

# EATING TOMORROW

ETH SUSTAINABILITY SUMMER SCHOOL 2012



**ETH**

Eidgenössische Technische Hochschule Zürich  
Swiss Federal Institute of Technology Zurich

Zurich, June 2012

Dear participants,

We warmly welcome you, the select group of participants admitted, to the ETH Sustainability Summer School 2012 at ETH Zurich, Switzerland.

The program is organized by ETH Sustainability in collaboration with the World Food System Center.

The ETH Zurich passes on to its students the highest level of knowledge and skills. It wants everyone to feel at ease and capable in complex and rapidly evolving environments, while at the same time being able to maintain an understanding for ethical and cultural values. On this basis, the study of sustainable development at ETH Zurich offers a sound foundation for the next generation of decision makers and future leaders.

With the Summer School 2012, we want to introduce innovative and sustainable approaches to secure our global food supply and find new ways of confronting the major challenges associated with food security. For three weeks, we will create an environment in which you can work in interdisciplinary and international teams together with experts and industry partners to create concrete solutions to the challenges posed in real case studies.

You will increase your knowledge on the global food system, the inter-linkages, complexities, key players and challenges, and generate creative alternatives in one of the three case studies: food waste, smallholder livelihoods and urban farming.

We are looking forward to working and learning with you.

We would like to thank the following people and institutions for initiating, planning, financing and implementing this summer school: the president of the ETH Zurich, Ralph Eichler; the ETH Sustainability advisory board; the World Food System Center, especially Michelle Grant; the chair of Ecological Systems Design, especially Ronnie Juraske; the NADEL, especially Jutta Werner; the Institute for Environmental Decisions, especially Martijn Sonneveld; the Department of Architecture, especially Nicola Eiffler; Quantis, especially An de Schryver; Tischlein deck dich, especially Caroline Schneider; Syngenta, especially Kavita Prakash-Mani and Ellen Jobling and the Urban Farmers, especially Mark Durno and MEEZAN, especially Bashar Humeid.

Furthermore we would like to thank João Almeida, Martin Amman, Marco Büttner, Raphael Dischl, Juan Gonzalez-Valero, Kaspar Günthardt, Isabel Günther, Dominik Hungerbühler, Christoph Inauen, Aurelian Jaggi, Ian Johnson, Samuel Jutzi, Rolf Kappel, Reto Knutti, Samuel Ledermann, Bernhard Lehmann, MICARNA, Adrian Müller, Michael Pawlyn, Juanita Schläpfer, Achim Walter, Erich Windhab, Bernhard Wehrli, Rita Wegmüller and Christan Zurbrügg for sharing their knowledge, time and enthusiasm and all the other people whose contribution has made the ETH Sustainability Summer School 2012 possible.



Christine Bratrach  
Director ETH Sustainability



Catherine Lippuner  
Organizer Summer School  
ETH Sustainability

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# INPUTS

## LECTURES AND WORKSHOPS

The first week of the summer school will be spent in the traditional Swiss valley of Emmental. Broad topics like food politics and workings of the world food system, health and different aspects concerning developing countries will be covered in preparation of the case study work to come later in the course.



Our Home for one Week - Seminar Hotel Möschberg

## Retreat to Emmental

### Intensive Course

The summer school will begin with a retreat to Emmental, a rural region in central Switzerland. The terrain is marked by verdant valleys and is home to a great many dairy farms, producing one of Switzerland's most famous products, the holey *Emmentaler* cheese, more commonly known in the English-speaking world as simply „Swiss“ cheese. Students will have a chance to experience rural Switzerland before spending two weeks in urban Zurich.

The class will stay in a conference hotel for the week. They will have lectures, workshops, and discussions during the day and keynote evening speeches at night. Throughout the week there will be many fun activities such as the cultural night. The class will have a chance to come together and bond and share their unique backgrounds and perspectives as they will be spending most of the day together.



Fields in Emmental

# Schedule Week 1

	Sunday, July 1	Monday, July 2	Tuesday, July 3	Wednesday, July 4	Thursday, July 5	Friday, July 6	Saturday, July 7
08							
09		<b>System Overview</b> <i>Michelle Grant</i> ETH Zurich	<b>It all Starts with Plants</b> <i>Achim Walter</i> ETH Zurich	<b>Visit of MICARNA</b> Courtepin	<b>Hunger in Developing Countries</b> <i>Isabel Günther</i> ETH Zurich	<b>Food Processing</b> <i>Erich Windhab</i> ETH Zurich	<b>Biomimicry</b> <i>Michael Pawlyn</i> Exploration Architecture
10	Train from Zürich HB to Grosshöchstetten						
11		<b>System Overview</b> <i>Michelle Grant</i> ETH Zurich	<b>It all Starts with Plants</b> <i>Achim Walter</i> ETH Zurich		<b>Landgrabbing and Food Security</b> <i>Rolf Kappel</i> ETH Zurich	<b>Organic and Fair-Trade Value Chains</b> <i>Raphael Dischl</i> Helvetas	<b>Biomimicry</b> <i>Michael Pawlyn</i> Exploration Architecture
Noon				<b>Livestock</b> <i>Samuel Jutzi</i> FAO			
13	Train from Zürich HB to Grosshöchstetten						
14			<b>Eating Water</b> <i>Bernhard Wehrli</i> Eawag		<b>Health &amp; Nutrition</b> <i>Rita Wegmüller</i> ETH Zurich		<b>Biomimicry</b> <i>Michael Pawlyn</i> Exploration Architecture
15		<b>International Food Politics</b> <i>Bernhard Lehmann</i> Federal Office for Agriculture		<b>Climate Change</b> <i>Reto Knutti</i> ETH Zurich		<b>Convince Consumers about Health and Sustainability</b> <i>Martin Amann</i> Institute for Limbic Comm.	
16			<b>Eating Water</b> <i>Bernhard Wehrli</i> Eawag		<b>Why we Invest in Developing Countries</b> <i>Juan Gonzalez-Valero</i> Syngenta	<b>Biomimicry</b> <i>Michael Pawlyn</i> Exploration Architecture	
17				<b>Climate Change</b> <i>Adrian Müller</i> FiBL			Train from Grosshöchstetten to Zürich HB
18	<b>Keynote Speech</b> <i>Ian Johnson</i> Club of Rome	<b>Cultural Night</b>			<b>Food Security in Emerging Markets</b> <i>Online Talk</i> Swiss Re		
19							
20							
21	<b>EM 2012 Final</b>						

█ Lectures    █ Events and Excursions



### Keynote Speech

Sunday, July 1. Evening.

The world produces sufficient food to enable every single person to have more than the WHO daily recommended calories required for good health. So why do we worry about food security? If we have enough food why do over 800 million people go to bed hungry each night? What causes famines to destroy lives and livelihoods? The answer is that food security depends largely upon peoples' income and access to food. Ian Johnson's talk will focus on the underlying causes of food insecurity, the changing nature of our agricultural systems and the need for agricultural policy reform (including tariff and non-tariff trade barriers) to ensure long term stable supply, and the importance of managing the delivery of our food systems, especially to those most vulnerable to nutritional problems as well as the key problem of waste. The challenges of today will be presented but the challenges of meeting food needs by the middle of the century will also be discussed. In particular the changing demand for food, the potential complexities of climate change and its effects on agriculture, and the competition for land from non-food products.



**Ian Johnson**

*Secretary General  
The Club of Rome,  
Winterthur, Switzerland.*

Ian Johnson, a British national, has experience in the areas of sustainable development, energy and economic policy. He joined the World Bank in 1980 and worked as an economist in the energy sector and subsequently as an advisor in the Policy and Research Department of the Bank. In 1991, he was appointed to the Global Environment Facility (GEF) and later became its Assistant CEO. In 1997 he was promoted to senior manager of the Environment Department and in 1998 he was promoted to Vice President with responsibilities for sustainable development, environment, agriculture and social policy. He was also appointed as Chairman of the Consultative Group on International Agricultural Research (CGIAR). Prior to joining the World Bank he worked with UNICEF and spent five years in Bangladesh. He left the World Bank in 2006 and has since then undertaken a number of advisory positions in the public and private sector. Mr Johnson is an economist and studied at the universities of Wales, Sussex and Harvard. In April 2010, Ian Johnson became Secretary-General of the Club of Rome.



## System Overview

Monday, July 2. Morning Lecture.

The question of how to feed the world, while considering human health, the environment and social wellbeing is really the defining, and possibly most complex, challenge of our time. As it stands today there are already billions of undernourished people on the planet. At the same time, over a billion people in the world suffer from obesity, which also has significant impacts in terms of health and chronic disease. At the same time, a growing global population, changing dietary habits and competing users (e.g. for fuel and feed) are placing record demands on the consumption side. All of these factors play out within a global political economy that influences prices and incentives, further increasing complexity and volatility. In order to address these challenges, it is necessary to work within a framework that considers the entire world food system – a non-linear system that includes all processes, infrastructure, inputs and outputs involved in feeding a population. Furthermore, it includes the environmental, social, political and economic contexts and conditions that set the boundaries of the system. This introductory session will provide an overview of the world food system, helping participants to understand the major issues, including an in-depth case study and will provide the background for the first week of the program.

## International Food Politics

Monday, July 2. Afternoon Lecture.

Switzerland does have an agriculture that supplies the population of our very densely inhabited country by more than half. At the same time, it is also the 14th most important importer of agriculture products in the world and purchases 45% of its caloric needs outside from its territory. Thus, Swiss consumers have the ability to influence and support efforts towards environment and animal protection as well as quality requirements of a very large number of producers worldwide. On the other hand, Swiss agriculture must improve its competitiveness on an international comparison scale, which will allow its products to find a better positioning on the markets. Swiss agriculture should be a pioneer in terms of environmental and animal standards, two areas, which will support competitiveness in future food markets. At the same time, agriculture should make a more efficient use of the resources it needs. To reach these goals, Swiss agriculture will further be financially supported by the Confederation; the differentiation from international standards as well as the market failures that result from these challenges are the justification for such support. Last but not least, agriculture should wisely combine the challenges raised by surface planning, landscape preservation and the offering of ecological system output by its effort to obtain „productive“ added value.



**Michelle Grant**

*Executive Director  
World Food System Centre  
ETH Zurich, Switzerland.*

Michelle Grant joined the World Food System Center in December 2011. She holds a Bachelor and Honors (1st) in Chemical and Environmental Engineering from the University of Queensland in Australia, along with Master in Management, Technology and Economics from the ETH Zurich. Michelle worked as an Engineer in Australia, Norway and Costa Rica for several years before joining the ETH in 2004 as the lead Project Manager at the former ETHsustainability. In this role she was responsible for the education, research and outreach programs of the Center, including running and expanding the Youth Encounter on Sustainability (YES) program in six different world regions. During this time she established graduate level programs and taught modules on food security and the global food system. More recently she ran her own consultancy business in Australia, which included a large project to establish the International Energy Center, a joint research and education initiative of 3 leading universities and a large industry partner.



**Bernhard Lehmann**

*Director  
Federal Office for Agriculture,  
Bern, Switzerland.*

Bernard Lehmann (born in 1954) was appointed Director of the Federal Office for Agriculture (FOAG) on 1 July 2011. Before taking up this post, he was Professor of Agricultural Economics at the Department of Agricultural and Food Sciences of the Swiss Federal Institute of Technology Zurich (ETHZ). For many years he was the director of the Institute for Agricultural Sciences, and subsequently head of the Department for Agricultural and Food Sciences. Mr Lehmann came from a farming background and between 1973 and 1977 he studied agricultural sciences at the ETHZ and gained a bachelor degree in agricultural engineering. After working as a scientific assistant at the Swiss Farmers' secretariat in Brugg, he gained a doctorate from the Institute of Agricultural Economics of the ETHZ and then went back to work at the Farmers' secretariat and the Swiss Farmers' Union, where he was head of the agricultural economics section. From 1987 to 1991 Mr Lehmann was Deputy Director of the Swiss Farmers' Union.



### It all Starts with Plants

Tuesday, July 3. Morning Lecture.

In this lecture, we will discuss the relevance of plants for our food system. Plant productivity is the ultimate driving force for all sections of agriculture. Plants are the basis for food, feed, fibre and for a lot of fuels – both fossil and biomass-based alike. More than half of the inhabitable earth surface is dominated by man-made crops. More than half of our calories are currently derived from three crops only: Wheat, maize and rice. The domestication and the improvement of plants throughout the last 10'000 years have been a prerequisite for the rise of the human population. Today, agriculture is at an unprecedented turning point. There are enormous challenges that have to be mastered within the coming decades. How can agriculture become more sustainable and produce more yield on the same area with less input in terms of water, fertilizers or pesticides? Are there sustainable ways to produce fuel from our fields? How can urban agriculture contribute to tomorrow's food? Why should we use – or hate – transgenic crops? Can organic farming provide sustainable food production in the future or is it a pathway for the wealthy few only? For none of these questions there is a simple answer, but the efforts to find adequate solutions to each of them will determine not only what we are eating tomorrow but also how we are living together tomorrow.

### Further Reading

[1] M.L. Parry et al. „*IPCC Fourth Assessment Report*“, Cambridge University Press, 2007; Chapter 5.

[2] D. Baulcombe, et al. „*Reaping the Benefits: Science and the Sustainable Intensification of Global Agriculture*“, The Royal Society, 2009.



**Achim Walter**

*Professor of Crop Science  
ETH Zurich, Switzerland.*

Achim Walter, a German national, is an expert in environmental systems, plant biology and agricultural sciences. He studied physics, biology and environmental sciences at the University of Heidelberg and at ETH Zurich. He spent his postdoctoral time as an Alexander-von-Humboldt-Fellow at Biosphere 2 Center in Arizona, USA. There, he studied the effect of altered environmental conditions on plant growth processes. In 2003, he became group leader at the Institute of Chemistry and Dynamics of the Geosphere (Plant Sciences) at the Research Center Julich, Germany. He was appointed Professor of Crop Science at ETH Zurich, Institute of Agricultural Sciences, in 2010. His research is dedicated to establishing and improving plant phenotyping approaches – non-invasive, image-based methods quantifying plant growth and crop performance. At ETH Zurich, Achim Walter teaches courses such as ‘Crops and Cropping Systems’ and ‘Alternative Crops’.



### Eating Water - How Agriculture and Fisheries Consume Aquatic Resources

Tuesday, July 3. Afternoon Lecture.

We might think of lots of sunshine when we eat an apple, but we should not forget the rain: It takes about seventy liters of water to grow a single apple. The topic of water scarcity and its impact on food security has emerged in many international policy debates about the future of the planet. Irrigation is the largest user of water and therefore the first sector to lose out under severe scarcity. As a consequence, scientific discussion on the value and potential flaws of concepts such as “water footprints” and “virtual water trade” has gained momentum. We will organize the facts and address the critical question how to feed more people with more variable water supplies.

The water planet also provides us with delicious fish and seafood. Global catches of marine fisheries are declining since the late 1980ies. We have been fishing down the trophic chain removing first the large predatory fish such as tuna and then the smaller prey like anchovies and krill. The eco-label of the Marine Stewardship Council was set up to reverse the trend and implement sustainable fisheries, but recent evidence indicates that the scheme cannot live up to its promise. Empowering local, low-impact fisheries with a proven track-record of sustainability might be a viable alternative to the subsidized fleets cruising distant corners of the world ocean.



**Bernhard Wehrli**

*Professor of Aquatic Chemistry  
Eawag, Dübendorf, Switzerland.*

Bernhard Wehrli is professor of Aquatic Chemistry at ETH Zurich and is affiliated with Eawag, the Swiss Federal Institute for Aquatic Science and Technology. His interdisciplinary research group is analyzing biogeochemical cycles in rivers and lakes with the goal to improve the sustainable management of water resources.

