APEC Climate Symposium 2017

Building Resilient Agro-Food Systems from Production to Consumption

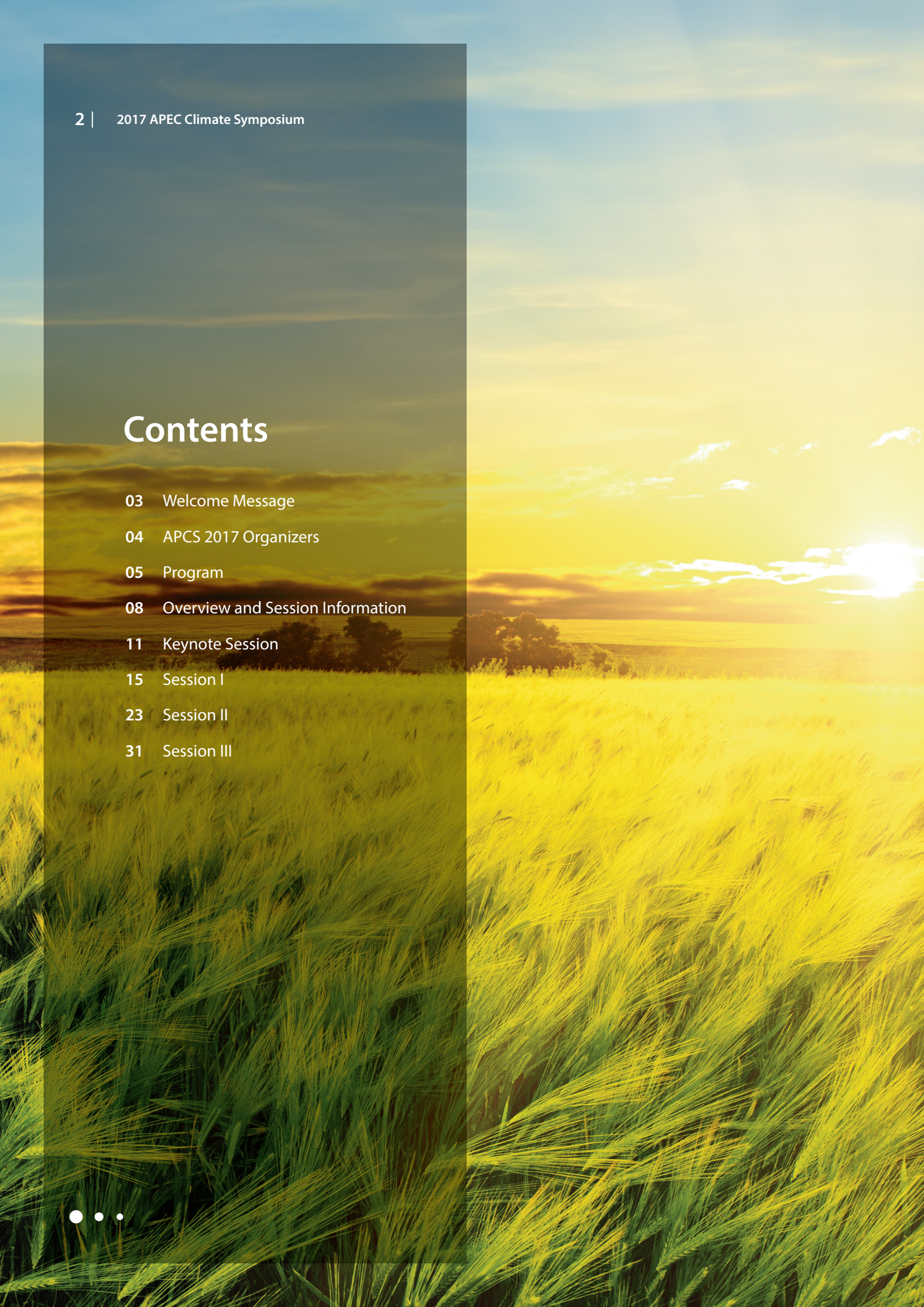
Interdisciplinary Approaches for Sustainable Food Security Using Climate Information

Can Tho, Viet Nam, August 18-20, 2017

Asia-Pacific Economic Cooperation

APCC
APEC CLIMATE CENTER

Contents



Welcome Message

On behalf of the organizers, the APEC Climate Center is delighted to welcome you to Can Tho, Viet Nam for the APEC Climate Symposium (APCS) 2017. The APEC Climate Center has developed this event to advance climate science to better strengthen food security in the face of large scale environmental change. By bringing together climate scientists and policy makers, APCS aims to tackle key climate issues through discussion on cutting edge science, sharing of best practices, and the advancement of policy.

Climate change is already affecting food security and the most vulnerable livelihoods in the Asia-Pacific, highlighting its importance for both sustainable development and economic growth. With food security and climate risk central to so many other issues such as human security and economic growth, these topics are rightly recognized as some of the most critical for this era. International collaboration is essential in addressing this multi-faceted issue, not just in terms of sustainably increasing agricultural production but also in fortifying entire the food system leading up to consumption.

With such a diverse group of participants bringing together experiences from emerging and advanced economies, research and application, APCS provides a unique opportunity to link innovations in science with lessons learned from across the globe to promote regional food security. We are excited to host a talented group of experts with such a remarkable group of participants to enhance discussions. We trust that, in addition to Symposium outputs integrated into the 2017 APEC Food Security Week, participants will return to their home economies enriched by the information and case studies shared over the next days and can apply their learning towards reducing the vulnerability of food systems towards both short- and long-term climactic events.

APCS 2017 would not have been possible without the strong support of our valuable partners. I would like to offer our sincere gratitude to all the members of the Organizing Committee and our co-hosts at the National Hydro-Meterological Service of Viet Nam, to the APEC Secretariat, and of course to all the speakers and participants.

Dr. Hong-Sang Jung
Executive Director, APEC Climate Center

APEC Climate Center

The APEC Climate Center (APCC) was established in 2005 with the unanimous endorsement of the Asia-Pacific Economic Cooperation (APEC) senior officials and leaders at the first APEC Senior Officials Meeting in Seoul, Korea, to enhance the socio-economic well-being of APEC member economies by utilizing up to date scientific knowledge and applying innovative climate prediction techniques. Since then, APCC has provided value-added, reliable, and timely climate prediction to nations in the APEC region and beyond, while serving as a key climate information center to distribute climate data, prediction and related tools. APCC is a unique organization that catalyzes climate information-based solutions through three interconnected pillars of work: climate prediction and information services; climate information application and climate change response; and capacity building.

APCC hosts the annual APEC Climate Symposium, which provides a forum for various scientists, academics, policy-makers and other stakeholders to share the latest science innovations in climate prediction and explore climate information applications.

National Hydro-Meteorological Service of Viet Nam

The National Hydro-Meteorological Service (NHMS) of SR Viet Nam was officially established in 1976 and is an operational unit under the Ministry of Natural Resources and Environment (MONRE). Under the NHMS, the National Centre for Hydrometeorological Forecasting (NCHMF), 9 regional hydro-meteorological centers and 54 provincial hydro-meteorological centers carry out the meteorological and hydrological forecasting and warning for the whole nation from central to provincial levels in order to meet all the requirements for the provision of meteorological and hydrological services in support of disaster prevention and preparedness, socio-economic development, and national security.

The NHMS plays an important and vital role for the safety, well-being and welfare of its population, and national economic development. It has been given the mandate to protect man and society from the vagaries of weather, climate and water induced disasters and provide for ways the nation can use weather, climate and hydrological information in pursuing sustainable economic development, through the timely provision and issuance of timely, accurate and reliable information.

