Carbon stocks in litter, forest floor and soil organic matter

36 litter traps (Fig. e) have been established in selected plots of the study areas. Collection of litter and forest floor takes place every two months, in order to estimate the dry biomass and the carbon stock in these pools, as well as the seasonal fluctuation of these pools. Soil coring took place in the same selected plots to determine C stock in soil organic matter.

Figure e. Collection and sample processing from a litter trap and from forest floor.

Carbon fluxes

Real time CO_2 και H_2O fluxes

An eddy flux tower (Fig.1) equipped with a CO_2/H_2O analyser and ultrasound anemometer (Irgason, Campbell Scientific, Fig.2) and a meteorological station, are established in the study area. The data are analysed in situ and are sent telemetrically to a central server.

Figure 1: The eddy tower

Figure 2: The CO_2/H_2O analyser at the top of the tower

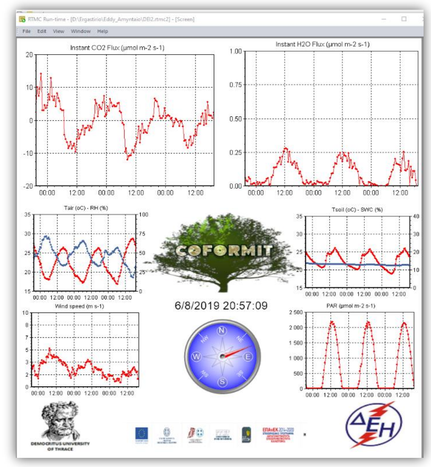

Figure 3: Real time fluxes diagrams

Estimation of vegetation indexes based on satellite images

For this purpose high precision Landsat satellite images are currently used, while images from the European satellite Sentinel will be used in the future. An example of timeseries of pseudo-colored NDVI images is presented for the study area of Amyntaio in Figure 4. Figure 5 shows the timeseries of NDVI values of the entire study areas.

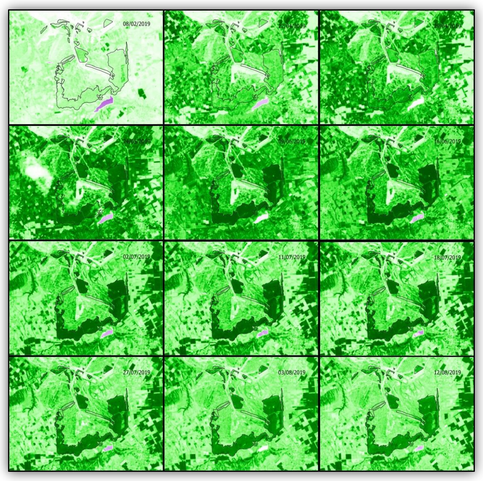

Figure 4: Timeseries of pseudo-colored NDVI images in Amyntaio (2019)

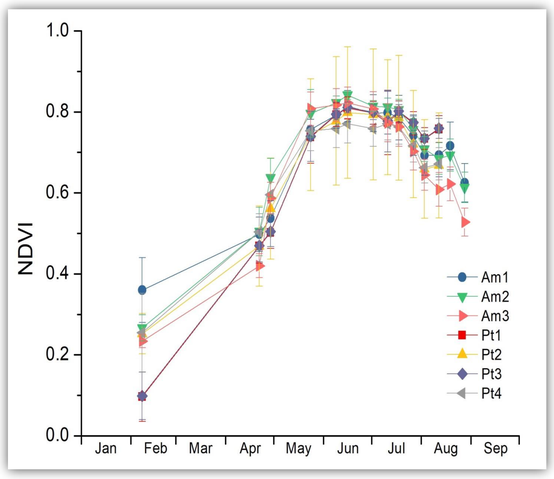

Figure 5: Timeseries of estimated NDVI values for the entire study areas (2019)

Phenology monitoring based on a ditigal PhenoCam camera

Phenology cameras enable the production of timeseries of real images and the calculation of vegetation indexes with better quality and frequency than that of the satellite images. The PhenoCam (Fig.5) established in the study area allows the continuous monitoring of the study area.