#### Further Reading

- [3] A.Y. Hoekstra et al., „*The Water Footprint of Humanity*”, Proceedings of the National Academy of Sciences, 2012.
- [4] D. Wichelns, „*Virtual Water and Water Footprints – Compelling Notions, but Notably Flawed*”, GAIA, 2011.
- [5] D. Pauly et al., „*Towards Sustainability in World Fisheries*”, Nature, 2002.
- [6] The Marine Stewardship Council’s website: [www.msc.org](http://www.msc.org)

## Climate Change

Wednesday, July 4. Afternoon Lectures.

Agriculture and the food system are important contributors to climate change, while at the same time, they are also significantly affected by its impacts. This contribution presents the tight interplay of agriculture and climate change and the difficulties in addressing some of the major challenges. The talks will quantify the main greenhouse gas emission sources in agriculture, the food system in general and discuss mitigation options. Besides this, the talks will present the basics on climate change, future scenarios based on climate models, and discuss the main impacts of climate change on agriculture and potential options to adapt agriculture to climate change. A particular focus will be on uncertainties in predicting climate change impacts locally, and the difficulty of adaptation in the presence of those uncertainties.

### Further Reading

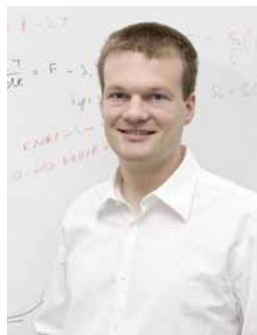
[7] A. Muller et al., „*The Potential of Organic Agriculture for Contributing to Climate Change Adaptation*“, in „*Organic Agriculture for Rural Development*“, Earthscan Publishers, forthcoming.

[8] A. Muller and C. Aubert, „*The Potential of Organic Agriculture to Mitigate the Impact of Agriculture on Global Warming - a Review*“, in „*Organic Farming, prototype for sustainable agricultures*“, Springer, forthcoming.

[9] A. Muller, et al., „*Mitigating Greenhouse Gases in Agriculture - A challenge and Opportunity for Agricultural Policies*“, Brot für alle, 2011.

[10] A. Muller et al., „*Reducing Global Warming: The Potential of Organic Agriculture*“, Scandinavian Working Papers in Economics, 2012.

[11] R. Knutti, „*Should we Believe Model Predictions of Future Climate Change?*“, Earth Science of Philosophical Transactions of the Royal Society A, 2008.



### Reto Knutti

*Professor of Climate Physics  
ETH Zurich, Switzerland.*

Reto Knutti is a Professor in Climate Physics at the Institute for Atmospheric and Climate Science at ETH Zurich. He studied physics at the University of Bern, where he earned his PhD (1999-2002) in the department of Climate and Environmental Physics, and subsequently worked as a postdoctoral researcher. Between 2004 and 2007 he worked at the „National Center for Atmospheric Research“ in Boulder, Colorado, as a postdoctoral researcher and visiting scientist in the Climate and Global Dynamics Division.

Reto Knutti's research focuses on changes in the global climate system caused by the growing emissions of anthropogenic greenhouse gases like carbon dioxide. He uses numerical models of different complexity, from simple energy balance to three-dimensional coupled climate models that resolve the atmosphere, ocean, land, sea ice and their interactions. In particular, he develops methods to constrain important feedback processes in the climate system by comparing observations with model results.



### Adrian Müller

*Senior Researcher  
FiBL, Frick, Switzerland.*

Dr. Adrian Müller is a senior researcher at the Research Institute for Organic Agriculture FiBL and at the Chair for Environmental Policy and Economics PEPE, ETH Zurich. He graduated in 1996 in theoretical physics and completed his PhD in 2000 in the same field at the Institute for Theoretical Physics at the University of Zurich. He worked as a post-doctoral and senior researcher at the Center for Energy Policy and Economics CEPE at the ETH Zurich, at the Environmental Economics Unit EEU at Gothenburg University and Center for Corporate Social Responsibility CCRS, University of Zurich. From 2007-2010 he also worked at the University Research Priority Programme in Ethics at the University of Zurich. His research focuses on policy instruments for environmental management, and on climate change mitigation and adaptation, currently mainly in the context of agriculture.



## Livestock

Wednesday, July 4. Morning Lecture.

The livestock sector currently provides 43 percent of global agricultural output in value terms. The anticipated continued expansion of the demand for animal products will require substantial improvements in resource use efficiencies, and accelerated development and adoption of appropriate technologies. The global livestock sector is characterized by a growing dichotomy between (i) livestock kept by a large number of smallholders, and (ii) intensive large-scale commercial livestock production. While traditional livestock systems contribute to the livelihoods of 70% of the world's rural poor, the structure of the livestock sector is changing and there is the danger of disease emergence and spread and the loss of genetic diversity. Livestock provide an important contribution to global calorie (15%) and protein (27%) supplies. Meat, milk and eggs in appropriate amounts are considered widely as valuable sources of complete and easily digestible protein, micro-nutrients and vitamins (B). Both under- and overconsumption of animal-source food are reported to be associated with significant human health problems. Livestock products alter the global edible protein balance, converting inedible proteins into an edible form as well as consuming protein that is edible for humans. In addition to this Livestock production and marketing systems can act to stabilize global and local food supply, however it also faces risks to its own stability.

**Excursion** - the lecture will be combined with a visit to the MICARNA headquarters and slaughterhouse in Courtepin.



## Samuel Jutzi

*Former Director Livestock Division  
FAO, Rome, Italy.*

Samuel Christopher Jutzi, Swiss citizen, born in Tanzania, was appointed, in early 1999, Director of FAO's Animal Production and Health Division (retired in September 2011).

Previous to this he was professor in international agriculture at the Agriculture Faculty of the University of Kassel, Germany. Prior to joining the University in 1990 he served at the International Livestock Centre for Africa (ILCA) with headquarters in Addis Ababa, Ethiopia, since 1983 as scientist and leader of the Highlands Programme, leader of the Inter Institutional Project on the Improved Management of Vertisols in the Ethiopian Highlands, coordinator of the Animal Traction Research Thrust, and as coordinator of the Animal Feed Resources Research Thrust.

Before joining ILCA he worked as a scientist in a parastatal forage germplasm research and herbage seed production enterprise at the University of Cochabamba, Bolivia (Faculty of Agronomy). He spent one year doing field studies at the Empresa Brasileira de Pesquisa Agropecuária (EMBRAPA) with the Cerrado Research Centre (CPAC) in Brazilia. Previous to that he served as an agricultural economist at the Swiss Mountain Farmers' Union (Brugg). He has a PhD from the Swiss Federal Institute of Technology in Zürich, Switzerland.

### Hunger in Developing Countries

Thursday, July 5. Morning Lecture.

Recent years have seen a tremendous rise in food prices and for the first time in 30 years food riots emerged throughout the world. Moreover, the resulting increase in hunger in developing countries led to almost 1 billion people suffering from hunger in 2008 according to the United Nations, reversing the positive trend in achieving the Millennium Development Goal One, with the objective to reduce by half the number of hungry people worldwide by 2015. In this lecture we will examine the causes of hunger and famines in developing countries and discuss how our understanding of necessary policy responses has changed over time.

#### Further Reading

[12] „*The Silent Tsunami*“, *The Economist*, April 17, 2008.

### Landgrabbing and Food Security - Can Foreign Direct Investment in Agriculture Save us from High Food Prices?

Thursday, July 5. Morning Lecture.

Agricultural foreign direct investments (FDI) in developing countries have increased tremendously as a reaction to the recent price hike on global food markets. Some observers and analysts emphasise the potential of this development to improve the food security of the poor, others see large land acquisitions as “land grabs” with predominantly negative effects for the poor. This lecture focuses on the impact of FDI on world market prices of cereals. Simulations indicate that the additional expansion of harvested land through FDI can have a discernible dampening effect on world prices. As the majority of the poor, also in rural areas, are net food buyers, such price effects would certainly help to strengthen the food security of the poor.

#### Further Reading

[13] R. Kappel et al., „*Can Foreign Direct Investment in Agriculture Save us from High Food Prices?*“, draft.



**Isabel Günther**

*Assistant Professor of  
Development Economics  
ETH Zurich, Switzerland.*

Isabel Günther is Assistant Professor of Development Economics at ETH Zurich, Centre for Development and Cooperation, since September 2008. She had previously been a research associate at University of Göttingen and Harvard School of Public Health. Her main research interest is in empirical microeconomics with a particular focus on measurement of poverty and risk, health and population economics, economics of water and sanitation and effectiveness of development aid. Isabel Günther has carried out most of her research in Burkina Faso, Benin, Ethiopia, Uganda, Kenya and South Africa.



**Rolf Kappel**

*Professor of Development Economics  
ETH Zurich, Switzerland.*

Rolf Kappel is Professor of Development Economics and director of the Centre for Development and Cooperation (NADEL) at ETH Zurich since 1992. His teaching and research activities focus on economic and institutional reforms in developing countries, on selected issues of environment and resource policy in developing countries, and on strategic issues in development policy.



„Tischlein Deck Dich“ by Martin Loos

## Health & Nutrition

Thursday, July 5. Afternoon Lecture.

Hunger continues to be a dramatic problem in developing countries affecting nearly 1 billion people. However, many people have access to the minimum amount of calories but are deficient in one or more micronutrients ('hidden hunger'). In particular, iron, zinc, vitamin A and iodine deficiencies adversely affect growth, immune function, and neural and cognitive development. Undernutrition and micronutrient deficiencies account for 3 million child deaths each year. The synergy of nutritional deficiencies with infectious diseases increases the risk of child deaths by pneumonia, diarrhea, malaria and measles.

Strategies for reducing 'hidden hunger' and thereby improving health include dietary diversification, supplementation, food fortification or biofortification of staple crops.

A recent and rapidly increasing health problem affecting transition countries is the so called 'double burden' of malnutrition and overweight due to rapid dietary and lifestyle changes.

This lecture will explore the above-mentioned issues in depth and show current research conducted to prevent and combat micronutrient deficiencies.

## Further Reading

[14] F. Burchi, et al. „*The Role of Food and Nutrition System Approaches in Tackling Hidden Hunger*“, *Int. J. Environ. Res. Public Health*, 2011.



## Rita Wegmüller

Senior Scientist  
Human Nutrition Laboratory  
ETH Zurich, Switzerland.

Rita Wegmüller, a Swiss national, has experience in the area of prevention and combat of nutritional deficiencies in less developed countries such as Iran, India, Thailand, and many African countries. She holds a Master in Food Science and got here PhD in Nutrition from ETH Zurich in 2005. In 2006 she joined the Swiss Tropical and Public Health Institute as a research associate and monitor of clinical trials in the field of malaria and African sleeping sickness. She rejoined the Human Nutrition Laboratory of ETH in 2007 as a post-doc and became a Senior Scientist in 2009. Her main focus is on zinc nutrition, including the assessment of the prevalence of zinc deficiency as well as the development of strategies to combat this deficiency. Another part of her work is dedicated to the investigation of the contribution of tropical diseases such as malaria and helminth infections to iron deficiency and solutions for reducing this deficiency in tropical regions.

## Why we Invest in Developing Countries

Thursday, July 5. Afternoon Lecture.

Agriculture plays a decisive role in development as it is closely linked to poverty. The poorest nations also tend to have the least productive agricultural sectors. Farmers in developing countries - predominately smallholders - reach significantly lower yields. Therefore, proportionally up to four times more is spent on food in developing countries per head. The agricultural productivity gap exposes those countries to volatile world market prices. This exposure bears risks for social unrest and is likely to increase in the future due to expected population growth, particularly in emerging economies.

Syngenta's solution is to create and share value by enabling smallholders in developing economies to achieve better yields. Smallholders must have a chance to enter markets with a competitive offer. Therefore, a system-wide approach involving not only agricultural inputs such as seed, fertilizer and crop protection but also financial instruments, investments in infrastructure and market facilities as well as IT services for relevant agricultural data is needed. One example is TEGRA™, a revolutionizing scheme from Syngenta designed for smallholding rice farmers in Asia. Thanks to an innovative combination of modern seed, crop protection and planting technologies, smallholders may secure a higher yield and reduce labor intensity while raising their income. Such new solutions allow smallholders to enter the market with their products, gaining sustainably a decent income and thereby contribute to ending poverty globally.

## Food Security in Emerging Markets

Thursday, July 5. Live Broadcast.

The Risk Talk series organised by the Swiss Re Centre for Global Dialogue brings together international experts and practitioners to discuss current and future economic, political and societal risks and opportunities.

At more than one billion, the number of hungry people in the world remains unacceptably high. And as the world population is estimated to exceed 9 billion by 2050, global food production must increase by 70% in order to meet this challenge.

In light of this development, securing the food supply remains one of the major challenges of the 21st century, especially so given soaring food prices and climate change. Triggered by the food price crisis in 2008, food security has attracted new public attention. Indeed, it is top of the discussion agenda for international opinion leaders at global platforms.



**Juan Gonzalez-Valero**

*Head of  
Public Policy and Partnerships  
Syngenta International AG,  
Basel, Switzerland.*

As the head of Public Policy and Partnerships at Syngenta, Juan develops and implements the company's corporate public policy agenda. In this role, he envisions Syngenta going beyond corporate responsibility to the next level of building meaningful private-public partnerships and helping shape key global policy debates. He directs much of the company's stakeholder outreach and engages frequently in public forums. He also heads the company's corporate responsibility agenda and initiated programs to strengthen Syngenta's contribution to addressing global challenges through its products and people, including Syngenta's association with the FLA. Since Juan joined the company in 1990, he has also worked in Sustainable Use, Stewardship and Ecology. Prior to Syngenta, he has held several leadership positions in Environmental Sciences and Risk Assessment across Europe and the USA. He received his Ph.D. in Biology from the University of Hamburg where his research focused on marine ecology and environmental toxicology.

Farmers and the agricultural industry who are key to increased food production face many uncertainties. To overcome these challenges, it is imperative to strengthen international cooperation and reinforce government and private investment in agriculture. Also crucial for both farmers and the agricultural industry are innovative and sustainable solutions, especially in the emerging markets.

At the Risk Talk, the following leading international experts will address these issues and shed light on solutions to increase food security in emerging markets:

**Peter Bieler**, Head of Global Programme Food Security, Swiss Agency for Development and Cooperation (SDC)

**Hans Rudolf Herren**, Laureate of the World Food Prize, Founder and President of Biovision Foundation, President of the Millennium Institute

**Kurt Maureder**, Head of Aviation & Agriculture Reinsurance, Swiss Re

**Johan Stessens**, Unit Manager Remote Sensing Department, Flemish Institute for Technological Research



### Organic and Fair-Trade Value Chains – A Suitable Approach to Improve Livelihoods in Rural Areas of the South?

Friday, July 6. Morning Lecture.

This lecture aims to provide practical insights and stimulate an active discussion between students on the subject of sustainable value chains and fair trade in development cooperations. Case studies of value chain projects of Helvetas Swiss Intercooperation (HSIC), Switzerland's largest non-governmental development organization, will form the basis for discussion. Students will have the opportunity to learn from first-hand experience of HSIC in organic and fair-trade rice, cocoa, cotton, vegetable and tropical fruit projects in different countries. After outlining the context and main tension fields of current development cooperation with regard to fair trade and food security, a brief overview on basic concepts and approaches of sustainable value chains will be given. Special emphasis will be put on organic and fair trade certified value chains.