Program

Friday August 18, 2017

08:00-09:00	**Registration**	
09:00-10:00	**Opening Ceremony**	**MC: Ms. Sangwon Moon** Head of External Affairs Department, APEC Climate Center
09:00-09:10	Opening Remarks	**Dr. Hong-Sang Jung** Executive Director, APEC Climate Center
09:10-09:20	Welcome Remarks	**Mr. Nguyen Linh Ngoc** Vice Minister, Ministry of Natural Resources and Environment, Viet Nam
09:20-09:30	Congratulatory Address	**TBD** Leader of Can Tho Authority
09:30-09:50	**Commemorative Plaque Presentation and Photo Session**	
09:50-10:20	**Coffee Break**	
10:20-12:00	**Keynote Session** **Fortifying Food Security with Climate-Smart Food Systems**	
10:20-11:00	Making Climate Services Work for Smallholder Agriculture: Innovations and Lessons from Across the Developing World	**Dr. Jim Hansen** International Research Institute for Climate and Society, Columbia University
11:00-11:40	AgMIP - Agricultural Production, Sustainability and Climate Change	**Prof. Senthold Asseng** Agriculture and Biological Engineering Department, University of Florida
11:40-12:00	Wrap-up and Discussion	
12:00-13:00	**Luncheon**	
13:00-18:00	**Session I** **Increasing Sustainable Agricultural Production using Climate Information**	
13:00-13:30	Food Security Enhancement in Southeast Asia under Climate Change through Multi-Scale Crop Modeling	**Dr. Jong Ahn Chun** APEC Climate Center
13:30-14:00	Implementing Climate Information to Support Sustainable Agriculture in Indonesia	**Ms. Nurhayati** Indonesian Meteorological, Climatological, and Geophysical Agency (BMKG)
14:00-14:30	Regional Impact and Adaptation Assessment of Climate Change on Agriculture	**Prof. Yuji Masutomi** College of Agriculture, Ibaraki University

Program

Friday August 18, 2017

14:30-15:00	**Coffee Break**	
15:00-15:30	Envisioning an Agricultural Renaissance	**Mr. A. G. Kawamura** Solutions From the Land
15:30-16:00	Private Sector Participation in Building Resilient Agro-food System: Converging ICT & Agriculture in Rural Korea	**Mr. Jaheung Koo** Korea Telecom
16:00-16:30	Seasonal and Sub-seasonal Prediction of Rainfall and Temperature for Vietnam	**Dr. Hoang Lam Phuc** National Hydro-Meteorological Service, Viet Nam
16:30-17:30	Wrap-up and Discussion	
18:00-20:00	**Welcome Reception hosted by National Hydro-Meteorological Service of Viet Nam**	

Saturday August 19, 2017

09:00-14:15	**Session II** **Beyond Growth: Building Resilient Post-Production Food Systems**	
09:00-09:30	Landscape Management for Resilient Value Chains	**Dr. Monica Petri** Food and Agriculture Organization of the United Nations
09:30-10:00	Weather Risk Management: What WNI Can Do for Your Country	**Mr. Mitsuhiro Ogata** Weather News, Japan
10:00-10:30	A Model Project for the Establishment of Climate Information Services in Tonga to Enhance Food Security in a Sustainable Manner	**Dr. Kwang-Hyung Kim** APEC Climate Center
10:30-10:45	**Coffee Break**	
10:45-11:15	Smart food systems to mitigate climate change and to attain Sustainable Development Goals	**Dr. Prajal Pradhan** Potsdam Institute for Climate Impact Research
11:15-11:45	Value Chain Approach and Gender Inclusion in Development of Climate Smart Agriculture: Experiences from Vietnam	**Dr. Tran Dai Nghia** Ministry of Agriculture & Rural Development of Vietnam
11:45-12:15	Intelligent Agricultural Production System based on Climate, Crop, and Field Information	**Prof. Kyeong-Hwan Lee** Chonnam National University
12:15-13:15	Wrap-up and Discussion	
13:15-14:15	**Luncheon**	

14:15-18:00	**Session III** **Large-scale Holistic Approaches to Climate Risk Management**	
14:15-14:45	Towards Transformational Climate Change Adaptation in the Agriculture Sector using Climate and Agrometeorological Information	**Dr. Hideki Kanamaru** Food and Agriculture Organization of the United Nations
14:45-15:15	Using Climate Knowledge to Create Sustainable Agricultural Systems	**Dr. Govindarajalu Srinivasan** Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
15:15-15:45	ASEAN Initiatives in Building Resilience of Agriculture for Food Security	**Ms. Imelda Bacudo** Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
15:45-16:00	**Coffee Break**	
16:00-16:30	Climate Information Services for Agriculture: from Big Data to Decisions	**Dr. Pablo Imbach** International Center for Tropical Agriculture (CIAT-CGIAR)
16:30-17:00	Climate Services for Supporting Climate Change Adaptation in Vietnam	**Dr. Le Minh Nhat** Department of Meteorology, Hydrology and Climate Change, Viet Nam
17:00-18:00	Wrap-up and Discussion	

Sunday August 20, 2017

09:00-12:00	**Session IV** **Wrap-up and Panel Discussion**	
09:00-09:30	Session I Wrap-up	**Dr. Jong Ahn Chun** APEC Climate Center
09:30-10:00	Session II Wrap-up	**Prof. Kyeong-Hwan Lee** Chonnam National University, Korea
10:00-10:30	Session III Wrap-up	**Dr. Govindarajalu Srinivasan** Regional Integrated Multi-Hazard Early Warning System for Africa and Asia
10:30-10:45	**Coffee Break**	
10:45-12:00	**Panel Discussion** Chair : Dr. Mark Howden, ANU	
12:00-12:20	**Closing Ceremony** • Dr. Hong-Sang Jung (Executive Director, APCC) • Dr. Tran Hong Thai (Deputy Director General, NHMS) • Mr. Nicholas Brooke (ABAC Principal Advisor to the APEC PPSTI)	
12:20-13:20	**Luncheon**	
14:00-18:00	**Eco-Tour (Fruit Village)**	

APEC Climate Symposium

Since 2005, APCC has hosted the annual APEC Climate Symposium (APCS) in partnership with the APEC Host Economy on priority topic with important linkages to climate science. Despite recent advances in climate science and related applications, there are often large gaps in its use in the implementation or management of relevant issues. By bringing together climate scientists and policy makers, APCS aims to bridge these gaps through discussion on cutting edge science, sharing of best practices, and the advancement of policy. The theme of this year's symposium, reflecting one of the most central concerns of the 21st Century, is Building Resilient Agro-Food Systems from Production to Consumption: Interdisciplinary Approaches for Sustainable Food Security Using Climate Information. Inherently, solutions to food security must be as complex and interdisciplinary as the challenge itself. There is thus a critical need to ensure the sustainability of global agro-food systems through a holistic approach, one that addresses the full food system from production to consumption, including the climate vulnerability of global supply chains, markets, nutrition and a lack of access of smallholder farmers to risk management tools like insurance.

Keynote Session. Fortifying Food Security with Climate-Smart Food Systems

Efforts to address the relationship between climate and food availability have predominantly focused on primary economy sectors such as agriculture and fisheries. While issues of production remain critical, it is imperative to address the adverse impacts of climate change on other, often sidelined, components of food security. Climate change adaptation can be achieved effectively through holistic approaches encompassing all dimensions of food security. The keynote presenters will provide an overview of global and regional issues of food security threatened by climate change and address strategies to help climate-proof food supply chains.

Session I. Increasing Sustainable Agricultural Production using Climate Information

Given that agricultural production systems are highly sensitive to climactic factors, it is critical to develop and use reliable climate information to better anticipate agricultural consequences of climactic events. Within this changing climate, sustainability depends on resilience, which may be obtained through the efficient use of climate information in agricultural production and establishing successful short- and long-term adaptation measures. This session will therefore focus on the opportunities and challenges for the utilization of climate information to increase agricultural production and help build food security.

Session II. Beyond Growth: Building Resilient Post-Production Food Systems

In addressing food security from a multi-sectoral approach, a value chain approach is useful in analyzing climate risks, as it looks beyond production and fosters a more systemic approach to risk management. This is pivotal when actors at all levels of agricultural value chains are impacted by climate change, yet these impacts are as varied and complex as the actors themselves. In particular, prioritizing climate resilience in supply and value chains empowers practical and economically sound approaches to reducing poverty sustainably and increasing food security beyond agricultural production.

Short- and long-term enhanced climate information can combined with information on food supply, to provide critical climate information for enhanced decision-making. Companies must also play a central role, both as critical sources of information and as catalysts for change. This session will explore the vulnerabilities of value chains to climactic variation and investigate how promoting climate resilience (in households, transporting, waste management, recycling etc.) through the use of climate information can enhance food security.

Session III. Large-scale Holistic Approaches to Climate Risk Management

As disaster management has evolved, the Asia-Pacific region has seen a paradigm shift from response-recovery governance to a risk-sensitive development approach. Agriculture and food production is no exception, with climate-related hazards due to climate variability and change, including extreme weather disasters, resulting in wide-scale damage and hindered socio-economic development. Bottom-up and top-down approaches that use climate information can be paired for large-scale change in agricultural risk management. Community-level educational and training programs, such as those for farmers, are central to raising awareness of climate-related risks and lead to a better understanding of benefits from basic climate risk managements. At higher levels, holistic approaches to reduce the risks associated with climate variability and change are necessary to effectively enhance resilience of provinces or nations. In this session, success cases to implement climate-related risk management measures at different scales will be introduced and discussed.

