



# Master Courses 2023-24



## Master in MEDITERRANEAN ORGANIC AGRICULTURE



Academic Year 2023 - 2024



## DESCRIPTION

The one-year Master of Science Programme offers unique opportunities for motivated students to become the next generation of professionals and researchers in organic farming and food systems able to support further development of the sector in the Euro-Mediterranean countries and worldwide. The programme considers organic food production as a system approach from primary production to consumption with a view to achieving the objective of the farm-to-fork strategy of at least 25% of the EU's agricultural land under organic farming by 2030 and in transition to fair, healthy and environmentally friendly food systems.

The master programme proposes a system-oriented approach in organic agriculture as a complex and dynamic process that requires careful management to ensure long-term sustainability and resilience. It integrates knowledge and methods from multiple disciplines to create sustainable organic food systems that match the needs of local communities and territories in a range of bio-physical and socio-economic contexts. Learning and teaching strategies are combined to advance students technical and analytical skills together with the important soft skills of communication, collaboration, creativity and critical thinking. At the end of the course, MOA students will be able to promote processes for the development of organic agriculture aimed at agroecological transition and sustainable food systems development.

After the MOA master students will:

- Master the principles and practices of organic agriculture, encompassing areas such as crop management, soil health, and pest and disease control;
- Develop strategies for planning and advocating the transition to organic agriculture, while embracing a holistic view of the entire value chain;
- Evaluate organic farming and food production from environmental, social, and economic perspectives;
- Gain a comprehensive understanding of the policy and regulatory frameworks governing organic agriculture at local, national, and international levels;
- Employ innovative solutions to enhance the sustainability and resilience of organic farming and food systems;
- Cultivate collaborative problem-solving skills and adopt a system thinking approach to tackle intricate challenges within the realm of organic agriculture.

The programme involves CIHEAM Bari staff and international scientists and practitioners who have made exceptional contributions to the organic sector. The first year of MOA programme is composed of eight thematic units followed by an applied project. The teaching methods are hands-on and experiential, involving peer education, field trips, technical visits, and active participation in learning activities. Students will engage in various practical tasks and assignments to enhance their abilities and expertise. They will also apply a cooperative problem-solving method and systems thinking to tackle intricate issues in the field of organic agriculture. The master's program fosters strong partnerships with diverse enterprises, effectively connecting the worlds of academia and industry. This connection enriches students' educational journey, providing them with a comprehensive learning experience and bolstering their professional opportunities.



The first year of the MSc programme is composed of seven thematic units and an applied project with 60 ECTS credits.

Units	Credits	Dates
Unit I - Sustainability and resilience in agriculture and food systems (on-line course)	6	2-29 October 2023
Unit II – Organic agriculture principles, concepts and legislation	6	6 November - 1 December 2023
Unit III - Agroecology	6	4 – 22 December 2023
Unit IV- Soil Management and fertility	6	8 January - 2 February 2024
Unit V – Crop disease and pest management	6	5 February -1 March 2024
Unit VI – Sustainable farm management	6	11 March - 5 April 2024
Unit VII – Organic food value/supply chains and marketing	6	8 Aprile - 3 May 2024
Unit VIII – Policies and local development	6	6 - 24 May 2024
Applied Project- Addressing the challenges of an organic enterprise through system thinking and collaborative problem solving	12	27 May - 14 June 2024

## UNIT I: SUSTAINABILITY AND RESILIENCE IN AGRICULTURE AND FOOD SYSTEMS

Food systems encompass all the elements (environment, people, inputs, infrastructure, institutions, etc.) and activities relating to food production, processing, distribution, and consumption. Over the last decades, food systems have come to the forefront of the debate on sustainable development. Indeed, food systems are under an unprecedented confluence of pressures and are at the center of global challenges (ecosystem degradation and biodiversity loss, resource scarcity, human population growth and climate change) to achieve sustainable food security. Moreover, the COVID-19 pandemic has revealed the vulnerabilities and brought to light the flaws in current food systems and the need to improve their resilience and sustainability. Furthermore, the dysfunction of modern food systems is a significant cause of several societal issues such as food insecurity and malnutrition, rural poverty and livelihood vulnerability, social inequality. The transformation of food systems and their transition towards more sustainable and resilient systems are the goal of many policies, strategies, and initiatives. While some initiatives focus on single stages of the food chain (e.g., sustainable agriculture, sustainable diets), others are more systemic and holistic (e.g., short food supply chains, alternative food networks).