**Raphael Dischl**

*Advisor Sustainable Agriculture  
Helvetas Swiss Intercooperation,  
Zurich, Switzerland.*

Raphael Dischl, MSc in Geography (University of Zurich) and MAS in Development Cooperation (ETH Zurich) specialized in natural resources management and environmental politics and joined Helvetas Swiss Intercooperation in 2006. After having worked for one year as a project coordinator in a forest management and ecotourism project in Guatemala, he joined the Organic and Fair Trade Competence Centre at the head office of Helvetas Swiss Intercooperation in Zurich. In his current position as Advisor Sustainable Agriculture he is in charge of supporting own and external projects thematically with regard to sustainable farming systems, organic agriculture, soil conservation, as well as value chain development and food security.

### Food Processing

Friday, July 6. Morning Lecture.

Modern food technology approaches couple the fields of food material science and food process engineering. For such coupling food structure can be seen as the "logistic interface". From this perspective we derived the S-PRO2 scheme which connects process, structure and properties of food systems by (i) process-structure functions and respective (ii) structure-property functions. In the typical case of specific food product characteristics being the development target a reverse engineering approach traces back from such target property via the related structure and process to the structure that resulted from the previous processing step and so on further backwards in the production chain. In order to illustrate the feasibility of such an engineering approach, examples will be given concerning the manufacture of food systems particularly in the context of global food security aspects. Three particular examples will be addressed: (a) a personalized food processing approach for flexible health supporting function implementation, (b) micronutrient fortified rice processing and (c) energy efficient ice cream production with radically reduced energy density. The examples will connect targeted physiological responses with physical product properties, the underlying structures and the related structuring processes.

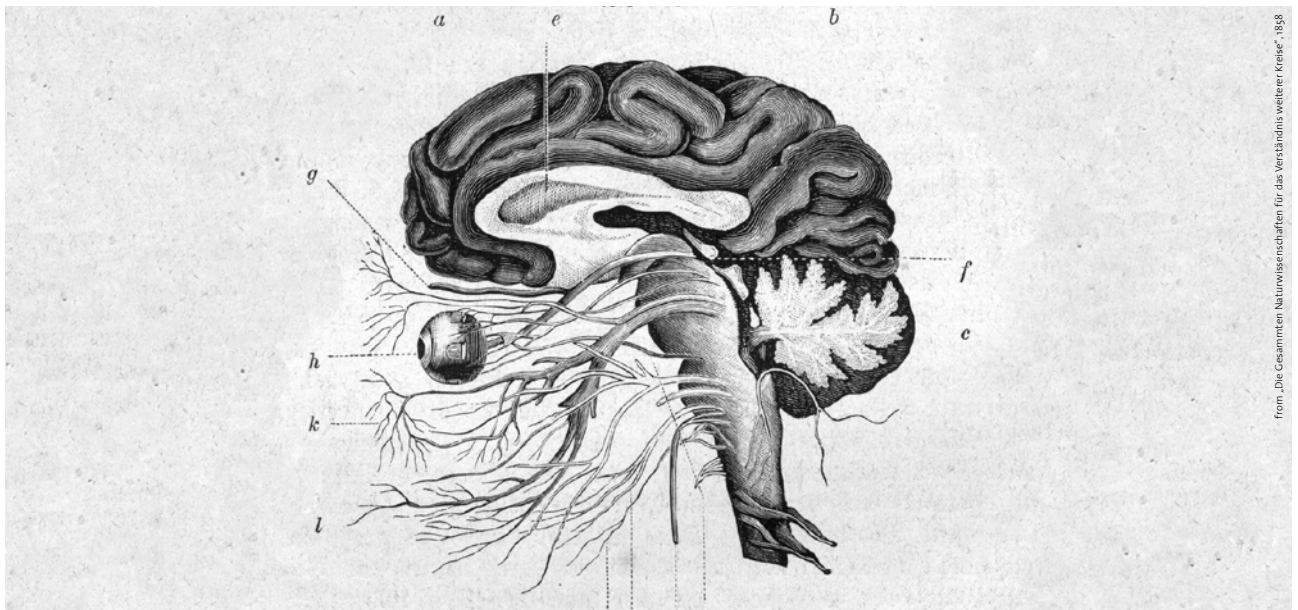


**Erich Windhab**

*Professor of  
Food Process Engineering  
ETH Zurich, Switzerland.*

Erich J. Windhab has been full Professor of Food Process Engineering at the Institute of Food Science at the ETH Zurich since April 1, 1991. In addition to the main office, laboratory and pilot plant complex at the ETH center, Prof. Windhab also oversees a pilot plant at the Technopark in Zurich.

Prof. Windhab's research priorities are fluid technological processes for microstructuring of multiphase systems, mainly in the food-related field. He connects the domains of rheology, fluid dynamics, micro structuring analysis and process-/apparatus development. Not only experimental but also numerical methods are incorporated. Interdisciplinary projects (so-called polyprojects) link Prof. Windhab's Laboratory for Food Process Engineering with the Laboratories for Physical Electronics, Polymer Physics, Food Microbiology, Food Chemistry and Technology, Food Biotechnology and the Paul Scherrer Institute, as well as with the food and food processing industry.



Which letter corresponds to the limbic system? After the Lecture you will know.

## How to Convince Consumers about Health and Sustainability?

Friday, July 6. Afternoon Lecture.

In order to change behaviour it is important to understand, why people are behaving the way they do. Do you believe that human beings act rationally and egotistically or in other words do you believe in the concept of „Homo Oeconomicus“? Some people still do, however Professor Daniel Hahnemann received the Nobel Prize in 2002 for disproving this paradigm. We are all instinct driven creatures. What leads us is our reptile brain – or more precisely – our limbic system. But why are people – based on exactly the same information – coming to very different conclusions?

The reason is because they have different limbic profiles. The 3 limbic instructions are responsible for the fact that humans think, decide and act in so different ways. The quintessence is that it's only an illusion that we are knowledge based and wisdom driven decision makers. Henry Ford once said: Half on my advertising is money thrown out of the window. Unfortunately nobody can tell me which half. This is still true today. What Henry Ford might appreciate is that now we – or rather the limbic – can tell him exactly which half of his money is wasted.

### Further reading

[15] Take the limbic test, [i-l-k.ch/pages/limbischer-test.php](http://i-l-k.ch/pages/limbischer-test.php)



**Martin Amann**

*Founding Partner  
Institute for Limbic Communication  
Zurich, Switzerland.*

Martin Amann studied economics and marketing. To perfect his language skills and to gain business experience he spent 1 year in London, 1 year in the french and 1.5 years in the italian speaking part of Switzerland. After returning to Basel Martin Amann worked as consultant at Schmidlin & Partner, one of the leading agencies in Corporate Identity and Packaging Design. 1990 he became the main shareholder and CEO of the company. In 1997 Martin Amann sold the business to The Interpublic Group of Companies N.Y. and continued as CEO Switzerland and Germany of Coleman Schmidlin & Partner (later remained Future Brand). In 2004 he founded Amann & Partner, a design agency which offers CI and Packaging Design based on the limbic (neuro-science) methodology. To provide limbic brand and marketing consultancy on a strategic level Martin Amann founded in 2010 the Institute of Limbic Communication in Zurich.



**Michael Pawlyn**

*Director  
Exploration Architecture,  
London, UK.*

Michael Pawlyn set up Exploration Architecture in 2007 to focus on biomimicry – an emerging discipline offering innovative architectural solutions inspired by nature. From 1997 to 2007 he worked with Grimshaw and was part of the core team that designed the Eden Project. In 2009 he opposed renowned environmental sceptic, Bjorn Lomborg, and more recently delivered a TED talk. He has taught at the Bartlett, AA, and at Schumacher College. His areas of interest include innovative structures and processes inspired by nature, industrial ecology and biomimetic technologies with near-to-mid-term applicability. He is currently working on the ambitious ‘Sahara Forest Project’ and an RIBA book titled ‘Biomimicry in Architecture.’

## **Biomimicry**

Saturday, July 7. All day.

In Michael Pawlyn’s TED talk ‘Using nature’s genius in architecture’ he introduced three big challenges which, in his opinion, must be addressed over the course of the next few decades if the grand project of humanity is to continue to make progress. The three themes were 1) Achieving radical increases in resource efficiency, 2) Shifting from linear to closed loop ways of stewarding resources, and 3) Transforming from a fossil fuel economy to a solar economy. During his talk, Michael will expand on each of these in three sessions and will make the case for why the emerging discipline of biomimicry will be one of the most important sources of innovation necessary to realise these transformations with a focus on the global food system.

Achieving sustainable development will require us to be ever more inventive with the resources we have and, in the first session he will describe how biomimicry can lead to solutions that deliver factor ten and factor 100 savings in resource use - allowing us to do far more with far less. The natural world can be viewed as a sourcebook of ideas that have all benefitted from a 3.8 billion year R&D period. Whether it is ultra-lightweight structures, super-efficient systems or materials manufactured with a fraction of the energy of conventional materials, there are examples in biology that can point the way to breakthroughs in architecture, engineering and industrial design. He will illustrate this session with a number of projects such as The Eden Project

and the recent concept study by his company for a Biomimetic Office Project.

It could be argued that many of our problems of resource shortages, waste and pollution are attributable to our linear way of using resources. Bill McDonough and Michael Braungart made a convincing case in their book ‘Cradle to Cradle’ for how we need to rethink the way we make things. The idea has continued to grow in popularity and increasingly people talk about the need for a ‘circular economy’. In the second session Michael will describe the extent to which biomimicry can contribute to devising closed loop solutions. This will look at the challenge both from the detailed level of materials and the system level of industries and cities. The opportunity exists to transform the wasteful metabolism of cities and create opportunities for urban agriculture and zero waste systems.

While the idea of a solar economy will be an important subject in the third session, the main emphasis will be on the importance of developing integrated solutions that tackle multiple challenges simultaneously. All too often we try to address challenges of food, energy and water security separately from other crucial issues like climate change and desertification. The Sahara Forest Project is an attempt to provide exactly this kind of integrated approach and is now rapidly moving towards reality with the construction of a one hectare pilot version in Qatar which will be complete.



psst. tell no one. july 20. 6 pm.

### Scientific Communication Training

July 9, July 11, July 17. Modules.

Why communicate science? Who are we communicating to? Communicating science is not like marketing a product, as while scientific knowledge is about facts it is also about the processes and social context of knowledge.

This course element aims to introduce students to a conceptual and practical toolbox for communicating the processes and products of their research. We will look at science as situated knowledge and the cultural filters that audiences have when learning scientific information. We will discuss what is needed in order to communicate effectively with other scientists, with policy makers or with the “general public”. Does communication require a more subjective standpoint than the objectivity of science? What are the methods from the arts that can be applied for effective and creative science communication?

The theoretical aspects will be raised during the two weeks of hands-on case study work and integrated into a creative mixed-media presentation of the case studies “Urban Farmers Globe” and “other case study” at the end of the summer school.

Learning objectives:

- To gain an understanding of the socio-political context of science communication.
- To develop a communication concept for a target audience including defining appropriate metaphors and media.
- To develop practical visual communication skills and apply them to the final presentation of summer school case studies.



**Juanita Schläpfer**

*Research Associate  
ZHdK, Zurich, Switzerland.*

Juanita Schläpfer is currently a research associate at the University of the Arts in Zürich and a freelance science communicator. Her professional background is in exhibition development for science centres on subjects ranging from particle physics to climate change. She was an Artist in Residence at the Exploratorium in San Francisco where she developed interactive artworks on the theme of complexity in nature and self-organising systems. At the Swiss national research facility, the Paul Scherrer Institute (ETH-Domain), she developed exhibits for the visitor centre and instigated hands-on science learning activities for children.

Her current research projects are of a transdisciplinary nature and examine the different modes of communication and collaboration in art-science research. Of particular interest is the relationship between formal and informal scientific knowledge, for example citizen science, and the role of art in informal science learning. This research brings together science communication, aesthetics theory and transdisciplinary theory, to examine ways of understanding and representing rapid environmental change.

Her education includes a BA in Communication Studies and Sociology and an MSc in Science Communication. A global nomad, Juanita was born in the U.S.A., educated in England, and has lived in central America and San Francisco, and since 1997 has lived, worked (and grown food) in Zürich.



,Oh, my butt hurts!' - ,What?'

## Rethinking the Chocolate Business

Wednesday, July 11. Company Visit.

Cocoa is the essential ingredient of chocolate. Cocoa farmers and with them the complete cocoa industry are facing severe problems; the loss of biodiversity through deforestation, monocultures and (over) use of pesticides, the noncompliance with ILO conventions (e.g. child labour), the low income of cocoa farmers, the low productivity and the changing climate. These problems are very much interrelated. In a presentation Christoph Inauen explains how Chocolats Halba successfully sets an example in the industry with an integrated and innovative sustainability-approach creating win-win situations for Cocoa farmers, the climate, Chocolats Halba and its clients.

### Further Reading

[16] P. Abbott, „Towards more socially responsible Cocoa trade“, International Agricultural Trade Research Consortium, 2002.

[17] P. Läderach, „Climate change could threaten African cocoa farmers“, Coffee and Cocoa International, 2012.

[18] The Economist, „Hedging for a cocoa shortage“, August 9, 2010.

[19] The cocoa section of Fairtrade International's website, [fairtrade.net/cocoa.html](http://fairtrade.net/cocoa.html).

[20] A. Dubón and J.A. Sánchez, „Economics of the Use of Broad Leaf, Tropical, Timber Tree Species for Shade in Cocoa Plantations“, FHIA, La Lima, Cortés, Honduras.

[21] Payson Center, „Oversight of Public and Private Initiatives to Eliminate the Worst Forms of Child Labor in the Cocoa Sector in Cote d'Ivoire and Ghana“, Tulane University, 2011.



### Christoph Inauen

Head of Sustainability  
Chocolats Halba, Wallisellen,  
Switzerland.

Christoph Inauen is member of the executive board of Chocolats Halba. As Head of Sustainability he is responsible for Chocolats Halba's sustainability strategy and the establishment of sustainable supply chains with all relevant stakeholders. Further he is member of the Fair Labeling Organization (FLO) Advisory-Council for Cocoa. Christoph Inauen holds a Master of Advanced Studies in Development and Cooperation from the ETH and a Bachelor of Science in Business and Economics from the University of Basel.



Cows decorated for the yearly traditional ‚Alpabfahrt‘.

## Of Farms, Gardens and Apples

### Seed City Garden Day

Sunday, July 15. All Day.

The concept of Permaculture sees nature from a holistic point of view, where productive and self-regulating ecosystems are created. Energy is produced in an efficient way, is saved and used; symbiosis is fostered in a purposeful manner. Permaculture strives towards cooperation instead of competition between the natural eco-system and the human being.

Since 2010, the ETH Zurich is host to a permaculture garden, which is located directly on the area of ETH Honggerberg. There, Permaculture comes to life through the work of students, neighbours and whoever is interested in getting involved. Healthy, local and seasonal food is grown and harvested, people get together, have fun and enjoy the conviviality with like-minded people.

This course introduces you to the principles of Permaculture, shows you how they are realised and what Permaculture means in the context of mankind’s future nutrition. Get your hands dirty in the garden and learn what it feels like to grow your own food.



### Aurelian Jaggi

*BSc in Information Technologies & Electrotechnics  
ETH Zurich, Switzerland.*

Aurelian Jaggi finished his BSc in Information Technologies & Electrotechnics at ETH Zurich last autumn. He is one of the co-founders of the community garden Seed City, and has been leading the project since January 2012. His wide interests in permaculture, ecovillages, sustainable economic cycles and flexible social structures brought him into the managing board of the association „Blühende Garten“, which is promoting sustainable and innovative gardening projects and ideas.



### Marco Buttner

*Outdoor Trainer  
Bern, Switzerland.*

Marco Buttner is outdoor trainer and pedagogue in social and environmental work. Trained by Bill Mollison’s partner Joe Polaischer, he has been a permaculture activist for many years. He brings along practical experience and education from several countries. Marco Buttner is co-running the Balmegegberg Permaculture Project in the Emmental region, Kanton Bern.

