UNIVERSITÄT HOHENHEIM

TROPENZENTRUM

Centre for Agriculture in the Tropics and Subtropics

We are the cross-sectional and interdisciplinary centre
on development-oriented agricultural and food sciences at the University of Hohenheim

www.troz.de

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After a quarter century of relative neglect, agriculture is back on the international agenda, sadly with a vengeance. The onset of the current food crisis has highlighted the fragility of our success in feeding the world's growing population with the technologies of the first green revolution and subsequent agricultural improvements.
We need to work together to develop a new generation of technologies and farming methods which make possible a second green revolution, one which permits sustainable yield improvements with minimal environmental damage and contributes to sustainable development goals.

Ban Ki-moon Secretary General of the United Nations (2008)

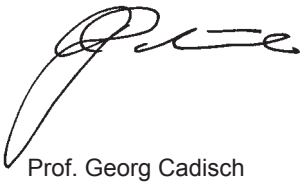
Preface

The Tropenzentrum looks back on almost thirty years of research and teaching in development oriented agricultural sciences. The present brochure highlights the current activities and recent achievements of the Tropenzentrum, including the successful initiative regarding the establishment of the Food Security Center.

In 2009, the University of Hohenheim and its Tropenzentrum participated in a call of the German Academic Exchange Service (DAAD) for “Higher Education Excellence in Development Cooperation”, and submitted a proposal for the establishment of a Food Security Center (FSC). The University of Hohenheim was amongst the five winners of the nationwide competition for excellence in development cooperation with regard to the Millennium Development Goals.

The FSC will cover the thematic areas of food availability, food access and food use, and will support research, post-graduate training, and knowledge transfer with regard to the first millennium development goal on the fight against hunger and malnutrition. The FSC has entered into strategic partnerships with universities and scientific networks in Asia, Africa and Latin America, and thereby seeks to intensify the international cooperation of the University of Hohenheim in the area of food security.

The Food Security Center will be set up as an independent and multidisciplinary center of the University of Hohenheim. In order to reap benefits of synergy, the Tropenzentrum and the Food Security Center will be closely working together.



Prof. Georg Cadisch
Director Centre for Agriculture in the Tropics and Subtropics (TROZ)

Prof. Manfred Zeller
Director Food Security Center (FSC)

Mission and Goals

» Development-oriented interdisciplinary and innovative research and training focusing on people's needs contributes to improve the living conditions in developing countries. However we can only continue to develop sustainable management systems, if rural development keeps a prominent place on the international agenda and policy makers share our concern about the problems of the tropics and subtropics.

Georg Cadisch, Director of the Tropenzentrum

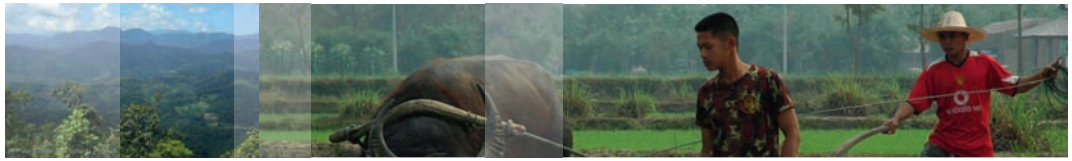
Mission

The Centre for Agriculture in the Tropics and Subtropics – the Tropenzentrum – at the University of Hohenheim generates new approaches towards solving the food and environmental problems of the world. Innovative thinking demands a commitment to multi-disciplinarity not just within agricultural sciences but across disciplines and faculties. Nearly 100 experts covering all disciplines related to agriculture and food science, from natural and technical sciences, to economics and sociology form the basis of the Tropenzentrum's interdisciplinary training and research approach.

Goals

- To develop more resource-efficient, productive and sustainable land use systems, to meet the challenges of climate change and the growing demand for food for a rapidly growing population in the South and work to arrest and help to counteract the alarming decrease in available arable land and biodiversity.
- To strengthen international cooperation. Researchers of the Tropenzentrum cooperate with universities and research institutions worldwide, thus forming an international network to combat the problem of hunger. Various research projects are carried out with a number of centres of the Consultative Group on International Agricultural Research (CGIAR) and collaborative projects are run with many other national and international scientific institutions. Long-term research projects of interdisciplinary nature are a core competence of the centre.
- To make a significant contribution to capacity development at university level. We believe that today we have to contribute our share to tomorrow's expertise.
- To support networking and scientific exchange, and thus promoting rural development issues on the national and international agenda.
- To offer consultancy services to governmental and non-governmental development organisations.

Current Research Examples



The following four projects are examples for interdisciplinary research where various departments of the University of Hohenheim are involved.

Collaborative Research Centre (SFB 564) in Southeast Asia

The SFB 564 **"Research for Sustainable Land Use and Rural Development in Mountainous Regions of Southeast Asia"**, known as **"The Uplands Program"** is a long-term collaborative research programme integrating nine universities and research institutions from Germany, Thailand and Vietnam with research areas in Northern Thailand and Northern Vietnam.

In 2000 the Tropenzentrum initiated the Uplands Program which combines 14 multi-disciplinary sub-projects. Four of these are run in Thailand, five in Vietnam and the remainder shared between both countries. The Uplands Program has entered phase IV (2009–2012) in July 2009. It is the only international special research programme (Collaborative Research Centre) in agriculture funded by the DFG.

Mountainous regions are worldwide vitally important ecosystems with fresh water and energy reservoirs and a rich source of biodiversity. High population growth, resettlement programmes, migration and changing market conditions have increased the pressure on the fragile natural resources in many marginal mountainous areas in Southeast Asia. The consequence has been vicious cycles of natural resource degradation combined with a shortening of fallow periods, soil erosion and loss of soil fertility, leading to declining agricultural productivity and further encroachment on forest areas. As a result poverty, unemployment and food insecurity are now wide-spread especially between the politically, economically and socially disadvantaged ethnic minorities.

Towards a people centred approach
The objective of the Uplands Program, sustainable land use and sustainable rural development including the improvement of livelihoods, can only be achieved if the research activities take into account the priorities of all stakeholders involved in the management of natural resources and rural developing processes. Full participation by all those involved and the coherent deployment of all relevant disciplines are therefore central components in the Uplands Program.

