

Annual Report

2016-17



Agricultural Water Management for Sustainable Rural Development



ICID•CIID

INTERNATIONAL COMMISSION ON IRRIGATION AND DRAINAGE



ANNUAL REPORT 2016-17

WHO WE ARE

The International Commission on Irrigation and Drainage (ICID) is a technical and voluntary not-for profit non-governmental international organization (NGO), dedicated, inter alia, to enhance the world-wide supply of food and fibre for all people by improving water and land management, and the productivity of irrigated and drained lands.

ABOUT THIS REPORT

This Annual Report for the financial year 2016-17 provides a glimpse of the activities undertaken by ICID as a network along with its partners.

FIND OUT MORE ABOUT THE ACTIVITIES OF ICID AT: www.icid.org

OR WRITE TO

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ICID OFFICE BEARERS



Dr. Saeed Nairizi (Iran)
2014-2017

President



Er. Avinash C. Tyagi (India)
2012-2018

Secretary General



Dr. Mohamed Abd-El-Moneim Wahba (Egypt)

Vice President 2014-17



Dr. Ding Kunlun
(China)

Vice President 2014-17



Mr. Bong Hoon Lee
(Republic of Korea)

Vice President 2014-17



Prof. Dr. Charlotte de faiture
(The Netherlands)

Vice President 2015-18



Mr. Lan William Makin
(UK)

Vice President 2015-18



Prof. Dr. Abdelhafid
Debbarh (Morocco)

Vice President 2015-18



Dr. (Mrs.) Irena G.
Bondarik (Russia)

Vice President 2016-19



Mr. Waseem Nazir
(Pakistan)

Vice President 2016-19



Er. Madhav Belbase
(Nepal)

Vice President 2016-19



FOREWORD

2016, year of the Monkey, as per the Chinese zodiac, started the action phase of realizing the targets under Sustainable Development Goals (SDGs). The phase is going to be tougher than the consensus development phase, as it would require sharing, cooperation and collaboration among all sectoral development players-within and among the nations.

As part of the process for developing strategies for realization of goals for ICID Vision 2030 that was initiated in Montpellier in September 2015, discussions with the members of WGs, NC representatives and Officer Bearers continued during the 67th IEC Meeting in Chiang Mai. All the stakeholders were engaged to deliberate upon their concerns, expectations and possible contributions for revitalization of NCs in order to fulfil their national role and undertake financial sustainability review of the organization. The Road Map, so developed includes the ICID Vision 2030, the organization goals and the strategies to realize the vision. The Working Groups, Regional Working Groups, NCs and Central Office have developed an Action Plan, identifying the activities that would be undertaken by each one of them during the period 2017-21. An important aspect of the Road Map is working together with all the stakeholders.

The Second World Irrigation Forum at Chiang Mai, Thailand, in November 2016, has taken this multi-stakeholder platform to the next level with more than 17 side events organized by various stakeholders bringing different perspective into discussions. Participating senior officers and Ministers together with important group of stakeholders, decided to establish a High Level Advisory Group on “Partnerships for Agriculture Water Management” as an action-oriented, multi-stakeholder mechanism to facilitate improving agricultural water productivity. It envisages to support member countries in achieving the SDG targets related to agricultural water management, and advocate for higher investments in irrigation and drainage sector.

The role of water as an enabler in realizing the social, economic, and environmental dimensions of sustainable development is fully recognized. Progress towards SDG 6 to “Ensure availability and sustainable management of water and sanitation for all” and many targets across other SDGs are interdependent.

A global indicator framework was developed by the Inter-Agency and Expert Group on SDG Indicators and agreed upon, including refinements on several indicators, at the 48th session of the United Nations Statistical Commission held in March 2017. The framework has subsequently been adopted by the UN General Assembly in June 2017. Multi-stakeholder partnerships to exploit the resources, knowledge and ingenuity of the relevant stakeholders have been recognized as essential elements. Efforts would have to be reinforced to mobilize and share knowledge, expertise, technology and financial resources that would complement the efforts of Governments and provide support towards the achievement of Sustainable Development Goals.

In an effort to facilitate better understanding among experts across institutions and disciplines and to address multi-disciplinary AWM issues, ICID initiated Webinar services during the year. Webinars on topics such as 'Water Productivity and Water Use Efficiency' and 'Water Accounting and Audit' received a very encouraging response with an outreach to more than 100 participants in each of the webinars. In the coming years, more such tools are planned to be developed and disseminated through reinforced Knowledge Management activities.

The challenge of diminishing interest among the young professionals in the agriculture water disciplines has been confronted with concerted efforts to get the young professionals interested in this sector through the ICID Young Professional's e-Forum (IYPeF), where more than 250 professionals are participating. Some of the NCs, such as CNCID and KCID, have facilitated the participation of Young Professionals from around the world at various ICID events, with support from International Partners such as WMO, FAO, etc.

During the year, many experts from member countries and partner organizations and direct members, working on a voluntary basis, shared their knowledge and expertise to fulfil the mandate of ICID. Although the complete list of such contributions is provided in the acknowledgment section of this report, I would particularly like to mention: Mr. Sanchai Ketworrachai, Chairman of the Thai National Committee of ICID, whose untiring efforts saw the successful organization of the Second World Irrigation Forum. Special thanks are due to Dr. Hüseyin GÜNDÜĞDÜ, Vice President, who in association with the members of Consultative Group, interacted with the network members, experts in agriculture water management and other stakeholders to develop the Road Map for ICID Vision 2030. I acknowledge the dedication of all the volunteers.

In December 2016, the United Nations General Assembly unanimously adopted the resolution declaring "International Decade (2018–2028) for Action – Water for Sustainable Development" to help put a greater focus on water during the next ten years. The resolution together with the Road Map to ICID Vision 2030, would help the member countries in moving towards the 'Future We Want'.



Avinash C. Tyagi
Secretary General



ABOUT ICID

The International Commission on Irrigation and Drainage (ICID), established in 1950 is a leading scientific, technical, international not-for-profit, non-governmental organization. ICID is a professional network of experts from across the world in the field of irrigation, drainage, and flood management. The main mission is to promote 'Sustainable agriculture water management' to achieve 'Water secure world free of poverty and hunger through sustainable rural development'.

ICID is a knowledge sharing platform dedicated to issues that covers the entire spectrum of agricultural water management practices ranging from rainfed agriculture to supplemental irrigation, land drainage, deficit irrigation to full irrigation, etc. In addition, drainage of agricultural lands forms the core theme of commission's activities. Floods and drought; the two extremes of increasingly variable climate as a result of potential climate change, also form the focus of activities.



VISION

Water secure World, free of poverty and hunger achieved through sustainable rural development".

MISSION

To work together towards sustainable agriculture water management through inter-disciplinary approaches to economically viable, socially acceptable and environmentally sound irrigation, drainage and flood management.



Organizational Goals

In order to fulfill the mission and realise the Vision 2030, ICID has set the following six organizational goals:



We fulfill our mission through generation, exchange and dissemination of knowledge

ICID is a widely recognized international organization with global flagship programs in 'Irrigation and Drainage'. The Commission promotes its mission by pooling and sharing of knowledge on the topics related to irrigation, drainage and flood management and making it available worldwide; addressing emerging problems and challenges by promoting evolution of suitable remedial measures; promoting water savings / conservation in agriculture; promoting equity including gender equity between users and beneficiaries; and promoting preservation and improvement of soil and water quality of irrigated lands; etc.

ICID provides a unique platform to the participants related to agricultural water management for the exchange of knowledge and information through triennial International Congress on Irrigation and Drainage to deliberate on certain specific Questions related to irrigation and drainage; and World Irrigation Forum (WIF) to bring together all the stakeholders involved in AWM.

ICID works in close collaboration with many international and regional organizations having similar objectives such as FAO, IFAD, IWMI, World Bank, ADB, UN-Water, WMO, UNDP, GWP, WWC, ICRISAT, ICARDA, AWC, WFO etc.

We address multi-disciplinary aspects of irrigation and drainage by synergizing all stakeholders

ICID is profoundly concerned with the sustainable development of irrigation and drainage while preserving the environment and is working towards social equity. As such the Commission is not merely technical but also concerned with the global development issues. It studies the close nexus between water, food, land, energy and eco-system.

The Commission with active support from its member countries, and stakeholders, provides an international forum and network (World Irrigation Forum) in which the technical, agronomic, socioeconomic, environmental and managerial complexities involved in the development, management and operation of irrigation, drainage and flood management works are discussed.



Recognizing that irrigation and drainage is not just an engineering activity, ICID also covers related agronomic, social, financial, and environmental aspects. The questions addressed by various triennial Congresses <http://www.icid.org/past_congresses.html> clearly indicates a progressive shift from deliberating on purely technical questions to global water and food related issues and the sustainability of development.

To achieve this purpose, ICID draws together diverse disciplines and a pool of over 300 eminent professionals/experts involved in the field of irrigation, drainage and flood management from all over the world. These professionals through technical and strategic workbodies address topics of current importance in developing/emerging, least developed and developed countries.

ICID works towards creating a synergy between agriculture and water policies, and increased investment both from public and private sources for sustainable development of irrigation and drainage. As farmers are at the core of agricultural water use and the principal stakeholders, ICID therefore promotes Participatory Irrigation Management (PIM)/ Management Transfer (MT) to enhance the performance of irrigation schemes.

Organization Structure and Management

ICID has a membership of more than 80 countries spread across the world. ICID promotes its objective through its network of National Committees (NC), like-minded international organizations, private companies, institutions, and professional individual members. The membership of the Commission primarily comprises of NCs representing their member countries. NCs in turn have their own membership of individuals, institutions and private companies from their countries. Direct Membership for institutions, companies and individuals

is also available, where the constitution of a NC does not have a provision for the ICID participation for individuals and private institutions / companies. Direct Membership is also available for those countries that are not a member of ICID, provided such members abide by the constitution of ICID.

ICID achieves its mission through voluntary contribution of experts from the NCs, Direct Members and Partner Organizations. An International Executive Council (IEC) supported by the Management Board (MB) governs its activities. The Commission is presently assisted in its strategic, administrative and technical matters by three Administrative Committees, three Permanent Committees, three Regional Working Groups, twenty Technical Working Groups and Task Forces.

International Executive Council

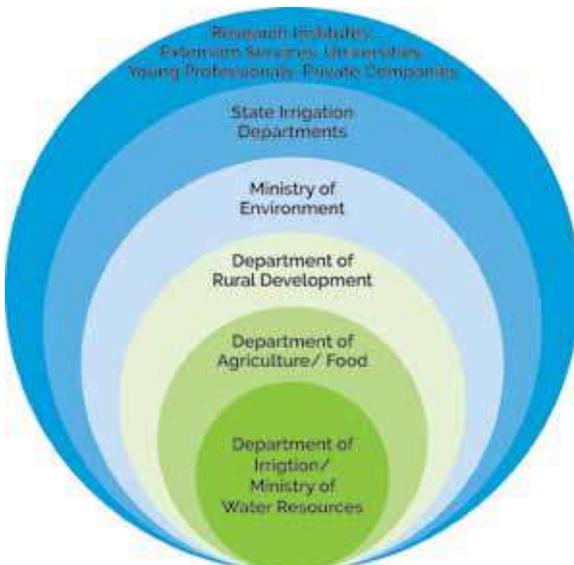


The International Executive Council (IEC), the General Body of the network is composed of one representative from each NC and the Office Bearers (OB): President, Secretary General, and nine Vice Presidents. All are vested with the management of the affairs of the Commission.

The Council meets each year and take up all the matters of policy which may be initiated or sponsored by any member of the NCs OBs or by the MB and might itself initiate or otherwise advise and lay down any matter of policy. All matters affecting the executive or administrative function and financial liabilities of ICID come up before the Council whose decisions are conclusive. IEC is presided over by

the President, who is also responsible for the direction to the Central Office. The Secretary General, who is the Chief Executive Officer (CEO), also serves as the Treasurer of the Commission.

National Committees



National Committees (NC) are the building blocks of the Commission and the main vehicle in advancing its mission. Any geographical area independently administered by a sovereign government and having interest in the activities of the Commission is eligible to become a member by establishing a NC.

NCs comprises of a wide network of representatives of experts from the government, technical and scientific organizations, governments and non-government institutions, irrigators, companies and individuals with interests in, concerned with, or desirous of promoting and furthering the mission and goals of the commission.

NCs are generally hosted by the government departments of irrigation or water resources or agriculture or rural development and provide multi-disciplinary platforms within the countries bringing together all the relevant stakeholders.

NCs disseminate the generated knowledge and share them at the ICID platform with the national stakeholders by organizing national activities: annual conferences, workshops and seminars or through publications in their respective countries.

Management Board

The Management Board (MB) comprises the President, immediate Past President (for one year only), Chairpersons of the Permanent Committee on Technical Activities (PCTA), Permanent Finance Committee (PFC), Permanent Committee on Strategy and Organization (PCSO) and the Secretary General. The Management Board (MB) is responsible for the implementation of the decisions made by the Council through the Central Office (CO) and also decides such actions in between Council meetings as are necessary to properly effect the working of the Commission.

ICID MEMBERSHIP NETWORK 2017



ICID NETWORK COUNTRIES

Sl. No.	National Committees	Acronym	Year of Joining
1	Australia	IAL (ICID NCA)	1952
2	Bangladesh	BANCID	1973
3	Brazil*	ABID	1970
4	Burkina Faso	CNID-B	2014
5	Canada	CANCID	1956
6	Chad	ATID	2012
7	China	CNCID	1983
8	Croatia	CRCID	1993
9	Czech Republic	CZNC-ICID	1997
10	Egypt*	ENCID	1950
11	Estonia	ESTICID	2001
12	Ethiopia	ETCID	1976
13	Fiji	FIJICID	2010
14	Finland	FINCID	2000
15	France	AFEID	1953
16	Hungary	HUCID	1955
17	India*	INCSW	1950
18	Indonesia*	INACID	1950
19	Iran	IRNCID	1955
20	Iraq	IRQCID	2006
21	Ireland	IRCID	1978
22	Italy*	ITAL-ICID	1950
23	Japan	JNC-ICID	1951
24	Kazakhstan	KAZCID	2006
25	Korea, Rep. of	KCID	1969
26	Madagascar	MADCID	2014
27	Malawi	MALCID	1967
28	Malaysia	MANCID	1958
29	Mali	AMID	2005
30	Mexico	MXCID	1951
31	Morocco	ANAFIDE	1959
32	Myanmar	MNCID	1962
33	Nepal	NENCID	1973
34	Netherlands*	NETHCID	1950
35	Niger	ANID	2007
36	Nigeria	NINCID	1970
37	Pakistan	PANCID	1953
38	Philippines	PNC-ICID	1956
39	Portugal	PNCID	1954
40	Romania	CNRID	1992

41	Russia	RUCID	1955
42	Saudi Arabia	SACID	1977
43	Slovenia	SINCID	1992
44	Somalia	SONCID	2017
45	South Africa	SANCID	1993
46	Spain	CERYD	1955
47	Sri Lanka*	SLNICID	1950
48	Sudan	SNCID	1964
49	Switzerland*	CH-AGRAM	1951
50	Tajikistan	TAJCID	2014
51	Tanzania	TANCID	2011
52	Thailand*	THAICID	1950
53	Turkey*	TUCID	1954
54	Ukraine	UACID	1996
55	United Kingdom	IWF/ICID.UK	1951
56	United States of America	USCID	1951
57	Uzbekistan	UzNCID	1994
58	Zambia	ZACID	1966
59	Zimbabwe	ZwCID	1955
Committee			
60	Chinese Taipei	CTCID	1969
Associate Members			
61	Afghanistan	AFGICID	2008 (2014) ¹
62	Austria	AUNCID	1954 (2015)
63	Bulgaria	BNCID	1960 (2006)
64	Germany	GECID	1957 (2015)
65	Greece	GRCID	1957 (2012)
66	Guyana	GUCID	1957 (2012)
67	Israel	ISCID	1950 (2012)
68	Kyrgyz Republic	KYRCID	2004 (2010)
69	Lithuania	LTCID	1994 (2014)
70	Macedonia	MAKCID	1995 (2010)
71	Mozambique	MOCID	1978 (2006)
72	Poland	POCID	1967 (2006)
73	Serbia (erstwhile Yugoslavia*)	YUGCID	2002 (2012)
74	Slovak Republic	SKNC-ICID	1996 (2006)
75	Syria	SYCID	1962 (2014)
76	Uruguay	URUCID	2007 (2012)

* Founder Member

¹ Year in parenthesis is of the NC becoming inactive

Permanent Committees

Permanent Committee on Strategy and Organization



Permanent Committee on Strategy and Organization Permanent Committee on Strategy and Organization (PCSO), as the name suggests, develops the strategy of the Commission and is concerned with increasing the membership and assisting the National Committees to become more active in their own countries to achieve the goals set for them from time-to-time. The Committee also undertakes issues related to strategic planning for ICID and coordinates the activities of Vice Presidents in their respective areas. Presently, PCSO is chaired by Vice President Bong Hoon Lee (Korea), since 2016.

Permanent Committee for Technical Activities



Permanent Committee for Technical Activities (PCTA) guides the technical activities of the Commission. It guides the activities of the technical working groups, selects Questions for Congresses, themes for World Irrigation Forum, Conferences, Special Sessions, and Symposia, and makes appropriate recommendations for actions there on. Vice President Dr. Ding Kunlun is chairing the PCTA since 2016.

Permanent Finance Committee



Permanent Finance Committee (PFC) guides all the financial matters of the Commission. It reviews the receipts and expenditures of the Commission, advises the Council on budgetary allocations, and recommends the rate of annual subscriptions and other support from the participating countries. It guides Secretary General on the elements to be taken into account while preparing the annual budgets. Vice President Hon. Laurie C. Tollefson (Canada) is chairing the Committee since 2014.

Central Office



The Secretariat of ICID, known as the 'Central Office (CO)' is located in New Delhi, India. Secretary General, as the Chief Executive Officer is responsible for the day-to-day affairs of CO and is assisted by a small team. A Staff Committee (SC) reviews and formulates the work procedures and the staff structure of CO, in keeping with the dynamic requirements, and advises the Secretary General.

The Central Office facilitates a knowledge sharing platform by hosting the website (www.icid.org) to fulfil its mission. CO also facilitates and coordinates annual meetings of various workbodies and Executive Council by compiling agenda and minutes, disseminating knowledge by bringing out in-house periodicals like weekly e-Bulletin, monthly News Update, and quarterly ICID News on regular basis in English and French (ICID official languages). It also houses a library having good collection of technical books, reports, proceedings, periodicals and ICID publications.

The Central Office building is maintained as a green building with provision of solar energy generation system commissioned in 2015 for reducing its Carbon Footprints, rainwater harvesting and use of raw water for gardening purposes.



MILESTONES IN THE HISTORY OF ICID

2001-2010

- Released MTD CD-ROM in multiple languages in 2010
- Release Special Postal Cover on 60th Anniversary, 2009
- Country Policy Support Program (CPSP), 2002-2007
- Start of Best Paper Award, 2006
- Best Performing WB and NC award, 2003
- Released 1st Edition of MTD CD-ROM, 2001
- Renamed ICID Journal as "Irrigation and Drainage", 2001

1981-1990

- IPTRID started, 1990
- ICID News Update started, 1990
- Joint Publication with World Bank, 1989
- Received UN Peace Messenger Award, 1987
- ICID Newsletter started, 1986
- First Worldwide Micro-Irrigation Survey, 1982
- N.D. Gulhati Lecture started, 1981

1961-1970

- Multilingual Technical Dictionary (MTD) released, 1967
- Central Office building inaugurated by the then Vice President of India, Dr. Zakir Hussain, 1966

2010-2017

- Established ICID Webinar Services, 2017
- Renamed International Micro Irrigation Symposium as International Micro Irrigation Conference, 2015
- Established ICID Young Professional e-Forum (IYPeF), 2015
- Released web version of the Multilingual Technical Dictionary (MTD), 2015
- Organized First World Irrigation Forum (WIF1), 2013
- Established Scheme for Recognition of Heritage Irrigation Structures (HIS), 2013
- Established Scholarships to Young Professionals, 2013
- Micro Irrigation Congress renamed as International Micro Irrigation Symposium 2012
- Direct Membership to Companies /Institutions and Individuals, 2012
- Launched on Social Media (Facebook, YouTube), 2012
- Established World Irrigation and Drainage Prize, 2012
- Elected to WWC Board of Governors, 2012
- ICID e-Bulletin (English and French) started 2012

1991-2000

- International Micro Irrigation Congress taken over by ICID, 2000
- Guidelines on Benchmarking, 2000
- Release of Special Postal cover on Diamond Jubilee Year, 2000
- Launch of Website, 1999
- Start of WATSAVE Awards 1998
- ICID Journal started, 1995
- Young Professional Forum (YPF) established, 1994
- Global Water Saving/ Conservation Program initiated, 1993
- Change of Logo, 1992

1971-1980

- First Irrigation and Drainage Workshop, Wageningen, 1978
- Joint Publication with FAO, 1975
- Release of Special Postal cover on Silver Jubilee Year, 1975

1951-1960

- Irrigation and Drainage - A Global Review, the First Publication released, 1955
- ICID Bulletin started, 1952
- First Congress organized in New Delhi, India, 1951
- Change of name as International Commission on Irrigation and Drainage (ICID), 1951
- First International Executive Council (IEC) meeting in Shimla, India, 1950
- Established on 24 June 1950 as International Commission on Irrigation and Canals (ICIC), with 11 founding member countries

WORKING TOGETHER

National Committees

There is a need to narrow the gap between water supply and demand through increasing irrigation efficiency, use of non-conventional water resources including reuse of water, amendment to cropping pattern, reducing losses especially evaporation loss etc. Since the increasing population and climate change is putting water under increasing stress, water needs to be managed more prudently. Each country and region would have to envision its own Green Revolution duly keeping water at the core. The National Committees (NCs) would be required to take up this challenge. NCs can improve their profile within their countries by broad basing their structure to include all stakeholders related to AWM; through formalizing linkages with the relevant government departments and ministries; implementing proper information dissemination policy; and organizing at least one annual event to showcase their activities and provide platform for networking etc.

Irrigation Australia's Committee on Irrigation and Drainage

The Queensland Regional Committee of Irrigation Australia celebrated World Water Day on 22nd March 2017 by organizing a meeting, wherein around 35 attendees participated. Irrigation Australia CEO Mr. Bryan Ward delivered a brief background on the importance of celebrating World Water Day. The event provided a great opportunity to network with fellow industry professionals, stay informed on the Irrigation Australia's industry news, training opportunities and study about the products and services available at KSB.



As part of the exchange programme Mr. Phil Price participated in the International Workshop on 'Piped Irrigation Network' which was organized by the Indian National Committee on Surface Water (INCSW) from 16th -17th March in New Delhi, India. Mr. Momir Vranes, Chair (IACID) visited ICID Central Office on 3rd February 2017 and discussed IACID's participation in the 23rd ICID Congress, Mexico, October 2017, submission of country paper for the International Symposium, and preparatory processes for the 24th ICID Congress in Sydney, Australia, September 2020.



A three-day Irrigation Australia International Conference and Exhibition was organized from 24th-26th May 2016 at Melbourne Convention & Exhibition Centre, Victoria, Australia. The theme of the conference was "Irrigation for prosperity and wellbeing". It addressed the latest issues in irrigation and water management including, agricultural irrigation, green walls, intensive horticulture, turf farms, irrigation technology, soil management, climate issues etc. More than 140 exhibiting companies, 100 speakers and 3500 industry professionals attended the conference. Mr. Momir Vranes and Ms. Kathleen Heuvel took over as new Chair and Deputy Chair of IACID.

Bangladesh National Committee



The Ministry of Water Resources in association with other organizations/ departments observed the World Water Day all over the country. A special supplement containing messages from Honourable President, Prime Minister, Minister of Water Resources, and State Minister of Water Resources, and higher officials on 'The Role of the Ministry of Water Resources on the Sustainable Management of Water Resources' were published in leading national newspapers.

The Bangladesh National Committee (BANCID) organized a seminar on the theme “Wastewater” on 28th March 2017 under the guidance of the Ministry of Water Recourses and in association with Bangladesh Water Development Board (BWDB), Institute of Water Modeling (IWM) and Center for Environmental and Geographic Information Services (CEGIS). Mr. Muhammad Nazrul Islam, Bir Protik, MP, Honorable State Minister, Ministry of Water Recourses graced the occasion as Chief Guests. Dr. Zafar Ahmed Khan, Senior Secretary, Ministry of Water Recourses attended the seminar as Special Guest. The Seminar was chaired by Mr. Md. Jahangir Kabir, Director General of BWDB and Chairman, BANCID. Eminent water experts and engineers from different government and non-government organizations, academicians and representatives from NGO’s attended the seminar. Mr. Md. Mahfuzur Rahman took over as Chairman of BANCID.

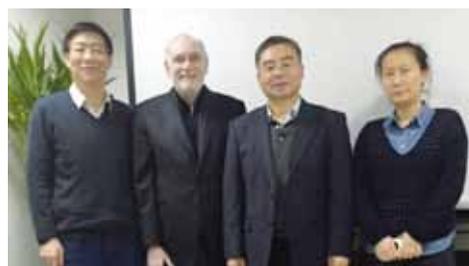
Canadian National Committee

President Hon. Dr. Chandra Madramootoo visited the ICID Central Office on 27th September 2016 and discussed the recent initiatives and progress in respect of ICID Action Plan 2030, Heritage Irrigation Structures (HIS), and Capacity Development and Training. During the meeting, preparation of the 69th IEC Meeting and International Conference on Innovative and Sustainable Agri-water Management: Adapting to a Variable and Changing Climate to be organized by Canadian National Committee (CANCID) in August 2018 in Saskatoon, Canada and input of ICID to the 8th World Water Forum were also discussed. Mr. Roger Hohm is appointed as the new President of CANCID.



Chinese National Committee

As part of inter-NC exchange of experts, Dr. Li Yunpeng, IWHR participated in the India Water Week 2016, 4-8 April 2016, organized by INCSW to present Chinese experience in the session PD-3- Learnings from Ancient wisdom and Traditional Experience. Vice President Waseem Nazir (Pakistan) visited Chinese National Committee on Irrigation and Drainage (CNCID) at Beijing, China on 29th November 2016 for strengthening cooperation between CNCID and Pakistan National Committee on Irrigation and Drainage (PANCID). During the meeting, strengthening of cooperation between PANCID and CNCID on matters of mutual interest and relationship between the ICID active member countries were explored. Cooperation opportunity among two countries viz. CNCID and PANCID enterprises in the field of irrigation and drainage was discussed and it also agreed to explore possibilities of collaboration between MM Pakistan (Pvt.) Ltd., and China Institute of Water Resources and Hydropower Research (IWHR).



Prof. Cheng Xianjun and Prof. Liu Qunchang participated in the International Workshop on ‘Piped Irrigation Network’ which was organized by the Indian National Committee on Surface Water (INCSW) from 16th -17th March in New Delhi, India. Prof. Cheng Xianjun and Prof. Liu Qunchang made a presentation on ‘Modernisation of Irrigation Systems using Piped Irrigation Network- Experiences from China’.

Egyptian National Committee

The Egyptian National Committee on Irrigation and Drainage (ENCID) organized the 4th African Regional Conference on Irrigation and Drainage (ARCID) from 26th -28th April 2016 on the theme ‘Agricultural Land and Water Management for Sustainability under Climate Variability’. Around 250 participants attended the conference representing 31 countries. The was inaugurated by H.E. Prof. Mohamed Abdel Atty, Minister of Water Resources and Irrigation, Egypt in the august presence of H.E. Magdy Hegazy, Governor of Aswan, H.E. Om Prakash Dhankar, Minister of Irrigation, Agriculture and Rural Development, Haryana State, India, H.E. Eng. Wassfi Hassan El-Sreihin, Secretary General, African-Asian Rural Development organization (AARDO), Dr. Saeed Nairizi, President ICID, VPH Dr. M.H. Amer, Chairman, ENCID, and an elite assembly of national, regional and international scientists, experts and professionals in the fields of irrigation, drainage, agriculture, environment and related fields.



ENCID in coordination with the Regional Center for Training and Water Studies (RCTWS) organized a short training programme from 18th -24th April 2016 on "On-farm Water Use and Management" for participants from African countries.

Association Française pour l'Etude des Irrigations et du Drainage

A Symposium on 'Compatibility of irrigation and agro-ecology' was organized by the Association Française pour l'Etude des Irrigations et du Drainage, French National Committee (AFEID) in partnership with the Société du canal de Provence (SCP), the Association of Irrigators of the French Mediterranean Regions (AIRMF) and the Chair of AgroSYS / Montpellier SupAgro on 22nd November 2016 in Aix-en Provence, France. More than 200 researchers, farmers, agronomists and politicians attended the symposium and discussed the complex relationship between irrigation and agro-ecology. During the Symposium, role of irrigation was discussed, which has powerful level to accompany the necessary agro-ecological change of agriculture in most sectors like cereals, cultivation of fruit trees, market gardening, wine growing, seeds production, etc. It was highlighted that the irrigation can contribute effectively to the sustainability of agro-ecosystems in the Mediterranean region, both economically and ecologically.

A meeting with the irrigation management and development agencies was organized by COSTEA (AFEID/ AFD) with the collaboration of the World Bank and the CILSS in May 2016 in Burkina Faso. The Association Française pour l'Etude des Irrigations et du Drainage, AFEID manages a Scientific and Technical Committee for Water in Agriculture, with the support of the French Agency for Development (AFD) since 2013.

Indian National Committee on Surface Water



The World Water Day 2017 was organized by the Indian National Committee (INCSW) in association with the Ministry of Water Resources; and Central Water Commission (CWC). A conference on Wastewater - Monitoring and Management was organized on 22nd March 2017 in New Delhi as part of the celebration. The event was graced by the presence of the Hon'ble Union Minister of Water Resources Sushri Uma Bharti, Hon'ble Union Minister of State for Water Resources, Mr. Vijay Goyal, and Dr. Amarjit Singh, Secretary, MoWR. More than 200 professionals from water resources sector attended the conference. Secretary General Avinash Tyagi made a presentation on UN World Water Development Report 2017.

In order to share experiences in the planning, design, implementation and management of piped irrigation networks for conveyance of irrigation water from the source (river, tank, canal etc.) up to the farm level an International Workshop on 'Piped Irrigation Network' was organized by INCSW and Central Water Commission from 16th -17th March 2017 in New Delhi, India. More than 100 participants attended the workshop. During the workshop, various sessions were organized and deliberated on issues associated with piped irrigation network maintenance and management, feasibility of converting existing canal distribution systems to piped distribution system etc. Mr. Phil Price from Australia; Prof. Cheng Xianjun and Prof. Liu Qunchang from China; Mr. Berat Kocan from Turkey participated in the workshop and shared their countries experience in respect of piped irrigation network.

INCSW organized the 2nd R&D Session on 5th September 2016 in New Delhi, India. Chairman, INCSW delivered a keynote address and highlighted the role of R&D in water sector in developed countries. Renowned experts shared their views on various topics including the requirement of environmental flows in water resources projects.



The 4th India Water Week (IWW4) on the theme 'Water for All: Striving Together' was organized by Ministry of Water Resources, River Development & Ganga Rejuvenation in cooperation with INCSW, a number of national and international partners from 4th -8th April 2016 in New Delhi, India. H.E. Uri Ariel, Agriculture Minister of Israel inaugurated Water Week along with Hon'ble Union Minister of Water Resources Sushri Uma Bharati; Union Finance Minister Shri Arun Jaitley; Union Agriculture Minister Shri Radha Mohan Singh; Union Environment Minister Shri Prakash Javadekar; and Chief Minister of Madhya Pradesh Shivraj Singh Chouhan. A large number of technical sessions viz. Seminars, Brainstorming Sessions, Panel Discussions, Case Study including Side Events and Exhibition named as 'India Water Expo 2016' were organized.

