

**WORKING GROUP ON CLIMATE CHANGE AND
AGRICULTURAL WATER MANAGEMENT (WG-CLIMATE)**

11 August 2021, 12:30 to 14:00 hours (IST)

Member present: (1) Dr. Ray Shyan Wu, Chair (Chinese Taipei Committee); (2) Dr. Fuqiang Tian, Vice Chair (China); (3) Dr. Ragab Ragab (UK); (4) Dr. Anton Urfels, Direct Member (Germany); (5) Ms. Dilek Demirel Yazici (Turkey); (6) Mr. Atin Kumar Tyagi, Direct Member, JISL (India); (7) Dr. Sue Walker (South Africa); (8) Eng. Talatha Janaki Meegastenna (Sri Lanka); (9) Dr. Takatori Nagano (Japan); (10) Dr. Nozar Ghahreman (Iran); (11) Prof. Ashish Pandey (India); (12) Mr. Tikaram Baral (Nepal); (13) Eng. (Ms.) Nermeen Essam El-Tahan-Young Professional (Egypt); (14) Mr. Sunil Kumar (India).

Observer: (1) Dr. Tsugihiko Watanabe (Japan); (2) Mr. Harish Kumar Varma, ICID Central Office; (3) Fiaz Hussain; and (4) Ms. Cheng (Secretariat of CTCID).

Minutes Item 1: To welcome new members

1. The Chair Dr. Ray Shyan Wu welcomed all members present in the meeting and invited to briefly introduce themselves. [Full list of membership is given as **Appendix 1**]
2. The group accepted two new members viz. Prof. Ashish Pandey from India and Mr. Tikaram Baral from Nepal. The Chair expressed his deep welcome and asked them to introduce themselves.

Minutes Item 2: Brief follow-up to the last meeting of the WG in 2020

3. The Chair presented the report on the action taken on the decisions and proposals of the working group at its last meeting held in October 2020.
4. The group briefly reviewed the minutes of 2020 virtual meeting and recognized the importance of the work on climate change with a mention of the recently published AR6 by IPCC.
5. Dr. Ragab Ragab (UK), President of ICID, suggested that the Chair of the WG-CLIMATE to prepare some material as early as possible for the ICID News about the UN Climate Report published on August 9, 2021, and how ICID will address the issues raised in the report. Chair Dr. Ray Shyan Wu was committed to prepare some material for this task.

Minutes Item 3: Working progress on WG publication “Guide to Innovated Irrigation and Drainage Management under the Changing Climate”

6. During the last meeting in October 2020, all the WG members were invited to contribute to the publication, the Chair would send the related guidelines to all. Experts’ review was also needed.
7. The Chair has sent the guidelines to all the members to ask for more attribution. However, as there was little progress on the book, the group reviewed the table of contents of the publication and suggested a change of plan. A final output will still be presented, whether it be a book and/or other publications such as a review paper or case study to be published on a journal. Many members offered to contribute but a settled framework and timeline will be necessary. Every member should be responsible for the task and a certain delivery. [**Table of contents and sample chapter of the book is shown as Appendix 2**]

Minutes Item 4: Finalizing Draft Scoping Document Working Group on WG-CLIMATE

8. As the present tenure of the WG comes to closure in 2021, WG decided in the meeting in October 2020 to propose a new WG. The current mandate was submitted by Dr. Watanabe in 2015. Dr. Wu appreciated his efforts and will come up with an updated mandate proposal and show the group’s interest to PCTA in starting a new WG in 2022, with the inclusion of new nominees.
9. During the meeting, the group reviewed the draft scoping document of WG-CLIMATE. To differentiate WG-CLIMATE from other WGs with similar names, the group decided the name of the new WG to be “Agriculture Water Management under Changing Climate”.

10. However, due to the delay of the publication, the timeline of the WG needs to be reconsidered. The Chair welcomes any suggestion on the document and will decide if the group applies for one-year extension or submits the proposal of the new WG to the IEC by the end of the year. [**Scoping Document is shown as Appendix 3**]

Minutes Item 5: Suggestions on WG activities on 2021 meeting

11. The group will hold another virtual meeting before the 72nd IEC in Morocco by November and the Central Office will help to set up the meeting and provide more information to all members.

Minutes Item 6: Any Other Business

12. At the end of the virtual meeting, the Chair Dr. Ray Shyan Wu reiterated his request for contributions/proposals/ideas from the members to restructure the WG activities, especially to the publication plan. The new ideas are most welcome for updating the Action Plan as well as for the scoping document. The meeting ended with vote of thanks.