Two parallel approaches are important for sustainable development:

- The productivity of natural resources must be increased while conserving their long-term viability and the pressure on those resources must be reduced by expanding non-farm employment opportunities. Our research activities concentrate on stabilising land use systems in mountainous regions by considering upstream and downstream areas as an interconnected system, and monitoring the external effects of land use change in the highlands on agriculture and the populations of the mountain valleys and lowland areas.

- Sustainable innovations in fruit, crop, animal and aquaculture production and potentials of product conservation, processing and marketing are analysed in order to integrate these production systems into the regional economic cycles. Numerous disciplines are involved in the project such as soil science and land evaluation, plant production and agro-ecology, fruit science, food technology, animal production, agricultural engineering and agricultural economics and social sciences.

Director Prof. Dr. K. Stahr
www.uni-hohenheim.de/sfb564

Phase IV: 2009–2012
The research in phase IV puts emphasis on the transfer of scientific knowledge to stakeholders with the objective of promoting sustainable land use and improvement of rural living conditions. A further focus will be on integrating multi-disciplinary knowledge about upland agriculture through quantitative modeling for building scenarios and testing policies.The project has produced a wide range of innovations applicable to upland agriculture. In this context three "transfer projects" have been started with phase IV focusing on the transfer of innovations. The innovations in these transfer projects are related to water saving irrigation of fruit orchards, fruit drying and integrated fruit processing.

Living Landscapes China (LILAC)

China's rapid industrial growth in recent years has also increased the demand for natural rubber. As a consequence, rubber plant monocultures have displaced much natural vegetation. The Yunnan and Mekong regions in particular are witnessing an unbridled boom in rubber production. The consequences of social changes, economic risk for the farmers and inadvertent losses of biological diversity and natural ecosystems have been given no consideration so far. Effective land use planning is crucial when taking into account the complexity of the economic, social and ecological processes which are inherent to the landscape. For this reason researchers from Germany and China initiated the Living Landscapes China (LILAC) project to bring both the cultivation of cash crops, particularly rubber and environmental protection into harmony with each other. LILAC is focusing on rural development through land use diversification in the south-western Chinese highlands. In Germany partners include the universities of Giessen, Hannover, Hohenheim, HU Berlin, Kassel and Passau.

The collaborative project aims at developing a land use plan, through the use of certain strategic tools. Economists, ecologists and sociologists from Germany and China are working together to develop an integrated model based on a Geographic Information System (GIS), which will be able to predict the economic, social or ecological effects of different land uses within a landscape context. Land use scenarios will be developed and analysed with local decision makers. Emphasis will also be placed on investigating alternative, high-value indigenous products, such as medicinal plants and spices, to promote the rural economy and agro-biodiversity. This project is funded by the Federal Ministry of Education and Research.

Director Prof. Dr. J. Sauerborn

www.lilac.uni-hohenheim.de

German-Sino Jatropha Project
Fuel and Livestock Feed for Future

Jatropha is a multifunctional plant that is capable of producing useful products on degraded and poor soils. The seeds contain about 25–35 % oil that can be used for bio-energy production. Although Jatropha seed meal has a high concentration of nutrients, so far it could not be used as an animal feed because of its toxicity. As biofuel production from Jatropha is economically unviable if Jatropha seed meal is not used as a livestock feed, the development of methods to detoxify the seed meal is of utmost importance. So far, through this project, detoxified kernel meal and detoxified protein concentrate of high biological value containing 60 % and 90 % protein respectively, have been obtained and proven to be an excellent substitute for soybean and fish meal in the diets of fish. Other innovations include the enhancement of the efficiency of screw-pressed based oil extraction from Jatropha seeds by over 30 %, the development of a low cost furnace using Jatropha seed shells as a source of energy and small and large scale Jatropha oil cleaning processes enabling the use of the oil in cooking stoves. The findings of this project have global implications because Jatropha plantations have been initiated on large scale in many countries. This project is funded by the Federal Ministry of Education and Research.

www.jatropha.uni-hohenheim.de

German-Madagascar Jatropha Project
Potential to recultivate abandoned land in Madagascar with the energy plant *Jatropha curcas*

This interdisciplinary research project addresses following basic issues, important for establishing Jatropha plantations in Madagascar:

- Water requirement and water use efficiency
- Physiological mechanisms of flowering
- Influence of propagation and irrigation strategies on seed yield, seed quality and toxicity (phorbol ester content)
- Development of approaches for integration of Jatropha into traditional production systems
- Financial and economic analysis of Jatropha plantation in Madagascar

The project is funded by the EnBW Rainforest Foundation and the Foundation Energy Research Baden-Württemberg.

https://jatropha-madagaskar.uni-hohenheim.de

The Department of Animal Production in the Tropics and Subtropics is coordinating both projects with six other Hohenheim institutions (three in each project) participating.

Director Prof. Dr. K. Becker

Capacity Development

International M. Sc. programme
In 1999, the Tropenzentrum took the lead in establishing the first international Master programme “Agricultural Sciences in the Tropics and Subtropics” (**AgriTropics**) in Hohenheim. It especially addresses rural decision makers and development planners from countries in the tropics and subtropics and imparts knowledge in all aspects of the agricultural sector, including communication, negotiation and project implementation skills. The University of Hohenheim, Faculty of Agricultural Sciences offers six more international Master of Science programmes taught in English.