The Valedictory Function of the 4th India Water Week was attended by President Pranab Mukherjee who called for undertaking a multi-disciplinary approach to water management in the country and stressed that, any strategy for efficient water management would remain incomplete without the active involvement of the community.

INCSW with support of ICID organized the First India Irrigation Forum (IIF1) on the theme “Innovative Techniques for Improving Water Use Efficiency (WUE) of Irrigation Systems and Farm Application”. on 7th April 2016.. IIF on the lines of WIF provide a platform for networking, interaction, exchanging experiences and sharing of knowledge amongst professionals engaged in AWM. The inaugural session on management issues was chaired by Dr. Takashi Matsuo (ADB). A wide range of topics were presented by SG Er. Avinash C. Tyagi, SGH Dr. Madhav A. Chitale, Vice President Ian Makin, and Dr. Martin Burton (UK).

ICID Central Office also participated in a panel discussion on ‘Water Management: Learning from Ancient Wisdom and Traditional Practices’. The Secretary General informed the audience about ICID initiatives to recognize the heritage irrigation structures and the HIS Register maintained on the ICID website. Er. Narendra Kumar took over as Chairman of the INCSW and CWC.

Iranian National Committee

The 13th International Drainage Workshop (IDW13) was organized by the Iranian National Committee on Irrigation and Drainage (IRNCID) under the auspices of the Ministry of Energy (MoE) and its subsidiary Khuzestan Water and Power Authority (KWPA), Islamic Republic of Iran from 4th -7th March 2017 in Ahwaz, Iran. The main theme of the workshop was “Drainage and Environmental Sustainability”. About 700 delegates from 23 countries attended the workshop and 36 papers were presented with 27 poster presentations. The theme was supported by rich discussions during the two roundtable meetings- “Alternative Drainage Methods” moderated by VPH Dr. Willem Vlotman and ex-Chair WG on Drainage and “Drainage Water Reuse” was moderated by Prof. Reisberk.



IRNCID organized its Annual Meeting on 5th January 2017 in Tehran in the presence of President Dr. Saeed Nairizi. During the meeting, presentations on ‘IRNCID Annual Performance’, ‘Introduction & Performance of International Research Program for Irrigation and Drainage’, and ‘13th International Drainage Workshop of ICID’ were made by Ms. Sahar Norouzi, Executive Secretary; Dr. M.J. Monem; and Ms. Dr. Narges Zohrabi, respectively. In addition, a short film on IRNCID events since 1970 and exchanging view-points on challenges, objectives and programs of IRNCID activities were part of the annual meeting. In the meeting, Eng. Mehrzad Ehsani took over as new Secretary General of IRNCID replacing Mr. S. A. Assadollahi, Ex-Secretary General, IRNCID who retired after 30 years of service.

A two-day International Research Cooperation Workshop on “Sustainable Agricultural Water Management” was hosted by the Khuzestan Water and Power Authority (KWPA) in Ahwaz, from 14th -15th August 2016 with representatives from Russia, Iraq, South Korea and Mali as well as relevant managers, authorities, researchers and professors participating in the event. Mr. M.R. Shamsaei, Chairman & Managing Director of KWPA and Dr. Shariatee, Khuzestan Governor General welcomed the participants and highlighted the importance of water and irrigation issues in Khuzestan and the requirement of regional cooperation in relevant researches to solve the existing problems. H.E. R. Maydani, Deputy Minister of Energy on Water and Wastewater highlighted the water crisis conditions in Iran and the region in particular, and recommended harmonious scientific approaches to overcome the crisis and solve water and irrigation issues. Dr. Saeed Nairizi emphasized the importance of irrigation and drainage researches in food security, and regional and international cooperation in supplying sufficient food production.

The Iran Regional Node Management Board session was organized on 15th August 2016 with the Chair of IRNCID in the presence of President Dr. Nairizi. SG ICID participated in the discussions through Skype. During the workshop, international cooperation mechanisms on irrigation and drainage research and extension methods, capacity building and research achievements in the methods of supplying the program required credits were discussed. Mr. Monem, Dr. Irena Bondarik, Mr. Seung Won Lee and Ms. Narges Zohrabi were nominated as the Secretary for the period of 3 years during the session.

Iraqi National Committee



The Ministry of Water Resources celebrated the World Water Day 2017 event. H.E. Minister of Water Resources Dr. Hassan Janabi in his welcome speech stressed the active role of the Ministry and its keenness to organize number of scientific and technical activities to raise the awareness about the importance of water supply, problems and solutions. President Dr. Fuad Masum also addressed the gathering and praised the efforts of preservation and rehabilitation works in of large projects in irrigation sector that will raise water shares to serve the people and agricultural lands.

IRQCID participated in the 1st Scientific Conference of the Mosul Dam on “The Safety of Mosul Dam is a national priority” organized under the patronage of H.E. Dr. Fuad Maasom, President of Iraq Republic and the Minister of Water Resources Dr. Hassan Al-Janaabi from 19th -20th March 2017. The conference was attended by local and international scientific institutes as well as global academics. During the meeting, cooperation between two countries in the fields of development and joint water resources investment were discussed with the Turkish Minister of Forestry and Water Affairs. IRQCID participated in the Workshop of “Water footprint in accordance with ISO-14046 specification” organised by the Iraqi Central Organization for Standardization and Quality Control (COSQC) in Baghdad from 27th February to 1st March 2017. During the workshop, both public and private sector, academics and professionals in the field of water and sustainable development were also participated. Contributed to the Arab Water Day’s ceremony organized by the Iraqi Ministry of Water Resources on 2 March 2017 wherein different lectures about marshes, biodiversity and international heritage were presented.

Participated in the 2nd Conference on Sustainable and Renewable Energy organized by Iraqi Engineers Society in cooperation with the Iraqi Ministry of Hider Education and Scientific Research in Baghdad from 26-27 November 2016. Also participated in the workshop organized by the International Bank in the Netherlands from 19-23 September 2016. Participated in the International Training Course on “Adaptation with the climate change for lands and water sustainable management in the tidal zone” organized by CTCID from 1-6 August 2016 in Taiwan.

Italian National Committee



President Dr. Saeed Nairizi alongwith Dr. Marco Arcieri, Secretary General (ITAL-ICID) attended the ceremony of the World Food Day (WFD) on 14th October 2016 which was organized by Food and Agriculture Organization of the United Nations (FAO) at FAO Headquarters, Italy on the theme “Climate is changing, Food and Agriculture must too”. H.E. Matteo Renzi, Prime Minister of Italy; Dr. Kanayo Nwanze, President of IFAD; and Mr. Ertharin Cousin, Executive Director of World Food Programme graced the event.

Using this opportunity, President Dr. Nairizi held a fruitful discussion with Dr. Emilio Gatto, Director-General of Ministry of Agriculture & Head of the Department of Rural Development and met a delegation of ITAL-ICID. During the discussion, Dr. Nairizi explained about the International Research Program for Irrigation and Drainage (IRPID) which is conceptualized as a programme for developing and implementing research agenda in the irrigation and drainage to meet the challenges of water and food security. President Dr. Nairizi recalled that Italy, with its strategic position within the Mediterranean region, has a long history and experience in leading cooperation and research programs. President Nairizi emphasized that a database of research institutions engaged in AWM within the other regional explore the possibility of hosting the Regional Node (RN) of IRPID.

Japanese National Committee

The Japanese National Committee (JNC-ICID) chaired by Dr. Yohei SATO, has utilized the recognition of HIS program of ICID a means to connect to the irrigation utilities. This year JNC-ICID recorded another 7 heritage irrigation structures and cleared 7 provisional structures from previous year. With this inclusion a total 27 structures from Japan are part of the Register which are publicized nationally through the local media. A ceremony for HIS registered structures was organized by JNC-ICID on 14th December 2016 and handing out the certification and plaques to each manager of the site. The ceremony was publicized through media viz.

TV and newspaper. On 27th October, the first Council Meeting of the newly elected JNC-ICID was organized nearby Uwae Irrigation Canal (a recognized HIS structure) located in Myoko city, wherein members and representatives of the National Committee and the National Federation of Land Improvement Association attended the meeting. JNC-ICID also holds regular meetings to share information.

JAICID, a support organization for JNC-ICID, organized its Annual General meeting on 20th July. A seminar on "The future view regarding sustainable irrigation and drainage project: the possibility of industry- academia-government collaboration" was sponsored by JAICID on 12th January 2017 for Young Irrigation Professionals where four presentations were made by young professionals including Mr. Uno, Ministry of Agriculture, Forestry and Fisheries; and a lecture was delivered by a senior professional.

Korean National Committee

The Korea Rural Community Corporation (KRC) organized a special Water Security and Agriculture Workshop on 9th March 2017 to commemorate the World Water Day 2017. Professor Dr. Jae-Kwon Son of Chonbuk National University, Vice Chairman of Korean National Committee on Irrigation and Drainage (KCID) made a keynote speech on 'Climate Change and Water Resources'. He highlighted that the explosive growth of the world population needs more food in opposition to increasing difficulties on food production due to climate change and it is necessary to build an effective water management system and to develop alternative water resources including underground reservoirs. During the workshop, 300 specialists shared management methods of water resources and discussed future direction to develop projects on rehabilitation of irrigation and drainage system.



VP Bong Hoon Lee, Chairman of KCID along with delegates from KRC participated in the 13th International Drainage Workshop (IDW13), 2nd meeting of the Management Board of Iran Regional Node of IRPID and 2nd Joint Technical Committee (JTC) meeting between KRC and Khuzestan Water and Power Authority (KWPA), March 2017 in Ahwaz, Iran. In the 2nd JTC meeting, KRC and KWPA agreed to pursue a pilot project on ICT-based Smart Water Management System (SWMS) development in Khuzestan. The project is expected to help in solving the region's water shortages and will benefit water management.

VP Bong Hoon, Lee, Chairman of KCID participated in the PAWEES's Small Conference on Agricultural Water for the Development of Rural Society in Asia in Daejeon, Korea on 20 October 2016, which aims to share agricultural water management and development and improvement of livelihood of rural community in Asia.

A Korean delegation comprising officials from Korea Rural Community Corporation (KRC) under the leadership of Dr. Ryu, Jeon-Yong, visited ICID Central Office on 18th May and 20th July 2016. During the visit, many important issues were discussed – Technical Support Unit (TSU), cooperation of KCID and KRC with other NCs, International Short Course on WG-SDTA alongwith other issues.

KCID hosted the 1st Joint Workshop on KRC Overseas Project and KCID Working Group on Research in Naju, Korea on 8th August 2016. The workshop was attended by more than 90 participants from KRC, KCID WGs, universities, institutes and private companies etc. and presented the theme of academic research in agricultural water resource and the direction of overseas agricultural projects.

KRC supported participants for training programme on 'On Farm Water use and Management' organized by ICID in Cairo, Egypt from 18th-24th April 2016. KRC also provided financial support for the activities of the Technical Support Unit (TSU).

VP Bong Hoon, Lee, Chairman of KCID, and delegates from KRC participated in ARCID4 from 26th -28th April 2016 in Aswan, Egypt and discussed new businesses with leading nations in Africa. VP Lee delivered a keynote address at the opening ceremony "Strategy on Rice Industry Development for Food Security in the EAC" and chaired a session on water use management. During the Conference, VP Lee and KRC delegation also discussed cooperation on solar energy generation, water management system modernization and education through high-level talks with the Egyptian top officials.

Mexican National Committee

The Mexican National Committee (MXCID) is organizing the 23rd ICID Congress and 68th International Executive Council (IEC) Meetings from 8th -14 th October 2017 in Mexico City, Mexico with the theme "Modernizing Irrigation and Drainage for a new Green Revolution". MXCID organized a special presentation over the dinner hosted during WIF2 at Chiang Mai, Thailand in November 2016 and invited all NCs to participants to be part of this mega event..



Nepal National Committee

Mr. Madhav Belbase, Chairman of Nepal National Committee (NENCID) visited the ICID Central Office on 15th September 2016 to discuss issues related to the organization of the 8th Asian Regional Conference (ARC) scheduled to be held in Kathmandu, Nepal. He also discussed the theme "Irrigation in support of an Evergreen Revolution" and sub-themes of the conference.

Pakistan National Committee



The Pakistan National Committee (PANCID) celebrated the World Water Day in association with University of Agricultural, Faisalabad an active member of PANCID by organizing a Seminar on 25 March 2017 on the theme "Wastewater". Dr. Syed Hamid Hussain Shah, Director WMRC, briefed about the theme and emphasized on the need of safe disposal and reuse of wastewater for agriculture after proper treatment.

Pakistan Council of Research in Water Resources (PCRWR), an active member of PANCID along with its supporting partners celebrated the World Water Day in Islamabad on 20th March 2017 by way of a poster competition on water conservation, wastewater management etc. Dr. Ghulam Rasool, Director General of Pakistan Meteorological Department opined that water pricing and proper billing were the only way to stop the wastage of water. The representatives from UNESCO, ICIMOD, IUCN, LEAD Pakistan, NARC, NUST, ECO-SF and Riphah International University participated and made presentations on the subject.

PANCID under the Chairmanship of Engr. Asjad Imtiaz Ali on 26th December 2016 organized a Consultative Meeting in Islamabad, Pakistan for revitalization of PANCID activities and interactive session with Vice President Mr. Waseem Nazir. Twenty-two members participated from all over the country, including the Heads of various organizations. VP Waseem Nazir made a presentation on 'ICID Vision and Current Initiatives' and informed that the members of ICID play a key role in identifying improved practices in core areas of irrigation, drainage and flood management and help promoting them through national committees as well as through their personal efforts.

During the meeting, it was decided to make PANCID website more vibrant and designated focal persons from PANCID member organizations for more effective contribution. It was also decided that PANCID would hold meetings in each provincial capital for the meaningful interaction and valuable technical input from provincial stakeholders. A proposal on financial sustainability of PANCID and annual business plan would be developed by a Committee and presented in the next meeting of PANCID. Mr. Naseer Ahmed Gillani, Chief (Water), Planning Commission emphasized that water needs to be given due priority in the national agenda and assured full support from the Planning Commission to further the activities of PANCID.

Philippine National Committee

A Philippines delegation headed by H.E. Fredelita C. Guiza, Presidential Assistant for Food Security and Agri-mondernization alongwith eight officials from National Irrigation Administration (NIA) of the Republic of the Philippines and Philippines Embassy in Indiavisited India from 1st-4th April 2016. The delegation organized technical discussions with Er. G.S. Jha, Chairman of INCSW and members of CWC along with other technical experts. The two delegations exchanged the experiences in dealing with emerging challenges in water sector.

Er. Florencio F Padernal, Chairman of PNC-ICID accompanied by experts from National Irrigation Administration (NIA) showed keen interest in understanding the ways farmers are participating in the management of various irrigation systems. The team visited Central Office and had discussions with Vice President Er. A.B. Pandya, Secretary General and other officials of ICID on various recent initiatives taken by ICID, particularly the development of ICID Vision 2030; Heritage Irrigation Structures (HIS); establishment of Technical Support Unit (TSU); activities on Capacity Development and training etc.



ICID organized a field visit of the Philippines delegation to the Indo-Israel Centre for Excellence for Vegetables at Gharaunda, Karnal. The team witnessed the excellent extension work being undertaken by the center by providing seedlings to farmers and popularizing the modern tools of drip and micro-irrigation. The team also visited Haryana Irrigation Research and Management Institute (HIRMI), Kurukshetra and were given a presentation on 'Overview of the Haryana Irrigation System'. The team also visited Bhakra Irrigation Canal System, interlinking at Moonak head, that operates the inter-basin transfer of water and interacted with the Water User's Associations in Haryana. The Minister also visited the Indo-Israel Centre for Horticulture at Ladwa. On 4th April 2016, the delegation used this opportunity to attend the 'Inaugural Function' of the 4th India Water Week 2016 and had the opportunity to interact with Hon'ble Union Minister of Water Resources Sushri Uma Bharti and various senior government officials and stakeholders.

National Committee of the Russian Federation on Irrigation and Drainage

Vice President Dr. Irena Bondarik (Russia) represented ICID at the First Baku International Water Week on the theme "Water is not only a source of life, but life itself" organized by the Azerbaijan Water Company with the support of Government of the Republic of Azerbaijan in collaboration with World Water Council (WWC) from 14th-18th March 2017 in Baku, Azerbaijan. During the event, several important issues were discussed such as clean and sustainable water resources, access to clean drinking water, ecology and the environment, climate change as well as emergence of droughts etc. VP Dr. Bondarik met Mr. Ahmed Ahmedzade Juma Oglu, Head of the State Land Reclamation & Water Management Agency and Academician Garib Mamedov Oglu, Adviser for Agrarian Science for National Academy of Science of Azerbaijan Republic and invited Azerbaijan Republic to take a lead role in ICID activities.



The 3rd EuroAsian Forum on the theme "Reclamation: Technologies and Investments" was organized on 7th October 2016 in Moscow, Russia in the framework of the Annual Agro-Industrial Exhibition "Golden Autumn". More than 120 representatives from various organizations in the field of operating irrigation systems; agro-industrial complex; agricultural producers; domestic manufacturers of equipment; research and educational institutions; industry associations from EAEC and CIS countries; and media participated in the Forum.

The Golden Jubilee celebration of "The Large Scale Programme for Land Reclamation in Russia" was organized from 2nd -3rd June 2016 in Moscow was attended by President Dr. Saeed Nairizi. The 50th Anniversary of the adoption of an ambitious program titled "On the broad land reclamation development to produce high yields of grain and other crops", and addressed the gathering. H.E. Dzhambulat Khatuov, First Deputy Minister of Agriculture of the Russian Federation informed that they have made a plan for reclamation of 2.5 million hectares of land before 2020. He presented a commemorative medal 'For land reclamation services' to President Dr. Nairizi. Mr. Alexander Bedritskiy, Advisor of the President of the Russian Federation was also present at the meeting. On 2nd June 2016, President Dr. Nairizi and H.E. Dzhambulat Khatuov held a meeting and discussed the effectiveness of the Memorandum of Understanding (MoU) which was signed in 2014 between the Ministry of Agriculture of the Russian Federation and ICID for strengthening the business contacts and finding joint solutions to the global land reclamation challenges. H.E. Khatuov explicated the partnership of Russian Federation with other countries in adoption and use of successful foreign technology for drainage systems construction and shared the experience to design rice irrigation systems, which had been recognized as the best practice in the world.



Somali National Committee



The Somalia National Committee (SONCID) was admitted to the ICID family in November 2016 and Prof. Mohamud Mohamed Mohamud, Director General, Ministry of Agriculture, Federal Republic of Somalia is the Chairman of SONCID. The SONCID has inferred that a Roundtable Meeting on Somalia Drought Crisis was held on 28th February 2017 in the capital of Somali, convened by His Excellency Federal President Mohamed Abdullahi Mohamed Farmaajo. He highlighted that the severe drought has affected over six million people and agreed on the necessary steps to avert another devastating famine in the country. President Farmaajo emphasized on declaration of drought as a national disaster and warned of the

risks posed by the drought in undermining the significant progress, achieved in the country over the past five years. At the conclusion of the meeting, a communique was issued which highlighted the drought crisis and its harsh impact on women, children and disabled persons. The representatives of the Federal Government of Somalia, Somalia Federal States, International Partners, the African Union, the United Nations, as well as representatives of Civil Society and the private sectors actively attended the meeting. Further, President Farmaajo called on International Aid agencies and the people of Somalia to extend life-saving humanitarian assistance to those hit by the severe drought in the country.

South African National Committee



For sharing knowledge and exchange ideas with the community of practice, Network on Irrigation Research Extension for Small-Scale Agriculture (NIRESA) along with South African National Committee (SANCID) organized a workshop on the theme “The role of water footprints in agriculture sector” on 2nd March 2017 at the University of Pretoria, South Africa. NIRESA established to strengthen the capacity of agriculturalists to practically serve smallholder farmers. During the NIRESA workshop, two projects funded by the WRC were presented viz. (a) Water footprinting of selected vegetable and fruit crops produced in South Africa, managed by University of Pretoria, and (b) Determining the water footprints of selected field and

forage crops towards the sustainable use of fresh water, managed by University of Free State.

SANCID organized its 2016 Symposium on the theme “Sustainable Irrigation Water and Drainage Management for Food Production: Vision 2030” from 11th -13th October 2016 at Worcester, South Africa. The Symposium was sponsored by Water Research Commission (WRC), Western Cape Provincial Department of Agriculture and NETAFIM. The aim of the Symposium was to attract a multi-disciplinary group of professionals involved with irrigation drainage in Southern Africa and was attended by more than 45 participants. The Symposium addressed the challenges which need to be addressed to feed a growing population based on the 24 scientific papers submitted by various participants. SANCID provided a wonderful platform for the irrigation community and interested development professionals to debate issues plaguing irrigated agriculture, in a time of depleting freshwater resources. The participants visited the BEE Equity table grape farm situated in the De Wet area and Greater Brandvlei Water Scheme as part of the technical tour which illustrated the construction underway to ensure an additional 4000 ha along the Breederivier.

As part of the recently introduced “ICID Webinar Services”, the inaugural webinar on 1st March 2017, on the topic “Water Use Efficiency” was delivered by Vice President Hon. Felix B. Reinders.

Swiss National Commission on Agro-Systems and Land Improvement

The Swiss National Commission on Agro-Systems and Land Improvement (CH-AGRAM) participated in the AgEng2016 Conference in Aarhus (DK) and discussed about the land management and irrigation issues. One of the main issue in the Switzerland is to develop a dedicated international network on water management. On the occasion of the General Assembly in 2017, the above topic was launched with four impulse lectures. These were the preparatory work for the organization of Land Management Conference in 2018 under the title “Agro-systems and water management - Situation analysis of irrigation / drainage in Switzerland” for discussing the link to the agro-system and the specific Swiss requirements.

Thai National Committee

The Second World Irrigation Forum (WIF2) was organized at Chiang Mai, Thailand from 6th -8th November 2016 under the leadership of Mr. Sanchai Ketworrachai who took over as the Director-General of the Royal Irrigation Department (RID) and President of the Thai National Committee on Irrigation and Drainage (THAICID) on the theme "Water management in a changing World: Role of Irrigation for Sustainable Food Production". The mega event was attended by more than 1200 participants from 56 countries drawn from different disciplines including Ministers, farmers, academicians, researchers, international scientific community, engineers, policy makers, industry and the irrigation managers. A variety of Side Events covering topics ranging from gender to education to smart technologies were organized in cooperation with and in partnership with international partners' viz. AARDO, ADB, AIT, FAO, ICRISAT, IFAD, IWMI, UNESCO-IHE, UNU-FLORES, WFI, World Bank and many others International Partners.



H.E. Prayut Chan-o-cha, Hon'ble Prime Minister of Thailand awarded Mrs. Supaporn Thongpook as the First Prize winner of the slogan contest for the WIF2 on 13th September 2016 for the slogan 'Smart Irrigation for Food Security: ZERO Hunger'. In addition to the award presentation ceremony, RID also organized an exhibition, on the concept "Thailand 4.0 toward Smart Irrigation for Food Security: Zero Hunger", for publicizing WIF2.

Uzbekistan National Committee

The Uzbekistan National Committee on Irrigation and Drainage (UzNCID) under the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan organized various activities and exchanged technical views during the year. Mr. Sh. Khamraev, Chairman of UzNCID and Deputy Minister of Agriculture and Water Resources participated in the Water Summit in Budapest, Hungary and made a presentation on the topic "Measures Implemented to Improve Water Resources Management in Uzbekistan" from 28th -30th November 2016. During the year, members of the National Committee prepared 13 articles, which were published in the "Irrigation and Reclamation" magazine issued by the Tashkent Institute of Irrigation and Land Reclamation.

During the UzNCID session held on 2nd November 2016, the working bureau reviewed all issues and recommended a few topical issues which are of great value for water management.

UzNCID members made presentations on radio and television that were devoted to the implementation of new technologies of irrigation of crops, the improvement of efficiency of canals, improvement of relations between the associations of water users and farmers, and depicting the economic efficiency of the reconstruction of canals and reservoirs.

Direct Members

The implementation of sustainable development will depend on the active engagement of both the public and the private sectors. Recognizing the active participation of the private sector can contribute to the achievement of sustainable development, including through the important tool of public-private partnerships.

Understanding the importance of active participation, National Committees are encouraged to broaden their membership to accommodate technical expertise and institutions involved in irrigation, drainage and flood management. A similar system was also introduced on ICID membership, for the past four years by accepting private companies, institutions and individuals involved in the activities related to irrigation, drainage, and flood management as 'direct members'.

Jain Irrigation Systems Ltd. (JISL), India

JISL is a fully integrated global food / plant production company recognized by Harvard Business to be one of five global sustainability champions, and the G-20 for lifting people out of poverty. JISL has manufacturing plants in 29 locations across the globe.





Mr. Ashok Jain, Chairman, JISL was honoured with 'Excellence in Entrepreneurship Award' for his significant contribution in several fields such as micro and drip irrigation, pipes, processed agricultural products, tissue culture and solar pump..

JISL is represented in a number of workbodies which includes: Mr. Abijit Joshi - TF-VE, WG-WATS, WG-SON-FARM; Mr. Yeolkar - TF-VE, WG-SDRG; Dr. P. Soman - WG-WATER & CROP, WG-WATS; Mr. S.P. Jadhav, WG-WATS, WG-SON-FARM)

JISL was one of the partners of the 4th India Water Week (IWW4) organized by CWC/INCSW from 4th -8th April 2016 in New Delhi, India on the theme 'Water

for All: Striving Together'. A Panel Discussion on 'Water Management: Learning from Ancient Wisdom and Traditional Practices' was also organized during the event. JISL actively participated in WIF2 activities and a paper titled 'Design Principles and Consideration for Solar Powered Micro Irrigation System' was submitted by Dilip H. Yewalekar, and Manisha Y. Kinge.

WAPCOS Ltd., India



WAPCOS Limited is a Public Sector Enterprise and is a technology driven consultancy and Engineering, Procurement and Construction organization with strong home country and global presence in the field of Water, Power and Infrastructure sectors. The quality management systems of WAPCOS comply with the Quality Assurance requirements of ISO 9001:2008 for Consultancy Services in Water Resources, Power and Infrastructure Development Projects & also with the Quality Assurance requirements of ISO 9001:2008 for Engineering, Procurement & Construction Projects related Irrigation, Agriculture and Water Projects among others.

Apart from India, WAPCOS has successfully completed/on-going consultancy assignments in about 60 countries covering Asia, Africa, Middle East, and South America. It is actively involved in consultancy/ capacity development in a number of ICID member countries (Afghanistan, Bangladesh, Burkina Faso, Chad, Ethiopia, Fiji, Malawi, Mali, Mozambique, Nepal, Niger, Nigeria, Philippines, Senegal, South Sudan, Sri Lanka, Tanzania, and Zimbabwe).

WAPCOS was represented by Ms. Indica, Head (Corporate Communications) at WIF2 and 67th IEC in November 2016, and presented a paper on "Utilization of Water Resources of Mekong River in Lao PDR under Adverse Topographical and Socio-Economic Conditions" authored by R.K. Gupta and R. K. Agrawal. WAPCOS is represented in a number of workbodies which includes: ASRWG - Mr. R.K. Gupta, CMD; Dr. Aman Sharma - WG-ENV; Mr. R.K. Agrawal - WG-CAFM; Ms. Indica - C-PR&P; Ms. Pooja Kapoor – IYPeF.

Asian Development Bank, Philippines



The Asian Development Bank (ADB) is one of the technical partner organizations of WIFs and a Direct Member of ICID. ADB comprises of 67 members, 48 of which are from the Asia and Pacific region. ADB offers a range of financial products that help developing member countries (DMCs) build economic growth and social development. These tools include loans, technical assistance and grants. ADB's Asian Irrigation Forum (AIF) inspired ICID to conceptualize the WIF and both Forums are held triennially with the mutual understanding not to overlap each other.

ADB partners with other agencies—bilateral as well as multilateral—in financing ADB-assisted projects and programs, either for technical assistance activities or components of investment projects.



ADB actively participates in ICID activities. ICID has actively participated in the 2nd Asian Irrigation Forum (AIF2) where President Dr. Nairizi delivered a keynote address during the inaugural session. ADB is one of the technical partner organizations of WIFs and actively involved in the organization of WIF2 in November 2016. Dr. Akhtar Ali, Principal Water Resources Specialist, made a presentation on the outcomes of the 2nd Asian Irrigation Forum and released a publication on Irrigation Financing. ADB coordinated a Side Event on 'Water Productivity Assessment for Improved Irrigation Performance and Water Security' during WIF2 and also partnered in the organization of a number of side events. ADB partnered with UNESCO-IHE in the organization of a

training program on 'Water Productivity Assessment for Improved Irrigation Performance and Water Security' and Ms. Yasmin Siddiqi, Principal Water Resources Specialist was part of the team for drafting the background paper for sub-theme 2 of WIF2. She also joined as an expert panelist in the recently organized ICID Webinar on 'Water Accounting and Audit'.

Central Board of Irrigation & Power, India

The Central Board of Irrigation & Power (CBIP) is a premier institution established in 1927 and has been serving the nation in the various disciplines of Water Resources, Power Sector and Renewable Energy Sector for more than 90 years. It is a knowledge bank with professional experiences to help the Indian Engineers /Professionals to update their knowledge and gain practical know-how. CBIP hosts headquarter of Indian Chapters of International organizations viz. ICOLD, IWRA, WWC, ITA, ISRM, IGS, and related to Power & Water Resources providing linkages to Indian experts with their counter parts in other countries.



CBIP Disseminates technical knowledge through publication of journals, manuals, technical reports, guidelines, and organizing conferences/ seminars etc. It has established a Centre of Excellence recognized by Ministry of Power, Govt. of India as Category-1 Training Institute for providing training for skill upgrade CBIP and ICID has a long association in the areas of mutual interest. It takes ICID on board in hosting all the national level events.

CBIP in collaboration with INCSW and ICID organized a seminar on "Implication for Sustained Water and Food Security" from 22nd -23rd September 2016 at Pune, India. More than 175 participants attended the seminar wherein five Technical Sessions were organised. Vice President Er. A.B. Pandya and Secretary General Hon. Dr. C.D. Thatte made their presentation on "Water Governance for equity and sustainability" and "Overview of reforms in water sector - Implications for sustained water and food security" respectively during the Plenary Session of the seminar. Er. Harish K. Varma also made a presentation on "Experiences in use of treated/untreated wastewater for irrigation".



India Water Foundation, India

The India Water Foundation (IWF) (Special Consultative Status with UN-ECOSOC) is a non-profit civil society engaged in generating public awareness about water and environment related issues in Asia-Pacific region.



The major thrust of activities during the year was on the Eco-WASH awareness campaign in 13 villages in the state of UP, India with the support of NCSTC, Ministry of Science and Technology, Gol. Till date around 50,000 people have been sensitized and galvanized. As a part of its ongoing project FY 2015-17 it conducted 20 residential training programmes on "Application and Uses of Hydro-Geo-morphological Maps (HGMs) for Groundwater Prospection" in 20 States of Indian supported by Ministry of Drinking Water and Sanitation.

In its quest to serve as a catalyst for getting sustainable development goals (SDGs) and objectives of the Paris Agreement on Climate Change (PACC), with water at its core, integrated into the country's policies to be implemented at grassroots. IWF sensitized and galvanized more than 1000 school through e-governance on sanitation and environment.

