



# LVII Convegno SIDEA

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“Agricoltura e Società tra mercato, innovazione e ambiente: le nuove frontiere di analisi dell’impresa agro-alimentare”



Università degli Studi Mediterranea di Reggio Calabria



SUSTAIN OLIVE

PRIMA PARTNERSHIP FOR RESEARCH AND INNOVATION IN THE MEDITERRANEAN AREA



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

## HOW TO EVALUATE THE SUSTAINABILITY OF

# AGROECOLOGY PRACTICES IN MEDITERRANEAN OLIVE GROWING?

## A METHODOLOGICAL FRAMEWORK MERGING THE SOCIO-METABOLIC APPROACH AND LIFE CYCLE METHODOLOGIES

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- Olive growing ecologically, economically, and socially identifies the Mediterranean rural regions and represents a significant development opportunity.
- However, high production costs, yields variability, climate change and low market prices of olive oil are critical aspects.
- The intensification of olive production processes has tried to solve these problems, but it resulted in oversimplified landscapes with low-nature-value.



- The international project “SUSTAINOLIVE” proposes a new methodology for sustainability assessment, based on the integration of Social Agrarian Metabolism -SAM (González de Molina et al., 2020) and Life Cycle Sustainability Assessment - LCSA (De Luca et al., 2018) to evaluate and compare innovative Sustainable Technical Solutions (STSs) introduced in experimental case studies, i.e. comparing “agro-ecological” and “ordinary” management practices.

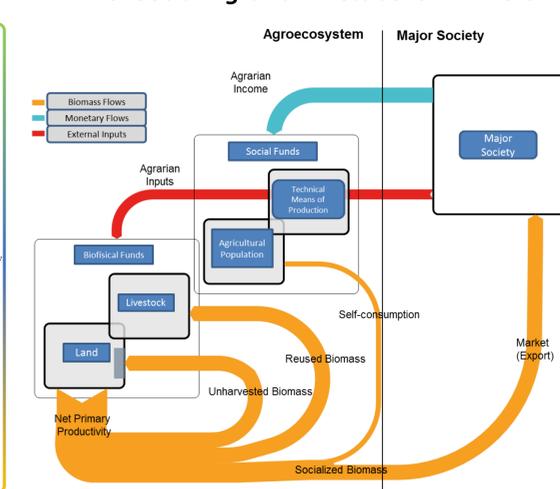
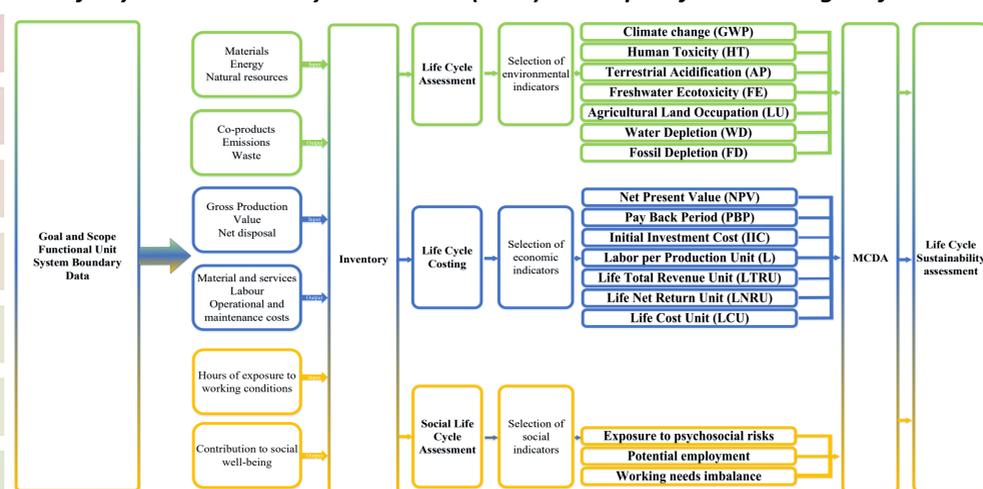