Keynote Session

Fortifying Food Security with Climate-Smart Food Systems

Jim Hansen
Research Program on Climate Change, Agriculture, and Food Security (CGIAR-CCAFS) & International Research Institute for Climate and Society at Columbia University

Senthold Asseng
Agricultural and Biological Engineering Department of the University of Florida

Keynote Session

Fortifying Food Security with Climate-Smart Food Systems

Jim Hansen

Research Program on Climate Change, Agriculture, and Food Security (CGIAR-CCAFS) & International Research Institute for Climate and Society at Columbia University

Making Climate Services Work for Smallholder Agriculture: Innovations and Lessons From Across the Developing World

Climate services involve the "production, translation, transfer, and use of climate knowledge and information in climate-informed decision making and climate-smart policy and planning" (Climate Services Partnership, http://www.climate-services.org/). Making climate services work for smallholder farmers at scale requires attention to: (a) supply-side capacity to provide actionable information; (b) demand-side capacity to communicate, understand and act on information; (c) balancing scalable services with farmers' context-specific needs; and (d) institutional and governance arrangements to sustain co-development of services. After discussing some basic concepts, I describe a few innovations from elsewhere (drawn largely from Africa) that aim to strengthen the design and implementation of climate services. The IRI-led ENACTS initiative is enabling several national meteorological services and regional climate centers in Africa to overcome data gaps, and greatly improve availability of localized and actionable historic and predictive information. I use CRAFT (CCAFS Regional Agricultural Forecasting Toolbox) to illustrate how raw climate information can be translated into more actionable forms by combining it with agricultural modeling. Multiple communication channels help ensure that rural communities can access relevant information and the knowledge needed to use it for their farming and livelihood decisions. Particular types of information are best communicated face-to-face; using structured participatory processes such as the PICSA (Participatory Integrated Climate Services for Agriculture) approach developed by University of Reading with CCAFS. In the context of Rwanda, I discuss how the use of gridded data and online Maprooms (through the ENACTS initiative), the development of effective training curriculum materials, training a core set of "trainers of trainers," and attention to governance aim to make scalable what would otherwise be very intensive, context-specific processes. Recognizing the current gap in knowledge and evidence, I conclude with thoughts about how institutional and governance arrangements might influence the effectiveness, scalability and sustainability of climate services for smallholder agriculture.

Biography

Dr. Jim Hansen works with the CGIAR research program on Climate Change, Agriculture and Food Security (CCAFS) where he leads the Flagship on Climate Services and Safety Nets. He is also a Senior Research Scientist at the International Research Institute for Climate and Society (IRI), at Columbia University, New York, where he has worked since 1999. Jim has worked on managing climate-related risk for agriculture and food security since 1996. His research focuses on finding practical, equitable and scalable solutions to the challenges of making smallholder livelihoods more resilient through climate services, climate-related insurance, and climate-informed food security management. Jim holds a Ph.D. in Agricultural and Biological Engineering from the University of Florida. He has served as Editor of Agricultural Systems.

Senthold Asseng

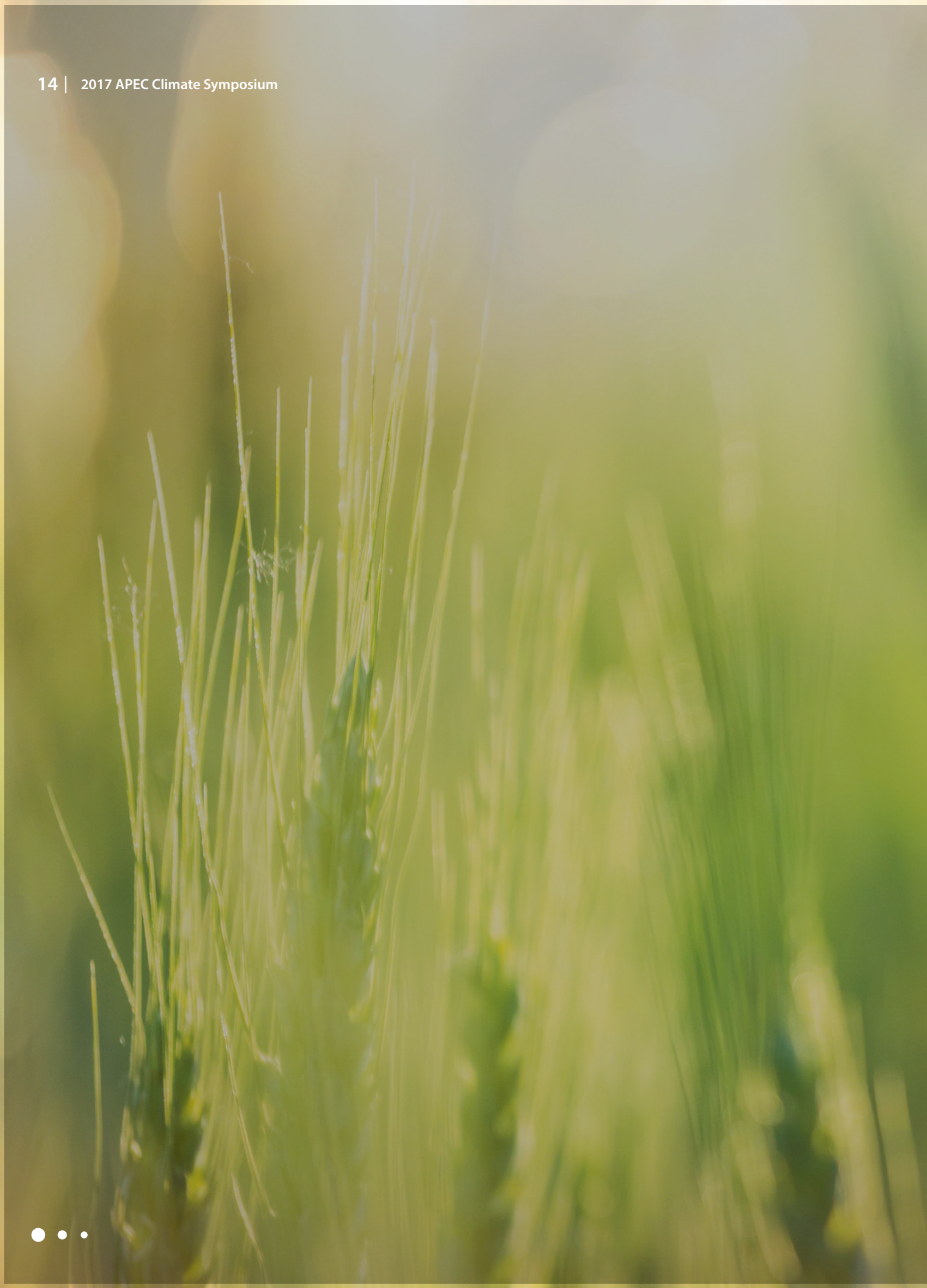
Agricultural and Biological Engineering Department
of the University of Florida

AgMIP - Agricultural Production, Sustainability and Climate Change

The Agricultural Model Intercomparison and Improvement Project (AgMIP) was founded in 2010 by Dr. Cynthia Rosenzweig, NASA Goddard Institute for Space Studies and Columbia University, and Dr. Jim Jones, University of Florida. AgMIP's mission is to improve the characterization of world food security as affected by climate variability and change, and to enhance adaptation capacity in both developing and developed countries. With more than 800 members and over 30 core activities, AgMIP has built a cutting-edge assessment framework on both regional and global scales, which links climate, crops, livestock, and economics to help decision-makers better understand how climate variability and change will reverberate through complex agricultural systems and markets. Outcome form various AgMIP activities will be presented.

Biography

Prof. Senthold Asseng is a Professor at the Agricultural and Biological Engineering Department of the University of Florida. He works on systems analysis to understand, compare and improve the productivity and sustainability of atmosphere-crop-soil systems changing over time, space and scales. He is interested in the impact and adaptation of climate variability and climate change on cropping systems and food security. He is the co-Leader of AgMIP-Wheat, an international team of wheat modelers and experimentalists as part of the Agricultural Model Intercomparison and Improvement Project and the elected Chair of the Expert Working Group Wheat Plant and Crop Modeling of the international Wheat Initiative. Prof. Asseng received a PhD in 1994 from Humboldt University Berlin and a DSc in 2004 from Technical University Munich, Germany.



