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WP5 PROGRESS IN THE PROJECT

In the last months, a further step has been moved toward the implementation of SUSTAINOLIVE international project. Coordinated by Prof. Anna Irene De Luca from the Mediterranean University of Reggio Calabria...

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START-UP OF WP3 INVESTIGATIONS

The main objective of WP 3 of the SUSTAINOLIVE project is the evaluation of a series of ecosystem services in commercial olive grove plots managed along a sustainability gradient of the main producing countries...

NEWSLETTER 3

SUSTAINOLIVE | January 2021 - July 2021

April 14, 2021

Progress in WP5 of the SUSTAINOLIVE project: socio-economic and life-cycle assessment of the STSs

In the last months, a further step has been moved toward the implementation of SUSTAINOLIVE international project. Coordinated by Prof. Anna Irene De Luca from the Mediterranean University of Reggio Calabria (Italy), and Prof. Manuel González de Molina from the University of Pablo de Olavide (Spain), the main objective of WP5 is to assess the environmental and socio-economic impacts and repercussions of the implementation of STSs. To do this, the following methods will be applied: Social Agrarian Metabolism (SAM), Life Cycle Assessment (LCA), Life Cycle Costing (LCC), Social Life Cycle Assessment (SLCA), to be merged into an innovative methodological proposal of Life Cycle Sustainability Assessment.

More in details:

The Social Agrarian Metabolism (SAM), is a methodology which provides information on biophysical functioning and produces synthetic indicators of sustainability that can be easily monitored. Flows (e.g. production of goods and services) and funds (e.g. reproduction and improvement of the series of processes required for the production and consumption of goods and services) will be evaluated to assess whether STSs and comparable non-STs are sustainable after data collection. SAM also analyses the role played by energy flows within olive groves, taking into account not only the harvested olives but also the produced biomass which is not harvested, which is essential to fuel the heterotrophic components providing ecosystem services to olive farmers (Fig. 1).

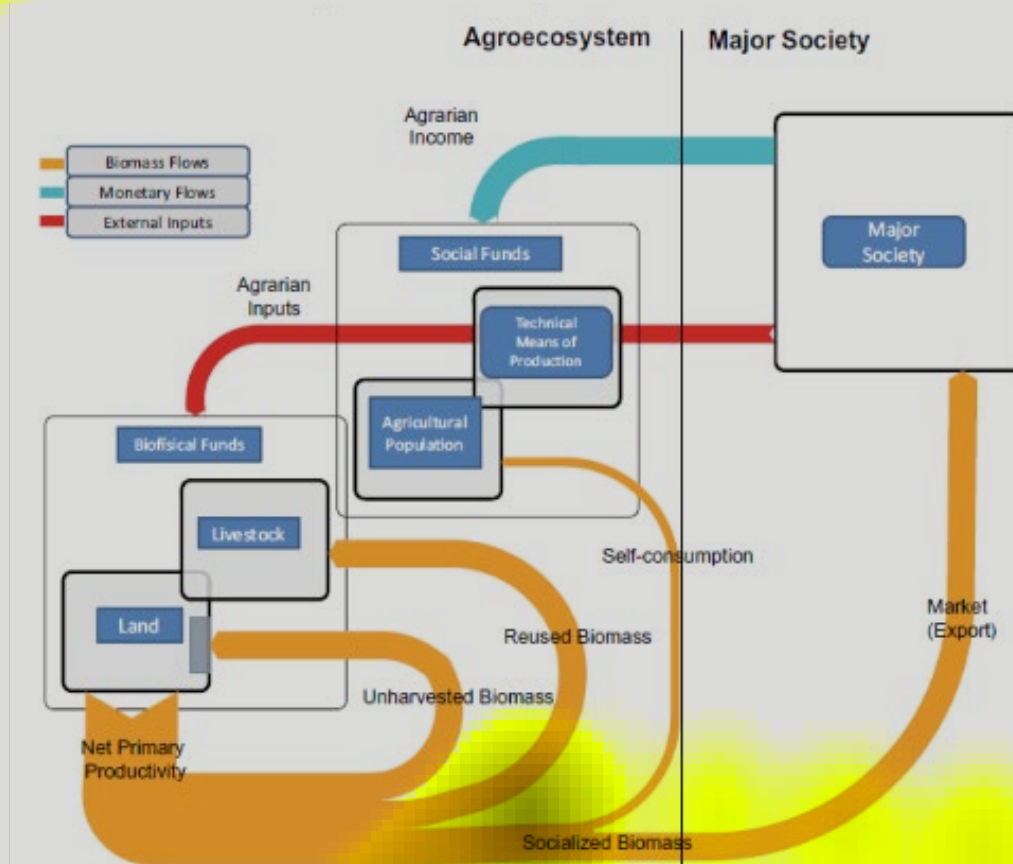


Fig.1 - Social agrarian metabolism, (source: Gonzales de Molina et al., 2020, p.14)



The Life Cycle Assessment (LCA) is a standardized methodology (ISO 14040-14044:2006) that enable to evaluate impacts and uncover burden shifts during the whole life cycle of a product or service, from cradle to grave (see Fig. 2). Data gathered will serve to build an inventory of input about materials and energy. A specific software, SimaPro 8.5, and an international database, Ecoinvent v. 3.5, will process data with the impact assessment model ReCiPe to obtain a list of indicators for each scenario assessed, such as for example: human toxicity, terrestrial ecotoxicity, freshwater eutrophication, marine ecotoxicity, global warming potential, and many others (Fig. 3).