## AIMS

This unit aims to:

- ❖ Explain the concepts of sustainability, sustainable development and resilience, and how to apply them to agriculture and food systems (sustainable agriculture, sustainable diets, sustainable food systems).
- ❖ Explore the environmental, social, economic, and health-nutritional challenges affecting agriculture and food sustainability in the Euro-Mediterranean area and worldwide.
- ❖ Introduce examples of sustainability assessment approaches and show how they have been used in agriculture and food systems.
- ❖ Present policies, strategies, and initiatives to foster the transition towards sustainability in agriculture and food systems in the Euro-Mediterranean area and worldwide.

## LEARNING OUTCOMES

Students will be able to:

- ✓ Understand the concepts of sustainability, sustainable development, and resilience, and apply them to agriculture and food systems.
- ✓ Explain sustainability challenges regarding agriculture and food in the Euro-Mediterranean area and worldwide.
- ✓ Know how sustainability assessment approaches are used in agriculture and food systems with practical examples.
- ✓ Understand strategies, pathways, and actions for the transition towards sustainability in agriculture and food systems.

## UNIT II: ORGANIC AGRICULTURE PRINCIPLES, CONCEPTS AND LEGISLATION

Organic agriculture is a production system based on specific sustainability principles that rely upon environmentally friendly practices and inputs. Precise rules and regulations govern this sector, covering farm conversion, production processes (for plants and animals, including aquaculture), food and feed processing and marketing. They also govern the import/export of organic products. Based on these regulations and strict control systems the organic products are certified and labeled.

## AIMS

This unit aims to:

- ❖ Introduce organic agriculture with an overview of the philosophy, principles, history and sector development;
- ❖ Illustrate organic regulations in the EU and non-EU Mediterranean countries;
- ❖ Explain import/export of organic products in the EU (TRACES) and export procedures from third countries;
- ❖ Explain organic control systems, inspection and certification procedures.



## LEARNING OUTCOMES

Students will be able to:

- ✓ Advocate for organic agriculture as a production system grounded in principles and concepts aimed at achieving sustainability;
- ✓ Comprehend the legal dimensions concerning the production, labeling, regulation, and trade of organic products;
- ✓ Know organic certification procedures and how to plan and conduct on-farm inspection audits.

## UNIT III: AGROECOLOGY

Agroecology is a relatively new discipline that focuses on the ecological complexity and functioning of the agroecosystem. It is one of the key disciplines to drive the transition of agriculture towards sustainable paths, to face challenges posed by climate change, but also the negative externalities from current intensive production systems. It focuses on biological processes and on how they interact and influence the functioning of agroecosystems and farming systems, to propose sustainable agricultural practices and solutions.

Biodiversity conservation and enhancement, sustainable management of natural capital and the provision of ecosystem services are of core interest for agroecology. Students will have the opportunity to explore how the agroecosystems are interlinked with the use of natural resources, with the health of soil, plant and environment, and how they cope with abiotic and biotic threats under a changing climate.

Nowadays, the conceptual development of agroecology goes beyond the aspects related to scientific discipline and discusses factors concerning economy, sociology, culture, and in general wellbeing of the sector actors. Smallholder farmers are considered as promoters of sustainable practices; agroecology strives for their autonomy, supports the community-self organization and co-learning, and bottom-up/place-based actions. While promoting its core values, agroecology is not immune to modern technologies and innovation. Synergies are developed between new technologies and nature-based solutions, whose approach to agri-food systems and to mitigation strategies helps face climate change and other global and local challenges.

All the topics listed above are discussed along the unit, taking into consideration basic principles and practices of agroecology, agroecosystem stability and resilience.

## AIMS

This unit aims to:

- ❖ Understanding the value of the agroecological approach for improving rural livelihoods and promote social equity;
- ❖ Explain agroecosystem functioning;
- ❖ Examine the agroecosystems' complexities and challenges;



- ❖ Review agroecological practices that enable a more sustainable production and sustainable management options to mitigate and adapt to climate change and other global drivers of change.

## LEARNING OUTCOMES

At the end of the unit, students will:

- ✓ Become knowledgeable about ecosystem functioning, principles of agroecology and related practices;
- ✓ Acquire practical skills in integrated, multiscale agroecosystem analysis;
- ✓ Achieve basic knowledge on nature-based solutions for biodiversity and for the provision of ecosystem services;
- ✓ Become familiar with social and cultural values promoted by agroecology.