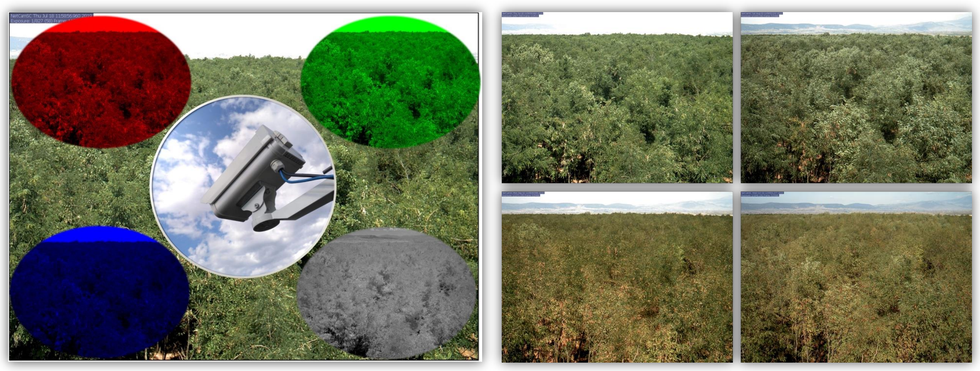

Figure 5: The phenology camera and its outcomes at the study area

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ΕΣΠΑ 2014-2020
ανάπτυξη - εργασία - αλληλεγγύη

Open LOD platform based on HPC capabilities for Integrated Administration of Common Agriculture Policy (Open IACS)

OPEN-IACS

https://open-iacs.eu

The new Commission proposal on the common agricultural policy (CAP) beyond 2020 includes, among other things,

- the calculation and use of various indicators related to agriculture for the purpose of assessing the effect of its policies.
- a push towards an EU open-data policy

and encourages te member states (MS) to create innovative tools aligned to these purposes.

In this direction the Open IACS project aims at making agri-environmental data available and discoverable through a Linked Open Data (LOD)-enabled platform with access to different high-performance computing (HPC) resources. The project is implemented by ten (10) partners, uses data from six sources and five different countries and ensures cross-border use of the services.

Three use cases/scenarios are defined in order to test and evaluate the proposed solution. The project also aims to increase HPC usage by creating a new access point for linked data accessing HPC resources by different providers.

GENERAL OVERVIEW

The overall objective of the project is to foster data use and reuse in the context of the CAP, and to improve its accessibility and usability by farmers, policy makers and other stakeholders. This can be achieved through the creation of a common infrastructure for agro-environmental governance of the CAP through a LOD-enabled platform with access to different HPC resources.

The term Linked Data refers to a set of best practices for publishing and connecting structured data on the Web using international standards of the World Wide Web Consortium. The project aims to design a network of interoperable LOD End-points powered by HPCs considering information for Agri-environmental management of IACS of the current and the future CAP. Additionally a common semantic model to represent and harmonize the data required to manage CAP and IACS will be produced. This will create the possibility to combine data from heterogeneous sources into integrated, consistent and unambiguous information. This set of services aim to facilitate the automated open access to the input datasets in Linked open data format as well as to the information related to the IACS management indicators.

The general overview of the Linked Open Data agri-environmental infrastructure for IACS is presented in Figure 1.

MAIN OBJECTIVES

1. Design a network of interoperable Linked Open Data End-point considering information for Agri-environmental management of IACS policies.
2. Implement the common agri-environmental infrastructure for IACS policy management by means of increasing HPCs capabilities.
3. Demonstrate the usefulness of this infrastructure through its application in different scenarios of use. The scenarios considered are:
   - Scenario 1: Information services for citizens, farmers and policy makers to support farmer activities and decision making.
   - Scenario 2: Agri-environmental Policy evaluation.
   - Scenario 3: Climate Change Impact evaluation

Scenario leaders coordinate the requirements specification in each case. For scenario 3 specific indicators were proposed to estimate GHG emissions. These are presented in Table 1.

Table 1: Agriculture-oriented GHG emissions

Source	Gas
Enteric fermentation	CH4
Manure Management	CH4, N2O
Rice cultivation	CH4
Soil Management (burning of residues, liming, C-fertilizers)	CH4, N2O, CO2

PROJECT STATUS

OPEN-IACS attempts to show how linked open data generated by IACS and other open data sources can provide solutions to the problem of GHG monitoring (see Figure 1).