### **Brüederhof**

Saturday, July 14. Afternoon.

You're into farmer's markets or maybe even into urban farmers? But have you ever weeded a garden? Have you ever milked a cow?

Luckily, you will get the opportunity for a brief moment this week end at the Brüederhof. Kaspar Günthardt welcomes us to help him get his daily business done. From a formal pick up with the tractor from the trainstation to the traditional z'vieri on the fields with the seasonal cake (bring your cowboy boots and your flannel shirts), you are in for a day at the farm. And on the side he will tell you stories from how he became one of the pioneers in organic farming in Switzerland.



### **Kaspar Günthardt**

*MSc in Agricultural Sciences  
Farmer, Brüederhof, Switzerland.*

The „Brüederhof“ farm has been established in 1923 by Kaspar Günthardt's grandfather. Since 1978, he manages the 36 hectare big estate after having studied agricultural sciences at ETH Zurich. Since 1982, the produce is purely organic. When the cow barn burned down several years later, he used the opportunity to start anew. As a pioneer in his field in Switzerland, he integrated a biogas unit and a CFC-free cooling unit and has therefore created a sustainably farm that is fit for future generations. The farm is currently managed by his son Simon and his wife Martina and continues to innovate. They currently deliver locally produced vegetables, meat and dairy products directly to subscribed households in Zurich and surrounding areas.

### **Öpfelchasper - Apples Delivered to your Doorstep.**

Tuesday, July 17. Evening

Joint Event with the Climate KIC Summer School.

This is a joint event between the ETH Sustainability Summer School and the Climate-KIC's theJourney. Dominik Hungerbühler will tell us about their start-up where they deliver organic fruits with bicycles to private homes or offices. He will focus on the impact they have on the environment, but also what is needed to become a social entrepreneur and why an apple a day keeps the doctor away.



### **Dominik Hungerbühler**

*Co-Founder, Öpfelchasper, Zurich.*

Dominik is originally from the Canton of Thurgau, where Switzerland's tastiest apples have been produced since the medieval ages. He considers his region to be the last and only area of real wilderness in Switzerland. His inherent connection to nature has led him to a passion for organic products. And so, since 2006, Dominik's organic neighborhood shop „Ultimo Bacio“ in Zurich-Wipkingen is never closed when you realize that you just ran out of sugar. After his degree in business administration in Amsterdam where biking exists in all forms and shapes, he co-founded Öpfelchasper in Zurich. Dominik also holds a degree in business communication and journalism from the ZHAW, Winterthur.

# CASE STUDIES

## WEEKS TWO AND THREE

During the second two weeks of the course we will break into three groups and apply the skills learned during the input sessions. The groups will focus on food waste, smallholder livelihoods, and urban farming respectively, through practical work, talks and site visits.





## Food Waste

Quantifying the environmental difference „Tischlein deck dich“ creates with their activities and put this in perspective with the social part of their actions.

In Switzerland, 250'000 tons of food is wasted every year. It has been estimated that 25'000 tons of this waste would in fact be edible.

Food waste is a major issue in our growing society. While statistics indicate that the amount of agricultural production will not be able to feed our growing future population, the amount of food wasted per person is only increasing. Roughly one-third of the edible parts of food produced for human consumption is lost or wasted worldwide, totaling approximately 1.3 billion ton per year. In developing countries, the largest parts of food waste are produced at the farm level and at the retailer. The main reasons for this being lack of hygiene, cooling and proper storage facilities. In western countries, more than 40% of food losses occur at the retailer and consumer itself, largely due to the fact that in western countries people can simply afford to waste food.

Several initiatives exist/have emerged to reduce food waste. Unfortunately, especially at consumer level food waste is hard to control. Public awareness through education is very important in order to start changing people's attitude. At retail level however, it is easier to prevent food waste through better management and organization.

„Tischlein deck dich“, a Swiss organisation that distributes surplus food to those in need, helps to make a difference by reducing the amount of food wasted in Switzerland. The charity relies on over 600 food donors and over 1000 volunteers who take the time to 'rescue' and help redistribute items approaching their use-by date. Some of the food comes from Schweizer Tafel, an organisation that makes deliveries to soup kitchens, shelters and other institutions. Over 80 locations spread through Switzerland redistribute the collected food.



„Tischlein deck dich“ - redistributing surplus food.

## Supervisors



**An De Schryver**  
Project Manager/LCA Expert  
Quantis, Lausanne, Switzerland.

An De Schryver (1982), works as post-doc researcher for ecological systems design at the Institute of Environmental Engineering of ETH Zurich (Switzerland). After finishing her master in Environmental Biology (2004) at the Free University of Brussels (Belgium) she started to work at PRé Consultants, as a Life Cycle Assessment consultant. At PRé Consultants she has contributed in several projects involving branch associations and European Union projects. Her research field encompasses life cycle assessment of products and impact assessment development. In 2008 she started a PhD at the Radboud University of Nijmegen in the field of Life Cycle Impact Assessment, more specific on value choices in human health modelling. In 2010 she finished her PhD and started to work as a post-doc at ETH to analyse the wood value chain and its improvement potentials from an environmental point of view. Since 2011, An works as a Project manager/LCA expert for Quantis.



**Ronnie Juraske**  
Senior Researcher  
ETH Zurich, Switzerland.

Ronnie Juraske is currently a postdoctoral researcher at the Institute of Environmental Engineering at ETH Zurich. His work mainly deals with life cycle impact assessment (LCIA) including fate, exposure, and effect analysis, with a special focus on human toxicity and eco-toxicity modeling of chemicals like biocides and pesticides in the frame of life cycle assessment (LCA). In 2002 he earned an Engineering degree in Biotechnology from the Mannheim University of applied Sciences, Germany. From 2003 to 2007 he completed his PhD at the University of Tarragona, Spain. Between 2005 and 2006 he was a visiting scientist at the University of Nijmegen, The Netherlands.

## Additional Inputs

### Foodwaste.ch

Wednesday, July 11. Afternoon.

Along the Swiss food supply chain edible foods are lost or wasted due to various reasons. Deterioration is not the only reason for these losses, financial factors as well as cultural habits influence the rate at which edibles are not being consumed. It is estimated that at least one third of all calories produced in and for the Swiss market are lost through all processes from farm to fork, approximately 50% at the consumer level (households and food service). ‚Foodwaste.ch‘ started in March 2012 and helps consumers reducing food waste at home and supports firms reducing waste throughout their production processes.

In this lecture the definition for food losses and waste will be introduced, the data behind these numbers unveiled, examples presented, reasons for the losses discussed and further research needs in this area considered.



**João Almeida**  
Co-Founder of foodwaste.ch  
Bern, Switzerland.

João Almeida is originally from Lisbon, Portugal, and has a degree in Economics from the University Nova of Lisbon (2008). He came into contact with the subject of food waste during a work experience within a multinational firm in Basel. When studying the Master of Science in Sustainable Development at the University of Basel (2009-2011), he wrote his master thesis with the title: ‚Food Losses and Food Waste, A Quantitative Assessment for Switzerland‘. Aside from foodwaste.ch, João is the executive director at the organisation he also co-founded, Refiller. This non-profit organisation focuses on reducing disposable packaging waste, informing consumers on the topic and offering strategies and solutions for firms and institutions, wishing to reduce waste quantities produced.

# Contents

## The Task

Within this case study, a life cycle assessment (LCA) will be performed of the organization ,Tischlein deck dich'. Both the environmental benefits and environmental impacts related to the activities from Tischlein deck dich will be modeled, quantified and analyzed.

## The Activities

- Data collection of the activities of the organization (e.g., the amount of food waste redistributed and the transport distances)
- Modelling the activities of Tischlein deck dich to reflect as much as possible reality
- Using the LCA software ,Quantis SUITE 2.0' to quantify the environmental impacts
- Assessing the results and giving useful recommendations

Within this study the difficulties of life cycle modeling will

be touched upon. Questions such as ,who should pay for the burden' and ,what are the exact system boundaries' will be widely discussed. Within the model, the changes in the original system of food waste need to be taken into account.

## The Outcomes

An environmental assessment of the activities of Tischlein deck dich, a quantification of the benefit they create for the environment and possible suggestions on how it could be improved.

**Understanding** of 1) food waste and reduction possibilities; 2) the work of the non-profit organization ,Tischlein deck dich'; 3) life cycle assessment.

**Skills** in 1) quantifying environmental impacts of an organization and activities; 2) ,Quantis SUITE 2.0', a life cycle assessment software.

Monday, July 9	Tuesday, July 10	Wednesday, July 11	Thursday, July 12	Friday, July 13	
<b>Introduction</b> <i>Ronnie</i> HXE	Individual Work HXE	<b>Visit of Halba</b> <i>Christoph Inauen</i> Wallisellen	Case Study Work <i>An</i> HXE	Case Study Work <i>Ronnie</i> HXE	09
	<b>Quantis Suite Introduction</b> <i>An</i> HXE		<b>Communication Training</b> <i>Juanita Schläpfer</i> HXE		10
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Individual Work HXE	Case Study Work <i>An</i> HXE	<b>Foodwaste.ch</b> <i>João Almeida</i> HXE	<b>Visit of Tischlein deck dich</b> <i>An and Ronnie</i> Winterthur	Individual Work HXE	14
<b>Communication Training</b> <i>Juanita Schläpfer</i> HXE <small>[ALL]</small>	<b>Impact Assessment</b> <i>An</i> HXE	Individual Work HXE			15
<b>Welcome to Zurich BBQ</b> Seed City Garden <small>[ALL]</small>					16
					17
					18
					19
					20

# Further Reading

[22] J. Parfitt et al., „*Food waste within food supply chains: quantification and potential for change to 2050*“, *Philos Trans R Soc Lond B Biol Sci*, 2010.

Food waste in the global food supply chain is reviewed in relation to the prospects for feeding a population of nine billion by 2050. Different definitions of food waste with respect to the complexities of food supply chains (FSCs) are discussed. An international literature review found a dearth of data on food waste and estimates varied widely; those for post-harvest losses of grain in developing countries might be overestimated.

[23] J. Gustavsson et al., „*Global Food losses and Food waste, extent causes and prevention*“, *FAO*, 2011.

The study highlights the losses occurring along the entire food chain, and makes assessments of their magnitude. Further, it identifies causes of food losses and possible ways of preventing them. The results of the study suggest that roughly one-third of food produced for human consumption is lost or wasted globally, which amounts to about 1.3 billion tons per year. This inevitably also means that huge amounts of the resources

used in food production are used in vain, and that the greenhouse gas emissions caused by production of food that gets lost or wasted are also emissions in vain.

[24] „*Household Food and Drink Waste in the UK*“, *WRAP*, 2009.

The issue of food and drink waste has moved up the social and political agenda in the UK in recent years, spurred in part by the publication of detailed information on the amount and types of waste produced (The Food We Waste report, WRAP, May 2008). Quantification of food and drink waste is of interest to a range of stakeholders including national and local governments, food retailers and manufacturers, waste management companies and concerned members of the public, with the information used to inform food-waste reduction activities, to plan waste collections and treatment, and for prioritisation by national governments.

[25] J. Lundqvist, et al., „*Saving Water: From Field to Fork – Curbing Losses and Wastage in the Food Chain*“, *SIWI Policy Brief, SIWI*, 2008.

	Monday, July 16	Tuesday, July 17	Wednesday, July 18	Thursday, July 19	Friday, July 20
09	Individual Work HXE	Case Study Work An HXE	Case Study Work An HXE	Wrap up and Work on Final Presentation Ronnie HXE	
10					Final Presentations You <small>[ALL]</small>
11		Communication Training Juanita Schläpfer HXE			
Noon					
13					
14					
15	Individual Work HXE	Case Study Work An HXE	Case Study Work An HXE	Wrap up and Work on Final Presentation Ronnie HXE	
16					
17					
18					
19		Öpfelchasper - Apples Delivered to your Doorstep Dominik Hungerbühler HUB Zurich <small>[ALL]</small>			Farewell Dinner and Party <small>[ALL]</small>
20					

█ Lectures   █ Events and Excursions   █ Case Study Work   [ALL] Joint Event



## Smallholder Livelihoods

Devising a sustainable market model while bringing commercial value for business.

### The Challenges

Tanzania has immense opportunities for agricultural development; there are 44 million hectares of arable land, only 24 percent of which is being utilized. Tanzania's agriculture is predominantly small holder, characterized with very low productivity, resulting in the country's huge agriculture potential remaining unutilized. In particular, Tanzania's southern corridor has the potential to become a globally important producer of crops and livestock, as it benefits from good 'backbone' infrastructure – including road, rail and power – and passes through some of the richest farmland in Africa. Today its agricultural potential is largely dormant and the majority of the rural population remains poor and food insecure.

*„Tanzania is, in essence, an agricultural country where agriculture means almost everything. Over 80 percent of the people live in the rural areas and agriculture is their main source of livelihood. Agriculture accounts for 95 percent of the food we eat, 25 percent of the GDP and 30 percent of the foreign exchange earnings. We cannot eradicate poverty, promote balanced socio-economic growth and achieve food security without transforming our agriculture.’*

**Jakaya Mrisho Kikwete**

President of the United Republic of Tanzania

### The Opportunity

The Southern Agricultural Growth Corridor of Tanzania (SAGCOT) initiative is a public private partnership that was born out of a World Economic Forum event held in Dar es Salaam in 2010. The SAGCOT initiative, made up of various public and private partners and the Tanzanian government, aims to catalyze \$2.1 billion of private investment over a twenty year period, alongside public sector grants and loans of \$1.3 billion. The objective is to triple the area's agricultural output and it is expected that approximately 350,000 hectares will be brought into profitable production, much of it farmed by smallholder farmers.

One of SAGCOT's main objectives is to provide opportunities for smallholder producers to engage in profitable agriculture. It will do this by incentivizing stronger linkages between smallholders and commercial agribusinesses, including 'hub and out-grower' schemes that allow smallholders in the vicinity of large-scale farms to access inputs, extension services, value-adding facilities and markets.

# Supervisors



**Jutta Werner**  
*Senior Scientist*  
 ETH Zurich, Switzerland.

Jutta Werner is senior scientist at the Centre for Development and Cooperation (NADEL) at the Swiss Federal Institute of Technology (ETH Zurich). She has a PhD in Agricultural Science from Humboldt University, Berlin and a Master of Arts in economy and management from the Technical University Kaiserslautern. In Berlin, she qualified to carry out international development management at the Centre for Advanced Training in Agricultural and Rural Development (SLE). She advised the German Development Cooperation (GIZ) in Morocco on natural resource management and spent three years as coordinator and technical adviser to a decentralised rural development programme in Chad. Her teaching and research work focuses on natural resource governance, decentralisation and communal development, promotion of the rural service sector, rural development strategies and methods, adaptation strategies to climate change, promotion of value chains as well as management for results, monitoring and evaluation of complex development projects.



**Martijn Sonneveld**  
*Postdoc*  
 ETH Zurich, Switzerland.

Martijn Sonneveld is a Postdoc at the Agri-food and Agri-environmental Economics Group at the ETH Zurich. He earned his master's and PhD in Agricultural Economics at the ETH Zurich. His research interests are global food security challenges from the household, to the meso- and macro-economic level, global agricultural markets and development economics. He is currently involved in a research project on the future perspectives of the global grain value chains until 2050. Martijn gained experience in research in different developing and transition countries in Africa and Asia.