- Agricultural Economics (**AgEcon**)
- Crop Science
- Environmental Science – Soil, Water and Biodiversity (**EnvEuro**)
- Environmental Protection and Agricultural Food Production (**EnviroFood**)
- Organic Food Chain Management (**OrganicFood**)
- Sustainable Agriculture and Integrated Watershed Management (**SAIWAM**), joint degree programme with the Chiang Mai University, Thailand

Apart from the international M. Sc. programmes, the agricultural faculty offers a structured doctoral programme with currently nine doctoral schools of which two have a strong development focus. Moreover the Department of Agricultural Economics and Social Sciences in the Tropics and Subtropics runs an international PhD programme funded by DAAD.

www.uni-hohenheim.de/studying.html

» I studied EnviroFood at Hohenheim and found that participating in the excursion to Thailand was the experience of a lifetime! It was amazing how well things can work out with the participation and collaboration of people at local level. I learned a great deal about agricultural management in an upland region and also had the chance to visit this beautiful country and get to know something about the people, their traditions and customs. The programme was outstandingly well organised. We visited different regions in the north of Thailand and even had stayed with the local people in one of the villages. The group included professors, students and researchers of the Uplands Project, which allowed for a fruitful exchange of experiences.

Isabel Matute participant of the excursion to Thailand in 2007

Excursion to the Tropics

The Tropenzentum organises regularly excursions to the tropics for advanced students who are interested in agricultural development in the tropics and subtropics. The so-called “Große Tropenexkursion” provides the opportunity to complement theoretical knowledge acquired during the course work with practical experience in the field. Visits to research sites, development projects and industrial enterprises and the exchange with researchers and their target groups give the participants a profound insight into the complexities of rural development issues. Previous trips were led to Thailand, Colombia, Kenya, India, Niger/Benin and Costa Rica. The next excursion is planned for Vietnam in 2010.

» The financial support of the Eiselen foundation allowed me to go to Brazil for my fieldwork. I studied the meat production chain of smallholder sheep farmers in Tauá, a village in the interior of the state Ceará in the northeast of Brazil. Traditionally the meat is partly processed into a dry meat product called “Manta de Tauá”. I analysed the essential conditions for the farmers to obtain a geographic certification for this local product. The Eiselen grant offered me the chance to implement theory learned at the university and to make a small contribution to science and development. The fieldwork was a wonderful personal experience that allowed me to gain working experience in a tropical country and to get to know the country, its people and culture.

Sarah Schneider AgriTropics student and Eiselen grantholder

Eiselen thesis research grants

The Eiselen Foundation Ulm offers the opportunity to conduct research in developing countries in order to complete a thesis for a B. Sc., M. Sc. or Diploma course. The research work, carried out in cooperation with national and international partner institutions, ensures that the students receive a practical training for future involvement in development cooperation. This programme has been running since 1982. To date, more than 430 students have completed their theses within the grant scheme.

» I was awarded my Ph.D in 1994 and returned to Nigeria to resume my work as a lecturer in the Nigerian university system. In October 2004, at the age of 40 I was promoted to full Professor, with a specialization in Resource and Environmental Economics, and Development Studies. Without my experience in Germany and the lessons I took home with me I would not have achieved my present position. The teaching staff at Hohenheim imbued me with a sense of duty, responsibility and the importance of being accountable for each day. Regular contact with German colleagues and the opportunity of ‘home coming’ to Hohenheim every three years assists me in keeping abreast of advances in research.

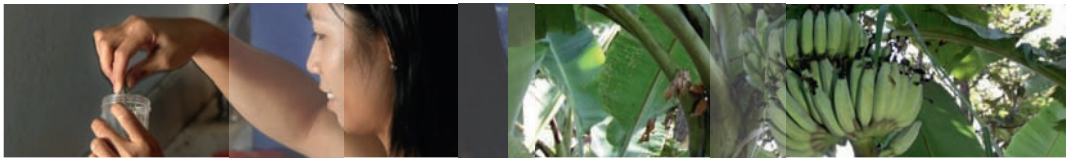
Prof. Chinedum Nwajiuba Full professor in Resource and Environmental Economics and Development Studies, Nigeria University and participant in the International PhD programme

International PhD programme

The Chair “Farming and Rural Systems in the Tropics and Subtropics” is responsible for the financial and logistic management of a PhD programme with the title “Agricultural Economics and Related Sciences”. Since the beginning in 1991 some 80 PhD students from all over the developing world have been graduated in the Agricultural Faculty. This project is financed by DAAD and BMZ and provides scholarships for PhD students. Preference is given to agricultural economists, but related disciplines such as agricultural production may also be considered. The objective is to contribute to human capacity building and to strengthen academic teaching and research in tropical and subtropical countries by providing the opportunity to acquire the “Dr. sc. agr.” degree (PhD).

https://490c.uni-hohenheim.de

Research Groups



The organisational set-up of the Tropenzentrum organises the researchers in four thematical groups: Agricultural Economics and Sociology, Plant Production and Landscape Ecology, Animal Production and Agricultural Engineering and Food Technology.

Agricultural Economics and Sociology

Department of Agricultural Economics and Social Sciences in the Tropics and Subtropics
The department is engaged in analysing problems of economic and socio-cultural development in tropical and subtropical countries with low per capita income. The goal is to identify potential solutions and, hence, to contribute to improved development strategies.

Rural Development Theory and Policy
(Prof. Zeller)
The research analyses agricultural and rural development policies and institutions and their impact on economic and ecological sustainability.

Subjects include:

- Equity issues: food and social security, poverty and gender, rural employment and migration
- Economic issues: land markets and agrarian reform, micro-finance, and agricultural research and technology adoption
- Environmental issues: global environmental change, renewable energy, and institutional change
- The application of innovative quantitative social science research methods, such as econometric impact analysis as well as spatial and sectoral modelling.

Impact evaluation of land allocation and rural finance policies
Despite the efforts of the Government's rural development policies, households in the upland areas of Northern Vietnam remain highly vulnerable and poor. Within the Uplands Program the working group is concentrating on the development of alternative lower-cost approaches for measuring poverty and ways to assess the impact of agricultural policies, particularly on land and credit market reform. It will also focus on the farmers' adoption of agricultural technologies, such as soil conservation measures, as well as their income and food security status.
www.uni-hohenheim.de/sfb564

Contact Manfred.Zeller@uni-hohenheim.de

International Agricultural Trade and Food Security
(Prof. Brockmeier)
Research at this chair addresses global food and agricultural economic issues and its implications for developing countries.

