



CIHEAM
BARI

Master Courses 2022-23



Master in MEDITERRANEAN ORGANIC AGRICULTURE



Academic Year 2022 - 2023



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. It provides the knowledge, skills and mindset needed to promote the sector growth and methodologies for doing it through a combination of multi-disciplinary and collaborative approaches to tackle main challenges.

At the end of the course, students will possess the abilities to:

- Know multiple benefits of organic farming and food production
- Identify the best practices based on a comprehensive multi-dimensional assessment framework;
- Advocate for the adoption of ecologically, socially, and economically sound systems based on organic principles;
- Drive farms/operators towards transition/conversion processes based on legal requirements for organic food production;
- Apply value chain approach and facilitate multi-actors' engagement processes in developing the entire organic food chain and beyond.

The programme involves CIHEAM Bari scientific and expert staff and visiting academics and practitioners who have made exceptional contributions to the sector. Experiential teaching methods such as peer education, field and technical visits, direct involvement of the students in learning by doing are just some of the applied innovative approaches. Students will also undertake several practical activities and assignments to develop their skills and competencies.

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	3-30 October 2022
Unit II – Organic agriculture principles, concepts and frameworks	8	7 November - 9 December 2022
Unit III - Agroecology and climate change	7	12 December 2022 - 13 January 2023
Unit IV- Soil Management and fertility	7	16 January-10 February 2023
Unit V – Crop disease and pest management	7	13 February -10 March 2023



Unit VI – Sustainable farm management	7	13 March - 7 April 2023
Unit VII – Organic food value/supply chains and marketing	8	10 April - 12 May 2023
Unit VII – Applied Project- Collaboration at a glance from problem-solving to system thinking	10	15 May - 18 June 2023

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 FRAMEWORKS

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 govern also the import/export of organic products. Based on these regulations and strict control systems the organic products are certified and labeled. Organic agro-food systems are supported at national and international levels by several tools and procedures of agricultural policies that pursue the development of the organic sector.

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;
- ❖ Demonstrate main EU Policies, programmes and umbrella organizations that support sector development.

LEARNING OUTCOMES

Students will be able to:

- ✓ Promote organic agriculture as a production system relies on principles and concepts to achieve sustainability;
- ✓ Understand the legal aspects of production, labeling, controls and trade of organic products;
- ✓ Know organic certification procedures and how to plan and conduct on-farm inspection audits;
- ✓ Recognize how policies and multi-stakeholders involvement contribute to development of organic sector and agricultural policy towards 2030

UNIT III: AGROECOLOGY AND CLIMATE CHANGE

Agroecology is a discipline that studies the ecological complexity and functioning of the agroecosystem. It is one of the key disciplines to drive the transition of agriculture towards sustainable paths, facing challenges posed by climate change and 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 to



agroecology. Nowadays, the conceptual development of agroecology goes beyond the aspects related to scientific discipline and discusses factors concerning economy, sociology, culture, and wellbeing. 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. All the topics listed above are discussed in the unit, including basic principles and practices of agroecology, agroecosystem stability and resilience, predictions related to different climate change scenarios, the carbon footprint of agricultural production and some assessment methods, such as life cycle assessment of greenhouse gas emissions.

AIMS

This unit aims to:

- ❖ Understand the value of the agroecological approach for improving rural livelihoods and promoting social equity;
- ❖ Explain agroecosystem functioning;
- ❖ Examine the agroecosystems' complexities and challenges;
- ❖ Review agroecological practices that enable more sustainable production;
- ❖ Understand how climate change affects the functioning of agroecosystems;
- ❖ Identify sustainable management solutions to mitigate and adapt to climate change and other global drivers of change.

LEARNING OUTCOMES

Students will be able to:

- ✓ Become familiar with social and cultural values promoted by agroecology;
- ✓ Become knowledgeable about ecosystem functioning, principles of agroecology and related practices;
- ✓ Acquire practical skills in integrated and multiscale agroecosystem analysis;
- ✓ Achieve basic knowledge of nature-based solutions for biodiversity and the provision of ecosystem services;
- ✓ Understand how climate change impacts agroecosystems and sustainable management of natural resources.

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.



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:

- ✓ Understand about soil system and role of soil organic carbon;
- ✓ Comprehend the importance of soil fertility;
- ✓ Learn the difference between fertilizers and amendments;
- ✓ Deepen the knowledge of soil agricultural practices;
- ✓ Prepare an agronomic plan

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

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;
- ✓ Decide the management of organic enterprises according to the principles of sustainability;
- ✓ Apply decision-making process to competitiveness and profitability improvement of organic enterprises within the sustainable supply chain;
- ✓ Develop business planning to achieve a sustainable farm goal.

UNIT VII – ORGANIC FOOD VALUE/SUPPLY CHAINS AND MARKETING

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 the organic food value chain.
- ✓ Assess marketing strategy and consumer behavior analysis.

UNIT VIII – APPLIED PROJECT- COLLABORATION AT THE GLACE FROM PROBLEM-SOLVING TO SYSTEM THINKING

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 in order 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