### Organization of Sustainolive Project

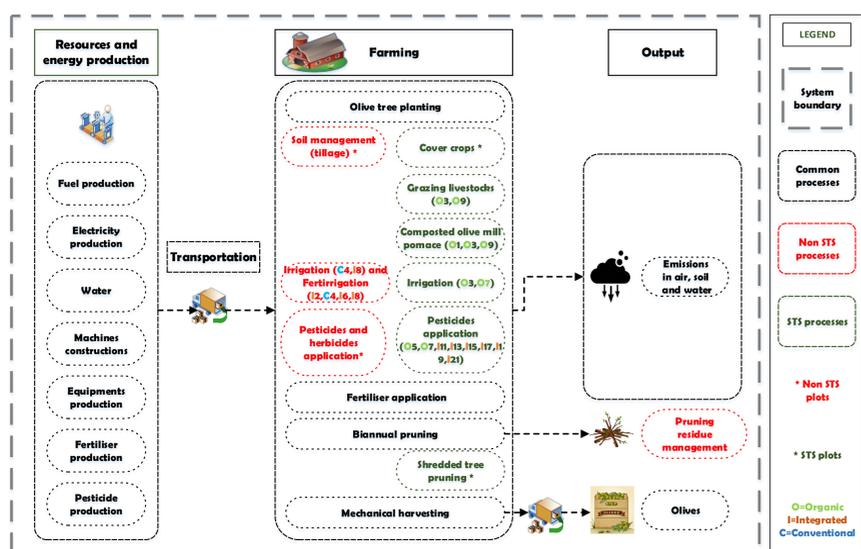
### WP5: Life Cycle Sustainability Assessment (LCSA) - example of methodological flow chart

### WP5: Social Agrarian metabolism - EROIs

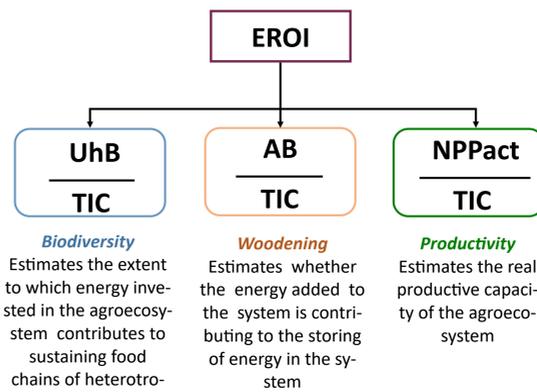
	<b>WP1</b>	• Project coordination and administration
	<b>WP2</b>	• Synopsis of olive cultivation and valorization of olive mill products • Identification of STSs
	<b>WP3</b>	• Implementation and evaluation of packages of STSs in commercial olive groves
	<b>WP4</b>	• Technologies for the recovery of olive oil mill by-products
	<b>WP5</b>	• Assessment of life cycles and socio-economic aspects
	<b>WP6</b>	• Participation platform
	<b>WP7</b>	• Dissemination, communication, demonstration and training



### Examples of ordinary and experimental farming solutions to be analysed:



### Agroecological “Energy Return On Investment” - EROIs



#### LEGEND

**UhB:** Unharvested biomass is the phytomass that is restored to the agroecosystem by abandonment.  
**AB:** Accumulated Biomass refers to the portion of phytomass that accumulates annually in the aerial structure and in the roots of perennial species, i.e., forest trees, woody crops, and shrubs.  
**NPPact:** actual Net Primary Production  
**TIC:** total input consumed = RuB + UhB + EI  
**RuB:** Reused biomass is the phytomass that is intentionally restored to the agroecosystem.  
**EI:** External inputs such as fertilizers, pesticides, machinery, feed, human labor and everything that originates outside the agroecosystem.

- SUSTAINOLIVE PARTNERS**
- 89 EXPERIMENTAL OLIVE FARMS
  - 8 UNIVERSITIES
  - 9 OLIVE GROWERS ASSOCIATIONS
  - 4 RESEARCH CENTERS
  - 1 COMMUNICATION COMPANY



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#### REFERENCES

De Luca AI, Falcone G, Stilitano T, Iofrida N, Strano A, Gulisano G (2018). Evaluation of sustainable innovations in olive growing systems: A Life Cycle Sustainability Assessment case study in southern Italy. Journal of Cleaner Production, 171, 1187-1202. 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.

**Life Cycle Assessment** 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”. **Life Cycle Costing** accounts every cost generated all along the functioning of the life cycle, allowing a long-term evaluation of the cost-effectiveness. A **Social Life Cycle Assessment** methodology will be applied to evaluate social impacts on workers, local community and consumers, in terms of hours of potential exposure to psychosocial risk factors (odd ratio). Finally, a **Life Cycle Sustainability Assessment (LCSA)**, by means of **Multi Criteria Decision techniques** (De Luca et al, 2018), will be carried out for a comprehensive evaluation of STSs and non-STSs for each olive farm case studies. This methodology will be applied to specific “olive farms case studies” in the countries partner of Sustainolive Project (Italy, Greece, Portugal, Spain, Morocco, and Tunisia) in close collaboration with key actors for the different management scenarios considered in the project. This may contribute to improve the effectiveness of decision-making processes, and support the reorientation of management practices.