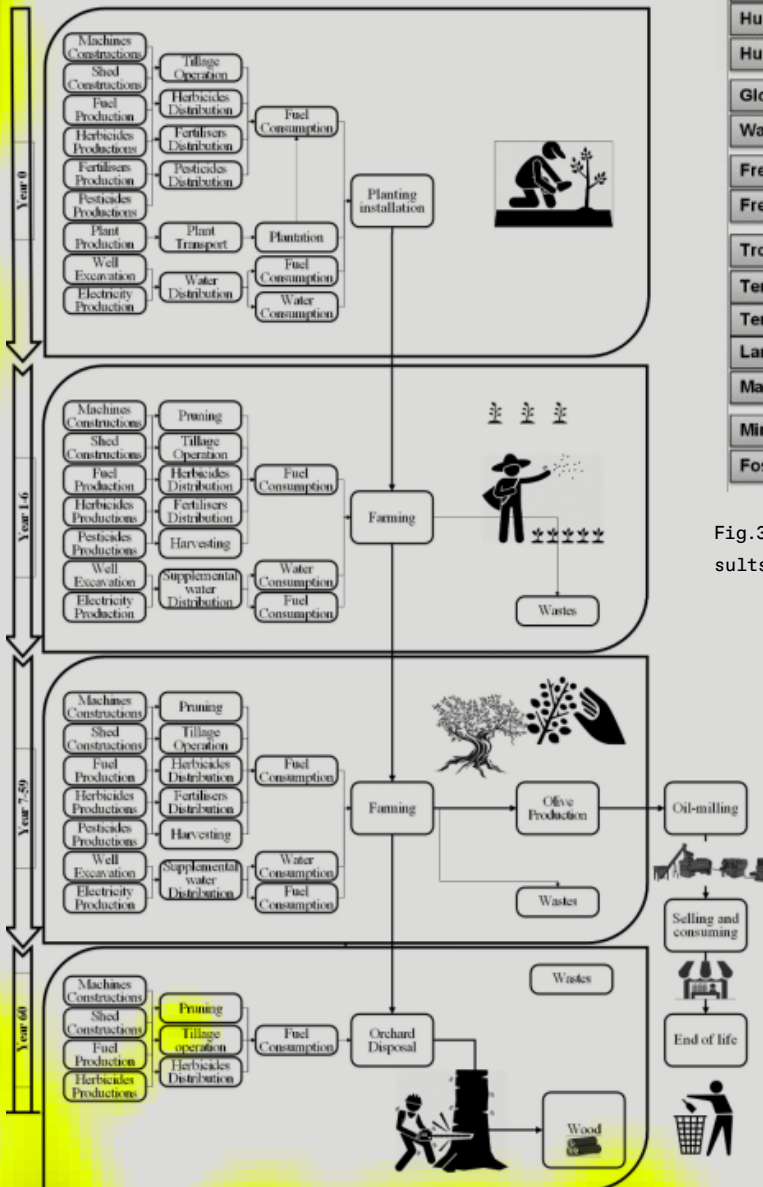


Fig.2 - Lyfe cycle inventory (source: Iofrida et al., 2020, p.123)

The Life Cycle Costing (LCC) is aimed at the accounting of every cost generated all along the functioning of the life cycle, allowing a long-term evaluation of the cost-effectiveness. It allows to highlight and quantify the main cost items, but also financial indicators of investment, throughout the life cycle stages, by classifying them in terms of initial costs, periodical maintenance costs, operational costs and end of life disposal costs or residual value. LCC also analyses all costs associated that are directly covered by one, or more, of the actors involved in the products life cycle, including externalities that are anticipated to be internalized in the decision-relevant future.

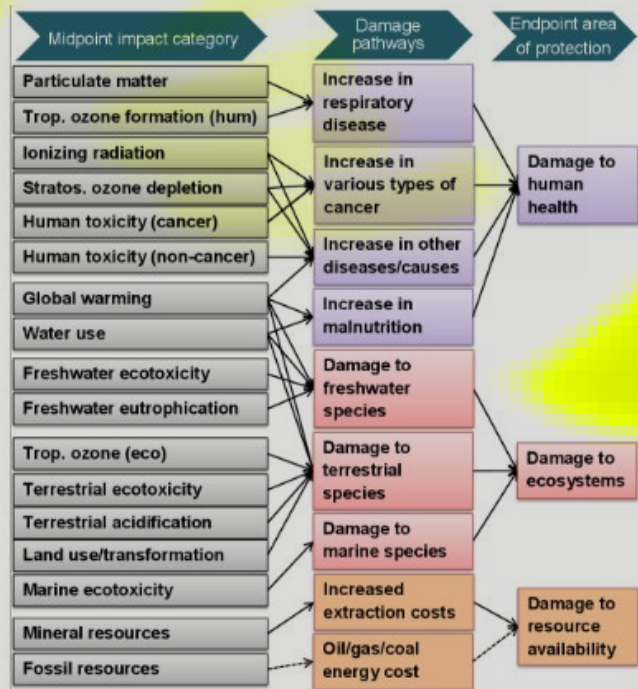


Fig.3 - Example of lyfe cycle indicators and impact results (source: Iofrida et al., 2020, p.123)

Social Life Cycle Assessment (sLCA): will be carried out to assess for the social impacts of olive farmers with STSs and without STSs. The impacts will be assessed in terms of psychosocial risk factors (PRF) i.e., the hours of potential exposure to working conditions that can lead to health problems, especially for workers directly involved, but also local communities and consumers can be affected. These risks are measured, according to the scientific literature, in terms of the odds ratio (OR) and they will be classified by strength of association. Each farming task will be related to one or more working condition (noise, vibrations, stress, open-air work, use of chemicals, work load, etc.) (Fig. 4).

