

# Applied Solar Technology in Developing Countries

held May 30<sup>st</sup> – June 7<sup>th</sup> 2011 in Witzenhausen / Germany

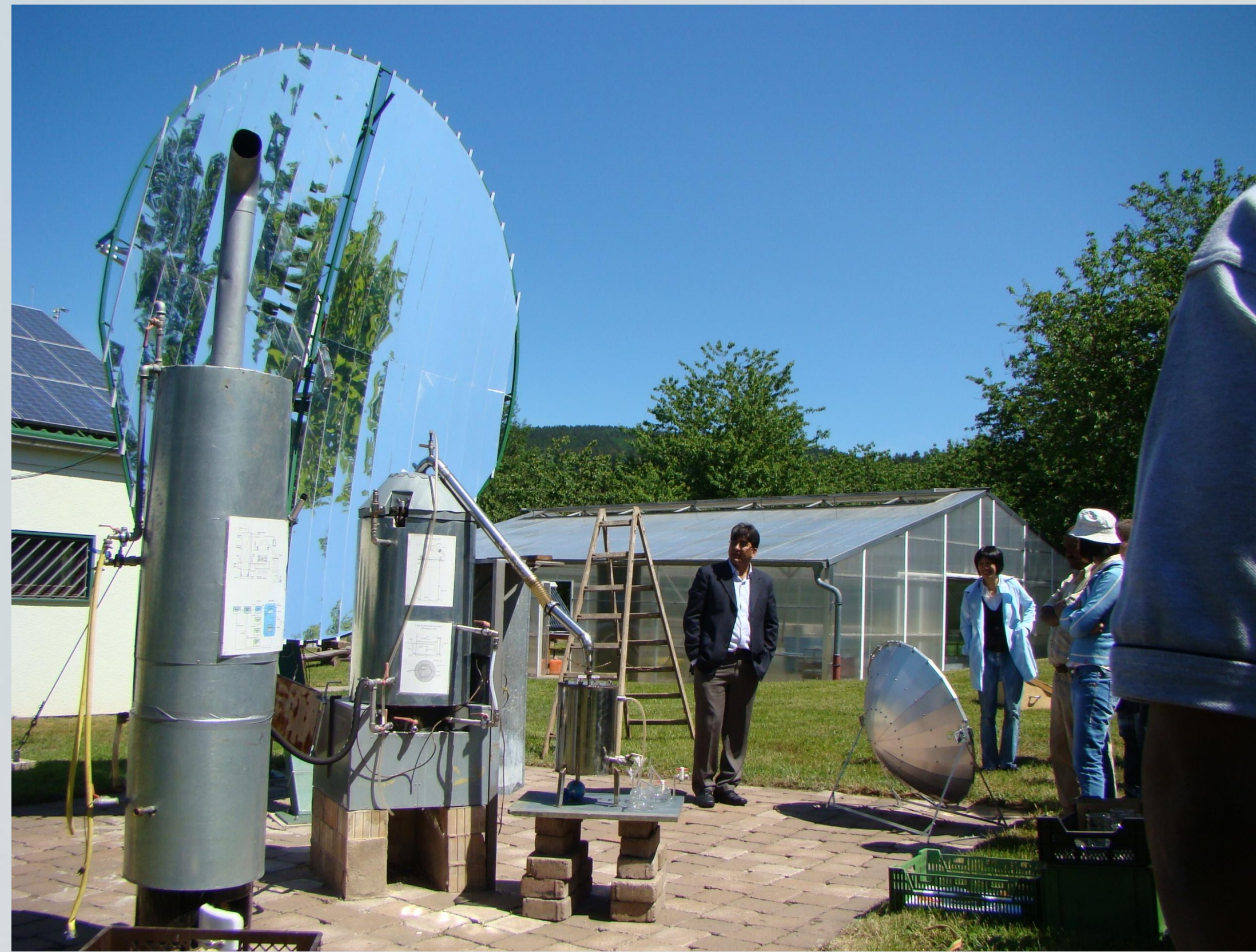
at the University of Kassel solar experimentation & demonstration plant "Am Sande"

Creating sustainable and productive value chains that offer income opportunities for people in rural areas of developing countries requires availability of and easy access to energy and water. In the light of dwindling global fossil fuel reserves and climate change, energy and water supply must seek new economically viable and ecologically sustainable ways.

As remote rural areas in developing countries are often not connected to the national power grid, development efforts must rely on decentralized supply systems. Solar technology has advanced rapidly over the past decades and today offers a whole range of different appliances to efficiently and sustainably harness solar radiation for various purposes.

The challenge for research and development professionals is to design and create locally adapted technological solutions for the specific energy requirements of different value chains.

