

Annual Report

2018-19

**Agricultural Water Management
for Sustainable Rural Development**



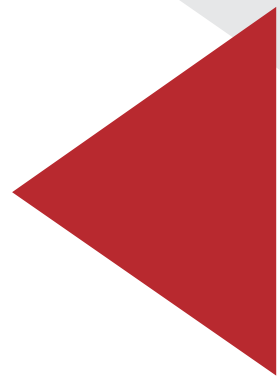
ICID • CIID

INTERNATIONAL COMMISSION ON IRRIGATION AND DRAINAGE



CONTENTS

FOREWORD	3
1. ABOUT ICID	5
2. WORKING TOGETHER	15
2.1 National Committees	15
2.2 Direct Members	25
2.3 International Partners	28
3. WORKING GROUPS IN ACTION	39
ICID Workbody Chairpersons	51
4. ACTIVITIES AT REGIONAL LEVEL	53
5. KEY ICID EVENTS	57
6. REWARDING EXCELLENCE	61
7. KNOWLEDGE MANAGEMENT AND DISSEMINATION	65
8. CAPACITY DEVELOPMENT ACTIVITIES	73
9. FINANCIAL MANAGEMENT	81
Annexures	83
Annex 1 Acknowledgements	84
Annex 2 Facts and Figures	89
2.1 World Irrigated Area	89
2.2 World Drained Area	92
2.3 Sprinkler and Micro-Irrigated Area	94



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FOREWORD



Agricultural irrigation is the primary consumer of freshwater resources and accounts for 70-80% of freshwater withdrawal globally. Rural livelihoods that depend on agriculture are hit the hardest in case of crisis, be it climate change, food insecurity, flood and droughts. Thus, for smooth functioning of the water sector, resulting in subsequent overall development, the role of water institutions with clear mandate is indispensable. With a long-term goal to provide a water-secure world free of poverty and hunger through sustainable rural development, ICID Vision 2030 outlines the urgent need for prudent agricultural water management by encouraging interdisciplinary approaches to irrigation and drainage management. The Vision Statement outlines specific objectives including improving crop productivity while preserving water and energy, recommendations for policy and best practices in agriculture, fluid exchange of knowledge among diverse stakeholders, cross-disciplinary and inter-sectoral engagement, research and innovation in the field practices and overall capacity building. Considering the vastly diverse nature of geographical, political and socio-economic fabric of institutions globally, different mechanisms may be needed to achieve the set objectives in certain contexts. There are both external and internal challenges faced by the institutions responsible for agricultural water management and their stakeholders involved at different levels, i.e., global, national, regional or local; and it is critical that their role and functionality and related institutional development processes essential to realize the UN-SDGs and ICID Vision 2030 are clearly articulated.

ICID will be celebrating its 70th Foundation Day on 24th June 2019. ICID has come a long way since its inception in 1950 at the instance of a small but influential group of countries and has seen changes in the irrigation sector in all its respects. Ensuring a world free of poverty and hunger is an exercise in progress and many parts of the world have yet to reach its goals. I see this as an opportunity to look back on the past activities of ICID and take stock of our enduring achievements. It is also an opportunity to spotlight where the ICID – and various stakeholders of the irrigation and drainage sector as a whole – need to come together to promote sustainable management of water for agriculture worldwide. This is a great occasion for all the members of ICID to work on the action plan and build momentum for fulfilling the objectives of “Vision 2030: A Water Security and Sustainable Rural Development” adopted by ICID.

Coming back to the Annual Report 2018-19, I am pleased to share with you that it has been quite an eventful year for all of us. It all began with the International Conference and 69th IEC Meeting of ICID in Saskatoon, Canada involving more than 500 global experts. It was a pleasure to meet many of you at Saskatoon during the 6-day international event that covered a significant variety of technical and social activities.

In October 2018, ICID served as a technical partner of the American Society of Agricultural and Biological Engineers (ASABE) and Indian Society of Agricultural Engineers (ISAE) for organizing very successfully the Global Water Security Conference at Hyderabad, India. The event witnessed more than 700 delegates from all over the world.

On the capacity building front, ICID has organized several training programs for Young Professionals, including with National Committees of China, Nepal, South Korea and Canada, to name a few. The ICID Young Professionals' e-Forum is growing up and up with more than 600 members from around the world, who regularly organize e-Discussions and Webinars on critical topics. A Young Professionals workshop was organised at 8th Asian Regional Conference at Kathmandu, Nepal in May 2018. ICID participated in the African Young Water Professional Forum (Af-YWPF) in Cairo, Egypt in October 2018. We are in the final preparations stage for the second global Young Professional training programme and workshop at Ansan-Si South Korea in the next month. Our emphasis on young professionals is indeed laying foundation for future ICID activities. I am delighted to share that ICID is now spreading its wings and testing new horizons in the form of partnerships around the globe that synergize our common quest to improve water productivity in agriculture in a seemingly unpredictable climate change scenario. The only miscalculation we can make right now is by grossly underestimating the magnitude of the task that lies ahead.

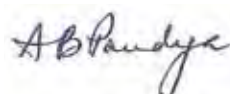
In January 2019, ICID in collaboration with the Indian National Committee of ICID (INCSW) organized the 9th International Micro-Irrigation Conference (9IMIC) from at Aurangabad, India. The conference provided a platform to promote Micro-Irrigation as one of the improved water-efficient irrigation technologies and invited the researchers, entrepreneurs, policymakers and other stakeholders in the water sector to share their views and experiences of new technologies and best management practices in drip, micro-sprinkler and other localized irrigation systems. More than 1000 participants of the conference included international stakeholders from various disciplines, agencies, sectors and most importantly the 300-strong group of farmers from all over India who organized a "Farmers Fair" on the venue.

ICID organized a study visit for a senior level delegation from Africa with support from the FAO-RNE on solar-powered micro-irrigation systems in India. The delegates visited several field projects and beneficiaries who have adopted this promising technology to improve water productivity of crops. The studies related to the visit provided important insights into the modalities for introducing this new technique around various parts of the developing world. ICID has been conducting Webinars leveraging the international expertise of its members and partners and also supported the Water Accounting (WA) Workshop in Iran earlier this year by sending an Australian expert on WA and publishing/distributing an ICID Position paper on WA as a Sustainable Water Management Framework.

During the year, ICID partnered with the Australia's premier research agency CSIRO in Beta-testing of Basin Futures (BF), a cloud-based GIS-enabled tool that can be very effective for rapid assessments, basin and country-level planning and monitoring, and climate scenario analysis with regard to water resources in data sparse regions of the world. ICID Young Professionals may find such applications very interesting and useful in their professional activities.

The upcoming World Irrigation Forum 3 (WIF3) to be held in Bali, Indonesia in September 2019 is the next opportunity for all us to be together again and continue our collaborative efforts in meeting the expectations of our stakeholders in these challenging times when we are dealing with the impacts of climate change on our water resources and food security.

This Annual Report includes the details of various activities that ICID members and partners undertook together over the year. As ICID is on the verge of completing 70 years of its operation, we must all be inspired to think about the idea of ICID@100 and all the responsibilities and challenges that come with it. It reminds me the famous poem by Robert Frost "I have miles to go before I sleep."



Ashwin B. Pandya
Secretary General, ICID



About ICID

The International Commission on Irrigation and Drainage (ICID) was established in 1950 as a leading scientific, technical, not-for-profit organization working internationally in the field of irrigation, drainage and flood management to promote 'sustainable agricultural water management.'

As a knowledge sharing platform, ICID is dedicated towards improving the status of agricultural water management (AWM) practices including rain-fed agriculture, supplemental irrigation, deficit and full irrigation. The other core areas of activity focus on drainage of agricultural lands and the management of extreme climate induced disasters such as floods and droughts.



A water secure world, free of poverty and hunger achieved through sustainable rural development.

To work towards sustainable AWM through inter-disciplinary approaches for economically viable, socially acceptable and environmentally sound irrigation, drainage and flood management.

Organizational Goals

In order to fulfill the targets of our mission and realize the Vision 2030, ICID has embarked on six organizational goals:



Fulfilling our mission through generation, exchange and dissemination of knowledge

ICID is widely recognized as a knowledge-based international organization with global flagship programs in 'Irrigation and Drainage.' The Commission promotes its mission by pooling and sharing knowledge on the topics related to irrigation, drainage and flood management, and then making it available worldwide; addressing emerging problems and challenges by promoting evolution of suitable remedial measures; water saving/conservation in agriculture; encouraging equity including gender equality between users and beneficiaries; and endorsing preservation and improvement of soil and water quality of irrigated lands. ICID provides a common platform for various stakeholders and experts from diverse disciplines to deliberate on technical, agronomic, socio-economic, environmental and managerial complexities for the development, management and operation of irrigation, drainage and flood management works. The aim is to attain sustainable AWM through exchange of experiences, ideas, good practices and promoting them widely among the member countries and stakeholders. As a Knowledge Hub, ICID generates knowledge with the help of its technical working groups by compiling and collating research data and disseminating them to all stakeholders through various channels.