In particular these issues involve:

- Effects of regional and international trade agreements on developing countries
- Implications of agricultural tariff and non-tariff protection for international food and agricultural trade
- Analysis of domestic agricultural policies in developed and developing countries and its effect on international agricultural trade
- Global impact of bioenergy on food security

Assessing the Impacts of the WTO Negotiation on the Global, National and Farm Level
In cooperation with the vTI in Braunschweig this DFG funded project analyses how the WTO agreement affects agricultural trade, production and consumption in developed and developing countries. The project utilises an extended global model (Global Trade Analysis Project (GTAP)) in tandem with a farm model (Farm Modelling Information System (FARMIS)) to explore the effects of global trade agreements on the global, national and farm level. Particular emphasis is given to the impacts of developed countries' domestic agricultural support on the farm structure.

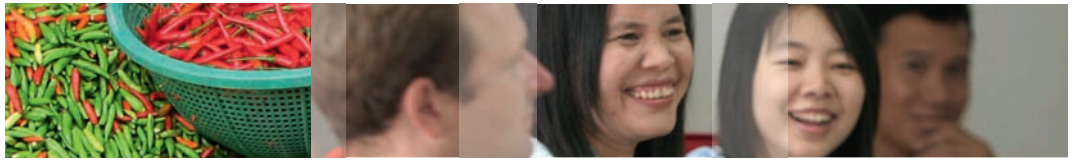
Contact i490b@uni-hohenheim.de

Social and Institutional Change in Agricultural Development
(N. N.)
This new chair will conduct research into social vulnerability and adaptation strategies of rural communities in developing countries facing profound ecological, economic and social changes and increased livelihood risks associated with climate change, resource scarcity and globalisation. A particular emphasis is placed on governance of common-pool resources (e.g. water), social networks, safety nets and migration patterns, and the role of institutions (e.g. property rights) in enhancing resilience of rural livelihoods.

Specific research topics include:

- Transformation processes in environmental and agrarian governance
- Politics of resource conservation and land use planning
- Rural associations and other actors in fair-trade and organic niche markets

Contact clara.fellmann@uni-hohenheim.de



Land Use Economics
(Prof. Berger)
Josef G. Knoll Professorship

The professorship is primarily concerned with human-environment interactions in the areas of land use, water resources and renewable energies.

Research includes:

- Global changes and their effects on resource protection at the regional/ local level
- Resource markets, over- and under-use of natural resources and sustainability strategies
- Rural land and water use planning
- Methodology of spatially-explicit modelling of agro-ecosystems

Integrating Governance and Modelling
The project Integrating Governance and Modelling is one of the 16 Competitive Call Projects funded by the CGIAR Challenge Programme on Water and Food. Water scarcity contributes both to food insecurity and human conflicts. The project objective is to explore policy options that improve the management of water resources at the local and regional levels. It is divided into two case studies, one located in Chile and the other in Ghana. www.igm.uni-hohenheim.de

Contact i490d@uni-hohenheim.de

Further departments and chairs involved in development-oriented research

Department of Farm Management
Computer Applications and Business Management in Agriculture (Prof. Doluschitz)

Department of Economics
Economics, especially Environmental Economics and Public Policy (Prof. Ahlheim)

Department of Agricultural Policies and Agricultural Markets
Agricultural and Food Policy (Prof. Grethe)

Department of Social Sciences in Agriculture
Rural Communication and Extension (Prof. Hoffmann)
Gender and Nutrition (Prof. Bellows)

Food security and right to adequate food in the context of land and agrarian reform in South Africa
In South Africa poverty and inequality are increasing. The project explores the impact of land and agrarian reform on local sustainable food systems and vulnerable groups, such as emerging farmers, farm workers and women, with emphasis on their perspectives and capacity. Research is carried out in cooperation with South African and German universities and civil society organisations, applying a transdisciplinary, intersectoral, multi-level and rights-based approach.
Contact stefanie.lemke@uni-hohenheim.de, Gender and Nutrition

Plant Production and Landscape Ecology

Department of Plant Production and Agroecology in the Tropics and Subtropics

The basic question is how the world population can be fed in the future by developing land use systems that provide sustainable high yields, are resource-efficient and conserve biodiversity while remaining compatible with people's livelihoods and the prevailing ecological conditions.

Plant Production
(Prof. Cadisch)
Increasing competition for natural resources and climate change feedbacks necessitate the development of innovative, sustainable and socio-economically acceptable plant production systems to ensure food security for all.

Major research topics:

- Agronomic and ecophysiological issues of major and neglected crops
- Nutrient cycles (including soil microbiology and symbiotic N_2 fixation), carbon sequestration and environmental impact of plant-animal production systems
- Trade-offs between viable crop production methods and environment
- Competition and complementarity in mixed (agroforestry) systems
- Development of plant models and integrated land use models
- Use of stable isotopes, molecular biology and infrared spectroscopy

Trees in Multi-Use Landscapes in Southeast Asia – TUL-SEA
Replicable, cost-effective approaches are needed in the hands of local professionals with interdisciplinary skills to help stakeholders assess both the positive and negative effects of trees (agro-forestry) in multi-use landscapes. The negotiation support approach developed by the World Agroforestry Centre in Southeast Asia will be further adapted and extended to include greenhouse gas emissions due to land use change in the TUL-SEA project funded by the Federal Ministry for Economic Cooperation and Development (BMZ), currently being implemented in six countries of Southeast Asia and China.