## UNIT IV- SOIL MANAGEMENT AND FERTILITY

Knowledge of sustainable soil management as a non-renewable resource is of utmost importance in organic farming. This unit will cover the basic principles of soil management and fertility using environmentally sustainable practices that aim to maintain or improve soil health and ensure production quantity and quality. The unit will explore the main physical, chemical, and biological principles that regulate the functioning of the soil as a living system and whose understanding is fundamental for managing soil fertility in different environmental and climatic conditions. Organic farming practices for soil fertility management will be described in detail and will be addressed within the framework of a comprehensive and strategic approach. A comprehensive and systemic perspective will be provided about the concepts of organic soil management and fertility as a potential self-sustaining system rather than one exclusively based on external inputs. Some classes will provide information about carbon farming, soil conservation and regeneration and waste biomasses valorization. Moreover, time for sharing and discussing real-case issues with farmers will be included.

## AIMS

This unit aims to:

- ❖ Describe main soil components and their interaction (biological, chemical and physical);
- ❖ Analyse and describe main soil nutrients;
- ❖ Describe main agronomic practices for soil management;
- ❖ Provide an overview to main fertilizers and amendments;
- ❖ Illustrate some farm examples of soil management.

## LEARNING OUTCOMES

Students will be able to:

- ✓ Gain insight into the soil system and the significance of soil organic carbon;



- ✓ Appreciate the critical role of soil fertility;
- ✓ Distinguish between fertilizers and soil amendments;
- ✓ Enhance your understanding of agricultural practices related to soil;
- ✓ Develop the ability to create agronomic plans;
- ✓ Explore topics like carbon farming, soil conservation and regeneration, and the utilization of waste biomasses.

## UNIT V – CROP DISEASE AND PEST MANAGEMENT

Disease and pest management in organic farming is a challenge, especially considering the strict limitations on chemical control and the delicate balance between external inputs and ecosystem services on which management should be based. The unit covers (a) the basic principles of organic agriculture related to disease and pest control in organic farming; (b) plant protection products allowed for use in organic agriculture and prospects for sustainable chemical control; (c) biological control, side effects of control tools and approaches on ecosystem services, and strategies to preserve populations of natural enemies; (d) management of vector-borne plant pathogens in organic agriculture. Emphasis will be placed on Mediterranean crops of economic/ecological/historical importance.

### AIMS

This unit aims to:

- ❖ Introduce principles for disease and pest control in organic agriculture;
- ❖ Present plant protection products allowed for use in organic agriculture, their mode of action and novel products for pest control;
- ❖ Illustrate biological control strategies and rearing of beneficial insects;
- ❖ Address the “Key pests” lifecycle of Mediterranean crops and relevant control strategies;
- ❖ Describe novel techniques that can be used to assess and study disease spread and transmission and control of the most important pests in Euro-Mediterranean countries.

### LEARNING OUTCOMES

Students will be able to:

- ✓ Approach pest and disease control in organic farming;
- ✓ Select and apply products for pest and disease control;
- ✓ Increase the presence of beneficial insects at the farm level;
- ✓ Design control strategies in accordance with EU regulations on organic farming.

## UNIT VI – SUSTAINABLE FARM MANAGEMENT AND AGRIBUSINESS

The organic farm is viewed as part of the agroecosystem and placed on the broader agrifood system, describing methods for performance analysis as tools to drive farmers towards competitiveness and business while respecting the environmental, economic and social contexts. The unit will introduce



the sustainable farm management as a decision-making process concerning allocating scarce resources for agricultural production and in line with multiple management goals. A sustainable farm must be managed holistically as an integrated system. Topics are addressed by exploring theoretical models, monitoring methodologies and real-life cases and developing strategies and possible future scenarios for sustainability improvement. As for the practical activities, students will learn how to analyse, assess and compare the sustainability performance of organic and non-organic enterprises.

## AIMS

This unit aims to:

- ❖ Introduce principles of farm economics with an agri-environmental perspective, particularly farm management, accounting and budgeting, economic analysis, business planning;
- ❖ Assess environmental, economic and social sustainability of an eco-friendly enterprise according to analytical methods and schemes for calculation and analysis;
- ❖ Provide tools to organize and manage an enterprise along the sustainable supply chain.

## LEARNING OUTCOMES

Students will be able to:

- ✓ Select and apply indicators for the assessment of environmental, economic and social sustainability;
- ✓ Make decisions for managing organic businesses in alignment with sustainability principles;
- ✓ Employ decision-making processes to enhance the competitiveness and profitability of organic enterprises operating within sustainable supply chains;
- ✓ Create business plans aimed at realizing sustainable farming objectives.