ICID provides a unique platform to the practitioners of AWM for exchange of knowledge and information through triennial International Congress on Irrigation and Drainage that deliberates on certain specific technical questions; and World Irrigation Forum (WIF) that strives to bring together all the stakeholders involved in AWM. The objective of WIF is to exchange latest irrigation and drainage policies, innovations and technologies, and advocate political commitments for sustainable irrigated agriculture. Regional issues and challenges concerning irrigation, drainage or micro-irrigation are addressed through Regional Conferences. ICID works in close collaboration with many international and regional organizations pursuing similar objectives such as Food and Agriculture Organization (FAO), International Fund for Agricultural Development (IFAD), International Water Management Institute (IWMI), World Bank (WB), Asian Development Bank (ADB), UN-Water, World Meteorological Organization (WMO), United Nations Development Programme (UNDP), Global Water Partnership (GWP), World Water Council (WWC), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Center for Agricultural Research in the Dry Areas (ICARDA), Arab Water Council (AWC), World Farmers' Organization (WFO) and African-Asian Rural Development Organization (AARDO), to name a few.

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

With an eye on preserving the environment and promoting social equity, ICID gradually expanded its focus from merely technical issues to include other related disciplines such as environment, socio-economic issues, capacity building and sustainable rural development, recognizing and appreciating at the same time, the complexities of sustainable development with regard to AWM.

The Commission provides an international forum and network in the form of World Irrigation Forum. This forum discusses issues related to technical, agronomic, socio-economic, environmental and managerial complexities involved in the development, management and operation of irrigation, drainage and flood management, and other areas to find solutions with the active support of its members and stakeholders. The questions addressed by various triennial Congresses <http://www.icid.org/past_congresses.html> clearly indicate a progressive shift from deliberating on purely technical questions to global water and food security related issues of sustainable development.

To achieve this purpose, ICID has created a pool of over 500 eminent professionals/experts belonging to diverse fields such as irrigation, drainage and flood management from all over the world. Through technical and strategic workbodies, these professionals address issues of current importance in developing/emerging and developed countries and provide assistance for bringing out various publications, reports, manuals and status reports on a number of specialized topics.

Creating synergy between agriculture and water policies, and encouraging increased investments both from public and private sources for sustainable development of irrigation and drainage—these are the areas of prime focus for ICID. As farmers are at the core of agricultural water use and the principal stakeholders, ICID promotes Participatory Irrigation Management (PIM) and Management Transfer (MT) to enhance the performance of irrigation schemes.

Organizational Structure and Management

ICID enjoys the trust from leadership of about 80 member countries across the world spanning all continents. The Commission promotes its activities through its network of National Committees (NCs), 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 generally include multi-disciplinary professionals such as planners and policy makers; water managers; irrigation and agriculture engineers; research scientists and educationists working in related areas. Companies, institutions and individuals can also participate in ICID activities through their respective NCs or as Direct Members (DM). Presently, ICID membership network covers over 90% of the irrigated area of the world. Direct Membership is also available for countries that are not members of ICID, provided such members abide by the constitution of ICID. Similarly, private companies and individual professionals are also offered direct membership.

ICID achieves its mission through voluntary contributions 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, four Regional Working Groups, twenty-one Technical Working Groups and Task Forces.

International Executive Council



The International Executive Council (IEC) forms the General Body of the network. The IEC is composed of President, Secretary General, nine Vice Presidents and one representative from each NC and Office Bearers (OB). All are vested with the management of the affairs of the Commission. The Council meets each year to 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 are placed before the Council whose decisions are conclusive. IEC is presided over by the President, who is also responsible for the direction of the Central Office. The Secretary General not only serves as the Chief Executive Officer (CEO) but also 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 comprise of a wide network of representatives of experts from the government, technical and scientific organizations, non-government institutions, irrigators, companies and individuals with interest 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, water resources, agriculture or rural development and provide a multi-disciplinary platform within the countries bringing together all the relevant stakeholders.

ICID publication titled 'A Roadmap to ICID Vision 2030' identified number of activities to be undertaken by the network especially NCs under the four categories - Strengthening of the ICID Network and NCs, Collective Network Knowledge Management, Organizational changes in the network and Enhanced visibility of ICID activities. National Committees, the backbone of the ICID network as they represent various stakeholders engaged in different facets of AWM in their respective countries, serve as the common platform for various AWM stakeholders in implementing sustainable development agenda within their countries, particularly with respect to meeting the goals of poverty alleviation, food security and sustainable water management and other related SDGs in the context of Climate Change.

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

Management Board

The Management Board (MB) comprises of 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 decisions made by the Council through the Central Office (CO) and also decides actions to be taken in between Council meetings that are necessary to rightly steer the functioning of the Commission.

Permanent Committees

Permanent Committee on Strategy and Organization

As the name suggests, the Permanent Committee on Strategy and Organization (PCSO), develops the strategy of the Commission and is concerned with increasing the membership and assisting the National Committees to become more active in their respective 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 Brian T. Wahlin (USA) since 2018.



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, Symposia and makes appropriate recommendations for the actions to be taken. Vice President Hon. Dr. Ding Kunlun (China) is chairing the PCTA since 2015.



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 the Secretary General on the rudiments to be taken into account while preparing the annual budget. Vice President Hon. Laurie C. Tollefson (Canada) is chairing the Committee since 2013.



Central Office

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

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

In order to reduce the carbon footprint, the Central Office is being maintained as a green building complex with the provision of solar



energy generation system commissioned in 2015. Other eco-friendly measures include rainwater harvesting and use of treated wastewater/untreated freshwater for gardening purposes.



ICID Membership Network 2019

Sl. No.	National Committees	Acronym	Year of Joining
1.	Afghanistan	AFGICID	2018
2.	Australia	IACID	1952
3.	Bangladesh	BANCID	1973
4.	Burkina Faso	CNID-B	2014
5.	Canada	CANCID	1956
6.	Chad	ATID	2012
7.	China	CNCID	1983
8.	Croatia	CRCID	1993
9.	Egypt*	ENCID	1950
10.	Estonia	ESTICID	2001
11.	Ethiopia	ETCID	1976
12.	Fiji	FIJICID	2010
13.	Finland	FINCID	2000
14.	France	AFEID	1953
15.	Georgia	GEAMCID	2018
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.	Malawi	MALCID	1967
27.	Malaysia	MANCID	1958
28.	Mali	AMID	2005
29.	Mexico	MXCID	1951
30.	Morocco	ANAFIDE	1959
31.	Myanmar	MNCID	1962
32.	Nepal	NENCID	1973
33.	The Netherlands*	NETHCID	1950
34.	Niger	ANID	2007
35.	Nigeria	NINCID	1970
36.	Pakistan	PANCID	1953
37.	Philippines	PNC-ICID	1956
38.	Portugal	PNCID	1954
39.	Romania	CNRID	1992
40.	Russia	RUCID	1955
41.	Saudi Arabia	SACID	1977
42.	Slovenia	SINCID	1992

Sl. No.	National Committees	Acronym	Year of Joining
43.	Somalia	SONCID	2017
44.	South Africa	SANCID	1993
45.	Sri Lanka*	SLNICID	1950
46.	Sudan	SNCID	1964
47.	Tajikistan	TAJCID	2014
48.	Thailand*	THAICID	1950
49.	Turkey*	TUCID	1954
50.	Ukraine	UACID	1996
51.	United Kingdom	IWF/ICID UK	1951
52.	United States of America	USCID	1951
53.	Uzbekistan	UzNCID	1994
54.	Vietnam	VNCID	2018
55.	Zambia	ZACID	1966
Committee			
56.	Chinese Taipei	CTCID	1969
Associate Members			
57.	Austria	AUNCID	1954 (2015) ¹
58.	Brazil*	ABID	1970 (2018)
59.	Bulgaria	BNCID	1960 (2006)
60.	Czech Republic	CZNC-ICID	1997 (2017)
61.	Germany	GECID	1957 (2015)
62.	Greece	GRCID	1957 (2012)
63.	Guyana	GUCID	1957 (2012)
64.	Israel	ISCID	1950 (2012)
65.	Kyrgyz Republic	KYRCID	2004 (2010)
66.	Lithuania	LTCID	1994 (2014)
67.	Macedonia	MAKCID	1995 (2010)
68.	Madagascar	MADCID	2014 (2018)
69.	Mozambique	MOCID	1978 (2006)
70.	Poland	POCID	1967 (2006)
71.	Serbia (erstwhile Yugoslavia*)	YUGCID	2002 (2012)
72.	Slovak Republic	SKNC-ICID	1996 (2006)
73.	Spain	CERYD	1955 (2018)
74.	Switzerland*	CHAGRAM	1951 (2018)
75.	Syria	SYCID	1962 (2014)
76.	Tanzania	TANCID	2011 (2018)
77.	Uruguay	URUCID	2007 (2012)
78.	Zimbabwe	ZwCID	1955 (2018)