IWF actively participate in ICID activities and a regular contributors for WIFs and Congresses. IWF supported ICID in establishing India Irrigation Forum and took a lead role in the establishment of the First India Irrigation Forum organized during the India Water Week, April 2016.



ICID Direct Members

Companies - (1) Jain Irrigation Systems Ltd. (India); (2) WAPCOS Limited, India; and; **Institutions** - (1) Asian Development Bank (ADB), Philippines; (2) Central Board of Irrigation and Power (CBIP), India; (3) India Water Foundation (IWF), India; and **Individuals** – (1) Md. Samiul Ahsan Talucder , Bangladesh; (2) Mr. Y. Abdul Basheer , India; (3) Mr. Tumaini E.R Mazengo , India; (4) Prof. P.K. Bordoloi , India; (5) Dr. Ashish Pandey , India; (6) Dr. R. Mahesh , India; (7) Prof. Umesh Chandra Chaube , India; (8) Ahmed Aziz , Iraq; (9) Mr. Naty Barak , Israel; (10) Mr. Aytekin Turgay , Turkey.

International Partners

The International Year of Water Cooperation launched by the UN provides a platform for countries to collaborate in the management of this precious resource in the interest of peace and development. UN encourages the international community to strengthen global partnerships for Sustainable Development, has invited the academic, research and scientific communities to contribute to the realization of the 2030 Agenda for Sustainable Development, and encourages it to play an important and growing role in filling knowledge gaps and facilitating better understanding of the core principles of the Sustainable Development.

The Sustainable Development Goal 17 requires a revitalized and enhanced global partnership that brings together Governments, civil society, the private sector, the United Nations system and other actors and mobilizes all available resources. Enhancing support to developing countries, in particular the least developed countries and the small island developing States, is fundamental to equitable progress for all.

ICID attributes paramount importance to collaborative efforts with its international and regional partners to enhance sustainable development of irrigated agriculture that forms an integral part of ICID's vision, mission and goals. ICID's cooperative arrangements have been formalized with its international partners either through MoUs or Letter of Agreements. Besides, ICID has also consultative status with a number of UN bodies like ECOSOC, FAO, UNESCO, WHO, WMO, IFAD and ISO. ICID's major collaborative programs are with UN-Water, FAO, ADB, IWMI, WWC, World Bank, AARDO, IGS, IFAD, ICOLD, ICRISAT, IWA, WFO, UNESCO-IHE, UNESCO-IHP etc.

A number of international partners are keenly supporting and enthusiastically participating in ICID initiatives like WIF, WSH, IRPID, TSU, and participating in the webinars on topics that interest the water community such as 'Water Use Efficiency', 'Water Accounting and Audit', 'Modernization Approach', 'Sustainable Development Goals', etc.

ICID shares mutual goals of poverty alleviation through food and water security with FAO, IWMI, ADB and WB, and has a mutual interest and commitment to work towards better management of agriculture water and mitigation of water-related disasters caused by floods, droughts, etc., using the latest tools and technologies.

ICID, over the years has evolved a technology exchange mechanism with international partners through training programs, etc. A glimpse of the collaborative activities that touch almost every spectrum of water towards ensuring food security through efficient and sustainable AWM is given in following sections.

UN-Water

ICID is a UN-Water partner and actively support the observation of UN-declared days such as (i) World Water Day on 22nd March on the theme 'Why Waste Water', (ii) International Day for Biodiversity on 22nd May with the theme 'Mainstreaming Biodiversity; Sustaining People and their Livelihoods', (iii) World Day to Combat Desertification on 17th June on 'Inclusive cooperation for achieving Land Degradation Neutrality' and (iv) World Soil Day on 5th December on 'Soils and pulses, a symbiosis for life', by way of organizing events through its NCs and stakeholders to create awareness about the objectives and importance of these days.



UNU-FLORES has been one of the technical partners in the organization of ICID's WIF2. Dr. Reza Ardakanian, Director, UNU-FLORES has contributed to the preparation of background paper for sub-theme 1 of WIF2 as the leader of the team for preparation of the background paper. ICID was represented at the scientific and capacity development workshop on the Safe Use of Wastewater in Agriculture (SUWA) organized by UNU-FLORES jointly with the Islamic Republic of Iran from 5-7 December 2016 in Tehran, Iran to enhance the use of wastewater.

Food and Agriculture Organization

ICID and Food and Agriculture Organization (FAO) have been partnering for decades for promoting sustainable agricultural water management and achieving food security worldwide. FAO is a technical partner in ICID

Congresses and World Irrigation Forums. FAO experts also participate in ICID technical work bodies. Dr. Marco Arcieri, Secretary-General, ITAL-ICID is designated as ICID's Permanent Observer to FAO meetings, including its Council meetings, held in Rome.



FAO was one of the sponsors of ICID's 4th African Regional Conference on Irrigation and Drainage (ARCID) organized on the theme 'Agricultural Land and Water Management for Sustainability under Climate Variability' in Aswan, Egypt from 26th -28th April 2016.

FAO has been actively supporting ICID's WIFs and Ms. Kundhavi Kadiresan, Asstt. Director General, FAO delivered the keynote address during the opening ceremony of WIF2, while FAO organized a Side Event on 'Coping with water scarcity in Agriculture: A global framework for action in a changing climate - FAO's Global Initiative on Water Scarcity'.



President Dr. Saeed Nairizi and Dr. Marco Arcieri represented ICID at the ceremony of the World Food Day (WFD) on the theme "Climate is changing, Food and Agriculture must too" held on 14th October 2016 at FAO Headquarters, Italy.

ICID NCs such as Ethiopia, Madagascar, Mali, Niger, and Tanzania are actively involved in the development of the FAO's project titled 'More effective and sustainable investments in water for poverty reduction', which aims to improve food security and reduce rural poverty of smallholder farmers through providing guidance and technical support to enhance the quality, impact and sustainability of AWM investments.

ICID is one of the partners 'Global Framework for Action to cope with Water Scarcity in Agriculture in the Context of Climate Change' initiated by FAO. ICID will be joining with FAO and IWMI to coordinate the theme "Development – Water for sustainable development" during the 8th World Water Forum that will be held in Brasilia, Brazil on 18th -23rd March 2018. Dr. Olcay Unver represents FAO in ICID's TF-WWF8.

International Fund for Agricultural Development

International Fund for Agricultural Development (IFAD) has been a partner in ICID's World Irrigation Forums and contributed to the successful organization of WIF2 as a member of its ITAC. Mr. Kanayo F. Nwanze, President, IFAD nominated Mr. Mawira Chitima, Lead Technical Specialist (Water and Rural infrastructure) to deliver his presentation on 'IFAD's experience in water management for improved food security and nutrition for smallholders' during the Plenary session of WIF2. Dr. Marco Arcieri, Secretary-General, ITAL-ICID is designated as ICID's Permanent Observer to IFAD meetings in Rome.



IFAD in association with German Development Institute / Deutsches Institut für Entwicklungspolitik (DIE) organized a two-day workshop on 'Public-Private Partnership in Irrigation: Experiences, Benefits and Risks' from 1st -2nd June 2016 in Bonn, Germany, ICID was represented by Er. Harish Varma, Executive Director, ICID, who made a presentation on 'Public-Private Partnership in Irrigation Sector - Indian Experience' during the workshop giving an overview of ICID's initiatives and programmes, Vision 2030, Water resources development scenario of India and Indian experience of PPP in irrigation and other infrastructure sectors.

A team of officials from IFAD led by Ms. Rasha Omar, Country Representative, Asia and the Pacific Division visited ICID Central Office on 27th June 2016. IFAD team sought support of ICID in their technical activities such as review of technical proposals, monitoring/implementation of project activities etc. It was agreed that cooperation between ICID and IFAD could be at two levels – one at headquarter level and the other at country level. Dr. Marco Arcieri attended the 40th Session of the Governing Council of IFAD which was held from 14th -15th February 2017 in Rome, Italy as ICID representative.



World Meteorological Organization

The World Meteorological Organization (WMO) is one of the partners of ICID in bringing together climate and water communities to manage the extreme events like floods and droughts. ICID has a consultative status with WMO while WMO is represented in ICID's technical workbodies of interest to it like WG-CLIMATE.



ICID has been collaborating with WMO in the Integrated Drought Management (IDMP) Programme which has recently released IDMP Handbook on Drought Indicators and Indices, which covers most commonly used drought indicators/ indices which are being applied across drought-prone regions, with the goal of advancing monitoring, early warning and information delivery systems in support of risk-based drought management policies and preparedness plans.

Dr. Johannes Cullmann, Director, Water and Climate Department of WMO contributed to the drafting of background paper on Sub-theme 2 of WIF2 titled 'Management of Climatic Extremes with Focus on Floods and Droughts.'

UNESCO-IHE Institute for Water Education



UNESCO-IHE and ICID have been collaborating to derive specialized educational solutions from the UNESCO-IHE experts to the needs of diverse clients from the professional water arena represented by ICID. ICID-UNESCO-IHE collaboration has significant value to ICID's young irrigation professionals this was informed vide a letter to Secretary General Avinash Tyagi, who was the governing board member of UNESCO-IHE till the end of 2016.

UNESCO-IHE partnered in the organization of two side events (i) "Water Productivity Assessment for Improved Irrigation Performance and Water Security"; and (ii) "Education and Training in Irrigation and Drainage" during ICID's WIF2 in Chiang Mai in November 2017. UNESCO-IHE has been an active partner in the trainings and webinars being organized by ICID.

World Water Council



ICID has been actively involved in all World Water Fora since its inception and number of ICID partners/ associates are functioning as members of BoG of WWC.

The World Water System Heritage (WSH) Program, a member-driven initiative by ICID in collaboration with various water-related international organizations and WWC has been launched, which aims to identify and preserve the people-centered water management systems, organizations, regimes and rules as intangible water heritage considered to be of outstanding value to humanity that created coexistent social systems for humanity and sound environment and giving them recognition. ICID Central Office currently functions as Secretariat for the WSH Program. ICID was represented by Secretary General Avinash C. Tyagi and Mr. Ali Reza Salamat (Iran) to introduce WSH to WWC members at the 60th BoG meeting held from 25-26 November 2016 at Marseille, France.

VP Dr. Irene Bondarik of ICID attended the First Baku International Water Week on the theme "Water is not only a source of life, but life itself" organized by Azerbaijan Water Company in collaboration with World Water Council from 14th -18th March 2017 and contributed on behalf of ICID.

International Water Management Institute



ICID and International Water Management Institute (IWMI) have been collaborating on issues of common interest and IWMI is one of the major technical partners in its annual meetings and flagship events -- WIFs and Congresses. IWMI is a Permanent Observer in ICID's PCTA, besides contributing to the work of a number of technical work bodies.

IWMI was a technical partner to ICID's WIF2 in 2016 and contributed immensely for its successful organization. IWMI organized the Side Event on 'New Developments in Irrigation and Modernization' and



partnered with a number of organizations in holding the events. Dr. Jeremy Bird, Director General, IWMI delivered the keynote address on 'Five years after the Bonn Nexus conference – Implications for irrigation and drainage' during the Plenary session-II of WIF2.

ICID co-organized a two-day Regional Workshop on 'South Asia Drought Monitoring System (SADMS)' from 30th -31st January 2017 in New Delhi in partnership with IWMI and with the support of GWP, WMO, IARI, IWP and the Ministry of Agriculture, Government of India.

IWMI organized a side event on 'Improving salt and water management in Nile Delta' jointly with ICARDA during ICID's 4th ARCID at Aswan where VP Ian Makin, Theme Leader (Revitalizing Irrigation), IWMI delivered a keynote speech on the topic 'The Main Considerations of IWMI on Opportunities and Challenges to Improve AWM in Africa'.

IWMI is a partner in ICID's research program in irrigation and drainage – IRPID and represented through VP Ian Makin in IRPID's Advisory Committee.

The World Bank

ICID and World Bank (WB) have intensified their collaboration in the recent past. In the rechristened and revitalized International Research Program on Irrigation and Drainage (IRPID), WB is represented by Mr. Steven N. Schonberger, Practice Manager for Middle East and North Africa Region and Global Lead for Water in Agriculture, Water Global Practice.



During WIF2 in November 2016, WB Representative Mr. Steven Schonberger held discussions with President Dr. Saeed Nairizi and Secretary General Avinash Tyagi to explore further ways to enhance the cooperation between both the organizations. Mr. Schonberger delivered a keynote on 'Water for Agriculture: Our role in meeting the Sustainable Development' during WIF2. WB is involved as a technical partner in the 23rd ICID Congress in Mexico in October 2017.



Secretary General Avinash Tyagi attended the World Bank Water Week, 2017 on the theme 'Working together for a water secure world' held from 13th -16th March 2017, in Maryland University Alumni Centre, Maryland, USA and contributed to sessions on 'Water Stewardship in Agriculture and Irrigation' and 'Principles of Irrigation Institutional Reforms'. A discussion on common management, legislative, and regulatory features for making WUAs more effective and responsive to its members was undertaken. Secretary General invited WB to present the principles for WUA reforms and sharing their experience as a practitioners in the symposium being organised during the 23rd ICID Congress. SG Tyagi also met Mr. Guangzhe Chen, Senior Director, Global Water Practice of the WB Group to hold discussion on matters of mutual interest.

Asian Development Bank (ADB)

The Asian Development Bank (ADB) is one of the technical partner organizations of WIFs and a Direct Member of ICID. More details of the activities are covered under Direct Members section at page 23.



Global Water Partnership

The Global Water Partnership (GWP) is a partner organization of ICID's WIF2 and a member of ITAC. ICID also collaborates with GWP in Integrated Drought Management Program (IDMP), being coordinated by WMO.



Secretary General Avinash Tyagi is a Regional Council member of GWP-SAS. In this capacity, SG Tyagi contributed on behalf of ICID at the 22nd Regional Council Meeting of GWP SAS and Regional Workshop on Rapid Country Level Analysis held in Kathmandu, Nepal from 28th -30th September 2016. He also participated in the GWP Network Meeting held virtually on 11th October 2016.

Secretary General Avinash Tyagi, Vice-Chair and a member of BoG of IWP, the Indian arm of GWP, emphasized the need for a Drought Early Warning System in building resilience of the farmers against temporary shortage of water for agriculture in a two day Regional Workshop on 'South Asia Drought Monitoring System (SADMS)' from 30th -31st January 2017 in New Delhi, jointly organised by ICID, IWMI, GWP and other partners. Stakeholders from ICID NCs of Bangladesh, Nepal, Sri Lanka and India participated in the workshop and were in unanimous agreement that capacity development had to be followed, if the tool so developed was to be put into operational use.



International Commission on Large Dams



ICID and International Commission on Large Dams (ICOLD) have been together taking up many issues in global water sector for decades. ICOLD has been supportive of WSH Program of ICID, a member-driven initiative under WWF, and is represented through Dr. Emmanuel Grenier in the TAC of WSH. SG Avinash Tyagi held discussions with Er. Michel de Vivo, Secretary General, ICOLD during the workshop on 'Seismic Aspects of Dam Designs – Issues and Challenges' held in New Delhi on 28th April 2016.

International Society of Paddy and Water Environment Engineers



The International Society of Paddy and Water Environment Engineers (PAWEES) and ASRWG of ICID have been collaborating on various issues of mutual interest. Prof. Tsugihiko Watanabe, the President of PAWEES and Chairman of ICID's WG-CLIMATE was in agreement with the PAWEES-ASRWG collaboration in general, and promised to support the ASRWG actively by preparing a detailed proposal for further strengthening the existing collaboration.

As part of collaboration between PAWEES and ASRWG, a conference on 'Agricultural Water for the Development of Rural Society in Asia' was organized on 20th October 2016. The conference was part of the two-day PAWEES conference on the theme 'Sustainable Paddy Water Management in Water-Energy-Food Nexus' jointly organized by PAWEES, KCID and WG-CLIMATE of ICID at Daejeon City in Korea from 20th-21st October 2016. The conference was chaired by Prof. Kyung Sook Choi, a member of ASRWG and Co-chair of the organizing committee of the PAWEES. Information on the on-going research challenges, which covered improvement of water use efficiency and rural development with improved irrigation system have been shared. In addition, PAWEES suggested that ICID should locate the collaborated activity ASRWG's Action Plan 2030, under ICID's Goal 5 "Encourage research and support development of tools to extend innovation into field practices." Emphasis was also laid on encouraging younger members, not only from the national committee of the paddy-dominant countries but also from ICID member countries, to join PAWEES.

International Crop Research Institute for the Semi-Arid Tropics



ICID and International Crop Research Institute for the Semi-Arid Tropics (ICRISAT) have been collaborating in the areas of mutual interest. ICRISAT is an observer in ICID's WGs on WATER and CROP and is one of the leading international partners of ICID in the organization of WIFs and was represented in ITAC. PH Dr. Chandra Madramootoo is currently chairing the BoG of ICRISAT. Dr. Suhas P Wani, Project Leader and Director, Asia Region represented ICRISAT in ICID's annual meetings in Chiang

Mai in November 2016 and ICRISAT partnered with a number of organizations in holding side events on topics of interest to it.

International Council on Monuments and Sites



The International Council on Monuments and Sites (ICOMOS) is a professional association that works for the conservation and protection of cultural heritage places around the world and ICID's recent efforts to recognize Heritage Irrigation Structures (HIS) and the initiative on WSH Program serve as a common goal between the two organizations. ICOMOS is a member of IC of WSH and represented through Prof. Henk van Schaik.

VPH Prof. László Hayde, Senior Lecturer in Irrigation Engineering at UNESCO-IHE represented ICID at the Conference on 'Water and Heritage for the Future Conference: Policy and Outreach' held on 26th November 2016 at Fort Vechten, The Netherlands and presented water heritage initiatives of ICID. He emphasized the need for heritage experts and water managers working together for sharing the knowledge on cultural and Industrial heritage sites and structures. He further indicated that many such historical water sites are still used in managing water every day. VPH Hayde informed that a short course on World History of Water Management coordinated by him at UNESCO-IHE is being run jointly with ICID, IWHA and the German World History Association, which is a good example of training and capacity development activity that can be used to link even more activities within the water and heritage context.

ICOMOS, Netherlands organized a roundtable on 'Water and Heritage' on 4th December 2016 at the international secretariat of ICOMOS near Paris, where Prof. Henk van Schaik presented, on behalf of President Dr. Nairizi, WSH Program and readout President's message to the participants.

International Food Policy Research Institute

ICID has been collaborating with the International Food Policy Research Institute (IFPRI) on matters of mutual interest either bilaterally or through its NCs. IFPRI coordinated a side event on 'Role of Women in Irrigation and Drainage' during WIF2 in partnership with ADB, IWMI and SLWP. Ms. Sophie Theis represented IFPRI at ICID annual meetings in Chiang Mai in November 2016.

Irrigated agriculture is one of the major contributors to the supply of food and fibre in the world. The forecast of water and food supply and demand by 2025 and 2030 has been assessed by IFPRI in association with FAO and IWMI. The forecasted results will have direct implications on decisions related to investment in water and in rural development and is important to assess as to how the irrigated area could be expanded within the available limited financial resources and irrigation-water use reduced in order to meet future needs which are of interest to ICID and its stakeholders.



International Network for Water and Environment in the Paddy Field

The 13th INWEPF Symposium and Steering Meeting was held from 6th-7th December 2016 at Phnom Penh, Cambodia on the theme "Flood and Drought Impact to Farming and Eco-system in the Context of Climate Change". The objective of the Symposium was to provide an opportunity for professionals in the field of water resources and agriculture sector to share their knowledge and experiences in order to improve the soil and water productivities and protect ecosystem. Representing ICID, Dr. Nobumasa Hatcho, former Chair of ICID's WG-HIST and a member of JNC-ICID and Mr. Florencio F. Padernal of PNC-ICID delivered the keynote speeches, besides Prof. Dr. Kyung-Sook Choi (Korea), a member of ICID's ASRWG and WG-WATS also made a presentation on technologies and policy related to paddy farming and irrigation. INWEPF expressed its keenness to join hands with ICID to address the challenges like 'multiple roles of paddy fields', 'sharing of policies, technologies and information on modernization of irrigation system for AWM efficiency in paddy fields' and 'sustainable paddy farming'. Both organizations have agreed to disseminate technology and practices for better paddy farming and ecosystem preservation among their stakeholders in particular and globally in general.



Southern Africa Regional Irrigation Association

The Alliance for Green Revolution in Africa (AGRA) has been working on various important aspects over the years and it is important that ICID community supports these efforts. As a network of AWM professionals, ICID is contributing towards sustainable rural development in Africa as a part of its new vision. AFRWG during its meeting in Aswan, Egypt on 26th -28th April 2016 deliberated on how irrigation and drainage can make GR 2.0 a reality in Africa and how ICID through its AFRWG and with the cooperation of regional irrigation associations in Africa like Southern Africa Regional Irrigation Association (SARIA) in Southern Africa, RAID in Western Africa and NARAID in Northern Africa can contribute towards GR 2.0 in Africa. ICID is also exploring the possibility of collaborating with the World Bank in reinvigorating irrigation and drainage research in this direction by utilizing the WB presence in Africa region in cooperation with ICID's African NCs. WB has also expressed its interest in engaging with active NCs of ICID in Africa regions, particularly in East Africa, where the Bank has a long standing working relationship with ICID NCs of Ethiopia, Somalia and Tanzania.



In order to take forward the capacity development agenda with a focus on Africa, a one week training course on "On-farm Water Use and Management" was organized in Egypt from 18th -24th April 2016 where 21 African Young Professionals completed the course successfully. The trainees also attended the 4th ARCID which adopted the Capacity Development Strategy for Africa. The participants decided to articulate the role that AWM should play in the impending GR2.0 in Africa.

SARIA has planned to host a symposium in 2017 in South Africa. The aim is to assess whether SARIA has achieved its milestones and targets sets in 2012, identify new thematic areas for the next three years etc. Dr. Sylvester Mpandeli, erstwhile Chairman and present Vice Chair of AFRWG of ICID and Vice Presidents Honoraire Dr. Gerhard Backeberg and Felix B. Reinders of ICID are spearheading the activities of SARIA. Dr.

Mohamed Wahba, VP, ICID and Chair of AFRWG plays a vital role in coordinating the activities of SARIA, ARID and NARAID in achieving the identified actions in the coming years in Africa region, including GR2.0 in Africa.

African-Asian Rural Development Organization



The African-Asian Rural Development Organization (AARDO) is one of the organization set up in 1962 to effect South-South cooperation in the field of agriculture and rural development with its headquarter in New Delhi, India. An autonomous inter-governmental organization comprising 31 African and Asian country governments as its members, AARDO promotes coordinated efforts, exchange of experiences and cooperative action for furthering the objectives of development of the rural areas. With rural development as a common objective and about half of AARDO members are NCs of ICID, it is but natural that the two organizations better cooperate to serve their members by synergizing their activities.

AARDO supported the one week training course on “On-farm Water Use and Management” for young professionals organized prior to 4th ARCID. AARDO Secretary General H.E. Wassfi Hassan El-Sreihin delivered the keynote address on the topic “Water Management and Sustainable Development in the Context of Africa” during the inaugural session of the 4th ARCID and later called on President Dr. Nairizi to discuss the matters of mutual interest.



Secretary General of AARDO and Er. Avinash C. Tyagi, Secretary General, ICID held discussions on 17th May 2016 to further strengthen collaborative and cooperative arrangements in line with the MoU signed between both the organizations on 9th December 2015. On an invitation from AARDO, ICID attended AARDO’s 68th and 69th sessions of Liaison Committees at AARDO headquarters, New Delhi on 24th August 2016 and 7th March 2017, respectively as an observer.

AARDO actively participated in WIF2 and took active part in organization of side events. H.E. Wassfi Hassan El-Sreihin, Secretary General was invited to deliver a

keynote address during the plenary session of WIF2.

Water for Food Global Institute



The Robert B. Daugherty Water for Food Global Institute (DWFI) at the University of Nebraska at Omaha was established to address the global challenge of achieving food security with less stress on water resources through improved water management in agricultural and food systems. ICID and DWFI have been collaborating on issues of common interest and DWFI was one of the major technical partners of WIFs.

Dr. Peter McCornick, Executive Director, DWFI delivered a keynote address during the plenary session of WIF2 on topic “Securing Water & Food: Opportunities in Irrigation”. DWFI also organized a Side Event on ‘Key and smart technologies for irrigation and drainage to reduce poverty and hunger’.

Asian Institute of Technology



Lack of adequate capacity and right skills is recognized as one of major issues facing the water resources sector. In order to give further impetus to Capacity Development, Training and Education, ICID is exploring the partnership with various regional institutions engaged in AWM from different parts of the world. With this objective, ICID has been exploring the possible areas of cooperation with Asian Institute of Technology (AIT), which has resulted in the increased involvement of AIT in ICID’s WIF2 in Chiang Mai,

Thailand. AIT was one of the technical partners of WIF2 and organized a Side Event on ‘Climate Change Impact and adaptation in Agriculture: Examples from Climate-Water-Crop Modelling and Field Studies’ to

understand the broad overview of climate change impact on agriculture sector. AIT was also part of the ITAC for WIF2 and contributed effectively to the successful organization of the Forum.

Asia Water Council

The Asia Water Council (AWC) was established during WWF7 in Korea in April 2015, which was an expansion and reorganization of the Asian Water High Level Round Table (AWHoT) to realize the need for an international entity to address Asian water problems at high-level in Asia. AWC aims to raise global awareness of Asia's water problems and promote the sustainable development of Asia by resolving regional water issues.



ICID extended its support to AWC by attending AWC's first general assembly held from 24th to 26th March 2016 at Bali, Indonesia where ICID was represented by Dr. Vijay K. Labhsetwar, Director, ICID together with representatives from INACID, MANCID, THAICID, KCID, CNCID. Minister of Public Works and People's Housing and Vice President Hon. Basuki Hadimoeljono (Indonesia) hosted a Roundtable Meeting of representatives from ICID National Committees on 24th March 2016 where representatives from prospective members of ICID such as Cambodia, Vietnam and Timor Leste also participated.

AWC delegates led by its Secretary General Dr. Kyungjin Min and Executive Director Dr. Yong Deok Cho participated in WIF2 meetings in Chiang Mai and held meetings with ICID Office Bearers for strengthening the cooperation between both the organizations. AWC organized a Session on 'Sustainable Development in Asia Water with the Asia Water Council' during WIF2 meetings.

ICID has joined hands with AWC in addressing the challenges being faced by irrigation and drainage community in Asia.

International Water Association

Spreading ICID's collaborative activities with International partners on Safe Use of Wastewater in Agriculture, ICID entered into a MoU with International Water Association (IWA) on 13th September 2016 in Tehran, Iran where the Presidents of both the organizations, Dr. Helmudt Kroiss of IWA and Dr. Saeed Nairizi of ICID, affixed their signatures towards an enduring partnership, initially implemented through NCs of ICID and IWA in Iran.



The MoU directed towards appropriate use of the outreach, capabilities and expertise of both organizations in the area of urban and agricultural water management for beneficial use of the member countries for effective basin management, urban water security, sanitation, water-energy neutrality, improving and maintaining safe water supplies by worldwide water, irrigation and drainage community. As per the MoU, the Secretariat for the collaborative program will be established and supported by Ministry of Energy of Iran. The Program is expected to explore low-cost options which can be implemented all the way along the food chain, from farm application of wastewater to markets and finally to consumers. The project will develop various techniques to assess risks by sampling the locally available water and irrigated crops which will be monitored and supervised by ICID workbodies of WG-PQW and WG-WATER & CROP. IWA is represented in TAC for WSH Program hosted at ICID Central Office.



Commonwealth Scientific and Industrial Research Organization

The Commonwealth Scientific and Industrial Research Organization (CSIRO) aims to improve the livelihoods and economic well-being of people in large and complex river basins in Australia, Asia, the Pacific and South America and provide access to water in highly variable and changing climates, considering the needs of the environment and people. One of the key objectives of CSIRO is to identify key challenges and opportunities for water use, planning and management.



ICID collaborated with CSIRO in their project - Water Cloud which seeks to (i) speed up the policy cycle using informed rapid assessments, leveraging off existing information and data; (ii) narrow the policy options by understanding the cost-benefit, leading to efficient and cost effective outcomes whilst minimizing externalities; (iii) be a disruptive model, that meets the needs with no frills, is accessible and lowers the cost of such assessments; and (iv) deliver a solution that is fit for purpose, supporting water policy in the absence of existing solutions or simplifying overly-complex solutions. In order to familiarize ICID stakeholders with Water Cloud, CSIRO made

a presentation on the Water Cloud tool at the 67th IEC Meeting in Chiang Mai in November 2016. ICID is now partnering in CSIRO's Water Cloud, which enables water resources planning using new disruptive technologies.

International Water Resources Association



ICID and International Water Resources Association (IWRA) had cooperative arrangements to improve the art and technique of managing water resources, particularly those that were relevant to irrigation and drainage based on an earlier MoU signed between both the organizations in 1994. IWRA has been effectively represented in the TAC of WSH, a member-driven initiative of ICID with WWC members, through its Secretary General Callum Clench, who examined the possibility of collaborating with ICID on 'Water-Energy-Food Nexus' to which President, ICID has responded positively. Accordingly, a fresh MoU has been drawn up between both the organizations with the objective to develop strategies for ensuring water and food security duly recognizing the importance of Water-Energy-Food Nexus. The MoU is set to be signed during IWRA's XVI World Water Congress at Cancun, Mexico from 29th May -3rd June 2017, which is expected to open up new vistas of cooperation between both the organizations.

International Geosynthetics Society



There is a standing MoU between ICID and International Geosynthetics Society (IGS) signed on 22nd October 2011 with the objective to liaise each other for improvements in the art and techniques of irrigation, drainage management, use of geosynthetics and also to periodically review and evolve progressive strategies in the outlined areas of cooperation. Ever since ICID and IGS has been collaborating in the areas of mutual interest and IGS will be organizing a session on 'Geosynthetics in Irrigation, Agriculture and Drainage Projects' during the 23rd ICID Congress in Mexico in October 2017, under the purview of existing MoU between both the organizations. Secretary General Er. Avinash Tyagi in his recent meeting with Dr. Herve Plusquellec in March 2017 at Maryland, USA explored the possibility of expanding the collaboration between both the organizations.

