Food and nutrition security (FNS) is a key challenge of development and a central element in broader debates surrounding environmental and social sustainability. Existing agricultural production systems may threaten environmental sustainability in the pursuit of ever more food for growing populations with increasing demands in terms of diet quality and diversity. The presence of some 795 million, or one in nine, people in the world still not having enough food to lead a healthy active life threatens social sustainability by creating (intergenerational) poverty traps due to stunting, permanent brain damages, and loss of productivity in adult life, and by increasing social conflict around land and water resources. To “End hunger, achieve food security and improved nutrition and promote sustainable agriculture” is the second sustainable development goal preceded only by “End poverty in all its forms everywhere” within the 2030 Agenda for Sustainable Development of the United Nations.

The minor in Global Food Security Studies is an interdisciplinary programme addressing the complex problem of food and nutrition security from a variety of academic disciplines, including economics, health sciences, natural resource management, and agronomics. You will learn key concepts and principles from these disciplines, which are relevant for FNS analysis and also learn to critically reflect on them. You will learn to combine these concepts and principles within an interdisciplinary analytical framework to explain the interlinkages between environmental resources, food production, food systems, policy, and quality of life, and to analyze possible policy options for improving FNS.

The minor programme consists of five courses. First, Challenges of Food and Nutrition Security offers you a broad understanding of the concept of FNS, both historically and contemporaneously, and analyzes the challenges to ensure food and nutrition security for all. Agriculture for Food and Nutrition Security focuses on the production of food. You will learn the basic agronomic principles underlying the interlinkages between environmental resources and agricultural production systems on the one hand, and between agricultural production systems and food productivity on the other hand. You will also learn the basic principles and tools for a spatial analysis of FNS issues. Food and Quality of Life addresses the effect of FNS on the quality of life at the level of the individual and population, with a specific focus on health, capacity for learning and productivity. Economics and Politics for Food and Nutrition Security introduces economic theory for analyzing how food systems (including producer and consumer behavior, markets) and policies impact FNS. In the final course Applications in Food and Nutrition Security Analysis, you will conduct a hands-on project to develop an evidence informed policy/intervention advice to address a specific problem in food and nutrition security.

Quintessential to the minor programme is interdisciplinary work and societal relevance. Interdisciplinarity is achieved by focusing throughout the courses on the same topic, FNS, from different scientific disciplines. Interdisciplinarity is further enhanced by having you applying the FNS concepts, principles and analytical framework in a series of course-linked assignments. At the start of the minor programme you choose a specific food group (e.g. Fish, Meat, Dairy, Horticulture (Fruits and Vegetables), Sugar) on which you will work (in groups) throughout the programme. In each of the first four courses you will analyze the selected food group using the concepts and analytical frameworks learnt in that course, i.e. the agronomic, environmental, health, spatial and economic aspects of Fish, Meat, etc.. In the final course, building on the previous assignments, you will work on a food group advisory study assignment that has been commissioned by a FNS stakeholder within or outside academics (private sector, government, NGOs), and which will be presented to this stakeholder.

Upon completion of the minor in Global Food Security Studies, you will have a thorough understanding of the key concepts and principles related to FNS from a variety of relevant disciplines. You will be able to apply these different concepts and principles within an interdisciplinary framework to explain the FNS
system in its key facets and to critically evaluate various FNS policy options. You will have learnt how to apply this knowledge and understanding in a sequence of practical applications and you will be capable of formulating and communicating the resulting evidence-based findings to FNS stakeholders in and outside academia. While it will be possible for you to follow only a subset of courses, the minor courses are designed to provide a good balance between knowledge and methodological acquisition from a variety of disciplines, critical thinking, and hands-on experience on a FNS topic. Also the integration of assignments across the different courses reinforces cohesion across the various topics and disciplines.

Overview programme and courses

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Course I. Challenges of Food and Nutrition Security

**Content**

Food and nutrition security is a critical input for the functioning and wellbeing in any society. At the same time, food and nutrition security remains far from guaranteed with more than 700 million people being undernourished and another billion people suffering from a lack of vitamins and minerals. In this course you will first develop a broad and deep understanding of the concept of FNS, both historically and contemporaneously. Next, the course will analyze challenges to ensure food and nutrition security for all now and in the future as well as challenges posed for societies and individuals by food and nutrition insecurity.

**Course objectives**

After successfully completing this course, you will:

- Have a broad understanding of the concept of FNS
- Be able to identify, calculate and interpret basic indicators for FNS and judge their relevance
- Be familiar with and understand the challenges to achieve FNS
- Be familiar with and understand the challenges posed by FNS failure for societies and individuals
- Be familiar with and understand the rationale for possible interventions to improve FNS

**Form of tuition**

Lectures and workgroups

**Assessment**

Exam (60%), assignments (30%), presentation (10%)
## Course 2. Agriculture for Food and Nutrition Security

### Content
In this course you will learn the basic agronomic principles underlying the interlinkages between food production and agricultural production systems on the one hand, and between agricultural production systems and environmental resources on the other hand. Basic principles of crop and livestock production will be introduced, and you will learn how they are employed across different production systems and how they affect the interaction between production systems and the environment. Given that the nature of these linkages also vary across space and time, the course will have an explicit temporal (dynamic and historical) and spatial focus to understand long term trends and diversity in food production and environmental impacts. Also alternative agricultural production systems to the dominant systems currently in used will be discussed, such as low input farming systems, including their potential for up-scaling and sustainability. You will also be taught the basics of GIS and how spatially explicit analysis can be utilized to better understand land use patterns and production possibilities and restrictions.