Session I

Increasing Sustainable Agricultural Production using Climate Information

Jong Ahn Chun
APEC Climate Center

Nurhayati
Indonesia Agency for Meteorology, Climatology and Geophysics (BMKG)

Yuji Masutomi
College of Agriculture, Ibaraki University

A.G. Kawamura
Solutions from the Land

Ja Heung Koo
Global Business Group, Korea Telecom

Hoang P. Lam
National Hydro-Meteorological Services, Viet Nam

Jong Ahn Chun

APEC Climate Center

Food Security Enhancement in Southeast Asia under Climate Change through Multi-Scale Crop Modeling

Regional impact assessments are a pre-requirement for decision-making and selection of adaptation methods at the sub-national, national and regional levels. In this study, a multi-scale crop modeling approach was proposed to assess the impacts of climate change on future rice yields in Southeast Asia. National- and farmer-level adaptation strategies may be developed by combining the advantages from regional-and field-scale crop models. Climate variables were collected from the COordinated Regional climate Downscaling EXperiment (CORDEX)-East Asia and used as inputs to run the GLAM-Rice and CERES-Rice crop models. Simulations produced by the GLAM-Rice model identified Cambodia as the country in Southeast Asia where the reduction in rice yields under climate change will be the largest (a decrease of approximately 45% in the 2080s under RCP 8.5, relative to the baseline period 1991-2000) without adequate adaptation. The results of the model simulations considering the CO2 fertilization effect showed that improved irrigation will largely increase rice yields (up to 8.2-42.7%, with the greatest increases in yields in Cambodia and Thailand) in the 2080s under RCP 8.5 compared to a scenario without irrigation. In addition, the grid cell that will benefit the most (12.6 °N and 103.8 °E) was identified through further investigation of the spatial distribution of the effects of irrigation for Cambodia. For this grid cell, the CERES-Rice model was used to develop the optimal combination of adaptation measures. The results show that while a doubled application rate of nitrogen fertilizer (100 kg N ha-1) will increase rice yields by 3.9% in the 2080s under the RCP4.5 scenario for the Sen Pidao cultivar, a decrease in rice yield was projected for the Phka Rumduol cultivar under RCP4.5. For both cultivars, the results show that additional adaptation strategies besides the 100 kg N ha-1 fertilizer application rate and planting adjustment should be applied in order to offset all of the negative projected impacts of climate change on rice yields in the 2080s under RCP8.5. It is concluded that this study can be useful to enhance food security in Southeast Asia by providing informed recommendations for efficacious adaptation strategies.

Biography

Dr. Jong Ahn Chun completed his Ph.D. in Agricultural and Biological Engineering from the University of Illinois at Urbana-Champaign in 2007. He has focused on the terrestrial hydrological and biogeochemical aspects of Earth Systems through his broad research areas. At USDA-ARS, he investigated the impacts of temperature and elevated CO2 on crop yields and water resources through crop modeling and observational methods, suggesting less water will be used by crops under high-CO2 environments in the future. Prior to join in APCC, at the Johns Hopkins University, he incorporated and applied irrigation schemes to Land Information System (LIS) to enhance the simulation of regional water balances and to quantify potential feedback of agricultural water managements to local climate change. He also numerically modeled CO2 effluxes from a suburban area to provide detailed belowground carbon dynamics. He continues to contribute to investigation of the impacts of global climate change on agricultural productivity and water resources and support of developing economies to provide technologies of adaption to and mitigation of climate change in agriculture.

Nurhayati

Indonesia Agency for Meteorology, Climatology and Geophysics (BMKG)

Implementing Climate Information to Support Sustainable Agriculture in Indonesia

Several studies have reported the increase frequency of extreme weather and climate events such as the intensity and number of heavy rain days, shifting of the rainy season onset and prolonged dry days. Changes in climate have increased the number of disasters that affected human life and deteriorated large environment which is important on agricultural societies. Agriculture is one of highly sensitive sectors to climate variability and extreme climate, such as droughts and floods. In the past, good seeds, fertilizer, irrigation and cultivation were sufficient for farmers to maximize their crops. However, those factors are no longer enough to be considered so that farmers need to know how to cope with climate variability and climate change which might affect and reduce their crops productivity.

The Indonesian Agency for Meteorology, Climatology and Geophysics (BMKG) through its closed collaboration with several Agriculture research institutes, academician and stakeholders initiated a National Climate Outlook Forum (NCOF) that aimed to develop advisory and recommendation for anticipating the negative impact of climate change on agriculture. The forum members meet periodically resulting in climate prediction and advisory for the following planting seasons. Moreover, BMKG has also applied an adaptive effort in facing the threat of climate change by holding Climate Field School (CFS) in collaboration with Ministry of Agriculture in Indonesia. CFS is aiming at bridging farmers and extension workers to better understand climate information through a training process. From the field experiences of CFS, It was found that CFS brought 20 - 30 % increase to the national average crops productivity. The practice of CFS using organic fertilizer from the animal waste and humus was an attempt to support sustainable agriculture in Indonesia.

Collaborators: Marjuki, Indonesia Agency for Meteorology, Climatology and Geophysics (BMKG)

Biography

Ms. Nurhayati is the Director of the Public Weather Services at the Indonesian Agency for Meteorological, Climatological and Geophysics (BMKG), and over the last eight years has worked in various capacities with BMKG's Climate, Agroclimate and Marine Climate Center and the Climate and Air Quality Analysis Division. As a specialist in the field of climate and agriculture, Dr. Nurhayati received her Master of Science at Monash University in Victoria, Australia. She also is a member of the Years of the Maritime Continent project Steering Committee.

Yuji Masutomi

College of Agriculture, Ibaraki University

Regional Impact and Adaptation Assessment of Climate Change on Agriculture

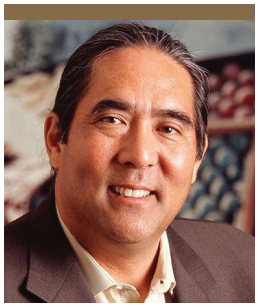
Many impact studies have shown that climate change has a profound impact on our food security (Porter et al. 2014). In order to reduce the impact, we need to actively promote mitigation measures to reduce the emissions of GHGs, which is the cause of climate change. However, its impacts have already emerged all over the world. Therefore, we must proceed with not only mitigation but also adaptation that respond to the emerged impacts. Actually, the promotion of adaptation is mentioned in the "Paris Agreement", which is in the new international rules on global warming countermeasures issued in 2016.

To implement effective adaptation to climate change, scientific evidence obtained by scientific methods is necessary. However, the number of studies on adaptation assessment is much fewer than impact assessment studies. While this is because adaptation assessment studies have just begun, there is also a reason that effective adaptation are highly dependent on regional situation. In that sense, adaptation assessment studies can be said to be one of regional studies. Hence, in order to carry out adaptation assessment studies, regional climate and crop information is necessary in the case of agricultural studies. However, the information is often lacking. In addition, the dialogue with regional stakeholders is essential in adaptation assessment studies. These points are major difference from impact assessment studies and major reasons why adaptation assessment studies are difficult.

In this presentation, I would like to introduce two trials of agricultural adaptation assessment studies in Japan and Indonesia. In Japan, the concerning agricultural impact due to climate change is not the reduction of yields of paddy rice but that of quality, although most agricultural impact assessment studies have focused on the impact on crop yields. In Indonesia, local information for adaptation assessment studies is lacking. Introducing these trials, I would like to discuss the future direction of adaptation assessment studies.

Biography

Prof. Yuji Masutomi is an Associate Professor in College of Agriculture at Ibaraki University, where he has been a faculty member since 2014. During 2009-2014 he was a researcher at Center for Environmental Science in Saitama, which is a local governmental research institute for environmental studies. He received his Ph.D. in global environmental studies from Kyoto University in 2007 and an M.S. in physics from Nagoya University in 2001. His current research interests lie in climate change impact assessment on agriculture at regional and global scales. In recent years, he has focused on regional climate change adaptation planning in Japan and Indonesia, and the combined impact assessment of climate change and air pollution on agriculture at a global scale. He has served as a member of the editorial board of the Journal of Japan Society of Hydrology since 2014 and was a member of the editorial board of the Journal of Agricultural Meteorology during 2013-2017.



A.G. Kawamura

Solutions from the Land

Envisioning an Agricultural Renaissance

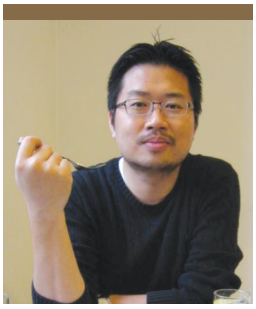
Global food systems are changing in dynamic and remarkable ways. The nexus between food, water, energy and changing climate is forcing agriculturists to re-imagine how they will provide sustenance to a hungry world. The challenges and opportunities that are emerging with the advent of expanding knowledge, technology and information systems are forcing us to re-think all aspects of agriculture. In a complacent world of abundance, the urgency to adopt, adapt and transform the global food system may seem remote, more like an indulgence. However, the very real threats to food security that confront our attempts to manage life systems and resources in a sustainable way are revealing themselves in concerning, even alarming pathways. The global agricultural community must become united and aligned in both thinking and strategic intent. The need for interactive and collaborative work is vital. The capacity to share, learn and expand the general capability of farmers while enhancing the predictability of their agricultural activities on a planet with changing climate regimes has never been more exciting. As we begin to envision new ways of approaching and accomplishing the UN's Sustainable Development Goals, a new age of agriculture is unfolding as a necessary compliment to how we achieve those transformational aspirations!