International River Foundation

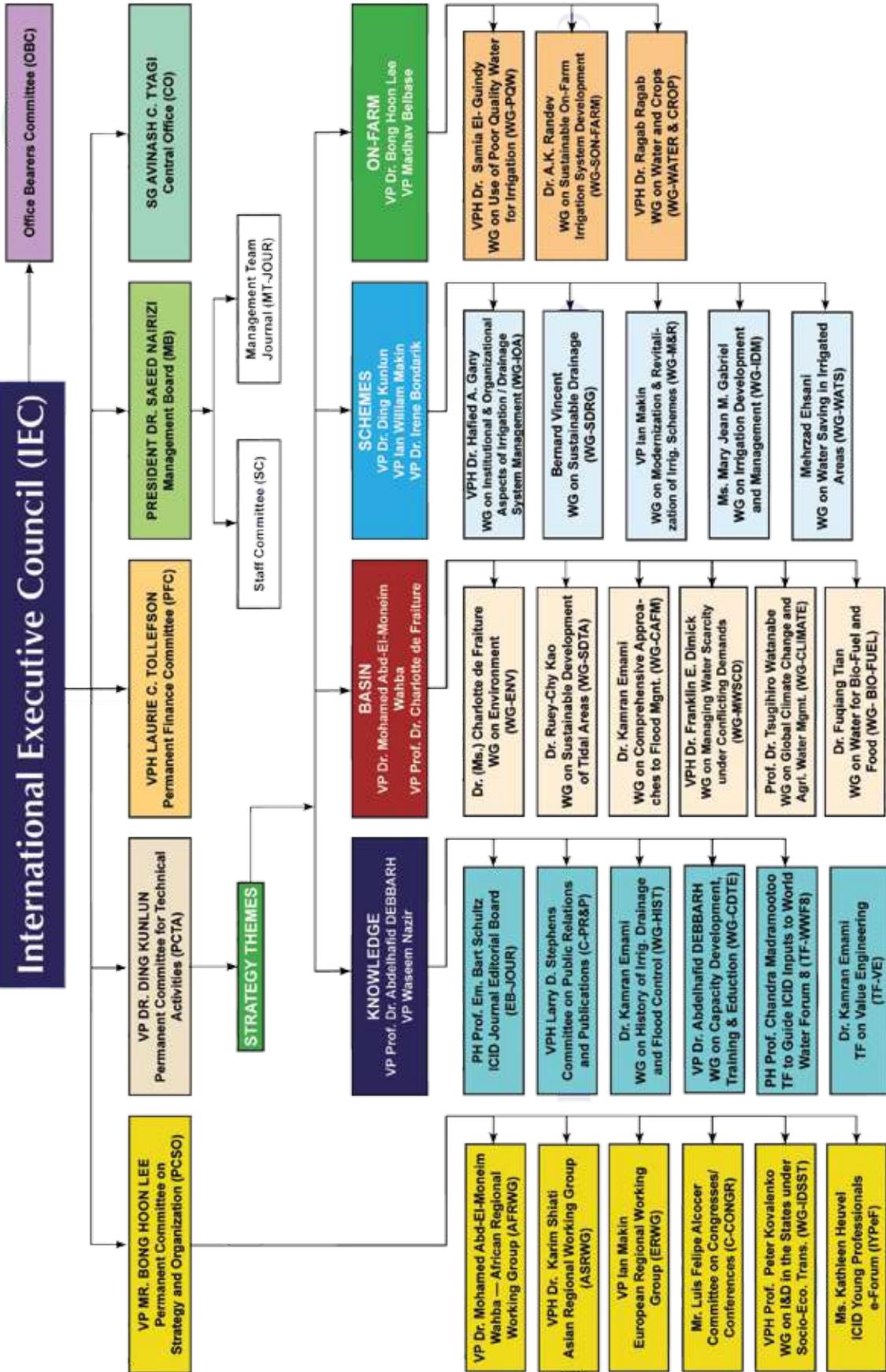


The International River Foundation (IRF) provides a platform for river managers, policy developers, scientists, consultants, NGOs and community organizations to share knowledge and innovative ideas on all aspects of river and water management. Secretary General Avinash Tyagi and Executive Director Harish Varma represented ICID at the 19th International River Symposium on the theme "Great rivers of the world: management for shared benefits" from 12th – 14th September 2016 in New Delhi, India. At the IRF that was held for the first time outside Australia in its history, Secretary General Tyagi made a presentation on "Role of ICID and other organizations in helping us achieve SDGs" and explored the ways and means to collaborate with IRF in the coming years.

Besides the organizations mentioned above, ICID has been working in partnership with UNESCO-IHP, IUCN, IHA, IWHA, ISO, ASTEE, NARBO, CIHEAM-Bari, MAFF of Japan, Indian Institute of Technologies (India), Khuzestan Water and Power Authority, IWHR of China, Korea Rural Community Corporation (KRC) of Korea, UNESCO-RCUWM, etc. in the areas of mutual interest, particularly emerging issues concerning irrigation, drainage and flood control, the core areas of ICID activities.



International Executive Council (IEC)



WG: Working Group, TF: Task force, PH: President Hon., VP: Vice President, VPH: Vice President Hon.

WORKING GROUPS IN ACTION



Water is fundamental to life, yet human development is bringing water supplies to a crisis point. Water scarcity affects over 40 per cent of the planet's population. By 2025, two-thirds of us may face water stress, while 1.8 billion people will live with 'absolute' water scarcity.

The 2017 edition of the United Nations World Water Development Report, entitled "Wastewater: The Untapped Resource", demonstrates how improved wastewater management generates social, environmental and economic benefits essential for sustainable development and is essential to achieving the 2030 Agenda for 'Sustainable Development'. This year, the focus is on wastewater and ways to reduce and reuse as over 80% of all the wastewater from our homes, cities, industry and agriculture flows back to nature polluting the environment and losing valuable nutrients and other recoverable materials.

Sustainable Development Goal 6 – ensuring availability and sustainable management of water and sanitation for all by 2030 - includes a target to halve the proportion of untreated wastewater and increase water recycling and safe reuse.

A large proportion of wastewater is still released into the environment without being either collected or treated. This is particularly true in low-income countries, which on average only treat 8% of domestic and industrial wastewater, compared to 70% in high-income countries. As a result, in many regions of the world, water contaminated by bacteria, nitrates, phosphates and solvents is discharged into rivers and lakes ending up in the oceans, with negative consequences for the environment and public health. The volume of wastewater to be treated will rise considerably in the near future especially in cities in developing countries with rapidly growing populations. "Wastewater generation is one of the biggest challenges associated with the growth of informal settlements (slums) in the developing world.

ICID has visualised the importance of wastewater and established WG-PQW in 1995 to promote a safe and good management of poor quality water for irrigation so as to minimize the negative impact on human health and the environment. The group also promotes multiple use of poor quality water with due consideration to the institutional and legal aspect.

The main objectives of ICID is generating, collating and sharing knowledge for fulfilling the mission of "Water secure world free of poverty and hunger through sustainable rural development". This can be achieved by the technical WGs, which are clubbed into four strategy themes:

- (i) On-Farm: Water application techniques related to crops, on-farm irrigation, and use of poor quality water;
- (ii) Schemes: Dealing with various aspects of irrigation systems such as, modernization and re-vitalization, institutional aspects, irrigation development and management, water saving in agriculture and sustainable drainage;
- (iii) Basin: Wide planning covering various issues such as drought, floods, environment, climate, tidal areas, bio-energy that effect agriculture water management; and
- (iv) Knowledge: Management that includes preserving history of irrigation, capacity development, value engineering, communication and dissemination, publications and conferences.

The WGs through their activities help to generate, extract, compile, and synthesize the available knowledge for wider dissemination through ICID channels. Various WGs and TFs have been established to study these aspects. Experts drawn from a wide range of disciplines like engineering, hydrology, agronomy, environment, sociology, economics, and climate change and so on, working as members, contribute voluntarily and share experiences across geographical, climatological, economic and social spectrum.

Members of WGs are nominated by the respective NCs. Direct Members also join and contribute as members of these WGs. In addition, observers from various partner organizations also join the deliberations of the WGs. The output of the WGs could be in the form of technical papers, reports, manuals and/ or guidelines, etc. In addition to sharing the technology and innovations at the annual WG meetings, experts share their experiences through technical deliberations at the Congresses and specialized workshops. WGs also organize virtual meetings using web conferencing tools to deliberate on matters of interest.

The following section briefly describe the activities of various workbodies during the year 2016-17:

ON-FARM

The ultimate aim of irrigation is to achieve increased crop production, through reliable, and sustainable water distribution on irrigated land. However, the management of on-farm water application systems is a very complex problem faced both by the farmers and irrigation managers, which constitute: selection of right crops based on water availability; selecting the most appropriate irrigation techniques for optimal utilization of scarce water resources matching the local context; reduce losses; using certified equipment ensuring a minimum quality for on-field irrigation; recycle and reuse of water including use of poor quality water in case of limited availability of good quality water and so on. In order to discuss these issues, ICID has constituted three WGs: WG-WATER & CROPS, WG-PQW, and WG-SON-FARM. Brief activities of these WGs are as follows:

Water and crop

Given the declining water availability for agriculture due to competitive uses, impact of climate change on crop yields, and increasing trend for biofuel production, issues related with water for food and fuel crops needs to be thoroughly studied. Keeping this in view, the Working Group on Water and Crops (WG-WATER & CROP) was re-established in 2007 with new mandate to promote the efficient use of water in crop production, study best techniques for rainwater harvesting, promote the multi-functionality of water use in paddy (rice) cultivation, investigate the adaption of agriculture to climate, and to promote low input agriculture.



As a new initiative, the WG generally agreed with the draft ICID Action Plan 2030 and decided to 'Develop guidelines on efficient use of water in crop production' under Goal 1.1. It was also decided to bring out a 'Technical Report' based on the work carried out so far, which includes - (a) efficient use of water in crop production, (b) crop water models, (c) multi-functional water use in paddy, and (d) rainfall harvesting and energy crops. NCs of China, Indonesia and Philippines have contributed their papers for the Technical Report. Dr. Kaluvai Yella Reddy (India), Secretary of the WG, contributed his report titled 'Efficient Use of Water in Crop Production'.

WG actively contributed to manage activities of Sub-theme 1 - "Key issues of irrigation and drainage in balancing water, food, energy and ecology" of WIF2 in October 2016 at Chiang Mai. Chair VPH Dr. Ragab (UK) contributed to the Background Paper of Sub-theme 1 (http://icid.org/wif2_bg_pap_st1.pdf) as a member of the Work Team. VPH Dr. Ragab was Co-chair of Parallel Session 1.5 and VPH Laurie Tollefson (Canada) was Rapporteur of Parallel Session 1.3. They were also members of the 'International Review Committee' of Second World Irrigation Forum (WIF2).

ICID is in the process of bringing out an updated online version of the Multilingual Technical Dictionary (MTD) and make it available through ICID website. Taking keen interest on the project, Dr. P. Soman (India), a member of the Group, has volunteered to serve as nodal person to review the terms related to the Water and Crop domain.

The Chair Dr. Ragab has developed an online distant learning program named "SALTMED" over the years. Dr. Ragab has organized special short training course for YPs in ICID in the past. In order to disseminate the SALTMED course, the details of the web-links have been shared within the group and website. Dr. Ragab showed actual demonstration of the functioning of 'SALTMED' during the groups meeting at Chiang Mai.

Dr. K.Y. Reddy (India), a member of the group, organized a Side Event of WIF2 titled 'Building Farm level capacities in irrigation water management to adapt to climate change' during WIF2 at Chiang Mai. Dr. Reddy

presented a video on 'Ultra Sonic Sensors for efficient on-farm water management' which was prepared under 'ClimaAdapt Project' among other presentations.

Use of poor quality water for irrigation



Wastewater is increasingly considered a valuable source of water particularly where water is scarce. The two main drivers of use of wastewater for irrigation are water scarcity and water pollution, resulting in wanted and unwanted water reuse. Use of wastewater, particularly in situations where more than 90 percent of it is directly discharged to natural water bodies after appropriate treatment, serves as an ecosystem service. In both scenarios, whole cities and thousands of livelihoods depend on the resulting agricultural outputs. ICID is also a strong supporter of the framework for health risks reduction in the use of wastewater as per World Health Organization (WHO) guidelines for the safe use of wastewater, excreta and greywater in agriculture. But it is also aware that recommendations are very stringent and difficult to implement. As such, they have remained unimplemented in most of the developing economies. Irrigation of food and fodder crops with raw urban and untreated wastewater is a widespread phenomenon in both arid and humid areas throughout Asia and Africa.

The Working Group on Use of Poor Quality Water for Irrigation (WG-PQW), established in 1995, has been promoting safe and good management of poor quality water for irrigation, minimizing the negative impact on human health and the environment, promoting the multiple use of poor quality water, and giving consideration to the institutional and legislative aspects with regard to the use of poor quality water.

During the year, the WG focused on: (1) Amending and improving the waste water related terminology by Dr. Takanori Nagano (Japan) for ICID's Multilingual Technical Dictionary (MTD), (2) Presentation on the use of brackish ground water for irrigation in China by Dr. Wenyong Wu (China) during Chiang Mai meeting, (3) Facilitating easy access to SALTMED course, ICID established a set of hyperlinks and uploaded the course at 'YouTube' channel for wider publicity, (4) Working together on Safe Use of Wastewater in Agriculture, under an agreement between Dr. Helmudt Kroiss, President, International Waterworks Association (IWA) and Dr. Saeed Nairizi, President, ICID for starting a country level collaborative program between NCs of ICID and IWA in Iran.

In addition, the group is also planning to organize a special session on 'Irrigation techniques for reuse of wastewater in agriculture and its impacts on health and environment' during the 23rd ICID Congress in Mexico, October 2017.

Sustainable on-farm irrigation system



Since water scarcity will be one of the major challenge of the 21st century, a number of innovative strategies and measures will have to be applied at farm level to counteract and cope with the negative impacts on agriculture. By improving on-farm irrigation efficiency, the return from agriculture to farmers can be enhanced due to the reduced inputs, improved productivity, better efficiency of water use, better protection to the environment and its natural resources. Good water management at the on-farm level comprises of three factors related to the level of control available to enable the right amount of water to be applied to the crop at the right time and in the right quantity (i) Social control - the ability to control who takes water, when and where, (ii) Management control - required to allocate and distribute water to match the farmers' demands, and (iii) Physical control - able to implement the agreed irrigation schedule to apply the right amount of water at the right place.

Keeping the above in view, the Working Group on Sustainable On-Farm Irrigation System Development (WG-SON-FARM) was re-established in 2015 to support research, evidence-based documentation and dissemination on latest scientifically significant and societal relevant issues and make recommendations with respect to design, installation, management and maintenance of on-farm irrigation structures and water distribution system networks; monitoring, investigation and implementation of soil-moisture, technical and management measures for enhancing the water infiltration and retention capacities of soils; optimization through trade-offs among on-farm irrigation technologies, socio-economic and environmental benefits; development, promotion, operation and maintenance of innovative technologies including local institutional arrangements; and ensuring scientific development and relevant research is conducted and its results are translated into actionable recommendations.

WG is finalizing an article on “Improvement of the On-Farm Irrigation Systems Using Simple Water Control Measuring and Application Devices”; and a report on “Micro irrigation for smallholders and greenhouses” as provided by Prof. Yoshisuke Nakano (Japan) for wider dissemination. WG in its meeting at Chiang Mai in November 2016 decided to prepare a paper on “Micro Irrigation under Saline Conditions” by Dr. Hossein Dehghanisani (Iran). The Indian National Committee on Surface Water (INCSW) is organizing the 9th International Micro Irrigation Conference (IMIC) in January 2019 in Aurangabad, India. The first announcement will be announced in October 2017.

During Chiang Mai meeting in November 2016, the group elected - Dr A.K. Randev (India) as Chair, Mr. Carl Walters (Australia) as Vice Chair, and Mr. Suman Sijapati (Nepal) as Secretary. The group thanked the retiring Chair VPH Felix Reinders for the leadership and strenuous efforts in leading the group to a significant height since 1998.

SCHEMES

Irrigation sector is plagued with numerous challenges, some of them are limitations on physical expansion of irrigation due to limited water and land resources including fiscal constraint to expansion; competitive use of water from other sectors; deteriorating irrigation infrastructure due to vicious cycle of build-neglect-build leading to poor and unreliable performance of the projects; weak institutional foundation both at department and farmers level etc. These issues, if not addressed properly result in inefficient and sub-optimal use of irrigation projects. Keeping the importance of these inter-related factors, five WGs- WG-M&R, WG-IOA, WG-WATS, WG-IDM, and WG-SDRG have been formed under this theme to discuss and develop strategies to address the above mentioned challenges. Brief activities of these WGs during the year are as follows

Modernization and revitalization of irrigation schemes

Increasing population accompanied by increased urbanization, rising income levels, and changes in dietary patterns will have a serious impact on food and water security. Food production will need to be almost doubled in developing countries with less water available for agriculture due to increasing competitive demands from other sectors. Water scarcity and increasing need for more effective management of water in all its uses is thus increasingly recognized as a global challenge. Irrigated agriculture production systems currently account for about 20 per cent of the world’s cultivable land and more than 40 per cent of the world’s food production; and is expected to contribute a major part of the additional food grain production in future that too with reduced water for agriculture. It is estimated that 85 per cent of projected food demand in 2050 could be met by bridging the gap between the actual and potential yield of both rain-fed as well as irrigated agriculture.

Irrigated agriculture is central to rural employment and food security in many of the ICID member countries; however, the sector is facing numerous challenges and is often considered to be inefficient and underperforming despite the substantial investments. Hence, efforts to ensure sustainable agriculture water management would require improving performance of irrigation systems through modernization and revitalization; adoption of modern technology and improved irrigation techniques leading to water saving to satisfy needs of other competing sectors or expansion of irrigation; conservation, recycle and reuse of water and so on. Further, improving the productivity and efficiency of water use in irrigated agriculture will involve: (i) investing in modern irrigation infrastructure, (ii) adopting enabling policies that correctly price the opportunity cost of water, and (iii) strengthening institutions for more efficient and sustainable water management. While doing so the consumption of energy, which is one of the crucial inputs, has to be factored in order to ensure more income per drop of water to the farmers. Irrigation needs to be revitalized and modernized to meet the challenges of agriculture in the 21st century considering technical, social, financial and institutional dimensions.

Keeping in view the importance of modernization and revitalization of irrigation schemes in light of its role in support of global food production and ensuring food security, the Working Group on Modernization and Revitalization of Irrigation Schemes (WG-M&R) was established in 2015. The group will investigate, analyse, and disseminate information on new developments and formulate recommendations with respect to- planning and preparation for modernization and revitalization of irrigation schemes; interaction between modernization, revitalization and required operation and maintenance including their cost sharing and institutional and organizational framework.



A Side Event on “New Developments in Irrigation and Modernization” was organized on 8th November 2016 during WIF2 wherein more than 50 participants participated and five presentations covering different views of modernization were made. After deliberation, the participants developed the working definition of modernization, and accepted the definition of modernization as - “Modernization is the process of upgrading infrastructure, operations and management of irrigation systems to sustain the water delivery service requirements of farmers and optimize production and water productivity”.

The group established its own dedicated website < <http://wg-mr.icidonline.org>> and uploaded scoping document, agenda and minutes, list of members, articles, documents, PowerPoint presentations, reports, and events for wider dissemination. WG is planning to prepare a document on state-of-the-art review of modernization for presentation at the Mexico Congress in 2017. The group is also planning to prepare a Position Paper on key issues of modernization for WWF 8 in Brasilia in 2018.

Institutional and organizational aspects

As already stated earlier major challenge of the 21st century is to ensure food security for rapidly growing population in an environment of fierce competition for water among various sectors. This calls for efficient management of irrigation system supplemented with use of improved agricultural practices and adoption of latest technologies. Appropriate institutional arrangement and organizational setup are must for proper operation and maintenance of the irrigation systems. There are at least five integrated aspects that must be properly maintained in order to secure the functional sustainability of irrigation/drainage in particular and development and maintenance functions of infrastructures in general. These are: (i) Human resources; (ii) Institution and organization (iii) Technology for sustainable O&M; (iv) Sustainable O&M budget; and (v) Effective regulatory instrument and enforcement. The absence or unbalance of an integrated relationship among any of the five aspects would bring about ineffectiveness of infrastructural functions, so the five aspects cannot be seen in isolation. During the operation phase of irrigation/drainage infrastructure, human resources in conjunction with appropriate institutional and organisational setting are of particular importance.



Keeping in view, the Working Group on Institutional and Organizational Aspects of Irrigation/ Drainage System Management (WG-IOA) was established in 2015 to scrutinize a variety of institutional and organizational aspects related with Irrigation and drainage development and management. The broad scope of the WG is to investigate, analyze and disseminate information and knowledge on interdisciplinary areas of institutional and organizational aspects which include mechanism and working improvement in relation with organizational arrangement, legal framework and organizational structures of Water User Association for improving water service delivery, approaches for successful participatory irrigation and drainage management (PIDM) transfer, working mechanism and involvement of the public private partnership (PPP), mechanism of charging of irrigation and drainage services as well as determination of the level of cost recovery.

In an attempt to grasp the global perspective of such a large interdisciplinary areas of institutional and organizational aspects of irrigation and drainage and to deliberate on the issues related institutional reforms needed for sustainable agriculture management, the WG is organizing a Symposium on the theme ‘Global Review of Institutional Reform in Irrigation Sector for Sustainable Agriculture Water Management, including WUA’ on 8th October 2017 during the 23rd ICID Congress at Mexico City, Mexico. The Concept Note of the Symposium, including background, scope and expected contents of the country papers were circulated to NCs for contributing country papers. The main aim of the Symposium is to provide a platform for irrigation and drainage professionals and other stakeholders to share their knowledge and experience related to sustainable agriculture water management with focus on institutional and organizational reforms in irrigation sector, participatory irrigation management, water users’ associations and other relevant stakeholders etc.

For intensifying the exchange of information, the Chairman presented the paper titled “Historical, present condition and future outlook of institution and organization of irrigation development and management in Indonesia”. Presentations were made by Mr. Madhav Belbase (Nepal) titled “Irrigation Institution Reform – a Future Course in Nepal”, and Dr. Kazumi Yamaoka (Japan) titled “Importance of Institution and Organization for Sustaining Irrigation and Drainage System Management in the Future - Lesson Learned from Practice in Japan”.

Water saving in irrigation

Population growth, economic development, urbanization, dietary changes, migration, regional conflicts, civil unrest, pollution, and climate change, all put immense pressure on water resources. Agriculture being the largest consumer of water (more than 70%) will be the most affected due to water scarcity, which is one of the leading challenges of the 21st century. However, it is also the sector having the largest scope and potential for adjustment in water consumption resulting insignificant water savings. But all this needs to take place against the backdrop of an increasing food demand.

Agriculture can significantly improve water-use efficiency while maintaining or even increasing productivity. There are several approaches for improving the crop productivity (yields) by replacing high water consuming crops with lower-consuming ones and adopting management and systems improvements to increase productivity per unit of water consumed. So, irrigation systems have been under increased pressure to produce more with lower supplies of water. In order to improve performance of irrigation systems, it would be necessary to undertake water accounting and irrigation audit to understand how, when and where the water is being used in the system as well as to manage it properly and efficiently. Measuring water use is a key step in this direction.

Keeping the above challenges in view, the Working Group on Water Saving in Irrigated Areas (WG-WATS) was established in October 2015 at Montpellier with the mandate - Water accounting and irrigation auditing (and other ancillary uses); Irrigation water measuring devices; Assessment of water loss in various components of irrigation systems; Various methods and techniques used for water saving in irrigation etc.

In its first meeting at Chiang Mai in November 2016, WG has finalized its action plan, which include to identify, collect, review and analyze the appropriate law and regulation of countries in order to provide a handbook on the topic; to prepare a technical book on water charging polices and mechanism to collect water charges; to organize a Seminar / Symposium on 'Water Saving' to explore all innovations and success stories related to water saving and share the outcome with professional experts and policy makers; to develop a technical paper on the state of the art on the aspects of management, technology, technique and policies for water saving in irrigated areas; and to undertake overview the existing key books, manuals, guidelines etc. on water saving and share key findings with the members and other professionals.



Ms. Jianxin Mu (China), Mr. Mehrzad Ehsani (Iran), WG Chair, Dr. P. Soman (India) and Mr. Mortaza Yazdekhasti (Iran) volunteered to take lead and coordinate activities in respect to identified activities of the WG.

Two winners of 2016 WatSave awards presented their respective works during the meeting of the WG viz. (a) "Innovation and extension of sprinkler and micro irrigation technologies in China" by Dr. Jiusheng Li from China; and (b) "Innovation implementation and extension of the water saving integrated smart farming AWDI technique in Thailand" by INWEPF-Thai Committee. These studies were publicized as an article in the ICID News for wider dissemination.

As a part of knowledge sharing activity, ICID has organized a Webinar on "Water Accounting and Audit" by Dr. Wim Bastiaanssen (The Netherlands) on 3rd April 2017 under the newly launched "ICID Webinar Services". The aim of the webinar was to introduce the standardized water accounting procedures that quantifies the watershed processes, assesses a safe level of exploitable water volumes and the maximum amount of water that could be withdrawn and consumed by the irrigation sector. The webinar was well received with more than 100 participants from all over the world. Live recording of the webinar is made available on ICID website http://www.icid.org/icid_webinar.html.

Irrigation development and management

It is estimated that agricultural production needs to increase by an estimated 70% globally and by 100% in developing countries by 2050 in order to keep pace with the population growth and shifting diets. Irrigation is of crucial importance for global food security as irrigated agriculture account for 40% of global crop production,

while being cultivated on 20% of the global land surface. So there is a need to expand area under irrigated agriculture coupled with other measures such as adoption of improved agronomical and management techniques, use of modern technology etc.

However, irrigation development is plagued with many issues and challenges which include diminishing financial resources for irrigation sector, competitive water demands from other sectors including impacts of climate change, complexities associated with development in general including environmental and social issues etc. FAO projects that only a small amount of additional land will be equipped for irrigation by 2050. In addition to development, efficient management of the irrigation systems is crucial to ensure reliable and best service to the farmers to achieve optimum production. Irrigation management has to focus on three elements namely water, physical structures, and social organization, which are interlinked.



ICID established a Working Group on Irrigation Development and Management (WG-IDM) in October 2015 at Montpellier to look into the issue associated with IDM with the broad scope of assessment of water demand; development of water resources including ground water and economic scarcity of water; social drivers and resistance to development of irrigation and progress in water management etc. The group will focus on the approach of water balance in irrigation, with the objective to develop appropriate guidelines in this respect.

WG in its first meeting at Chiang Mai, Thailand in November 2016, agreed to develop a guideline on 'Water balance approach in irrigation systems'. Two presentations were made during the meeting viz. (a) Water Resources for Irrigation in Taiwan (Mr. Ming-Young Jan's) relating to IDM scopes and experiences in Chinese Taipei, with a special focus on GIS for precise irrigation management, and (b) Irrigation Development and Management in South Africa (Ms. Mary Jean M. Gabriel). Ms. Mary Jean M. Gabriel from South Africa and Mr. Ahmet Şeren from Turkey were elected as Chair and Vice-Chair of the group respectively.

Sustainable Drainage



Sustainable agriculture is not possible without well designed and well managed drainage system as this provides facilitating environment to root zone for plant growth and optimizes crop production as well as reduce chances of land degradation caused by waterlogging and salinization. So, sustainable drainage management at both resource and system level is not only an important requirement in support of global food production, but to improve environment as well as provide improved livelihood opportunities to the rural population.

In order to discuss these issues and arrive at sustainable solutions, ICID re-established the Working Group on Sustainable Drainage (renamed as WG-SDRG) in 2013 with a mandate to promote drainage as part of integrated water resources management; to promote sustainable approaches for drainage and related projects through a balanced integration of - environmental, economic, and social and cultural aspects. The WG is to investigate, analyze and disseminate information and knowledge regarding drainage of irrigated lands in the overall context of integrated water resource management.

As a part of sharing and compilation of experience in drainage, an internal workshop was organized during the Chiang Mai meeting where papers on bio-drainage, dry drainage, and controlled drainage were presented by Mr. Mika Turunen (IYPeF), Dr. Momon Sodik Imanudin (Indonesia), and Dr. Gurbachan Singh (India). Mr. Ardavan Azari (Iran) made two presentations about Dry Drainage and Bio Saline Agriculture. WG is planning to compile and issue scientific papers on controlled drainage and dry drainage bio-saline agriculture and bring out a publication on bio-drainage. The document titled "Bio-drainage for Management of Waterlogging and Soil Salinity" prepared by Dr. Gurbachan Singh (India) is under final process. During Chiang Mai meeting, Dr. Momon Sodik Imanudin (Indonesia) Vice Chairman of the group was also requested to act as Secretary for one year until the Mexico meeting in October 2017.

The group has been organizing International Drainage Workshops (IDW) since 1978 with the aim of sharing experience across various regions of the world. The 13th IDW on the theme "Drainage and Environmental Sustainability" was held from 4th -7th March 2017 in Ahwaz City, Iran. About 700 delegates from 23

countries attended the workshop, wherein 36 papers were presented with 27 poster presentations. The theme was supported by rich discussions during two roundtable meetings, first on “Alternative Drainage Methods” moderated by VPH Dr. Willem Vlotman, ex-Chair WG-DRG and second on “Drainage Water Reuse” was moderated by Prof. Reisberk.

BASIN

The Strategy Theme ‘Basin’ address all basin level influences such as: Climate change, environmental issues, irrigation in tidal areas, irrigation in water stressed regions, flood management and water for bio-energy. ICID has constituted six WGs, WG-CLIMATE, WG-SDTA, WG-ENV, WG-BIO-FUEL, WG-MWSCD; AND WG-CAFM. The activities of the WGs are as follows:

Climate change

The climate change is recognized as one of the most serious and urgent issue for human society and global environment. A changing climate leads to changes in the frequency, intensity, spatial extent, duration, and timing of weather and climate extremes, and can result in unprecedented extremes. These climate extremes pose significant impacts on human and ecological systems, which are influenced by changes in climate, vulnerability and exposure, resulting in increased fatalities and economic losses especially in developing countries. The extreme events will increase the vulnerability of food production and affect natural resources such as soil fertility; availability of water resulting in water stress; land degradation and desertification.

To deliberate on above issues and study various aspects of impacts of climate change on water resource management, its implications on agriculture, irrigation, drainage and flood management, the Working Group on Global Climate Change and Agricultural Water Management (WG-CLIMATE) was reconstituted in 2015. The group is mandated to share the information about prediction of the global and regional climate change and climate variability; to explore and analyze the implications of climate change and climate variability for agricultural water management including irrigation, drainage, and flood control; to promote archiving useful information and case studies on climate change for practical use in improved impact assessment and adaptation development; 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; and to join the international dialogue on climate change and water management.



The group organized online WebEx meeting on 10th October 2016 and discussed to build more collaborations with other WGs such as WG-ENV and WG-MWSCD, to incorporate water-food-energy nexus idea into current Action Plan 2030 of the WG, and to consider the available resources including labor and financial sources when the action plan is finalized. Dr. Waleed Hassan M. Abou El Hassan (Egypt) along with other members of the WG reviewed and contributed to the chapters on climate change of the MTD which includes adaptation and mitigation, climate, meteorology, international framework, climate change category, extreme events, and others.

WG organized a workshop on “Agricultural Water Management under the Changing Climate” wherein 40 experts participated. Four researches on climate change impacts and water management practice for mitigating the climate change were presented by Dr. Sucharit Koontanakulvong (Thailand); Dr. Kazunori Minamikawa (Japan); Dr. Nozar Ghahreman (Iran); and Dr. Fuqiang Tian (China). The group is also planning to organize similar workshop in Mexico City in October 2017.

Dr. Tsugihiko Watanabe, WG Chair and other members of the WG actively contributed to the activities of the Sub-theme 2 “Management of climatic extremes with focus on floods and droughts” of WIF2 held in Chiang Mai, November 2017. Dr. Watanabe, as the Leader of team for preparation of background paper, finalized and presented the background paper at WIF2, while other members reviewed the abstracts/ papers submitted under sub-theme 2 and also acted as session Co-Chairs and Rapporteur.

Sustainable development of tidal areas



Tidal areas are by nature sensitive areas with high ecological value. Due to their environmental value, they are normally left as such and spared from development. However, due to growing population pressure or strategic reasons, in many locations there are often tremendous pressures to develop these areas for various types of land uses. On the other hand there is an increasing need to prevent further environmental degradation and to protect areas with a high environmental value. Therefore, there is an urgent need for integrated sustainable development and management of such areas. Keeping the importance of tidal areas in view, ICID established the Working Group on Sustainable Development of Tidal Areas (SDTA), with the aim to optimize

use of land and water resources, disaster prevention, and preservation of biodiversity for the present and the future generations.

