U.S.-Pakistan Center for Advanced Studies in Agriculture and Food Security

International Conference on Sustainable Agriculture in Pakistan

Jointly Organized by:
University of California, Davis, USA &
University of Agriculture, Faisalabad, Pakistan
Introduction

Deceleration in agricultural growth rates, bridging yield gaps, adapting to climate change / developing mitigation strategies, desertification, negative afforestation rates, degradation of rangelands, over-mining of ground water and emerging water scarcity, SPS compliance and ensuring food security for a fast growing population are major challenges faced by the agricultural sector in Pakistan. Focused policy interventions and the adoption of advanced technologies under changing climate conditions can help to overcome these challenges.

The Center for Advanced Studies in Agriculture and Food Security, UAF has taken an initiative to discuss these issues by holding an International Conference on Sustainable Agricultural Development in November 2016. It will be a three day conference (November 17, 18 &19) focusing on three major topics. The first day will be devoted to challenges and policy issues for agricultural sustainability. The second day will explore how long-term research experiments could be usefull in responding to these challenges, particularly in the context of climate change. The role of advanced technologies in agricultural sustainability will be discussed on the third day. The conference will be attended by a number of international experts, planners, policy makers, implementers, researchers, farmer representatives and elected representatives. It is expected that a policy framework will be developed that can serve as a guiding document for the country’s policy-makers.

Challenges and Policy Issues in Agricultural Sustainability

Historically, Pakistan’s agriculture has performed well. With the expansion of in cultivated / cropped and irrigated area / increasing livestock numbers, the introduction of green revolution technology, and investment in agricultural education, research and extension, it has been possible to feed the growing population, provide raw material to local industry and generate surpluses for exports. However, stresses and strains are now appearing for the sustainability of agricultural development. A thorough analysis is needed of the many current challenges: including structural changes in farm size / livestock herds, land-water and other input use, the institutional framework, investment in agricultural research, competitiveness in domestic and international markets, and emerging urban and foreign markets. Thoughtful deliberations among stakeholders and sectoral experts would reveal the nature and extent of challenges being faced in ensuring sustainable agricultural development, the adequacy of existing policies and need for policy reforms.
Long Term Research Experimentation for Sustainable Agricultural Research

Long-term Experiments in agricultural research (LTRE) can make a valuable contribution to the search for sustainable solutions. Such experiments generate valuable scientific knowledge on long-term outcomes of different crops, cropping systems and practices under changing environmental and other experimental conditions. Knowledge generated through LTREs strengthens the research community, informs extension services and can contribute vitally to the development of policy. Research experiments should include changes in micro nutrient and trace metal concentrations in crops over time, constraints of the subsoil to plant production, and use of the experimental sites to monitor biological changes in soil. Scientific knowledge from LTRE will be used in the design of climate change mitigation and adaptation strategies for agricultural production. The indo-Pak subcontinent offers a unique climate rich in cropping diversity and associated commodities including livestock and rangelands.

There are currently no long term experiments being carried out under the USPCAS-AFS program, The University of Agriculture intends to initiate LTRE in Punjab. Before initiating such experiments, the value of LTREs in answering upcoming questions about agricultural practices and the environment must be fully recognized and understood. Therefore, the Agricultural Sustainability Conference in November 2016 will have a daylong session on LTRE. The session will be attended by representatives of LTREs around the world especially the U.S. The meeting session will be an excellent opportunity for us to learn more about what is going on among world-wide LTREs and develop a sound strategy to start this important intervention in Punjab, Pakistan.

Advanced Technologies for Sustainable Agriculture

Agricultural production must be sufficient to feed us now and in the future. Advanced agricultural technologies will play a critical role in bridging anticipated productivity and yield gaps. The “Sustainable-Management of Agriculture through Resources and Technologies (SMART)” approach encompasses situation analysis through real time monitoring, improving seed characteristics, reducing inputs, and promoting public private profitable partnership for improving sustainable livelihoods of farmers. Advanced biotechnologies like Genomics and Genome Editing and Precision Agriculture show great promise to meet such SMART needs.

Genomics has emerged as the science linking DNA structures with functions at the cellular level. Thanks to better understanding of DNA, now Genome editing provides unprecedented control over animal and plant genetic material for precise, robust and highly specific genome engineering. Precise genome modifications mediated by designer nucleases and the cellular DNA repair system can provide a platform to address basic biological questions and crop improvement. Precision Agriculture permits use of advanced machinery to reduce inputs, the application of real time farm management based on ICT, sensors and computer modeling. The integration of these SMART technologies will help to improve traditional cultivation in accordance with local conditions.

This session will focus on recent developments in Genomics, Genome editing and Precision Agriculture technologies and their potential use for agriculture sustainability.
**INTERNATIONAL CONFERENCE ON SUSTAINABLE AGRICULTURE IN PAKISTAN**

**Day 1: Thursday, November 17, 2016**

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*Prof. Dr Iqrar Ahmad Khan (S.I)*  
(Vice Chancellor, University of Agriculture, Faisalabad)

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- Mr. Qamar Bukhari  
(Director Communication, USPCAS-AFS, UAF)

**Conference Coordinator:**  
*Dr. Muhammad Jehanzeb Masud Cheema*  
(+923368303500, mjm.cheema@uaf.edu.pk)