A total of 23 alumni from 14 countries in Asia, Africa and Latin America spent an intensive week of theoretical debate, practical demonstration, experimentation and scientific exchange to gain deeper insight into working concepts for bridging the gap between solar technology theory and technical appliances at the solar plant "Am Sande" in Witzenhausen.



**Am Sande** operates a wide range of solar appliances for state-of-the-art experimentation, knowledge transfer and hands-on experience. Am Sande is run by Prof. Dr. Oliver Hensel, Department of Agricultural Engineering, Faculty of Organic Agricultural Sciences, University of Kassel.

**The programme:** After participants introductory presentations on the current state and perspectives of solar technology and its application in their home countries, the interactive work programme addressed the following thematic fields:

- Solar thermal units
- High temperature applications in solar post-harvest technology and food processing
- Different solar food processing appliances
- Solar drying of agricultural produce, particularly perishable tropical fruits and vegetables
- Practical use of solar dryers, measurement and data collection, dryer design
- Quality aspects in solar drying
- Storage of solar energy
- Solar pumping of water and solar water disinfection
- Photovoltaic technology in rural electrification

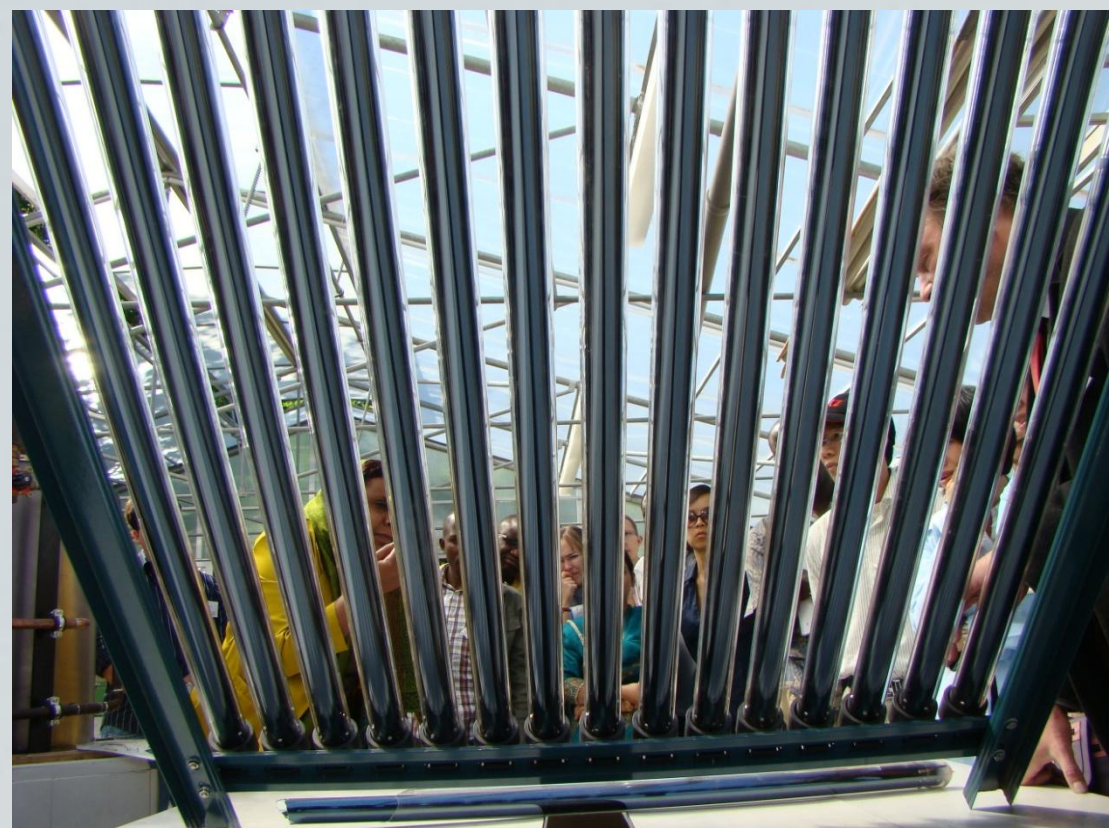
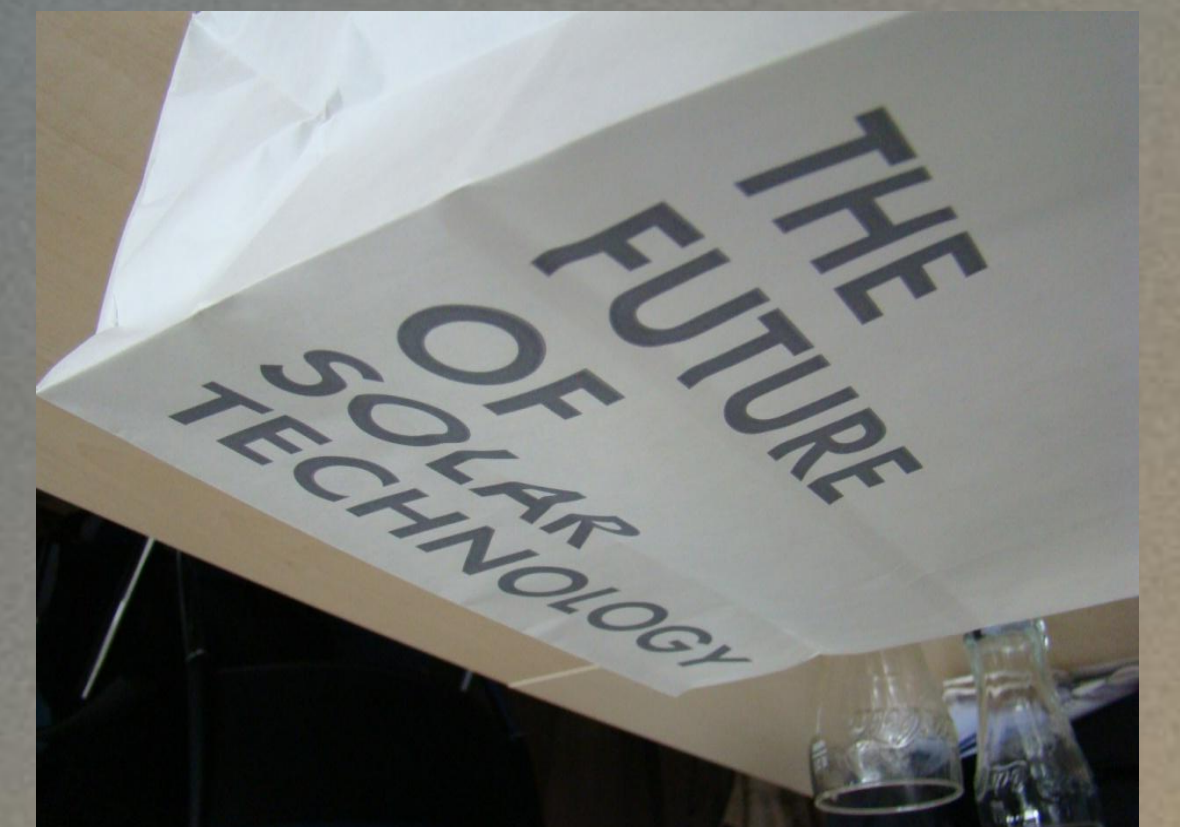
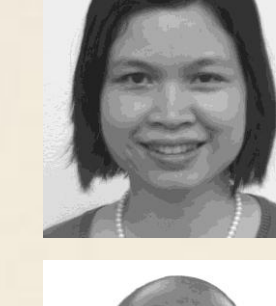
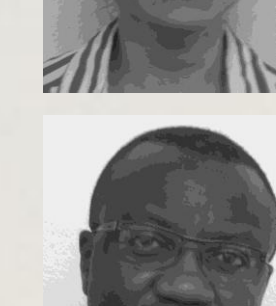