Biography

Mr. A.G. Kawamura is a third generation grower and shipper from Orange County, California. From 2003 to 2010 he was the secretary of the California Department of Food and Agriculture. He is co-chair of Solutions From the Land, a nationally acclaimed non-profit that is developing innovative and sustainable collaborations for 21st century agriculture. He serves on several boards and committees including the Ag Advisory Committee for the Chicago Council on Global Affairs, AGree Initiative; the Board on Agriculture and Natural Resources, a policy arm of the National Academy of Sciences' Natural Resource Council; American Farmland Trust Board member; Farm Foundation Round Table member; Western Growers Association Board member and former chair. Mr. Kawamura serves on the boards of the Delta Vision Foundation, Southern California Water Committee and Calif. Water Reuse Foundation. For over 30 years Mr. Kawamura has pursued a lifelong goal to work towards an end to hunger and malnutrition. He has worked closely with regional food banks to create exciting projects that address nutrition and hunger. As a progressive urban farmer, Mr. Kawamura has a lifetime of experience working within the shrinking rural and urban boundaries of southern California. Through his company, Orange County Produce, LLC, he is building a collaborative, interactive 21st century 100-acre agricultural showcase at the Orange County Great Park in Irvine, California.

Ja Heung Koo

Global Business Group, Korea Telecom

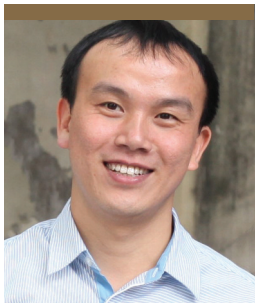


Private Sector Participation in Building Resilient Agro-food System: Converging ICT & Agriculture in Rural Korea

Telecom operators in Korea are entering the agriculture sector by converging their traditional expertise in Information, Communication and Technology (ICT) with that of Agriculture to explore and expand their horizons into non-telecom areas or into so called convergence service areas. There is a growing demand for Smart Farming in Korea's domestic agriculture sector and a strong support from the government to promote ICT in the field of agriculture. Information Communication Technology (ICT) can be an area to look into when it comes to overcoming such situations. Aid of ICT such as information processing, autonomous control technologies (IoT, GPS, sensors, Big data, FTTH, LTE, etc.) can help the agriculture sector. Smart Farming sector is growing in Korea maybe due to Koreans being especially capable in the use of technology as population both urban and rural, young and old all use the latest smart phones and fast speed internet such as 4G LTE network that covers 99.9% of the country and broadband network that covers 99.7% of the country which further shows the high tendency of adaptability when it comes to the use of ICT (Korea's ICT development index announced by ITU is number one in 2016). However, deploying such high technology and systems as well as linking them to real time information such as climate information is an area where companies such as KT needs to come in. KT provides the infrastructure, applications as well as training so that there are less technological barriers faced by farmers in using ICT and this helps provide efficiency and quality improvement in production, distribution and consumption of agricultural products. Korean government also is very eager and keen to promote the use of ICT in agriculture and provides various support to farmers in the area of Smart farming. United Nation's ICT body Telecommunication Standardization sector of International Telecommunications Union (ITU-T) released its recommendation Y.2238 in June 2015 that provides an overview of Smart Farming based on networks or so called Converged service for agriculture, Smart Farming. This shows that Smart farm is perceived as an efficient tool to use by more and more countries throughout the world. There are various players in the Smart farming value chain. Some of the key players in Smart Farming are Agricultural producers (outdoors producer, greenhouse producer, plant factory operator), distributors (direct seller, wholesale/retail distributor, on-line seller), Service providers (service business operator, content business operator), Network providers (Network business operator), Consumers (General consumer, Business consumer, Group consumer). KT is looking into using its primary strength in its traditional business as well as interested in entering new areas to play a key role in "building" a more resilient agro-food system with other stakeholders and to create profit from an area that is outside of its traditional boundary. A few case studies will be covered to highlight KT's progress so far.

Biography

Mr. Ja Heung Koo works as a Director for Korea Telecom (KT) Corporation's Global Business Group. KT is Korea's incumbent telecom company and its business scope spreads from traditional telecom services to new business scopes that have emerged. In the Agriculture sector, ICT technologies are assisting local farmers in many ways and the growing demand along with the Korean government's support has led KT to seriously explore the area.
Mr. Koo has worked for KT's Global business group for more than 15 years and has been involved in many ICT projects in Africa, Asia and Central America regions. He has carried out Corporate Social Responsibility (CSR) projects in Korea and more recently in rural Bangladesh where smart farm has been included as a module in the projects. Although from the Telecom sector, he has great interest in the Agriculture sector where he hopes to see KT's Smart farm business grow. Ja Heung Koo has briefly worked for International Telecommunications Union (ITU) Asia-Pacific regional office as a consultant and is currently a member of ITU Committee in Korea under the Ministry of Science, ICT and Future Planning where he contributes to "Study Group 2: Telecommunications for rural and remote areas." He holds a Bachelor degree in Business Administration from Korea University in Korea, a Master of Science degree in Development studies from the University of Manchester in the UK and is currently a PhD candidate in Development Economics at Kyunghee University in Korea.



Hoang Phuc Lam

National Centre for Hydro-Meteorological Forecasting, Vietnam
National Hydro-Meteorological Services, Viet Nam

Seasonal and Sub-seasonal Prediction of Rainfall and Temperature for Vietnam

Seasonal prediction of rainfall, temperature, and water level for the whole Vietnam are issued every two months and updated monthly if needed. Frequency and intensity of severe weather like heavy rain, tropical cyclone, cold surge, hot spell, dry spell, flood and tide are also discussed. This report will introduce the forecast procedure as well as the forecast guidances that we are using in our operational system. ENSO index is one of our key predictors that is being used even though the correlation is not very strong. ECMWF official products are another important guidance for the seasonal forecasters together with our own statistical and dynamical downscaling models and products from other climate prediction centres like IRI, CPC. Monthly prediction is improving with the use of NWP guidances with reasonable accuracy for the first 3 weeks.

Collaborators: Hoang Duc Cuong

Biography

Dr. Hoang Phuc Lam is currently the Head of Medium and long-range Meteorological Forecasting Division, National Centre for Hydro-Meteorological Forecasting (NCHMF), Vietnam Hydro-Meteorological Services (HMS). He joined the NCHMF after finishing his PhD in Atmospheric Sciences at School of Earth, Atmosphere and Environment, Monash University early 2016. His PhD thesis covered summer heavy rain and tropical cyclone genesis in Australia region using PV. Dr. Lam's current work focuses on improving the sub-seasonal to seasonal prediction in Vietnam. He also has experience in weather and severe weather forecast when working at Short-range Meteorological Forecast Division.

His hobbies are swimming and soccer.

Session II

Beyond Growth: Building Resilient Post-Production Food Systems

Monica Petri
Food and Agriculture Organization of the United Nations

Mitsuhiro Ogata
Weathernews Inc.

Kwang-Hyung Kim
APEC Climate Center

Prajal Pradhan
Potsdam Institute for Climate Impact Research (PIK)

Tran Dai Nghia
Ministry of Agriculture and Rural Development of Viet Nam

Kyeong-Hwan Lee
Chonnam National University

Session II

Beyond Growth: Building Resilient Post-Production Food Systems

Monica Petri

Food and Agriculture Organization of the United Nations

Landscape Management for Resilient Value Chains

Food production needs to grow in the face of climate change while addressing GHG emission. Adaptation is the most pressing concern and action is required across all agriculture sectors. Water management, climate planning and policy, disaster risk reduction, forestry management and sustainable crop production are the main technical focus. Food processing, packaging, storage, and distribution are strongly susceptible to climate change, however, there are some promising trends. Mechanization is spreading rapidly in a range of crops, efficiency of farms practice increases production and decreases environmental impacts, information technology contribute to improved farm practices through provision of business services.

Risks posed by climate change can affect business by affecting core operations, affecting the value chain, and setting up broader changes in the economy and infrastructure (C2ES, 2008; CC impacts in USA, 2014). Focusing on the single value chain reduces intervention trade-off and might disregard territorial socio-economic and environmental characteristics (van der Horn, 2015). Landscape thinking integrates the different elements of a landscape addressing potential trade-offs between production and conservation and gives ability to upscale success (ADB, 2017). Integrated climate smarts landscapes are multisectoral, multistakeholder and multi-scale, focusing on agro-environmental and governance interactions and applying rights-based principles and considers short and long term perspectives (FAO, under publication).

Biography

Dr. Monica Petri has 19 years working experience, a PhD in environmental agriculture and deep project manager capacity in multiple regions. From 2014 until 2016, she coordinated a CGIAR ICRISAT climate change adaptation project financed by USAID in Mali that integrated agro-meteorology information and field level agricultural activities. She has been working with FAO since 2005 in various functions, prominently in Africa, Central America and Central Asia. Since 2011 until 2014 she technically led the development and starting up of the GEF climate change portfolio of the FAO Ecosystem Management team in eight countries Africa. Previously she worked in the university research and experienced field activities in South and Central America.

