## Module description: Food Systems and Natural Resources

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| **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** | CCR Ltg. |
| **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**<br>Compulsory Elective |
| **Prerequisite Knowledge** | The students should be able to…<br>· explain the importance of different natural resources in ecosystems and food systems.<br>· view the agriculture and food sector as a system and identify and describe important processes.<br>· identify problematic developments in food systems. |
| **Contribution to Program Learning Objectives (by the concerned Module)** | • Professional Competence<br>• Methodological Competence<br>• Social Competence<br>• Self-Competence |

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| **Contribution to Program Learning Objectives** | **Professional Competence**<br>• Knowing and Understanding Content of Theoretical and Practical Relevance<br>• Apply, Analyze, and Synthesize Content of Theoretical and Practical Relevance<br>• Evaluate Content of Theoretical and Practical Relevance<br>**Methodological Competence**<br>• Problem-Solving & Critical Thinking<br>• Scientific Methodology<br>• Work Methods, Techniques, and Procedures<br>• Information Literacy<br>• Creativity & Innovation<br>**Social Competence**<br>• Written Communication<br>• Oral Communication<br>• Teamwork & Conflict Management<br>• Intercultural Insight & Ability to Change Perspective<br>**Self-Competence**<br>• Self-Management & Self-Reflection<br>• Ethical & Social Responsibility<br>• Learning & Change |
| **Module Learning Objectives** | Students...<br>• apply life cycle and closed cycles approaches to complex systems in the agri-food sector.<br>• develop solutions that contribute to spare resources, reduce impacts, and close nutrient cycles while contributing to global food security and more sustainable food system.<br>• evaluate the feasibility, challenges, and positive or negative impacts of these solutions.<br>• identify players and stakeholders of agriculture and food in a given context or region.<br>• map the social-ecological system (SES) for agriculture and food in a given context or region.<br>• recognize players' interests and concerns.<br>• 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<br>• Interactions and synergies of ecosystem services and agricultural production systems in the sense of agroecology<br>• Societal transformations for sustainable food systems<br>• Methods of evaluation of developed solutions<br>• 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:<br>• w.MA.XX.BIMA.23HS<br>• w.MA.XX.SYPA.23HS<br>• w.MA.XX.MES.23HS |
| **Digital Learning Resources** | • E-Learning Kurse Nachhaltige Ernährungssysteme / Designing Sustainable Food Systems (Modules 1 and 2) |
| **Methods of Instruction** | • Project Work   Social Settings Used:<br>• Exercises     • Individual Work<br>• Lecture       • Group 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 |
|---|---|---|---|
| - | | | |

| Others | Assessment | Length (min.) | Weighting |
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| Diagnostic of previous knowledge (optional)<br>*Activity 1 is proposed as a preparation step for the first lecture. 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 3).* | | 0 | 0 |
| E-learning "Designing Sustainable Food Systems"<br>*Activity 2 consist of self-assessment. The student must follow six lectures of the e-learning "Designing Sustainable Food Systems". The lectures include quizzes, that enable the students to self-assess their learning. Students need the theoretical inputs from the e-learning to actively participate in the group sessions (Activity 4), to report in their learning journals (Activity 3), and to understand what to include in the description of a food value chain (Activity 5).* | Pass/Fail | 0 | 0 |
| Learning journal<br>*Activity 3 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.* | Grade | 0 | 30 |
| Active participation in class and during th field Trip<br>*Activity 4 is a group assessment for the whole class. It is included because the Module requires a high degree of self-directed learning. This requires, in addition to the self-study part, constructive exchanges during the group sessions. Also, each student will have to prepare two to three questions to ask during the field trip. These questions will have to be uploaded in Moodle before the field trip day. The tutor will assess the overall quality of the participation in the group sessions, and control that each student uploaded their questions for the field trip.* | Pass/Fail | 0 | 0 |

| Others | Assessment | Length (min.) | Weighting |
|---|---|---|---|
| Project work, part I (Poster and poster presentation)<br>*Activity 5 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 from a proposed list of topics. 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 | 0 | 30 |
| Project work, part II (Presentation)<br>*Activity 6 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 5, apply the inputs on circularity acquired in the various modules of the master, and in the discussions of the group sessions of the Module Food Systems and Natural Resources. The expected result will be a presentation of solutions to make the food value chain circular. The presentation should include the justification of the solution, from different perspectives. The format of the presentation can be chosen from the following list of authentic tasks: (1) Pitching the idea for a funding agency to gain the necessary financial support to implement the developed circular concept, (2) Producing and presenting a communication leaflet for the consumers (considering the proposed solutions for circularity are implemented), (3) Producing a podcast of an interview for a radio program about innovations. A discussion with the whole calls follows the presentations. Thereby, students from the other groups should evaluate and critically reflect on the feasibility, challenges, and positive or negative impacts of the proposed solutions. The expected output will be the presentation and follow-up discussion. The results of the analysis (50%), the presentation (25%), and answers to the questions during the discussion (25%) will be part of the grade (according to the percent indi-cated in parenthesis).* | Grade | 0 | 40 |

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| **Classroom Attendance Requirement** | 75% <br><br> On site attendance will be compulsory: - for the lecture/discussion sessions of the first half of the module, - for the field trip (date to be confirmed, tentative date 28.10.2024), - for the presentations of the results of project work, part I and part II (see Activity 5 and Activity 6). Coaching sessions for the project work will be possible, including online. |
| **Compulsory Reading** | • Will be communicated during the lecture |
| **Recommended Reading** | • Will be communicated during the lecture |
| **Comments** | |