FEED THE FUTURE
The U.S. Government's Global Hunger & Food Security Initiative

First International

Sustainable Agricultural Intensification and Nutrition Conference

Royal University of Agriculture, Phnom Penh, Cambodia

January 10 and 11, 2018

USAID
FROM THE AMERICAN PEOPLE

Collaborative Research on Sustainable Intensification
FEED THE FUTURE INNOVATION LAB

KANSAS STATE UNIVERSITY

CONTENTS

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WELCOME

Dear Distinguished Guests, Conference Participants, Ladies, and Gentlemen,

It gives me great pleasure and honor to extend to you a very warm welcome on behalf of the Royal University of Agriculture, Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN) and Kansas State University to the First International Sustainable Agricultural Intensification and Nutrition Conference. We are all excited to host this conference at our university. The Royal University of Agriculture is one of the leading agricultural universities in Cambodia with strong multidisciplinary programs that include agronomy, animal science, veterinary medicine, agricultural engineering, forestry, fisheries, food science, and policy dialogue and development.

Sustainable intensification of agriculture is critical to not only enhance productivity and environmental protection but also to increase resilience to climate change and nutritional security. Innovations in farming systems research and sustainable intensification are certainly needed in Cambodia and other countries in Southeast Asia and Africa where resources (land, labor and inputs) are limited and expensive. This conference provides a great networking platform for scholars from different countries to engage in useful dialogue to address needs of smallholder farmers who produce most of our food.

I personally take this opportunity to welcome the participants from multiple countries in different continents for visiting Cambodia and sharing knowledge and wisdom. This is an excellent opportunity for all of us to learn from each other and leverage resources for addressing the common cause of improving food and nutritional security. It is critical to ensure that we are not only conducting cutting-edge research with innovations, but also transferring these innovations to farmers and providing quality education to youth and all those who are engaged in agriculture.

We thank the United States Agency for International and Development (USAID) and the Feed the Future Innovation Lab for Collaborative Research on Sustainable Intensification of Kansas State University for providing funding and technical support for this conference. We wholeheartedly value your friendship, and we could not accomplish what we do without your support and leadership.

I thank everyone here for their participation and hope you have a productive meeting and also have an opportunity to experience our beautiful country and its culture.

Sincerely Yours,

Rector Ngo Bunthan
Royal University of Agriculture

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On behalf of USAID Cambodia, I would like to welcome you to the First International Conference on Sustainable Agricultural Intensification and Nutrition.

Sustainable Intensification (SI) is an agricultural production approach that aims to improve resource use efficiency and enhance productivity of farms without creating negative environmental or social impacts. SI has the potential to increase the production of affordable and nutritious food while also improving the resiliency of smallholder farmers.

I am thrilled that Cambodia is hosting the First International Sustainable Agricultural Intensification and Nutrition (SAIN) Conference. Since 2004, Cambodia has engaged in sustainable intensification and SI technologies have increased crop yields by improving soil health and water quality. Cambodia is now a leader in Southeast Asia on soil health enhancing No-till Conservation Agriculture Systems technology for rice, corn, and vegetable production.

USAID is especially proud of our partnership with the Royal University of Agriculture (RUA). Together we have worked to establish the Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN). CE SAIN, through its technology parks, demonstrates many of the SI and other Feed the Future Innovation Lab technologies. This is a place where researchers, agriculture extensionists, and private sector can engage to transform Cambodia's agriculture to be more productive. I would like to encourage those of you who have projects here in Cambodia to demonstrate your research in the Parks.

This is a great opportunity to learn more about the great breadth of research conducted here at RUA, CE SAINs Technology Parks, and on farms. We hope that the interactive discussions, presentations, and field trips will provide insight on how SI can improve food security, especially for small farmers.

