



LIVINGAGRO

Cross Border Living Laboratories for Agroforestry

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LIVINGAGRO: Innovation, transfer of knowledge and technology for Mediterranean agroforestry

Work in progress – discover the advancement of LIVINGAGRO project activities!

A review of the project challenges in brief

LIVINGAGRO project addresses the challenge of **knowledge and technological transfer in Mediterranean agriculture and forestry systems** for achieving and sharing **good practices** aimed at **sustainable production, protecting biodiversity, enhancing transfer of innovation and increasing profitability** for territories and main actors as well as stakeholders involved. Using an **open-innovation approach** for co-creating economic and social values and interactions between supply and demand, **two Living Laboratories (LLs) are established** focusing on **olive multifunctional systems (LL 1) and grazed woodlands (LL 2)** in order to promote the creation of a public-private community experimenting cooperation between companies and research organizations for the **development of innovative startups, activities, services and products.**

What specifically refers agroforestry to and what are Living Laboratories?

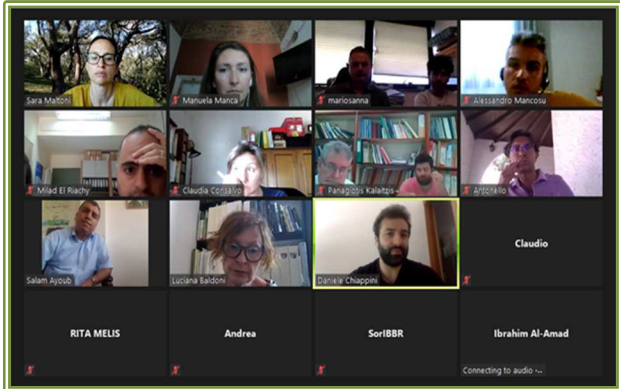
Agroforestry is a land use management system in which trees or shrubs are grown around or among crops or pastureland. This **diversification of the farming system** initiates an **agroecological succession**, like that in natural ecosystems, and so starts a chain of events that **enhance the sustainability of the farming system.**



A **Living Lab, or Living laboratory**, is a research concept, which may be defined as a **user-centered, iterative, open-innovation ecosystem**, often operating in a territorial context (e.g. city, agglomeration, region or campus), **integrating concurrent research and innovation processes** within a **public-private-people partnership**.

Work in progress for achieving project outputs and results

Almost **one year after the start of the LIVINGAGRO** project, the technical activities are proceeding, all in all without significant shifts compared to the work plan.



This is despite the temporary slowdown and the global emergency difficulties of Covid-19, thanks to an **acceleration of activities by the technical team** of the partnership which has started to meet monthly, with two technical meetings already carried out in June and on last July 8th, in addition to the virtual comparison made possible by the steering committee meeting.

The **second semester of the project is still highly preparatory**, the ongoing work phase consists in fact **acquiring the tools, defining the project's bases, framework and procedures**, to then be ready to start with the concrete actions at the beginning of the third semester. For this reason, **many activities can be carried out despite the emergency**. The **only concerned was the ones foreseen "in presence"**, indicated below, for which specific solutions or compensations were however provided:

- **Field visits** scheduled for the second semester: they have been rescheduled for the third semester;
- **Face to face meetings**: to be performed in virtual mode;
- **Participatory procedures for stakeholder involvement**: to be implemented using remote survey methods.



Photo by Cristian Mascia, Regional Forest Agency for Land and Environment of Sardinia (Fo.Re.S.T.A.S.)

This **preparatory phase** therefore saw the technical team engaged in **building the starting points of the project** and in particular for:

1. **improving the knowledge between the partners and in particular among the people who make up the local technical groups** with a team building activity;



2. **defining and acquiring the technical staff**, the cognitive **tools** and the technical **IT-equipment**;
3. creating the **working procedures and methods** of the group and the spaces for sharing the work itself;
4. defining its **reference context**;
5. defining the **reference models of the two Living Laboratories** and the **procedures**;
6. determining **methods for identifying the actors and for identifying their needs**; **collecting data**, structuring the most suitable **databases** to collect and process project data.
7. designing and preparing the fundamental tool for the implementation of the project, the **ICT platform**, necessary at the same time to contain, organize and make accessible and transfer the available knowledge and innovations to end users.