**Ellen Jobling**  
*Food Security Associate*  
 Syngenta International,  
 Basel, Switzerland.

Ellen Jobling works for the Food Security Agenda at Syngenta; a group that has established a strategic agenda that aims to embed food security and sustainability into business activities across Syngenta globally. Along with helping to coordinate and communicate the various smallholder and environmental projects that the group is leading across the globe, she is also the project manager for one of Syngenta's current projects in Tanzania which is focusing on the environmental footprint of agriculture in the context of smallholder farmers and is coordinating Syngenta's activities on and around the KPL farm in Tanzania. She previously worked for Syngenta's Global Marketing department and for a large agricultural retailer in Australia. Ellen holds a Bachelor of International Business from RMIT University, Melbourne.

# Additional Inputs

## The SAGCOT Initiative

Monday, July 9. Morning.

Kavita Prakash-Mani, supported by Ellen Jobling, will talk more broadly about the SAGCOT initiative; how it came to be, what value it aims to deliver and what role Syngenta believes they can play within it, and within public private partnerships more broadly, particularly in regards to smallholder farmers. They will also talk about the motivation behind involving students in the project, and what value they believe this fresh perspective could bring to the SAGCOT strategy and activities on the ground.



### Kavita Prakash-Mani

*Head Food Security Agenda  
Syngenta International,  
Basel, Switzerland.*

Kavita Prakash-Mani is Head Food Security Agenda at Syngenta. She is responsible for establishing a strategic agenda that embeds food security and sustainability into business activities across Syngenta globally and developing innovative business models to create additional value for the company while contributing to sustainable development. The current focus of her work is working with smallholder farmers and ecosystem services. She was previously Vice President for Client Services and Emerging Economies at SustainAbility, a strategy consulting firm and think tank focused on corporate responsibility. In this role, she was also responsible for leading the food and beverage sector practice and developing the Emerging Economies focus. Previous to that she worked with the World Resources Institute in Washington DC. Kavita holds an MBA from the Indian Institute of Management, Ahmedabad.

## Introduction Tanzania

Monday, July 9. Morning.

This input will give the participants of the case study an overview of various fields in Tanzania. It will deal with the country's situation (environment, climate, culture, politics, etc.), its agricultural practices (small scale, large scale - connections/challenges-links to development) as well as the characteristics of farming households.



### Samuel Ledermann

*Programme Coordination Officer  
Biovision Foundation,  
Zurich, Switzerland.*

Dr. Samuel Ledermann manages agricultural development projects in Ethiopia, Tanzania, Kenya and Uganda. Prior to joining Biovision in January 2012, he obtained his PhD in Economic Geography at Rutgers University, USA, researching the socio-economic impact of organic cotton production in Shinyanga, Tanzania. His research interests include studies on the relationship between agricultural production, poverty reduction and income inequalities in sub-Saharan Africa. In his current position, he studies sustainable agriculture – a knowledge-intensive technology – as an alternative to more capital-intensive interventions. He also has prior experience working as a consultant on agricultural development in Tanzania.

# Further Reading

[26] „*Mobilizing the Southern Agricultural Growth Corridor of Tanzania*“, Harvard Kennedy School, 2012.

Tanzania has enormous agricultural potential, with 44 million hectares of arable land, good soils, ample water resources, and access to both regional and international markets. But only 24% of arable land is currently under production. And production is mostly small-scale, plagued by land tenure constraints, poor infrastructure, limited use of modern techniques, lack of access to finance, and low productivity. In this context, a group of local and international players in business, government, and the donor community are rising to the challenge of modern agricultural development in Tanzania through an agricultural growth corridor strategy.

[27] „*Realizing a New Vision for Agriculture: A roadmap for stakeholders*“, World Economic Forum, 2011.

[28] „*Putting the New Vision for Agriculture into Action: A Transformation Is Happening*“, World Economic Forum, 2012.

[29] S. Vermeulen and L. Cotula, „*Making the Most of Agricultural Investment: A Survey of Business Models that Provide Opportunities for Smallholders*“, FAO and IIED, 2010.

Recent years have witnessed a renewed interest in agricultural investment. In many cases, this new momentum has translated into large-scale acquisitions of farmland in lower- and middle-income countries. Partly as a result of sustained media attention, these acquisitions have triggered lively if polarised debates about “land grabbing”. Less attention has been paid, however, to alternative ways of structuring agricultural investments that do not involve large-scale land acquisitions. These include a wide range of more collaborative arrangements between large-scale investors and local small-scale farmers and communities, such as diverse types of contract farming schemes, joint ventures, management contracts and new supply chain relationships.

[30] J. Ashby et al., „*Investing in Women as Drivers of Agricultural Growth*“, The World Bank, 2008.

Agriculture for Development, the 2008 World Development Report, showed that agriculture is a critical source of livelihoods for women in many developing countries, and a key pathway out of poverty. It also portrayed women in many rural societies as especially constrained by a lack of access to inputs, productive resources, and services. They also often lack incentives to invest given the greater vulnerability and propor-

tionately greater exposure to risk that result from having fewer assets, and the very real likelihood that once their niche in the value chain becomes commercially profitable it will be expropriated by men.

[31] M. Porter and M. Kramer, „*Creating Shared Value*“, Harvard Business School Publication, 2011.

[32] G. Gereffi et al., „*The Governance of Global Value Chains*“, Review of international political economy, 2005.

[33] U. Heierli, „*Market Approaches that Work for Development*“, Swiss Agency for Development and Cooperation, 2008.

[34] M. Morris et al., „*Awakening Africa’s Sleeping Giant*“, World Bank Publications, 2009.

[35] „*Africa’s smallholder farmers - Approaches that work for viable livelihoods*“, African Smallholder Farmers Group, 2010.

Most Africans depend on small-scale farming systems as the primary source of their livelihoods. Yet they are marginalised and often do not produce enough to enable their families to have sufficient food to eat throughout the year. Smallholder farmers are also particularly vulnerable to climatic and economic shocks. Despite these challenges, the agriculture sector has been neglected by national governments and international donors over a sustained period. While development aid to Africa has increased by 250 per cent since the early 1980s, the allocation to agriculture has halved.

[36] M. Pfitzer et al., „*Market Development Investments by Agricultural Input Companies and their Foundations: Transforming Smallholder Agriculture*“, The Syngenta Foundation for Sustainable Agriculture, 2009.

Millions of smallholder farms in poor countries are disconnected from markets and caught in potentially destructive cycles of economic, social and environmental degradation. For agricultural input companies whose success depends on raising farm productivity and having sustainable farm enterprises as customers, the transformation of smallholder operations into intensive, sustainable and diversified farm enterprises is the future business and development challenge. This new perspective on the companies that deliver products and services to farmers has captured their growing business and philanthropic engagement to transform smallholder agriculture.



# Contents

## The Task

Based on the concepts presented in the SAGCOT investment blueprint and with the goal of optimizing smallholder livelihoods:

1. Devise a sustainable market model for a ‘hub and out-grower’ scheme (or a concrete alternative).
2. Define how Syngenta can best engage with and support the model. How can this bring commercial value for the business? Which other partners will be needed and what role would they play?

The **model** will need to take into account the various challenges that smallholders face, including but not limited to:

- Lack of access to modern technology
- Limited access to new agricultural knowledge and innovations
- Lack of access to appropriate finance products
- Lack of access to profitable markets
- Lack of access to information
- Poor infrastructure
- Poverty and food insecurity

In addressing these challenges, the model should:

- Improve smallholder livelihoods
- Support and contribute to the local economy and rural development
- Encourage resource efficiency and environmental sustainability
- Create sustainable commercial value for the public and private partners
- Reduce vulnerability to social, political, economic and environmental shocks
- Consider gender issues in agriculture and rural development

And by meeting these requirements, improve food security in the region and beyond.

To download the SAGCOT Investment Blueprint and other useful resources: (<http://www.africacorridors.com/sagcot/resources.php>)

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<b>The SAGCOT Initiative</b> <i>Kavita Prakash-Mani, Ellen</i> HXE					10
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Case Study Work <i>Jutta</i> HXE	Case Study Work <i>Martijn</i> HXE	Case Study Work <i>Skype with Ellen</i> HXE	<b>Communication Training</b> <i>Juanita Schläpfer</i> HXE	Individual Work HXE	15
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**THE Outputs**

1. Conceptual model for a ‘hub and out-grower’ scheme in southern Tanzania that includes the role of different stakeholders and meets the needs of the farmers
2. Operational strategy outlining the specific role of each stakeholder and including, to the extent possible, the agricultural system, crops and geographical focus, number of farmers that can be reached and a plan with a timeline
3. A cost-benefit analysis from the point of view of the farmers, Syngenta and the other partners
4. Physical demonstration of the model (optional presentation format – other alternatives possible)

**Learning Objectives**

An understanding of:

- The complex linkages between poverty, agriculture and food security
- The role and importance of the agricultural sector and

- smallholders in developing countries
  - The function of value chains in the broader context of food systems
  - The opportunities for market mechanisms and value chain approaches to contribute to development objectives
  - The principles of public private partnerships, development cooperation, livelihood approaches and multiple stakeholder processes
- and skills in:
- Analyzing complex food systems and value chains within a defined context
  - Defining models based on optimizing multiple criteria
  - Exploring and defining partnership models that create added value for all stakeholders
  - Communicating complex theoretical concepts and ideas
  - Working in multidisciplinary and multicultural teams
  - Working with diverse stakeholders and interests

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09	Individual Work HXE	Case Study Work <i>Jutta and Martijn</i> HXE	Individual Work HXE	Wrap up and Work on Final Presentation <i>Jutta and Martijn</i> HXE	<b>Final Presentations</b> <i>You</i> <small>ALL</small>
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13	Individual Work HXE	<b>Communication Training</b> <i>Juanita Schläpfer</i> HXE	Individual Work HXE	Wrap up and Work on Final Presentation <i>Jutta and Martijn</i> HXE	
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A Rooftop Farm by MEEZAN in Amman.

UrbanFarmers Inc. develops and markets aquaponic rooftop farming systems that are going to revolutionize the way people eat and grow food in the city. In order to achieve these goals we are using sophisticated and highly efficient components and designs that are currently too costly for developing countries. Therefore we would like to use the opportunity and give a talented group of academics from all fields, a go at designing and constructing a simple low cost/low tech aquaponic rooftop farm system.

Aquaponics, the combined production of vegetables and fish within a recirculation systems is an ideal candidate to solve food production and supply problems for low-income families and urban communities , especially in areas of poor soil quality and water scarcity. The world's population is not only constantly and rapidly growing but ever more people are moving to cities in search of jobs and a higher living standard.

However, the large majority of food production takes place outside the cities and often even beyond a country's borders. Aquaponic rooftop farms can help to supply a growing urban population with healthy, fresh and local food. Without additional production costs as for transportation, storage/refrigerating, large quantities of irrigation water and fertilizer the high quality food from urban aquaponic systems could be made affordable for all income levels and help families and communities to be self-sustaining.

The output will be to design and build a low cost, highly efficiency aquaponic rooftop farm system based on a case study for the NGO MEEZAN that is based in Amman, Jordan.

## Supervisors



**Mark Durno**

*Urban Farmer*

*Urban Farmers, Zurich, Switzerland.*

Mark Durno grew up farming arable, beef and dairy on a 250 hectare commercial farm in the North East of Scotland. Stepping away from the family farm, Mark graduated with a Law Honours degree from the University of Glasgow, moving on to practise as a Scottish solicitor and operate the branch office of a Glasgow city centre law firm specialising in criminal and civil court work. Mark took leave from the law and returned to his farming roots in 2010 to gain practical experience in organic food production. This proved to be a fateful decision, leading Mark to his current position with UrbanFarmers and providing him with a channel to funnel his energy and passion for developing sustainable food production models for the future.



**Bashar Humeid**

*PhD Student University of Zurich, Switzerland.*

*Founder, MEEZAN, Amman, Jordan.*

Bashar is a PHD candidate at the University of Zürich. His field of research is renewable energy and democracy. Previously he worked as an Energy and Environment Editor in Abu Dhabi/ UAE.

Throughout his career, he has researched, written and made interviews with leading figures in the renewable energy field (i.a Director-General of the International Renewable Energy Agency). His articles about renewable energy were published in Arab and German media like the Emirates Center for Strategic Studies and Research and Germany's international broadcaster DW-WORLD. He has numerous contacts in the field of renewable energy both in Europe and the Arab World and has the passion to make this project a success.

# Inputs

## Implementing «Technologies» in Developing Countries - the Principles of Appropriate Technology and Balanced Development

Monday, July 9. Morning.

This session will outline general challenges in sustainability projects and more specifically the introduction of technical innovations in developing countries. What aspects need to be considered in project planning and preparation to enhance the chances of success? Why and how must and can we take the “enabling environment” into account when thinking about strategies and technical improvements? Ensuring a long and enduring positive impact and outcome of programs and projects is a critical aspect for sustainable development. If improvement and change is driven by technology supply or by funders (donors) rather than demand of beneficiaries then chances of success are fairly slim. So what have we learned from the past failures and what we recommend to enhance chances of success when introducing improvements?

The debate around sustainability usually includes the terms of economic, social and environmental sustainability. In the field of appropriate technology we generally use a few more “dimensions” such as institutional aspects, knowledge and skills and finally technical aspects. For instance the economics of the technical solution (project) can be endangered if the target group’s financial capacity cannot come up with the monetary contribution for capital or operational expenses. Institutional concerns for sustainability can occur when the project organization and setup shows substantial weaknesses that endanger its long-term performance and ability to ensure services, or if it is in conflict with policies, rules and regulations or cannot integrate the various stakeholders. Social concerns become critical when the target group shows little ownership or acceptance for the envisaged change, or social cohesion is lacking as a precondition or endangered by the project. Finally, sustainability can seldom be achieved without a transfer of skills and knowledge to the responsible long-term project holders or a sufficient capacity of the supply chain labour market. The presentation will use examples from solid waste management, water supply and sanitation infrastructure and services, however the aspects in general are applicable for other sectors of such as agricultural engineering.



**Christian Zurbrügg**

Researcher

Eawag, Dübendorf, Switzerland.

Christian Zurbrügg is a senior researcher on water, sanitation and solid waste for developing countries and also heads the Department of Water and Sanitation in Developing Countries at Eawag (Swiss Federal Institute of Aquatic Science and Technology). His research interests focus on the urban environment in cities of the developing world in particular on the challenges with regard to solid waste management, environmental sanitation and water supply. In addition to the technical issues of this domain his interest have comprised the economic, institutional and social issue surrounding sustainable solutions for improving health and wellbeing of the urban population by improved environmental services and infrastructure. His research experience is based on projects in a multitude of low and middle income countries in the Asian, African and Latin American regions.

### Further Reading

- [37] P. Schuebeler et al., „*Conceptual framework for municipal solid waste management in low-income countries*“, Swiss Agency for Development and Cooperation, 1996.
- [38] E. Schumacher, „*Small Is Beautiful: Economics As If People Mattered*“, Harper & Row, 1973.
- [39] „Water 2015 - Policy Principles and Strategic Guidelines for Integrated Water Resources Management“, Swiss Agency for Development and Cooperation, 2005.
- [40] „DFID Guidance manual on water supply and sanitation programmes - Guidelines on water and sanitation programmes and livelihoods“, UK Department for International Development, 1998.

## The Historical Context

Tuesday, July 10. Morning.

All over the world people are recognizing that the environment, biodiversity, social justice, culture and taste are important pieces in the food system. This session will show the historical development of gardens within the city. The question of self-sufficiency but also biological, social, economic, political, cultural and global aspects and interrelationships of these factors are central. The aim will be to show a student project on the roof of one of the University building in Oerlikon, Zurich and to open up a discussion on urban agriculture, but also to look at the issue of sustainability critically.