Membership list of WG-CLIMATE

Title	Name	Country	Email	Year	Position
Dr.	Ray Shyan Wu	Chinese Taipei Committee	raywu@ncu.edu.tw , raywux@gmail.com	2014	Chairman
Dr.	Fuqiang Tian	China	tianfq@tsinghua.edu.cn	2014	Vice Chair
Dr.	Waleed Hassan M. Abou El Hassan	Egypt	Waleed-hassan@live.com	2015	Secretary
Dr.	Jih-Shun, Liu	Chinese Taipei Committee	jsliu@aerc.org.tw	2018	
Eng (Ms.)	Nermeen Essam El-Tahan - YP	Egypt	eng_eltahan@yahoo.com	2017	
Mr.	Mika Tähtikarhu	Finland	mika.tahtikarhu@luke.fi , mika.t.turunen@gmail.com	2015	
Dr.	Anton Urfels (Direct Member)	Germany	anton.urfels@outlook.com , anton.urfels@wur.nl	2020	
Mr.	Sunil Kumar	India	bpdte@cw.cdelhi.nic.in	2021	
Dr.	Man Singh	India	mansingh61@ymail.com	2021	Provisional Member
Dr.	Ashish Pandey	India	ashisfwt@gmail.com , ashish.pandey@wr.iitr.ac.in	2021	
Mr.	Atin Kumar Tyagi – Direct Member, JISL	India	tyagi.atin@jains.com	2016	
Dr.	Nozar Ghahreman	Iran	nghahreman@ut.ac.ir , nghahreman@yahoo.com	2015	
Mr.	Jafer Kathom Alwan Alamiriyi (Young Professional)	Iraq	Jaferalwan1977@gmail.com	2016	
Prof.	Anna Dalla Marta	Italy	anna.dallamarta@unifi.it	2020	Provisional Member
Dr.	Ms. Kumiko Tsujimoto	Japan	tsujimoto@okayama-u.ac.jp	2020	
Dr.	Takanori Nagano	Japan	naganot@ruby.kobe-u.ac.jp	2020	
Prof.	Choi, Jin-Yong	South Korea	iamchoi@snu.ac.kr , jinyong.choi@gmail.com	2013	
Mr.	Tikaram Baral	Nepal	baral.tikaram@gmail.com	2021	
Engr.	Reynaldo L. Baloloy	Philippines	rbaloloy_cckeiy@yahoo.com	2019	
Prof.	Sue Walker	South Africa	walkers@arc.agric.za	2018	
Eng. (Ms.)	Talatha Janaki Meegstenna	Sri Lanka	janakimeega@hotmail.com , dpdcrip.irrigation@gmail.com	2016	
Ms.	DEMİREL YAZICI Dilek	Turkey	dilekdemirel@dsi.gov.tr	2017	
Dr.	Ragab Ragab	UK	ragab@icid.org	2021	
Mr.	Michael Davidson	USA	michaeldavidson24@gmail.com	2015	
Dr.	Tsugihiro Watanabe	Japan	nabe@kumamoto-u.ac.jp	2014	Observer
	WMO representative				Permanent Observer
	IWMI representative				Permanent Observer
	FAO representative				Permanent Observer

DRAFT TABLE OF CONTENTS

Tentative Title (tbd) :

Guide to Innovated Irrigation and Drainage Management under the Changing Climate

Table of Contents (Draft)

C.1 General Introduction

- 1.1 Overview of the changing climate as one of the most serious global issues
- 1.2 Agricultural water management as a mean to adapt to weather and climate
- 1.3 Outline of the recent problems in agriculture and water use due to the climate change

C.2 Impacts of climate change on agricultural water management

- 2.1 Global climate change
- 2.2 Impacts of climate change on basin hydrology and water resources
- 2.3 Impacts of climate change on agricultural production
- 2.4 Impacts of climate change on irrigation and drainage
- 2.5 Case studies on climate change impacts on agricultural water management

C.3 Adaptation to changing climate in agricultural water management

- 3.1 Adaptation in agricultural production:
 - crops -cropping pattern -cultivar and breeding -GM
- 3.2 Adaptation with irrigation and drainage management
 - expansion of irrigation, -on-farm water management practices, -application method,
 - drainage improvement
- 3.3 Countermeasures to climate change damages
 - warning system, -damage compensation, - insurances
- 3.4 Institutional modification to adapt to climate change in agricultural water management
 - governmental policy, -facility design criteria, -management organization
- 3.5 Case studies on adaptation to climate change in agricultural water management

C.4 Smart water management against the climate change

- 4.1 Smart agricultural water management as an innovated technology - overview
- 4.2 Smart water management for adapting to the changing climate
- 4.3 Smart water management for mitigating the climate change and for sustainable production

C.5 Case studies on climate change impact on agricultural water management and adaptation

C.6 Conclusion - Guide to Innovated Irrigation and Drainage Management under the Changing Climate

- 6.1 Information, technologies, and preparedness
- 6.2 Integrated and innovated assessment of climate change impacts
- 6.3 Preparation and attitude of establishment of adaptation strategy to changing climate
- 6.4 Promotion of smart water management
(Appendices if necessary)

DESCRIPTIVE SAMPLE

This working note is related to 5th virtual meeting of the working group on climate change and agricultural water management (WG-CLIMATE) 14 October 2020, where the chair and members decided to include a separate chapter (Case studies on climate change impact on agricultural water management and adaptation) in Table of content. Here we are provided you a sample (attached below) for reference, that can be used to prepare the case study short paper according to your research findings. The collection of comprehensive studies on climate change and adaptation can be an asset and helpful to conclude a policy statement and remarks on global and regional scale.