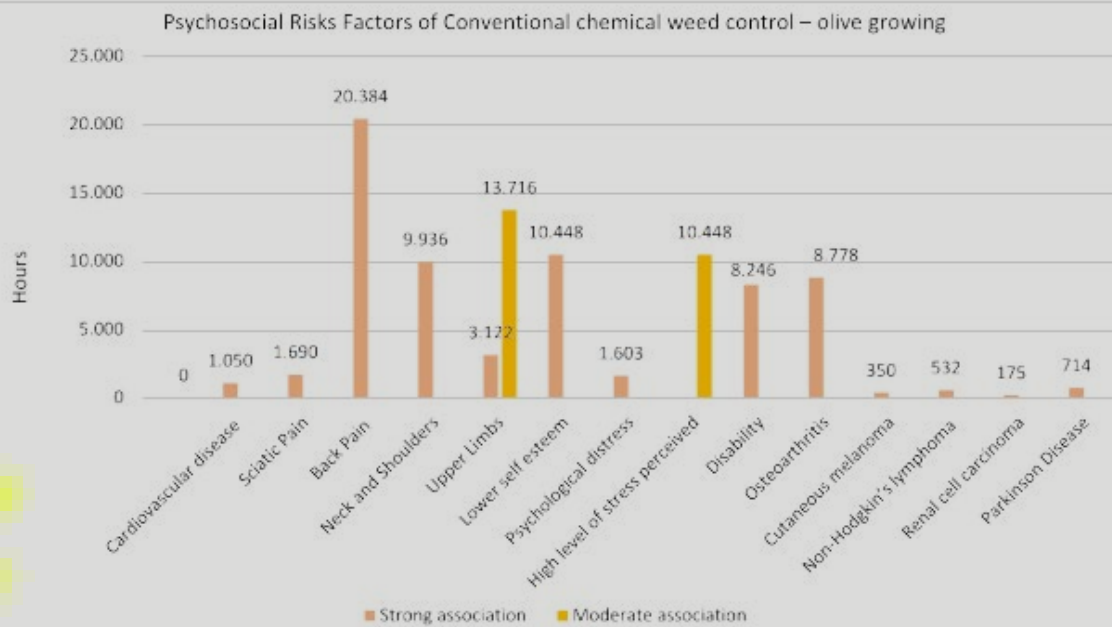


Fig.4 - Example of social life cycle assessment results (source: our elaboration)

Life Cycle Sustainability Assessment (LCAA): is a recent methodology, currently under development. To the purpose of Sustainolive, after measuring the environmental, economic and social indicators, the overall sustainability level olive groves under the innovative and sustainable practices will be evaluated using a Multi Criteria Decision Analysis (MCDA) method, such as the Analytic Hierarchy Process (AHP). AHP

is a well-known technique that has been widely implemented in many scientific fields and is applicable for valuing the different criteria, when the nature of alternatives is non-continuous. An evaluation matrix will be created by using the results of all above-mentioned analyses and then assembling all performances of the scenario per each criterion belonging to the environmental, economic and social dimensions (see Fig. 5).

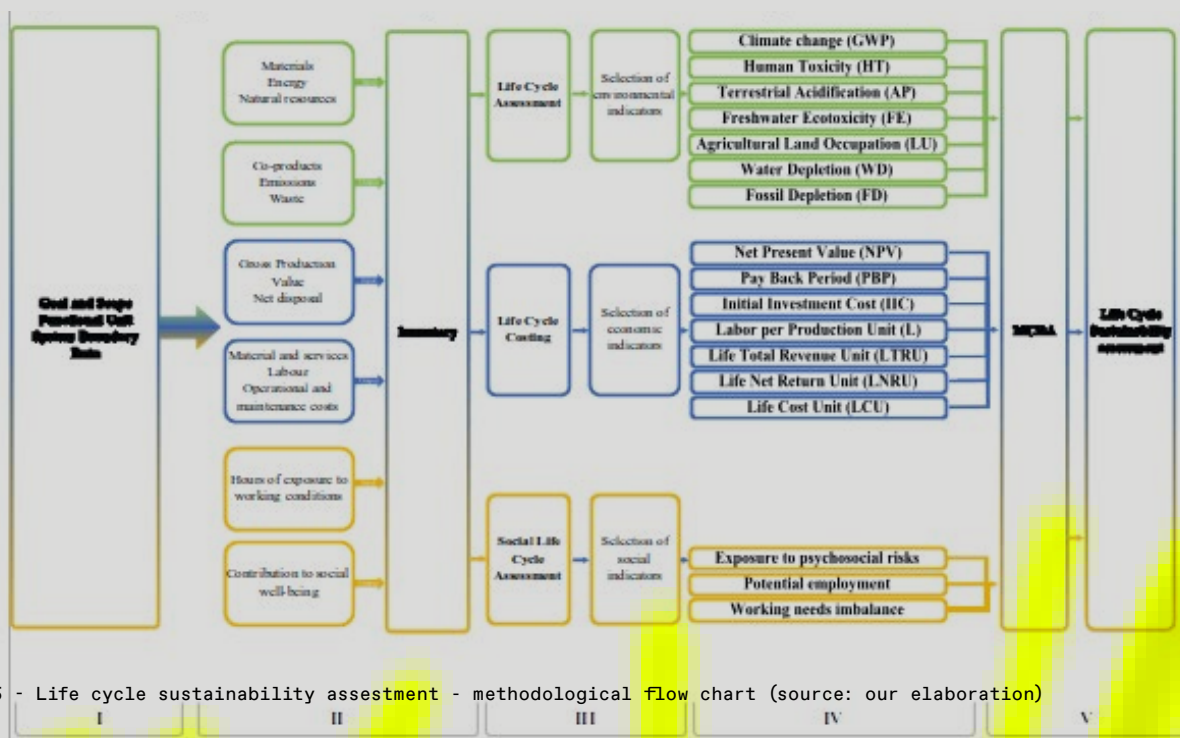


Fig.5 - Life cycle sustainability assessment - methodological flow chart (source: our elaboration)