*The lecture will be followed by a visit to a rooftop garden designed by architecture students from ETH Zurich.*

### Further Reading

- [41] M. Toussaint-Samat, „A History of Food“, Wiley-Blackwell, 1999.
- [42] L. Lawson, „City bountiful: a century of community gardening in America“, University of California Press, 2005.
- [43] M. Pollan, „The Omnivore’s Dilemma: the Search for a Perfect Meal in a Fast-Food World“, Bloomsbury, 2011.
- [44] C. Steel, „Hungry City: How Food Shapes our Lives“, Vintage, 2009.
- [45] S. Wolf, „Zwischendrin und zwischendurch: temporäre Gärten“, Anthos, 2010.



**Nicola Eiffler**

*Landscape Architect  
ETH Zurich, Switzerland.*

Nicola is a landscape architect experienced in working in larger urban contexts and in multidisciplinary teams, leading an internal project team from conception through to conclusion. She worked and works on several large scale projects in Switzerland, India and the Arab World such as Bawadi Development Dubai or MOMA Colcata. Employed with Vogt Landscape Architects since 2006, she is a member of the Board since 2011. She is also a research assistant at the Chair of Günther Vogt, Institute of Landscape Architecture, ETH Zurich since 2011. She holds a Master at the Technical University of Munich 2005, where she did her Thesis with Prof. Peter Latz, Institute for postindustrial Landscape. Previously, she did her bachelor degree at the Manchester Metropolitan University in 2002.

# Contents

## OUTPUTS

Design and build a low cost, highly efficiency aquaponic rooftop farm system based on a case study for Amman, Jordan. The system should be easily adaptable for other urban communities and generally urban, low-income target groups in Developing Countries.

Learning Objectives are to gain an understanding of:

- Local/regional food production systems
  - Resilience of urban communities
  - Recirculation systems in food production
- and skills in:
- Sourcing, building and running an aquaponics rooftop farm system
  - Projecting one’s thoughts into other cultures, social settings and necessities

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<b>Welcome to Zurich BBQ</b> Seed City Garden <small>ALL</small>					18
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# Further Reading

- [46] Thomas M. Losordo, „Recirculating Aquaculture Tank Production Systems“, SRAC, 1999.
- [47] M. Frei and O. Hartmann, „Aquaponic zur Selbstversorgung mit Fisch und Gemüse“, Hochschule Wädenswil, 2007.
- [48] K. Connolly, „Optimization of a Backyard Aquaponic Food Production System“, McGill University, 2010.
- [49] Charlie price’s aquaponics uk: [aquaponics.org.uk](http://aquaponics.org.uk)
- [50] Backyard aquaponics: [backyardaquaponics.com](http://backyardaquaponics.com)
- [51] Nelson & pade: [aquaponics.com](http://aquaponics.com)
- [52] MEEZAN: [youtube.com/watch?v=44FrYCV1qvo](https://youtube.com/watch?v=44FrYCV1qvo)
- [53] ruaf amman: [ruaf.org/node/2166](http://ruaf.org/node/2166)
- [54] ruaf middle east north africa: [urbanagriculture-mena.org](http://urbanagriculture-mena.org)
- [55] urban agriculture atlas: [foodurbanism.org](http://foodurbanism.org)
- [56] humane slaughter association: [hsa.org.uk](http://hsa.org.uk)
- [57] fish welfare: [fishwelfare.net/about/](http://fishwelfare.net/about/)
- [58] all about fish: [fishbase.org](http://fishbase.org) and [fishdoc.co.uk](http://fishdoc.co.uk)
- [59] aquaponics journal: [aquaponicsjournal.com](http://aquaponicsjournal.com)
- [59] diyaquaponics journal: [diyaquaponics.com/journal](http://diyaquaponics.com/journal)
- [60] byap magazine: [byapmagazine.com](http://byapmagazine.com)

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# PARTICIPANTS

## STUDENTS AND TEAM

This section gives you an introduction to the people you will be spending the next three weeks with -- like a printed version of Facebook! Feel free to read through and don't be shy introducing yourselves to one another!



With participants from 16 countries, almost every continent - Asia, Australia, North and South America, and Europe - is represented at the Summer School.

## Participating Students

**35 students, 16 nations and 21 disciplines.**

Participants come from a diverse array of backgrounds, both academically and geographically. Below are their profiles, backgrounds and what they hope to gain from the summer school. We hope you leave after the three weeks with all those expectations fulfilled - and maybe some unexpected ones too.

You were chosen to attend this summer school because of your motivation, skills and experiences. You're experts in various fields and we would like you to share your expertise with the rest of the group.

We are looking forward working and learning with you.

### **Food Waste**

Akiko Segawa, Aurelia Jud, Birte Kahmann, Fiona Sartori, Janice Johnson, Jenny Weilemann, Laura de Baan, Ling Wie Ng, Lorenzo Heis, Luis Lopez, Nynne Uldal Meisner.

### **Smallholder Livelihoods**

Burjis Godrej, Charlotte Malterre, Deborah Cheong, Federico Davila, Isabelle Martiel, Mathias Voges, Matthew Hatson, Milja Fenger, Moritz Hofstetter, Silva Lieberherr, Zeno Robbiani.

### **Urban Farming**

Aliza Gazek, BinBin Jiang Pearce, Elena Chestnova, Francis Liesting, James Redmore, John Grant, Karol Yanez, Kate Hofman, Laura Marty, Lea Eymann, Marco Aurélio Sousa, Mel Ronca, Stefan Kramer.



**Akiko Segawa, Japan**

*BSc student in Applied Chemistry at University of Tokyo, Japan.*

I am looking forward to meet people from various backgrounds and talking about food system together. There are 3 reasons for that. For Japanese “food” is one of the most important problems to solve. Not only because we are a major importer of food including grains but also because Damage from salt water (or Tsunami), and radioactive contamination have had a devastating effect on Japanese agriculture. I have strong interest in food distribution. For example, a cup of coffee costs more than 3\$ in Japan. I think it is very expensive when think of farmers who grow coffee beans get very small money. I am interested in how the money consumers paid for their coffee is used. Personally, I have to decide my major this summer(in my college, all students have to belong the Faculty of Arts and Science for 2 years before they decide their majors).So far I am going to major Applied-Chemistry, but I have some other fields I want to study. Taking part in this program will give me great opportunity to think about my future. Looking forward to see you all and have a good time at Zurich!

*Akiko will participate in the Food Waste case study.*



**Aliza Gazek, United States**

*BSc student in Human Biology at Stanford University, United States.*

I look forward to connecting with students from around the world and learning the stories behind their passions for all things food. My interdisciplinary studies focus on creating social and structural changes around issues at the intersection of health and environment, and food is a prime example. This has led me to work on urban farms and U.S. food policy, and to my current studies in Cape Town. I am eager to further my engagement with international perspectives on social justice by exploring multi-disciplinary approaches and developing lasting collaborative partnerships this summer.

*Aliza will participate in the Urban Farming case study.*

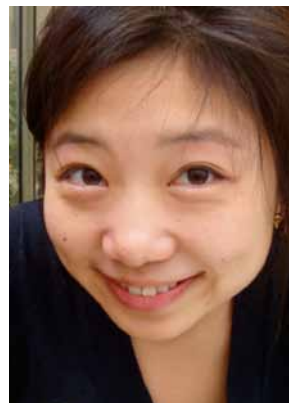


**Aurelia Jud, Switzerland**

*BSc student in Biology at University of Zurich, Switzerland.*

I see the summer school as a great chance to learn a lot more about some really important issues. I'm looking forward to getting to know people who share the same interests and want to change something in this world. For years I've been concerned about nature, nurture and consumer behavior. I grew up on a farm, that's why I know how much effort is put in producing our food. Many people aren't aware of the huge amount of energy they spoil every day by throwing away food. I want to get more consolidated knowledge, so I can show them easy ways how to change their habits towards a more 'sustainable' way of living.

*Aurelia will participate in the Food Waste case study.*



**BinBin Jiang Pearce, United States**

*PhD student in Forestry and Environmental Studies at Yale University, New Haven, United States.*

My interest is in making food systems more sustainable by understanding its environmental impact in the context of the city. In particular, I would like to use the workshop as an opportunity to connect the realms of urban agriculture and food waste management. My current research as a PhD student is concerned with determining the degree of environmental loading of foodsheds by following the nutrients (nitrogen, phosphorus, potassium) that flow through and are accumulated in an area.

*BinBin will participate in the Urban Farming case study.*



**Birte Kahmann, Germany**

*MSc student in Sustainability Science at Leuphana University, Lüneburg, Germany.*

Hey, I am postgraduate student in the programme of Sustainability Science at Leuphana University of Lüneburg, Germany. The past year I have worked in a research project on sustainable agriculture in Germany. We developed a new indicator system to assess a single farm's level of sustainability. I learned a lot in this project but I strongly feel that there is much more for me to learn, especially on an international level. Therefore I am really looking forward to meeting you all with your different backgrounds and cultural experiences in the field of sustainability.

*Birte will participate in the Food Waste case study.*



**Burjis Godrej, India**

*BSc student in Earth Systems at Stanford University, United States.*

My interests in food security and sustainable agriculture led me to apply to the „Eating Tomorrow“ conference. This program will be an excellent way to learn more about the complexities and challenges of the global food system. I hope to use what I learn to improve the livelihood of smallholder farmers in India and other developing nations. I am looking forward to meeting people from different backgrounds and cultures, and working with them to find ways to make the global agriculture system more sustainable.

*Burjis will participate in the Smallholder Livelihoods case study.*



**Charlotte Malterre-Barthes, France**

*PhD candidate in Architecture at ETH Zurich, Switzerland.*

Charlotte is a practicing architect and urban designer. She is involved in research and currently co-teaches the seminar Urban Mutations on the Edge at the chair of Prof. Dr. Marc Angélil at the Swiss Federal Institute of Technology (ETH) in Zurich, Switzerland. Charlotte is, in a preliminary phase for a PhD, investigating the correlation between food systems, political economy and urban form, with Cairo as case study. Charlotte (born in Lyon, France) studied at the Ecole Nationale Supérieure d'Architecture in Marseille and at the Technische Universität in Vienna. She has been a student of Marc Barani, Erich Raith and Françoise-Hélène Jourda. While doing her internship with the firm Coop Himmelb(l)au in Vienna, she was part of the European Central Bank Competition team. Her diploma 'a Women Social Centre in Baghdad', obtained in 2003 magna cum laude, tackled political and social involvements of architecture. A graduated architect, she collaborated with several offices, such as Rudy Ricciotti, Dipol Landscape Architects and OOS. In India, Charlotte worked with Balkrishna Doshi at Sangath. She obtained in 2008 a Master of Advanced Studies in Urban Design at the ETH. Apart from her architectural practice, Charlotte is -since 2009 co-founder with Noboru Kawagishi, of the urban research laboratory OMNIBUS, focused on trans-disciplinary metropolitan explorations.

*Charlotte will participate in the Smallholder Livelihoods case study.*



**Deborah Cheong, United Kingdom**

*MSc student in Modern Chinese Studies at University of Oxford, United Kingdom.*

My interest in global food systems led me to undertake an independent study module pursuing economic research on Indonesian rice self-sufficiency. My research served to fuel my curiosity about the relationships between food security, agricultural sustainability, and social justice issues. Currently, I am exploring the role of technology in inclusive and sustainable development through my coursework at Oxford. Working at the intersection of innovative changes in farming and technology development theories, I hope to be better able to understand what a sustainable food future might look like for Asia. I see my participation in the ETH Sustainability Summer School as a continuation of the above journey to understand both the technological changes in food and farming, as well as the increasing need for stronger local food systems and cultures. At ETH, I hope to further explore the relationship between urban farming and industrial agricultural systems.

*Deborah will participate in the Smallholder Livelihoods case study.*



**Elena Chestnova, Russia**

*MSc student in Architecture at ETH Zurich, Switzerland.*

My interest in food and the problems of providing cities with nourishment started off during my university courses. On the one side we have to worry about feeding the city, on the other also about the cultural significance of the food. What we eat is highly specific and local, even though ingredients sometimes travel half-way around the globe before being consumed. I am interested in the links between food, place and local culture and how these are to be addressed in the context of the global food security challenges. Food is also a big part of my private world - I am a passionate cook and gourmet and love to experience other cultures through their food. I look forward to meeting people from other countries at the summer school!

*Elena will participate in the Urban Farming case study.*



**Federico Davila, Venezuela**

*MSc student in Environment at ANU, Canberra, Australia.*

I am currently studying the role peasant farmer movements play in shaping a new agricultural paradigm. My current focus is on the emergence of Food Sovereignty as a concept that offers possibilities for alternate food systems. I have an undergraduate degree on Interdisciplinary Studies (Sustainability), where I majored in Human Ecology. As a human ecologist, I seek to understand how our cultures shape our behaviours and in hand the decisions we take for sustainability issues. This thinking is fundamental for rethinking the world food system for a sustainable future.

*Federico will participate in the Smallholder Livelihoods case study.*



**Fiona Sartori, Switzerland**

*BSc student in Industrial Design at ZHdK, Zurich, Switzerland.*

I've been studying Industrial Design at the Zürcher Hochschule der Künste (ZHdK) for 2 years. This spring semester I have done an exchange at the School of Industrial Design (Institute of Technology) in Lund, Sweden, where I had the chance to do valuable experience from both, the educational and the social part of view. In other words: a one in a lifetime experience. Next year I will finally finish with my Bachelor and start gathering work experience for the Master.

Coming from the design point of view I am of course really interested in contributing to a sustainable consumption of goods (in this case food). After all sustainability is a core theme in Design nowadays and should be seen as a duty for all designers.

I am really looking forward to take part of this year's Summer School, to deepen my knowledge and experience and to contribute with my high motivation!"

*Fiona will participate in the Food Waste case study.*



**Francis Liesting, Netherlands**

*MSc student in Architecture at TU Delft, Netherlands.*

I study Architecture at the Delft University of Technology, where I am part of the graduation laboratory 'Explore Lab', which enables students to follow their fascination for a certain issue and conduct research for their graduation design project. I titled my graduation project 'Agritecture', because I am exploring how to combine city architecture with food production. I research this because I am very interested in combining different fields of expertise to try to deal with contemporary problems such as the food crisis in a sustainable manner. I see great potential in bringing food production into the city again, as it used to be in the beginning of urbanisation. I would really like to expand my knowledge about the global food system and get inspiration for combining agriculture with dwelling in the city. I am also looking forward to meet people from all around the world who share the same interest.

*Francis will participate in the Urban Farming case study.*





**Isabelle Martiel, France**

*PhD student in Food Science at ETH Zurich, Switzerland.*

As any other Frenchman, I love food. Perhaps more than many, as I decided to study the science of food during my PhD, and hopefully in my future career. When it comes to feeding the world in a sustainable way, I believe that we students have the biggest part to play, since we will be managing the world food system in the coming years. For me, ETH Sustainability Summer School “Eating Tomorrow” represents a unique opportunity to get ready to help shaping our future food system in a responsible way. I have studied chemistry, physics and biology in Paris, at ESPCI ParisTech. In addition, I have an MSc in Physico-chemistry of Materials. During my studies, I worked as a research trainee in Japan, in Lausanne (Switzerland) and as visiting graduate student at MIT (USA). My current research activities focus on the design of new encapsulation systems for micronutrients in foods, based on natural components. I am looking forward to sharing experiences and ideas with fellow students and supervisors. Besides, don’t hesitate to ask me if you need a good recipe or restaurant address!