Last but not least, she is a senior GIS expert having been deeply involved in the FAO agro-ecological zoning (AEZ) and Land Degradation Assessment (LADA) methods within which she facilitated a wide range of agro-environmental resources management activities in more than 15 countries. She is also one of the authors of the Harmonized World Soil Database. She has recently arrived in Laos to coordinate the project "Strengthening agro-climatic monitoring and information systems to improve adaptation to climate change and food security in Lao PDR" (SAMIS) including geographical information systems, agro-meteorology, policy recommendations, land use planning and field level agricultural activities.

Mitsuhiro Ogata

Weathernews Inc.

Weather Risk Management: What WNI Can Do for Your Country

WEATHERNEWS INC. (WNI) is a global Weather Data, Technology and Risk Management Company with its Global Center in Japan. WNI has branch offices in Singapore, Thailand, Philippines, Vietnam, Indonesia, India and Nepal to develop new weather risk management service system for each country based on global weather database that will help minimize disaster damages to life and business included supporting operation (i.e. Agricultural farming operation and water utilization). WNI has established a corporate agreement with NHMS, Vietnam's Meteorological office, since 2015 to share each other's data and technology that will help develop weather risk management service. Since then, WNI has been co-working with NHMS. Reviewing the recent climate change and disasters in the world, we will share our approach on how to cope with the present climate change challenges with the use of our data, technology and risk management capability in the field of farming and water utilization based on a shift from Calendar-based (Season-based) operation mindset to a Climate Change Control-based operation (C to CCC). WNI will provide required services by your country based on existing services: Treatment and Harvest Farming Schedule Optimization for Agriculture, and Water Utilization Planning for Hydroelectric Power Generation Plants, which are developed using observation networks and site specific forecast equipped with decision making system for operation enhancement. Moreover, these weather data that we are using in our system are as follows: Global weather database, Observation data, Remote sensing satellite data, Analysis data, Statistical data, Now-cast data and Forecast data (short-range to long-range). In addition, we also have our own observation network infrastructures that we deploy for weather risk monitoring in your country if necessary.

Biography

Mr. Ogata joined Weathernews Inc. (WNI) in Aug 1994 as a Risk Communicator for shipping industry. After graduating from KOBE University taking-up Mercantile Marine Course, he joined Oceanroutes Japan. He then worked as a route analyst at Oceanroutes Inc. Sunnyvale CA, USA. He provided weather routing service to vessels operated by Japanese shipping company and developed new routing system and service menu for the market requirements. In WNI, he developed a new service menu called Optimum Ship Routing (OSR) for global shipping market. WNI has been providing Weather Risk Management Services to Sea, Sky and Land Transportation market including global shipping industries. Currently, WNI is developing Global Weather Risk Management Services based on winning experiences in Japan for Energy market, Retail Market and Agriculture Market as part of Environmental Weather.

Mr. Ogata is in charge of developing the service menu for global Environmental Weather market especially for Europe and Asia. Clinpact-Metnext, which is one of the major weather risk management company in Paris working for European Energy, Retails and Agriculture market, was acquired by WNI last April 2017. The company name has been changed to WNI France. Mr. Ogata is making best use of their European technology and engineering to develop services and systems for various countries. It is the goal of WNI to optimize weather risk management customized for the specific needs of a country. This is done through predictive control of climate change by investing on big data, Internet-Of-Things (IOT) and innovation. He will share with you more about WNI's capability and your feedback will be highly appreciated.

Kwang-Hyung Kim

APEC Climate Center

A Model Project for the Establishment of Climate Information Services in Tonga to Enhance Food Security in a Sustainable Manner

The project was first conceived in the Global Framework for Climate Services Regional Consultation in the Cook Islands in March 2014. In this meeting, key officials from the Ministry of Agriculture and Food, Forests, and Fisheries and the Tonga Meteorological Services had a meeting with the APEC Climate Center scientists with the idea to collaborate on a joint project. The Tonga AgroMet Project, which ran from 2014 to 2016, focused on building the adaptive capacity in Tonga by bringing together the agriculture and meteorological sectors to develop critical climate services for agriculture, thus changing the way climate and agricultural knowledge are linked in Tonga. The activities targeted a range of stakeholders, from climate information providers to farmers, extension workers, and policy makers. This project pursued a holistic approach to address the broader development goal of improving the economic productivity and sustainability of crop production in the country. In this regard, not only were climate information services established through the project, but it also generated and collected a range of climate smart technologies and agricultural development plans. Local knowledge and institutional structures were brought together to support effective, sustainable agricultural risk management enabling Tongan growers and exporters to be better equipped for success despite increasing climate variability. Through this presentation, we will share some project activities together with lessons learned to ensure that future efforts result in better outcomes to enhance food security in a sustainable manner.

Biography

Dr. Kwang-Hyung Kim joined APCC in 2013 as a Research Fellow. Before coming to APCC, he worked as a senior researcher at the Samsung Advanced Institute of Technology and Samsung Techwin, where he developed molecular diagnostic assays that simultaneously detect and quantify human infectious microorganisms. He received his Ph.D. in Biological Sciences from Virginia Tech, USA, followed by a year of postdoctoral work at the Virginia Bioinformatics Institute. His Ph.D. and postdoctoral research focused on understanding a specific pathosystem in the interaction between plant or human hosts and microbial pathogens at a molecular and genomic level and dealt with the fungal diseases of major crop plants, the human Aspergillosis disease, and allergy/asthma caused by air-born fungi. At APCC, his research goal is to systematically estimate plant infectious diseases under the ongoing effects of climate change through the sophisticated integration of pathological and ecological (biotic) information, as well as abiotic (primarily weather/climate) data. In addition to plant disease epidemiological modelling, his research has expanded into the practical level of climate services for agriculture such as agro-meteorological modelling, agricultural disaster early warning systems, and agriculture data management. Currently he is also leading the Strategic Planning Team at APCC, responsible for the development of new collaborative projects with external partners.

Prajal Pradhan

Potsdam Institute for Climate Impact Research (PIK)

Smart Food Systems to Mitigate Climate Change and to Attain Sustainable Development Goals

A global sustainability challenge is to produce enough food for growing population and at the mean time to reduce environmental impacts and resource uses of the agricultural sector. This is also essential to achieve several Sustainable Development Goals (SDGs). The global food demand is projected to increase by 60%--110% between 2005 and 2050. The food system not only provides nutrition to human but also puts pressure on the environment (e.g. greenhouse gas emissions) and consumes excessive resources (e.g. water and fertilizers). For addressing this challenge, we need to investigate and identify options and opportunities to make the food system climate smarter and more efficient. So far, many studies explore options to increase food production to meet the growing food demand. However, consideration of both food production and consumption aspects is essential to improve overall efficiency of the food system, instead of focusing only on producing more food. This consists of changing dietary habits towards reduces animal product consumption, reducing food loss and food waste, consumption of local and regional food, production of diverse type of food, closing yield gaps, etc. This is important because changing dietary patterns towards a larger share of animal products will significantly increase future crop demand, agricultural GHG emissions, and international food trade when compared to population growth only. However, such increments can be dampened by reducing food waste and technology transfer and technological progress that will enhance crop yields, decrease agricultural emission intensities, and increase livestock feed conversion efficiencies. Moreover, international trade dependency and urban food-miles can be lowered by consuming local and regional food products, by producing diverse types of food, by closing yield gaps, and by reducing food waste. Nevertheless, every cultivated land may not need to attain its potential yields to enable food security while closing yield gaps only may not be enough to achieve food self-sufficiency in some regions. Hence, a combination of sustainable implementations of agricultural intensification, expansion, and trade as well as shifting dietary habits towards a lower share of animal products and reduction of food waste is required to sustainably feed the growing population.

Biography

Dr. Prajal Pradhan is a researcher at the Potsdam Institute for Climate Impact Research (PIK). His main fields of scientific interest include food and nutrition security, sustainable agricultural, food system analysis, regional and urban food systems, Sustainable Development Goals, sustainable transitions, ecosystem services, climate change impacts, and climate change adaptation. Dr. Pradhan received a BE Agricultural Engineering from Tribhuwan University (2006), a MSc Environmental Management from Kiel University (2009), and a PhD in Geoecology from Potsdam University (2015). Scientific publications from Dr. Pradhan induce studies on typical dietary patterns and dietary shifts, greenhouse gas emissions due to changing dietary habits, food waste and its environmental impacts, nourishment potential of regional and local food, etc. Dr. Pradhan focuses on addressing the dual challenge of nourishing the growing population and at the mean time of achieving environmental sustainability by applying food system approach that considers both food production and consumption aspects.

