



## **CLIMATE SMART AGRICULTURE IN ASIA: RESEARCH AND DEVELOPMENT PRIORITIES**

*Knowledge sharing and planning workshop involving Asia's climate specialists,  
leading agricultural scientists, development organizations and global experts*

**11-12 April 2012; Bangkok**

**Organized by**

**Asia-Pacific Association of Agricultural Research Institutes (APAARI)**

**CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS)**

**World Meteorological Organization (WMO)**

**This workshop will**

- ✓ review best practices and technologies being used to make agriculture climate smart
- ✓ review latest knowledge of impacts of climate change on agriculture
- ✓ identify gaps in solutions available and prioritize research and development needed to fill gap
- ✓ agree on plan to address gaps and link knowledge with policy actions at the local/national/regional level to make agriculture climate smart

**The Challenge for Climate Smart Agriculture -Faced with growing problems of food security and climate change, agriculture must become more productive, more resilient and more climate friendly.** South and Southeast Asian regions are home to more than 30% of the world's population; half the world's poor and malnourished – a full 500 million! Agriculture is the back-bone of most of these economies; with nearly 50% of the population dependent on the sector for food and livelihoods. Climate change in these regions is expected to reduce agriculture productivity by 10- 50% in the next 3 decades; with a dramatic impact on stability and incomes. In India alone, a projected additional 50 million people will live in poverty due to climate change, than would have otherwise. In the last 5 years these regions have witnessed considerable increase in the number of floods, droughts, some of the most devastating cyclones in recorded history; and water, soil and land resources continue to decline. The increased climatic variability in future would further increase production variability. Agriculture, forestry and land use change account for 30% of greenhouse gas emissions; there is great mitigation

potential from better agriculture, soil, water and livestock management practices as well as reduced deforestation. Producing enough food for the increasing population in a background of decreasing resources and a changing climate scenario is a challenging task.

**Best options being implemented to build climate smart agriculture are many but gaps remain.** Drought and flood tolerant varieties of crops, adapted livestock and fish, weather forecasts, ICT based agro-advisories, weather based insurance, water management practices, conservation tillage, soil, and agroforestry for carbon sequestration, precision fertilizers, adapted mechanization, seed and fodder banks, are some of the best options and practices in use. But there is still considerable technology and knowledge gaps and much more scope for partnering and policy reform. The proposed meeting in Bangkok will build on the momentum created by the earlier meetings and expand discussions on climate smart agricultural research and development to the whole of South Asia and South East Asia. The meeting is also timely to take stock of activities underway to build climate smart agriculture since the last regional meeting nearly 5 years ago.

### **Participants**

- Chiefs of agricultural research organizations of south and south-east Asian countries
- Negotiators from the south and south-east Asian countries responsible for discussion on adaptation and mitigation in agriculture in UNFCCC
- Chiefs of the meteorology departments of south and south-east Asian countries
- Regional and global agriculture and climate change experts
- CGIAR climate change scientists
- Regional and global development organizations

### **About CCAFS and APAARI**

In order to address the challenges of climate change, the Climate Change, Agriculture and Food Security (CAAFS) global program supported by the Consultative Group on International Agriculture Research, was recently launched and brings together the world's best researchers in agricultural science, development research, and climate science. Asia-Pacific Association of Agricultural Research Institutes (APAARI) promotes agricultural research for development in the Asia-Pacific region by facilitating through novel partnerships among NARS and other related organizations to contribute to sustainable improvements in the productivity of agricultural systems. It also organized a major conference on climate change in 2008 which led to a Tsukuba Declaration emphasizing the need for greater and continued focus on adaptation and mitigation research, and policy interface in agriculture in Asia-Pacific region. World Meteorological Organization (WMO) also organized a workshop in 2008 at Dhaka to review the impacts of climate change on south Asia and to develop future research priorities.



Empowered lives.  
Resilient nations.

*Draft program of the Workshop on*  
**Climate Smart Agriculture in Asia: Research and Development Priorities**  
 11<sup>th</sup> and 12<sup>th</sup> April 2012,  
 Hotel Rama Gardens, Bangkok