Contact cadisch@uni-hohenheim.de

Our Research Cooperations in the Tropics and Subtropics

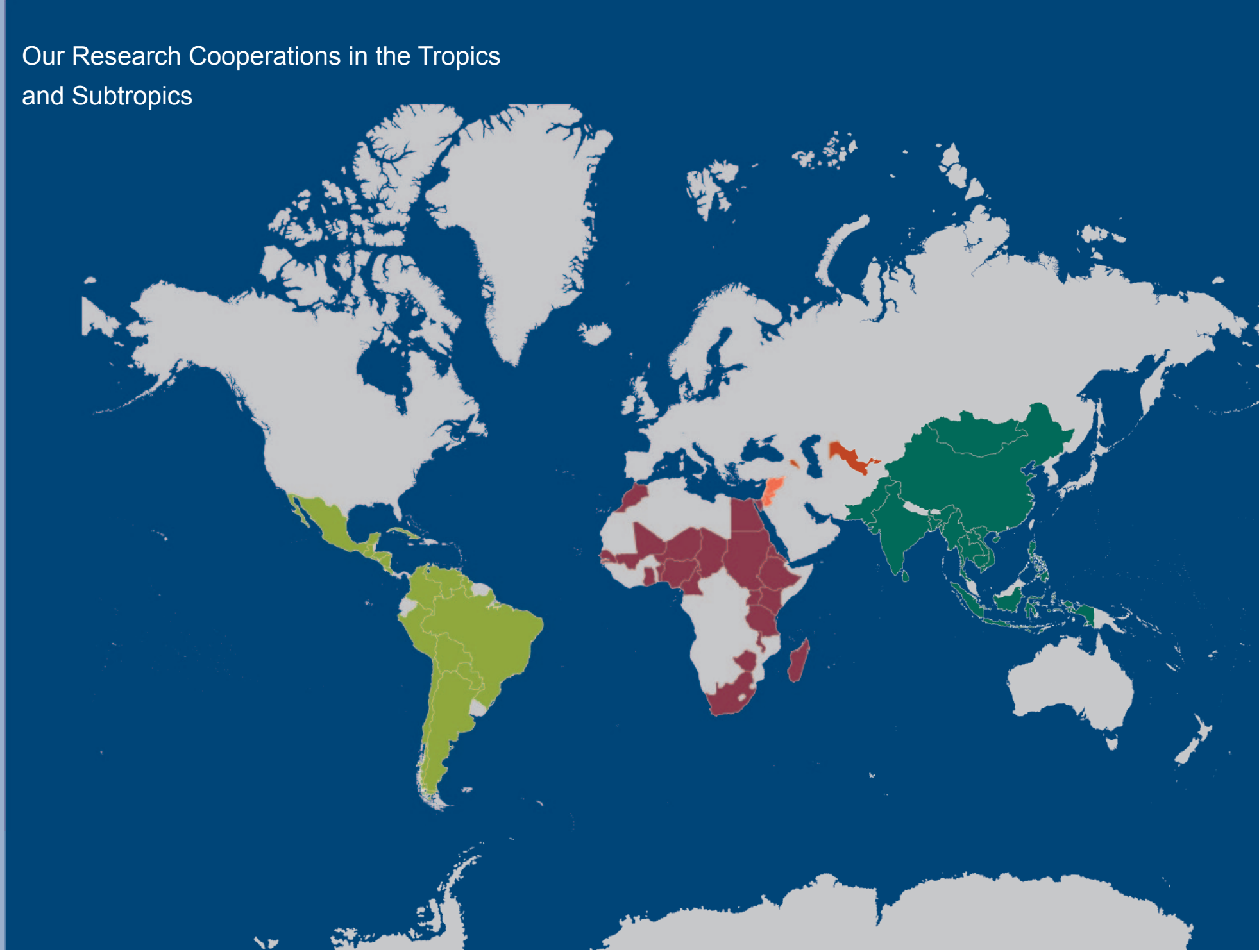
Asia
Bangladesh
Cambodia
China
India
Indonesia
Laos
Mongolia
Myanmar
Pakistan
Philippines
Sri Lanka
Thailand
Vietnam

Central Asia
Armenia
Uzbekistan

Middle East
Israel
Jordan
Lebanon
Palestina
Syria

Africa
Benin
Cameroon
Chad
Egypt
Eritrea
Ethiopia
Ghana
Kenya
Madagascar
Malawi
Mali
Morocco
Niger
Nigeria
Senegal
South Africa
Sudan
Tanzania
Uganda
Zimbabwe

Latin America
Argentina
Bolivia
Brazil
Chile
Colombia
Costa Rica
Cuba
El Salvador
Guatemala
Guyana
Honduras
Mexico
Nicaragua
Paraguay
Peru
Venezuela



Our Research Cooperations in the Tropics and Subtropics

Agroecology
(Prof. Sauerborn)
Research activities aim at designing diversified, self-sustaining, low-input and resource-efficient agricultural systems with a high but sustainable level of productivity.

These include:

- Land-use diversification
- The effects of land-use change on natural biodiversity
- Forest-based production systems in Asia
- Crop-weed interactions
- Interactions and functional diversity of arthropods in communities of cultivated landscapes

Balancing trade-offs in the "Indo-Burma Biodiversity Hotspot"
The extension of rubber plantations in the "Indo-Burma Biodiversity Hotspot", takes place at a remarkable speed. This development triggers shifts in a variety of ecosystem functions and services (ESF/ESS) as well as in regional socio-economy. The complex and interrelated factors thereof require qualitative and quantitative analyses of ESF/ESS and the development of new land use concepts. The major outcome of the project will be a conceptual management framework safeguarding ESF/ESS in tropical land use system. The identified sustainable management concepts will be implemented into practise by an integrated transfer subproject.

Contact sauerbn@uni-hohenheim.de

Crop Water Stress Management
(Prof. Asch)
Agricultural water use is increasingly competing with industrial and urban water consumption particularly in areas with a fast growing population. The key to meeting future food demands and preserving the functionality of regional ecosystems is the efficient use of water.