We are currently developing a survey questionnaire (Fig. 6) to collect primary data needed to implement the evaluations. Consultancies among the expert partners have been of utmost importance to develop a shared questionnaire through an iterative and participative process.

The information will be gathered in the next months, thanks to the help of local experts (animators) and concerns qualitative and quantitative data about the main characteristics of olive groves, their management and farming systems, soil operations, weed management, phytoiatric treatments, harvesting operations, typology of workforce, costs and market prices, working capitals, among other. The asset of primary data collection to the purposes of Sustainolive are about the specificity and accuracy of information, the reliability of data source, and the possibility to interact with respondents and make the evaluations really adherent to our Mediterranean reality. Once the data will be gathered and validated, the above-mentioned methodologies will be applied. ✎

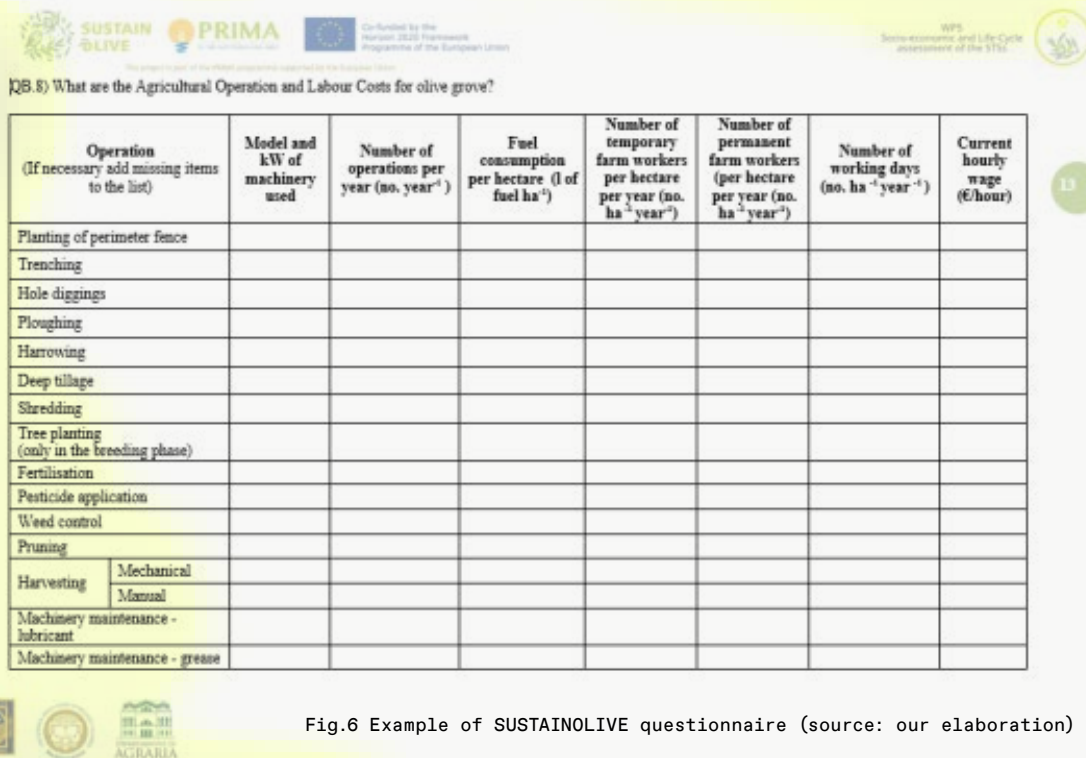


Fig.6 Example of SUSTAINOLIVE questionnaire (source: our elaboration)

References:

González de Molina M., Soto Fernández D., Guzmán Casado G., Infante-Amate J., Aguilera Fernández E., Vila Traver J., García Ruiz R. (2020). The Social Metabolism of Spanish Agriculture, 1900-2008. *Environmental History*, 10, 10.1007/978-3-030-20900-1.

Iofrida, N., Stalitano, T., Falcone, G., Gulisano, G., Nicolò, B. F., & De Luca, A. I. (2020). The socio-economic impacts of organic and conventional olive growing in Italy. *New Medit*, 19(1), 117-131. <https://doi.org/10.30682/nm2001h>

January 15, 2021

Work on experimental plots (WP3) in Portugal, started recently in this year's campaign

Our partners in Portugal have been already conducting field work in selected experimental plots. Some components of this experimental field work are related to the monitoring of the effects of bats in the Prays oleae plague through the use of a device powered by solar panels, which incorporates a modified delta trap and which is equipped with a photographic camera and ultra-sonic bat detector. Such monitoring activities are intended at obtaining synchronized data about the positive effects of bats over the P. oleae plague in order to assess the potential for interaction between them. At the same time, and in order to enhance or increase the populations of bats, shelter-boxes are to be placed in order to increase the availability of Bat coats (see Fig. 1) in our study.