Date	Time		Topic	Resource person
	From	To		

Chairman: H Konuma				
11 <sup>th</sup> April	08:00	09:00	Registration	Nirmal Sigtia, Urairat
	09:00	09:10	Welcome and initial remarks	R.S. Paroda, APAARI
	09:10	09:20	Welcome and initial remarks	B. Campbell, CCAFS
	09:20	09:35	Summary of regional initiatives	P.K. Aggarwal, CCAFS
	09:35	09:50	Inaugural address	J. Lengoasa, WMO
	9:50	10:00	Chair's remarks	H. Konuma, FAO
	10:00	10:20	Tea Break	
Session 1: Chairman: P Faylon				
	10:10	10:40	Climate services in agriculture	M. Sivakumar, WMO
	10:40	11:10	Adaptation to progressive climate change	T. Horie, NARO, Japan
	11:10	11:40	Mitigation in agriculture	P. Grace, AUT, Australia
Session 2: Chairman: Dr. Nguyen Van Bo				
	11:40	12:10	Agriculture in UNFCCC : Durban and beyond	B. Campbell, CIAT/CCAFS
	12:10	12:15	Remarks	Md. Sohrab Ali, Bangladesh
	12:15	12:20	Remarks	B.M.U.D..Basnayake, Sri Lanka
	12:20	12:25	Remarks	S.D. Attri, India
	12:25	12:30	Remarks	N. Sharma, Nepal
	12:30	12:35	Remarks	A. dePinto, IFPRI
	12:35	13:00	General Discussion	
	13:00	14:00	Lunch	
Session 3: Parallel group discussions (Goal: To identify 5 key priorities)				
	14:00-16:00		Group discussion on adaptation to	Chair : C.L.L. Gowda



Empowered lives.  
Resilient nations.

*Draft program of the Workshop on*  
**Climate Smart Agriculture in Asia: Research and Development Priorities**  
 11<sup>th</sup> and 12<sup>th</sup> April 2012,  
 Hotel Rama Gardens, Bangkok

Date	Time		Topic	Resource person
	From	To		
			climate change	Co-Chair : T. Horie Panelists: D. Beare, M. McCartney, A.K. Joshi, K.T. Shong, Le Thi Thu Ha
			Group discussion on mitigation in agriculture	Chair : A. dePinto Co-Chair : P. Grace Panelists: V.P. Singh, H. Pathak, J. Sander, A. dePinto, P. Mehta, H. Francisco
	16:00	16:30	Tea Break	
Session 4: Current state of research and development on climate smart agriculture. Chairman: M Sivakumar				
	16:30	16:40	Bangladesh	Md. R.I. Mondal
	16:40	16:50	India	J.C. Dagar
	16:50	17:00	Nepal	D.B. Gurung
	17:00	17:10	Pakistan	N. Ajmad
	17:10	17:30	Discussion	
	17:30	17:40	Vietnam	N.Van Bo
	17:40	17:50	Indonesia	A. Unadi
	17:50	18:00	Malaysia	D. Haron
	18:00	18:10	Philippines	P. Faylon
	18:10	18:20	Thailand	Thailand
	18:20	18:40	Discussion	
	18:40	18:50	Chair's remarks	
	19:00	21:00	Reception	
Session 5: Chairman: RS Paroda				
12 <sup>th</sup> April	08:30	09:00	Adapting to current weather variability	J. Hansen, IRI/CCAFS



Empowered lives.  
Resilient nations.

*Draft program of the Workshop on*  
**Climate Smart Agriculture in Asia: Research and Development Priorities**  
 11<sup>th</sup> and 12<sup>th</sup> April 2012,  
 Hotel Rama Gardens, Bangkok

Date	Time		Topic	Resource person
	From	To		
	09:00	09:30	Knowledge to action and policies for climate smart agriculture	P. Kristjanson, ICRAF/CCAFS
	9.30	10.00	Tea Break	
Session 6: Parallel group discussions (Goal: To identify 5 key priorities)				
	10:00 : 12:00		Adapting to current weather variability	Chair : M. Sivakumar; Co-Chair : J. Hansen Panelists: K.D. Sharma, M.R. Arif, S. Kinkgeo, J.A. Weerawardena, J. Jutakorn
			Knowledge to action and policies for climate smart agriculture	Chair : P.K. Joshi; Co-Chair : P. Kristjanson Panelists: P. Mehta, R. Lefroy, J.D. Samarsinghe, P.K. Joshi, K. Kamp
	12:00	13:00	Lunch	
Session 7: Plenary session: Reports from discussions (Goal: to shortlist a total of 10 key priority areas): Chairman : T. Horie: Facilitator: Helen Leitch				
	13.00	13.10	Adaptation to progressive climate change	Rapporteur Session 3a
	13.10	13.20	Mitigation in agriculture	Rapporteur Session 3b
	13.20	13.30	Adapting to current weather variability	Rapporteur Session 6a
	13.30	13.40	Knowledge to action and policies for climate smart agriculture	Rapporteur Session 6b
	13.40	14.00	Participatory prioritization exercise	H. Leitch
	14.00	14.30	Discussion	
	14.30	15.00	Tea Break	
Session 8: Concluding session on next steps and follow-up actions. Chair : RS Paroda, Co-Chair: B Campbell, M. Sivakumar				
	15.00	15.15	Research and development priorities for climate smart agriculture in Asia: Summary of Session 7	H. Leitch



Empowered lives.  
Resilient nations.