## UNIT VII – ORGANIC FOOD VALUE/SUPPLY CHAINS AND MARKETING STRATEGIES

Nowadays, organic food value chains are run in an ever more complex and dynamic environment, characterised by new consumer demands, new technologies and solutions, changing structures and modes of cooperation. Strategic alliances among stakeholders contribute to providing high-quality and differentiated food products and distributing the rewards equitably across the chain. Marketing plays a crucial role in linking organic agrifood chains to the market. Overall, this unit aims to teach how organic agrifood chains face the challenge of continuously improving their competitiveness and profitability by producing sustainable food. The unit provides knowledge and methods to enter the organic market with a multi-stakeholder and supply chain perspective. A range of approaches to developing more inclusive, equitable, transparent and sustainable organic value chains will be experienced. Moreover, innovative solutions able to add value along the value chain will be exploited.

## AIMS

This unit aims to:

- ❖ Provide knowledge about value chain concept and functioning, its components, stages,





actors and services.

- ❖ Explain the holistic concepts for the assessment of organic food quality.
- ❖ Address advanced technologies for organic food processing, post-harvesting and packaging.
- ❖ Analyse trends and drivers of organic food markets and consumption.

## LEARNING OUTCOMES

Students will be able to:

- ✓ Apply the organic food value chain development approach and perform its analysis.
- ✓ Understand the values of organic food.
- ✓ Identified technologies that create additional value and reduce the losses along entire value chain.
- ✓ Assess marketing strategy and consumer behavior analysis.

## UNIT VIII – POLICIES AND LOCAL DEVELOPMENT

Nowadays organic agriculture is considered as key element to mitigate territorial and global concerns. Therefore, organic agriculture is becoming a consistent successful model for sustainable rural development. It contributes to protecting natural resources and to support socio-economic and cultural features of well-being of local communities. Understanding the features of socio-economic, cultural and social capitals of local territories is of a high importance for improving and strengthening the quality of life. Additionally, comprehensive exploration of both national and international policy frameworks is essential in shaping the growth and development of organic agriculture.

## AIMS

This unit aims to:

- ✓ Provide students with a comprehensive understanding of national and international policy frameworks and local development opportunities in organic agriculture.
- ✓ Explore the role of policies and multi-actor involvement in shaping the organic sector and agricultural policy for the future, with a focus on the year 2030.
- ✓ Emphasize the connections between territorial and socio-economic factors and highlight the significance of community participation and stakeholder networks for sustainable development.
- ✓ Illustrate successful case studies and best practices at the local level.

## LEARNING OUTCOMES

Students will be able to:

- ✓ Demonstrate a comprehensive understanding of policy and local development opportunities.
- ✓ Understand the impact of policies and multi-actor collaborations on the organic sector and



agricultural policy in the context of future developments.

- ✓ Examine the intricate relationships between territorial and socio-economic factors and assess the importance of community participation and stakeholder networks in shaping sustainable development.
- ✓ Apply acquired knowledge to propose informed strategies and solutions for advancing organic agriculture and local development within the context of evolving policy frameworks.

## APPLIED PROJECT- Addressing the challenges of an organic enterprise through system thinking and collaborative problem solving

Understanding the activities and problems of organic enterprises is crucial to address the different challenges along the value chain. Students will have the opportunity to participate in activities addressing the main issues of the organic sector. The activities are designed to develop the student's capacity to observe, analyze and propose solutions to complex phenomenon by applying combined approaches gained throughout the course. Understanding a phenomenon within the context of a larger whole to understand things systemically and holistically literally means to put them into a context and establish the nature of their relationships. This unit develops the collaborative problem-solving competencies of students to effectively engage in a process to solve a problem by sharing the understanding, pooling their knowledge and effort required to come to a solution. There is a paramount need for collaboration between disciplines, communities, practitioners, students, and researchers which could help better to achieve sustainable solutions. A collaborative learning process aims at addressing 'real world' problems and gives the opportunity for diverse actors to come together to resolve problematic situations beyond individual possibilities. Addressing these problems and finding relevant solutions are key issues of transdisciplinary research that are needed in organic food and farming systems.

### AIMS

This unit aims to:

- ❖ Explore the case studies focusing on main problems and understand the local context of organic enterprises;
- ❖ Engage stakeholders in a problem-solving approach;
- ❖ Learn how to put knowledge into practice in addressing 'real world' problems;
- ❖ Improve the quality of knowledge and reasoning by integrating of disciplinary content.

### LEARNING OUTCOMES

Students will be able to:

- ✓ Provide practical solutions to practical problems;
- ✓ Apply methods for dialogues, discovery and apply new knowledge;
- ✓ Identify relationships between parts of a system and/or design a system to express the connections between parts;
- ✓ Gain insights into co-opting ideas and methods from various disciplines and working together across disciplines.