Photo by Cristian Mascia, Regional Forest Agency for Land and Environment of Sardinia (Fo.Re.S.T.A.S.)

The activities carried out in the context of points 1, 2 and 3 have made it possible to activate a close-knit **technical group**, which operates according to shared methods, equipped with human resources and the technical and IT tools necessary to carry out the planned activities. The group today **operates by sharing weekly activities and progress** through, besides the **project mailing list**, a system of **shared virtual folders**, where each partner can consult and share and give their contribution to technical documents.

In addition, the technical team updates itself through **monthly meetings on the progress of the activities**, and shares, through the leader, further initiatives relating to the project.

While the team building activity represents the human basis necessary for the project, point 4, with the **definition of the baseline and the possible laboratory models**, represents that of **creating the knowledge base**. For this reason, **three separate studies were developed in the first half of the year**, aimed at defining the **Living Laboratory framework at the partnership area level**. The **first study identified, contacted and interviewed the contact persons of about 125 international related projects** in terms of topics of interest to LIVINGAGRO acquiring important information, useful for the development of the project and the availability of contacts **to share problems and experiences**; these data are **collected in the Baseline Survey document**.





Another important element in the construction of the knowledge base is represented by the **Policy framework analysis**, which is currently in a good implementation phase thanks to the **collection of various available documents, on agroforestry systems** and, in particular, on **grazed woodlands and olive multifunctional systems, CAP** and its two pillars. The framework is being updated especially as regards the definition of the reference framework in cross-border, non-EU project areas, Lebanon and Jordan, which will be possible thanks to the support of the partners LARI and NARC.

At the same time (point 5) the **two Living Laboratory models were developed**, with an analysis of the meaning and characteristics and potential of the Living Lab open-innovation based method, verification of the different theorized and applied models, choice of the most suitable model for the LIVINGAGRO Project.



The analysis led the partners to **choose the so-called "Umbrella model"**, which, for the characteristics of the LIVINGAGRO project and of its cross-border partnership, turns out to be the most suitable model, for its flexibility, plasticity and democracy. **The study is reported in the two reports Model of Living Lab 1 and Model for Living Lab 2, elaborated in the first semester.** Today, however, the technical group works together with the **transition from the theoretical, model to the operational and concrete phase**, with definition of

details and operating methods and procedures, also in order to proceed with the definition of the external services related to Living Lab building. The key differences between the two laboratories will be considered in detail during the updating phase currently underway.

Another ongoing challenge, equally important to create a project that is actually useful to end users, is the one foreseen in point 6, represented by the **need to identify the different categories of economic and research stakeholders to involve highlighting their needs**, and define, compared to these, the innovations and key products available for the two Living Laboratories, to be shared and disseminated.

It is in some way to **bring together the demand for innovations from stakeholders and economies with the offer**, represented by the solutions produced by the world of research and institutions.

To do this, **two different methodological approaches have been put in place**, designed on the basis of the type of stakeholders studied. In particular, as regards the **economic stakeholders**,



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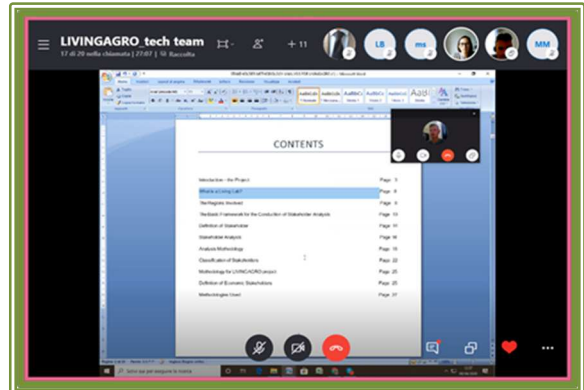
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which represent the demand for innovation, the use of participatory approaches, bottom-up, has been envisaged, designed on the model of those already used by some of the partners in other projects such as “LIFE Regenerate” and “AGForward”.

