

The project aims to achieve several key results:

- > developing a framework to assess the sustainability implications of three supply chains in the Italian agri-food sector;
- > generating knowledge regarding methodological choices for applying life cycle-based methodologies to food products within circular supply chains;
- > identifying circularity assessment methodologies and indicators tailored to the agri-food sector;
- > establishing an approach linking circularity and sustainability assessment to aid decision-makers in making supply chains more circular while ensuring increased sustainability;
- > identifying best practices, considering sustainability impacts, for structuring wine, olive oil, and pasta/bread supply chains.



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Towards CIRCULar and sustainable AGRI-food Systems: metrics for assessment



Brief description of the Project

Agricultural sustainability lies at the core of numerous European Union initiatives, including the Common Agricultural Policy and the “Farm to Fork Strategy”. The latter is pivotal to the implementation of the new European Green Deal (EGD), where the Circular Economy (CE) paradigm has been firmly integrated into both policy and business practices. In Italy, agriculture holds a prominent position. Scholars emphasise the importance of assessing sustainability impacts at both company and inter-firm

levels. A circular supply chain may not always be the most sustainable choice and sustainability impacts should be assessed on a case-by-case basis. When it comes to the agri-food sector, life cycle-based assessment methodologies, i.e., Life Cycle Assessment, Social Life Cycle Assessment and Life Cycle Costing are considered suitable for evaluating sustainability. However, further development of life cycle-based methodologies is necessary for assessing CE practices in an effective way. This project aims to understand the



relationship between circularity and sustainability in this sector, identifying metrics and exploring the impact of circular practices on sustainability.

The project establishes the participation of 3 Italian RUs:

RU1 - University “G. d’Annunzio” of Chieti-Pescara (Abruzzo, Leader of the project)

RU2 - University of Messina (Sicily)

RU3 - University of Bari Aldo Moro (Apulia)

RU1 - University “G. d’Annunzio” of Chieti-Pescara



The Chieti-Pescara unit, as the CIRCULAGRIS project leader, coordinates all phases and activities while collaborating with other research units to establish methodological approaches and joint efforts. The Chieti-Pescara team boasts extensive experience in multi- and interdisciplinary research on sustainability management and circular economy at national and international levels, also engaging with various stakeholders such as industries. With internationally recognized expertise in Social-LCA (S-LCA), they aim to develop an S-LCA framework to analyse social practices in the agri-food sector. Building on their consolidated research in the wine-making industry, they focus on the wine supply chain, mapping circular systems and adapting circularity metrics to that specific sector, seeking to identify correlations between circular practices and sustainability, thus aiming to enhance performance.

RU2 - University of Messina



The Messina unit has experience in multi- and interdisciplinary research projects, at national and international level, where Life Cycle Thinking (LCT) tools and methods have been applied to the agri-food system and other sectors, often highlighting the problems connected in integrating sustainability and circularity evaluations. In this project, the Messina unit specifically focuses on the olive oil supply chain. Indeed, the members of the unit have gained many years of consolidated research experience in the implementation of LCA and other LCT methods in the olive oil making industry, both from a methodological and operational perspective. Therefore, sustainability and circularity assessment within the olive oil making industry are carried out, evaluating selected circular systems and comparing them to traditional linear ones to verify their life cycle sustainability performances.

RU3 - University of Bari Aldo Moro



The Bari unit, with extensive experience in Life Cycle Assessment (LCA) applied to agri-food systems, participates in the project, focusing specifically on the pasta and bread supply chains. Specific circularity assessment methods and indicators are identified, adapted to selected circular systems, and compared to traditional linear ones to verify their sustainability performance and thus prove whether circularity practices in the pasta and bread supply chains show improved performance in terms of sustainability. In particular, the Bari unit focuses on the Environmental Life Cycle Costing (LCC) in the bread and pasta supply chains. The integration of LCA, LCC and S-LCA is expected to allow the definition of economic, environmental and social indicators, unifying these aspects that are often separately assessed in food chains.