Thus reseach focuses on:

- Seasonal water balance and plant mechanisms in response to variable soil water supply and atmospheric demand
- Plant water use efficiency as affected by diverse abiotic stresses such as drought, salinity, iron toxicity and temperature

Coping with climate change
RISOCAS is a joint project of the African Rice Center (WARDA, Benin), CIRAD (France), the Institute for Rural Economy (IER, Mali), the National Centre for Applied Research for Rural Development (FOFIFA, Madagascar) and Hohenheim. Irrigated rice, rainfed sorghum, and rainfed upland rice are three of the most important staple small-grain cereals in Sub-Saharan Africa. The project aims at developing coping strategies for increasing climate variability and weather extremes, with a broad range of varietal types of rice and sorghum. The objective is to enable policy makers in agricultural research to develop strategies to adapt African agriculture to climate change.
www.risocas.de

GrassNet
GrassNet is a cross-continental network for sustainable adaptation of grassland systems vulnerable to climate change. It addresses general knowledge gaps in a transdisciplinary research and educational approach. Natural grasslands are the world's largest multifunctional terrestrial ecosystems covering about 30% of the global land surface. To date, however, little is known about the parallelism or divergence of grasslands' vulnerability, the relative importance of individual factors, the strategies used by pastoralists to buffer variability, and the comparative advantage of different scientific approaches in a cross-continental comparison.
http://www.grassnet.info/

Contact fa@uni-hohenheim.de

Further departments and chairs involved in development-oriented research

Department of Soil Science and Land Evaluation
Soil Science and Petrology (Prof. Stahr)
Biogeophysics (Prof. Streck)

Department of Landscape and Plant Ecology
Landscape Ecology and Vegetation Science (Prof. Böcker)
Plant Ecology and Ecotoxicology (Prof. Fangmeier)

Department of Plant Breeding, Seed Science and Population Genetics
Plant Breeding (Prof. Melchinger)
Plant Breeding and Biotechnology (Prof. Weber)

Department of Biological Chemistry and Nutrition
Biological Chemistry and Nutrition (Prof. Biesalski)
Biological Chemistry and Nutrition Biofunctionality and Food Safety (Prof. Grune)

Department of Plant Nutrition
Fertilization with Soil Chemistry
(Prof. Torsten Müller)

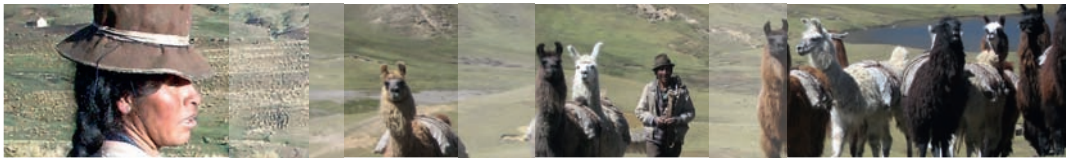
Department of Plant Physiology and Biotechnology
Plant Physiology and Biotechnology
(Prof. Schaller)

Department of Special Crop Cultivation and Physiology
Crop Physiology of Speciality Crops
(Prof. Wünsche)

Department of Botany
General Botany (Prof. Küppers)

New potentials for millet farmers in Africa and Asia
This project will enhance food security and reduce malnutrition in Africa and Asia through more efficient conservation and use of two currently underutilized species with high nutrient value and excellent adaptability: finger millet and foxtail millet. The access of partner NARS in India, Kenya, Tanzania and Uganda to diverse germplasm will be enhanced and core collections will be characterized for agronomic characters, nutrient contents and resistance to biotic and abiotic stresses to push plant breeding activities. The project is funded by BMZ/GTZ.
Contact Department of Plant Breeding, Seed Science and Population Genetics

CODE-WA – integrating research and development
CODE-WA is an interdisciplinary project, working with a strict participatory approach. It aims at increasing farmers' options to cope with the effects of climate change such as shortened rainy seasons and higher unpredictability and variability of rainfall. It includes climatology, plant breeding, phytodiversity, soil science and communication issues to improve crop diversity in the region. The project is funded by the German Ministry for Economic Cooperation and Development (BMZ), hosted at ICRISAT Sahelian Centre in Niger and intervenes in Niger, Burkina Faso, Mali and Ghana.
https://codewa-icrisat.uni-hohenheim.de
Contact herrmann@uni-hohenheim.de, Soil Science and Petrography



Animal Production

Department of Animal Production Systems in the Tropics and Subtropics
The department works on topical issues in animal production in order to enhance resource efficiency, in particular of animal and plant genetic resources, to make livestock production systems sustainable and to improve the socio-economic conditions of farmers.

Animal husbandry and animal breeding
(Prof. Valle Zárate)
Animal husbandry systems are analysed and sustainable breeding programmes developed for marginal sites aiming at optimising product output and contribution of livestock to farmers' livelihood and stabilisation of systems.

Research includes:

- Productive adaptation potential and special traits of local breeds
- Use-efficiency of available resources under (semi-)nomadic and smallholder conditions
- Development and promotion of community breeding programmes
- Optimisation of breeding methods, planning and organisation
- Improving livestock's adaptability to warm climates
- Conservation of local genetic resources by utilisation

Improving llama breeds in the Andes
This long term project aims at the development of a breeding programme and a breeding organisation connected to a marketing cooperative of llama breeders in the high Andes through the development of adapted husbandry techniques and the genetic selection of llama populations with special fibre qualities. It is conducted in cooperation with the Universidad Mayor de San Simón, the NGO ASAR and the producer organisation ORPACA in the Department Cochabamba of Bolivia. Several doctoral and master theses have been conducted within the framework of the project.

Contact valle@uni-hohenheim.de

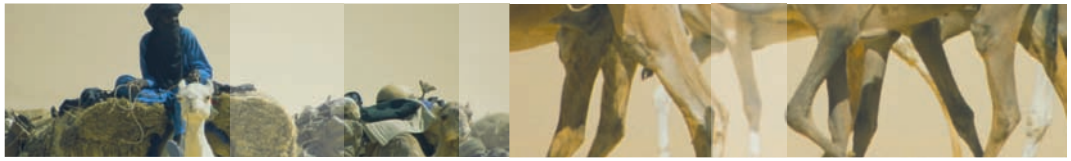
Aquaculture systems and animal nutrition
(Prof. Becker)
The function of the chair is to enhance aquaculture and domestic animal productivity and to increase farmers' income, while conserving the environment and natural resources. This is achieved through the rational and effective utilisation of natural resources and agricultural by-products.