Tran Dai Nghia

Ministry of Agriculture and Rural Development of Viet Nam

Value Chain approach and Gender Inclusion in Development of Climate Smart Agriculture: Experiences from Vietnam

In Vietnam, agriculture has been a major pillar of the economy. Agriculture contributes 16.23% of GDP, 18.2% of export value and employs about 41.9% of the labor force (GSO, 2017). Agriculture needs to maintain its growth momentum to meet food, energy, medicines, fibers and fuel demand of the economy. Food production is identified as the most vulnerable sector to climate change. Applying value chain and gender inclusion approach in developing CSA practices is found to be an effectively integrated adaptation measure in managing efficiently natural resources in food producing systems in response to climate change. This framework includes (i) drawing the value chain , evaluate processes, review related stakeholders, mechanisms and policies affecting specific stages, actors in the value chain; (ii) analyze climate change vulnerability and resilient capacity of each stage/node and throughout the chain, climate change adaptive capacity of each stakeholder in the value chain as a basis for developing appropriate adaptation solutions. The CSA development process should also provide opportunities directly or indirectly supporting to empower women, ensuring gender equality in decision-making when considering and selecting CSAs, which then, can better mobilize fully potentials and resources of the community in building resilience to climate change. Negative impacts of climate change on increasing gender inequality should be addressed. Adaptation activities that empower women and improve their living conditions and livelihoods mitigate climate change and disaster risks should also be prioritized.

The presentation also provide some experiences of Vietnam in development CSA based on the application of value chain and gender inclusion approach, e.g., bio-shrimp with mangroves, coconut-aquaculture-fruit tree or ethnic women with traditional herbal plantation under natural forest.

Biography

Dr. Tran Dai Nghia is the Head of the Department of natural Resource and Environmental Economics Studies, a head of the Climate Change and REDD+ research group at IPSARD, Ministry of Agriculture and Rural Development, a member of NAP taskforce and also a country point contact of Global Alliance of CSA (GACSA).Dr. Tran is currently leading a number of climate change projects including (1) Development of NAP M&E indicators for NAP-Ag of Vietnam (FAO funded); (2) CSA book for Vietnam extension system (UNPD funded), CSA stocktaking for whole country of Vietnam; (3) CSA country profile (for 11 key agriculture commodities) and CSA case study (GACSA), (4) Mainstreaming Climate Change Adaptation (CCA) and Ecosystem Based Adaptation (EbA) in policy development framework at national and sub-national level; (5) Mainstreaming REDD+ in commodity value chain development plans for rubber, coffee and aquaculture (under UN-REDD+) ; (6) Implementation of NAP in agriculture of Vietnam; and (7) Farmers' selection of mitigation options in rice production in Vietnam (CCAC), etc.Dr. Tran has also involved deeply in reviewing policies and providing advice for policy makers in the areas of Green Growth and Sustainable Development in the context of Restructuring Agriculture sector in Vietnam.

Kyeong-Hwan Lee

Chonnam National University

Intelligent Agricultural Production System based on Climate, Crop, and Field Information

The current world population of 7.3 billion is projected to reach 9.6 billion by 2050 according to the Food and Agricultural Organization(FAO) of the UN. With the world population growth, food production also must increase by 70 percent more by 2050. However, there are several obstacles to fulfill this goal: slow-down in productivity growth, loss of farmland, climate change, high cost of energy, and aging farmers. Especially, climate change is a critical issue in agricultural production. Climate change can cause more frequent and severe weather events such as heavy rainfall, intense storms, and heat waves, all of which can reduce crop yields. Agriculture consumes 70 percent of the world's fresh water supply. Reducing water consumption in agricultural production is an urgent need since it is directly related to food security. Although agriculture faces these challenges, food production should increase in a highly effective and sustainable way. An intelligent agricultural production system (IAPS) equipped with automation technologies can be a solution for this.

An IAPS consists of a monitoring system, a decision making system, and an actuating system. The monitoring system precisely measures micro-climate in fields and the status of soil and crop using a variety of sensors. The measured data are transferred to a cloud server through internet of things (IoT) and then are analyzed to make an optimum decision for farm work using big data analysis and artificial intelligence technologies in the decision making system. The optimum decision for farm work is actuated into agricultural fields using unmanned aerial vehicles and mobile robots equipped with variable-rate implements. The input of IAPS can be labor, energy, and agricultural materials such as chemicals, fertilizer, etc. and the output can be quantity and quality of agricultural product. The IAPS is learned in a feedback loop system to reach the highest efficiency showing minimum input and maximum output. In this symposium, I would like to discuss how the IAPS works and where it can be applied.

Biography

Prof. Kyeong-Hwan Lee is an Associate Professor at Chonnam National University (CNU) in Gwangju, South Korea. His main fields of scientific interest include sensors and intelligent biosystems, agricultural robotics, micro/nano biosensors and precisions agriculture. Previous to joining CNU, in 2008 Prof. Lee was a Postdoctoral Research Associate at the Citrus Research and Education Center at the University of Florida, USA. His work there focused on Instrumentation for Biosystems, biorobotics and intelligent control systems, and citrus harvesting and production. In 2010, Prof. Lee also worked at the Gwangju Institute of Science and Technology as a Research Assistant Professor.

Prof. Lee received his PhD from Kansas State University (2005) in biological and agricultural engineering, an MS in Agricultural Engineering from CNU (1998), as well as a BS from CNU (1996). He is a member of the American Society of Agricultural and Biological Engineers (ASABE), Institute of Electrical and Electronics Engineers (IEEE), and Institute of Controls, Robotics, and Systems (ICROS). Prof. Lee also contributes to a number of publications as the Co-Editor-in-Chief for Engineering in Agriculture, Environment and Food (EAEF), and as an Associate Editor for Transactions of the ASABE, Applied Engineering in Agriculture, and Journal of Biosystems Engineering.

Session III

Large-scale Holistic Approaches to Climate Risk Management

Hideki Kanamaru
Food and Agriculture Organization of the United Nations

Govindarajalu Srinivasan
Regional Integrated Multi-hazard Early-warning System

Imelda Bacudo
Deutsche Gesellschaft fur Internationale Zusammenarbeit (GIZ)

Pablo Imbach
International Center for Tropical Agriculture (CIAT-CGIAR)

Le Minh Nhat
Ministry of Natural Resources and Environment, Viet Nam

Session III

Large-scale Holistic Approaches to Climate Risk Management

Hideki Kanamaru

Food and Agriculture Organization of the United Nations

Towards Transformational Climate Change Adaptation in the Agriculture Sector Using Climate and Agrometeorological Information

Climate change adaptation is a long-term iterative process from the farm to national levels, and it requires a robust evidence base to design investments and interventions. More than ever, there are needs for better climate and agrometeorological information in order to facilitate transformational changes towards a climate-resilient agriculture sector. Climate risk assessments need to be better connected with national policy and program processes such as those for Climate-Smart Agriculture, National Adaptation Plans, implementation of Nationally Determined Contributions, Green Climate Fund projects, etc. Food security and climate change is a highly interdisciplinary challenge, which requires coordinated efforts across sub-sectors, and between science and policies, fostering enabling environments. Capacity development is key because adaptation planning requires periodic revisions to policies, learning from the latest science, and successes and failures on the ground. FAO has been supporting countries in filling information and capacity gaps, and the presentation will illustrate key points with examples from different countries, working with governments, agencies, research institutes, universities, and NGOs.

Biography

Dr. Hideki Kanamaru is Natural Resources Officer at the Regional Office for Asia and the Pacific for the Food and Agriculture Organization of the United Nations in Bangkok, Thailand. He holds an MSc in Climate Change from the University of East Anglia in Norwich, UK and a PhD in Geography from Boston University, USA. After a research career at the Scripps Institution of Oceanography in San Diego, USA, he joined FAO in 2007. He works on the use of climate data and information in the agriculture sector, climate downscaling, assessments of climate change impacts on food security, climate change adaptation, and disaster risk reduction.

Govindarajalu Srinivasan

Regional Integrated Multi-hazard Early-warning System

Using Climate Knowledge to Create Sustainable Agricultural Systems

Agriculture systems have evolved over centuries equilibrating to human needs and the physical environment controlled by soil, climate and ecology of the place. Increasing productivity for a growing population has been the main goal of the agriculture sector in many countries. This has invariably led to push of technologies with little consideration to climate suitability resulting in excessive use natural resources. Growing awareness of the need to create environmentally friendly and sustainable agricultural systems is now beginning to drive a change. Climate knowledge is an important driver to steer this change, wherein climate services are crucial.