Following are some important information related to paper format and submission.

Important deadlines:

- Submission of Full papers: 15 January 2021
- Notification to Authors: 15 February 2021

Instructions for Authors:

- Manuscripts should be written in English. Abstracts not more than 200 words.
- 4 to 5 keywords for example Climate Change; Water Management; Adaptation.....
- Font: Time New Roman, 12 pt, Font color: Black, Justified, Line spacing: single
- Total page 8-12. A4 Size

References Style: following Irrigation and Drainage style

The paper can be submitted directly via email to following

1. raywux@gmail.com
2. enr.fiaz@uaar.edu.pk

Impacts of Climate Change on Agricultural Water Management and Adaptation in Northern Tiawan

ABC¹, XYZ²

ABSTRACT

This is a sample paper for the reference of working group on global climate change and agricultural water management (WG-CLIMATE). Manuscripts should be written in English. Abstracts not more than 200 words. The abstract should cover climate change impact on agricultural water management or adaption to climate change in agricultural water management or mixing of both. The study may be at farm level or sectoral level or regional level.

Keywords: 4 to 5 keywords should be given and placed below the abstract

1. Introduction

Section headings should be concise and numbered sequentially, using a decimal system for subsections. The Manuscripts should be typed single-column, single-spaced, using a font size of 12 points within 12 pages.

The introduction should cover the global as well as regional and local prospects of climate change impacts on agricultural water management and adaptation with up to date references. The scope of study and main objectives should be clear.

2. Materials and Methods

2.1. Study area description

The description of study area along with climatic variables, available water resources, existing cropping system and irrigation, water management is necessary.

2.2. Local observational evidence of changing climate

The historical records of climatic variables and up to date reference studies can be used as an evidence of climate change in the study area. The spatiotemporal record on seasonal and annual basis should be informative. For agricultural water management, the more focus should be on evapotranspiration, effective precipitation, streamflow and available water to crops. The Figure 1 and 2 are attached for reference related to variations in climatic variables at temporal and spatial scale.

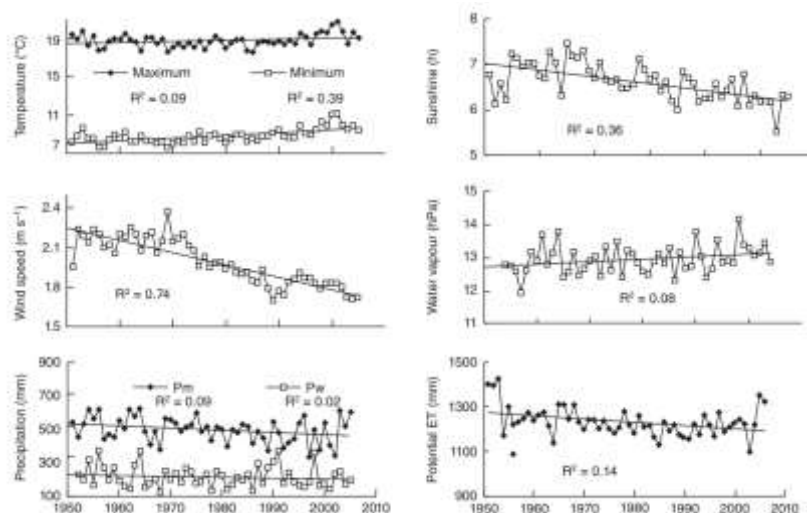


Figure 1: Annual variation of climatic variables (source: Xia et al., 2016)

¹ ABC, Department, University, City, Country, Tel: , E-mail:

² XYZ, Department, University, City, Country, Tel: , E-mail:

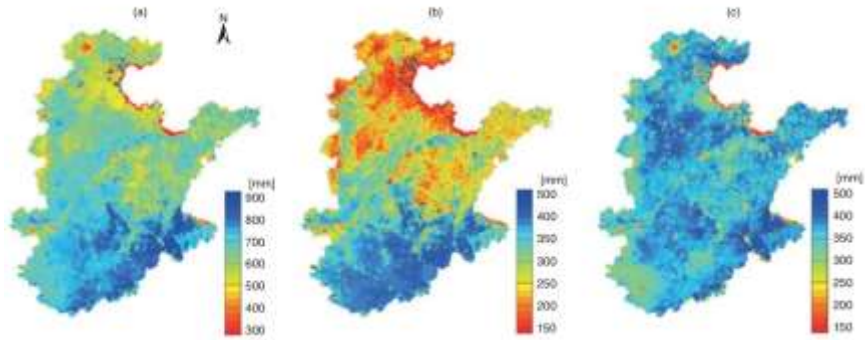


Figure 2: Decadal averages of evapotranspiration (a) on annual total, (b) in winter wheat-growing period and (c) in summer main-growing period, during 2000-2009.