* Founder Member

¹ Year in parenthesis is of NC becoming inactive

Milestones in the History of ICID

- 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
- Released MTD CD-ROM in multiple languages in 2010
- Released 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

- 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

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

2013-2018

2001-2012

1991-2000

1981-1990

1971-1980

1961-1970

1951-1960

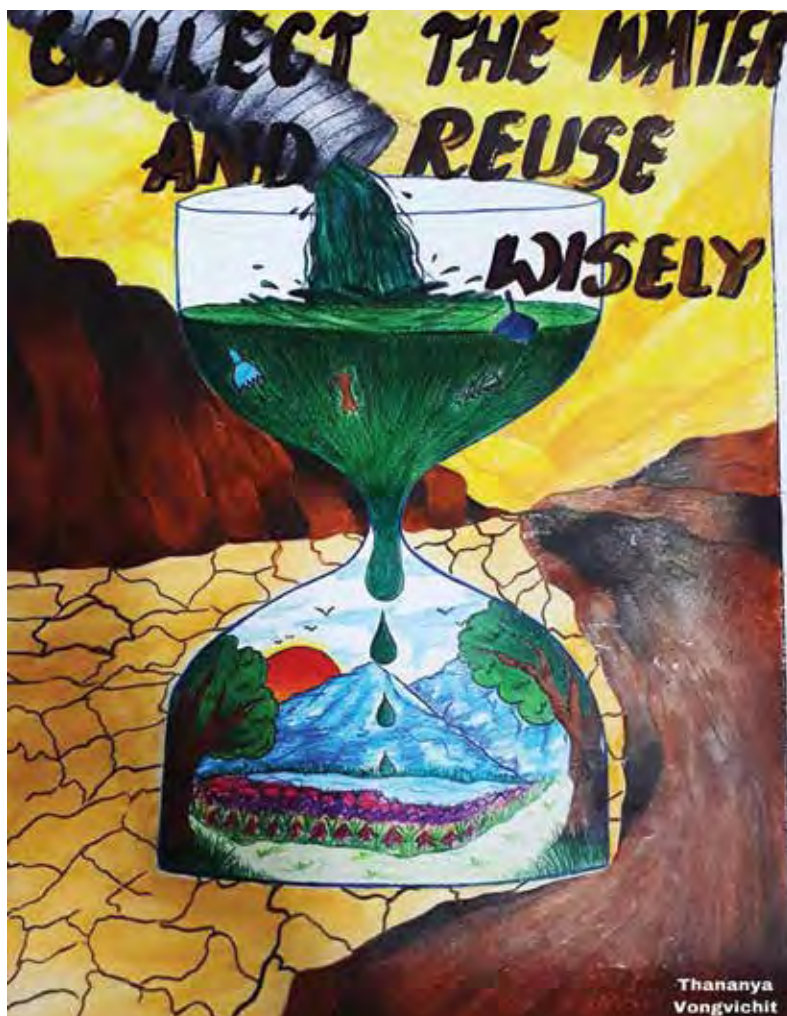
- Launched World Water System Heritage Programme (WSH), 2018
- Launched 'A Roadmap to ICID Vision 2030', 2017
- Established ICID Webinar Services, 2017
- Renamed International Micro Irrigation Symposium as International Micro Irrigation Conference, 2015
- Established ICID Young Professional e-Forum (IYPeF), 2015
- Released web version of the Multilingual Technical Dictionary (MTD), 2015
- Organized First World Irrigation Forum (WIF1), 2013
- Established Scheme for Recognition of World Heritage Irrigation Structures (WHIS), 2013
- Established Scholarships to Young Professionals, 2013

- 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

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

- 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 – PARTNERS IN PROGRESS

National Committees (NCs) are the building blocks of the Commission that strengthen the structure and help in advancing the mission of ICID. Any geographical area independently administered by a sovereign government with an abiding interest in the activities of the Commission is eligible to become a member by establishing an NC. NCs represent a wide network of experts from the government, technical and scientific organizations, non-government institutions, irrigators, companies and individuals with interest 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, water resources, agriculture or rural development and provide a multi-disciplinary platform within the countries bringing together all the relevant stakeholders.

ICID publication titled 'A Roadmap to ICID Vision 2030' has identified several activities to be undertaken by the network (especially NCs) under four categories: (i) Strengthening of the ICID Network and NCs; (ii) Collective Network Knowledge Management; (iii) Organizational changes in the network; and, (iv) Enhanced visibility of ICID activities. National Committees form the backbone of the ICID network as they represent various stakeholders engaged in different facets of AWM in their respective countries. They serve as the common platform for various AWM stakeholders in implementing sustainable development agenda within their countries, particularly with respect to meeting the goals of poverty alleviation, food security and sustainable water management and other related SDGs in the context of Climate Change.

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

The ICID believes in collective wisdom and collective efforts to achieve its goals. It goes about fulfilling its mission in a spirit of partnership, co-operation and sharing. In order to promote this spirit of partnership, National Committees are called upon to host IEC meetings, Congresses, World Irrigation Forum, and Regional Conferences in rotation and also organize activities in their respective countries to implement various action programs of their own or promoted/sponsored by the Commission. The ICID is keen to ensure that all National Committees assume important roles as partners in progress and make valuable contributions to the mission of ICID.

Afghanistan National Committee



Ensuring water security remains critical in Afghanistan for future agricultural production and to satiate other livelihood needs. Irrigation rehabilitation is a key element in increasing agricultural productivity and improving food security. Mr. Najumuddin, Technical Coordinator, On Farm Water Management Project (OFWMP), Ministry of Agriculture, Irrigation and Livestock (MAIL) delivered a webinar on the topic 'Water Productivity of Wheat Crop in Afghanistan' on 28 February 2019 to share his research and explain the concept of Crop Water Productivity (CWP). This is taken as a robust measure of the ability of the agricultural systems to convert water into food and fiber. The webinar primarily focused on OFWMP and how it improved the

agricultural productivity in the undertaken project areas. Because of the arid climate in Afghanistan, wheat yields in irrigated areas are up to three times higher than in rain-fed areas. Given this large differential, the government assigns high priority to rehabilitation of irrigation schemes. Afghan river systems are already among the most stressed river systems in Asia (with Helmand river topping the list of such river systems in Afghanistan) and probably in the world. Mr. Najumuddin explained that lack of availability of irrigation water is an important impediment in improving the agricultural productivity

in Afghanistan. The OFWMP has been conceptualized with the objective of improving the agricultural productivity in the project areas by enhancing the efficiency of water used. The project started its operation in March 2011. At present, its operations cover five regions (Central, Bamyán/Baghlan, Herat, North, East regions) comprising of 23 provinces to provide effective and efficient irrigation systems to improve the conveyance and application efficiency and increase water productivity.

Irrigation Australia's Committee on Irrigation and Drainage

Mr. Amit Parashar, Principal Research Consultant, CSIRO Land and Water (Australia) visited ICID Central Office on 10 May 2018 for a presentation on Basin Futures (BF) - a web-based capacity development and planning online tool (developed by CSIRO) that helps create various development scenarios in a river basin in the face of scarce data availability. The meeting was attended by ICID Office Bearers and Central Water Commission (CWC) members. The CSIRO project team was represented by Mr. Parashar, Mr. Carmel Pollino, Mr. Peter Taylor and Ms. Ashmita Sengupta. Mr. Taylor projected BF as a Basinpedia (encyclopaedia of basins) which can be used to search for basins all over the world with different parameters and generate content for rainfall, potential evapotranspiration, climate and environment. Mr. Parashar clarified that BF is neither aimed at modelling regulated systems nor supporting water trading or water sharing. The key goal is to enable a cohort of users requiring early stage understanding of water resources to support planning outcomes in sustainable and climate resilient manner. He emphasized that although the model is free for every country and basin in the world, for developing countries like Africa where the data is not available, one has to rely on satellite observations.

