

# Tropentag 2016

International Research on Food Security, Natural  
Resource Management and Rural Development

## **Solidarity in a competing world - fair use of resources**

Book of abstracts

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# Preface

The annual *Tropentag*, the largest European interdisciplinary conference on research in Tropical and Subtropical Agriculture and Natural Resource Management, rotates between universities and research institutes in Berlin, Bonn, Göttingen, Hohenheim, Kassel-Witzenhausen, Prague, and since 2016 Vienna, where this year's Tropentag is hosted by the University of Natural Resources and Life Sciences Vienna (Universität für Bodenkultur Wien).

Regular organisational support for the event is provided by the Council for Tropical and Subtropical Research (ATSAF e.V.), the German Institute for Tropical and Subtropical Agriculture (DITSL) in Witzenhausen, and the GIZ Advisory Service on Agricultural Research for Development (BEAF) on behalf of the German Federal Ministry for Economic Cooperation and Development BMZ. Since 2015, additional financial support is provided by the German Federal Ministry of Education and Research BMBF and the German Federal Ministry of Food and Agriculture BMEL in collaboration with the Federal Office for Agriculture and Food BLE, both hosting additional thematic sessions. Unique is the organisation of a common workshop of BMEL with the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW). The *Tropentag* 2016 also profits from the participation of the Austrian Development Agency ADA and the United Nations Industrial Development Organization UNIDO, each with an own workshop. Again with us is our longstanding supporter, the *fiat panis* foundation represented by Dr. Andrea Fadani. New on board is the "Bäuerliche Erzeugergemeinschaft Schwäbisch Hall" represented by Rudolf Bühler, which took over the award for the best conference poster.

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 and provides a unique platform for scientific and personal exchange for students, junior and senior scientists, development experts and funding organisations from several countries together with their international partner institutions. Approximately 1000 participant registrations from 74 countries underline the importance of interdisciplinary scientific exchange to address the challenges ahead of us.

The *Tropentag* 2016 is organised by the University of Natural Resources and Life Sciences (BOKU), Vienna, Austria from September 18. - 21. It has been developed

by several Departments and Divisions of BOKU, Eric Tielkes from DITSL, Witzenhäusen, and supported by several sponsors.

The theme of 2016 is "Solidarity in a competing world - fair use of resources". While on the one hand, one part of the world is profiting from natural resources, the other part of the world is suffering with hunger, malnutrition, human diseases, low income, violence and lately is also challenged through climate change. There is need to rethink and engage in a fair share of all resources between the continents and nations. This includes huge engagement into the management of natural resources to solve the long list of environmental threats expressed through ongoing erosion, loss of soil fertility and loss of biodiversity, and topped by climate change having strong impact on the productivity in agriculture, fishery and forestry, and the use and quality of water and of energy in the South.

Natural sciences are able to contribute to sustainable use of natural resources through all kind of strategies today discussed under terms like sustainable intensification, organic farming or bioeconomy, but have to keep in mind that their success is highly dependent from learning and training processes that are sensitive to the cultural, social and religious as well as socio-economic and political environments. Gender and generation sensitive participatory and governance structures are to develop which secure the integration of stakeholders along the whole value chains. Thus the broad field of social sciences takes over a crucial role for identifying and understanding the needs and strategies for implementing solidary and fair solutions for the future use of global resources. In this context, besides excellent disciplinary approaches, inter- and transdisciplinary research takes over a key role to bring the potential of different disciplines together toward an added value in a process of mutual knowledge production of scientists and stakeholders.

The *Tropentag* 2016 theme will be critically introduced and further discussed in a panel discussion by six renowned international keynote speakers. In 28 oral sessions including specific contributions by the ministries, 34 guided poster sessions and 16 workshops, participants present and discuss their research ideas and findings of the theme. A special session featured by CGIAR Center Bioversity International will underline the role of biodiversity and the CGIAR on tropical trees and forests conservation and crop diversity under climate change.

We wish to thank all participants for their scientific contributions, our colleagues, supporting the conference through reviewing more than 1000 abstracts and acting as session and poster chairs. Special thanks are given to Eric Tielkes, who gave us guidance and strong support in organising the conference. Finally we thank the donors for their financial, and food and drinks contributions that allow us to offer the conference affordable for participants with lower income.

We welcome you from different parts of the world at the *Tropentag* Conference 2016 in Vienna and wish you an inspiring and enriching event with lots of discussions and exchange of knowledge and experiences, and finally learning steps.

On behalf of the local organising team of *Tropentag* 2016

Univ.Prof. Dr. Bernhard Freyer (BOKU)

and

Anna Porcuna (local coordinator - special thanks to you) and the organising team with Ass.Prof. DI Dr. Michael Hauser, Priv.-Doz. DI Dr. Günter Langergraber, Univ.Prof. Dr. Willibald Loiskandl, Max Manderscheid, Ass.Prof. DI Dr. Reinfried Mansberger, Tamara Piniel, Ao.Univ.Prof. Dr. Harald Vacik, Priv.-Doz. Dr. Maria Wurzinger

Vienna, September 2016

## Closing the Feed Gap in Drylands for Enhanced Livestock Productivity and Efficient Resource Use

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Livestock is the world's fastest-growing highest-value agricultural sub-sector already accounting for about 40 % of agricultural GDP globally. By 2050 massive increases over 2005/7 amounts of cereals, dairy and meat will be needed: an extra of 2–3 Gt cereals, 0.66–1 Gt dairy products and 258–460 Mt meat. To meet this demand, large productivity increases are required as expansion of animal numbers and croplands is no longer an option. Hence, food and feed production will compete for land and water resources, particular in the drylands. These trends have to be seen against the background of widespread and growing land degradation and the additional challenge of climate change and variability. As one of the most extensive agents of land degradation, grazing pressure has already resulted in a significantly reduced contribution of rangelands to feed supply. E.g. in Near East — North Africa region this is only 10 to 25 % of livestock needs. This scenario clearly calls for research on resource-efficient feed production optimally integrated with food production. The International Center for Agricultural Research in the Dry Areas (ICARDA) and its partners have been exploring resource-efficient options to increase feed quantity and quality, among others addressing inefficiencies in feeding systems through balanced rations and smart supplementation; replacing expensive food grains in animal diets by agro-industrial by-products without jeopardising product quality; breeding for full purpose crops which includes selecting for food-feed cultivars in grain legumes and barley, and harvesting green forage from winter cereals in early growth stages; and intensifying cropping systems by replacing summer fallows with short duration legume crops which contribute to feed supply and soil health. This presentation will give examples of these research areas in dryland countries.

**Keywords:** Feed supply, livestock