The Regional Integrated Multi-hazard Early-warning System (RIMES) has been implementing a World Meteorological Organization (WMO) Global Framework for Climate Services (GFCS) project in South Asia being funded by the Canadian Government. Within this initiative, specific interventions were made in some of the project countries to mainstream climate and weather information into agriculture and irrigation water management. Key sectoral stakeholders engaged through the process of National Climate Outlook Forums (NCOFs) conducted by the National Hydrological and Meteorological Services (NMHSs) were identified for further consultations to develop decision support systems. Examples of such systems implemented will be presented. The need for capacitating different levels of users to understand climate information and be able to effectively use it for both short-term decisions and long-term planning is very important. Once such institutional links are created and made operational, they can significantly contribute to minimize losses and optimize inputs leading to more environmentally tuned and sustainable systems.

Biography

Dr. Govindarajalu Srinivasan is a Chief Scientist, Climate Applications at Regional Integrated Multi-Hazard Early Warning System for Africa and Asia (RIMES), based in Thailand. His work focuses on climate variability and change in south and south East Asia, particularly on issues that put societal systems at risk. He has served/serving as a Team leader and Climate Change modeling specialist in projects funded by FAO-RAP, UNDP, ADB, WMO and the UN ESCAP being implemented in the South and South East Asia. He has more than 25 years' experience in research and operational aspects of climate information, applications and services. He has represented India at UNFCCC and IPCC meetings and been involved in policy issues of climate change. He has served on the editorial board of the international journals - Agricultural and Forest Meteorology & Climate Research. He has also been a contributing author and expert reviewer for the IPCC reports.

He held positions as consultant, Climate Adaptation and Prediction branch, World Meteorological Organization (WMO); Program Manager, Climate Change, Ministry of Earth Sciences &; Scientist, Dept. of Science & Technology (DST), Gov't of India. His started his career as a Meteorologist with the India Meteorological Department and lead the Climate Change related research and science policy aspects as the Director, Climate Change Unit of IMD. Dr. Srinivasan holds a Doctoral Degree in Atmospheric Sciences from Indian Institute of Technology, Delhi. His postdoctoral work was at the Climate Research Unit (CRU), University of East Anglia, U.K., and the School of Environmental Sciences, Rutgers State University of New Jersey, USA.

Imelda Bacudo

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

ASEAN Initiatives in Building Resilience of Agriculture for Food Security

Southeast Asia (SEA) is one of the world's most vulnerable regions to climate change, due to its long coastlines, high concentration of population and economic activity in coastal areas, and heavy reliance on agriculture, fisheries, forestry and other natural resources[1)] . ASEAN leaders recognized that the impacts of climate change are affecting all sectors and that close cross-sectoral collaboration and coordination is essential when planning and implementing climate change responses, especially for food security. Trans-boundary impacts of potential climate change scenarios, but also potential responses, call for a coordinated regional framework, strategy and mechanism to cope with climate change and its impacts. Hence close cooperation between the relevant ASEAN communities and frameworks is integral in addressing climate change in ASEAN. This presentation shares the various frameworks that ASEAN has put in place to respond to the challenges of climate change in general, and in particular highlight the work of the ASEAN Climate Resilience Network – a platform for knowledge exchange and technical cooperation that aims to promote resilience of agriculture and enhance its mitigation potential. The ASEAN CRN in its 3rd year of operation has successfully contributed to wider promotion of practices through knowledge exchange events on the topics of agriculture climate insurance, stress-tolerant varieties, climate information services, integrated crops management, as examples. It is also instrumental in assisting ASEAN Member States to formulate the first common position on agriculture issues delivered at COP22, as well as translating learnings from the ground to regional policies, while collaborating with most stakeholders and forging partnerships with those aiming for the same goals within the region, and at a global level. The impacts of climate change do not recognize geo-political boundaries, and ASEAN along with the ASEAN Climate Resilience Network have valuable insights to share in addressing climate change impacts across various scales.

1) The Economics of Climate Change in Southeast Asia: A Regional Review. ADB, Manila, April 2009

Biography

Ms. Imelda Bacudo currently works as Senior Advisor and Deputy Head of the Forest and Climate Change Project under the ASEAN-German Programme on Response to Climate Change (GAP-CC) programme implemented by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. She has over 15 years' experience in the areas of biodiversity conservation, sustainable development, and conservation finance in the Philippines, Latin America, Uganda and Southeast Asia, working with NGOs, national governments, and international development corporation agencies. Recently, she has been focusing on the promotion of climate-smart agriculture with the 10 member states of ASEAN. She acquired her Master's Degree in Environmental Science from the Yale School of Forestry and Environmental Science under a Fulbright Scholarship.

Pablo Imbach

International Center for Tropical Agriculture (CIAT-CGIAR)

Climate Information Services for Agriculture: from Big Data to Decisions

Climate information Services (CIS) rely on the effective production of climate information that is translated into products and services that are communicated in a timely manner to support decision making at the farm level and national policy and planning activities for the agricultural sector. We review these aspects across different experiences on CIS focused on: (i) the role of understanding local stakeholder roles and relationships for designing communication mechanisms and information products, (ii) understanding the potential of climate data to support specific decision making needs from farms to the national level, (iii) the role of the CGIAR platform on Big Data in Agriculture to integrate top-down and bottom-up approaches linking globally produced observational (i.e. on land cover and weather) and modeling (i.e. seasonal weather and yield forecasts) data to local scale needs and (iv) the potential role of ICTs (Information and Communications Technologies) to support local data collection to provide data inputs and feedback for continuous improvement of the CIS.

Biography

Dr. Pablo Imbach has twenty years of experience working in climate and land use change, ecosystem services, agriculture, hydrology, and sustainable development. He has developed and led environmental modelling teams for over a decade. He has skills in quantitative water-soils-ecosystems modelling and GIS. He and his team analysed ecosystems responses to climate change, agricultural and hydrological dynamics, assessed land use change scenarios to support the development of adaptation and mitigation strategies. He currently works for the International Center for Tropical Agriculture (CIAT) at its regional office for Asia in Hanoi. His research interests include the design of climate information services, modelling at different geographical scales for land use change, ecosystem services for agriculture and water sectors, climate change risk and vulnerability assessments, and methodological developments to design mitigation and adaptation strategies.

Le Minh Nhat

Ministry of Natural Resources and Environment, Viet Nam

Climate Services for Supporting Climate Change Adaptation in Vietnam

Vietnam is considered one of the most hazard-prone countries in the world. Typhoons, floods, droughts and landslides are recurrent and were responsible for losses equal to 1.5 percent of annual GDP between 2001 and 2015. This situation is compounded by a host of non-climate factors such as high population density, high levels of poverty concentrated in coastal areas vulnerable to extreme events, and extensive low-lying land highly susceptible to flooding. The country's poorer populations are concentrated in mostly rural areas with precarious housing and social infrastructure, low-lying roads and high dependence on climate-sensitive livelihoods such as fishing and rainfed agriculture. Climate projections for Vietnam include an increase in temperatures, increased intensity of extreme weather events and a rise in sea levels.

This paper will present the role of governments and public policy in supporting adaptation including on how to help small-scale farmers increase and secure their access to productive resources through policies such as land reform; and by enhancing access for all small-scale farmers, including women, to the finance, inputs, and extension services that can support adaptation. Vietnam government needs to implement GFCS for: Increase understandability of early warning information; Efforts of bridging climate information to sectoral stakeholders by translating climate information into sector-relevant information; Increase accessibility of early warning information; Mainstream the risk management scheme into national planning and share within economies; Develop policy recommendation for regional cooperation to scale out and mainstream the risk management scheme within economies.

Biography

Dr. Le Minh Nhat is Director of the Climate Change Adaptation Division (CCA Vietnam) of the Department of Climate Change (DMHCC), Ministry of Natural Resources and Environment Vietnam (MONRE). Dr. Nhat is a key person involved in development of policies and strategies of climate change adaptation. He is taking lead in state administration of CCA activities in Viet Nam, specifically conducting climate change impact assessments; developing and managing national CC database; management of the evaluation of the pilot models and replications of the evidence based effective CCA interventions; Analyzing loss and damage in line with Warsaw International Mechanism; Building up Climate Change Scenarios;

Prior to his appointment as CCA division Director, Dr. Nhat served as the Deputy Director of the National Centers for Flood and Storm Control in Central and Highland of MARD in 2009 and as the official of Department of Flood and Strom Control from 1995-2004, both within Vietnam National CCFSC. In his capacity of law and policy development, he set significance to an inclusive and participatory process of legal and policy making. Relevant stakeholders were enabled to participate in the law and policy making activities in different forms, either direct face to face policy dialogues or indirect consultations during these processes to ensure their issues were reflected in a new law or policy.

Dr. Nhat received his PhD (2008) degrees in Hydrology from the Kyoto University,Japan and Masters of Science (1998) and his Bachelor of Science degree from Hanoi Water Resouces University. Dr. Nhat research interests span climate variability and change, and weather - climate linkages (including extreme events), with emphasis on diagnostic evaluation of observations and models to improve climate prediction. He has more than 10 peer-reviewed journal articles, technical reports published, and 40 conference proceedings.

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