Applied Engineering for Smart Integration of Renewable Energy in Value Chains in Developing Countries




International DAAD-Alumni Seminar

held in
Witzenhausen, Germany
from
March 24th 2019 (arrival date)
to
March 31st 2019 (departure date to Hanover)

UNIKASSEL VERSITÄT

organized by the Department of Agricultural Engineering in the Tropics and Subtropics at the Faculty of Organic Agricultural Sciences of the University of Kassel

DITSL where science meets people

in close cooperation with the German Institute for Tropical and Subtropical Agriculture (DITSL)

DAAD Deutscher Akademischer Austauschdienst German Academic Exchange Service

funded by the German Academic Exchange Service (DAAD)




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Background & Objectives

Rural development and particularly the creation of sustainable and productive value chains that offer income opportunities for people in developing countries require the availability and easy accessibility of the necessary resources, particularly energy and water. In the light of dwindling global fossil fuel reserves and global climate change, energy supply needs to seek new and smart ways that are economically viable and ecologically sustainable. Furthermore, remote rural areas in developing countries are often not connected to the national power grid and development efforts must therefore rely on decentralized energy supply systems. The technology for renewable energies has advanced rapidly over the past decades and today offers a whole range of different appliances to efficiently, and sustainably harness for different purposes. The challenge for professionals involved in research and development is to design and create locally adapted technological solutions for the specific energy requirements of the respective value chain. In this context the University of Kassel and the German Institute for Tropical and Subtropical Agriculture (DITSL) have developed a training program, which will be held in the framework of the

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in Witzenhausen, Germany

followed by a visit to the world's leading trade fair for industrial technology

"Hannover Messe 2019"

March 24th – 31st 2019 in Hanover, Germany

The seminar will offer a strategic platform for both, the participants and resource persons for exchanging knowledge and experience on renewable energies technologies and adapted value chains in developing and emerging countries. Professional discussion on adaptation of renewable energies in the participants' home countries as well as presentations of external resource persons on application technologies, renewable energy sources, sustainable value chains in rural areas and decentralised energy supply systems will ensure a high benefit for the participants.

This intensive exchange will be complemented by a visit of the industrial trade fair "Hannover Messe 2019".

The program is organized and hosted by the Department of Agricultural Engineering in the Tropics and Subtropics at the Faculty of Organic Agricultural Sciences of the University of Kassel (Prof. Dr. Oliver Hensel – project leader), and DITSL Witzenhausen with financial support of the German Academic Exchange Service (DAAD).

The seminar targets German university alumni from developing countries (DAC country nationals) who are professionally involved in regenerative energy and/or solar technology in the framework of rural or urban, public or private sector development, and/or who are working for public bodies or private enterprises, academic, educational or development organizations. Participants should be multipliers in a position to spread the acquired knowledge and experience and/or take decisions on implementation.
Besides promoting exchange between the participants in the field of organic production and processing, the seminar will facilitate international scientific cooperation and qualify the participants in the field of quality management along agri-value chains. The seminar will foster exchange of experiences, establishment of international networks between the participants, scientific discourse with regard to the implementation of regenerative energies in value chains, and international academic cooperation in this field. It will stimulate and promote ideas for joint research, strategy development and knowledge transfer.

The DAAD-Alumni Seminar and its Organizers

DITSL – German Institute for Tropical and Subtropical Agriculture
DITSL is a non-profit limited liability company (GmbH) at the Faculty of Organic Agricultural Sciences of the University of Kassel at its campus in Witzenhausen. DITSL supports capacity building and human capacity development, technology development, collaborative learning and rural innovation worldwide. It initiates, conducts and fosters research, and raises public awareness on sustainable regional management and resource and land use with a focus on agro-ecosystems, knowledge systems, food safety and security, food- and product-chain development

and related issues. The institute follows an inter- and transdisciplinary social-ecological research approach and puts an emphasis on sub/tropical low external input systems and organic agriculture in the tropics as two major fields of activities and expertise.

University of Kassel – Faculty of Organic Agricultural Sciences

Since 1971, Witzenhausen has hosted the agricultural faculty of the University of Kassel. For 20 years Organic Agriculture has been part of the curriculum. Since 1995 the faculty focuses on organic agricultural sciences and has changed its name to "Faculty of Organic Agricultural Sciences". The faculty is known for its applied, interdisciplinary and open-minded education of students from different countries and cultures. The relatively small number of 1.000 students, the close proximity of all facilities, the individual contact to staff and lecturers and the intimate atmosphere of a small town create a conducive environment for research and academic training. The faculty's main aim is to impart extensive expert knowledge, which is an essential pre-requisite of sustainable agriculture with regard to different agro-ecological and economic conditions. The general objective of the faculty's research approach is the development of site-specific solutions with minimal use of non-renewable resources for the sustainable protection of the food basis of a rapidly expanding world population. The main principles behind this are the maintenance of nutrient cycles, the reflected use of means in organic agriculture and food production, the balanced relation between productive and 'non-productive' areas such as landscape protection, and the link between agricultural practice, regional market and rural development. Training and research are directed towards these topics through elaboration of cause-effect-relationships in system approaches.

Important aspects of social justice must be considered and protected to ensure the sustainable provision of food. This is at the heart of the faculty's longstanding international commitment. Therefore, all graduates will, through their course of study, be able to make socially responsible contributions with regard to sustainable agriculture, land use, food production and trade. In order to gain a broad understanding of the field of organic agriculture, an interdisciplinary approach in teaching is very important. Students learn to work in a case-specific and methodical manner. In addition, they acquire key qualifications, such as team work ability,

interdisciplinary thinking, and responsibility, enabling them to develop modern and practical solutions to problems.

The Faculty comprises 20 departments, one of which is the Department of Agricultural Engineering. The department runs the Experimental and Demonstration Site for Irrigation and Solar Technology "Am Sande", where most of the DAAD-Alumni Seminar takes place.

The site is located very close to the university's Campus Steinstraße and is used for intensive research and training activities in co-operation with DITSL. The site is available for students conducting trials and projects as part of their thesis research. Since July 2009 the whole area is fully converted to organic agriculture as part of the farm "Hessian State Domain Frankenhausen". The site consists of arable land (2.0 ha) and horticultural land (0.7 ha). The horticultural land is terraced and has a subterranean piping system, which makes it suitable for various types of irrigation systems such as basin-, furrow-, flood- and drip irrigation. Irrigation water is supplied by gravity flow from an elevated tank that is filled from an on site well, using a small wind energy plant or an 18.5 kW electric pump. There is also a reed bed waste water purification system set up on the area. The horticultural land is mainly used for growing medicinal herbs and spices for further research on harvest- and post-harvest engineering. The main building on the site is equipped with a 14 kWp photovoltaic plant, which feeds electricity into the grid. Furthermore, a comprehensive set of scientific equipment for acquisition of meteorological data is available. Among the facilities are solar a tunnel for drying fruits and vegetables and an experimental solar research greenhouse with a dryer for medicinal herbs, with various biomass kilns. Two wind power plants are installed to show pumping of water and generation of electricity. An 8 m² Scheffler reflector for high temperature use is available for solar distillation, for food preservation and processing investigations and for steam production.