2.3. Climate change scenarios and downscaling

GCM models provides the future climate and different RCPs scenarios can be used for short term 2030, medium term 2050 and long term 2070 changes in climate variables under considerations. The methodology of downscaling either statistical or dynamic is a key of future climate projection at regional or local scale from GCM models. So, the downscaling methodology should be provided.

2.4. Estimation/Calculation of Evapotranspiration and crop water requirement

The future projections of potential ET can be calculated or estimated using future climatic data with Modified Penman-Monteith method. This is one of the common methodology used by the researchers. The assumptions and limitations should be clearly described inside the methodology.

3. Results and Discussion

3.1. Impact of climate change on Agricultural water management

ET: The change of climatic parameters will cause a change in ET. Figure 3 represented the future ET projections for reference under A2 and B2 scenarios. The results should be temporal as well as spatial sale. Similarly, Figure 4 represent changes in ET and P under RCP scenarios.

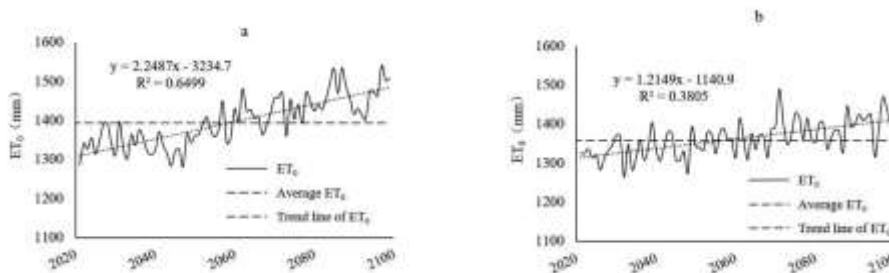


Figure 3: The temporal change of ET₀ during (a) 2021–2099 under scenario A2; (b) 2021–2099 under scenario B2 (source: Zhou et al., 2017).

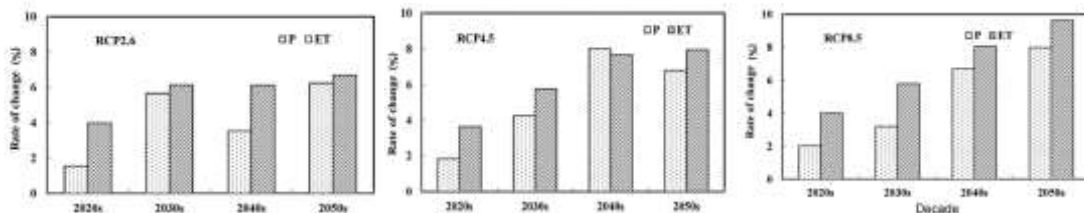


Figure 4: Decadal changes (relative to the 1990s) in precipitation (P) and actual evapotranspiration (ET) under three RCP scenarios (source: Mo et al., 2017)

Crop water requirement under climate scenarios: ET_c represents the CWR and future CWR under different potential scenarios should be presented as shown in Figure 5.

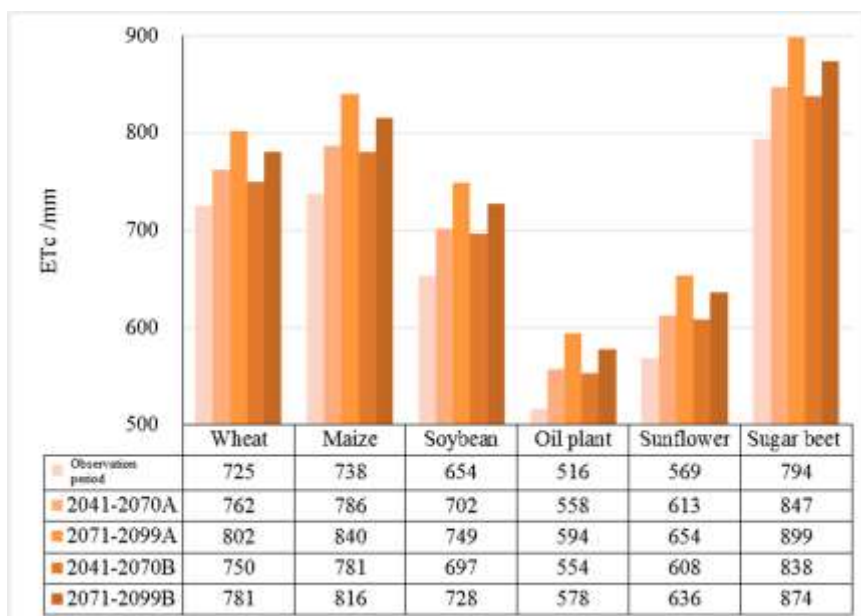


Figure 5: ETc of different crops in different periods (source: Zhou et al., 2017).

The difference in ETc and precipitation is the amount of water requirement that should be managed either via irrigation or conjunctive use or through crop varieties or through conservation of moistures in future. This leads to adaptive strategies of agricultural water management under climate change.