Mr. Momir Vranes, Irrigation Australia's Committee on Irrigation and Drainage (IACID) visited ICID Central Office on 24 July 2018 and discussed several matters including the possibility of formation of a new Working Group on Rainwater Harvesting. To enhance the role of IACID in ICID activities, Mr. Momir indicated IACID's interest in nominating more experts from Australia for the Working Group on Capacity Development, Training and Education (WG-CDTE). He suggested that based on his discussions with Food and Agriculture Organization (FAO), their expertise would benefit the proposed working group on rainwater harvesting.

Irrigation Australia's Annual general meeting was organized on 25 October 2018. During the meeting, Chair Andrew Ogden thanked the members who took part in the voting process for electing five directors to the Irrigation Australia Board and showing keen interest in the association's activities and events over the past year and the upcoming opportunities and plans for the year 2018-19. In the meeting, the special resolution relating to amendments to the constitution was passed and the new constitution was uploaded on the member's area of the website <<https://www.irrigationaustralia.com.au/>>. IACID will organize the 24th ICID Congress and 71st IEC meeting at Sydney, Australia in September 2020.



Canadian National Committee

Over 500 experts from around the world gathered in Saskatoon to attend the International Conference and 69th IEC Meeting of ICID from 12-17 August 2018 held at Saskatoon, Canada. Saskatoon is the heart of the Canadian Prairies.

The Canadian Water Resources Association (CWRA) organized the six-day conference in collaboration with the Canadian National Committee for Irrigation and Drainage (CANCID) with participation of experts, researchers, policy makers, government officials, irrigators and the private sector professionals from around 41 countries. The main theme of the conference "Innovation and Sustainable Agri-water Management: Adapting to a Variable and Changing Climate" further explored three sub-themes during the technical sessions held at the Teachers Credit Union (TCU) Place, Saskatoon. President Honora ire, Dr. Chandra A. Madramootoo, conducted the opening ceremony and on behalf of the Government of Canada, Hon'ble Ralph Goodale, Minister of Public Safety and Emergency Preparedness welcomed the audience. Hon'ble Goodale remarked that water is critical to agriculture in the Prairies and to realize that potential in the face of frequent severe floods and droughts caused by climate change, better water management is essential. Other key speakers were Dr. John Pomeroy, Director of the Global Water Futures Programme, University of Saskatchewan, Dr. Peter McCornick, Executive Director of the Daugherty Water for Food Global Institute at the University of Nebraska, Mr. Maurice Molony, Executive Director and CEO of the Global Institute for Food Security and Mr. Roger Hohm, President, CANCID.

CANCID organized a special seminar on 14 August 2018 on the topic 'Development and Financing Models for Irrigation and Drainage Sector' in order to understand various options available for development and



financing of irrigation infrastructure and its management and to learn from the merits and demerits of models already in use. Mr. Roger Hohm gave an introduction about the objective of the seminar followed by a keynote speech on 'Overview of Development and Financing models' by Mr. Francois Onimus, Sr Water Resources Management Specialist in the Water Global Practice in the MENA region, World Bank. Presentations from different National Committees (NCs) and the private sector formed a part of the seminar that brought out the challenges and risks associated with private sector participation in the development and management of irrigation sector. CANSID organized its Annual General Meeting on 14 August 2018. Over 15 members participated in the meeting and discussed the previous year's activities and planning efforts by the CWRA and CANSID in hosting the International Conference.



As a follow-up to the 69th IEC Meetings, Vice President Hon. Laurie Tollefson met and interacted with Canadian Prime Minister Hon'ble Justin Trudeau and Hon'ble Ralph Goodale, Minister of Public Safety and Emergency Preparedness to discuss current and future water challenges. Hon'ble Prime Minister Trudeau opined that given the important role that agriculture plays in the life and economy of Canada, sustainable water management is vital for the future of our footprint, while increasing yields. He remarked that the country has adopted many leading-edge technologies to manage and distribute its limited water resources and to further realize that potential in the face of frequent floods and droughts of severe nature caused by climate change, better water management is essential. Hon'ble Minister Goodale noted the importance of the agri-food sector to deliver safe, high-quality food to a growing world population with effective water management. He emphasized that the need of the hour is to yield new solutions for climate-smart agriculture that will help the world's farmers meet the challenge of feeding a growing population sustainably.

Dr. Warren Helgason was elected as the new President and Mr. Evan Derald nominated as the new Secretary-Treasurer of CANSID. Mr. Derald replaced VPH Laurie Tollefson, who recently stepped down from his position.

Chinese National Committee

The Chinese National Committee on Irrigation and Drainage (CNCID) in association with ICID and support from the Korean National Committee of ICID (KCID) organized a five-day Young Professionals (YP) training programme to hone the skills of the budding young professionals on the theme "Performance Assessment of Irrigation Systems" from 9-13 April 2018 at China Hall of Science and Technology in Beijing, China. The training programme mainly focused on the physical, institutional, organizational and participatory management aspects of the irrigation systems and was attended by 19 participants



from 14 countries namely, Australia, India, Iran, Iraq, Nepal, Pakistan, Sri Lanka, Tajikistan, Thailand, Uzbekistan, Korea, Indonesia, Myanmar and Iran. On 13 April 2018, a joint field visit of trainees and workshop participants was organized to Dayu Group of Companies to study their plant manufacturing drip and sprinkler irrigation equipment and later to physical modelling and experimental station of Institute of Water and Hydropower Research (IWHR), China. Mr. Amit Parashar, Principal Research Consultant, CSIRO Land and Water gave a presentation to the participants on 'Basin Futures: Supporting water planning in data sparse basins-Australia.'

CNCID organized a two-day workshop on "Innovations of Irrigation Technology" from 14-15 April 2018 for the young professionals. PH Dr. Gao Zhanyi in his opening remarks gave an introduction to the participants about the role of innovation in irrigation as water conservation is a growing concern throughout the world and how new developments in technology are lending support to make this process much easier. President Reinders, Secretary General Pandya, Dr. Marco Arcieri and many others shared their respective country experiences for innovations in irrigation technology and its impact on agricultural production. Other key concepts like smart fertigation, dripline production, smart water management, ET by satellite technology to enhance crop productivity and creating a secure world food system were

also discussed. The workshop concluded with a discussion wherein participants raised issues on use of new technological innovations and suggestions to harness their full potential.

Chinese Taipei Committee

Prof. Ray-Shyan Wu assumed charge as the new Secretary General of Chinese Taipei Committee on Irrigation and Drainage (CTCID) w.e.f. May 2018. Prof. Wu also served as CTCID's Deputy Secretary General for many years and during his professional tenure lent his expertise and guidance to the ICID Working Group on Climate Change and Agricultural Water Management (WG-CLIMATE).

Egyptian National Committee

The first meeting of the Egyptian National Committee on Irrigation and Drainage (ENCID) headed by Vice President Hon. Dr. Mohamed Wahba, President of ENCID and Chair of AFRWG was organized on 10 April 2018. During the meeting, the role of ICID, its vision and mission and various different activities including a draft vision for the future activities of ENCID at national and international levels were discussed. During the meeting, preparation of the First African Young Professional Forum in October 2018 in Egypt and to activate the young professional group of the committee were discussed. Dr. Wahba also headed the first meeting of the Young Professional Working Group of ENCID on 14 May 2018. During the meeting, a brief introduction was given about ICID and its activities, the role of the National Committee and the tasks of the working group.



The first Cairo Water Week (CWW1) was held from 14-18 October 2018 by Egypt's Ministry of Water Resources in partnership with the European Union (EU), Food and Agriculture Organization (FAO), the UN Educational, Scientific and Cultural Organization (UNESCO), Global Water Partnership (GWP), International Water Management Institute (IWMI) and other international partners on the theme 'Water Conservation for Sustainable Development.' The event aimed at promoting water awareness, foster new thinking about the most pressing water-related challenges and take actions towards integrated water resources management (IWRM) and conservation for sustainable development. The opening ceremony was presided by His Excellency Mustafa Madbouli, Prime Minister of Arab Republic of Egypt, Mr. Mohamed Abdel Aty, Egyptian Minister of Water Resources and Irrigation and the Deputy Secretary General of the UN along with around 20 Ministers and more than 40 international delegates. During the CWW1, VPH Dr. Mohamed Abd-El-Moneim Wahba (Egypt), seized the occasion to establish the African Young Water Professionals Forum (Af-YWPF) and organized its first meeting to discuss the forum's objectives and mandate.