Major research topics:

- Identification of multifunctional plants especially for degraded and poor soils
- Development of strategies for overcoming negative effects of anti-nutritional and toxic factors in tropical feeds
- Study of rumen fermentation and rumen ecology as affected by bioactive plant compounds
- Evaluation of strategies for reducing methane emission from ruminants
- Quantification of nutrient flows in aquaculture systems
- Investigation on plant-derived and unconventional protein sources for aquafeeds including feed resources for organic aquaculture
- Rural aquaculture systems

Increasing productivity and efficiency of Nile tilapia production
This project evaluates the effects of the saponins of different plant origins on the growth, reproduction and sex ratio of Nile tilapia in areas under the jurisdiction of the Palestinian Authority. Chemical substances such as methyl-testosterone, which have been used to achieve sex inversion in Nile tilapia, are highly hazardous. The identification of degradable and environment-friendly substances could replace such chemicals in tilapia production. In addition, the project aims at developing feeds for larval fish and for grow-out based on resources available within Palestine.

Contact kbecker@uni-hohenheim.de



Further departments and chairs involved in development-oriented research

Department of Animal Husbandry and Animal Breeding
Animal Husbandry and
Regulation Physiology (Prof. Stefanski)
Farm Animal Ethology and
Poultry Production (Prof. Bessei)

Department of Animal Nutrition
Animal Nutrition (Prof. Rodehutscord)

Department of Zoology
Parasitology (Prof. Mackenstedt)

Apicultural State Institute
(Dr. Rosenkranz)

Department of Environmental and Animal Hygiene and Veterinary Medicine
Anatomy and Physiology of Domestic Animals (Prof. Amselgruber)
Environmental and Animal Health
(Prof. Böhm)

This cooperative DFG project was initiated by the Parasitology Unit at the University of Hohenheim and involves the universities of Ulm, Witwatersrand (South Africa) and Gezira (Sudan), the Makerere University (Uganda), Jomo Kenyatta University (Kenya), the African Medical & Research Foundation (Kenya), the Kenya Medical Research Institute, and various other medical and veterinary organisations in Sudan, Kenya, Uganda and South Africa. The study focuses on the genetic diversity of cystic echinococcosis (CE) in humans, livestock and wildlife. Recently developed methods are used to investigate clinical features, public health and economic impact, transmission cycles, host ranges and the geographical occurrence of the genotypes.
Contact Dr. Thomas Romig, Parasitology

Honeybees
The worldwide decline of pollinators in general, and honey bees in particular, results in problems for the ecosystem and losses in agricultural yields. In contrast to countries with temperate climate the tropics still provide huge feral populations of honey bees, evolved under natural selective conditions. In cooperative research projects with partners in the state of São Paulo, Brazil, we are focusing on two topics: The effect of intensive agriculture on the honey bee population and the reasons for the higher resistance of tropical honey bees to common honey bee diseases.
Contact peter.rosenkranz@uni-hohenheim.de

Agricultural Engineering and Food Technology

Department of Agricultural Engineering in the Tropics and Subtropics
(Prof. J. Müller)
Driven by increasing scarcity of natural resources, this group is working on technologies to improve the efficiency of water and energy use. Research on water-saving irrigation strategies, renewable energy supply systems and post-harvest processes are major research activities. Continuous feedback from field experience guarantees that this fundamental research is addressing relevant and exigent problems.

Specific methodical competences are:

- Systematic Design (VDI 2221) and Computer Aided Engineering (CAE-Software CATIA)
- Computational Fluid Dynamics (CFD-Software FLUENT)
- Model-based control of post-harvest processes
- Non-invasive sensor systems for *in situ* measurements of physiological conditions (drought stress, maturity)

Multi-layer fruit drying models
Fruit tree cultivation is a viable option for erosion control in the mountainous regions of Southeast Asia. However, seasonal overproduction and insufficient access to markets can cause economic losses. The possibility of processing fruits locally could contribute considerably to the increase and stabilization of farm income.
The objective of the project is to optimize the drying process in small-scale fruit processing industries by improvements in dryer capacity, energy consumption and end product quality.

Contact joachim.mueller@uni-hohenheim.de

Further departments and chairs involved in development-oriented research

Department of Food Technology
Plant Foodstuff Technology (Prof. Carle)
Food Analysis (Prof. Isengard)

Shelf life extension
Litchi production is one of the most popular agricultural enterprises in the mountainous regions of Northern Thailand. However, the rapid perishing of the fruit is a great problem. Traditionally the characteristic reddish fruit shells of litchis are preserved by sulphurisation or by fungicide application. The food stuff technologists are developing alternative methods of preservation to increase export opportunities.
Contact Prof. Carle, Plant Foodstuff Technology

Communication and Networking

The Tropenzentrum – well known for its excellent research and training – is also actively involved in global networking and communication activities intended to place rural development issues at the forefront of the international agenda.

Major activities

- The Centre organises conferences in collaboration with national and international partners to broaden the scientific dialogue.
- Politicians and the private sector are regularly invited and informed about current research in developing countries.
- The seminar series “Tropenzentrum invites: Hohenheim discussions on global challenges”, where in-house and external experts give talks about development topics, serve as platform for scientific exchange.
- The Tropenzentrum takes the lead in establishing an Alumni Network for former students of all Master Programmes.
- The Tropenzentrum promotes collaborations between Hohenheim and other Universities, such as the Kyushu University in Japan. Both are members of the International Platform for Asian Agricultural Education.
- Release of public relations material, e.g. annual reports, information brochures and the trailer “25 years Tropenzentrum”.
- The Tropenzentrum organises the Tropentag when it takes place in Hohenheim. The Centre also assists Hohenheim students with transport and accommodation to participate in all Tropentag conferences.

Tropentag

In recent years the Tropentag has become the most important International Conference on development-oriented research in the fields of Food Security, Natural Resource Management and Rural Development in central Europe. This annual event is jointly organised by the Universities of Bonn, Göttingen, Kassel (Witzenhausen) and Hohenheim and the Council for Tropical and Subtropical Research (ATSAF e. V.) in co-operation with the Council for Tropical and Subtropical Agricultural Research and Development (BEAF). Recently the University of Hamburg and the ETH Zürich joined the consortium as new members.
www.tropentag.de

Food Security Center (FSC)


Excellence Center for Exchange and Development

The Food Security Center (FSC) was founded in 2009, after the University of Hohenheim and its Tropenzentrum had been among the five award winners in a nationwide competition, involving 44 outstanding university projects. The German Academic Exchange Service (DAAD) and the Federal Ministry for Economic Cooperation and Development (BMZ) had called for this competition to strengthen the scientific contributions of German universities towards the Millennium Development Goals. The newly established Food Security Center will receive up to five million Euro of support over the next five years under DAAD's programme EXCEED (Excellence Centers for Exchange and Development).