3.2. Adaptation's strategies in agricultural water management

Adaptations become necessary to cope with the impacts of climate change, especially for agricultural risk management. Some studies show that adaptations in agriculture may not be a concern because technological improvement (e.g., new crop varieties and better cropping practices) or policy reforms might far outweigh the effects. There are number of location specific adaptation strategies and measures that may be applied to increase climate resilience. These measures are based on best practices in the area, which may be modified to suite local conditions. Crop production system, there are many options for short-term risk management at farm level as well as long-term adaptation of agricultural sector (Debaeke et al., 2017, Lansigan et al., 2016).

Table is an example related to climate change adaptation strategies (source: De silva et al., 2017)

Table 3 - Climate change adaptation strategies, with examples for rice production in Sri Lanka	
Adaptation type	Examples of application
Share loss	<ul style="list-style-type: none"> Encourage farmers to diversify individual cropping, to share risk.
Bear loss	<ul style="list-style-type: none"> Where losses cannot be avoided or adaptation cost exceeds benefit.
Mitigate the effects: structural and technological	<ul style="list-style-type: none"> Increase reservoir capacity. Implement water efficiency schemes.
Mitigate the effects: legislative, regulatory and institutional	<ul style="list-style-type: none"> Change land-use planning practices. Change water allocation practices.
Avoid or exploit changes in risk	<ul style="list-style-type: none"> Move rice crop to lower-risk areas. Promote other agricultural crops. Change cropping calendar.
Research	<ul style="list-style-type: none"> Refine relationships between variations in climate, water resources and crop yield. Improve reliability and/or resolution of future climate variability models.
Education, behavioural	<ul style="list-style-type: none"> Increase farmer awareness of the need to take individual or communal action to prepare for climate change.

Source: Modified from Willows and Connell (2003), who modified from Burton (1996).

4. Conclusion

The conclusion part should cover brief results of research along with adaptations statement to cope with climate change for policy makers, water managers and farmers. Future work and recommendations also help in advance research based on local experience.

References (material used in this descripton)

De Silva, C.S., Weatherhead, E.K., Knox, J.W., and Rodriguez-Diaz, J.A. (2017). Predicting the impacts of climate change - A case study of paddy irrigation water requirements in Sri Lanka. *Agricultural Water Management*, AGWAT-2468.

Debaeke, P., Pellerin, S., and Scopel, E. (2017). Climate-smart cropping systems for temperate and tropical agriculture: mitigation, adaptation and trade-offs. *Cah. Agric.* 2017, 26, 34002.

Lansigan, F.P., and Cruz, A.C.D. (2016). *Climate Change Impacts and Adaptation in Agricultural Water Management in the Philippines*. In: Climate Change and Agricultural Water Management in Developing Countries (Eds: Hoanh et al., 2016). *CAB International* 2016, 78-96.

Mo, X-G., Hu, S., Lin, Z-H., Liu, S-X., and Xia J. (2017). Impacts of climate change on agricultural water resources and adaptation on the North China Plain. *Advances in Climate Change Research*, 8(2017): 93-98.

Xia, J., Mo, X., Wang, J., and Luo, X. (2016). Impacts of climate change and adaptation in agricultural water resources in North China. In: Climate Change and Agricultural Water Management in Developing Countries (Eds: Hoanh et al., 2016). *CAB International* 2016, 63-77.

Zhou, T., Wu, P., Sun, S., Li, X., Wang, Y., and Luan, X. (2017). Impact of Future Climate Change on Regional Crop Water Requirement - A Case Study of Hetao Irrigation District, China. *Water*, 9, 429. doi:10.3390/w9060429



WORKING GROUP ON SMART AGRICULTURAL WATER MANAGEMENT UNDER CHANGING CLIMATE (WG-CLIMATE)

Scoping Document

*(Prepared by **Ray-Shyan Wu** in consultation with Central Office and with contributions as received by e-mail from various specialists)*

1. Introduction

The ICID congress themes highlighted that the climate change needs to be recognized as an added stress on the increasingly uncertain complex and interlinked issues of rural development and food security under demographic changes, overstretched environmental and natural resources. As we still lack sufficient knowledge to better understand what is going on and what can be predicted in climate change with reasonable accuracy and cannot wait until whole understandings of the future climate change and its impacts are known. Challenges due to the climate change should be considered as another driving force to improve the irrigation and drainage system. It is therefore necessary to factor known impacts of climate change in all processes of planning, design, implementation, operation, maintenance and management of the irrigation and drainage activities. According to the Fifth Assessment Report of IPCC, it is extremely likely that human influence has been the dominant cause of global warming and the IPCC AR5 comprehensively assessed observed changes in the climate system based on available observational datasets. AR6 moves step forward with process-based understanding of climate change build on fundamental physical science.