Prof. Dr. Hesham Mostafa, Deputy Chairman of NWRC – MWRI, Egypt assumed charge as the new Chairman of Egyptian National Committee (ENCID) replacing Dr. Wahba. Indian National Committee on Surface Water

India

The 9th International Micro Irrigation Conference was organized by the Ministry of Water Resources, River Development & Ganga Rejuvenation (MoWR, RD&GR), Government of India in association with ICID, Indian National Committee on Surface Water (INCSW) and WAPCOS Limited from 16-18 January 2019 in Aurangabad, Maharashtra, India. 'Micro Irrigation in Modern Agriculture'—the theme of the conference—aimed at sharing experiences in the use of new technologies and best management practices in drip, micro-sprinkler and other localized irrigation systems with sub-themes focusing on (i) Design, Innovations, and New Techniques for increased Crop Productivity; (ii) Micro-irrigation funding and Government support; (iii) Micro Irrigation for 'Cluster Level Farming and Small farm holders'; and (iv) Operation and Maintenance Services and Capacity Development for the Micro-Irrigation Systems.



Union Minister of Road Transport and Highways, Shipping and Water Resources, River Development & Ganga Rejuvenation Mr. Nitin Gadkari inaugurated the event as the chief guest which was presided over by Hon'ble Chief Minister of Maharashtra Mr. Devendra Fadnavis. Union Minister for Agriculture and Farmers' Welfare Mr. Radha Mohan Singh, Minister of State for Water Resources, River Development & Ganga Rejuvenation and Parliamentary Affairs Mr. Arjun Ram Meghwal, and Ministers from several state governments also presided as guests of honor during the event.

Hon'ble Minister Dr. Mahendra Reddy (Ministry of Agriculture, Rural and Maritime Development and Waterways and Environment, Government of Fiji) graced the occasion as a Special Invitee. Mr. U.P. Singh, Secretary, MoWR, RD&GR, Govt. of India); Mr. S. Masood Hussain, Chairman, (INCSW, Central Water Commission); Er. Felix B. Reinders, President and Er. A.B. Pandya, Secretary General from ICID were also present during the conference. Speaking on the occasion, Mr. Gadkari declared that micro irrigation is a gamechanger in agricultural development.



As part of the conference, Water and Land Management Institute (WALMI), Aurangabad organized a one-day "National Micro Irrigation Workshop for Farmers" on 15 January 2019. Around 200 farmers from various states of the country participated in the event. The event was graced by Mr. Uday Chaudhari, Collector and District Magistrate of Aurangabad; President Reinders and Mr. Giriraj Goyal, Director, MoWR, RD&GR. President Reinders made a presentation on Micro Irrigation and introduced different practices and technologies used in various countries. On special request from the farmers, the presentation was interpreted in Hindi and was very well received.



The Energy and Resources Institute (TERI) in association with the Ministry of Water Resources River Development & Ganga Rejuvenation, Government of India organized the 4th India Water Forum (IWF) on the theme "Water for All: Options for Safe, Sustainable and Resilient Future" from 5-6 March 2019 in New Delhi, India. During the keynote session, Mr U.P. Singh, Secretary, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India stated "India's key challenge is of water resource management, not of water availability. Now there is not much scope of building more large and medium dams, but there is an urgent need for groundwater recharge."

Secretary General A.B Pandya chaired a session on "Ensuring water security through enhancing efficiencies and advocating conservation" during the event.

Indonesian National Committee



The 2nd preparatory meeting between ICID and Indonesian National Committee on Irrigation and Drainage (INACID) officials was organized on 15 March 2019 in Jakarta, Indonesia. The meeting was attended by the members of the INACID including Ir. AdangSaf Ahmad, President, INACID, DrIr. MochammadAmron, Dr. Mohamad Hasan, Ir. IwanNursyirwan, Ir. Muhamad Arsyadi, Ir. MochamadMazid, Mr. Syaiful Mahdi, Ir. Agung Djuhartono, Ir. TrisasongkoWidianto, Ir. EkoSubekti, Ir. Muradi R, Mr. Dendy Triandi, Ms. YantiErmawati, Mr. Ivan M Sburian, Mr. BayuChozali, Mr. SekarAdjena, Usman, Mr. Renony Aslan and Ir. (Ms) Nita Yulianti. Secretary General Ashwin Pandya and Er. Harish Kumar Varma, Executive Director from ICID Central Office participated in the

meeting. INACID is organizing the Third World Irrigation Forum (WIF3) & 70th International Executive Council (IEC) Meeting from 1-7 September 2019 in Bali, Indonesia.

Iranian National Committee

As Iran aims to expand its National Water Accounting system by exchanging experiences and knowledge with other countries, a training course on Water Accounting was organized by the Iranian National Committee on Irrigation and Drainage (IRNCID) on 8-9 May 2018. The course lecture was delivered by Dr. Amgad Elmahdi, former leader of the research team in CSIRO, Land and Water. It was attended by around 110 participants from both the private as well as government sectors with an aim to expand the

knowledge threshold in this field and benefit from Australia's experience. In addition to an overview of Australia's experience, the training course covered various topics including Water Accounting Concepts, types of Accounting, identifying factors affecting Water Accounting, Australia's National Accounting Procedure and actions undertaken in the country's water sector by presentation of a case study on Murray-Darling basin. Besides, there was an illustration of Iran's experience with regard to water accounting along with a report on data collection network of both surface and groundwater resources' information. The workshop concluded with the participants practically familiarizing themselves with Water Accounting concepts through discussions in designated groups.

Dr. Narges Zohrabi, Executive Secretary of ICID International Research Programme for Irrigation and Drainage (IRPID) - Iran Regional Node was appointed as the Head of the Iran-Regional Node. On 16 July 2018, the Iran Regional Node of IRPID (IRPID-RN-I) organized its annual meeting of the Management Board through WebEx meeting. IRPID-IRN, affiliated to ICID, successfully organized the "International Training Workshop on Water Accounting- Concepts and Tools" with the support of leading institutions and specialists from 23-26 February 2019 in Iran. Hon'ble Deputy Minister of Water and Wastewater of Iran, Ghasem Taghi Zadeh Khamesi inaugurated the first day of the workshop held in Tehran. The workshop on the second and third days were organized in Ahvaz, Khuzestan province, one of the major water places in Iran. Khuzestan Water and Power Authority (KWPA) hosted the workshop wherein Hon'ble Chairman and Managing Director of the Board, Farhadzadjoor delivered a welcome address to the participants and appreciated the collaborative effort of FAO and ICID in organizing the workshop. Dr. Banafsheh Zahraie, Director General, Office of Water Demand Management and Water and Wastewater Productivity Improvement, Ministry of Energy, Iran gave a presentation on "Actions and Activities Undertaken for Water Accounting and its Future Perspectives."



Italian National Committee

Dr. Graziano Ghinassi, Researcher, Dept. of Agriculture, University of Florence (Italy) and an active member of ICID Working Group on Sustainable On-Farm Irrigation System Development (WG-SON-FARM) delivered an ICID webinar on the topic 'Smart technology to reduce energy consumption for water spreading and pipe production in hose reel sprinkler irrigation' on 5 December 2018. Mr. Sergio Sacchini (Expert Assistant) joined as a panelist during the webinar. The webinar primarily focused on the use and performance of a new device which allows the positioning of an anti-friction plastic tape below the pipe of hose reel machines when sliding over the field surface. With 2,100 m³/ha of supplied water per season, the potential of the device in reducing both energy use (fuel consumption and GHG emissions) and operating cost amounted to about 25%, with the same system performance and under the assumption that economic durability of the pipe and machine remain the same. The webinar is available at http://www.icid.org/icid_webinar_13.html along with presentations and collated resources.



Vice President Dr. Marco Arcieri and Secretary General of Italian National Committee (ITAL-ICID) visited ICID Central Office on 23 January 2019 and interacted with Secretary General Ashwin Pandya and ICID officials. Dr. Arcieri appreciated the proceedings of the 9th International Micro Irrigation Conference (9IMIC) organized in Aurangabad, India from 16-18 January 2019. He expressed his interest and assured active representation from ITAL-ICID during the WIF3 in Bali, Indonesia and to publicize the event among potential stakeholders.