Fig. 1: Shelter box for bats (photo by Bruno Silva)

January 20, 2021

Starting WP3 in Morocco

At the meeting conducted by the Moroccan scientific research team with the leaders of WP3 about the olive farms that were selected in Morocco in WP3, the working group decided to make some changes as the majority of olive farms in the north and south of Morocco are considered traditional and most of the agricultural practices practiced in them respect the concept of Sustainability. Through the analysis of the data, it became clear that there is a great similarity in many of the selected farms, as is the case in most of the farms in the region, in addition to the difference in the farms located at a great altitude with the farms that are at a relatively small altitude.

As it is known, the sustainability score differs from one country to another, for example Spain, it is easy for them to choose STS and non-STS farms, unlike some other countries such as Morocco due to the great similarity between farms and the existing agricultural practices.

As a result, the work team in Morocco decided to make some changes in the selected farms. The team made a field visit to a group of new farms in northern Morocco in Tetouan region, and another visit to southern Morocco in region of Marrakech.

Working on two approaches:

1) Working on a comparison between STS and non-STS farms by selecting the most sustainable farms and comparing them with the least sustainable farms (according to the degree of sustainability in Morocco)

2) The new working approach is a comparison between olive farms in northern Morocco, which are located at a relatively small altitude, with a total dependence on rainfall and precipitation between (600-800mm), and olive farms that are located in southern Morocco, which are located at great altitudes up to 1000 meters with reliance on irrigation and weak precipitation not exceeding 300 mm.

Picture of some new selected farms in Amizmiz (Marrakech region).

A meeting was held with Tismonin women's cooperative, located near to Amizmiz to hear them as part of a workflow with women cooperatives active in the olive field.





February 8, 2021

Meeting with the director of the Provincial Directorate of Agriculture (DPA) Mr. Ghouasli Mohamed in the Abdelmalek Essaâdi University

On January 22, 2021, the scientific team of Abdelmalek Essaâdi University, represented by Professor Kamal Targuisti and the doctoral Ali Yahya, as well as Salah El-Din El Azouzi in his capacity as vice-president of the Agricultural Association AFTHA, made a field visit to "Ouazzane" to hold a meeting with the director of the Provincial Directorate of Agriculture (DPA) Mr. Ghouasli Mohamed. Many points were discussed during the meeting:

- Starting with a detailed explanation of the Sustainolive project and the role and importance of the project in improving the olive sector in the region, in addition to the role of Morocco in the project.
- The possibility of engaging the Provincial Agricultural Directorate of "Ouazzane" as a potential partner by concluding a convention between the University and the Directorate Provincial, to participate in the sustainolive project within the framework of concerted efforts to do very effective work to ensure the smooth running of the project.
- Proposal for another potential partner which is the institute of technicians specialized in agriculture, and set a date for a working meeting with the director of the Agricultural Institute.

February 1, 2021

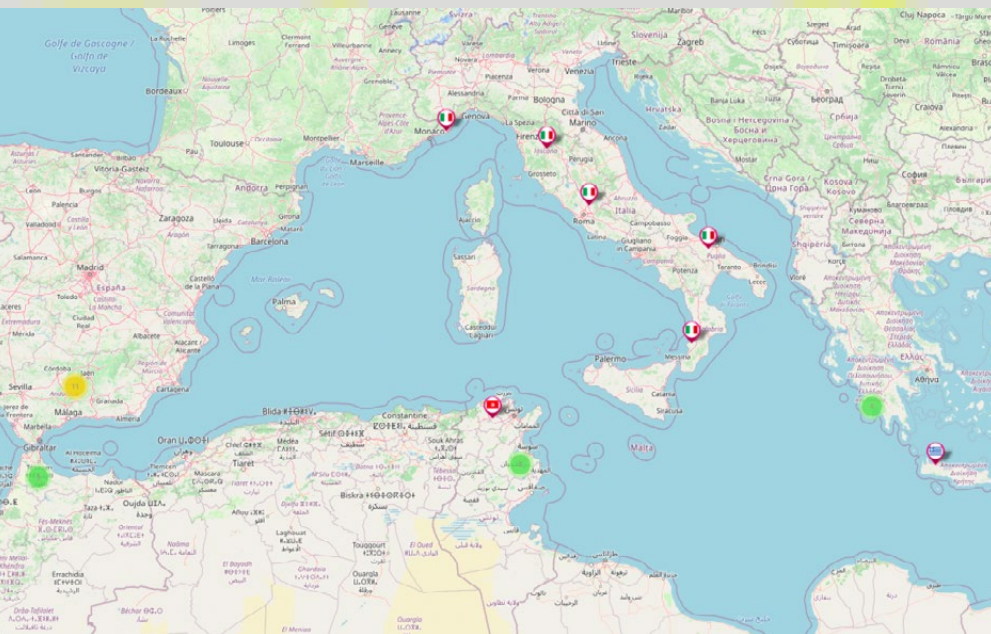
Start-up of work package 3 investigations in the SUSTAINOLIVE project

The main objective of work package 3 of the SUSTAINOLIVE project is the evaluation of a series of ecosystem services in commercial olive grove plots managed along a sustainability gradient of the main producing countries of the Mediterranean Basin.