The world has already warmed by 1 °C since pre-industrial times, due to human activity. On current trends, it is likely to pass the 1.5 °C mark between 2030 and 2052, which stresses on an urgent development of and efficient implementation of adaption measures based on present available information, including infrastructure improvement and institutional reorganization, design criteria revision and management strategy for the extreme events. Even many researches have been carried out all over the world with number of useful outcomes in terms of better availability of information related to climate, state-of-the-art techniques to evaluate and predict impacts of climate change including adaptation measures. Still it is felt that the challenges due to climate change in the irrigation, drainage and other relevant sectors would be long lasting which calls for focused and concerted efforts from all stakeholders.

With these situation and understandings on climate change and increased role of irrigation and drainage in achieving food security in the present situation, ICID as the platform for promoting the irrigation and drainage sector is under obligation to organize a semi-permanent or standing working group on climate change for the coming decades. ICID Working Group (hereafter referred as "Working Group" or "WG") on Climate Change and Agricultural Water Management (hereafter referred as "WG-CLIMATE"), which was established in 2005. 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 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. This was aiming at

- (a) developing arena where relevant players or stakeholders may communicate and collaborate for intensification of data collection networks,
- (b) research into methodologies to downscale the climate impacts on water and agriculture,
- (c) review of the operation of storage systems, enhancing soil water storage with water harvesting structures, and
- (d) sharing knowledge and information

Every third year ICID triennial Congresses are organized to discuss and evaluate the upcoming and dynamic changes within the water sector in the entire world. The 22nd ICID Congress main theme was “Securing Water for Food and Rural Community under Climate Change”. As it shows explicitly, the climate change is one of the most serious and urgent issue for human society and global environment. The theme was organized in the context that improving irrigation and drainage systems and rural development would play a key role in achieving the rural water and food security under impending climate change, especially in the developing countries. Under this theme, two congress questions were raised and the one related to climate change was “How Irrigation and Drainage play an important role in Climate Change Adaptation?” with three sub-questions: 1) Understanding Impacts of Climate Change on Land and Water Use, 2) Revisiting Design and Operation Criteria for Irrigation and Drainage Facilities, and 3) Managing Frequent Floods and Droughts. Similarly, 23rd ICID Congress organized at Mexico City in October 2017 with main theme “Modernization of Irrigation and Drainage towards a New Green Revolution” and two questions “Water Productivity, Revisiting the concepts in light of water, energy and food nexus” and “State of knowledge of irrigation techniques and practicalities within given socio-economic settings”. The adaptation of precision irrigation system using new technologies such as ICT, IoT, remote sensing, control system and modeling is the way toward modernization of irrigation and drainage under green revolution to combat water scarcity.

In the past decade, the WG-CLIMATE has performed well in the context of climate change impact on irrigation and drainage system and needs to be continued with updated objectives and mandate with focus on climate change adaptation, mitigation and smart agricultural water management.

2. Formal Mandates

The WG set up the mandate to review the progression of and predictions for Global Climate Change (GCC) variability and to explore and analyze the medium-term implications of climate change variability for irrigation, drainage, and flood management. It stimulates discussion and raises awareness of water related GCC issues within the ICID network and at national scales among scientists and policy makers. The WG collaborates with global partners like UN System wide Global Framework for Climate Services (GFCS) under the leadership of WMO.

2.1 *The WG Mandate 2005*

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

2.2 *The WG Mandate 2015*

- (a) To share the information about future prediction of the global and regional climate change and climate variability,
- (b) To explore and analyze the implications of climate change and climate variability for agricultural water management including irrigation, drainage, and flood control,
- (c) To promote archiving useful information and case studies on climate change for practical use in improved impact assessment and adaptation development,
- (d) To enhance discussion on climate change and water management at national and regional scales among the stakeholders including academicians, practitioners, decision makers, media as well as farmers and water users in a region,
- (e) To join the international dialogue on Climate change and water management.

2.3 *Activities and outcomes*

The WG personnel are approved and recommended by the national committee of ICID member and permanent observers. At the occasion of the WG meeting in the IEC in October 2015, the countries of members include Japan (Chairperson), Chinese Taipei (vice-chairperson), China (Secretary), and members from South Africa, Indonesia, Spain, Turkey, and Korea. The Secretary General of ICID is a member, and Representatives of WMO, IFPRI, IWMI and FAO are the permanent observers.

The WG has organized the workshop on climate change almost every year taking the opportunity of IEC of ICID. In the workshop, activities and outcomes of the WG members and observers were presented and shared for their further challenges. Especially, in the First World Irrigation Forum, held in Mardin, Turkey in 2013, the WG co-organized the Workshop “Management of Water, Crops and Soils under Climate Change”. There, seventeen contributions both oral and posters were presented. 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 skepticism 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, evapotranspiration and the shift in agro-climatic zones. 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 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)

Dr. T. Watanabe (Honorable Chairperson) served as the general reporter for the main theme (Question 58) of ICID 22nd Congress “How Irrigation and Drainage play an important role in Climate Change Adaptation”. The outcomes consist of climate change impact assessment via suitable scenarios, models and applications. Design and operation criteria for irrigation modernization, improvement and planning via facilities and institutions for food and water security under climate change. The activities of the WG-CLIMATE for 2017 to 2021 are only for the Goals B and D of ICID vision 2030, also activities involved in the whole process of the ICID activities due to the characteristics of climate change. The strategies involved integrated irrigation and drainage management, helping development of climate change adaptation strategy, develop guideline for water management practices under changing climate, prepare position paper on smart water management for mitigation and adaptation of climate change, develop integrated impact assessment of climate change with case studies and apply to other regions.