VP Dr. Arcieri participated in the First International Forum on Water Scarcity in Agriculture (WASAG) organized under the patronage of the Government of Cabo Verde in collaboration with the Food and Agriculture Organization (FAO), the Ministry of Agricultural Food, Forestry and Tourism Policies of Italy (MIPAAFT) and the Swiss Federal Office for Agriculture (FOAG) from 19-22 March 2019 in Praia, Cabo Verde, West Africa. During the forum, six areas of key focus were covered: water



and migration, water and nutrition, saline agriculture, sustainable agricultural water use, drought preparedness and financial mechanisms.

Korean National Committee

The Korean delegation and ICID Office Bearers organized a meeting on the side-line of the 8th Asian Regional Conference (8ARC) on 2 May 2018 in Kathmandu, Nepal. President Reinders, VP Naoki Hayashida, VPH Ding Kunlun and Secretary General Pandya attended the meeting. The Korean delegation headed by Mr. Kyu Sung Choi, KRC CEO and KCID President included VPH Bong Hoon Lee, Mr. Jung Suk Jang, Mr. Jeon Yong Ryu and Mr. Jung Chul Lee. Ms. Sang-heePARK assumed charge as the new Secretary of KCID.



and management scenarios

considering the urgent need for a sustainable climate change-resilient agriculture sector.

Japanese National Committee



Mr. Naoki Hayashida, Vice President, ICID accompanied by Mr. Mitsuolshijima, Secretary General, and Mr. Yasunori Saiki, Secretariat from Japanese National Committee of ICID (JNC-ICID) visited ICID Central Office on 12 March 2019. The meeting aimed at exploring possible areas of cooperation between ICID and JNCID. Activities related to various working groups and latest initiatives undertaken by Central Office were discussed at the meeting. On their part, JNCID made a special offering of USD 5000 for supporting the YP training programme in Bali and other activities conducted by ICID as part of Technical Support Programme (TSP).

Moroccan National Committee



President Hon. Dr. Saeed Nairizi and Vice President Hon. Dr. Mohamed Wahba, Chair of Egyptian National Committee of ICID (ENCID) and Chair of African Regional Working Group (AFRWG) visited Rabat, Morocco from 16-20 April 2018. The visit was organized by Pr El Houssine Bartali, Vice President of ANAFIDE and Director of Agricultural Engineering School at Hassan II Institute of Agronomy and Veterinary Medicine (IAV), Rabat. The aim of the meeting was to discuss and support the preparation of the 5th African Regional Conference on Irrigation and Drainage to be organized by ANAFIDE in collaboration with ICID in Morocco in March 2020; enhance cooperation and exchange among ANAFIDE (Morocco), IRNCID (Iran) and ENCID (Egypt); and promote the activities of ANAFIDE within the AFRWG, particularly the Moroccan Young Professionals Forum. PH Nairizi gave a presentation on the "Role of ICID in Tackling Global Food Security Challenge" on 17 April 2018 and outlined the 'Road Map to ICID Vision 2030' and recalled the mandate of AFRWG. He presented ICID initiatives and programs to facilitate the implementation of the vision through the Technical Support Programme (TSP) and the International Research Programme on Irrigation and Drainage (IRPID) Nodal Centre. It was agreed ANAFIDE and ENCID will collaborate with the Italian National Committee of ICID (ITAL-ICID) for the establishment of a Regional Node for the Mediterranean and North African Region.

On 19 April 2018, VPH Wahba gave a presentation on "Innovative technology for use of green concrete for ecological slope protection." Later VPH Wahba and Pr. El Houssine Bartali chaired a meeting

attended by the young professionals and engineering students. During the meeting, the Moroccan Young Professional Forum was established which will undertake activities within the AFRWG of ICID. The forum will be coordinated by Ms. Sara Boularbah for enabling the Moroccan young professionals to benefit and contribute to various ICID activities including e-discussions, webinars, ICID Journal and various conferences/seminars. At the end of their visit, PH Nairizi and VPH Wahba expressed their contentment regarding the arrangements and facilities for hosting the 5th African Regional Conference in 2020.

Pr. Bartali El Houssine, Vice President of Moroccan National Committee (ANAFIDE) represented ICID during the expert meeting hosted by the African Union Commission (AUC) in AUC headquarters, Addis Ababa, Ethiopia from 11-12 December 2018 on the theme "Validation of the AUC report on Continental Irrigation for Agricultural Development Framework (CIADF)". The workshop was attended by invited experts in the field of African irrigation agriculture, agricultural policy/ strategies and development from Food and Agriculture Organization, World Bank, International Water Management Institute (IWMI), Japan International Cooperation Agency (JICA), Global Water Partner Eastern Africa (GWPEA), and International Center for Tropical Agriculture (CIAT). Prof. Bartali highlighted that two major projects were undertaken for water conveying and distribution networks as well as management of irrigation schemes using surface water stored in dam reservoirs (El Guredane project) and desalinated water from the Atlantic Ocean (Chtouka project).

ANAFIDE plans to organize the 5th African Regional Conference on Irrigation and Drainage from 16-19 March 2020 in Marrakech, Morocco to exchange experiences about lessons drawn, innovative technologies and irrigation development strategies to reduce deleterious impacts of climate change on African agriculture. The conference will focus on the theme "Sustainable Management of Irrigation for Improved Resilience of Agriculture in Africa" considering the need to address the aforementioned challenges to improve resilience in agriculture productivity for ensuring food security for the present and future generations in the African region.

Nepal National Committee

The Nepal-Australia Joint Advisory Committee agreed to continue their bilateral partnership focused on river basin planning, ecosystem management and exchange their viewpoints on water management policy options. Joint Secretary of the Water and Energy Commission Secretariat, VP Madhav Belbase highlighted the partnership as a good example of cooperation among Nepal and Australian scientists and government officials. During the meeting, a briefing on recent river basin planning efforts in the Kamala Basin which is being assisted by Australia's premier research organization, CSIRO, was made. In addition, Australia's International Centre of Excellence in Water Resources Management (ICEWaRM) offered to provide policy support to Nepal officials in preparing the National Water Resources Policy and associated legislations. Mr. Pete Budd, Australian Ambassador to Nepal, as joint Chair of the Committee, indicated that Australia was open to expand their partnership to new areas.



The 8th Asian Regional Conference (ARC) on the theme "Irrigation in Support of an Evergreen Revolution", was organized during 2-4 May 2018 in Kathmandu, Nepal by the Government of Nepal (Department of Irrigation and Department of Water Induced Disaster Management), Nepal National Committee of ICID (NENCID,) and co-organized by USAID

The other partners who joined hands in organizing the conference were ADB, ICEWaRM, ICIMOD, IWMI and the World Bank. Renowned professionals from United States Agency for International Development (USAID), World Bank, International Water Management Institute (IWMI), International Centre for Integrated Mountain Development (ICIMOD), Farmer Managed Irrigation Systems Promotion Trust, Nepal (FMIST), Asian Development Bank (ADB), International Centre of Excellence in Water Resources Management (ICEWaRM) and other reputed organizations participated in the conference to deliberate on various issues for steering the region's irrigation and drainage into the 21st century.

The conference was inaugurated by Rt. Hon'ble Bidya Devi Bhandari, President, Federal Democratic Republic of Nepal in the presence of Hon'ble Barsha Man Pun, Minister, Energy, Water Resources and Irrigation, Nepal. More than 520 participants from 22 countries attended the conference which included approximately 100 international participants. Technical Report of ASRWG-WT titled "Contribution of Agriculture Water to the Rural Development of Asia" was released jointly by the ICID President and Vice-Presidents. During the conference, Young Professional Training Programme was also organized.



VP Madhav Belbase, NENCID visited Central Office on 14 June 2018 and 31 October 2018 and had a brief interaction with ICID professionals. During the meeting in October 2018, VP Belbase presented copies of the 'Proceedings of the 8th Asian Regional Conference (ARC) in Support of Evergreen Revolution' to Secretary General Pandya and other ICID officials. SG Pandya further deliberated the participation of NENCID in the ICID events including the 9IMIC in Aurangabad, India and the WIF3 and 70th IEC Meeting in Bali, Indonesia. VP Belbase with keen interest assured active representation from NENCID in the ICID events.