In the case of Spain, some of the plots are linked to project partners such as the Estepa Denomination of Origin, and others belong to collaborating entities, such as the San Vicente de Mogón Cooperative or the private company of Espíritu Santo or La Casona. The location and main characteristics of the plots are represented on the <https://sustainolive.eu/olive-farms/?lang=en>

For the implementation of the research, the University of Jaen has a complete variety of research groups in charge of the execution of the different tasks and which include the functional units of Ecology, Process Engineering and Biochemistry of the Center for Advanced Studies in the Olivar y Aceites de Oliva (Dr. Sebastián Sánchez Villasclaras, Dr. Roberto García Ruiz, Dr. Juan Antonio Torres Cordero, Dr. Ramón González Ruiz and Dr. Juan Bautista Barroso Albarracín) and the center for advanced studies in Energy and Environment Environment (Dr. Julio Antonio Calero González and Dr. Tomás Manuel Fernández Del Castillo).

The results obtained during the execution of the project will be a scientific endorsement that will promote the transfer of knowledge related to the implementation of a combination of sustainable technological practices in the olive oil sector.



February 10, 2021

New field visit to the Institute of Specialized Technicians in Agriculture, located in "Benkarich", on the outskirts of Tetouan

A new field visit to the Institute of Specialized Technicians in Agriculture, located in "Benkarich", on the outskirts of "Tetouan", to hold a meeting with the heads of the institute, headed by Mr. Director Othman El Mrabet, within the framework of the introduction of the SUSTAINOLIVE project and to give it more resonance, as well as to attract the authorities concerned and involve them in the project in the sense of uniting efforts and exchanging the experiences and knowledge.

And in this context, the institute is committed to providing experts to supervise training for farmers, as well as to integrate the students of the institute into the project in addition to making the institute available to the scientific team in order to carry out experiments related to composting and providing a plot from the institute's olive farm to work there as part of the STS trials during WP3.

Another Convention has been concluded between the University and the Agricultural Institute.

The meeting was followed by a visit to all the institution's facilities, during which all the institute's qualifications were reviewed, starting with the nurseries, going through the pedagogical blocks, and ending by laboratories.

It should be noted that all the partners have expressed a great interest in the idea of the project in addition to expressing their willingness to provide assistance at any time.



March 16, 2021

Dr Vasileios Stournaras (ELGO) visits the experimental olive farms of Greek partners ACK and NGC



Dr. Vasileios Stournaras, Researcher in partner ELGO, visited on Friday 5/3/2021 and on Thursday 11/3/2021 the olive experimental farms of Greek partners Agricultural Cooperative of Kalamata (ACK) and NILEAS Producers Group Company (NGC), in order to monitor the pests and diseases and the phenological stages in the olive trees. During the visit, Dr Stournaras had the opportunity to see the new shredder machine of ACK and the application of shredded pruning materials and composted leaves in the farms. Also, he had the opportunity to see the application with hen manure on the NGC olive farms.



March 25, 2021

ELGO DIMITRA's pilot and experimental olive farm in Chania, Greece

In November 2020, an olive grove, at the premises of the ELGO DIMITRA – Institute of Olive Tree, Subtropical Crops and Viticulture, was selected for pilot applications of Sustainable Technological Solutions (STS), within SUSTAINOLIVE project. This olive farm has been used also for demonstrating environmentally friendly agricultural practices in the project LIFE Oliveclima in period 2012-2017. The farm, with area 1.1 ha, is consisted of forty year old olive plantation (*Olea europaea* L., cv. 'Kalamon', distances between trees 7 x 7 m) and is located at the experimental station of the Institute of Olive Tree, Subtropical Crops and Viticulture in Nerokourou region, Crete island, Southern Greece (35o28'36.76" N, 24o02'36.44" E; 51 m a.s.l.). According to the meteorological station placed at the Institute, the annual average air temperature was 18oC, the relative humidity (RH) was 64%, and the annual rainfall was 700 mm. Soil is sandy loam, pH 7.2, with very low contents in main macroelements. Irrigation is implemented weekly according to evapotranspiration through drippers (five per tree).



March 29, 2021

The Carbon Footprint and the measurement of the biovolume of an olive groves

Today we begin to publish a series of videos on the protocols developed by the University of Jaén for taking samples that allow us to measure the environmental services offered by olive groves to all of society. Today we present a video about the Carbon Footprint and the measurement of the biovolume of an olive groves. The video stars the Professor of Ecology at the University of Jaén Roberto García Ruíz, coordinator of the SUSTAINOLIVE project. We hope that these videos will help all actors in the world of olive groves who want to know better the agronomy of olive groves.



March 25, 2021

STS applications in ELGO DIMITRA's pilot and experimental olive farm in Chania, Greece

Between December 2020 and February 2021, applications of Sustainable Technological Solutions (STS) was initiated on ELGO DIMITRA's (Institute of Olive Tree, Subtropical Crops and Viticulture) pilot and experimental olive farm in Chania, Greece. More specifically, a compost derived from recycling all byproducts of a three phase olive mill was applied on the olive ground soil. Also, a mixture of legumes and cereal plant species were sown to enrich soil with nitrogen and carbon and also enrich biodiversity. Furthermore, olive tree pruning residues was chopped and recycled on the ground surface. Moreover, manure from worms was applied on the soil. These STS farming practices were applied one by one or altogether in different parts of the olive grove. Detailed measurements in tree soil and agroecosystem level will be implemented to assess sustainability of these STS farming practices.