2.4 *71st IEC Virtual Meeting (2020)*

The outbreak of the COVID-19 pandemic has affected everyone and the irrigation sector is no different. Given the emerging situation of COVID-19, many meetings have been postponed until the situation comes under control. With this difficult situation, members were requested to make full use of web-ex platform for virtual meeting to ensure regular contribution from the WG members as well as to discuss and initiate follow-up actions emerging from the minutes of the previous WG meeting and review the progress of the action points. Accordingly, in order to organize the WebEx Meetings, Webinars and e-Discussions, ICID Central Office requested Chairs of the workbodies to initiate the processes. The following activities and actions were taken in WebEx meetings.

- (a) Updated the membership of WG-CLIMATE. Dr. Ray Shyan Wu was elected as the new Chair, Dr. Fuqiang Tian, as the new Vice Chair, and Dr. Waleed Hassan as the new Secretary.
- (b) Forward the publication planning “Guide to Innovated Irrigation and Drainage Management under the Changing Climate”.
- (c) Continuation in exchange of information, knowledge & networking via updating website of the WG and Multilingual Technical Dictionary (MTD).
- (d) The present tenure of the WG as established in 2015 comes to a closure in 2021. The WG decided to propose a new updated mandate proposal and scoping document.

3. Proposal for reconstitution of WG

Based on the current climate change issue and challenges and the new role ICID is to play in sustainable development, review of past activities and outcomes of the WG, the mandate, scope and timelines for reconstitution of WG are defined as follows:

Due to the COVID-19 pandemic, the working methodology of WG is also affected and new WG decided to continue virtually. WG propose a new name of group with same basic theme i.e. "Climate Change and Agricultural Water Management". The new WG decided to continue the previous work as affected by COVID-19 with updated mandate up to 2028.

3.1 The WG new Name:

"Smart Agricultural Water Management under Changing Climate "

3.2 The WG Main Objectives:

The original objectives of the WG are still relevant and to be carried over:

- (a) To prepare the arena and develop network for cooperation cutting across institutional and disciplinary boundaries. It includes sharing the useful information, applicable methods, and case studies (both successful and unsuccessful).
- (b) Focus 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.
- (c) Develop more understanding in an integrated manner with focus on inter-sectoral and trans-boundary approach.

3.3 Updated Mandate 2021:

Since climate change future projections are much more precise and reliable with higher temporal and spatial resolution and development of models for assessing the impacts and designing adaptation measures are being accelerated. Therefore, it is a need of time to develop an integrated approach to address challenges of complex climate change and climate variability as assessment and adaptation planning at local scale. So keeping in view the climate change adaptation and mitigation for agricultural water management at local scale, the following updated mandate is proposed.

- (a) To explore and analyze future prediction of the global and regional climate change variability and its implications for agricultural water management
- (b) Exchange useful information and experience from successful and unsuccessful case studies at local scale on climate change for practical use in improved impact assessment and adaptation development
- (c) To prepare "Guide to Innovated Irrigation and Drainage Management under Changing Climate" for knowledge sharing about climate change adaptation, mitigation for smart agricultural water use
- (d) To enhance interaction on climate change mitigation and adaptation for agricultural water management at national and regional scales among the stakeholders including academicians, practitioners, decision makers, media as well as farmers and water users in a region,
- (e) To join the international dialogue on climate change and water management.

3.4 Relevance of the Working Group:

The relevance of the WG can be specified as follows:

- (a) The topic of climate change and water management is relevant to the vision and mission of ICID and of higher interest for its members, especially in the developing countries that are sensitive and vulnerable to climate change;
- (b) The WG is expected to contribute to effective implementation of the strategy theme Basin and to other strategy themes for that matter;
- (c) It may be expected that, in the coming period, climate change impact and adaptation strategies be factored in all processes and activities of irrigation and drainage.

3.5 *Existing gap that the Working Group is expected to fill*

Almost all other ICID Working Groups and Task Forces have a related scope of climate change, especially WG-CROP, WG-ON-FARM, WG-WFE-N, WG-SDTA, WG-ENV, WG-CAFM, WG-DROUGHT, and WG-BIO-ENERGY. The Working Group will coordinate these groups for sharing information, collaborating works and enhancing discussion about climate change as cross cutting issue.

3.6 *Expected collaboration with other International Organizations*

International Organizations (ADB, FAO, IFPRI, IWMI, WB, WMO etc.) can contribute to the activities of the WG as Permanent Observers (PO). On the other hand, presentations on the works and achievements of the WG could be presented at the occasion of events organized by International Organizations.