*Draft program of the Workshop on*  
**Climate Smart Agriculture in Asia: Research and Development Priorities**  
 11<sup>th</sup> and 12<sup>th</sup> April 2012,  
 Hotel Rama Gardens, Bangkok

Date	Time		Topic	Resource person
	From	To		
	15:15	15:25	Regional programs/projects of ADB and comments on R&D priorities	J. Zhang, ADB
	15:25	15:35	Regional programs/projects of IDRC and comments on R&D priorities	H. Francisco, IDRC
	15:35	15:45	Regional programs/projects of GIZ and comments on R&D priorities	L. Waldmueller, GIZ
	15:45	15:55	Regional programs/projects of Sustaining Human Progress in a Changing Climate: Greener Opportunities for Agriculture and comments on R&D priorities	A. Rajivan, UNDP
	15:55	16:05	Regional programs/projects of JIRCAS and comments on R&D priorities	T. Kawashima JIRCAS
	16:05	16:15	Regional programs/projects of USAID and comments on R&D priorities	Michael Satin, USAID
	16:15	16:25	Regional programs/projects of World Bank and comments on R&D priorities	World Bank
	16:25	16:35	Regional programs/projects of DFID and comments on R&D priorities	DFID
	16:35	17:00	General discussion, next steps, conclusions, and follow-up actions	
	17:00	17:30	Chair's remarks and close	





## **TSUKUBA DECLARATION on ADAPTING AGRICULTURE TO CLIMATE CHANGE**

The last few years have witnessed a wide range of concerns on climate change and the challenges associated with it, particularly as highlighted in IPCC reports. Several thematic conferences, symposium, workshops have been organized globally and the topic well-discussed. Emerging challenges are still being debated for an action-oriented approach impacting climate change. Overall, such global climate changes are affecting agriculture through their direct and indirect effects on crops, soils, livestock, pests and diseases, and hence global food security. And this challenge is more pertinent to Asia which is the home for more than one half of the world population. Alleviating poverty and attaining food security are the major concerns to most countries within Asia-Pacific region. Reorientation of agricultural research is thus considered imminent and is a global priority in the context of climate change.

APAARI through its expert consultations has been debating on emerging issues *vis-a-vis* ARD concerns in the Asia-Pacific region. Accordingly, adaptation to, and mitigation of climate change, was identified as an important subject by its members during an earlier Expert Consultation on “Research Need Assessment” organized in 2006. The issues of climate change and food crisis were also the major themes of the G8 Summit hosted by Japan in July 2008. All these events necessitated further debate on this topic with regional focus in view. Accordingly, APAARI and JIRCAS had jointly organized a “Symposium on Global Climate Change: Imperatives for Agricultural Research in Asia-Pacific” from 21-22 October 2008 at the International Congress Center, Tsukuba, Japan. This event was also co-sponsored by GFAR, CIMMYT, ICARDA, ICRISAT and AVRDC.

The Symposium was attended by 158 participants from 30 countries representing APAARI member NARS, CGIAR, IARCs, GFAR, ACIAR, JIRCAS, ARIs, universities, regional fora, NGOs, FOs, private sector and the donor organizations. The deliberations were conducted in four technical sessions that dealt with research strategies in national and international context, panel discussion on adaptation and mitigation options, followed by plenary session-emerging with specific recommendations. The landmark of the symposium was the “Tsukuba Declaration on Adapting Agriculture to Climate Change”, adopted unanimously by the participants.

APAARI has been instrumental in promoting regional cooperation for agricultural research in the Asia-Pacific region. In this context, it was agreed that APAARI, in collaboration with its stakeholders, especially CGIAR centers, ARIs, GFAR, regional fora, and its members, should continue facilitating regional collaboration on adaptation and mitigation to climate change in a consortium mode and also take advantage of new initiatives such as Challenge Program on Climate Change for future sustainability of all concerned in the region. APAARI looks forward to catalyse the process towards effective implementation of “Tsukuba Declaration”.





## **Tsukuba Declaration on**

### **Adapting Agriculture to Climate Change**

An International Symposium on 'Global Climate Change- Imperatives for Agricultural Research and Development' was held at Tsukuba, Japan from 21-22 October, 2008, organized jointly by Asia-Pacific Association of Agricultural Research Institutions (APAARI) and Japan International Research Centre for Agricultural Sciences (JIRCAS). In all, 158 participants from 30 countries, representing national agricultural research systems, regional and sub-regional organizations, universities, advanced research institutions, non-governmental organizations, the private sector, farmers' organizations, young professionals, multilateral and donor agencies, and international agricultural research centers of the Asia-Pacific region attended. The following '*Tsukuba Declaration on Adapting Agriculture to Climate Change*' was unanimously adopted.