April 1, 2021

SUSTAINOLIVE develops the idea “Collaborating Entities”

The project has developed the idea of “Collaborating Entities to increase the visibility of the project’s actions and increase synergies with actors from the world of olive groves and olive oil. In principle, 3 types of collaborations have been created:

- Entities that facilitate their operations to measure the ecosystem services associated with the cultivation of olive groves.
- Entities that participate in training and transfer activities to the olive sector, to which technical advice is provided, the possibility of carrying out internships in the plots of other collaborating entities, as well as all the tools produced throughout the project: protocols of research, manuals and audiovisual tools.

- Entities that collaborate in the communication actions of the project: newsletters, manuals on good practices, videos, etc. These collaborating entities are included on the project’s website and in the periodic newsletters, multiplying their visibility at the international level. Collaborating entities have no obligation whatsoever, with the exception of those in which a collaboration agreement-agreement has been established.

Today we want to share with you the videos produced by TEKIEROVERDE of 2 collaborating entities that describe their farms and operating philosophy.

April 1, 2021

7th Annual Kalamata olive oil and olive festival

The Kalamata Cooperative (Greece), a partner of the SUSTAINOLIVE project, is organizing the 7th Annual Kalamata Olive Oil and Olive Festival, which will take place from April 25 to 27. During the celebration of the Festival, the Kalamata 2021 Olive Oil Contest will also be held with its section of Awards for the best oils. In the last edition, 2 entities collaborating with SUSTAINOLIVE in Spain, Puerta de las Villas and Cortijo Sp Espíritu Santo, obtained the First Prize for Extra Virgin Oil and the 2nd Prize for the best Organic Oil respectively. We encourage all cooperatives and oil mills to present your oils to the 7th edition following the rules of the contest. www.kalamata-olivefestival.gr





April 13, 2021

Determination of apparent density in olive grove soils. Julio Calero, department of ecology of the UJA

S econd video on the protocols developed by the University of Jaén for taking samples to measure the environmental services offered by olive groves to all of society. Today we present a video on the measurement of the apparent density of olive grove soils. The video stars Julio Calero, professor in the department of ecology at the University of Jaén. We hope that these videos will help all actors in the world of olive groves who want to know better the agronomy of olive groves.



April 20, 2021

Roberto García Ruiz, coordinator of SUSTAINOLIVE has organised a visit to an olive mill pomace plant

R oberto García Ruiz, coordinator of SUSTAINOLIVE has organised a visit to the olive mill pomace plant of the Cooperative of Nuestra Señora de los Remedios (Olvera, Cádiz). The visit was sponsored by the International University of Andalusia and in the context of the course on agroindustrial waste/byproduct management of the Master on organic agriculture and livestock production. During the visit, Francisco share his know how on the management of the olive mill pomace composting plan. Yearly about between 10000 to 15000 tons of olive mill pomace and between 1500 to 2400 tons of olive leaves are obtained during the production of olive oil, which are co-composted with cow manure in the 8.6 ha composting plant. During the visit, Francisco explained step by step the different stages of the composting.



May 4, 2021

Sebastián Sánchez describes the progress in work package N°. 4

S ebastián Sánchez, Director of the center for advanced studies of the Olivar describes the progress in work package No. 4 of the SUSTAINOLIVE project. The laboratories where the by-products of the olive grove that they receive from the project partners are also presented.



May 12, 2021

Collecting biomass from the manipulative experiment on seeded cover crops set up in SUSTAINOLIVE-Spain on Los Almendros organically managed olive grove

On May 12, a group of researchers from the University of Jaén, led by the coordinator of the SUSTAINOLIVE project, Roberto García Ruíz, visited the organic olive farm “Los Almendros” (Granada, Spain) to take samples of aerial biomass in the experimental sites where different combinations of cover crops seeds had been previously sown.

The purpose of this field experience is to determine which of the seed combinations produces a greater plant cover and, therefore, provides the olive grove a better pool of ecosystem services (improvement in water retention capacity, increased soil fertility, erosion prevention, etc.).



May 14, 2021

IRTA, a partner in the SUSTAINOLIVE project, held its VIII Plant Defense Groups Workshops on the olive sector in online format

The purpose of the workshop is to share knowledge and exchange experiences between the technical staff of the Plant Defense Groups of Catalonia, the Plant Health Service and research entities such as IRTA and Universities. The trials, experiments and actions in common that have been carried out during the last year are presented. During the workshop, knowledge is updated, proposals are made and work is done on new problems related to plant health, pests, diseases and weeds. In this edition, the Plant Defense Groups present the tests carried out in the last campaigns and the news or concerns on plant health issues. It will explain how the monitoring of olive tree pathogenic organisms is done through the RedFara application in Aragon and the news of the FICAT network in Catalonia.

<https://sustainolive.eu/download/9444/>



VIII Tallers d'Agrupacions de Defensa Vegetal. Sector olivera

Seminari tècnic en línia
Divendres 14 de maig de 2021



May 28, 2021

Evaluation of STS application in ELGO DIMITRA's pilot olive farm in Chania, Greece



Between February and May 2021, field measurements and laboratory analyses have been implemented to evaluate the impact of Sustainable Technological Solutions (STS) on ELGO DIMITRA's (Institute of Olive Tree, Subtropical Crops and Viticulture) pilot olive farm in Chania, Greece. More specifically, detailed measurements in olive tree canopy, soil, earthworm, cover crops and agroecosystem level have been implemented to assess sustainability of these STS farming practices.

https://drive.google.com/file/d/1CjQFRZkk2s_SX-YI4pVjpxRV64ugm_IL/view?usp=sharing



June 2, 2021

Presentation of the project to farmers in the municipality of Kantano in Chania, Greece

Agronomists of ELGO-DIMITRA, Institute of Olive, Subtropical Crops and Viticulture specializing in olive cultivation, fertilization, entomology and diseases, visited the Municipal Unit of Kantanos on Friday, May 21st. Together with the deputy mayor of Kantanos, George Vakakis, they conducted an visit in olive groves in the area of Xerokampos, discussed with producers the problems they face. Systematic cooperation was agreed with the implementation of information events to improve olive cultivation and the creation of demonstration olive groves in the area so that farmers can see in practice the sustainable cultivation practices and the results in the production of trees compared to neighbouring olive groves.