4. **Work Plan**

4.1 *Scope:*

The WG is expected to investigate, analyze, and disseminate information on new developments and to formulate recommendations. The plan is with respect to:

- (a) The progression of and predictions for climate change and climate variability
- (b) The medium-term adaptation strategies of climate change and climate variability for irrigation, drainage, and flood control
- (c) The water environment issues relating to climate change within the scope of agricultural water management activities within ICID
- (d) The international dialogue on climate change and agricultural water environment between regions and countries.

A proposal for the six-year rolling plan is shown in **Appendix A**.

4.2 *Target audience:*

The target audience for this working group will be meteorologists, farmers, managers of irrigation schemes, researchers, consultants, government officials, and staff of international organizations working on the topic.

4.3 *Outputs*

The expected outputs can be expected from this WG:

- (a) Sharing knowledge and experiences with and by the representatives of NCs, and disseminating this knowledge within their country;
- (b) Presenting condensed overview of existing key reports (IPCC, UNESCO, WMO, etc.), national adaptation guidelines and other relevant publications on the topic;
- (c) Organizing or co-organizing at least one workshop, seminar or symposium in every two years at occasion of an international ICID meeting; and
- (d) Distributing ICID experiences in practice for adaptation to climate change in irrigation, drainage and flood sector

4.4 *Timelines*

While climate change is a very important and complex issue to deal with in the management of agricultural water sectors, it is recommended that the term of this WG will be set further for next six years up to 2027. The timeline would have to be based on the scope of work and the expected outputs. Details of the timeline would have to be formulated and refined at the meetings of the WG.

4.5 Collaborators and dissemination strategy

4.5.1 The WG would have to base its activities on an open attitude with a clear scope for invitation of outsiders.

4.5.2 The dissemination strategy would have to be based of reaching those who can apply the findings and recommendations of the WG in their research and especially in policy development, decision making and implementation in practice.

4.6 Core Group and Members

This draft has been circulated among the members of WG-climate. Comments received from the members of the WG have been included in this scoping document. The Core Group consists of:

Convener (Chair):	Prof. Ray-Shyan Wu	(Chinese Taipei Committee)
Vice Chair:	Dr. Fuqiang Tian	(China)
Secretary:	Dr. Waleed Hassan M. Abou El Hassan	(Egypt)
Members:	Prof. Sue Walker	(South Africa)
	Prof. Choi, Jin-Yong	(South Korea)
	Mr. Jafer Kathom Alwan Alamiryi	(Iraq)
	Eng. Janaki Meegstenna	(Sri Lanka)
	Ms. Dilek Demirel Yazici	(Turkey)
	Dr. Jih Shun Liu	(Chinese Taipei Committee)
	Eng (Ms.) Nermeen Essam El-Tahan	(Egypt)
	Engr. Reynaldo L. Baloloy	(Philippines)
	Dr. Kumiko TSUJIMOTO	(Japan)
	Dr. Mika Tähtikarhu	(Finland)
	Dr. Nozar Ghahreman	(Iran)
	Mr. Michael Davidson	(United States of America)
	Dr. Takanori NAGANO	(Japan)
Direct Member:	Dr. Anton Urfels	(Germany)
Observer:	Prof. Dr. Tsugihiko WATANABE	(Japan)
Provisional Member:	Prof. Anna Dalla Marta	(Italy)



SIX YEAR ROLLING PLAN

Item of Mandate	2021	2022	2023	2024	2025	2026	2027	2028	
Mailing the Scoping Document to participants (current WG Climate)	Yellow								Chairperson, Vice-Chair and Secretary of WG Climate
Comments on Scoping Document,	Yellow								Web meeting
Finalizing Scoping Document and detailing of Work plan on 72 st ICE	Red								Chairperson, Vice-Chair and Secretary
Invitation to NC for nominations and information		Blue							Central Office
Submission of nominations and information		Light Blue							National Committees
Meeting in 24 th Congress, Adelaide, Australia			Red						Members and Permanent Observers. Electing Chairperson, Vice-Chair and Secretary
Finalize Climate Change guide book	Blue	Blue	Blue						Selected / nominated members
Meeting in 74 th ICE Beijing China			Red						Members and Permanent Observers
Meeting in 25 th Congress Andhra Pradesh State, India				Red					Members and Permanent Observers
Side event with workshop on AR6 topics				Green					Selected members
Meeting in 76 th ICE Sydney Australia					Red				Members and Permanent Observers
Meeting in 77 th ICE TBA						Red			Members and Permanent Observers
Side event with workshop on topics						Green			Selected members
Meeting in 78 th ICE TBA							Red		Members and Permanent Observers
Side event with workshop on topics							Green		Selected members
Meeting in 79 th ICE TBA								Red	Members and Permanent Observers
Position paper on key issues related to the Climate Change Smart Agricultural Water Management								Blue	Chairperson, Vice-Chair and Secretary

