Valid from 2025.HS

Module description: Food Systems and Natural Resources

Module Code	w.MA.XX.FOSANR.23HS
ECTS Credits	6
Language of Instruction/Examination	English
Module Description	Food systems are most important worldwide for food security, economic development, and societies. They are also the largest users of natural resources such as water, soil, land, biomass, fuels, and biodiversity, as well as human labor. Agriculture, land use change, food processing, consumption trends, and food waste are major causes of overshoot of all planetary boundaries. In this module students are able to define the requirements for a sustainable use of natural resources within food systems. Strategies and solutions to spare resources, the sustainable use of them and the nutrient cycles at regional, national, and international level are explored and developed. A life cycle and closed cycle perspective is used to evaluate food systems holistically. This will help to identify hotspots and conflicts within the food value chain and “win-win” solutions regarding actors’ perspectives and local contexts for a sustainable future of the whole food system.
Organizational Unit	Zurich CTR f Sustainability Leadership
Module Coordinator	Alice Aubert
Deputy Module Coordinator	Rolf Krebs
Program and Specialization	• Circular Economy Management
Legal Framework	Academic Regulations MSc in Circular Economy Management dated 02.06.2022, Appendix to the Academic Regulations for the degree program in Circular Economy Management, first adopted on 23.09.2022
Module Category	**Module Type** Compulsory Elective
Prerequisite Knowledge	Students should be able to… · explain the importance of different natural resources in ecosystems and food systems. · view the agriculture and food sector as a system and identify and describe important processes. · identify problematic developments in food systems.
Contribution to Program Learning Objectives (by the concerned Module)	• Professional Competence • Methodological Competence • Social Competence • Self-Competence

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Contribution to Program Learning Objectives

Professional Competence
- Knowing and Understanding Content of Theoretical and Practical Relevance
- Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance
- Evaluate Content of Theoretical and Practical Relevance

Methodological Competence
- Problem-Solving & Critical Thinking
- Scientific Methodology
- Work Methods, Techniques, and Procedures
- Information Literacy
- Creativity & Innovation

Social Competence
- Written Communication
- Oral Communication
- Teamwork & Conflict Management
- Intercultural Insight & Ability to Change Perspective

Self-Competence
- Self-Management & Self-Reflection
- Ethical & Social Responsibility
- Learning & Change

Module Learning Objectives

Students...
- apply life cycle and closed cycles approaches to complex systems in the agri-food sector.
- develop solutions that contribute to spare resources, reduce impacts, and close nutrient cycles while contributing to global food security and more sustainable food system.
- evaluate the feasibility, challenges, and positive or negative impacts of these solutions.
- identify players and stakeholders of agriculture and food in a given context or region.
- map the social-ecological system (SES) for agriculture and food in a given context or region.
- recognize players' interests and concerns.
- recognize conflicts between different sustainability goals of food production and nutrition, name them, and explain them in a differentiated way.

Module Content
- Challenges of agricultural production and food systems on the way to a sustainable use of resources, including societal, political, and economic challenges
- Interactions and synergies of ecosystem services and agricultural production systems in the sense of agroecology
- Societal transformations for sustainable food systems
- Methods of evaluation of developed solutions
- Specific case studies on food loss and food waste, closed nutrient cycles in animal production, challenges for remote and rural regions, solutions in developing countries

Links to other modules

This module is linked to the following modules:
- w.MA.XX.MES.23HS
- w.MA.XX.SYPA.23HS
- w.MA.XX.BIMA.23HS

Digital Learning Resources
- E-Learning Kurse Nachhaltige Ernährungssysteme / Designing Sustainable Food Systems (Modules 1 and 2)

Methods of Instruction
- Lecture
- Exercises
- Project Work

Social Settings Used:
- Group Work
- Individual Work

Type of Instruction

	Classroom Instruction	Guided Self-Study	Autonomous Self-Study
Lecture	22 h	12 h	
Excercise	-	-	
Project Work	10 h	36 h	
Seminar	-	-	
Total	**32 h**	**48 h**	**100 h**

Performance Assessment

End-of-module exam	Form	Length (min.)	Weighting
-			

End-of-module exam	Form	Length (min.)	Weighting
Permitted Resources			

Others	Assessment	Format	Length (min.)	Weighting
Active participation *Activity 2 is included because the Module requires a high degree of self-directed learning. The default grade is 6. Students will lose one point if they fail to meet the 75% of presence (i.e. 100% presence in the compulsory sessions). Students will lose another point if they fail to upload on Moodle the preparatory questions for the field trip in due time. Students will lose another point if they systematically have a passive or disrespectful attitude in the exchange sessions.*	Grade	Einzelarbeit	0	25.00
Diagnostic of previous knowledge (optional) *Activity 0 is proposed as a preparation step for the first lecture and is optional. Students are invited to draw a mind map summarizing their knowledge about food systems and how they connect the principles of circular economy management with food systems. These preliminary thoughts can be shared during the first lecture. Comparing these preliminary thoughts with a mind map drawn at the end of the module can be an interesting element of the learning journal (Activity 1).*		Einzelarbeit	0	0.00

	Assessment	Format	Length (min.)	Weighting
Others Learning journal *Activity 1 consists of writing a learning journal. The purpose of writing a learning journal is to enable a deeper understanding of what students have learnt through regular follow-up and self-formulated reflection. Students create their learning journal independently using for instance taskcard, padlet , or any similar tool. The learning journal reflects each of the lecture days (preparation with the e-learning and discussion session), the field trip, the learning from the feedback, and contains a final log upon completion of the Module reflecting on two to three key learnings that occurred during the Module. Students submit the learning journal by Week 14 as a link on Moodle. Students will self-assess their learning journal by grading it using a co-designed raster. Students will receive written feedback.*	Grade	Einzelarbeit	0	25.00

	Others	Assessment	Format	Length (min.)	Weighting
	Project work, part I (Poster and poster presentation) *Activity 3 is an intermediary grading of the project work. It consists of the description and mapping of a food value chain (steps, actors), also showing interlinkages with its context (organizations, institutions, etc.). Students in groups of (two to four) will choose a food product to study. They will identify actors and actors 'interests and concerns. This part of the project enables to apply the inputs from the e-learning to a real-world case. Student will reflect on the sustainability of the described (linear) food value chain, based on a structured methodology, to identify hotspots of potential improvements, among others through implementing principles of circular economy management. The expected result is a presentation of a poster picturing the outputs of the analysis. The results of the analysis (50%), the poster including suitable graphic/visual means (25%), and the oral 10 minutes presentation (25%) will be part of the grade (according to the percent indicated in parenthesis).*	Grade	Gruppenarbeit	0	25.00
	Project work, part II (Presentation) *Activity 4 is the final assessment of the project work. It consists of the proposed solutions to address the sustainability hotspots, and to make the food value chain (more) circular. Students, in the same groups as for Activity 3, apply the*	Grade	Gruppenarbeit	0	25.00