*Isabelle will participate in the Smallholder Livelihoods case study.*



**James Redmore, United Kingdom**

*MSc student in Public Health Imperial College London, United Kingdom.*

I am currently reading for a Master of Public Health degree at Imperial College London. As the world’s population continues to exponentially grow, I am intrigued to see how society will sustain itself with regard to worldwide food supply. I also would love the opportunity to use the skills obtained in my BSc Biological Science degree and my current MPH degree to complement this year’s group in formulating innovative suggestions and solutions to address such complex dilemmas. Finally, having only travelled to Spain in my lifetime, the prospect of experiencing Switzerland and sampling authentic Emmental cheese is an additional lure! I am optimistic that by the end of this year’s summer school, I will have enjoyed a fantastic experience at ETH Zurich and will be better informed about the issue of food security that faces humanity in the forthcoming decades.

*James will participate in the Urban Farming case study.*



**Janice Johnson, Germany**

*MSc student in Environmental Science at University of Geneva, Switzerland.*

My name is Janice, I am German and I am currently enrolled in a Master degree programme at the Institute of Environmental Sciences at the University of Geneva, Switzerland. I find the dynamics of our natural environment extremely fascinating, especially when they are closely linked to human evolution, development and activities, as is the case in agri-food systems. I enjoy seeing food production and cultivation from many different perspectives, such as for example from a cultural viewpoint with agri-food produce and recipes being a celebration of natural resources, local expression and identification, or, for example, from a more biogeochemical perspective with agriculture acting as a major strategy to influence and facilitate human access to the nutrient cycle. Since discussions on food security often centre primarily around cultivation and production, I am highly motivated to broaden my horizon and to find out more about the potentials of securing food supply through approaching the other end: managing and reducing waste. I am really looking forward to meeting you all and I can hardly wait to hear and exchange multicultural and multidisciplinary ideas and viewpoints on local and global food systems. See you soon in Emmental. :)

*Janice will participate in the Food Waste case study.*



**Jenny Weilenmann, Switzerland**

*MSc student in Management, Technology and Economics at ETH Zurich, Switzerland.*

Already during my bachelor studies I was interested in topics on how to make our food system more efficient and sustainable. Moving from Food Science to an Economics master program gave me a totally new view on many topics, and I'm sure this Summer School will open up even more horizons. I think it is crucial to find a way between a drastic green thinking and economical efficiency. Discussing and optimizing strategic solutions and finding innovative ways out of our „throw-away-society“ will be very interesting. Working with so many people from different backgrounds is fantastic and I can't wait to meet you all and share ideas on how to rethink the World Food System.

*Jenny will participate in the Food Waste case study.*



**John Grant, Australia**

*BSc student in Science and Law at ANU, Canberra, Australia.*

I'm in my fourth year and have recently returned from an exchange in The Netherlands. Before commencing at ANU, I lived on a farm in rural New South Wales. Despite the fact that my degree has spanned a range of subjects including genetics, contract law, neuroscience and anthropology, my interest in food production has remained strong after my years growing up in an agricultural community. Having now lived in an urban setting for some years, the combination of sustainability and food production in a developed environment is intriguing and exciting. I hope to expand my knowledge in this area through this course.

*John will participate in the Urban Farming case study.*



**Karol Yanez, Mexico**

*PhD candidate in Development and Planning at University College London, United Kingdom.*

My passion: is about learning from diverse sustainable ways for producing food; taking care of people and the environment. Specially I enjoy practicing urban agriculture. Some experience: I have learnt and worked with small rural and urban food producers in different parts of the world: Accra, Lisbon, London and Mexico. I have also participated in a co-research between University College London and the Food and Agricultural Organisation for the United Nations (FAO), leading an investigation about the best practices and legal and institutional framework for urban agriculture worldwide in the past decade.

My expectations: I would love to meet people who to learn from and share experiences and ideas to potentially start working in collaborative projects.

*Karol will participate in the Urban Farming case study.*



**Kate Hofman, United Kingdom**

*MSc student in Environmental Technology and Business at Imperial College London, United Kingdom.*

I am currently writing my Master's thesis for an MSc in Environmental Technology and Business at Imperial College London. My thesis is on „the commercialisation of urban agriculture in London“. I am particularly interested in roof-top farming and innovative technology which would allow us to make better use of underutilised space in the city. I am passionate urban farmer myself, growing food on my balcony and the communal roof terrace of our apartment block in central London. I am working on setting up London's first aquaponic roof-top farm.

*Kate will participate in the Urban Farming case study.*



**Laura de Baan, Switzerland**

*PhD student in Environmental Systems Science at ETH Zurich, Switzerland.*

How can we feed 9 billion people without destroying our planet? This is one of the most challenging questions humanity is facing. With my past, current and future work I hope to make a small contribution to better understand some of the involved trade-offs and finding solutions to overcome them. In my current PhD work, I am developing new methods to assess the impacts of agricultural land use on biodiversity within the framework of life cycle assessment. I am looking forward to the summer school to discuss challenges and potential solutions among participants and lecturers from various disciplines and countries and to get new insights from in-depth input lectures. In addition, I am excited about the real-life case studies that provide a chance to not only strengthen academic, but also practical knowledge.

*Laura will participate in the Food Waste case study.*



**Laura Marty, Switzerland**

*MSc student in Agricultural Economics at ETH Zurich, Switzerland.*

Being a student in Agricultural Sciences, the question of 'How to achieve global food security' has been a daily companion during my last 5 years of study.

For me it is one of the most important questions the world is facing today and this summer school is a small step in the path of finding an answer.

I'm very much looking forward to discuss this challenging question with you all and to learn from your different backgrounds and different cultures.

*Laura will participate in the Urban Farming case study.*



**Lea Eymann, Switzerland**

*MSc student in Environmental Engineering at ETH Zurich, Switzerland.*

My name is Lea and I will participate in the urban farming case study. I must admit that so far, I only have modest knowledge concerning this issue, but since I first read an article in a newspaper about some visionary ideas of food production in cities I am fascinated by this topic. Apart from the interesting subject of this year's Sustainability Summer School I especially like the idea to learn more about the different stakeholders of the global food system and to work in an intercultural team on a challenging case study.

*Lea will participate in the Urban Farming case study.*



**Ling Wei Ng, Malaysia**

*BSc student in Civil Engineering at Imperial College London, United Kingdom.*

Last term, I volunteered in a local outreach school in London and was taken aback by the sight of young children fighting for boxes of milk because the school was poor. That got me thinking about how wealthy society are wasting food while on the other hand, how scarce food is, to these poor children. I was taught to not waste food since I was young and I strongly believe in fighting hunger by reducing food waste and that food should always be distributed to those who need it. And what am I expecting from the ETH Sustainability Summer School? Hmm... I am looking forward to meeting and interacting with all the enthusiastic and interesting people from various cultural backgrounds who are coming under one roof to lend their hands in solving one of humanity's greatest challenges!

*Ling Wie will participate in the Food Waste case study.*



**Lorenzo Heis, Switzerland**

*MSc Student in Banking and Finance at HSG St. Gallen, Switzerland.*

During my Bachelor's studies in Economics I developed a particular interest in the fields Corporate Sustainability/ Sustainability Marketing and Logistics Management and would like to see how these topics are handled in real life. Besides the great opportunity to develop ideas and possibilities for a sustainable future, I believe that this summer school could give me the chance to meet and work with interesting people from all over the world, acquire knowledge and get an insight into a different work field. My goal is to develop inspiring discussions and great ideas thanks to the interdisciplinary and international background of all participants and under the supervision of extraordinary competent people.

*Lorenzo will participate in the Food Waste case study.*



**Luis Lopez de Obeso, Mexico**  
*student at ETH Zurich, Switzerland.*

¡"Hola" Everybody! For as long as I can remember I have invested every Mexican Peso to cross my way into my travels. My current stopover happens to be Zurich, where I am studying a master in environmental engineering. Through these years I've come to realise how important water and food are to every society. They are at the core of every culture and thus they are worth investing every brain cell we have. I came to Switzerland looking to learn how to clean water, but by a quirk of fate (and with ETH twisting a nut here and there) I gladly ended up focusing on Life Cycle Assessment topics, notably of beer. I mention beer because complementary to academia I did an internship with Feldschlösschen (a Swiss brewery) which gave an insight of the food (well... food and beverages) industry. I'm about to finish my master and I believe this trip to Emmental will crown my studies by helping me to better understand the multi-disciplinary challenges the food industry (specifically the waste it produces) places: on a global scale. Looking forward to crossing our paths!

*Luis will participate in the Food Waste case study.*



**Marco Aurélio Sousa, Brazil**  
*PhD student in Agricultural Sciences at ETH Zurich, Switzerland.*

My name is Marco Aurélio; I am currently attending the second year of PhD studies at ETH Zurich. I have been working with food production since a few years. I am very enthusiastic on taking part of the Summer School because it is a valuable opportunity to learn, share skills and perhaps produce outputs that might be used by our society. I am expecting to interact with other cultures and, as a team, learn how to define and analyze existing emerging issues in sustainability and the world's food shortage problem.

*Marco will participate in the Urban Farming case study.*



**Mathias Voges, Netherlands**

*MSc student in Life Science & Technology at TU Delft, Netherlands.*



**Matthew Hatson, Canada**

*MA student in European Affairs: Economic and Political Concentration at University of Geneva, Switzerland.*

Hello “Eating Tomorrow” enthusiasts! I am a MSc student in the program Life Science & Technology at the Delft University of Technology. I grew up on the island of Saba, Maarten in the Caribbean. I have focused my research mainly on the fields of evolutionary ecology and bioengineering as I believe many of the answers to sustainability lie on the interface of these disciplines. I hope to further broaden my perspective on sustainability by viewing it through the eyes of all parties involved. I wish to be a part of a multifaceted team that actively searches for sustainable solutions to global food problems that can be applied to a large audience. Furthermore, I believe that the diversity in courses offered by the program will be the key to sustainable answers.

*Mathias will participate in the Smallholder Livelihoods case study.*

My name is Matthew (Matt) and I hail from the frigid city of Ottawa, Canada. I’m very excited to meet all you fellow ETH Sustainability Summer School`ers. To make quite a long story short, I graduated some years ago from Cornell University with a BA in Economics. So with diploma in hand, and many grand ideas in mind, I chose to not follow my colleagues to the shining towers of Wall Street but instead took „the road less traveled“ to the far reaches of Africa, Asia and S. America. In 2010, I accepted a position in Basel, CH, where I worked in a development finance role until deciding to return to graduate studies at the University of Geneva, both to finally attain bilingualism and to add some class qualifications to my well developed real world experience. I am planning to pursue a thesis related the „hidden evils“ of trade openness and on inequality in some general capacity and so I hope that this summer course will fill a lot of knowledge gaps that I currently have and really push my creative side to its limits. Although I am a numbers-guy to start, I have a passion for all things physical (architecture, industrial design, Apple products :), and so I am excited to tap in to the non-economic/ public policy parts of my brain and really come up with some cool ideas and new angles for approaching traditional problems. I can’t imagine a more appropriate course content or high quality technical university in which to exchange ideas and take on these challenging questions than the „Eating Tomorrow“ summer course at ETH Zurich.

*Matthew will participate in the Smallholder Livelihoods case study.*





**Mel Ronca, Australia**

*MSc student in Applied Anthropology and Participatory at ANU, Canberra, Australia.*

My interest in food isn't new. Like everyone I have been eating since the day I was born. But unlike most, my interest goes deeper. I like exploring the complexities involved in everything that food is and represents to us, how it is part of who we are as individuals, how it shapes and is shaped by our cultures and what the implications of cooking and eating it are for our society, our natural and urban environments and our world as a whole. I began my career working in agricultural, biosecurity, market access and trade policy with the Australian Government. I have since worked on opium crop substitution projects in Thailand and coordinating a community development project that assisted older migrant women overcome issues of food security and social isolation through sustainable gardening and permaculture theory and practice. With an undergraduate degree in geography I guess that makes me a project managing social scientist who dabbles in policy and likes to travel the world! I'm very much looking forward to completing my current masters program with Eating Tomorrow and bringing my work and study together with a focus on food.

*Mel will participate in the Urban Farming case study.*



**Milja Fenger, Netherlands**

*BSc student in Human Sciences at University of Oxford, United Kingdom.*

A typical day of my life in Oxford:

- 8:00 Getting up and eating porridge with ever-evolving toppings (today strawberry and pumpkin seeds)
- 9:00 Racing on my bike to attend a lecture in Ecology, genetics or demography
- 11 – 13 Directing a rehearsal for one of the theatre plays I'm working on
- 14:00 Lunch meeting to discuss marketing, production or lights for the play
- 14 – 16 Working frantically to finish one of my weekly essays
- 16 – 17 Meeting with a tutor and a fellow student to discuss, debate, digress on the topic of the week (currently biological conservation)
- 18:00 Cook and eat with friends or my boyfriend
- 19:30 Attempt to work on my next essay, and fail to do so
- 20:30 Chat on Skype to my family in Holland, friends in London and Germany
- 22:30 Watching TED talks, videos of orangutans or chimpanzees and reading a novel (currently Crime & Punishment)
- 00:30 Sleep

*Milja will participate in the Smallholder Livelihoods case study.*



**Moritz Hofstetter, Switzerland**

*BSc student in Agricultural Sciences at ETH Zurich, Switzerland.*

When I saw that the ETH offers this Summer Programm, it was clear for me that I was going to apply. I started my studies in agronomics in order to expose myself and to deal with questions of mass starvation. I am aware that finding new ways to feed the world in a sustainable way is a big challenge today and that it requires a huge amount of knowledge. I am really looking forward to these three weeks since we will be able to debate and share our ideas in a thorough way. The international aspect of the program makes it even more exciting. I cannot wait to get to know you all and to get started!

*Moritz will participate in the Smallholder Livelihoods case study.*



**Nynne Uldal Meisner, Denmark**

*BSc student in European Ethnology at University of Copenhagen, Denmark.*

After rather randomly experiencing being put in charge of cooking five meals in a row for 150 hungry union activists at the age of sixteen my love to everything food related has been all-absorbing. Besides having made food my primary subject in my academic studies, I took a year out of the calendar where I trained as a chef in as different places as Canteens, a pub and a Michelin-stared restaurant in England. In my academic studies, food as a tool for social integration and cultural enactment has been my focus. My hope is that the three weeks at the Summer School will prove to be a fruitful learning environment, where different academic disciplines can unite and produce realistic and innovative suggestions to tackle the question of food sustainability in the future.

*Nynne will participate in the Food Waste case study.*



**Silva Lieberherr, Switzerland**

*PhD student in Human Geography at University of Zurich, Switzerland.*

I have spent my life trying to understand the global food system and thinking of sustainable alternatives that provide a living for farmers in North and South and produce enough food for everyone. I am far from having found any alternatives - so I am keen on discussing with all of you, on exchanging ideas, dismissing and rethinking them. I am looking forward to hearing viewpoints from all over the world and to getting new inspiration. I hope to gain new visions about what we can do to make the global food system a bit more like we want it to be.

*Silva will participate in the Smallholder Livelihoods case study.*



**Stefan Kramer, Switzerland**

*BSc in Biology at University of Zurich, Switzerland.*

The reason I want to be a part of this summer school is because I am sure that this summer school will be a great opportunity to develop ideas for a more sustainable way of producing, consuming or just handling food. It is such an every day's topic that there are only few people who are actually interested in what they eat, where it comes from or where it goes if thrown away. That is why I am looking forward to meeting people who share my interest in our existing or better in our future food system and I am glad to be a part of a group of people who might create lasting solutions to make our food system more environmentally compatible. And since we all have various backgrounds, personal, educational or even cultural, I am sure that I can learn a lot more about food topics from all of you.

*Stefan will participate in the Urban Farming case study.*



**Zeno Robbiani, Switzerland**

*MSc Student in Mechanical Engineering at ETH Zurich, Switzerland.*

I have been employed for the last 6 months in Ghana by Sandec (EAWAG), research group focusing on water and sanitation in developing countries. My main passion is developing and implementing innovative solutions using waste as a resource to tackle climate change. My motivation to take part to this program is to share my perspectives and visions with inspiring students from different horizons to develop innovative ideas and find sustainable solutions to the challenges associated with the world food system.