Nigerian National Committee

The second IYPEF e-Discussion on 'Solar-Powered Irrigation System: Exploring Opportunities and Threats' was organized from 15 February-2 March 2019. The discussion organized on virtual open platform witnessed active participation from young professionals and explored how the potential of Solar Powered Irrigation System (SPIS) can be realized, whilst addressing the risks and challenges that come with the technology to provide sustainable energy access in rural areas and to promote innovative investment models and organizational structures. Eng. Amali Abraham Amali (Nigeria) acted as the IYPEF lead coordinator. Dr. Petra Schmitter, Research Group Leader, Agricultural Water Management, International Water Management Institute (IWMI) steered the e-Discussion as a mentor and highlighted the vital role SPIS is poised to play in achieving the Sustainable Development Goals (SDGs) of Agenda 2030 and in solving agriculture's energy challenges whilst increasing reliability and affordability.

Philippine National Committee

Gen Ricardo R Visaya (Ret) assumed charge as the Chairman of Philippine National Committee of ICID (PNC-ICID) while Maj Gen Romeo G Gan (Ret) - NIA Deputy Administrator for Administrative and Finance was appointed as Vice Chairman.

Portuguese National Committee

Mr. Gonçalo de Freitas Leal, General Director of DGADR assumed charge as the new President of the Portuguese National Committee on Irrigation and Drainage(PNCID). PNCID has been an active member of ICID since 1954 and has always been supportive of ICID's vision and mission.

Saudi Arabian National Committee

The Saudi Arabian National Committee on Irrigation and Drainage (SACID) membership was reactivated and it joined as an active member of ICID's expanding network. SACID has nominated Mr. Bahaa K. Helmy as the nodal person to actively engage in the activities of the committee and support ICID to carry forward its vision and mission. Mr. Helmy made significant efforts and played a vital role in bringing Saudi Arabia into ICID's fold. The Royal Embassy of Saudi Arabia in New Delhi and the Ministry of Environment, Water and Agriculture provided their constant support to reactivate the membership of Saudi Arabia.

Somalia National Committee

The Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia and ICID signed a Memorandum of Understanding (MoU) for furthering scientific cooperation to encourage joint research and development activities in the development of Basin Futures (BF)—a web-based capacity development and planning tool (developed by CSIRO) that helps create various development scenarios in a river basin—particularly, in scarce data situations. As part of the MoU, ICID in consultation with CSIRO is exploring ways to jointly promote BF through case studies in ICID member countries and identified Somalia (Africa) where BF can be applied as a case study to promote its use. Mr. Amit Parashar, Principal Research Consultant, CSIRO Land and Water (Australia) and his team gave a live demo presentation of BF on 6 November 2018. SG Ashwin Pandya, Executive Director Harish Varma, Director KM, Dr. Sahdev Singh from ICID Central Office and Mr. Abdullahi Hassan Hussein from Somalia attended the meeting. The CSIRO project team was represented by Mr. Parashar, Mr. Carmel Pollino, Mr. Peter Taylor and Mr. Tony Slatyer.

South African National Committee

President Felix B. Reinders visited ICID Central Office on 13 December 2018 and had a brief interaction with Secretary General Pandya and other ICID officials. President Felix shared his experiences about the 'International Conference on Sustainable Water Management' organized by Bhakra Beas Management Board (BBMB) under the aegis of the National Hydrology Project of the Union Ministry of Water Resources, River Development and Ganga Rejuvenation held in Mohali, Punjab, India from 10-12 December 2018. He felt that the conference was extremely relevant in present scenario especially in the light of global climate change and the way the conference theme dealt with promoting integrated, sustainable development and management of water resources. The President and the ICID team also visited the Borlaug Institute for Sustainable Agriculture, Ludhiana, Punjab and interacted with the scientists working on crop requirement-based irrigation to improve water productivity.



Sri Lanka National Committee

Sri Lanka National Committee on Irrigation and Drainage (SLNICID) organized a meeting with VPH Ian Makin on 28 November 2018 at the Irrigation Department conference room. The meeting was attended by SLNICID President, Secretary and Committee Members and discussed the update on activities pertaining to submission details to World Heritage Irrigation Structures (WHIS); training of young professionals; participation in the upcoming 3rd World Irrigation Forum (WIF3) in Bali, Indonesia and future activities to be undertaken by SLNICID. VPH Makin presented the WHIS plaques (Elahera Anicut, Kantale Wewa and Sorabora Wewa) to the President and Secretary of SLNICID. Eng. S. Mohanarajah, Director General of Irrigation Department, Sri Lanka assumed charge as the new President of SLNICID.



Turkish National Committee

Mr. Mevlut AYDIN, Director General of State Hydraulic Works assumed charge as the new President of Turkish National Committee of ICID (TUCID). TUCID is one of the founding members of ICID and has made active contribution to ICID activities since 1954.

Uzbekistan National Committee

H.E. ShavkatKhamrayev, the Minister of Water Resources of the Republic of Uzbekistan, Chairman of the National Committee on Irrigation and Drainage, participated in the meeting of the Council of Heads of State and Founders of the International Fund for Saving the Aral Sea organized on 24 August 2018 in Turkmenistan.

To highlight the importance of freshwater and advocate sustainable management of freshwater resources, a one-day conference to celebrate the World Water Day was held on 19 March 2019 at the Tashkent State Institute of Irrigation. The conference embraced the theme: "Leaving no one behind" and "Water is life." R. Mamutov, Deputy Minister of Water Management of the Republic of Uzbekistan delivered the opening address and highlighted the ongoing activities for the efficient and economical use of water resources. The conference was well-attended by UN representatives and international organizations including the Asian Development Bank, Swiss Waters Agency, World Bank, scientists, teachers and media thereby collectively engaging and discussing the importance of water for future development. The participants of the conference came up with a lot of valuable suggestions relating to economical use of water resources and conservation of water bodies with the underlying aim of increasing water efficiency, reducing water pollution and treating polluted water with the need for setting the limits on water usage for crop irrigation, industry and energy.



Electrosteel Castings Limited participated in the 9th International Micro-Irrigation Conference 2019 held in Aurangabad, Maharashtra (16-18 January 2019) as a Silver Sponsor. It was organized by ICID, Central Water Commission (CWC), Indian National Committee on Surface Water (INCSW) and WAPCOS under Ministry of Water Resources, River Development Ganga Rejuvenation, Govt. of India. Electrosteel Castings Limited presented a paper titled "Life Cycle Cost of HDPE, GRP, MS and DI Pipes as per Central Water Commission Pressurized Irrigation Network Manual – ISO:2451 and NEERI Handbook and also put up a stall in the exhibition of the conference.



During the last year, critical activities undertaken by Electrosteel Castings Limited in the Irrigation Sector are:

1. To utilize waste-water flowing out of the proposed six sewage treatment plants in Patna City for irrigation purpose under Water Resources Department, Government of Bihar.
2. Sone Kanhar underground pipeline project in Garhwa under Water Resources Department, Government of Jharkhand.
3. Champatpur branch canal of Badaun Irrigation project in Uttar Pradesh under Irrigation and Water Resources Department, Government of Uttar Pradesh.
4. Borolia Medium Irrigation Scheme under AIBP/PMKSY under Borolia Division (Irrigation), Tamalpur of Bodoland Territorial Council, Kokrajhar, Assam.
5. Tatko Irrigation Project under Irrigation and Waterways Department, Government of West Bengal.

India Water Foundation, India

India Water Foundation (IWF), a non-profit civil society and think tank (Special Consultative Status by UN-ECOSOC, Observer Status Governing Body of UNEA), established with the idea of generating heightened public awareness towards water and its impact on human health, economic growth and environmental sustainability with specific emphasis on SDGs 1 (no poverty), 2 (zero hunger), 6 (clean water and sanitation), 7 (affordable and clean energy), 12 (responsible consumption and production), 13 (climate action) and 17 (partnerships for the goals). IWF has been recently granted observer status organization with United Nations Framework Convention on Climate Change (UNFCCC) and member of Climate Technology Centre and Network (CTCN), thereby offering greater opportunities for bringing about synergy among water, energy, environment and related sectors. Dr. Arvind Kumar, President, IWF has been elected to the Board of Governors of World Water Council (WWC) during the 8th General Assembly of WWC in Marseille, France (29 Nov- 1 Dec 2018), providing the opportunity to enhance IWF's momentum to espouse 'environmental security' at the global level.



In the national arena, IWF was conferred the 'Water Digest Award' in the category of Best Water NGO – 'Water and Sanitation' for the year 2018-19. Currently, IWF as a Key Resource Hub of Networking of Ministry of Science and Technology, Government of India has initiated 'Eco Routes, a project supported by NCSTC department, in Uttarakhand and Uttar Pradesh. Activities involving dialogues with state actors including public outreach programs were conducted. Overall, the idea was to converge various activities, dialogues, consultations on a single platform to bring forth the best eco-solutions.

