

Working Group on Global Climate Change and Agricultural Water Management (WG-CLIMATE)

October, 14, 2015

The Working Group on Global Climate Change and Agricultural Water Management (WG-CLIMATE) of ICID was approved to extend its term and mandate one year at the PCTA meeting of October 2014, at Gwangju, Korea, and is expected to continue its activities with reorganized Scoping Document. For this reorganization, this reports summarize its history, activities and achievements since its establishment in 2005 and future necessary works identified at this stage.

History and Mandates

The Working Group was established in 2005 with the name of “WG on Global Climate Change and Irrigation”, by well-designed coordination of a devoted leader Dr. Mark Svendsen. In 2007, it was renamed as “WG on Global Climate Change and Agricultural Water Management” with refining the target area expanding from just “irrigation” to the wider scope “water management”.

The establishment was based on the recognition that the looming climate change and its likely impacts on water management for agriculture require cooperation cutting across institutional and disciplinary boundaries. The WG set up the mandate to review the progression of and predictions for global climate change (GCC) and climate variability and to explore and analyze the medium-term implications of climate change and climate variability for irrigation, drainage, and flood management. Its formal mandates set up in 2005 are following:

- (i) To review the progression of and predictions for Global Climate Change (GCC) and climate variability,
- (ii) To explore and analyze the medium-term implications of climate change and climate variability for irrigation, drainage, and flood control,
- (iii) To stimulate discussion and raise awareness of water-related GCC issues within the ICID family,
- (iv) To stimulate discussion at national scales among scientists, policy makers, and, through the media, the general public on GCC and water, and
- (v) To join the international dialogue on GCC and water

Activities and Achievements

According to the mandate, the WG has tried to be an arena where relevant players or stakeholders may communicate and collaborate for intensification of data collection networks, research into methodologies to downscale the climate impacts on water and agriculture, review of the operation of storage systems, enhancing soil water storage with water harvesting structures, and sharing knowledge and information.

The WG has organized the workshops on climate change almost every year taking the opportunity of IEC of ICID. In the workshops, activities and outcomes of the WG members and observers were presented and shared for their further challenges, and stimulated discussion and raised awareness of water related GCC issues within the ICID network and at national scales among scientists and policy makers. The WG has been also collaborating with global partners like UN System wide Global Framework for Climate Services (GFCS) under the leadership of WMO.

Beside the workshops, the WG has organized some mini-seminar with presentations of the WG members as well as the participants at the WG annual meetings in the IEC as follows:

- **2006 in Kuala-Lumpur, Malaysia**
 - Presentations in the WG Meeting
 - 1) Dr. Mark Svendsen (USA)
 - 2) Dr. Tsugihiko Watanabe (Japan)
 - 3) Prof. Roland E. Schulze (South Africa)
 - 4) Dr. Ragab Ragab (UK)

- **2007 in Sacramento, USA**
 - Presentations in the Mimi-Workshop of the WG Meeting
 - 1) Dr. Avinash Tyagi, Director, Hydrology and Water Resources Department, WMO
 - 2) Dr. Paul Van Hofwegen, Program Director of the WWC
 - 3) Dr. Tsugihiko Watanabe, Professor, RHIN and Dr. Takanori Nagano (Kobe University)
 - 4) Dr. Kim Russell, Australia
 - 5) Dr. André Musy, Canada
 - 6) Dr. Ray-Shyun Wu, Chinese Taipei
 - 7) Ms. Nurgül Üzücek, Turkey
 - 8) Dr. Kanikicharla, India

- **2008 in Lahore, Pakistan**
 - Presentations in the WG Meeting

Mr. Maurice Roos, Department of Water Resources, California

- **2009 in New Delhi, India**
 - Presentations in the Mimi-Workshop of the WG Meeting
 - 1) Dr. A. K. Gosain, IIT-Delhi
 - 2) Mr. Maury Roos, California DWR
 - 3) Dr. Takao Masumoto, National Institute for Rural Engineering, Japan
 - 4) Prof. Hector Malano, Melbourn University, Australia
 - 5) Dr. Yih-Chi Tan, National Taiwan University, Chinese Taipei
 - 6) Dr. T. Watanabe, RIHN, Japan
 - 7) Dr. Jose Ortiz (prepared by J. A. Rodriguez Diaz)

- **2010 in Yogyakarta, Indonesia**
 - Workshop on “Climate Change and the Global Food Supply”
 - 1) Mr. Maurice ROOS, Chief Hydrologist, CA Department of Water Resources: Can We Save the California Delta From the Effects of Sea Level Rise?
 - 2) Dr. Shinsuke OTA, ARTF-CC: Japan's Countermeasures for Global Warming and Activities of Asian Regional Task Force on Climate Change

- 3) Prof. Sue Walker, University of the Free State: Agricultural Interventions for Climate Variability
- 4) Prof. Ray-Shyan Wu, National Central University, Chinese Taipei: Climate Change Adaptation Strategies for Irrigation Affairs In Taiwan

*At the New Delhi meeting, the WG accepted to accommodate the topic “Methane Flux from Irrigated Wetland Rice Fields”. Vice Chairman Dr. Watanabe introduce a new research program at RIHN of Japan on methane measurements from a new Japanese satellite from paddy fields.