At this moment, due to **Covid-19 emergency**, it is difficult to carry out the expected participatory processes at regional and international level, in traditional way (face to face). In this sense, despite having thought about and implemented some compensatory activities, it is **necessary to find new involving and participatory approaches** to be carried out in the coming months. Surveys can be a good alternative option for analyzing innovation supply and demand. As regards the **research stakeholders**, who represent the innovation offer, the **top-down approach is chosen, which starts from the identification of the topics of interest of the two Living Labs and the study of products, patents and results** of the research available with respect to these topics, to then reach the authors, owners and holders of the innovations themselves and create a subsequent contact with the economic stakeholders.



These activities are described in specific methodological documents and the results collected in specific databases, by stakeholders and innovations and publications that are currently being shared, updated and implemented by the technical group.

Last preparatory element, but not less relevant, is that relating to the **creation of the ICT platform**, which will represent the **engine of open-innovation and the virtual meeting point, essential for giving life to the two Laboratories and for guaranteeing their success**. In these first ten months



the platform has been conceived and designed, its main requirements have been defined, the types of content, accessibility, capacity. The public tender will soon be launched for its concrete implementation, which will hopefully allow the tool to be available for the third semester of the project.

In relation to the complexity and cross-border nature of the project, there are various **challenges in progress**, many of which are transversal: from **how to share data respecting rules and the right to privacy**, to how to overcome the **language barriers between the stakeholders** of the two cross-border Living Labs, and again **how to involve the "people" component**, end users, farmers but also consumers.

These and other challenges will be addressed in the coming months by the project team as a

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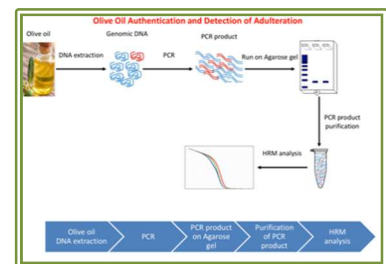
whole, with the common goal of achieving the **objectives set by the LIVINGAGRO project**, focused on the **transfer of existing innovations useful to solve technical problems common to different Mediterranean agroforestry systems**, such as, for example, improving the management of olive systems and tree pastures, improving their resilience, quantity and quality of products, the effectiveness of their distribution, their value on the market.

FROM THE PROJECT PARTNERS – In this edition: News from the GREEK PP – Part 2



DNA-based markers for olive oil authentication and adulteration

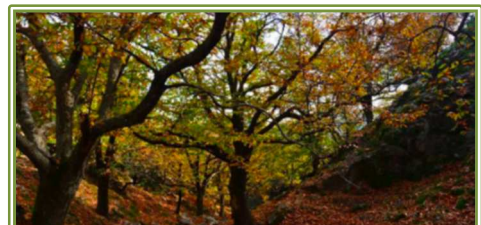
Mrs. Elsa Chedidn (now a Ph.D. candidate at the INRAE - University of Strasbourg, France) successfully completed her Masters' thesis under the supervision of Dr. Panagiotis Kalaitzis by developing an **accurate, fast and easy method for olive oil authentication** ([link](#)). The high-resolution melting analysis using **DNA-based markers** as targets is proved to be an **efficient method for traceability of olive oil**. Within this study three monovarietal olive oil samples from Greek cultivars were used for **SSR-HRM** and **SNP-HRM** assays. In order to investigate the **adulteration** of olive oil with other plant oils, the plastid trnL (UAA) intron was selected as the analytical target. **Two sets of primers** were designed to **amplify** two different regions of the intron. **Adulteration of olive oil with sunflower and corn oil** was taken as a case study. This approach suggests that **high-resolution melting analysis** is a **reliable method** to detect the **different botanical origin of plant oils** and the **varietal origin of olive oils**. SNP-HRM assays are **more accurate** for the **detection of olive oil mixtures** with a limit of detection of 5%. The plastid intron is an analytical target capable of distinguishing among different vegetable oils with a limit of detection of 1%.