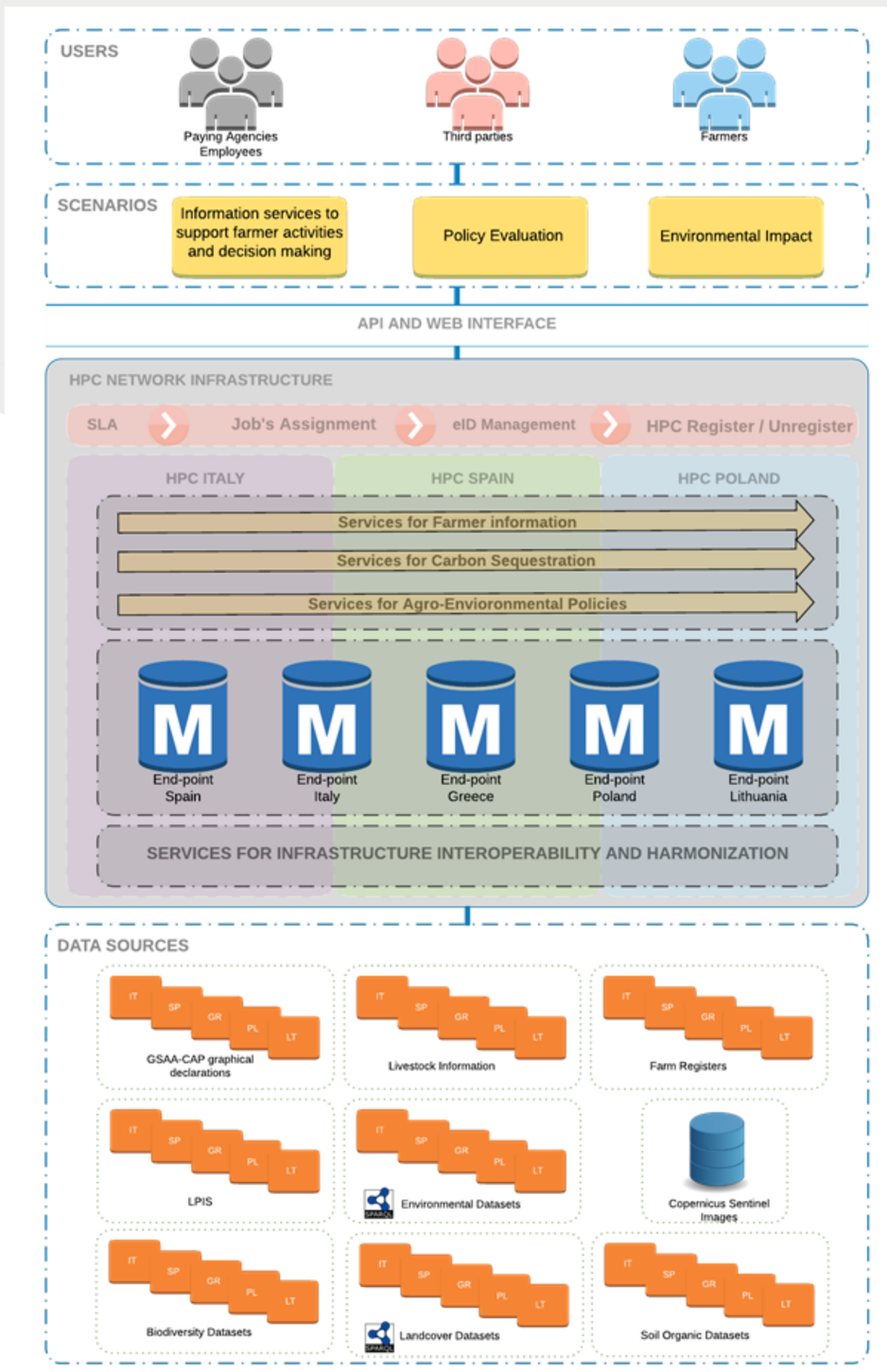

Figure 1: Overall approach of the Open-IACS platform

RELATION TO RURAL DEVELOPMENT

The relevant indicators in the field of climate and the environment are set in the CAP Strategic Plan and will be used to monitor and evaluate the performance of the CAP. Also these indicators are associated to the Green Deal targets and require new efforts by all administrations involved to guarantee high quality of the data obtained as well as enhance data sharing approaches.

In the framework of this structured dialogue, Open IACS attempts to contribute to the new EU ambition by indicating the use of LOD generated by IACS, LPIS, GSAA, Sentinel-2 imagery and other open data sources to calculate indicators connected to agricultural activity. We are also evaluating standards for sharing/obtaining information from FMIS to facilitate a more efficient calculation of the indicators.

EXPECTED OUTCOMES

The outcomes of the project will allow

- to facilitate the provision of information services for citizens, farmers and policy makers to support farmers' activities and decision-making;
- to improve the management of biodiversity associated with the development of crops in the scope of the CAP;
- to facilitate climate change mitigation, and adaptation to its effects.

For more information you can visit: https://open-iacs.eu

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