*Zeno will participate in the Smallholder Livelihoods case study.*

# Student Suggested Reading

- [61] Barilla Center for Food & Nutrition, „*Eating Planet*“, Edizioni Ambiente, 2012.
- [62] „*How to Feed the World in 2050*“, FAO, 2009.
- [63] J. Foley et al., „*Global Consequences of Land Use*“, Science, 2005.
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- [66] J. Ingram et al., „*Food security and global environmental change*“, Earthscan, 2010.
- [67] H. Wittman et al., „*Food Sovereignty: Reconnecting Food, Nature and Community*“, Fernwood, 2010.
- [68] M. Altieri and V. Toledo, „*The agroecological revolution in Latin America: Rescuing nature, ensuring food sovereignty and empowering peasants*“, Journal of Peasant Studies, 2011.
- [69] The Hungry City Book, [hungrycitybook.co.uk](http://hungrycitybook.co.uk)
- [70] T. Stuart, „*Waste: Uncovering the Global Food Scandal*“, Norton, 2009.
- [71] J. Foer, „*Eating Animals*“, Little, Brown and Company, 2009.
- [72] P. Roberts, „*The End of Food*“, Tantor Media, 2008.
- [73] E. Fraser and A. Rimas, „*Empires of Food*“, Free Press, 2010.
- [74] C. Clover, „*The End of The Line*“, Ebury & Vermilion, 2004.
- [75] T. Grescoe, „*Bottomfeeder*“, Bloomsbury, 2008.
- [76] new harvest [new-harvest.org](http://new-harvest.org)
- [77] B. Smart, „*Consumer Society: Critical Issues and Environmental Consequences*“, SAGE Publications, 2010.
- [78] M. Berners-Lee, „*How Bad Are Bananas?: The Carbon Footprint of Everything*“, Profile Books, 2010.
- [79] J. Schmidhuber and W. Traill, „*The changing structure of diets in the European Union in relation to healthy eating guidelines*“, Public Health Nutrition, 2005.
- [80] „*International Conflict Triggers and Potential Conflict Points Resulting from Food and Water Insecurity*“, Global Food and Water Crises Research Programme, 2012.

# Organisation

## ETH Sustainability

Coordinating Office for Sustainability at ETH Zurich.

The ETH Zurich is a leading international university that anticipates solutions for sustainable future, in an excellent and interdisciplinary environment and in partnership with other strong global partner organizations. This leads to a distinguished systems knowledge and pioneering technical innovations; a new generation of leaders and decision-makers, practical ideas for everyday sustainability in teaching and research and reinforced knowledge and technology transfer to promote the application of academic findings to the private sector and to public administration.

### MISSION

The ETH Zurich provides all its students and employees with an environmentally friendly and socially responsible teaching, research and working environment. Furthermore: the ETH Zurich makes its students sensitive of the demands of sustainable development. It conveys to them an independent spirit, which allows them to implement sustainable actions in a competent and practical manner; the ETH Zurich supports the constructive collaboration of different fields of study to develop sustainable solutions for the most significant social problems; the ETH Zurich places great emphasis on practicing sustainability in the everyday activities of teaching and research. It sponsors people, projects and initiatives that contribute to reducing the ecological footprint of teaching and research activities, which improves the working environment.



**Christine Bratrach**

*Director ETH Sustainability  
ETH Zurich, Switzerland.*

Dr. Christine Bratrach accepted the position as director of ETH Sustainability in October 2008. Interdisciplinary research and applied projects on the topic of sustainability as well as interactions with interest groups in business, politics, and NGOs have characterized her career: As Head of the Danube/Freshwater Programme at WWF International from 2004-2008 she was responsible for coordinating more than 20 conservation and restoration projects in Central and Eastern Europe. Before she completed her PhD at ETH Zurich and Eawag where she worked on key elements for successful river restoration projects. From 1997-2001, she was part of the project management of the Eawag project on «greenhydro».



**Michelle Grant**

*Executive Director  
World Food System Centre  
ETH Zurich, Switzerland.*

Michelle Grant joined the World Food System Center in December 2011. She holds a Bachelor and Honors (1st) in Chemical and Environmental Engineering from the University of Queensland in Australia, along with Master in Management, Technology and Economics from the ETH Zurich. Michelle worked as an Engineer in Australia, Norway and Costa Rica for several years before joining the ETH in 2004 as the lead Project Manager at the former ETHsustainability. In this role she was responsible for the education, research and outreach programs of the Center, including running and expanding the Youth Encounter on Sustainability (YES) program in six different world regions. During this time she established graduate level programs and taught modules on food security and the global food system.



**Catherine Lippuner**  
*Summer School Organizer*  
*ETH Sustainability*  
*ETH Zurich, Switzerland.*

Catherine has been a part of the ETH Sustainability team since May 2009. Before joining ETH Sustainability, she worked for the Swiss green party and the Alliance for Global Sustainability (AGS). During her studies, she was engaged in both the managing board and as a project leader with the ETH Zurich student organization [project 21] and the international World Student Community for Sustainable Development. She completed her studies with two Master’s degrees in microbiology from the University of Zurich and in international public health from the Free University of Amsterdam. Catherine loves, practices and teaches yoga and is passionate about art and architecture.



**Lex Schaul**  
*BSc Student in Architecture*  
*ETH Zurich, Switzerland.*

After having participated in 2010’s ETH Sustainability Summer School in Addis Ababa, Ethiopia, Lex joined the organizational team and now contributes as a program assistant. He is particularly interested in the intersection of the creative fields and science. After his Master’s degree in engineering from the Swiss Federal Institute of Technology Lausanne in 2007, he has worked in the research domain of digital photography and printing. Currently, he is pursuing a degree in architecture from ETH Zurich. He just returned from his exchange semester in Ahmedabad, India where he followed Bimal Patel’s urban design studio, focussing on how to improve the quality of a city in a developing country while keeping the social and environmental aspects in mind



**Florian Hilbert**  
*BA Student in Interior Design*  
*FHNW Basel, Switzerland*

After completing his training as a Chef in a Michelin Star restaurant in Zürich, Florian has maintained his love for food. During his work experience in a biodynamic vineyard in the south of France, he was introduced to implementations of sustainable production practices. Taken with the desire to explore this field further, he chose to study Interior Design at the FHNW, with a special interest in integrating sustainability into design thinking.



**Anna Hostettler**  
*MSc Environmental Engineering*  
*ETH Zurich, Switzerland.*

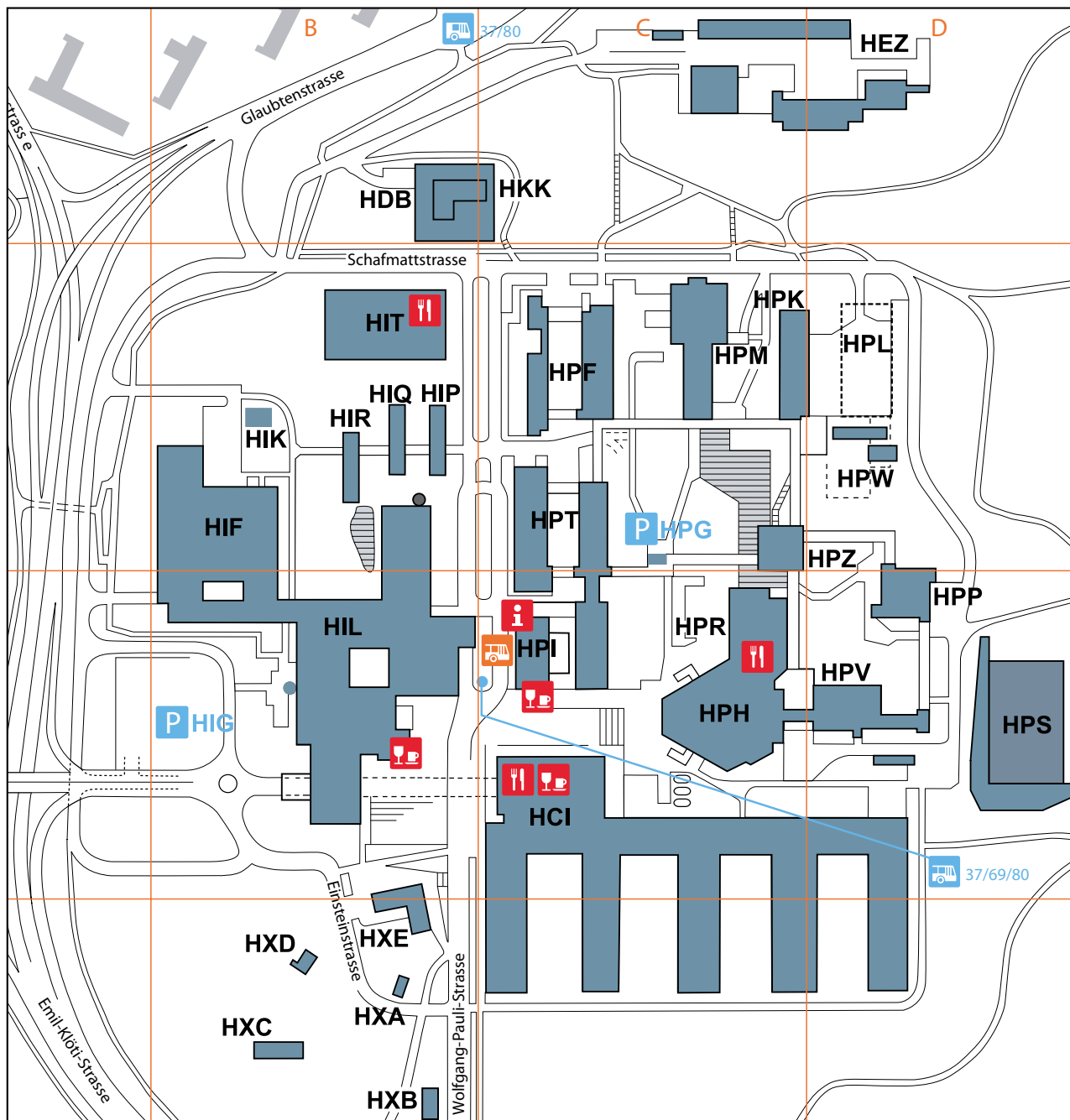
After graduating from ETH Zurich as an Environmental Engineer, Anna followed her passion for cooking and food. For one year she has been working in an organic restaurant in eastern Switzerland as a cook’s assistant. Not only food processing, but also its production draws her interest. She gained practical experience in organic farming during her travels in Greece as well as in Switzerland. As an intern for the ETH sustainability summer course she combines her academic background and the fascination for food and food production.








**Annie Barker**  
*BSc Student in Geography*  
*Oxford University, United Kingdom*

Annie is a student at Oxford University and a summer intern with ETH sustainability. Studying at the School of Geography and the Environment many aspects of her studies revolve around the sustainability of human-environmental interactions including a focus on food and commodity chains for her dissertation. As part of a project funded by Centrica she is looking into the possibilities for improving the supply of renewable energy within the UK and as part of the college committee spends is attempting to improve recycling and reduce energy consumption levels within college.

# ETH Zurich - Campus Höggerberg (Science City)

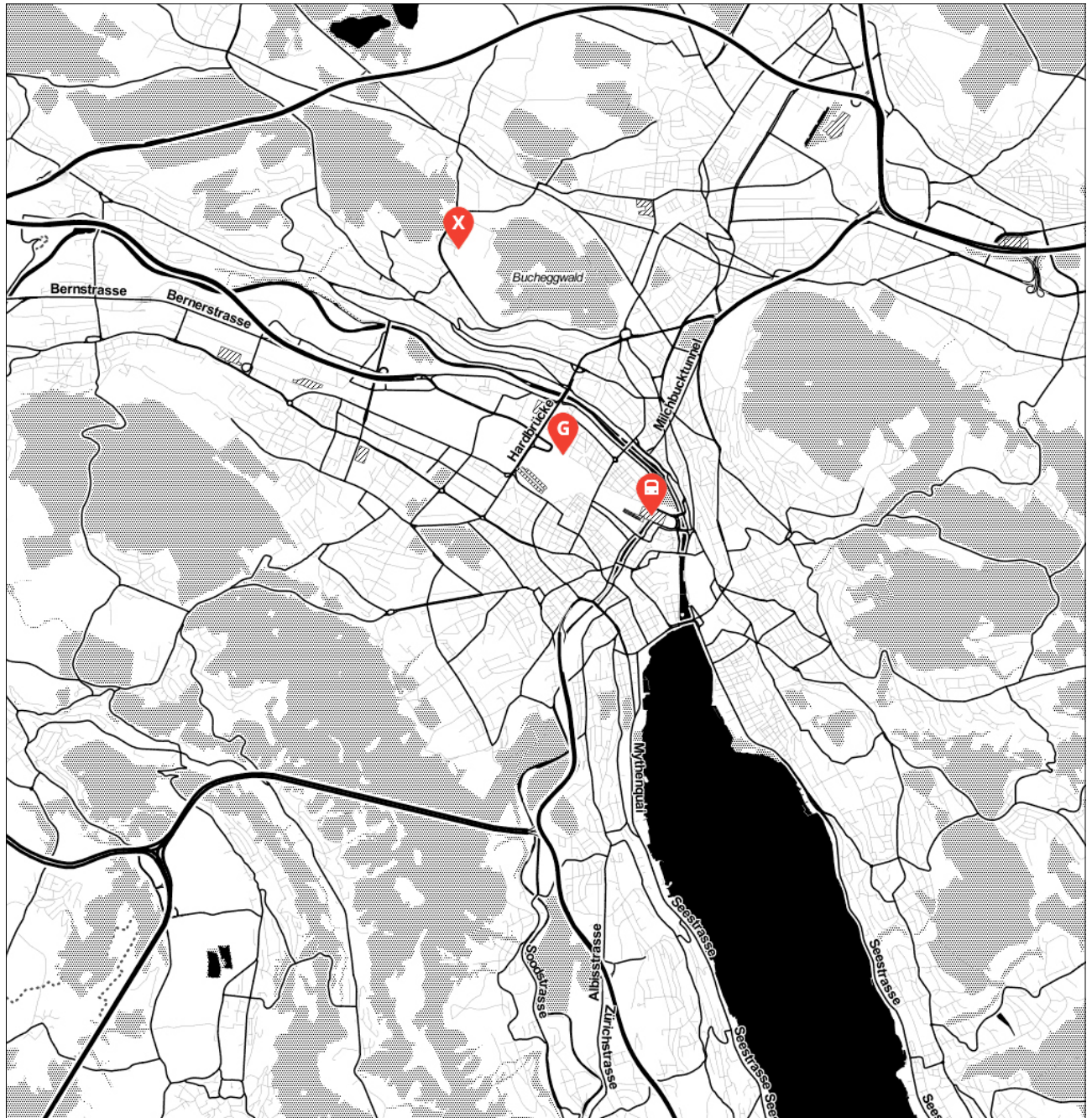


-  Bus stop
-  ETH shuttle "Science City Link"
-  Canteen
-  Cafeteria
-  Science City Welcome Desk (phone +041 44 633 64 44)

All buildings and parking garages are handicapped accessible. For more information contact Science City Welcome Desk.



# Zurich



**HXE** is our base during the Summer School in Zurich. It's the orange building on the ETH Science City Campus. Take Bus 69, 80 and get off at ETH Hönggerberg.



**Gerold Garden** is located behind the FREITAG tower in Kreis 5. The UF students will often be here and the HUB is around the corner. Take the S-Bahn, Tram 4 or Bus 33, 72 and get off at Bhf. Hardbrücke.

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