To facilitate the dissemination of knowledge and experiences in the area of SDTA, during the Chiang Mai meeting a Memorandum of Understanding (MoU) was signed between the two organisations i.e. the Rural Research Institute (RPI) of Korea Rural Community Corporation (KRC), Republic of Korea and Tainan Hydraulic Laboratory (THL), National Cheng Kung University (NCKU) and Water Resources Agency (WRA, MOEA), Chinese Taipei for future cooperation on issues related to SDTA..

Further, to create interest among Young Professionals, the Chair Prof. Ruey-Chy Kao (Taiwan) organized an International Short Course on 'Resilience and Adaptations to Climate Change for Sustainable Management of Tidal Areas', under the mandate of WG-SDTA, from 1st -6th August 2016 at National Cheng Kung University (NCKU), Tainan City, Taiwan. The course was attended by 20 participants from 14 countries, which covered Asia, Africa and North-America. The contents of the course were made rich by the presentations from experts and guest speakers on the subject. The faculty to the course included a galaxy of experts such as PH Bart Schultz and Er. Henk Ritzema (The Netherlands), Chair Dr. Ruey-Chi Kao and Dr. Hsiao-Wen Wang (Chinese Taipei) and VPH Shinsuke Ota (Japan). The speakers covered a wide range of topics, such as: (a) Special characteristics of land and water management in tidal areas; (b) Impact of climate change on land and water management in tidal area; (c) Risk assessment and adaptive management considering climate change; (d) International experiences of adaptations to climate change; (e) Stakeholders participation; and (f) Development of water industry. A brief information on the short course is covered in the News Update, August 2016 issue <http://www.icid.org/nup2016_8.pdf>.

WG also developed a 'Concept Note' and launched an e-Discussion on 'Sustainable Development of Tidal Areas' to share the knowledge and experiences on SDTA among the young professionals on the platform of "ICID-Young Professional's e-Forum (IYPeF)", which was created as a LinkedIn group (<https://www.linkedin.com/groups/6990321/profile>). WG is also expected to publish a special issue of ICID Journal titled "Sustainable Development of Tidal Areas: Climate Change and Environmental Impacts" in 2017. More than 10 papers have been received and are under review.

Environmental issues



Irrigation and drainage systems worldwide interact with complex, dynamic and diverse environments which include physical, chemical, ecological, climatic, social, human and economic dimensions. Environmental sustainability is a moving target, which evolves as the complex and dynamic relationships between nature and societies unfold and as new challenges emerge. The pillars of the 'Green Revolution', – high yielding varieties, use of agro-chemical inputs, and mechanization, along with massive irrigation developments – had a definite positive outcome in increasing food production, which prevented hunger in many parts of the world in the early sixties. But this also resulted in negative impact on the environment in the due course of time.

To handle the negative impact on the environment, ICID established the Working Group on Environment (WG-ENV) in 2008 with the objective to provide guidance to policy makers, planners, designers, and managers in the irrigation and drainage sectors on the environmental aspects of drainage and irrigation systems. In 2016, the group organized various events/ activities viz. (a) online WebEx meeting on 25th May 2016; (b) Side Event on "Environmental performances of paddy rice systems in the context of CC" during WIF2; (c) Training session for ICID

Young Professionals on “The environmental impact analysis of irrigation systems: using LCA” on 10th November 2016 at Chiang Mai. The training session was attended by 28 young professionals from around the world.

The group is currently planning to update its website; contribute to ICID Vision / Action Plan 2030; and finalizing a declaration on soil & water salinization, jointly with WG-SDRG. Chair Dr. Sylvain Perret also participated in the first virtual meeting of AC-IRPID on 30th September 2016.

In 2017, the group is planning to organize a joint workshop with WG-SDRG on ‘Soil and water salinization’ during the 23rd ICID Congress, October 2017. The following publications are also under preparation - (i) Paper on “Ecosystem services in irrigation systems” for submission to ICID Journal on Irrigation and Drainage based on workshop proceedings (2015) on ecosystem services; and (ii) Finalization of the LCA methodology and case study document to be published as an e-publication.

VP Dr. Charlotte De Fraiture (The Netherlands) has been elected as the new Chair of the WG-ENV while Prof. Hatcho (Japan) will remain Co-Chair and Dr. Perret, former Chair, becomes the new Secretary.

Water for bio-fuel and food

Rising energy prices, geo-politics and concerns over the impact of greenhouse gas emissions on climate change are increasing the demand for biofuel production. Over the last two decades, biofuel production has increased dramatically and is expected to increase further with beneficial impacts which include reduction in greenhouse gases, improved energy security and new income sources for farmers. Biomass production for energy will compete with food crops for scarce land and water resources, which is already a major constraint on agricultural production in many parts of the world. So, sustainable development requires recognition of intricate linkages not only between water-food-energy nexus but extending it to a larger framework that encompasses other natural resources: land, climate and environment. Policy on use of biofuels needs to recognise these linkages.

Growing bioenergy crops in an irrigated agriculture scheme may improve the energy supply but it may also result in increased water withdrawals and risks to food security. The critical link of bio-fuels with water security is ultimately whether growing crops for fuel competes for limited land and water with growing food for human consumption. Thus, it is important to understand the synergies and the tradeoffs to ensure the sustainability of the environment.

Keeping the above in view, the Working Group on Water for Bio-Fuel and Food (WG-BIO-FUEL) was established in November 2016 at Chiang Mai to stimulate discussion and raise awareness on water and food security issues associated with biofuel and to enhance the understanding of the nexus among water-food-energy, to explore and analyse the implications of existing and new bio-fuel technologies on water resources availability, food production, and rural development, and to enhance the discussions on appropriate promotion of policies for bio-fuel production to balance food and energy, urban and rural, carbon and economy. With a new mandate.



WG will be updating an e-publication of the Technical Report titled “Water for Bio-Energy” based on the new mandate. The first meeting of the new WG-BIO-FUEL will be held during the 68th IEC meeting in October 2017, Mexico City, Mexico.

Managing water scarcity under conflicting demands

Water scarcity is both a natural and a human-made phenomenon. At the current consumption rate, it is projected that by 2025, two-thirds of the world’s population may face water shortages. Water shortages may be caused by climate change, such as altered weather-patterns (including droughts or floods), increased pollution, and increased human demand and overuse of water. Two converging phenomena drive water scarcity: growing freshwater use and depletion of usable freshwater resources. Water scarcity can be due to physical water scarcity and economic water scarcity. Physical water scarcity refers to a situation where natural water resources are unable to meet a region’s demand and economic water scarcity is a result of poor water resources management. The agriculture sector is impacted the most by water scarcity and shortages as use of water for agricultural purpose has become secondary importance to other uses, mainly domestic in times of scarcity of water.

There are several available solutions to effectively address water scarcity which may include water reuse, storage, management, conservation, and adoption of latest technologies and improved water management practices. However, without holistic and integrated water management approach and strategies, the solution will remain incomplete and may not be sustainable.



Keeping the above points in view, a Working Group on Managing Water Scarcity under Conflicting Demands (WG-MWSCD) was established in 2016 in place of WG-DROUGHT with a new mandate.

The Group will have its first meeting in October 2017 during 68th IEC meeting in Mexico. WG-MWSCD is finalising technical report on Drought covering three sub-themes - Drought Management Strategies in Water Stressed / Scarce Regions, Coping with Water Scarcity, and Rainfall Harvesting and Management for Sustainable Agriculture in Water Stressed/ Scarce Regions.

Flood management

Floods are the most common and widespread of all natural disasters and could be caused due to natural causes, or human activities, or a combination of both. Usually, flooding impacts a large area, however, sometimes, flooding is much localized which may be mostly caused due to human activities and failure to manage water flow due to localised intense rain. It is estimated that river flooding affects 21 million people worldwide and affects \$96 billion in GDP each year. By 2030, those numbers could grow to 54 million people and \$521 billion in GDP affected on average in a year. The top 11 countries (ranked by population affected) are India, Bangladesh, China, Vietnam, Pakistan, Indonesia, Egypt, Myanmar, Afghanistan, Nigeria and Brazil (Source: DELTARES (<https://www.deltares.nl/en/news/global-flood-risks-mapped/>)).

Since it is not possible to fully prevent or control flood, so acknowledgment of the necessity of a wider multi-disciplinary approach led to a paradigm shift from flood control to integrated flood management, i.e. from the “need to master” floods from a technical standpoint to the “need to manage them” from every point of view – not only technical but also social, political and economic, by anticipating the event rather than undergoing it. The concept of integrated flood management lies within the framework of IWRM. The application of a risk management approach provides measures for preventing a hazard from becoming a disaster. Flood risk management consists of systematic actions in a cycle of preparedness, response and recovery. Flood risk assessment needs to incorporate climate change effects on the magnitude of floods and the vulnerability of population. Accordingly, Integrated Flood Management (IFM) endorses this idea, aiming at maximizing the net benefits from flood plains, meanwhile minimizing loss of life. IFM plan is generally built on the following six pillars: (i) manage the water cycle as a whole, (ii) integrated land and water management, (iii) manage risk and uncertainty, (iv) adopt a best mix of strategies including carefully selected points of interventions, and appropriate types of measures (structural or non-structural, short or long-term), (v) ensure a participatory approach, (vi) and adopt integrated risk management approaches.



Keeping in view the need for comprehensive and integrated approach to flood management, the Working Group on Comprehensive Approaches to Flood Management (WG-CAFM) was established in 1999, with a mandate to study the social, political and economic aspects of flood mitigation measures with the aim of promoting ecologically sound development and encouraging people’s participation in flood disaster preparedness.

The WG is finalising a publication on “Adaptive Flood Risk Management” with country case studies covering both structural and non-structural aspects of floods management. Members of WG made number of presentations on various topics related to flood management during the meeting of WG in November 2016 at Chiang Mai in order to enrich the publication.

WG actively contributed to manage activities of Sub-theme 2 - of the WIF 2 “Management of climatic extremes with focus on floods and droughts”. WG Chair Dr. Emami (Iran) supported preparation of the Background Paper of the Sub-theme (http://www.icid.org/wif2_bg_pap_st2.pdf). While Dr. Takao Masumoto (Japan), Vice-Chair and Dr. Maurice Roos (USA), member of WG also contributed their papers titled “Hydrology of the Recent California Drought and Comparison with Past Droughts” and “Flood Risk Formulation on Low-Lying Paddy Regions as an Impact Assessment Tool for Extremes”.

The WG completed its tenure in 2016 and IEC approved formation of a new Working Group on 'Adaptive Flood Management' and suggested to develop the Scoping Document (SD) for new WG. The revised mandate of the new WG will be discussed during the 68th IEC meeting in Mexico City in October 2017.

KNOWLEDGE

Knowledge is very crucial for successful and sustainable development initiatives, but the way knowledge is collected, organized, communicated and shared needs to be given due attention for achieving the mission and vision of the organization as well as providing the international community with impartial information and knowledge. An effective knowledge management program that goes beyond collecting, producing and disseminating information is very important for outreach and making an impact on the intended audiences.

Keeping in view the need, sharing of knowledge and experience including use of latest and new techniques and capacity development of young as well as in-service professionals of agriculture water management sectors by including sharing of learnings from our historical irrigation systems, ICID organized number of working groups/task forces under the theme knowledge such as EB-JOUR, WG-HIST, C-PR&P, WG-CDTE, TF-VE, and TF-WWF8. Brief activities during the year are as follows:

Journal on 'Irrigation and Drainage'

Irrigation and drainage plays an important role as the world struggles to meet the food demand of a rapidly growing population and problems with floods and droughts are increasingly encountered. It is a publication that directly addresses the management of water resources for agriculture and flood management. The potential impact of the Journal on the transfer of technology is large as is its potential for continued success.

The Journal is published by M/s Wiley-Blackwell (UK) since 2001 under full editorial responsibility of ICID. Formerly, it used to be published as ICID Bulletin since 1952. ICID Journal is guided by an International Editorial Board (EB-JOUR) established in 1994, which is chaired by President Hon. Prof. dr. Bart Schultz (The Netherlands). Five issues of the Journal are published every year along with one or two extra 'Special Issues' focusing on the current topics of significance almost every year.



The Journal is accessible online at more than 9000 institutes worldwide of which about 5000 are in developing countries. During the year, the Board ensured that the Journal is published in accordance with editorial policies and reviewed manuscripts. A total 50 articles are published in three issues special issues published in 2016 on selected papers of the 22nd International Congress on Irrigation and Drainage, Gwangju, Republic of Korea, 2014.

History of Irrigation

The vision in the future can be acquired by studying the success of the historical structures and systems including the causes of the known failures in the past. Present-day problems could be improved by better understanding of the past practices. Keeping the above in view, the Working Group on History of Irrigation, Drainage and Flood Control (WG-HIST) was established in 1998 with a view to motivate NCs to set up their national WGs on history and provide guidance to compile, publish, update and/or translate documents on history of irrigation, drainage, flood management, and river engineering. ICID has been working on the history of irrigation and drainage for the last 30 years through its Working Group on History and its associated experts on the subject from around the world through its NCs and has also initiated program for recognition of Historical Irrigation Structures (HIS) from around the world.

Thirty-five Heritage Irrigation Structures (HIS) qualified for inclusion in the ICID Register of Heritage Irrigation Structures till 2015. The Panel of Judges (PoJ) in 2016 evaluated the nominations for HIS and selected 12 more nominations from China (3), Korea (2), and Japan (7) for inclusion in the register. The information on these structures are available at ICID website: <www.icid.org/icid_his1.php>.

Recognizing that wisdom of humanity is worth protecting and preserving as heritage which has ability to lead us towards better water management; with a view to conserve and manage these heritages to the



benefit of present and future generations, a World Water Heritage System (WSH) program has also been developed in collaboration with WWC. The 58th meeting of the Board of Governors (BoG) of the World Water Council (WWC) held in March 2016, in principle approved the World Water System Heritage (WSH) Program.

The group organized a Side Event on the 'History of Irrigation and Drainage around the World' during WIF2 on 8th November 2016 at Chiang Mai. PH Dr. Gao Zhanyi (China) coordinated the side event in cooperation with the Chair Dr. Emami. Nine presentations were made during the event including the "Introduction of

the activities of WG-HIST" and "Historical Water Sustainability in Iran" by the Chair Dr. Emami. A History Exhibition was also organized based on the contributions from China, Japan, Thailand and Korea. In all, ten posters were presented by CNCID, JACID and KCID.

The current activities of the group include: (1) Finalizing the book titled 'Historical Water Sustainability' with the editorial assistance from PH Peter Lee and Mr. Charles Abernethy, and (2) Organization of a workshop on "Historical Water Sustainability" during Mexico meetings in October 2017 and also releasing the book during the workshop.

Capacity Development

Fully realizing that the lack of capacity is a major constraint to deal with increasing complexities and challenges in the field of agriculture water management, ICID established the Working Group on Capacity Development, Training and Education (WG-CDTE) in 2015 with the mandate to coordinate and guide the knowledge management activities of the ICID and the capacity development activities by various WGs; compile the status of training and educational programmes offered in different regions; identify the training and education requirements, and identify gaps in available training programs, explore the feasibility of developing e-Learning program and prepare guidelines for their development to support education and training programmes; webinars; explore the scope of use of IT in capacity development including distant learning, and implement where feasible etc.



WG-CDTE in its first meeting in Chiang Mai, Thailand in November 2016 highlighted importance and need of empowering YPs and NCs, disseminating the appropriate modern tools (ITC and e-Learning materials) to help them develop their capabilities and overcome any gaps they may have. WG-CDTE has planned to undertake studies related to "The capacity development needs, available training courses, gaps, institutes which can provide training to fill gaps" and "The role of ICT in capacity development in agricultural water management".

In line with the mandate, the Egyptian National Committee (ENCID) in collaboration with the Regional Centre for Training and Water Studies (RCTWS) organized the capacity development program in Egypt in April 2016 on the topic "On-farm Water Use and Management". This capacity development activity was supported by African-Asian Rural Development Organization (AARDO), Ministry of Water Resources China through CNCID and Korea Rural Community Corporation (KRC) through Korean National Committee on Irrigation and Drainage (KCID).

Value Engineering in Irrigation and Drainage

Value Engineering (VE) is an internationally practiced methodology to achieve the required product, process, services and system at the minimum possible cost by analyzing their functions and life cycle costs. Today, VE needs to be applied with greater rigor than ever before to meet the current global business need of sustainable development and growth. VE is an intensive, interdisciplinary problem solving activity that focuses on improving the value of the functions that are required to accomplish the goal or objective of any product, process, service, project or organization. In other words, the Value Methodology (VM), a systematic and structured approach, improves projects, products, and processes. VM is used to analyze manufacturing products and processes, design and construction projects, and business and administrative processes. VM helps achieve balance between required functions, performance, quality, safety, and scope with the cost and other resources necessary to accomplish those requirements.

Keeping in view the advantages of VE, ICID established a Task Force on Value Engineering (TF-VE) in 2012 to promote the application of Value Methodology (Value Engineering, Value Analysis, Value Planning, Value Management and Value Engineering Change Proposal (VECP)) in irrigation, drainage and flood management projects to increase benefits, reduce cost and ensure sustainable irrigated agriculture.



TF-VE organised an Internal Workshop on the main theme ‘The Challenges of Effective and Efficient Application of Value Engineering in Irrigation and Flood Projects’ on 9th November 2016 in Chiang Mai, Thailand, where four presentations i.e. Application of VE in irrigation and flood projects, Challenges of application of VE in irrigation projects in Japan, Value Engineering of surface water project, and Value Engineering in federal highways in U.S. were made by members of TF (http://www.icid.org/tf_ve.html). TF is finalising a manual on ‘Application of Value Engineering in Irrigation and Flood Projects’

TF completed its tenure in 2016 and IEC in principle approved the formation of a new Working Group on Value Engineering and requested TF to develop the Scoping Document (SD) for the new WG. The revised mandate of the new WG will be discussed during the 68th IEC meeting in Mexico City, in October 2017.

Inputs to World Water Forum

To lead inputs from ICID to the 8th World Water Forum, a Task Force to Guide ICID Inputs to 8th World Water Forum (TF-WWF8) was established in 2015. The main aims of the TF are –

To provide overarching lead role on behalf of ICID in monitoring and pushing forward the actions set in IR (Implementation Roadmap) and for inputs to 8th WWF by liaising with the National Committees and Workbodies.



The Thematic Framework for WWF8 discussed during the 1st meeting of TF was held on 8th November 2016 in Chiang Mai. It was proposed that in addition to contributing to the topic of Water for Food Security, ICID should also contribute and collaborate with other Topics and Theme Coordinators. A session under the topic of Water for Food Security on the theme “Development – Water for Sustainable Development” is being proposed to be jointly organized by ICID, FAO, IWMI and Water for Food – University of Nebraska in March 2018 in Brazil.

In order to pursue broader engagements of Latin American irrigation and drainage professionals and decision makers in water for food security, TF is planning to organize an ‘Americas Session’ during Mexico meetings in October 2017. Further, EB-JOUR is planning to bring out a Special Issue of the ICID Journal based on papers from WIF2, which would be made available as input to the contents of WWF8; Special issue of ICID News capturing the ‘Conclusions and Recommendations’ of WIF2 is also being prepared by ICID Central Office as contribution of ICID to WWF8; and report on modernization of irrigation/ drainage, standards and codes of practices would be prepared by MXCID by October 2017 which would be additional contribution to WWF8 from ICID.



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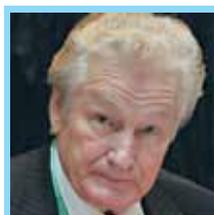
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ACTIVITIES AT REGIONAL LEVEL

The global understanding of development has changed over the years, and countries now have agreed that sustainable development – development that promotes prosperity and economic opportunity, greater social well-being, and protection of the environment – offers the best path forward for improving the lives of people everywhere.

ICID has established regional WGs towards promoting stronger communications and networking among the countries in the region as well as international institutions for enhancing cooperation and coordination. To fulfil the task of doubling the food production in the region, WGs organizes conferences on topics of current importance.

Presently, three regions have active WGs viz., Africa, Asia, and Europe. The activities of these WGs and interaction with other regional groupings/ gatherings are presented in this chapter that supports regional cooperation.

African Regional Working Group



Africa as a whole is going to face two major problems in the 21st century - the first is how to feed the growing population of the continent, and the second is how to adapt to climate change. The population on the African continent is expected to double from around one billion to almost two billion over the next 40 years (United Nations, 2004) which will result in significant increase in food demand. Currently Africa ensures food supply by a mix of domestic food production and overseas food imports, almost, 30% of all cereals consumed are imported. Despite domestic production and import efforts there were 239 million undernourished people living in the African continent in 2012, most of them in Sub-Saharan Africa. During the last two decades the number of undernourished people in Africa has increased by more than 35%, which shows that increasing food insecurity is a matter of real concern. In order to address food security issue the food production needs to be increased significantly supplemented by increased imports.

During the first ever African Green Revolution Conference held in 2008 in Oslo by the Alliance for Green Revolution in Africa (AGRA), in collaboration with African Development Bank and others, to discuss the challenges of transforming Africa's agricultural landscape from subsistence farming to sustainable modern agriculture, in order to achieve food security, some very important observations were made as indicated below.

"The world urgently needs a green revolution in Africa. And the African continent has the potential to deliver"
-Lennart Bage, then President of IFAD

"The international community must work in partnership with all affected stakeholders to achieve sustainable agricultural development and real outcomes for the people in Africa" - Kofi Annan, Former UN Secretary General

Mr. Bage called for investments into research that focuses on technologies and seed varieties that poor rural farmers need, to respond to challenges from pests, droughts and salinity.

In order to discuss various issues related to food security and sustainable development in Africa, ICID established African Regional Working Group (AFRWG) in 1994 with a mandate to promote links and networking among the African countries as well as regional and international institutions for enhancing

cooperation and coordination, and to support integrated river basin development, training and research issues and information system for African needs. At present 15 countries from the region are member of AFRWG (see page 10).

AFRWG finalized and adopted Capacity Development Strategy for Africa as a dynamic and living strategy to be updated regularly every 3 years. In order to implement the capacity development agenda for Africa, the Egyptian National Committee on Irrigation and Drainage (ENCID) organized a week training course on “On-farm Water Use and Management” from 17th -24th April 2016 in Egypt in partnership with ICID and AFRWG. 21 participants from 15 countries participated in the training programme. WG Chair Dr. Sylvester Mpandeli presented a paper titled “Understanding water – energy –food nexus for better on farm management” during the training on 17th April 2016. Participants felt that this was a very good training course meant to empower African scientists and professionals on water related issues. AFRWG propose to organise such training program regularly across all the African regions. The trainees also attended the 4th Africa Regional Conference on Irrigation and Drainage (ARCID4) held from 26th -28th April 2016 in Aswan, Egypt.

ENCID supported by AFRWG hosted the ARCID4 at the historic city of Aswan, Egypt from 26th -28 th April, 2016. The main theme of the conference was “Agricultural Land and Water Management for Sustainability under Climate Variability” and three principal topics were - Water Use Management, Food Security; and Research, Extension Services and Capacity Development. About 250 participants representing policy makers, water managers and other stakeholders from 31 countries from all over the world attended the conference.

In order to support African region to usher into green revolution to address challenge of food security, ARCID4 recommended ICID and AFRWG to prepare a position paper on ‘Green Revolution in Africa’ and to set up a mechanism to extend its support in the area of AWM. A questionnaire was circulated among NC members from the region to provide their views on what should be the mission, objectives, main components of the African Green Revolution; main challenges inhibiting implementation and tools required for green revolution; capacity gaps for supporting green revolution etc. Only few countries have provided their response to the questionnaire.

Asian Regional Working Group

Water security in a changing climate is equally important, if not more, for peace and security. Agriculture being the biggest extractor of water, AWM can be crucial in these global efforts for peace and security. The rural transformation leading to sustainable development would require that water security is ensured. Keeping this in view, a Side Event on ‘Agricultural Water Management for Sustainable Rural Development’ was jointly organized by Asian Regional Working Group (ASRWG) and African-Asian Rural Development Organization (AARDO) on 7th November 2016 at Chiang Mai. Chair Prof. Choi (Korea), informed that 7 papers, one each from India, Japan, Korea, Nigeria, Sri Lanka, Taiwan and Thailand, were presented. Some of the papers presented will be considered for the publication of ASRWG Technical Report and others for the special issue of AARDO Journal in 2017.

As per the mandate of the group, linkages with regional and transnational organization for cooperation are to be strengthened. Following the mandate, a Memorandum of Understanding (MoU) between Iranian National Committee (IRNCID) and Korean National Committee (KCID) was signed in May 2016 followed by technical exchanges and visits by both countries as part of regional cooperation. The Chinese Taipei Committee (CTCID), Indonesian National Committee (INACID) and Malaysian National Committee (MANCID) are also planning to make such regional collaboration in coming years.

As a part of developing cooperative arrangements with International Society of Paddy and Water Environment Engineering (PAWEES) and International Network for Water and Environment in the Paddy Field (INWEPF), the group co-organized the two-day International Society of Paddy and Water Environment Engineering (PAWEES) Conference on the theme ‘Sustainable Paddy Water Management in Water-Energy-Food Nexus’ which was organized from 20th -21st October 2016 at Daejeon City, Korea. The conference was jointly organized by PAWEES, KCID and ICID WG-CLIMATE. As part of collaboration between PAWEES and ASRWG, a Conference on ‘Agricultural Water for the Development of Rural Society in Asia’ was organized on 20th October 2016 and was chaired by Prof. Kyung Sook Choi (Korea).



During the conference, four presentations were made viz. Prof. Kwang-Sik Yoon (Korea); Ir. Toshiaki Lida (Japan); Prof. Budi Indra Setiawan (Indonesia); and Mr. Seung Won Lee (Korea). The participants exchanged information on the on-going research challenges, which covered improvement of water use efficiency and rural development with improved irrigation systems. It emerged from the Conference that there is need to involve younger researcher and engineers into the discussion on current world practical issues; and to provide the members with information about the world issues on paddy irrigation and drainage, which might identify or establish a new research topic or target. The collaborated work would be the “co-design” for the further challenges toward the better paddy irrigation and drainage as well as sustainable paddy based rural society. The 13th International Network for Water and Environment in the Paddy Field (INWEPP) Symposium on the theme “Flood and Drought Impact to Farming and Eco-system in the Context of Climate Change” and Steering Meeting was held from 6th -7th December 2016 in Phnom Penh, Cambodia where members of ASRWG actively participated.

The Nepal National Committee (NENCID) is organizing the 8th Asian Regional Conference (ARC) in March 2018 in Kathmandu, Nepal and is planning to bring out its first announcement in 2017.

European Regional Working Group

In order to promote awareness about relevant water issues at all levels and to pay special attention to the environmentally sustainable water management in the European region, ICID established European Regional Working Group (ERWG) in 1995 with present representation from 16 member countries. ERWG includes 7 National Water Management Associations, 5 European professional organizations and 5 European Water Management institutes. ERWG has five focus groups which were setup to raise the issues related to European viewpoint in the respective workbodies of ICID and revert back to ERWG on the relevant issues within the scope of focus groups. These focus groups are: (a) Focus Group on History (b) Focus Group on Environment (c) Focus Group on Sustainable Drainage (d) Focus Group on Water Related Risks (e) Focus Group Irrigation and Drainage in the States under Socio-economic Transformation.

Since there is a drop in membership from region, a Task Force on Revitalization of ICID Network (TF-Revitalization) was established under the Chairmanship of VPH Dr. Huseyin Gundogdu (Turkey) to study the reasons responsible for the gradual withdrawal of NCs from European region. The TF held three meetings during the year and noted that reasons for withdrawal of some members are a combination of economic, political and organizational such as changes in the organizational structures within the governments, resulting in AWM (and consequently the NCs) left parentless; lack of involvement of all stakeholders, particularly private sector and international development agencies; disconnect between NC and the concerned funding department in the absence of regular feedbacks; and absence of policy feedback or advocacy under the banner of the NCs.

International Research Program in Irrigation and Drainage



ICID has formally launched its International Research Program in Irrigation and Drainage (IRPID) in 2015 on a trial basis and a revised IRPID program drafted on the basis of the experiences learned from trial run, deliberations at the IRPID Advisory Committee meeting and inputs gathered from Regional Nodes (RN) of IRPID, which was presented at the 67th IEC meeting in Chiang Mai on 12th November 2016. The approved IRPID Scheme by the Council was eventually notified in February 2017 for its implementation and formation of new RNs as per the provisions laid down therein.

The vision of IRPID is to ‘Intensify Irrigation and Drainage Research to Achieve Global Food Security’ and its mission is to enhance research activities in irrigation and drainage science, technology, and management aspects in order to develop capabilities of member countries to achieve water and food security and poverty alleviation while preserving the environment. The objectives of the revised IRPID are to: (a) Foster a conducive policy environment for increasing research and development, technology transfer and networking needs of members, (b) Enhance research impacts in member countries by fostering innovation through increased coherence, convergence and concerted efforts, (c) Identify and promote opportunities to gain relevance, efficiency and effectiveness of NC’s within their countries, and (d) Help NCs raise the financial resources required to undertake required activities.

The organizational structure of IRPID consists of an Advisory Committee (AC) as a Permanent Committee (PC) to guide the program that is aimed to be implemented through a network of Regional Nodes (RN). The Advisory Committee for IRPID consists of: (a) Chair: Chairperson of PCTA, (b) Members: Head of regional nodes, (c) Thematic Chairs of various themes, (d) FAO, IWMI and World Bank Representatives, and (e) ICID Secretary General

The Program is implemented through the establishment of RNs hosted by NCs of ICID, by way of formalized Memorandum of Understandings (MoUs). Currently two RNs – one each in Tehran and Beijing – are functional. A database of research institutions engaged in AWM within the member NCs is proposed to be established which would be further expanded to include the various research activities being carried out by them. This will help the RN members to collaborate on research areas of common interest. RNs will also undertake capacity building activities at a later stage when they are fully functional.



KEY ICID EVENTS

ICID events provide platform for exchange of knowledge, sharing of the experiences among stakeholders, understand various perspectives of sustainable development and networking among participants as well as setting up the agenda, policy and direction for future ICID activities. Following major events were organised by ICID during the year viz. (i) 4th African Regional Conference hosted by ENCID; (ii) 2nd World Irrigation Forum (WIF2) and 67th International Executive Council (IEC) meeting, hosted by THAICID; and (iii) 13th International Drainage Workshop, hosted by IRNCID.

4th African Regional Conference, Aswan City, Egypt



The 4th African Regional Conference on Irrigation and Drainage (ARCID4) was organized from 26th -28th April 2016 at the historic city of Aswan, Egypt on the main theme 'Agricultural Land and Water Management for Sustainability under Climate Variability' by the host Egyptian National Committee on Irrigation and Drainage (ENCID). Three sub-topics covered were (i) Water Use Management; (ii) Food Security; and (iii) Research, Extension Services and Capacity Development. Around 250 participants attended the conference representing 31 countries, mainly from Africa, Europe, Asia, Australia and USA. The conference was held under the patronage of the Prime Minister of Egypt, and inaugurated by H.E. Prof. Mohamed Abdel Atty, Minister of Water Resources and Irrigation, Egypt in the august presence of H.E. Magdy Hegazy, Governor of Aswan, H.E. Om Prakash Dhankar, Minister of Irrigation, Agriculture and Rural Development, Haryana State, India, H.E. Eng. Wassfi Hassan El-Sreihin, Secretary General, African-Asian Rural Development organization (AARDO), Dr. Saeed Nairizi, President ICID, VPH Dr. M.H. Amer, Chairman, ENCID, and an elite assembly of national, regional and international scientists, experts and professionals in the fields of irrigation, drainage, agriculture, environment and related fields.