Pilot actions for the conservation of the genetic material of *Castanea sativa* in the prefecture of Chania (Crete)



Mr. Mohamad Ali Hassan El Chami, a MSc student from the Department of Horticultural Genetics, for his thesis worked towards the **genotypic and phenotypic characterization** of the Cretan chestnut. A set of trees corresponding to four best-known chestnut cultivars



(*Stroviani, Rogdiani, Koutsakera* and *Katharokastania*) sampled from Chania region, were evaluated using **quantitative leaf and fruit morphological traits** and **simple sequence repeat (SSRs) markers, nSSRs and EST-SSRs**.

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All Departments of the Mediterranean Agronomic Institute of Chania in **collaboration with the Ministry of Environment** and Energy, General Directorate of Development, Forests Protection and Agro-environment aim to **protect the indigenous chestnut varieties** from the risk of **genetic erosion** and from various invasive **phyto-pathological agents** (fungi and insects), mainly related to the import of propagating material from mainland Greece and abroad, and to implement other activities towards the **promotion, certification and standardization** of the specific **quality characteristics of the crop**. The cultivation of the chestnut is exclusively found in the southwestern hinterland of Chania. **Cretan chestnut** is considered to come from a distinct variety with a unique taste, texture and nutritional properties, providing an important additional income for the farmers of the area.

OLIVE ROADS - The foremost flagship initiative in Greece



The Venture

The research network **“Olive Roads”** was established as an initiative of the Research and Innovation Department of the Ministry of Education and Science in collaboration with the Ministry of Rural Development and Food. The **network consists of research teams** from the majority of the **Greek institutes that work on the multi-functional olive system** and the Department of Horticultural Genetics and Biotechnology from **MAICH is**

among them. Olive Roads is the promotion of the cooperation of the country's human resources and infrastructures, in order to highlight the qualitative characteristics of Greek varieties and olive oil. The **objectives** of this research project are the a) **genetic characterization of Greek olive cultivars** using **phenotypic** and **molecular** markers; b) **de novo genome sequencing** in two emblematic olive varieties **“Koroneiki”** and **“Chondrelia Chalkidikis”**; c) **transcriptomic, proteomic, metabolomic** and **metagenomic** analysis of emblematic olive cultivars and their association with important biological phenomena (e.g. **abiotic stresses, fruit developmental stages etc.**); d) **microbiome characterization** using massive sequencing tools and e) **bioinformatics analysis** in order to exploit data acquired by multi-omics analysis.

Purpose

The tracing, promotion, identification and certification of olive varieties and the improvement of edible olives' and olive oil's production processes.

Objectives

The development of the Greek countryside, the support of local producers and the consumers' protection. At the same time, emphasis is placed on plant protection and the fight against important **“enemies”** of the olive tree at the holistic sequencing of the genomes of the **“Koroneiki”** and **“Chondrelia Chalkidikis”** olive varieties.



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The **2014-2020 ENI CBC Mediterranean Sea Basin Programme** is a multilateral Cross-Border Cooperation (CBC) initiative funded by the European Neighborhood Instrument (ENI). The Programme objective is to foster fair, equitable and sustainable economic, social and territorial development, which may advance cross-border integration and valorize participating countries' territories and values. The following 13 countries participate in the Programme: Cyprus, Egypt, France, Greece, Israel, Italy, Jordan, Lebanon, Malta, Palestine, Portugal, Spain, Tunisia. The Managing Authority (JMA) is the Autonomous Region of Sardinia (Italy). Official Programme languages are Arabic, English and French. For more information, please visit: www.enicbmed.eu.

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