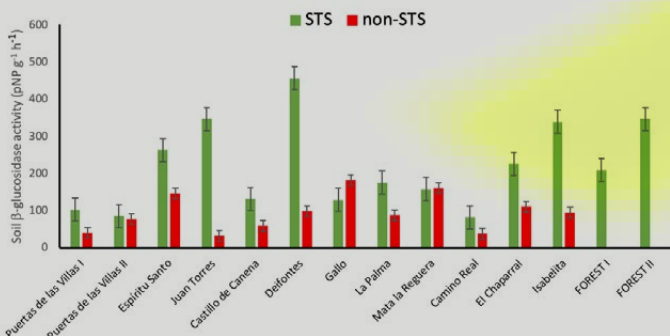
Soil β -glucosidase activity in SP-STs and non-STs

June 8, 2021

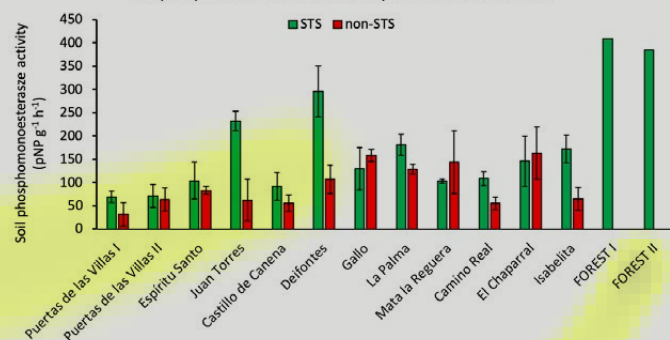
Soil functional quality

The Spanish team, lead by Roberto García Ruiz, together with Gustavo Francisco Ruiz has already analysed a couple of soil enzyme activities which are related to the recycling/reuse of organic phosphorus (soil pH phosphatase activity) and sources of labile organic carbon (soil β -glucosidase) in all the STS and non-STs experimental farms of Spain (SP). Analysis were also done in two forest sites nearby some of the STS-non-STs pair. These activities are linked to work package 3 and are part of the first results obtained in the SUSTAINOLIVE project.

These soil enzyme activities, together with other in progress, individually, or in combination by using complex indicators, are indicators of soil functional quality.



Soil phosphomonoesterase activity in SP-STs and non-STs





June 14, 2021

STS Farms in Morocco

During the week of June 14, 2021, the scientific team from Abdelmalek El Saadi University in Tetouan, represented by Ali Yahya and the Master student Abdel Aziz el Mahmoudi, carried out a field visit to the olive farms selected in the province of Ouazzane.

This field visit was for two main objectives. Sampling soil in order to do the analysis (Physico-chemical indicators, soil functional assessment, and microbial community, etc...). And also to do the biovolume measurement in order to know the amount of CO₂ that is transformed from the atmosphere

to Organic Carbon within the permanent and stable tree structures.

The works were carried out in two plots in the province of Ouazzane, the plot "Selam Azzuz" which is located in Assjen, and the plot "Alhuda" which is located in the village of Harrara near the town of Ouazzane.

Pending, the same working methodology will be applied to all STS and non-STS farms in North and South Morocco in the coming days in order to carry out soil analysis for all farms.



June 17, 2021

Presentation of SUSTAINOLIVE project in festival in Kalamata

Dr. Vasileios Stournaras, assistant professor in the University of Ioannina (ex-scientific responsible for SUSTAINOLIVE project of partner ELGO DIMITRA and now member in the research team), made an oral presentation about the actions and results of the SUSTAINOLIVE project so far, during the 7th pan-Hellenic Olive Oil and Table Olive Kalamata's Festival which took place on 12-13 of June 2021 in Kalamata, Greece.



July 13, 2021

Presentation of Sustainolive to the Minister of Rural Development and Food

The Minister of Rural Development and Food of Greece accompanied by the Head of the Prefecture of Crete and congressmen and stakeholders of Crete visited ELGO-DIMITRA in Chania on Tuesday, July 6th. Sustainolive project among other activities were presented. A short visit to the certified plant nursery, the genotype-environment interaction trial and other field experiments was realized resulting in a very fruitful discussion.

Click to
watch the
videos

—
**SUSTAINOLIVE
Project**

—
**Dr Roberto García
Ruíz - Interview**

—
**Dr José Quiles from
the University of
Granada - Interview**

—
**Dr Anna Irene De
Luca - Interview**

—
**Work visit to Morocco
for the project**

—
**Dr Ignacio Lorite
Torres - Interview**

—
**Dr Olfa Boussadia -
Interview**

—
**Dr Nelson Marmioli
and Dr Elena Maestri -
Interview**



This project is part of the PRIMA programme supported by the European Union



**SUSTAIN
OLIVE**



PRIMA
Partnership for Research and Innovation
in the Mediterranean Area



Co-funded by the
Horizon 2020 Framework
Programme of the European Union