ARCID4 was sponsored by a number of partners from ICID, ENCID, Ministry of Water Resources and Irrigation of Egypt, KRC, KCID, ICARDA, RTSWRI, NWRC, Arab Water Council, GIZ, WMRP, MWRI Planning Sector, Egypt Air, Banque du Caire, FAO, National Bank of Egypt, among others.

The main issues discussed during the conference were: Global food problems and the role of irrigation and drainage, Emerging forces (Climate, urbanization, increase in energy prices), Water management challenges and water resources planning, Irrigation efficiency and crop productivity, Role of ICID in the African Green Revolution Global Initiative, Improving salt and water management, Use of non-conventional water in agricultural production, Public-private partnership, Stakeholders involvement and gender equality etc. For more information, kindly visit http://www.icid.org/conf_4afrc_report.html.

Second World Irrigation Forum (WIF2), Chiang Mai, Thailand



Opening Ceremony

The Second World Water Forum (WIF2) was organised at Chiang Mai International Convention and Exhibition Center, Chiang Mai, Thailand from 6th -8th November 2016 on the theme "Water management in a changing World: Role of Irrigation for Sustainable Food Production" by THAICID in partnership with a number of international institutions such as Asian Development Bank (ADB), Food and Agriculture Organisation (FAO), International Water Management Institute (IWMI), UN University (UNU-FLORES), International Fund for Agricultural

Development (IFAD) to name a few. The main objective of the forum was to support member countries in achieving the SDG's and share experiences in implementation of targets related to agriculture water management which is key to both water and food security. The theme of the forum was divided into three sub themes covering a range of associated topics as indicated below:

Sub-theme1: Key issues of irrigation and drainage in balancing water, food, energy and ecology

- 1.1 Roles and efforts of the irrigation sector with respect to the World water issues
- 1.2 Drivers of policy, institutional, organisational and financial innovations for better stakeholder participation in irrigation and drainage services
- 1.3 Roles of water users, private sector, government organizations and civil society in management, operation and maintenance of irrigation and drainage systems
- 1.4 Innovations and extension under new irrigation and drainage performance and services requirements for national water and food security
- 1.5 Role of irrigation and drainage for Forest management

Sub-theme 2: Management of climatic extremes with focus on floods and droughts

- 2.1 Adaptation of design and operation criteria for irrigation and drainage schemes in light of climate change impacts
- 2.2 Managing impacts of extreme events – floods and droughts
- 2.3 Dealing with climate change impacts on food security
- 2.4 Regional water management in Asean countries and international river basins

Sub-theme 3: Key and smart actions to alleviate hunger and poverty through irrigation and drainage

- 3.1 Water and climate smart approaches for sustainable small holder agriculture
- 3.2 Financing mechanisms for development and management of irrigation and drainage projects
- 3.3 Adaptation measures for rural water management for water and food security

The mega event was attended by over 1200 participants from 71 countries, with more than 500 foreign delegates including 8 Ministers and 10 international organizations drawn from different disciplines including ministers, farmers, academicians, researchers, international scientific community, engineers, policy makers, industry and irrigation managers. The glittering opening ceremony was held on 5th November 2016 with a tribute to the Late King, His Majesty, King Bhumibhol Adulyadej of Thailand. H.E. General Prayuth Chan-ocha, Prime Minister of Thailand welcomed the delegates through a video address and highlighted the importance of this event for the future of Thailand. H.E. Mr. Pawin Chamniprasart, Governor, Chiang Mai and President Dr. Saeed Nairizi, ICID also welcomed the delegated and guests. Mr. Sanchai Ketworrachai, Director General, Royal Irrigation Department and Chairman, THAICID presented a brief report on the activities of THAICID and WIF2. The Opening Address was delivered by H.E. General Chatchai Sarikulya, Minister of Agriculture and Cooperatives, Thailand; followed by a Keynote Addresses by Mr. Petipong Pungbun Na Ayudhya, Former Minister of Agriculture and Cooperatives of Thailand; Ms. Kundhavi Kadiresan, Assistant Director General, FAO; and Eng. Wassfi Hassan El Sreihin, Secretary General, African-Asian Rural Development Organization (AARDO).

Plenary and Parallel Sessions

Following the Opening Ceremony, parallel plenary sessions were held to deliberate and discuss the theme and sub-themes. In total three plenary sessions and 12 parallel sessions were organised where 5 Keynote papers on behalf of partner organizations (IWMI, DWFI, World Bank, KRC and Mc Gill University), 3 Background papers prepared by eminent experts from around the world on the topic of the sub-themes and more than 50 papers were presented and discussed. About 90 papers were presented through posters.

Roundtables and Training Workshops

In addition to plenary and parallel sessions on theme and sub-themes, other main attraction of the Forum were Ministerial, Senior Officers, Farmers and Young Professionals (YPs) Roundtable meetings.



Ministerial Roundtable: A Ministerial Roundtable was held during the Forum, in which Ministers from around 8 countries (Bhutan, Cambodia, China, Ethiopia, Indonesia, Laos, Nepal, and Thailand) both member as well as non-members participated on the invitation of H.E. General Chatchai Sarikulya, Agriculture and Cooperatives Minister of Thailand. Ministers discussed their countries perspective on the theme of the Roundtable 'Rural Transformation through Efficient Agriculture Water Management'. Based on the roundtable discussions, it was agreed to establish a High Level Advisory Group on "Partnerships for Agriculture Water Management" as an action-oriented multi-stakeholder partnership.

Senior Officials Roundtable: During the Forum, a senior officials' roundtable was also organized with the objective of sharing the experiences, knowledge, and practical solutions with regard to managing water resources in a sustainable way. Senior officers from 11 countries attended the roundtable. While discussions during Ministerial Roundtable were on the policy level, senior officer discussions addressed the topics in more detail at the management level and discussed a possible mechanism to implement the Minister's Declaration and to achieve targets for relevant indicators of SDGs.

Farmer's Roundtable: The Farmer Roundtable on the theme "Farmers' Contribution to Sustainable Agriculture Production" was also held during the Forum where the farmers discussed issues of their interest related to AWM. Farmers from five different countries deliberated on the challenges being faced by them for sustainable food production and the role played by irrigation and drainage in their endeavour.

Young Professionals Roundtable: More than 25 Young Professionals (YPs) from 14 countries, most of them sponsored by ICID/THAICID, actively participated in the Forum by sharing the responsibilities in number of technical sessions and other related activities. Discussions among the YPs provided diverse perspective and insights of the youth professionals in the field. Two training workshops were also organized for YPs to provide them opportunity to learn about various upcoming topics, namely, "Water Accounting and Auditing: Improving water governance and water management" organised by FAO; and the other on "The Environmental Impact Analysis of Irrigation Systems: Using Life Cycle Analysis" organised by Dr. Sylvain R. Perret, CIRAD, France.

Side Events and International Exhibition



The unique identity of WIF is the "Side Events" organized in association with its partner organizations that covered a variety of related topics presented on a spectrum of views and formed one of the successful segments of the Forum. A total 17 side events were organised in partnership with number of international and local organisations covering wide ranging aspects of AWM encompassing technological, gender, educational, and climate change issues to share experiences and best practices from different regions.

The International Exhibition was inaugurated after the Opening Ceremony by H.E. General Chatchai Sarikulya, Minister of Agriculture and Cooperation, Thailand in the presence of all the participating Ministers and Senior Officers. A total of 40 exhibitors from national and international organizations participated in the exhibition.

Closing Ceremony

WIF2 was concluded on 8th November 2016 with the issue of the WIF2 Statement emphasising the need to maintain the balance between water, energy, food, and ecosystem services and adopting complete water chain approach with full stakeholder involvement from farmer to minister. (WIF2 Statement at page 58). For more information, abstract volume, presentations etc., kindly visit http://www.icid.org/iec_thailand_16.html.

CHIANG MAI FORUM STATEMENT, 2016



The Second World Irrigation Forum (WIF2) was held from 6th - 8th November 2016 in Chiang Mai, Thailand. The Forum was organized by the International Commission of Irrigation and Drainage (ICID) and the Thailand National ICID Committee (THAICID) in cooperation with a number of International and National Partners that brought together representatives of various stakeholders involved in irrigation of all types at all scales. About 1200 participants from 71 countries, 10 International Organizations and 9 Ministers attended the Forum.

The main theme 'Water Management in a Changing World: Role of Irrigation for Sustainable Food Production' recognizes that the world's population is growing rapidly and is expected to reach about 9 billion by 2050, mostly living in urban areas, which pose challenges in meeting the sharply growing water, food and energy demands. In order to feed this growing population, it is estimated that agricultural production needs to be increased by about 70% globally and by as much as 100 % in developing countries. It is likely that increased food production will have to be achieved with a reducing share of water for agriculture due to competition from other sectors including uncertainty due to climate change and variability. This calls for growing more with less water in a sustainable manner. New ways to grow food in ecologically and ethically responsible manners and expansion of irrigation to previously rainfed areas, along with supply and demand side management options will play a significant role in achieving this goal.

The key to sustainable development of irrigated agriculture in the changing environment and the on-going rural transformation lies around modernization of irrigation systems and related services to improve water use efficiency; improving water and land productivity supported by financial mechanisms; reform of management institutions; adoption of efficient water management techniques including recycling and reuse of waste water; use of modern technologies; increasing awareness about water scarcity and capacity development of service providers and farmers etc. with participation of all the stakeholders (public and private sector, academic and research institutions, industry, civil society, farmers' and their organizations etc.).

Within the context of the Main theme, more than 183 papers, short communications and posters were presented and discussed under three Sub-themes: (1) Key issues of irrigation and drainage in balancing water, food, energy and ecology; (2) Management of climatic extremes with focus on floods and droughts; (3) Key and smart actions to alleviate hunger and poverty through irrigation and drainage. In addition to the thematic sessions there were 17 Side events and an Exhibition.

A WIF first was the round table Ministerial meeting where Ministers from Bhutan, Cambodia, China, Ethiopia, Indonesia, Laos, Nepal, Pakistan, Sudan participating in the Second World Irrigation Forum, hosted by the Kingdom of Thailand, under the chairmanship of Honourable Minister of Agriculture and Cooperatives of Thailand, made a press release based on their deliberations on 6th November 2016. They agreed to establish a High Level Advisory Group on "Partnerships for Agriculture Water Management" as an action-oriented multi-stakeholder partnership. The objective is to support member countries in achieving the Sustainable Development Goals (SDGs) and share experiences in implementation of targets related to agriculture water

management which is key to both water and food security. It will also support the UN System efforts in monitoring the progress on related SDGs. The partnership will advocate strong policy support for higher investments in Agriculture Water Management (AWM) to ensure food and water security.

As a result of the presentations and discussions at the World Irrigation Forum, the following statements were agreed:

1. The big challenge for the coming decades will be to increase food production with fewer resources -water, soil, energy, and biodiversity.
2. In order to foster sustainable development, it is essential to maintain the balance among water, energy, food, and ecosystem services.
3. The issues that irrigation and drainage sector is facing are (a) safeguarding resource availability and its quality when designing new systems, (b) the operation and maintenance of existing systems and in turn their impact on resources and the environments that hold them, and (c) the stakeholder interaction and participation that lead to the governance of the systems and their underlying resources.
4. The future challenges require unconventional thinking and solutions. Thinking within the water-energy-ecosystem-food nexus framework with water resources at its heart is essential.
5. Increasing water supply to meet the future demand requires a more efficient water use, use of non-conventional water resources, and water harvesting.
6. Sustainability can only be achieved within a complete water chain approach and with full stakeholder involvement from start to end and from farmer to minister.
7. We need to adopt a more integrated holistic approach to understand and sustainably manage resources with the aim to produce more from less "more crop per drop per kilowatt" without hampering natural ecosystem services.
8. Climate change is recognized as one of the most serious and urgent issue for human society and global environment. In the context of agriculture, improving irrigation and drainage systems and rural development will play a key role in achieving the rural water and food security under impending climate change, especially in the developing countries.
9. To reduce the disaster risks, the global and local society or community need to assess the magnitudes, frequencies, and variabilities of weather and climate events; the exposure of the society for these events; and the vulnerability of the region and society to these extremes.
10. Under the given uncertainties in climate change impact projections, improving resilience by reinforcing the capability of societies to better cope with the extreme events is one of the most favoured approaches.
11. In the pursuit of information to support the policies and actions to alleviate hunger and poverty from a perspective of the role and impacts of irrigation and drainage, correlation must be provided between water scarcity, community and poverty.
12. One of the main goals of the international community is to eliminate hunger and poverty and in this perspective, through the Millennium Development Goals much progress has been achieved and evidence obtained. Sustainable Development Goals and various United Nations and other initiatives, intend to move forward this agenda by making it a part of the broader development frameworks.
13. The important elements of irrigation and drainage that affect the alleviation of hunger and poverty can be grouped into governance, rights-based development, water rights and pricing, management, efficiency improvement, and role of technology.
14. Both the potential and the need to make use of innovative technology and solutions in irrigation are underlined and these can be used to cater the challenges in different sub-sectors with focus on maximizing productivity and efficiency, reducing water losses, achieving sustainable intensification and managing demands on water resources and the associated trade-offs.

67th International Executive Council, Chiang Mai, Thailand

WIF2 was followed by the 67th International Executive Council meeting and its pre-Council meetings held from 8th -12th November 2016. Some of the important decisions taken during the meetings are:

- Approved hosting of the World Water System Heritage (WSH) Program Secretariat at ICID Central Office and participate in the program.
- Revised mandate for International Research Program for Irrigation and Drainage Scheme
- Changes in the mandate of new / existing Workbodies (TF-MTD; WG-Bio-Fuel & WG-IDM)
- Closure of WG-DROUGHT and WG-CAFM
- Extended the tenure of TF-REV, WG-IDSST, WG-SDTA, WG-HIST and WG-PQW for one more year.
- Setting up of High-level Advisory Group as per the declaration of Minister's meeting held during the WIF2 for "Delivering SDGs through agriculture water management".
- Approving membership of Somalia, which joined ICID family
- The Council elected Dr. (Mrs.) Irena G. Bondarik (Russia); Mr. Waseem Nazir (Pakistan) and Er. Madhav Belbase (Nepal) as Vice Presidents for the period 2016-2019.

13th International Drainage Workshop, Ahwaz, Iran

The 13th ICID International Drainage Workshop (IDW13) was held from 4th -7th March 2017 at Ahwaz, Iran on the theme of "Drainage and Environmental Sustainability" and four sub-themes as: (i) Measures to improve drainage water quality; (ii) Measures to lower volume of drainage water; (iii) Adaptation of new design criteria in favour of the environment; and (iv) Application of alternative drainage methods.

IDW13 was attended by some 700 delegates from 23 countries. The aim of the workshop was to introduce the challenges, needs and solutions facing the drainage community worldwide and to share experience on the national, regional and international scales in the field of agricultural drainage in relation to the environment. The theme 'Drainage and Environmental Sustainability' enabled discussions on issues related to environmental concerns of drainage, addressing its design, implementation and management duly factorizing these concerns. The theme was supported by rich discussions during the Roundtable on "Alternative Drainage Methods" and six keynote addresses. It was highlighted that it is essential to manage not only the drainage water quality but also its volume. In addition, papers were presented on Drainage Modelling, Drainage Material and Special Issues related to Drainage.



REWARDING EXCELLENCE

Out of the global population of around 7 billion (2016), almost 1 billion people are undernourished, particularly in Sub-Saharan Africa and Asia. By 2050 when population is expected to touch 9 billion, as per FAO estimates, even if agricultural production doubles by that time, one person in twenty still risks being undernourished – equivalent to 370 million hungry people mostly in developing countries. Therefore, the challenge is not just to produce more food but also ensure that families have access which will bring them food security. This calls for increased momentum in research and development supplemented by appropriate incentives for development of enabling policies, improved practices and innovative technologies to boost agriculture productivity and strengthen food security.

Keeping the above in view and to encourage irrigation professionals to improve various aspects of agriculture water management, ICID has instituted a number of awards to recognize the works and encourage the researchers for their outstanding contributions. The objective is to encourage development and implementation of innovation technologies, agronomic innovations, improved management practices, and institutional reforms to bring higher crop productivity, higher farm income, and preservation of the land, water and the environment resources for irrigated and rainfed agriculture ensuring sustainable development.

WatSave Awards 2016

WatSave Awards instituted in 1997 are given for proven and robust technology, tool or work that has actually resulted in saving of water in agriculture. Like every year, the WatSave Awards were given during the 67th IEC meeting held at Chiang Mai, Thailand, 2016 in the four categories - the technology award, innovative management award, young professional and farmer award. The research works of the winners awarded during the year are briefly described below:

Technology Award



Prof. Li Jiusheng (China) received the 'WatSave Technology Award 2016' for carrying out his research on consumption mechanism of sprinkler water intercepted by crop canopy, droplet size distributions from sprinklers, design standards of sprinkler uniformity, transport of water and nitrogen in soil under drip fertigation, efficient and safe utilization of reclaimed sewage effluent through micro-irrigation. The innovations on consumption mechanism of water and nutrients applied by sprinkler and micro irrigation systems have greatly promoted the government and farmers to select sprinkler and micro irrigation as water-saving and environment friendly irrigation methods. This has significantly accelerated the extension of these emerging

irrigation technologies in China, resulting in vast savings of irrigation water. The applications of the findings on design and operation parameters in sprinkler and micro irrigation systems have significantly reduced the amount of water and fertilizers used comparing to the conventional practices. Newly designed landscape sprinklers have been used in landscape irrigation in more than ten provinces of China, with a total area of exceeding 1,000 ha. Comparing with the conventional landscape irrigation, the estimated amount of accumulative water savings has exceeded five million cubic meters. The technology has possibility of scaling up to other countries as well. For more information, refer to ICID News 2016 (Fourth Quarter - http://www.icid.org/icidnews_16_4.pdf).

Innovative Water Management Award



Mr. Va-Son Boonkird and Dr. Watchara Suiadee (Thailand) received the 'WatSave Innovative Water Management Award 2016' for successfully introducing the 'Weekend Farmer Alternate Wet and Dry Irrigation (AWDI) with Smart Farming' innovations to produce a new model of merging best practice based on practicalities in the real world, such as minimized labour intensity, with maximum water saving. Previously, AWDI techniques called for four alternate wet and dry periods, but in the modified method alternate wet and dry periods have been reduced to only two. The method was developed and demonstrated at the Experimental Station for

Water Management and Cutting Edge Technology, which is regulated in partnerships by Irrigation Development Institute (under RID), the private sector from Siam Kubota Corporation, and Pathumthani professional farmer Mr. Tawee Kumraksa. The results showed that the Weekend Farmer AWDI technique demonstrated water saving of 20-33% is found to be less complicated and less labour intensive.

Young Professional Award

Dr. Mohamed Elsayed Abdell Rahman Albaumy Elhagarey (Egypt) received the 'WatSave Young Professional Award' for his innovative Soil and Water Management Machine for Rice Cultivation (SWMR). SWMR can save water, nutrients, time, efforts, applied energy, and operating costs. An innovative machine was developed to manage soil for 20 cm depth for the new technique of rice cultivation which depends on translating rice in the bottom of a long trench having V shape cross-section and as such the rice did not have any water stress. The volume of water needed for irrigation under new technique becomes about 50% less as compared to the water needed under the traditional method while yield increased by about 5%. Innovation has potential for replication to other areas and countries.

Farmer Award

Mr. Chandrashekhar H Bhadsavle; Mr. Changev K Nirguda and Mr. Anil D Nivalkar (India) received the WatSave Farmers Award 2016 for their successful innovation and extending Saguna Rice Technique (SRT). SRT is a unique method of cultivation of rice and related rotation crops without ploughing, puddling and transplanting (rice) on permanent raised beds. This is a zero till, Conservation Agriculture (CA) type of cultivation method evolved at Saguna Baug, Neral, Dist. Raigad, Maharashtra, India. It reduces water requirement by 50% for rice (3000 litres water required to produce 1 kg of rice) cultivation, reduces back breaking labour by 50% and cost of production by 40%. It also reduces emission of greenhouse gases and effectively does carbon sequestration to improve soil fertility. Above all, SRT is bringing joy and confidence to the rice farmers which helped in reversing the trend of farmers giving up farming. The technique has been replicated with the support of Government of Maharashtra by about 1200 farmers who have reported an overwhelming satisfaction. For more information, refer to ICID News 2017 (First Quarter - http://www.icid.org/icidnews_17_1.pdf).



Best Paper Award

ICID promotes and encourages professionals and experts working in the domain of agriculture water management to share their experiences, research outcomes and best practices with others through contributing to its Journal 'Irrigation and Drainage', which is a prestigious, peer-reviewed publication, publishing original papers on scientific, engineering, environmental and socio-economic issues associated with irrigation and drainage. In order to recognise and incentivise professionals to contribute to the Journal, ICID instituted the 'Best Paper Award' in 2006 for the outstanding paper contributed to the Journal 'Irrigation and Drainage' during the preceding year (January-December). The award consists of a citation plaque and either US\$ 500 cash or US\$ 800 worth of Wiley books from M/s Wiley Blackwell (UK). The Wiley-Blackwell 2016 Best Paper Award was awarded to Ludivine Pradeleix, Philippe Roux, Sami Bouarfa, Bochre Jaouani, Zohra Lili-Chabaane and Veronique Bellon-Maurel (France) for their paper titled "Environmental impacts of contrasted groundwater pumping systems assessed by life cycle assessment methodology: Contribution to the water-energy nexus", published in the ICID Journal (Volume 64, Issue 1, February 2015 issue) - http://www.icid.org/best_paper-2016.pdf. The award was given during the 67th IEC meeting held on 8th November 2016, Chiang Mai, Thailand, and was received by Ms. Ludivine Pradeleix.

Recognition to "Heritage Irrigation Structures"

Throughout the history mankind has indulged in managing limited available water resources appropriately to conserve and use it for meeting ever increasing demand. Understanding of learnings from our ancient wisdom and traditional experiences provide an insight on how people-centred institutions, practices and development have managed and conserved water systems for over generations and these needs to be preserved as heritage for the benefit of present and future generations. The valuable intangible information on heritage common to

humanity needs to be disseminated to the public to build awareness about heritage structure and learn lessons from these systems that have contributed to peace and socio-economic development for over generations even under pressure from the adverse natural and social conditions.

Keeping the importance of preservation of our heritage in agriculture and irrigation sector, International Executive Council (IEC) Meeting during its 63rd meeting held in Adelaide, Australia in 2012, approved the idea for recognition of the Heritage Irrigation Structures and accordingly scheme for recognition of Heritage Irrigation Structures (HIS) was initiated by ICID. During the current year, 25 irrigation structures from 5 countries were approved for inclusion in the ICID Register of World Heritage Irrigation Structures at the 67th IEC meeting. These are:

- China: (1) Chatan Weir Irrigation System; (2) Lougang Irrigation and Drainage System of Taihu Lake Basin; (3) Zhengguo Canal Irrigation System; (4) Quebei Pond; (5) Tuoshan Weir; (6) Zhuji Shadoof Irrigation System
- Egypt: (1) Aswan Dam; (2) Delta Barrages
- Korea: (1) Byeokgol-je (2) Chukmanje Dam
- Japan: (1) Teruizeki Irrigation Canal; (2) Asakasosui Irrigation System; (3) Naganoseki Irrigation Canal (4) Asuwagawa Irrigation Canal; (5) Meiji-yousui Irrigation Canal; (6) Kounomizo-Hyakutaroumizo Irrigation System; (7) Mannou-ike Reservoir; (8) Uchikawa Irrigation System; (9) Murayama-rokkamurasegi-sosui Irrigation Canal; (10) Takinoyusegi and Okhavarasegi Irrigation System; (11) Jikkasegi Irrigation System; (12) Genbegawa Irrigation Canal; (13) Minamiieki-kawaguchi-yusui Irrigation System; (14) Tokiwako Reservoir
- Russia: (1) Drainage System in Novgorod Region.

Details of all the approved structures included in the online register of Heritage Irrigation Structures are available at <http://www.icid.org/icid_his1.php>





KNOWLEDGE MANAGEMENT AND DISSEMINATION

The effective management of knowledge has been described as a critical ingredient for organisation seeking to ensure sustainable strategic competitive advantage. One of the important objectives of the Commission is to facilitate exchange of information among its members and various stake holders. This objective is achieved through a mix of communication tools/technologies like Internet, publications (digital and print format), and social media. Dissemination of information, knowledge and sharing of successful experiences in agriculture water management forms an important activity.

The Commission has prioritized knowledge management to fulfil its new vision and mission. Info-rich ICID website, and flagship publication 'Irrigation and Drainage' Journal are the main tools in implementing dissemination strategy. The effort is supported by periodicals like weekly e-Bulletin, monthly NEWS UPDATE, and the quarterly ICID NEWS. In addition, ICID also brings out special publications and reports as an outcome of workbody activities in print/online formats. National Committees also brings out publications of their specific interest, besides newsletters, journals in their local languages.

As part of the new initiative, all the publications in digital format are now freely accessible/downloadable to ICID registered members, through the 'Members only' section on the ICID website <<http://www.icid.org/ximlogin/login.php>>.

ICID Website



The ICID website acts as a gateway to a wide range of information on irrigation, drainage, flood management and serves as a vital mechanism of communication with NCs and partner organizations. During this year the website has gone through many additions and changes, which includes: Expansion of ICID Register of Heritage Irrigation Structures (HIS); Irrigation and Drainage - Products and Services Directory; new Tools/Models; Digital collection of ICID publications/ reports; ICID Young Professional's e-Forum (IYPeF); Vision 2030; Live recordings of ICID Webinars; and information on 23rd ICID Congress, etc. The website is updated on regular basis and receives on an average, 18,500 plus visitors per month.

All publication brought out starting from the year 2000 are now available in e-Publication (EPUB) format in collaboration with M/s De Books New Delhi. The facility is now operational and visitors interested in EPUB can view these publications online by visiting http://www.icid.org/diva_epub_icid.html

The 'Basic Information' section introduces to widely used irrigation and drainage terms under the themes such as: Irrigation, Drainage, Flood Management, Climate Change and Irrigation Systems, Drought Management etc. Under each thematic area a number of sub-topics have been introduced. During the 67th IEC meeting workbody members were requested to undertake these important topics and sub-topics and further develop as per their expertise and domain.

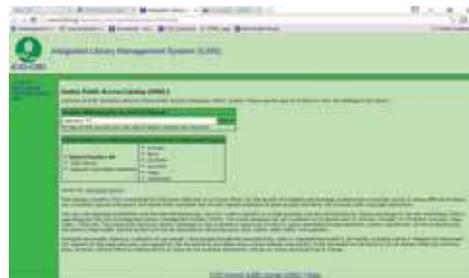
The 'Resources' section provides links to open source tools available in the irrigation and drainage sector such as: Basin Wide Holistic Integrated Water Management (BHIWA) Model; PODIUM - The Policy Dialogue Model; Multilingual Technical Dictionary (MTD); Water Evaluation and Planning (WEAP) Model; SALTMED Model etc. The section is continuously being strengthened through voluntary contribution by the experts from various WGs.

In addition, some 20 workbody websites are operational through ICIDONLINE.ORG domain name.

Some of the other major sections of ICID website are as follows:

Integrated Library Management System (ILMS)

The Text Delivery Services (TDS) was established in 2001 with an objective to collect and disseminate the grey literature, which is not covered under copyright restrictions. The service has been further improved by expanding its scope to a virtual technical library by adding ICID technical library catalogue for online searching. While the old TDS database included only Books and Articles for online searching, additional data items such as CD-ROMs, Journals, Maps, Video / DVDs etc. are now being part of this database. In addition, all digitized ICID publications and documents from the year 1950 onwards are now available in e-format. The digital collections are now being made available for download through 'Members only' section in ICID website.



To develop a dedicated 'One-Stop Knowledge Catalogue' on irrigation and drainage, selected NCs (Bangladesh, China, Egypt, India, Iran, Italy, Korea, Pakistan, South Africa, Sri Lanka, Turkey, and Zimbabwe) were requested in 'Phase-1' to join the initiative in data building. Few NCs have shown their interest to join this network and others are expected to follow soon.

ICID Register of Heritage Irrigation Structures (HIS)

With the inclusion of nine new Heritage Irrigation Structures, the register now consists of 25 Structures, which are now available online at http://www.icid.org/icid_his1.php.

Nomination for heritage irrigation structures is open and NCs can submit nominations throughout the year. A milestone from administrative perspective has been earmarked as 15th July every year, specifically to enable the International Jury to process them before the next IEC meeting held generally between September – November for inclusion in the "ICID Register of Heritage Irrigation Structures".

NC can nominate more than one structure, using separate nomination form for each structure. Associated Members and non-member countries can also nominate their structures through the neighbouring active NCs or by submitting directly to Central Office. For information related to nomination form and more details, visit http://www.icid.org/icid_his1.php.



Irrigation and Drainage Products & Services Directory

The online directory service helps various stakeholders in locating required business/ product information. The online directory enlists all the services and products being provided by consultants, manufacturing companies, dealers, and other professional institutions dealing in irrigation, drainage and flood management.

The information is presently listed in the following categories and sub-categories:

- (a) Consultancy Services (1. Individuals/ Experts/ Freelancer; 2. Organizations);
- (b) Companies / Manufacturers / Dealers (1. Company/ Implementing Agency; 2. Dealer/ Distributor / Contractor; 3. Manufacturer; 4. Publisher; 5. Software developers/ vendors);
- (c) Institutions (1. Academic Institutions; 2. Farmer's Associations; 3. Funding Agencies; 4. Government/ Non-Governmental Organizations (NGO)/ Not for Profit Organizations; 5. Research Institutions; 6. Training Institutions); and
- (d) D. Others

NCs and other stakeholders are making use of this service. NCs are further encouraged to promote this service by promoting it among consultants, manufacturers, companies, organizations, software, etc. to join and play an active part. .



Social media

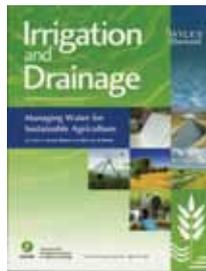


Over the past few years, organizations worldwide are beginning to understand the importance of social media, which provides an opportunity for an exchange of ideas between members, partners and other stakeholders. As part of the social media initiative, ICID established a LinkedIn page <www.linkedin.com/in/icidonline>, which has a direct membership of around 2000 AWM professionals around the world. In addition, ICID LinkedIn page is part of around 30 international Groups involved in AWM activities, which has a huge membership. ICID also established separate Groups for WG-ENV, ICID Young Professional's e-Forum - IYPEF <<https://www.linkedin.com/groups/6990321>> as part of professional network which is open for discussion on public domain.

ICID YouTube channel <<http://www.youtube.com/icidonline>> is growing fast from the contributions received from members and partners. The new addition includes, WIF2 recordings, Heritage irrigation structures, and Webinar recordings. SlideShare account <<http://www.slideshare.net/icidciid>> has also enriched with many new presentations made at various ICID events providing a versatile medium to share information widely. ICID's 'Facebook' page <<http://www.facebook.com/icidat>> is growing steadily for informal communication between members with common interest and thereby promoting their activities. All the received pictures of the events are widely circulated through this medium. All are invited to make good use of these new platforms.

Publications

Irrigation and Drainage Journal



'Irrigation and Drainage' is the official journal of the International Commission on Irrigation and Drainage (ICID) and is published by M/s. Wiley-Blackwell (UK) for the last 15 years. The Journal is a peer-reviewed specialized flagship publication of ICID and features technical papers on all scientific, engineering, environmental and socio-economic issues associated with irrigation, drainage and flood management. The Journal is a rich resource of references to professionals, engineers, researchers, university professors and students of irrigation, drainage, and agricultural disciplines. With ISSN series (ISSN 1531-0353) it appears under the categories of 'Water Resources' and 'Agronomy'.