**Two excursions:** to "The Bio Energy Village" at Jühnde and to the SMA Solar Technology AG at Kassel brought the alumni into contact with industry based large scale renewable energy research and development experts

**Theory and practice amalgamated:** In a combined lecture and practical workshop, Wolfgang Scheffler demonstrated the professional use of an 8m<sup>2</sup> Scheffler concentrator in agro-based industries. Food processing by solar drying at small and large scale was addressed in detail by Rolf Behringer (ISES-solar food processing network) and Dr.-Ing. Albert Esper from the leading solar food dryer company Innotech Ltd.

Water is a key resource for rural development and solar energy as a decentralized technology can offer an important contribution to its provision. A special session was held on the design of solar pumping technology and solar driven water treatment, during which all participants were introduced to the handling of the related scientific instruments.

**Conclusion and Outlook:** In this intensive week, new networks between scientists were established. A joint South-South cooperative proposal writing was initiated and resulted in a first draft of ideas for a full R&D proposal. In addition future South-North exchange of students and lecturers was planned.

Solar food processing was identified important income generating application and as scientific challenging topic. Hence the joint organisation of a solar food conference is envisaged, where many of the alumni would like to meet again. The cultural program, including a breathtaking visit to a mining company and the cultural evening with international colleagues from the University of Kassel further strengthened the newly created scientific linkages.



Scientific coordination: Prof. Dr. Oliver Hensel, University of Kassel at Witzenhausen

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