### Course objectives
After successfully completing this course, you will:
- Be familiar with main concepts of agronomy relevant for FNS analysis
- Understand the relation between locational (environmental) factors and the food production system
- Understand the relation between food production systems and FNS
- Be able to analyze these relationships with empirical data, including spatial analysis, and to interpret the results
- Be able to critically reflect and communicate on contemporaneous land use issues

### Form of tuition
Lectures, workgroups, computer practicals, peer review

### Assessment
Exam (60%), assignments (30%), presentation (10%)
Course 3. Food and Quality of Life

Content
Food and nutrition security are quintessential to quality of life. This course introduces basic health and nutrition science principles to zoom in on the effect of food on individual wellbeing: a balanced diet can contribute to prevent diseases and improve cure rates, improve productivity and nutrition is an important aspect of social relations and wellbeing. The course starts by understanding the composition of nutrition (e.g. what are macro/micro nutrients) and the basic metabolism processes in the body. Thereafter we relate food intake to the concept of a healthy diet and quality nutrition. This student will learn to conduct research into food intake (food frequency questionnaires / 24 hour recalls/food diaries). Thereafter we will relate the food intake to specific health outcomes and conduct basic quantitative analysis into these. The emphasis is on outcomes in relation to health, here we will go into basic measurements such as BMI, stunting, wasting. We will also assess how food intake will contribute to improved educational attainment and labor productivity. Students will further understand how foods, even those that contribute to ill health, may positively affect individuals social life’s and their quality of life. Lastly we will also explore how individuals make decision in relation to food intake.

Course objectives
After successfully completing this course, you will:
- Be familiar with main concepts of nutrition science relevant for FNS analysis
- Understand what a healthy diet is
- Understand the relation between diets and quality of life outcomes: physical, mental and social
- Understand (behavioural/environmental reasons for food choices
- Understand differences in food intake/outcome between social groups
- Be able to collect and analyze data regarding food intake and outcomes
- Be able to critically reflect and communicate on contemporaneous FNS quality of life issues, such as the ‘balanced diet’

Form of tuition
Lectures, workgroups, practicals, peer review

Assessment
Exam (60%), assignments (30%), presentation (10%)
# Course 4. Economics and Politics for Food and Nutrition Security

## Content

In this course you will acquire basic economic principles for analyzing how food systems and policies impact FNS. First, a definition of a food system is given as the whole of interactions governing the production and consumption of food, including trade, transport, processing and marketing. Several elements of a food system will be discussed by introducing economic theories of farm (household) behavior, food consumption, and food markets/chains. Anonymous markets and international trade are discussed as options, and the conditions under which such interactions are possible are discussed. Options to address market failure in areas of food safety, animal welfare and the position of the poor are discussed. Also more personalized interaction is covered as well, to account for the ubiquitous cases where governance is not adequate to allow anonymous markets to function. The analytical insights are subsequently used to formulate specific policy options (interventions) that can improve FNS by relieving specific failures in the food system or strengthen local informal institutions. Evidence from empirical studies (including case studies) will be used to evaluate the success of these interventions in practice.

## Course objectives

After successfully completing this course, you will:

- Be familiar with main concepts of economics relevant for FNS analysis
- Have knowledge of economic theories of farm (household) behavior, food consumption, and food markets/chains
- Be able to analyze why food markets/chains (and FNS) may fail because of behavioral, market, and government failures and how different food systems do (or don’t) tackle these failures
- Understand the relationships between FNS and poverty
- Formulating policy options and analyzing how they affect FNS, in theory and practice
- Be able to critically reflect and communicate on contemporaneous economic and policy FNS issues, such as the “food poverty trap”

## Form of tuition

Lectures, workgroups, peer review

## Assessment

Exam (60%), assignments (30%), presentation (10%)
## Course 5. Applications in Food and Nutrition Security Analysis

### Content
In this course groups you will work on a project to develop a evidence informed policy/intervention advise to address a specific problem in food and nutrition security. From the very first day, you will be part of a project team of about ten students. You are confronted with a real policy problem from an external commissioning institution. Within 4 weeks you will collect data by literature review and interviews (and analysis of databases) to conduct an interdisciplinary analysis on the basis of which you provide an advice. The design of the inquiry is partly prepared by the course instructors and (some of the) interviewees are also arranged. The analysis will contain an investigation of problems and solutions. Specific attention is paid to working in a project team and team building. At the end of the course, you prepare an advisory report. On the last day of the course you present the report to the representative of the external institution who commissioned the project. The presentation session is based on a video made by students and an additional interactive session to stimulate reflection. In the video presentation your team will highlight the main results of your analysis and defend the recommendations you propose. The lectures and tutorials will focus on interdisciplinary and transdisciplinary research.

In addition to the project assignment lectures on interdisciplinary research and interview methods/analysis are provided. Case studies of interdisciplinary research will be presented to students.

### Course objectives
After successfully completing this course, you will:
- Understand the need for inter/transdisciplinary research in FNS
- Be able to critically reflect on choices of design in inter/transdisciplinary research
- Be able to conduct an inter/transdisciplinary project in relation to FNS
- Be able to formulate evidence informed policy advice
- Have acquired skills in interviewing and video-based presenting
- Have improved his/her capacity as a professional (work in teams, coordinate a project)

### Form of tuition
Lectures, peer review, interview training, fieldwork, group work

### Assessment
Paper (50%), individual participation (20%), video presentation (30%)