- We recognize that the Asia-Pacific region sustains almost half of the global people, with high rates of population growth and poverty. Agriculture continues to play a critical role in terms of employment and livelihood security in all countries of the region. At the same time, this region has the largest concentration of hungry and malnourished people in the world. Droughts, floods, heat waves and cyclones occur regularly. Climate change is likely to raise regional temperatures and lead to decline in fresh water availability, sea level rise, and glacial melting in the Himalayas. We recognize that the IPCC has considered the developing countries of the Asia-Pacific region, especially the megadeltas of Asia as very vulnerable to climate change.
- Attainment of Millennium Development Goals (MDGs), particularly alleviating poverty, assuring food security and environmental sustainability against the background of declining natural resources, together with a changing climate scenario, presents a major challenge to most of the countries in the Asia-Pacific region during the 21<sup>st</sup> century.
- Water is a key constraint in the region for attaining food production targets and will remain so in future as well. Steps are, therefore, needed by all the stakeholders to prioritize enhancing water use efficiency. In addition, measures for water storage using proven approaches such as small on-farm ponds, large reservoirs, groundwater recharge and storage, and watershed approach managed by the farming communities require attention.
- We fully recognize that increasing food production locally will be the best option to reduce poor people's vulnerability to climate change variations. Available agricultural technologies can help increase the yield potential of crops that has not yet been tapped in many countries of the Asia-Pacific region. Hence, a concerted effort, backed by policy makers at the national level would be the key to enhance food security as well as ensuring agricultural sustainability.
- New genotypes tolerant to multiple stresses: drought, floods, heat, salinity, pests and diseases, will help further increase food production. This would require substantial breeding and biotechnology (including genetically modified varieties) related efforts based on collection, characterization, conservation and utilization of new genetic resources that have not been studied and used. CGIAR Centers, Advance Research Institutes (ARIs) and the National Agricultural Research Systems (NARS) of the region have a major role to play in this context.







This will require substantial support in terms of institutional infrastructure, human resource capacity and the required political will to take up associated agricultural reforms. We, therefore, fervently call upon the national policy makers, overseas development agencies (ODA), other donor communities as well as the Private Sector to increase their funding support for agricultural research for development in the Asia-Pacific region.

- We also recognize that a reliable and timely early warning system of impending climatic risks could help determination of the potential food insecure areas and communities. Such a system could be based on using modern tools of information and space technologies and is especially critical for monitoring cyclones, floods, drought and the movements of insects and pathogens. Advanced Research Institution, such as JIRCAS, could take the lead in establishing an 'Advance Center for Agricultural Research and Information on Global Climate Change' for serving the Asia-Pacific region.
- The increasing probability of floods and droughts and other climatic uncertainties may seriously increase the vulnerability of resource-poor farmers of the Asia-Pacific region to global climate change. Policies and institutions are needed that assist in spreading the risk and to provide protection against natural calamities, especially for the small farmers. Weather-crop/livestock insurance, coupled with standardized weather data collection, can greatly help in providing alternative options for adapting agriculture to increased climatic risks.
- Governments of the region should collaborate on priorities to secure effective adaptation and mitigation strategies and their effective implementation through creation of a regional fund for improving climatic services and for effective implementation of weather related risk management programs. Active participation of young professionals is also called for.
- We do recognize that there are several possible approaches to enhance carbon sequestration in the soils of the Asia-Pacific region such as greater adoption of scientific soil and crop management practices, improving degraded lands, enhanced fertilizer use efficiency, and large scale adoption of conservation agriculture. To be effective, these would require simultaneously improved use of inputs such as fertilizers, crop residues, labour and time. This soil carbon sequestration has the added potential advantage of advancing food security at the national/regional level. We do urge the global community to ensure appropriate pricing of soil carbon and related ecosystem/environmental services in order to motivate the small farmers to adopt new management practices that are linked to proper incentives and rewards.
- APAARI has been instrumental in stimulating regional cooperation for agricultural research in the Asia-Pacific. Global climate change and its implications for agriculture underline the need for such an organization to become even more active at this juncture. APAARI, in collaboration with its stakeholders, especially CGIAR Centers, ARIs, GFAR and other regional fora, should continue facilitating regional collaboration in a Consortium mode and take advantage of new initiatives such as Challenge Program on Climate Change for building required capability to adapt and mitigate the effects of climate change and ensure future sustainability of all concerned in the region.