- **2011 in Tehran, Iran**

Symposium on “Climate Change Impacts on Soil and Water Resources” in the ICID 21st Congress

* The symposium was co-sponsored by the WG-CLIMATE. In the Symposium, 10 papers (9 oral and 1 poster) were presented, including Ms. Sue Walker and Dr. Ray Shyan of the WG-CLIMATE.

- **2012 in Adelaide, Australia**

Presentation of the Asian Regional Task Force on Climate Change and Irrigation (ARTF-CC) in the WG meeting

The final report of ARTF-CC “Climate Change Adaptation for Irrigation and Drainage in Asia” prepared under the aegis of Asian Regional Working Group (ASRWG) was presented and its copy was distributed, which was released at the 6th World Water Forum (WWF6) in March 2012 at Marseille, France.

- **2013 in Mardin, Turkey**

International Workshop on “Management of Water, Crops and Soils under Climate Change”

International Workshop on “Management of Water, Crops and Soils under Climate Change” was held during the First World Irrigation Forum (WIF1) held on 2 October 2013. The workshop is organized jointly by WG-CROP and WG-CLIMATE. There, seventeen contributions both oral and posters were presented. The papers presented covered a wide range of climate change impact and offered solution to counter the impact through adaptation and mitigation measures. These covered the introduction of new water management techniques (e.g. SRI for Paddy Rice), new drought tolerant crops (e.g. Bambara groundnut), reducing greenhouse gases (NH₄, N₂O) through lowering the groundwater table, and reservoir management.

The main outcomes of the workshop include; 1) It was obvious from the presentations with global evidence that the climate change is a fact not a fiction and the scepticism about the climate change is reversing to believing in, 2) The current extreme weather events of drought, floods, hurricanes, tornados, and cyclones are becoming regular visitors more than ever, and 3) In agriculture industry, the impact is visible through the change in sowing and harvest dates, length of growing season, water availability for irrigation, evapo-transpiration and the shift in agro-climatic zones. The results also indicated that farmers are now familiar with the changing climate and are adjusting their activities accordingly. (Source: Summary Report of First World Irrigation Forum)

- **Presentations in the WG Meeting**
 - 1) Dr. Mark Svendsen (USA): Understanding the Impacts of Climate Change on Land and Water Use
 - 2) Prof. Sue Walker (South Africa): Crops for the Future Research Centre
- **2014 in Gwangju, Korea**
 - Presentations in the Mimi-Workshop of the WG Meeting
 - 1) Dr. Jacques PLANTEY, France: CIID/AFEID, GWP & France’s proposals for inputs to WWF7 and COP21 about water management and food security faced to climate change challenges
 - 2) Dr. WU Ray Shyan, Professor of Civil Eng., National Central University, Chinese-Taipei: Overview of Taiwan Climate Change Projection and Information Platform Project (TCCIP)
 - 3) Dr. TIAN Fuqiang, Associate Professor, Department of Hydraulic Engineering, Tsinghua University, China: Impact of climate change on human-water relationship: a socio-hydrological perspective in Tarim River basin of China
 - 4) Dr. Takao MASUMOTO, National Institute for Rural Engineering (NIRE), NARO, Japan: An Approach to Assessing Damage on Rice Yield associated with Paddy Inundation by Climate Change
 - 5) Dr. Udaya Sekhar NAGOTHU, Bioforsk (India/Norway): An integrated science-stakeholder-policy approach to develop Adaptation framework for Water and Agriculture sectors in selected states of India

The 22nd ICID Congress “Securing Water for Food and Rural Community under Climate Change”, 2014, in Gwangju, Korea

Question 58: “How Irrigation and Drainage play an important role in Climate Change Adaptation?”

Sub-questions;

- Q.58.1 “Understanding Impacts of Climate Change on Land and Water Use”,
- Q58.2 “Revisiting Design and Operation Criteria for Irrigation and Drainage Facilities”, and
- Q58.3 “Managing Frequent Floods and Droughts”.

On this Question 58, seventy five papers and posters are presented.

* Prof. Watanabe, the vice-chair of the WG-CLIMATE, acted as the General Reporter for Q.58 and delivered the General Report on 14 September and the Wrap-up presentation on September 16 in 22nd ICID Congress.

Future Necessary Works and Focal Points

Based on the review of the activities and achievements, the WG-CLIMATE has carried out the mandates well, even while not completed as planned at the initiation, and taking the current climate change issue and challenges and the new role of ICID for sustainable development into account, ICID should take continuous responsibility to assessing the climate change impacts on agricultural water management, preparing wise adaptation measures to them as well as developing mitigation strategies.

Since the future projection of climate change is becoming much more precise and reliable with higher temporal and spatial resolution and development of models for assessing the impacts and designing adaptation measures are also being accelerated, therefore at this stage, focus should be on information exchange and interconnectedness development in the community, compilation and archiving of experiences and case studies on climate change impact assessment and adaptation strategy from all over the world.

Another issue which needs consideration is how we can develop an integrated approach to address challenges of complex climate change and climate variability, since understanding of climate change issues, processes, assessment and adaptation planning at local scale is very limited.

With the progress of impact assessments, we also need to prepare exact guideline on adapting to the climate change and being prepared for future changes for local stakeholders, including policy makers and governmental engineers as well as farmers and water users. Then, for development of the guideline, it is be accelerated to promote archiving useful information and case studies on climate change for practical use in improved impact assessment and adaptation development.