ICID Journal is guided by an International Editorial Board (EB-JOUR) which is chaired by President Hon. Prof. em. dr. Bart Schultz (The Netherlands), the winner of World Irrigation and Drainage Prize 2016. Five issues of the Journal are published every year along with one or two extra 'Special Issues' focusing on the current topics of significance almost every year.

The Journal is widely distributed around the world. Each National Committee gets 10 free copies (5 copies as 'online only' + 5 copies as 'online + print') of the Journal. All Office Bearers and workbody members are provided free online access. Additional copies of the Journal can be purchased at subsidized rates by ICID members. The Journal can be subscribed by contacting Ms. Leigh Duke, Assistant Marketing Manager of M/s. Wiley-Blackwell, E-mail: <Leigh.Duke@wiley.com>.

To extend the benefits to the developing and least developing countries, M/s Wiley provides free access. Under the Research4Life programme, local, not-for-profit institutions of select countries may register for access to Irrigation and Drainage for free under AGORA (agora@fao.org) and OARE (oare@oaresciences.org) initiatives. The Journal is accessible online at more than 9000 institutes worldwide, of which about 5000 are in developing countries. The full text of the Journal is available through Wiley Online Library [http://onlinelibrary.wiley.com/journal/10.1002/\(ISSN\)1531-0361](http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1531-0361) for all issues published since 2001. Access to abstracts is freely available to all guest users, with facility to view full text papers, or to newly accepted papers which have been not published in print so far, is limited to paid subscribers only. All papers have linkages to other Cross Referenced papers from the reference lists.

Weekly e-Bulletin

The e-Bulletin is a weekly compilation of important and latest news items on agriculture, climate change, drainage, droughts, floods, food security, irrigation and water resources management across the world. It also includes information on forthcoming events, latest publications, editorials and opinions and employment opportunities that might be of interest to the ICID fraternity. Brief news items are hyperlinked and directs the reader to the detailed news item. Fifty one issues of ICID e-Bulletin were compiled and prepared during the year and sent to NCs, Office Bearers, Workbody Members, International Organizations (IOs), and other subscribers. NCs are encouraged to provide the contact details of their members and interested institutions, so that the e-Bulletin services could be directly provided to them from the Central Office. Past issues of e-Bulletin can also be accessed from <http://www.icid.org/ebulletin.html>.



Monthly News Update

The News Update is a monthly e-publication of ICID that provides update on the progress made on various decisions taken by IEC and covers current news from NCs, brief reports of the activities of the President and other Office Bearers of ICID, outcomes of the national/ regional level workshops, meetings, announcement of ICID and related events, international workshops, training courses etc. Important news from partner organizations are also part of this service. Past issues of the News Update can be viewed at www.icid.org/icid_newsupdate.html.



Quarterly ICID News

The ICID News intends taking technical issues to the non-technical stakeholders. Published quarterly, it includes short invited technical articles from eminent professionals on topics of current interests relating to agriculture water management. The following are some of the articles published during April 2016 – March 2017:



- Water Saving and Profitable Rice Cultivation (Prof. Li Xinjian, China)
- Key Issues of Irrigation and Drainage in Balancing Water, Food, Energy and Ecology (Prof. Dr. Reza Ardakanian, UNU-FLORES)
- Soil Moisture (Peter White, UK)
- Second Green Revolution: Articulating an Agriculture Water Management Perspective (Secretary General Avinash C. Tyagi)
- Management of Climatic Extremes with Focus on Floods and Droughts (Prof. Tsugihiko Watanabe, Japan)
- Key and Smart Actions to Alleviate Hunger and Poverty through Irrigation and Drainage (Dr. Olcay Unver, FAO)
- Country Profile – Kingdom of Thailand (THAICID)
- Announcement of the 2nd World Irrigation and Drainage Prize, 2016
- Five years after the Bonn Nexus Conference – Implications for irrigation and drainage (Jeremy Bird, DG IWMI)
- Role of Women in Irrigation and Drainage Sector (Kathleen Heuvel, Australia)
- Declaration of Ministers' Meeting
- 2nd World Irrigation Forum Statement
- Increasing Crop Productivity Ecofriendly by Improving Sprinkler and Micro Irrigation Design and Management (Prof. Li Jiusheng, China)
- Agricultural Water Management and Food Security in a Sustainable Environment (PH Bart Schultz, The Netherlands)
- Beyond modern land drainage (VPH Dr. Willem F. Vlotman, Australia)
- Improve performance of irrigation by applying a water balance (VPH Felix Reinders, South Africa)
- A zero till conservation agriculture technique for rice farming (Chandra Shekhar Bhadsalve, India)
- Past issues can be accessed at http://www.icid.org/news_icidnews.html.

National Committee Publications



- 'Irrigation Australia' the official publication of Irrigation Australia Limited/ ICID NCA and is published quarterly < <https://www.irrigationaustralia.com.au/publications/ial-journal>>
- ABID, Brazil: Brought out 'Irrigaccao & Tecnologia Moderna – ITEM' journal published in Portuguese language <<http://www.abid.org.br/revista.asp>>
- IWF/ICID.UK: brings out News & Views twice a year <<https://waterforum.org.uk/articles-papers/news-and-views-articles/>>
- KCID, Korea: brings out KCID Magazine, Korean National Committee on Irrigation and Drainage (KCID) <<http://www.ekcid.org/home/index.html>>
- USCID, USA: Publishes Newsletter three times a year <http://uscid.org/news-letter.html>

Technical Library



ICID Central Office technical library has a large collection of technical books, reports, proceedings, and periodicals, besides ICID's own publications. The Library receives about 21 periodicals on complimentary basis. With the acquisition of 17 new books during the period 1st April 2016 to 31st March 2017, the Library has acquired 32,251 technical reference documents on various aspects of agriculture water management such as development, operation, maintenance, and rehabilitation of irrigation works; flood and drought management; climate change etc. All ICID publications including the technical books, reports, proceedings, and workshops, etc. are digitized and available on request.

In addition, Central Office Technical Library, with the help of a new online library software on ICID website (www.icid.org/members_only/openbiblio/opac/index.php), host 12107 entries under "Articles Section"; and 55 entries in CD-ROMs/DVD section. The service would be beneficial for all ICID members and NCs as this would provide easy access to all ICID publications. To expand the scope of the library catalogue, NCs can join this online catalogue service by contributing digitally their locally available literature to develop Integrated Library Management System (ILMS) which is an attempt to serve as 'One-Stop Knowledge Catalogue' for all Irrigation and Drainage related literature to the ICID community and all irrigation professionals.

ICID Central Office has renovated the library wing with induction of compact library shelving system to maximize space, increase library capacity, energy efficiency, and protect collection from dust, etc. The new wing will be inaugurated shortly.





CAPACITY DEVELOPMENT ACTIVITIES

One of the biggest challenge of the governments especially in developing countries is to ensure water and food security for the rapidly growing population. This is becoming more challenging due to increasing complexities of development, multi-disciplinary nature of inputs for sustainable solutions, the close linkages between water-food-energy, rapid changes in the irrigation and drainage sector further aggravated by the climate change and variability. In addition lack of capacity is also identified as a constraint to the development of productive and viable irrigated systems especially in Asia and Africa. In order to address these challenges there is a need for a well-informed, skilled and technology savvy contingent of agriculture scientists, irrigation engineers, and extension service workers. There is also need for special impetus and systematic capacity development both at institutional and individual levels. ICID started number of new initiatives and programmes to support capacity development of professionals in AWM sector.

Technical Support Unit

The main purpose of the Technical Support Unit (TSU) is to support the member countries in general assessment of gaps in AWM capacities within the countries and suggest possible solutions; developing feasibility reports for small and medium irrigation, drainage and flood management proposal and undertaking assessment of training requirements. The 66th IEC Meeting held at Montpellier, 2015, approved establishment of TSU with the overall objective to "Undertake capacity development activities in the field of agriculture water management (AWM) in support of rural development" with the following broad scope:

1. To coordinate capacity development programs of ICID;
2. To liaise in developing a knowledge base in AWM with the help of ICID working groups, partner institutions and member countries; and
3. To support the member countries in:
 - a. General assessment of gaps in AWM capacities within the countries and suggest possible solutions;
 - b. Developing feasibility reports for small and medium irrigation, drainage and flood management proposal,
 - c. Training assessment needs; and
 - d. Undertaking capacity development activities.

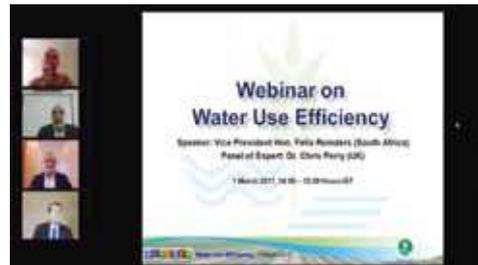
TSU will consist of distributed network of expert volunteers from NCs to support its activities to be coordinated by the Coordination unit within the Central Office. In addition, professionals/ expert from members or partner institutions would also be deputed to the coordination unit of TSU from time-to-time, based on requirement.

In order to ensure smooth functioning of TSU, a 'Capacity Development Fund' has been established and Korean National Committee (KCID) has contributed US\$ 5000. KCID is also identifying an expert for deputation to TSU to support capacity development activities. National Committees are encouraged to join this new initiative to make it successful.

A Core Group headed by the President ICID has also been set up to finalize and prioritize the work program of TSU; Review and monitor progress of activities of TSU; Take administrative and financial decisions regarding the engagement of volunteers and other experts; and Support raising resources.

Webinars

ICID adopted its vision for 2030 as “A water secure world free of poverty and hunger through sustainable rural development” and mission as “Facilitate prudent agriculture water management by encouraging interdisciplinary approaches to irrigation and drainage management.” in line with UN Sustainable Development Goals of Agenda 2030. In order to realize the Vision 2030, ICID has set six organizational goals for the network, which are (i) Enable more crop per drop, (ii) Be a catalyst for change in policies and practices, (iii) Facilitate technology exchange, (iv) Enable cross disciplinary dialogue, (v) Support development of tools to convert research and innovation into field implementation, and (vi) Facilitate capacity development.



The vision of ICID is proposed to be achieved by generating new knowledge, compiling and collating information, sharing experiences and good practices, disseminating the new knowledge to and capacity development of the relevant stakeholders. Number of approaches and tools are available to undertake capacity development and sharing of knowledge which include conducting training programs, developing e-Learning modules, organizing webinars (or web-based seminars) etc. During the 67th IEC meeting at Chiang Mai in November 2016, IEC and different workbodies agreed that Webinar is an efficient tool to disseminate and share knowledge and vast expertise available within and outside the ICID fraternity.

Accordingly, ICID has initiated its first professional series of webinars in its 67 years of history under “ICID Webinar Services” woven around the 23rd ICID Congress theme ‘Modernizing Irrigation and Drainage for a new Green Revolution’. (http://www.icid.org/icid_webinar.html) during the year. The webinars are customized keeping in view the requirement of different professionals working in the AWM sector.

The first webinar in the series was delivered by VPH Felix Reinders (South Africa) on 1st March 2017 on the topic ‘Water Use Efficiency’ to bring a common understanding amongst the water policy makers, irrigation managers and wider international water research community. President Dr. Saeed Nairizi inaugurated the service and welcomed the participants from across the globe. SG Avinash Tyagi introduced the concept of ICID webinar service. Dr Chris Perry (UK) provided introduction to the topic and VPH Felix Reinders delivered the webinar explaining the concept of water use efficiency and applying the water balance approach to assess water use efficiency. Live recording of the webinar has been uploaded on ICID website and shared through social media for its wider dissemination and benefit of professionals who could not attend the webinar (http://www.icid.org/icid_webinar_1.html).

Other webinars proposed to be held under this series during the year 2017 are: (i) Water Accounting and Audit (Dr. Wim Bastiaanssen, UNESCO-IHE), April 2017; (ii) Benchmarking (Dr. Martin Burton, UK), June 2017; (iii) MASSCOTE (Dr. Robina Wahaj, FAO), July 2017; (iv) Modernisation Approach (VP Ian W Makin, UK), August 2017; (v) Sustainable Development Goals (Secretary General Avinash C. Tyagi), September 2017.

In addition, webinars are also planned under Young Professional series (IYPeF) during 2017 on the topics such as: (i) Modern Technologies for improved irrigation and drainage sector; (ii) Use of waste water in agriculture; (iii) Controlled drainage; (iv) ICID WatSave Awards; and (v) Environmental impact analysis of irrigation systems using life cycle analysis.

ICID Scholarships to Young Professionals

In spite of the need for rapid development of AWM sector to ensure water and food security, interest of the young professionals to take up a career in the sector is dwindling. Further, looking into the complexities and multi-disciplinary aspects of the sector, the young professionals, besides engineering, need exposure to the social, environmental and other disciplinary influences on AWM. Keeping this objective in view, ICID is facilitating participation of the young professionals, entering or desirous of entering the irrigation and drainage sector, in the customized training programme and events being organized by ICID in order to expose them to the opportunities and challenges that the sector faces.



The African Regional Working Group (AFRWG) during its 26th meeting held on 13th October 2015 at Montpellier, France during the 66th IEC meeting also laid emphasis on sustainable development for Africa to alleviate poverty and hunger and put emphasis on strengthening the existing national committees across the African continent as well as pursue countries who are not part of the member network to join ICID. AFRWG identified lack of capacity development especially among young professionals as one of the critical issues and accordingly developed a Capacity Building Strategy (CBS) for Africa in 2015. In order to support capacity development of young professionals and practitioners from Africa in the areas of water resources management, irrigation and drainage, ICID with the support of the Egyptian National Committee on Irrigation and Drainage (ENCID) and in coordination with the Regional Center for Training and Water Studies (RTCWS) organized a short training programme on “On-farm Water Use and Management” for participants from African countries during 18th -24th April 2016. The course was designed to give the candidates an opportunity to obtain knowledge and experience in different related subjects dealing with irrigation and drainage.

A total 21 participants from 15 countries (Burkina Faso, Egypt, Iran, Kenya, Malawi, Mauritius, Morocco, Nigeria, Somalia, South Africa, Sudan, Uganda, Tanzania, Tunisia, and Zambia) were fully sponsored for the training programme by ICID with support from African-Asian Rural Development Organization (AARDO), Ministry of Water Resources, China through CNCID and Korean Rural Corporation (KRC) through Korean National Committee on Irrigation and Drainage (KCID).

In addition, 10 young professionals were also awarded full Scholarship for their participation in WIF2 and the 67th IEC meeting held at Chiang Mai, October 2017. The host Thai National Committees (THAICID) also sponsored another 18 YPs to participate in WIF2 and IEC meetings. The sponsored YPs took active participation in various technical sessions of WIF2 and also acted as Rapporteur. ICID also organised two training workshops: (i) Water Accounting and Auditing: Improving water governance and water management organized by Er. Jippe Hoogeveen, and Er. Robina Wahaj, FAO; and (ii) The Environmental Impact Analysis of Irrigation Systems: Using Life Cycle Analysis by Dr. Sylvain R. Perret, CIRAD, France.

ICID Young Professionals e-Forum



Since YPs are the future flag bearers of the agriculture sector therefore ICID is focussing on their capacity development as well as providing platform to them to discuss among themselves various issues and challenges being faced by AWM sector through ICID Young Professional’s e-Forum (IYPeF) established as a LinkedIn Group (<https://www.linkedin.com/groups/6990321>). The membership of IYPeF has marked a steady growth with a present membership base of more than 200 members. During the year IYPeF supported by ICID organised three e-Discussions on the topic (i) Role of women in irrigation, (ii) Role of new technologies for irrigation and drainage, and (iii) Education in irrigation. VP Prof. Dr. Charlotte de Fraiture (The Netherlands), Ms. Badra Kamaladasa (Sri Lanka), and Ms. Jyotsana Chuchra Raheja (India) acted as Mentors for the e-Discussion. These e-Discussions received an overwhelming response from YPs from all over the world and outcome of these e-Discussions were presented by the selected YPs during WIF2.

Based on the active participation in the e-Discussions, scholarships were awarded to 10 young professionals from the IYPeF membership to participate in WIF2 and 67th IEC meeting held at Chiang Mai, November 2016. Six most active members were nominated by IYPeF as its Coordinator and Joint Coordinators to monitor and oversee the activities and also to act as the link to the ICID network. IYPeF held its 1st meeting at Chiang Mai, Thailand during the 67th IEC Meeting on 9th November 2017.

IYPeF, in its first virtual meeting held on 16th January 2017, decided to hold during 2017 a number of e-Discussions on the emerging and important topics such as Water-food-energy nexus in changing world, Climate change and its impact on irrigation especially on women, Drainage issues, On-farm efficiency for small scale farming, and Role of irrigation in food security; and to explore possibilities of linking IYPeF with social media platforms such as Facebook, Twitter etc. IYPeF also agreed to organise a series of webinars for young professionals on topics ranging from Technology for improved Irrigation and Drainage, ICID WatSave awards, Water Audit and Accounting; and Environmental impact analysis of irrigation systems using life cycle analysis (LCA) before the 23rd ICID Congress in October 2017.





FINANCIAL MANAGEMENT

Prudent financial management of an international professional organization is a key to achieve its mission and its targets as it provides the required confidence among its members. It helps mobilize the financial resources and generates confidence of the patrons in the challenging environment which has become increasingly important. ICID, therefore, has put in place a transparent financial system with sufficient checks and balances.

ICID's major resources comprise of subscriptions from its member countries, direct members and special contributions by the host National Committees organizing ICID events. Currently, ICID network is spread over 76 countries across Africa, Americas, Asia and Oceania, and Europe, covering over 95% of the irrigated area of the world. The Commission also receives funds from NCs and various International Organizations to support specific activities to further the ICID objectives.

Secretary General (SG) of ICID, in accordance with its Constitution, acts as the Treasurer and the Financial Controller of the Commission under the overall aegis of the International Executive Council (IEC) which is assisted by the Permanent Finance Committee (PFC), and is responsible for the financial management of the Commission, including receipts, expenditure and management of all funds. SG prepares annual budgets for consideration of the IEC, and is responsible for proper execution of budget as approved by the Council. He is also responsible for all the legal, financial and administrative requirements under GoI provisions on behalf of the Commission.

PFC provides the required oversight into all financial matters and reviews income and expenditure and advises the Council. It makes recommendations on the annual subscriptions and other financial support of the participating NCs. PFC also recommends to the IEC, from time-to-time, ways and means of improving the financial resources of the Commission in order to meet the financial requirements.

Financial Accounts of the Commission are regularly audited on an annual basis by a Statutory Auditor, appointed by IEC, as per the Indian Accounting and Assurance Standards (ICAI) and are complying with the Foreign Contribution Regulation Act (FCRA), 2010; Society Registration Act, 1860; and Direct Tax Law and Indirect Tax Law of the country.

Duly audited consolidated financial statement which include Balance Sheet, Income and Expenditure Account and Receipt and Payment Account for the Financial Year starting from 1 April 2016 to 31 March 2017 are presented on page 76.

FINANCIAL STATEMENTS

BALANCE SHEET AS ON 31st MARCH 2017

ASSET		2016-17 (Amount in INR)	2015-16 (Amount in INR)
1	Property & Equipment	112,66,479	114,13,117
2	Receivables	185,48,685	129,69,440
3	Stock of Publications	2,51,130	2,41,800
4	Bank Balances & Cash in Hand	757,60,428	674,42,621
5	Subscription Accrued	30,95,246	30,83,580
Total Assets		1089,21,968	951,50,558
LIABILITIES		2016-17 (Amount in INR)	2015-16 (Amount in INR)
1	Gulhati Memorial Lecture Fund	3,91,359	3,62,618
2	General Fund	550,56,122	488,90,317
3	Project Funds	-	2,28,913
4	Gratuity Fund	72,85,304	93,40,742
5	Leave Encashment Fund	57,23,148	-
6	Corpus Fund-WID Prizes	24,32,501	16,44,395
7	Security From Tenant	246,32,200	212,30,000
8	Subscription Received in Advance	40,86,770	29,39,243
9	Sundry Creditor, Payables & Provisions	92,71,440	104,96,051
10	Duties & Taxes Payable	43,124	18,279
Total Liabilities		1089,21,968	951,50,558

INCOME AND EXPENDITURE ACCOUNT FROM 01 APRIL 2016 TO 31 MARCH 2017

INCOME		2016-17 (Amount in INR)	2015-16 (Amount in INR)
1	Membership & Subscriptions	167,71,646	211,69,513
2	Sale of Publication	11,66,292	8,30,347
3	Special Contribution to the Budget	55,13,406	20,81,507
4	Interest on Fixed Deposits	32,45,951	46,91,434
5	Other Incomes	10,90,061	44,90,524
6	Rent and Provision of Services on Let Out Property	477,25,895	399,92,127
7	Special Subscriptions	38,96,642	-
8	Closing Stock of Publications	2,51,130	2,41,800
Total Incomes		796,61,023	734,97,252
EXPENDITURE		2016-17 (Amount in INR)	2015-16 (Amount in INR)
1	Opening Stock of Publications	2,41,800	2,73,600
2	Compensation for Secretary General	36,67,644	33,20,081
3	Salaries & Allowances	286,45,480	183,22,443
4	Superannuation Relief to Retd. Employees	35,41,647	30,13,507
5	Service & Maintenance	45,43,796	52,03,681
6	Taxes and Utilities	167,73,753	243,43,110
7	Rehabilitation or Refurbishing and Maintenance of ICID CO Building	2,55,108	11,04,185
8	Publication, Knowledge Management and Dissemination	34,57,695	28,94,876
9	Conference Expenditure	14,59,985	10,89,786
10	Cooperation with Other Organization	54,071	-
11	Travel Expenditure	8,62,574	21,42,912
12	Depreciation on Fixed Assets	15,14,683	15,92,426
13	Workshop, Training and Studies	5,54,526	27,15,261
14	Other Expenditure	48,29,209	1,37,358
15	Excess of Income over Expenditures	92,59,052	73,44,026
Total Expenditures		796,61,023	734,97,252



ANNEXURES



ACKNOWLEDGEMENTS

Country-wise Membership in Workbodies

About 300 professionals from 51 countries contribute to various Committees, Working Groups, and Task Forces directly. Also represented by 12 international organizations in the above workbodies. We thank all our members, who work voluntarily by devoting their valuable time in promoting the mission of ICID.

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	Permanent Observer, WG-CLIMATE

World Bank representative	Permanent Observer, PCSO, PCTA
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WWC representative	Permanent Observer, PCTA; PCSO
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FACTS AND FIGURES

WORLD IRRIGATED AREA

(Arranged in descending order of the irrigated area)

Sl. No.	Country	Million ha	Reference Year
		Irrigated Area	
DEVELOPED COUNTRIES			
1	Australia	2.150	2016 ¹
2	Austria	0.117	2014 ²
3	Bahamas	0.001	2012 ²
4	Bahrain	0.004	2014 ²
5	Barbados	0.005	2014 ²
6	Belgium	0.023	2014 ²
7	Canada	1.053	2004 ¹
8	Chile	1.110	2014 ²
9	Croatia	0.024	2014 ²
10	Cyprus	0.046	2014 ²
11	Czech Rep.	0.032	2014 ¹
12	Denmark	0.435	2014 ²
13	Estonia	0.003	2016 ¹
14	Finland	0.070	2010 ¹
15	France	2.600	2014 ²
16	Germany	0.650	2014 ²
17	Greece	1.555	2014 ²
18	Hungary	0.220	2008 ¹
19	Ireland	0.100	2010 ¹
20	Israel	0.225	2014 ²
21	Italy	2.420	2013 ¹
22	Japan	2.919	2016 ¹
23	Korea Rep.	1.036	2015 ¹
24	Kuwait	0.010	2014 ²
25	Latvia	0.001	2014 ²
26	Lithuania	0.004	2011 ¹
27	Malta	0.004	2014 ²
28	Netherlands	0.486	2014 ²
29	New Zealand	0.722	2014 ²
30	Norway	0.090	2014 ²
31	Oman	0.059	2004 ²
32	Poland	0.097	2014 ²
33	Portugal	0.540	2014 ²
34	Puerto Rico	0.022	2005 ²
35	Qatar	0.013	2001 ²
36	Saudi Arabia	1.620	2014 ²
37	Slovakia	0.087	2014 ²
38	Slovenia	0.007	2011 ¹
39	Spain	3.636	2015 ¹
40	Sweden	0.164	2014 ²

41	Tanzania	0.184	2014 ²
42	Switzerland	0.040	2007 ¹
43	UK	0.084	2010 ¹
44	United Arab Emirates	0.092	2014 ²
45	Uruguay	0.238	2014 ²
46	USA	26.400	2014 ²
	Sub-Total	49.248	

Sl. No.	Country	Million ha	Reference Year
		Irrigated Area	
EMERGING/DEVELOPING COUNTRIES			
1	Albania	0.331	2014 ²
2	Algeria	0.570	2014 ²
3	Angola	0.086	2014 ²
4	Argentina	2.360	2014 ²
5	Azerbaijan	1.430	2013 ¹
6	Bangladesh	5.217	2010 ¹
7	Belarus	0.114	2014 ²
8	Belize	0.004	2014 ²
9	Benin	0.023	2014 ²
10	Bhutan	0.032	2014 ²
11	Bolivia	0.300	2014 ²
12	Bosnia & Herzegovina	0.003	2014 ²
13	Botswana	0.002	2014 ²
14	Brazil	5.800	2013 ¹
15	Bulgaria	0.102	2014 ²
16	Cambodia	0.354	2014 ²
17	Cameroon	0.029	2014 ²
18	China	65.870	2016 ¹
19	Chinese Taipei	0.380	2009 ¹
20	Colombia	1.090	2014 ¹
21	Congo, Rep.	0.002	2014 ²
22	Costa Rica	0.102	2014 ²
23	Cuba	0.870	2014 ²
24	Djibouti	0.001	2011 ²
25	Dominican Rep.	0.307	2014 ²
26	Ecuador	1.500	2014 ²
27	Egypt	3.650	2014 ²
28	El Salvador	0.045	2014 ²
29	Fiji Island	0.004	2014 ²
30	Gabon	0.004	2014 ²
31	Georgia	0.433	2014 ²
32	Ghana	0.034	2014 ²

33	Guatemala	0.338	2014 ²
34	Guyana	0.143	2014 ²
35	Honduras	0.090	2014 ²
36	India	62.000	2010 ¹
37	Indonesia	6.722	2014 ²
38	Iran	8.570	2015 ¹
39	Iraq	3.550	2016 ¹
40	Jamaica	0.025	2014 ²
41	Jordan	0.096	2014 ²
42	Kazakhstan	1.200	2013 ¹
43	Kenya	0.103	2014 ²
44	Kyrgyzstan	1.023	2014 ²
45	Lao People DR	0.310	2014 ²
46	Lebanon	0.104	2014 ²
47	Libya	0.470	2014 ²
48	Macedonia	0.128	2014 ²
49	Malaysia	0.385	2009 ¹
50	Mauritania	0.045	2014 ²
51	Mauritius	0.019	2014 ²
52	Mexico	6.500	2014 ²
53	Moldova Rep.	0.228	2014 ²
54	Mongolia	0.084	2014 ²
55	Morocco	1.458	2014 ²
56	Myanmar	2.295	2014 ²
57	Namibia	0.008	2014 ²
58	Nicaragua	0.199	2014 ²
59	Nigeria	0.293	2014 ²
60	Pakistan	19.080	2015 ¹
61	Panama	0.032	2014 ²
62	Paraguay	0.136	2014 ²
63	Peru	2.580	2014 ²
64	Phillipines	1.520	2008 ¹
65	Romania	3.149	2014 ²
66	Russia	4.500	2012 ¹
67	Serbia, Republic of	0.095	2014 ²
68	South Africa	1.600	2007 ¹
69	Sri Lanka	0.570	2014 ²
70	St. Vincent	0.0005	2011 ²
71	Suriname	0.057	2014 ²
72	Swaziland	0.050	2014 ²
73	Syria	1.428	2014 ²
74	Tajikistan	0.804	2013 ¹
75	Thailand	4.736	2011 ¹
76	Trinidad and Tobago	0.007	2014 ²
77	Tunisia	0.459	2014 ²
78	Turkey	5.730	2012 ¹
79	Turkmenistan	1.869	2013 ¹
80	Ukraine	2.176	2016 ¹
81	Uzbekistan	4.312	2016 ¹
82	Venezuela	1.055	2014 ²
83	Viet Nam	4.585	2005 ²
84	Yemen	0.680	2014 ²
85	Zambia	0.156	2014 ²
86	Zimbabwe	0.174	2014 ²
	Sub-Total	248.644	

Sl. No.	Country	Irrigated Area	Reference Year
		Million ha	
LEAST DEVELOPED COUNTRIES			
1	Afghanistan	3.208	2014 ²
2	Burkina Faso	0.040	2015 ¹
3	Burundi	0.023	2014 ²
4	Chad	0.030	2014 ²
5	Congo, Dem. R.	0.011	2014 ²
6	Eritrea	0.021	2014 ²
7	Ethiopia	0.539	2005 ¹
8	Gambia	0.005	2014 ²
9	Guineabissau	0.025	2014 ²
10	Haiti	0.097	2014 ²
11	Korea, DP Rep	1.460	2014 ²
12	Lesotho	0.003	2014 ²
13	Liberia	0.003	2014 ²
14	Madagascar	1.086	2014 ²
15	Malawi	0.074	2014 ²
16	Mali	0.378	2014 ²
17	Mozambique	0.118	2014 ²
18	Nepal	1.180	2012 ¹
19	Niger	0.100	2014 ²
20	Rwanda	0.010	2014 ²
21	Senegal	0.120	2014 ²
22	Sierra Leone	0.030	2014 ²
23	Somalia	0.200	2014 ²
24	Sudan	1.890	2014 ²
25	Togo	0.007	2014 ²
26	Uganda	0.014	2014 ²
	Sub-Total	7.464	

Sl. No.	Region	Irrigated Area Million ha	% Irrigated Area
1	Developed Countries	49.248	16.068
2	Emerging/Developing Countries	248.644	81.488
3	Least Developed Countries	7.464	2.444
	TOTAL	305.356	100

Footnotes: 1 National Committees Data
2 FAO Statistical Handbook, 2015
3 FAO Aquastat Data



WORLD DRAINED AREA

Sl. No.	Country	Arable land and permanent crops (Mha)	Total drained area (Mha)	% drained area	Reference year
DEVELOPED COUNTRIES					
1	Australia	384.56	2.17	2.17	2016
2	Austria	1.44	0.2	0.2	1997
3	Belgium	0.87	0.07	0.07	1996
4	Canada	67.5	9.46	9.46	2002
5	Chile	0.78	0.035	0.035	2006
6	Croatia	0.95	0.76	0.76	1990
7	Cyprus	0.11	0.02	0.02	2000
8	Czech Rep.	3.26	1.07	1.07	2011
9	Denmark	2.35	1.77	1.77	2012
10	Estonia	1.3	0.64	0.64	2016
11	Finland	2.26	2.5	2.5	2008
12	France	19.33	3	3	2011
13	Germany	12.13	4.9	4.9	1993
14	Greece	3.23	0.52	0.52	2002
15	Hungary	4.8	2.3	2.3	2003
16	Ireland ⁴	1.06	0.254	0.254	2010
17	Israel	0.38	0.1	0.1	1987
18	Italy	13.2	5.3	5.3	2005
19	Japan	4.496	NA	3.52	2016
20	Korea Rep.	1.82	1.15	1.15	2016
21	Latvia	1.18	1.58	1.58	1995
22	Lithuania ⁵	2.68	2.58	2.58	2011
23	Netherlands	1.09	3	3	2010
24	Norway	1.02	0.61	0.61	2012
25	Poland	12.97	4.21	4.21	1999
26	Portugal	1.64	0.04	0.04	2002
27	Puerto Rico	0.1	0.02	0.02	2000
28	Saudi Arabia	3.68	0.04	0.04	1992
29	Slovak Republic	1.41	0.6	0.6	1997
30	Slovenia	0.2	0.08	0.08	2007
31	Spain	24.9	0.3	0.3	2014
32	Sweden	2.64	1.1	1.1	1996
33	Switzerland	0.43	0.16	0.16	2002
34	UK	6.05	4.65	4.65	1996
35	USA	173.2	47.5	47.5	1987
	Sub-Total	759.016	106.209	13.993	