Sincerely,

Veena Reddy
Acting Mission Director
USAID Cambodia

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CONFERENCE AGENDA

WEDNESDAY, JANUARY 10, 2018

Royal University of Agriculture, Phnom Penh, Cambodia

TIME	DESCRIPTION	
7:00AM	Load buses at the Himawari Hotel Apartments ***Attendees must be present by 7:00AM for transportation to the Royal University of Agriculture***	
8:00AM-8:30AM	*Registration*	
8:30AM-8:35AM	Introduction to the Event by the Master of Ceremonies and National Anthem	
8:35AM-8:45AM	Welcome Remarks by Veena Reddy, Acting Mission Director, USAID Cambodia	
8:45AM-9:00AM	Opening Remarks by MAFF Representative or RUA Rector	
9:00AM-9:30AM	Keynote Presentation: Sustainable Intensification *Dr. Jerry Glover, USAID*	
9:30AM-9:45AM	*Transition to Oral Session Rooms*	
9:45AM-10:30AM	Farming Systems and Resource Use Efficiency (Oral Session 1)	Farming Systems and Resource Use Efficiency (Oral Session 2)
9:45AM-10:00AM	O476; Trade-Off with Different Cropping Pattern in the Polders of Bangladesh *Priyanka Saha, Khulna University*	O538; Soil Enzymes and C Pools as Indicators of C Build Up in Short-Term Conservation Agriculture Cropping Systems in Cambodia *Lyda Hok, Royal University of Agriculture*
10:00AM-10:15AM	O497; Central Role of Underutilized Species in the Sustainable Intensification of Cambodian Smallholder Agriculture *Ricky M. Bates, Penn State University*	O492; The Effects of Converting Field Crop to Rubber (Hevea Brasiliensis) Plantation on Slope Lands in Nan Watershed *Wanwisa Pansak, Naresuan University*
10:15AM-10:30AM	O542; Ecological Intensification and Soil Ecosystem Services Assessment *Sambo Pheap, Royal University of Agriculture*	O448; Closing Senegal's Millet Yield Gap Through Site-Specific Fertilizer and Plant Population Recommendations Modeled Across Precipitation and Soil Fertility Gradients *Aliou Faye, Institut Sénégalais de Recherches Agricoles*
10:30AM-11:00AM	*Coffee Break*	
11:00AM-11:45AM	Livestock and Aquaculture (Oral Session 1)	Horticulture and Agroforestry (Oral Session 1)
11:00AM-11:15AM	O436; Piloting a Sustainably Intensified Broiler Production Model with Rwandan Smallholders *Thomas Gill, University of Tennessee*	O534; Pesticide Residues Detected in Vegetables, Herbs and Spices, a Commonly-Exporting Plant Produce from Cambodia to European Markets *Samnang Nguon, University of Battambang*
11:15AM-11:30AM	O528; Animal Health and Sustainable Intensification: Towards Systematic and Holistic Prioritization of Disease Associated with Consumption of Livestock Foods *Delia Grace, International Livestock Research Institute*	O535; Vegetable Production under Protection of Nethouses: Pest Management Success and Challenges *Nin Davuth, Royal University of Agriculture & UC Davis Safe Vegetable Value Chains Project*
11:30AM-11:45AM	O519; A Paradigm Shift for Sustainable Intensification of Aquaculture System: Co-Innovation for a Nutritious Pond System *Olivier Joffre, WorldFish*	O550; Comparing Vegetable Yield of Conventional versus Conservation Agriculture Production Systems in Seven Countries *Manuel Reyes, Kansas State University*

We will present results of the ongoing social and technical innovation process, providing key results in the design process and early lessons on how agency in driving transformational change is realized in the Vietnamese context, in which technology transfer oriented as opposed to co-innovation approaches prevail.

Keywords: aquaculture, innovation, innovation platform, shrimp farming, sustainable intensification

O528; Animal Health and Sustainable Intensification: Towards Systematic and Holistic Prioritization of Disease Associated with Consumption of Livestock Foods

Delia Grace[1], Kristina Roesel[1], Sothyra Tum[2], Chhay Ty[3], Hung Nguyen-Viet[1], Fred Unger[1], Hardisman Dasman[1], Nicoline de Haan[1], Melissa Fox Young[4], Johanna Lindahl[1]
[1]*International Livestock Research Institute (ILRI)*
[2]*National Veterinary Research Institute*
[3]*Centre for Livestock and Agriculture Development (CelAgrid)*
[4]*Rollins School of Public Health at Emory University*

We first discuss the sustainability of livestock systems, emphasising bidirectional relations with animal health. We review conventional and contrarian thinking on sustainability, and show that health aspects of livestock system sustainability have been under-examined. Negative implications, or threats to health sustainability, associated with livestock encompass the emerging, neglected and non-communicable diseases. We also argue that improving animal health represents a pathway towards more sustainable livestock systems.

Focusing on food-borne disease, one important but neglected category of animal associated disease, we summarise recent evidence on the importance of human disease associated with consumption animal source food. The health burden of foodborne disease is comparable to that of malaria, HIV-AIDS or tuberculosis and the majority of this burden is the result of consuming animal source foods purchased in informal (or wet) markets in developing countries. The health burden leads to economic loss and may adversely affect nutrition. However, attempts to manage foodborne disease in informal markets can have even greater negative impacts on nutrition, livelihoods and gender equities.

Existing food safety systems are based on tradition and convention; they focus on hazards rather than risks, and on problems which are perceived as important rather than those which actually are important. In contrast, a risk based food safety system would prioritize food safety problems and preventive interventions using the best available data on the distribution of risk and on how risk can be reduced most effectively and efficiently. Moreover, a development-oriented food safety system would take into account how foodborne disease and attempts to manage it affects different groups.

We describe a systematic, evidence-based, structured and participatory prioritisation process, undertaken in Cambodia to identify the priority hazards in animal source foods. This had four novel and important elements:

- An evidence-gathering process using systematic and grey literature review to garner best evidence on hazards and risks.
- A systems perspective driven gathering of information on nutrition and gender aspects of food safety.
- A participatory process whereby national stakeholders obtain capacity-building in using risk-based approaches and then take the lead in selecting priorities.
- A decision support tool that incorporates risk, nutrition, gender equity and opportunities for risk management in order to help stakeholders prioritize.

We discuss the process of prioritization and the priority hazards identified and compare this with more conventional approaches. An important advantage of risk-based prioritization is it allows hazards to be easily categorized as "the vital few" and "the trivial many". In contrast, conventional prioritization leads to much less differentiation among hazards making prioritsation more difficult.

Keywords: food safety, prioritistion, risk