FSC objectives

The FSC aims at providing effective and innovative, scientific contributions to reduce hunger and achieve food security, and thus to progress towards achieving the Millennium Development Goal 1. Thematically, the FSC is concerned with (sustainable) food availability, (socio-economic) food access, and food use. The FSC seeks to be the leading think tank in Germany for food security related issues.

FSC activities

Interdisciplinary teaching and training of PhDs and PostDocs through the Young Excellence School (YES) in Hohenheim.

Demand-driven and impact-oriented research at postgraduate level by implementing research projects in developing and transition countries, jointly with partner universities and research networks in Africa, Asia and Latin America and in collaboration with agencies for development cooperation and local and national stakeholders.

Capacity building through South-North and South-South academic exchange, implemented by various instruments such as a visiting professorship of the FSC in Hohenheim, PhD scholarships, conferences, seminars and workshops, and other forms of exchange.

Capacity strengthening of universities in developing countries, especially with respect to improved integration of partner universities in international networks related to academic training and research in food security and the support of selected postgraduate programmes at partner universities.


Knowledge transfer, brokerage and advisory services regarding evaluation of policies, projects, and food and agricultural technologies on request of German bilateral development cooperation and of government and non-government organisations in developing and transition countries involved in the fight against hunger and malnutrition.

FSC structure

The FSC is organised as an interdisciplinary centre of the University of Hohenheim that seeks to bundle the competence of professorships with experience in food security issues from all the three faculties of the university. The personnel of the FSC consists of an executive manager who is assisted by two project officers, one responsible for administering FSC's budget and one for coordination and knowledge transfer with FSC's partners in the North and South. The Tropenzentrum and the FSC share the same advisory and management board. For this purpose, the size of the two boards will be extended during 2009. In October 2009, the FSC will move to its new offices at Wollgrasweg 43 in Stuttgart-Plieningen.

Contact fsc@uni-hohenheim.de
www.fsc.uni-hohenheim.de

FSC network

The FSC builds on existing long-term partnerships of the University and its Tropenzentrum. In each of the three developing continents, both a university and a network partner have agreed to join the FSC network. The FSC is further supported by GTZ, KfW, Deutsche Welthungerhilfe, Bread for the World, FIAN, the Eiselen Foundation, and by many centers of the Consultative Group on International Agricultural Research (CGIAR).

International Partners of the FSC

Regional Universities Forum for Capacity Building in Agriculture (RUFORUM)
The Regional Universities Forum for Capacity Building in Agriculture is a consortium of 25 universities in East, Central and Southern Africa to strengthen human resource capacity.

Sokoine University of Agriculture (SUA)
Founded in 1984, Sokoine University of Agriculture is one of the leading higher education institutions in the areas of food and agriculture in Tanzania.

Kasetsart University (KU)
Kasetsart University (KU), founded in 1943, was the first agricultural university in Thailand. It offers many M.Sc. and Ph.D. programmes in the food and agricultural sciences.

Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA)
The Southeast Asian Regional Center for Graduate Study and Research in Agriculture founded in 1965 is one of the 15 regional centers of excellence of the Southeast Asian Ministers of Education Organisation (SEAMEO).

Universidad de Costa Rica (UCR)
The University of Costa Rica was founded in 1940, and is one of the leading academic institutions in Latin America in the fields of food, agriculture and the environment. UCR coordinates the Research Network on Food and Nutritional Security and Safety, which encompasses members from many Latin American countries.

Centro Agronómico Tropical de Investigación y Enseñanza (CATIE)
During its 35 years of existence, the Tropical Agricultural Research and Higher Education Center (CATIE) has served as a knowledge center for sustainable agriculture and natural resource management in Latin America and the Caribbean.

The FSC seeks to gradually expand its network, and welcomes additional partners and collaboration in scientific exchange and development cooperation on food security.

About us

Members assembly
The participation of scientists in the Tropenzentrum is by membership. All scientists engaged in research and/or teaching in the tropics or subtropics can become members upon application. About 100 members work on a wide thematic spectrum across more than 42 different institutions of the three University´s faculties (Agricultural Sciences, Natural Sciences and Business, Economics and Social Sciences), forming a unique competence centre in research and development for tropical and subtropical regions, at the University of Hohenheim.

The members' assembly is the governing body of the centre, taking major decisions on strategy development, setting priorities and electing the centre's board.

Board
The board is the decision making body between the member' assembly which is held once a year. It determines the centre's immediate activities and the allocation of research funds and students grants. The centre's director is elected by the board members for a two-year term.

Prof. Georg Cadisch (director)
Prof. Joachim Müller (vice-director)

Advisory board
The Advisory Board is comprised of representatives from industry, science and public organisations. It is a selection of distinguished experts who have agreed to give the Centre meaningful support and advice in many different areas, including organisational development, policy and outreach. Through their own networks, they also promote the work of the Tropenzentrum to the wider public.

Claus-Peter Hutter (chair) Umweltakademie Baden-Württemberg

Institutional Partnership with FSC
To continue the close cooperation with the newly founded Food Security Center, TROZ and FSC will share the same management and advisory board.

Management
The day-to-day business and accounting is run by the management team, headed by Dr. Ludwig Kammesheidt, the executive manager, assisted by Bärbel Sagi, part-time staff member for public relations and Margit Völmle, the centre's secretary.

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University of Hohenheim

Centre for Agriculture in the Tropics
and Subtropics
Tropenzentrum (790)

Garbenstraße 13
70593 Stuttgart
Germany

Phone +49 711 459 23543
Fax +49 711 459 23315

tropenzentrum@uni-hohenheim.de
www.troz.de