EMERGING/DEVELOPING COUNTRIES					
36	Albania	0.7	0.28	40.00	1999
37	Algeria	8.42	0.06	0.71	1999
38	Argentina	33	0.13	0.39	2002
39	Azerbaijan	2.09	0.61	29.19	2013
40	Bangladesh	8.7	1.5	17.24	1993
41	Belarus	5.64	3	53.19	1993
42	Bolivia	3.82	0.02	0.52	2000
43	Brazil	66.9	1.08	1.61	2013
44	Bulgaria	3.25	0.08	2.46	2000
45	China	130.03	21.14	16.26	2008
46	Chinese Taipei	0.8	0.13	16.25	2012
47	Colombia	3.46	0.23	6.65	1989
48	Costa Rica	0.5	0.04	8.00	1999
49	Cuba	3.97	0.33	8.31	1997
50	Dominican Rep.	1.3	0.03	2.31	2000
51	Ecuador	2.5	0.05	2.00	1998
52	Egypt*	3.54	3.36	94.92	2011
53	El Salvador	0.92	0.01	1.09	1997
54	Fiji	0.25	0.01	4.00	2000
55	Georgia	0.58	0.16	27.59	1996
56	Guyana	0.45	0.15	33.33	1991
57	Honduras	1.43	0.06	4.20	1991
58	India	169.32	5.8	3.43	1991
59	Indonesia	37.1	3.35	9.03	1990
60	Iran	14.8	0.28	1.89	2015
61	Iraq	7	1.367	19.53	2016
62	Jordan	0.15	0.01	6.67	2008
63	Kazakhstan	22.8	0.45	1.97	2013
64	Kenya	5.8	0.03	0.52	2003
65	Kyrgyzstan	1.35	0.2	14.81	2013
66	Lebanon	0.29	0.01	3.45	2001
67	Libya	2.05	0.01	0.49	2000
68	Malaysia	9.5	6	63.16	2009
69	Mexico	27.5	5.2	18.91	1997
70	Mongolia	0.85	1.5	176.47	2000
71	Morocco	8.98	0.65	7.24	2004
72	Myanmar	11.7	0.19	1.62	1994
73	Pakistan	30.4	7.86	25.86	2015
74	Paraguay	4.3	0.01	0.23	2000

75	Peru	4.44	0.08	1.80	2000
76	Philippines	9.16	2.72	29.69	2008
77	Romania	9.85	1.83	18.58	2008
78	Russia	192.6	4.78	2.48	2007
79	Serbia & Montenegro	3.72	0.4	10.75	2000
80	South Africa	18	0.06	0.33	2011
81	Sri Lanka	2.2	0.03	1.36	1967
82	Surinam	0.06	0.05	4.75	1998
83	Syria	5.68	0.27	37.93	1993
84	Tajikistan	0.87	0.33	0.85	2013
85	Thailand	18.85	0.16	3.97	1997
86	Tunisia	5.04	0.2	13.19	2000
87	Turkey	26.01	3.43	57.29	2012
88	Turkmenistan	1.92	1.1	9.85	2013
89	Ukraine	33.5	3.3	70.21	2013
90	Uzbekistan	4.7	3.3	9.25	2016
91	Venezuela	3.35	0.31	10.62	2002
92	Viet Nam	9.42	1	93.17	1994
93	Yemen	1.61	1.5	9.140	2000
	Sub-Total	987.12	90.227	9.140	

LEAST DEVELOPED COUNTRIES					
94	Afghanistan	7.91	0.01	0.13	2000
95	Ethiopia	14.51	0.03	0.21	1987
96	Madagascar	3.55	0.11	3.10	2000
97	Malawi	7.7	NA	3.64	2002
98	Nepal	2.47	0.09	5.73	2000
99	Rwanda	1.57	0.09	83.33	2000
100	Sudan	20.91	0.56	2.68	2000
101	Zimbabwe	11	0.1	0.91	2011
	Sub-Total	58.62	0.89	1.52	

SUMMARY

Sl. No.	Region	Arable land & permanent crops (Mha)	Total drained area Mha)	% drained area
1	Developed Countries	759.02	106.21	13.99
2	Emerging/Developing Countries	987.12	90.23	9.14
3	Least Developed Countries	58.62	0.89	1.52
	Total	1804.76	197.33	10.93

Notes:

- 1 ICID data (both for arable land and permanent crop (APC) and for drained areas)
- 2 CEMAGREF data (for drained area)
- 3 Monitoring and Evaluation Department (EPADP), Egypt, 2011
- 4 The total drained area in Ireland is 0.254 million ha, the total utilised agricultural area is 4.02 million ha. Apart from a very small area of Ireland that is irrigated on a commercial basis for crop production there are no major irrigation schemes in Ireland. Suggested figure for irrigated area in Ireland is 10,000 hectares. Source: Dr. Oliver Nicholson, Chairman, Irish National Committee on Irrigation and Drainage (IRCID), 28 June 2010
- 5 Statistics referred as "arable land" in Lithuanian registry as per 01.01.2010. The drained area slightly decreased as some of the area excluded from registry since that area has been completely depreciated and drainage no more functioning. Source: Prof. dr. Antanas Maziliauskas, President of Lithuanian National Committee (LICID), 26 June 2010.
- 6 The fact that the drained area is more than the APC area is a matter of definition. In the Netherlands' case the drained area includes areas with other functions such as drainage of meadows and urban areas. Source: Dr. Pol (A.L.) Hakstege, Secretary/ Treasurer, Netherlands National Committee (NETHCID), 2 July 2010.
- 7 Country Classification – World Economic Situation and Prospects (WESP), United Nations, 2012

SPRINKLER AND MICRO IRRIGATED AREA

(Arranged in descending order of the total sprinkler and micro irrigated area)

Sl. No.	Country	Total irrigated area (Mha)	Sprinkler irrigation (Hectare)	Micro irrigation (Hectare)	Total sprinkler and micro irrigation	% of total irrigated area	Year of reporting
1	USA	24.737	123,48,178	16,39,676	139,87,854	56.5	2009
2	China	65.870	37,30,000	52,70,000	90,00,000	13.7	2015
3	India	62.000	30,44,940	18,97,280	49,42,220	8.0	2010
4	Brazil	5.797	38,57,104	6,21,346	44,78,450	77.3	2013
5	Spain	3.636	8,85,000	17,93,000	26,78,000	73.7	2015
6	Russia	4.500	25,00,000	47,000	25,47,000	56.6	2012
7	France	2.900	13,79,800	1,03,300	14,83,100	51.1	2011
8	Iran	8.570	8,02,000	5,94,000	13,96,000	16.3	2015
9	Italy	2.420	9,58,535	4,22,534	13,81,069	57.1	2013
10	South Africa	1.670	9,20,059	3,65,342	12,85,401	77.0	2007
11	Australia	2.150	8,20,000	2,17,000	10,37,000	48.2	2016
12	Turkey	5.730	6,80,000	3,40,000	10,20,000	17.8	2012
13	Saudi Arabia	1.620	7,16,000	1,98,000	9,14,000	56.4	2004
14	Canada	1.053	6,83,029	6,034	6,89,063	65.4	2004
15	Azerbaijan	1.433	6,10,000	100	6,10,100	42.6	2013
16	Mexico	6.200	4,00,000	2,00,000	6,00,000	9.7	1999
17	Egypt	3.420	4,50,000	1,04,000	5,54,000	16.2	2000
18	Germany	0.540	5,25,000	5,000	5,30,000	98.1	2005
19	Japan	2.919	4,30,000	60,000	4,90,000	16.8	2014
20	Ukraine	2.176	4,12,000	70,000	4,82,000	22.2	2016
21	Romania	1.500	4,48,000	4,000	4,52,000	30.1	2008
22	Slovak Rep.	0.313	3,10,000	2,650	3,12,650	99.9	2000
23	Israel	0.231	60,000	1,70,000	2,30,000	99.6	2000
24	Morocco	1.650	1,89,750	8,250	1,98,000	12.0	2003
25	Hungary	0.220	1,85,000	7,000	1,92,000	87.3	2008
26	Iraq	3.550	1,66,000	16,000	1,82,000	5.1	2016
27	Moldova	0.228	1,45,000	15,000	1,60,000	70.2	2012
28	Syria	1.280	93,000	62,000	1,55,000	12.1	2000
29	Korea, Rep. of	1.036	71,000	64,000	1,35,000	13.0	2015
30	UK	0.111	1,05,000	6,000	1,11,000	100.0	2005
31	Finland	0.070	60,000	10,000	70,000	100.0	2010
32	Portugal	0.630	40,000	25,000	65,000	10.3	1999
33	Malawi	0.055	43,193	5,450	48,643	88.4	2000
34	Sudan	1.890	42,000	-	42,000	2.2	2012
35	Chile	1.090	16,000	23,000	39,000	3.6	2006
36	Chinese Taipei	0.380	18,850	8,750	27,600	7.3	2009
37	Bulgaria	0.588	21,000	3,000	24,000	4.1	2008
38	Czech Rep.	0.153	11,000	5,000	16,000	10.5	2011
39	Philippines	1.520	7,175	6,635	13,810	0.9	2004
40	Poland	0.100	5,000	8,000	13,000	13.0	2008
41	Uzbekistan	4.312	5,000	2,000	7,000	0.2	2017
42	Malaysia	0.380	2,000	5,000	7,000	1.8	2009
43	Macedonia	0.055	5,000	1,000	6,000	10.9	2008
44	Nepal	1.180	-	-	5,000	0.4	2012
45	Burkina Faso	0.040	4,500	280	4,780	12.0	2015
46	Estonia	0.003	100	500	600	20.0	2016
	Total	231.906	382,05,213	144,12,127	526,22,340	22.69	
DEVELOPED COUNTRIES							
1	USA	24.737	123,48,178	16,39,676	139,87,854	56.5	2009
2	Spain	3.636	8,85,000	17,93,000	26,78,000	73.7	2015
3	France	2.900	13,79,800	1,03,300	14,83,100	51.1	2011
4	Italy	2.420	9,58,535	4,22,534	13,81,069	57.1	2013
5	Australia	2.150	8,20,000	2,17,000	10,37,000	48.2	2016

6	Saudi Arabia	1.620	7,16,000	1,98,000	9,14,000	56.4	2004
7	Canada	1.053	6,83,029	6,034	6,89,063	65.4	2004
8	Germany	0.540	5,25,000	5,000	5,30,000	98.1	2005
9	Japan	2.919	4,30,000	60,000	4,90,000	16.8	2014
10	Slovak Rep.	0.313	3,10,000	2,650	3,12,650	99.9	2000
11	Israel	0.231	60,000	1,70,000	2,30,000	99.6	2000
12	Hungary	0.220	1,85,000	7,000	1,92,000	87.3	2008
13	Korea, Rep. of	1.036	71,000	64,000	1,35,000	13.0	2015
14	UK	0.111	1,05,000	6,000	1,11,000	100.0	2005
15	Finland	0.070	60,000	10,000	70,000	100.0	2010
16	Portugal	0.630	40,000	25,000	65,000	10.3	1999
17	Chile	1.090	16,000	23,000	39,000	3.6	2006
18	Czech Rep.	0.153	11,000	5,000	16,000	10.5	2011
19	Poland	0.100	5,000	8,000	13,000	13.0	2008
20	Estonia	0.003	100	500	600	20.0	2016
	Sub-total	45.932	196,08,642	47,65,694	243,74,336	53.1	

EMERGING/DEVELOPING COUNTRIES

1	China	65.870	37,30,000	52,70,000	90,00,000	13.7	2015
2	India	62.000	30,44,940	18,97,280	49,42,220	8.0	2010
3	Brazil	5.797	38,57,104	6,21,346	44,78,450	77.3	2013
4	Russia	4.500	25,00,000	47,000	25,47,000	56.6	2012
5	Iran	8.570	8,02,000	5,94,000	13,96,000	16.3	2015
6	South Africa	1.670	9,20,059	3,65,342	12,85,401	77.0	2007
7	Turkey	5.730	6,80,000	3,40,000	10,20,000	17.8	2012
8	Azerbaijan	1.433	6,10,000	100	6,10,100	42.6	2013
9	Mexico	6.200	4,00,000	2,00,000	6,00,000	9.7	1999
10	Egypt	3.420	4,50,000	1,04,000	5,54,000	16.2	2000
11	Ukraine	2.176	4,12,000	70,000	4,82,000	22.2	2016
12	Romania	1.500	4,48,000	4,000	4,52,000	30.1	2008
13	Morocco	1.650	1,89,750	8,250	1,98,000	12.0	2003
14	Iraq	3.550	1,66,000	16,000	1,82,000	5.1	2016
15	Moldova	0.228	1,45,000	15,000	1,60,000	70.2	2012
16	Syria	1.280	93,000	62,000	1,55,000	12.1	2000
17	Sudan	1.890	42,000	-	42,000	2.2	2012
18	Chinese Taipei	0.380	18,850	8,750	27,600	7.3	2009
19	Bulgaria	0.588	21,000	3,000	24,000	4.1	2008
20	Philippines	1.520	7,175	6,635	13,810	0.9	2004
21	Uzbekistan	4.312	5,000	2,000	7,000	0.2	2017
22	Malaysia	0.380	2,000	5,000	7,000	1.8	2009
23	Macedonia	0.055	5,000	1,000	6,000	10.9	2008
	Sub-total	184.699	185,48,878	96,40,703	281,89,581	15.26	

LEAST DEVELOPED COUNTRIES

1	Malawi	0.055	43,193	5,450	48,643	88.4	2000
2	Nepal	1.180	-	-	5,000	0.4	2012
3	Burkina Faso	0.040	4,500	280	4,780	12.0	2015
	Sub-total	1.275	47,693	5,730	58,423	4.58	

COUNTRY CATEGORY

Sl.	Country	Total Irrigated area (Mha)	Sprinkler irrigation (Mha)	Micro irrigation (Mha)	Total sprinkler and micro irrigation	% of total irrigated area	% of sprinkler irrigation	% of micro irrigation	% of total sprinkler and micro irrigation
1	Developed Countries	45.932	196,08,642	47,65,694	243,74,336	53.07	51.32	33.07	46.32
2	Emerging/ Developing Countries	184.699	185,48,878	96,40,703	281,89,581	15.26	48.55	66.89	53.57
3	Least Developed Countries	1.275	47,693	5,730	58,423	4.58	0.12	0.04	0.11
	Total	231.906	382,05,213	44,12,127	26,22,340	22.69	100.00	100.00	100.00



ACRONYMS AND ABBREVIATIONS

AARDO	African-Asian Rural Development Organization	CANCID	Canadian National Committee on Irrigation and Drainage
AARO	Association of Americans Resident Overseas	CBIP	Central Board of Irrigation and Power
ABID	Brazilian National Committee, ICID	C-CONGR	Committee on Congresses/Conferences
AC	Advisory Committee	CCRD	Climate Change Resilient Development
ADB	Asian Development Bank	CEE-GWP	Central and Eastern Europe Global Water Partnership
AFEID	Association Française pour l'Etude des Irrigations et du Drainage (French National Committee on Irrigation and Drainage)	CEGIS	Center for Environmental and Geographic Information Services
AFGICID	Afghanistan National Committee of ICID	CEO	Chief Executive Officer
AFRWG	African Regional Working Group	CERYD	Comité Español de Riegos y Drenajes (Spanish National Committee on Irrigation and Drainage)
AGORA	Access to Global Online Research in Agriculture	CH-AGRAM	Swiss National Commission on Agro-Systems and Land Improvement
AGRA	Alliance for Green Revolution in Africa	CH-AGRAM	Swiss National Commission on Agro-Systems and Land Improvement
AGRF	African Green Revolution Forum	CHICID	Comité Nacional Chileno de Riego y Drenaje (Chilean National Committee on Irrigation and Drainage)
AIF	Asian Irrigation Forum	CI	Controlled irrigation
AIRMF	Association of Irrigators of the French Mediterranean Regions	CIGRE	The International Council on Large Electric Systems
AIT	Asian Institute of Technology	CMECC	Chiang Mai International Exhibition and Convention Centre
AIT	Asian Institute of Technology	CNCID	Chinese National Committee on Irrigation and Drainage
AMID	Association Malienne des Irrigations et du Drainage (Malian Committee of Irrigation and Drainage)	CNRID	Romanian National Committee on Irrigation and Drainage
ANAFIDE	Association Nationale des Améliorations Foncières de l'Irrigation, du Drainage et de l'Environnement (Moroccan National Committee on Irrigation and Drainage)	CO	Central Office
ANID	Association Nigérienne pour l'Irrigation et le Drainage (Niger National Committee on Irrigation and Drainage)	COSQC	Central Organization for Standardization and Quality Control
APFM	Associated Program on Flood Management	CPCT	Center for Protected Cultivation Technology
ARCID	African Regional Conference on Irrigation and Drainage	C-PR&P	Committee on Public Relations and Publications
ARCID4	4th African Regional Conference on Irrigation and Drainage	CPSP	Country Policy Support Program
ARS	Agricultural Research Station	CRCID	Croatian Committee on Irrigation and Drainage
ARTF-CC	Asian Regional Task Force on Climate Change and Irrigation	CSIRO	Commonwealth Scientific and Industrial Research Organization
ASRWG	Asian Regional Working Group	CSUFs	Climate Services User Forums
ATID	L'Association Tchadienne pour l'Irrigation et le Drainage (Chad National Committee on Irrigation and Drainage)	CTCID	ICID-Chinese Taipei Committee
AUNCID	Austrian National Committee on Irrigation and Drainage	CULS	Czech University of Life Sciences
AWC	Arab Water Council	CWC	Central Water Commission
AWD	Alternate Wetting and Drying	CYCID	Cyprus National Committee on Irrigation and Drainage
AWM	Agriculture Water Management	CZNC-ICID	Czech Committee of the International Commission on Irrigation and Drainage
BANCID	Bangladesh National Committee on Irrigation and Drainage	DAFF	Department of Agriculture, Forestry and Fisheries
BCM	Billion Cubic Meters	DM	Direct membership
BES	Better Engineered Solutions	DMCs	Developing Member Countries
BIS	Bureau India Standardization	DPRK	Democratic People's Republic of Korea
BoM	Bureau of Meteorology	DSI	General Directorate of State Hydraulic Works (Turkey)
BUET	Bangladesh University of Engineering and Technology	DWF	Water for Food Global Institute
BWDB	Bangladesh Water Development Board	DWR	Department of Water Resources
BWP	Bangladesh Water Partnership	EB-JOUR	ICID Journal Editorial Board
		ECO-SF	

EECCA	Eastern Europe, Caucasus and Central Asia	IEEC	International Education and Exchange Center
ENCID	Egyptian National Committee on Irrigation and Drainage	IFAD	International Fund for Agricultural Development
EPA	Environment Protection Agency	IFM	Integrated Flood Management
EPADP	Egyptian Public Authority on Drainage Projects	IFPRI	International Food Policy Research Institute
ERWG	European Regional Working Group	IGS	International Geosynthetics Society
ES	Ecosystem Services	IHA	International Hydropower Association
ESTICID	ICID National Committee of Estonia	IHP	International Hydro-logical Program
ETCID	Ethiopian Committee on Irrigation and Drainage	IIF1	First India Irrigation Forum
EWTDR	European Work Team on Drainage	IMD	India Meteorological Department
EWT-SIM	European Work Team on Sustainable Irrigation Management	IMIC	International Micro Irrigation Conference
EWT-WRRA	European Work Team on Water Related Risk Analysis	IMIS	International Micro Irrigation Symposia
FAO	Food and Agricultural Organization	IMS	Innovative Material System
FAO-RAP	FAO Regional Office for Asia and the Pacific	INACID	Indonesian National Committee on Irrigation and Drainage
FCRA	Foreign Contribution Regulation Act	INCH	Indian National Committee on Hydraulics
FIJICID	Fiji National Committee on Irrigation and Drainage	INCID	Indian National Committee on Irrigation and Drainage
FINCID	Finnish National Committee on Irrigation and Drainage	INCSW	Indian National Committee on Surface Water
GB	Governing Board	INCT- EL	National Institute of Science and Technology in Irrigation Engineering
GCC	Global Climate Change	INCTSAL	National Institute of Science and Technology in Salinity
GECID	German National Committee of ICID	INDC	Intended National Determined Commitments
GFCS	Global Framework for Climate Services	INWEPF	International Network for Water and Ecosystem in Paddy Fields
GIS	Geographic Information Services	IPTRID	International Program on Technology Research in Irrigation and Drainage
GRCID	Greek National Committee, ICID	IRCID	Irish National Committee for Irrigation and Drainage
GUCID	Guyana National Committee, ICID	IRNCID	Iranian National Committee on Irrigation and Drainage
GWP	Global Water Partnership	IRPID	International Research Program for Irrigation and Drainage
HIRMI	Haryana Irrigation Research and Management Institute	IRQCID	Iraqi National Committee on Irrigation and Drainage
HIS	Heritage Irrigation Structures	ISCID	Israeli National Committee on Irrigation and Drainage
Hon.	Honoraire	ISO	International Organization for Standardization
HUCID	Hungarian National Committee of ICID	ISRM	International Society for Rock Mechanics
IACID	Irrigation Australia's Committee on Irrigation & Drainage	ITAC	International Technical Advisory Committee
IAL	Irrigation Australia Ltd	ITAL-ICID	Comitato Nazionale Italiano, ICID (Italian National Committee of ICID)
IARI	Indian Agricultural Research Institute	IUCW	International Union for the Conservation of Water
IASH	International Association for Small Hydro	IWA	International Water Association
ICAR	Indian Council for Agricultural Research	IWF	India Water Foundation
ICARDA	International Center for Agricultural Research in the Dry Areas	IWHR	Institute of Water Resources and Hydropower Research
ICE-WaRM	International Centre of Excellence in Water Resources Management	IWM	Institute of Water Modelling
ICID	International Commission on Irrigation and Drainage	IWMI	International Water Management Institute
ICID.UK	British National Committee of ICID	IWRA	International Water Resources Association
ICID-YPF	ICID Young Professional's Forum	IWRM	Integrated Water Resources Management
ICIMOD	Integrated Mountain Development	IWW4	4th India Water Week
ICOLD	International Commission on Large Dams	IYPeF	ICID Young Professionals e-Forum
ICOMOS	International Council on Monuments and Sites	JISL	Jain Irrigation Systems Limited
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics	JNC-ICID	Japanese National Committee on Irrigation and Drainage
IDMP	Integrated Drought Management Program	JTC	Joint Technical Committee
IDMT	Irrigation/Drainage Management Transfers	KAZCID	National Committee of Kazakhstan on Irrigation and Drainage
IDW	International Drainage Workshop		
IDW13	13th International Drainage Workshop		
IEC	International Executive Council		

KCID	Korean National Committee on Irrigation and Drainage	PAWEES	International Society of Paddy and Water Environment Engineers
KRC	Key Resource Centre	PCRWR	Pakistan Council of Research in Water Resources
KWPA	Khuzestan Water and Power Authority	PCSO	Permanent Committee on Strategy and Organization
KYRCID	Kyrgyz National Committee on Irrigation and Drainage	PCTA	Permanent Committee for Technical Activities
LCA	Life Cycle Approaches	PEC	Pakistan Engineering Congress
LDCs	Least Developed Countries	PH	President Honoraire
LESTARI	Institute for Environment and Development	PIDM	Participatory Irrigation/Drainage Management
LTCID	Lithuanian National Committee on Irrigation and Drainage	PIM	Participatory Irrigation Management
MAKCID	Comite Nationale d'Irrigation et de Drainage de Macédoine (Macedonian National Committee on Irrigation and Drainage)	PNC-ICID	Philippine National Committee on Irrigation and Drainage
MANCID	Malaysian National Committee on Irrigation and Drainage	PWP	Pakistan Water Partnership
MASSCOTE	Mapping System and Services for Canal Operation Techniques	RAC	Rahad Agricultural Corporation
MB	Management Board	RCTWS	Regional Center for Training and Water Studies
MCS	Monte Carlo simulation	RID	Royal Irrigation Department
MDGs	Millennium Development Goals	RIMES	Regional Integrated Multi-Hazard Early Warning System
MDWS	Ministry of Drinking Water and Sanitation	RN	Regional Node
MNCID	Myanmar National Committee on Irrigation and Drainage	RUCID	National Committee of the Russian Federation on Irrigation and Drainage
MoE	Ministry of Energy	SADC	Southern African Development Community
MoU	Memorandum of Understanding	SADMS	South Asia Drought Monitoring System
MoWR	Ministry of Water Resources	SANCID	South African National Committee
MSAE	Malaysian Society of Agricultural Engineers	SANCID	South African National Committee on Irrigation and Drainage
MT	Management Transfer	SAPCC	State Action Plan on Climate Change
MTD	Multilingual Technical Dictionary	SARIA	Southern Africa Regional Irrigation Association
MXCID	Mexican National Committee on Irrigation and Drainage	SARIA	Southern African Regional Irrigation Association
MyCWP	Malaysian Country Water Partnership	SASCOF6	6th session of South Asian Seasonal Climate Outlook Forum
MyWP	Malaysian Water Partnership	SC	Staff Committee
NAPCC	National Action Plan on Climate Change	SCP	Société du canal de Provence
NARAIID	Northern African Regional Association for Irrigation and Drainage	SDGs	Sustainable Development Goals
NARC	Nepal Agricultural Research Council	SDGs	Sustainable Development Goals
NASM	National Agricultural Science Museum	SG	Secretary General
NC	National Committees/Committee	SGH	Secretary General Honoraire
NENCID	Nepal National Committee on Irrigation and Drainage	SINCID	Slovenian National Committee on Irrigation and Drainage
NETHCID	Netherlands National ICID Committee	SIWI	Stockholm International Water Institute
NIRESA	Network on Irrigation Research Extension for Small-Scale Agriculture	SLNICID	Sri Lanka National Committee, ICID
NGO	Non-Governmental Organization	SNCID	Sudanese National Committee, ICID
NINCID	Nigerian National Committee on Irrigation and Drainage	SOMIS	Service Oriented Management of Irrigation Systems
NMSA	National Mission on Sustainable Agriculture	SONCID	Somali National Committee on Irrigation and Drainage
NMSs	National Meteorological Services	SPIS	Solar Powered Irrigation Systems
NUST	National University of Sciences and Technology	SS	Summer School
NWMC	National Water Museum of China	SSD	Sub Surface Drainage
O&M	Operation and Management	SWMS	Smart Water Management System
OB	Office Bearer	SWWW	Stockholm World Water Week
PACC	Paris Agreement on Climate Change	SYCID	Syrian National Committee on Irrigation and Drainage
PANCID	Pakistan National Committee on Irrigation and Drainage	TANCID	Tanzania National Committee on Irrigation and Drainage
PAWEES	Paddy and Water Environment Engineers	TERI	The Energy and Resource Institute
		TF-BIO-ENERGY	Task Force on Water for Bio-Energy and Food

TF	Task Force	WG-CROP	Working Group on Water and Crops
TF-FIN	Task Force on Financing Water for Agriculture	WG-DROUGHT	Working Group on Water Management in Water Stressed Regions
TF-VE	Task Force on Value Engineering	WG-ENV	Working Group on Environment
TF-WWF7	Task Force to Guide ICID Inputs to World Water Forum 7	WG-HIST	Working Group on History of Irrigation, Drainage and Flood Control
Tf-wwf8	Task Force to Guide ICID Inputs to 8th World Water Forum	WG-IDM	Working Group on Irrigation Development and Management
THAICID	Thai National Committee on Irrigation and Drainage	WG-IDSST	Working Group on Irrigation and Drainage in the States under Socio-Economic Transformation
TR	Technical Report	WG-IOA	Working Group on Institutional and Organizational Aspects of Irrigation/ Drainage System Management
TSU	Technical Support Unit	WG-M&R	Working Group on Modernization and Revitalization of Irrigation Schemes
TSU	Technical Support Unit	WG-MWSCD	Working Group on Managing Water Scarcity under Conflicting Demands
TUCID	Turkish National Committee on Irrigation and Drainage	WG-ON-FARM	Working Group on "On-Farm Irrigation Systems
UACID	Ukraine National Committee on Irrigation and Drainage	WG-PQW	Working Group on Use of Poor Quality Water for Irrigation
UKM	Universiti Kebangsaan Malaysia	WG-SDG	Working Group on Sustainable Drainage
UN	United Nations	WG-SDRG	Working Group on Sustainable Drainage
UNDP	United Nations Development Programme	WG-SDTA	Working Group on Sustainable Development of Tidal Areas
UNECE	United Nations Economic Commission for Europe	WG-SON-FARM	Working Group on Sustainable On-Farm Irrigation System Development
UNESCO	United Nations Educational, Scientific and Cultural Organization	WG-WATER & CROP	Working Group on Water and Crops
UNESCO-IHE	UNESCO-IHE Institute for Water Education	WG-WATS	Working Group on Water Saving in Irrigated Areas
UNFCCC	United Nations Framework Convention on Climate Change	WHO	World Health Organization
UNU-INWEH	United Nations University Institute on Water, Environment and Health	WIC	Water Technology Centre
UPM	Universiti Putra Malaysia	WID	World Irrigation and Drainage
URUCID	Uruguay National Committee on Irrigation and Drainage	WIF	World Irrigation Forum
USCID	United States Committee on Irrigation and Drainage	WIF2	2nd World Irrigation Forum
UTAEM	International Agricultural Research and Training Centre	WMO	World Meteorological Organization
UzNCID	Uzbekistan National Committee on Irrigation and Drainage	WRC	Water Research Commission
VP	Vice President	WSH	Water Systems Heritage
VPH	Vice President Honoraire	WSH	World Water System Heritage
WALAMTARI	Water and Land Management Training and Research Institute	WUAs	Water User Associations
WAPCOS	Water and Power Consultancy Services	WUE	Water Use Efficiency
WAPDA	Water and Power Development Authority	WUGs	Water User Groups
WARPO	Water Resources Planning Organization	WUOs	Water User Organizations
WATSave	Water Saving	WWAP	World Water Assessment Programme
WB	World Bank	WWC	World Water Council
WBD	World Biodiversity Day	WWD	World Water Day
WDCCD	World Day to Combat Desertification	WWF	World Wide Fund for Nature
WED	World Environment Day	WWF-7	7th World Water Forum
WESP	World Economic Situation and Prospects	YUGCID	Yugoslav Association on Irrigation and Drainage (Erstwhile)
WG-BIO-ENERGY	Working Group on Water for Bio-Energy and Food	ZACID	Zambian National Committee on Irrigation and Drainage
WG	Working Group	ZwCID	Zimbabwe National Committee on Irrigation and Drainage
WG-BIO-FUEL	Working Group on Water for Bio-Fuel and Food		
WG-CAFM	Working Group on Comprehensive Approaches to Flood Management		
WG-CDTE	Working Group on Capacity Development, Training and Education		
WG-CLIMATE	Working Group on "Climate Change and Agricultural Water Management		