During the conference organized by Indra Gandhi National Open University (IGNOU) on 5 October 2018 on "Environmental and Ecological Sustainability", Dr. Kumar highlighted that changeover to a truly inclusive green economy needs to be built on resilient ecosystems, clean production systems, healthy consumption choices, reduced negative distributional effects of environmental policies and improved overall environmental justice for all.

At the international level of the 6th Asia Pacific Climate Change Adaptation Forum 2018 held from 15-19 October 2018 in Manila, Philippines, Dr. Kumar was a mentor and panellist. He shared his experiences and learnings of ecosystem based adaptation and resilience in Meghalaya where he acknowledged that the twin goals of natural resource management and livelihoods must be integrated into development



activities to bring holistic sustainable development. Dr. Kumar along with Chief Functionary Shweta Tyagi attended the second meeting of the Ad-hoc open-ended expert group on “marine litter and micro plastics” from 3-7 December 2018 in Geneva with a mandate to explore the barriers to combat marine litter and micro-plastics calling for a dedicated convention on plastics.

Dr. Kumar attended the 3rd Forum of Ministers and Environment Authorities of Asia-Pacific held from 23-26 January 2019 in Singapore which called for collaborative efforts to make a visible impact and envisage a ‘Responsible Production and Consumption’ for the near future. Overall, it was a great year for IWF, indicating a blend of momentous joy of success, accreditations and new avenues to venture upon in the coming years.



Jain Irrigation Systems Ltd., India

Jain Irrigation Systems Ltd. (JISL) is a diversified entity with a global presence with 33 manufacturing bases spread over four continents and the second largest Micro-Irrigation company in the world. The Micro-Irrigation Division of JISL manufactures a complete range of precision-irrigation products. Jain irrigation provides services from soil survey, engineering design to agronomic support. It nurtures a sprawling 2300-acre Hi-Tech Agri Institute; a Farm Resource R&D, Demo, Training and Extension Centre. JISL also undertakes turnkey projects for agricultural and irrigational development with holistic and integrated approach. Over 1500 agricultural and irrigation scientists, engineers and technicians are engaged in offering services for complete or partial project planning and implementation e.g. Watershed Development through Wasteland Transformation, including crop agronomy, protected cultivation etc. JISL is the only company in India which is not only a pioneering manufacturer of hi-tech agricultural inputs but also a complete Agri-Service provider, Training and Extension Institute, large farm cultivator and an Agricultural Consultancy organization. JISL has a reach of over 8.5 million farmers.



During the period 2018-19, JISL undertook various activities highlighting their achievements, accolades and lifetime commitment to introduce modern, yet affordable, and viable technologies in all their product offerings.

JISL actively participated in the 9IMIC organized at Aurangabad, India, January 2019. Plenary Session 2 was Co-Chaired by Mr. Atul B. Jain, Joint Managing Director. Mr. Anil Jain, CMD, was one of the Panelists of SE6-Challenges and issues in upscaling of drip and micro irrigation in Maharashtra. In addition, JSIL organized a technical visit to Jain

Jalgaon plant, which manufactures pipes, drips and sprinklers. the visit was very well appreciated by the international participants. A highlevel delegation led by VP Hayashida visited Command Area Development Authority (CADA) a JISL micro irrigation demonstration project in March 2019.

JSIL was conferred CBIP Award 2019 for “Optimum and efficient utilization of water”.



WAPCOS Ltd., India

WAPCOS Limited is a “MINI RATNA-I” Public Sector Enterprise under the aegis of the Ministry of Water Resources, River Development & Ganga Rejuvenation. Incorporated on 26 June 1969 under the Companies Act 1956, WAPCOS is a technology driven Consultancy and Engineering, Procurement and Construction (EPC) organization with strong domestic as well as global presence in the field of Water, Power and Infrastructure sectors. WAPCOS has the requisite experience and expertise to undertake Consultancy and EPC projects of any scale and complexity in the sectors of its operations. WAPCOS portfolio of projects is both impressive and diverse in nature.

The Company provides concept to completion services for developmental projects in India and abroad. WAPCOS is registered with numerous international funding agencies for participating in the funded projects like the World Bank, Asian Development Bank, African Development Bank, Japan Bank for International Cooperation, United Nations Office for Project Services, French Development Agency and German Development Bank.

In 2008-09, WAPCOS footprint spanned 8 countries that has expanded to 47 countries by 2018-19. Apart from India, WAPCOS has successfully completed/on-going consultancy assignments across continents

covering Asia, Africa, Middle East, South America, Pacific Islands including Angola, Afghanistan, Bangladesh, Benin, Bhutan, Burkina Faso, Burundi, Cambodia, Central African Republic, Chad, Democratic Republic of the Congo, Ethiopia, Fiji, Georgia, Ghana, Guinea Conakry, Indonesia, Kenya, Kazakhstan, Lao PDR, Lesotho, Liberia, Malawi, Maldives, Mali, Mongolia, Mozambique, Myanmar, Nauru, Nepal, Niger, Nigeria, Philippines, Rwanda, Senegal, Sierra Leone, South Sudan, Sri Lanka, Swaziland, Tanzania, Tajikistan, Togo, Uganda, Uzbekistan, Vietnam, Yemen and Zimbabwe. WAPCOS comprising of highly qualified professionals, vibrant management and excellent infrastructural facilities is poised to meet the challenges of the 21st century very effectively. The works are spread across African continent with strong presence in 27 countries. WAPCOS operates in all the states of India through 45 project offices spanning across all Government and Private sectors, with the pride of being associated with almost all the premier Government of India schemes.

Hon'ble President of India presented 'Award for Excellence and Outstanding Contribution to the Public Sector Management - Institutional' instituted by Standing Conference of Public Enterprises, an apex body of Central Government owned Public Enterprises to recognize the contribution of Public Enterprises, to WAPCOS. The Company has received several prestigious National/International Awards such as Indian Chamber of Commerce - India Corporate Governance & Sustainability Vision Summit - Corporate Governance & Sustainability Vision Awards 2018; CSR Leadership Awards by ET Now-Rise Awards - Best Corporate Social Responsibility Practices, Corporate Affairs Leadership Award - Best Use of Media Relations; World Water Leadership Congress Awards - Best Community Water Project, Most Promising Brand endorsed by Asian Confederation of Businesses; India Africa Champion in Biz & SME Awards 2017 under Achievement in Power & Renewable Energy, Exemplary services in Agriculture & Dedicated Leadership in Infrastructures supported by ASSOCHAM.



The 9th International Micro Irrigation Conference was jointly organized by WAPCOS in association with INCSW. A good number of technical sessions were organized with invited international participation. President Felix Reinders also issued a special appreciation letter for excellent organization and management of technical events.

WAPCOS was conferred CBIP Award 2019 for "Best consultancy organization in water sector".

INTERNATIONAL PARTNERS

ICID has consultative status with a number of UN bodies like UN Economic and Social Council (UN-ECOSOC), Food and Agriculture Organization (FAO), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Health Organization (WHO), World Meteorological Organization (WMO) and International Standards Organization (ISO). ICID's major collaborative programs are with UN-Water, FAO, Asian Development Bank (ADB), International Water Management Institute (IWMI), World Water Council (WWC), World Bank, International Water Resources Association (IWRA), Daugherty Water for Food Global Institute (DWFII), Commonwealth Scientific and Industrial Research Organization (CSIRO), African-Asian Rural Development Organization (AARDO), International Geosynthetics Society (IGS), International Fund for Agricultural Development (IFAD), International Commission on Large Dams (ICOLD) and ICRISAT among others. Besides, ICID undertakes joint activities with its international and regional partners through formalized Memorandums of Understanding (MoUs) or Letters of Agreement (LoAs) in areas of mutual interest.

A number of international partners are keenly supporting and enthusiastically participating in ICID's flagship events like triennial WIFs and Congresses; initiatives like World Water System Heritage Programme (WSH), International Research Programme for Irrigation and Drainage (IRPID), Technical Support Unit (TSU) and webinars on topics that are of interest to the water community.

ICID collaborates with all the major international organizations dealing with AWM such as FAO, IWMI, IFAD, ICRISAT, WWC, ICOLD, IWRA and WMO among others to address challenges associated with food and water security and AWM. As a partner organization of UN-Water, ICID interacts with various UN agencies dealing with water and thereby utilizes this platform for advocating and promoting policies for irrigation and drainage. ICID is looking forward to strengthen its relationship with Multilateral Development Banks (MDBs) in order to further develop cooperation and collaboration with these institutions for their active support and participation in ICID initiatives and programs.

Over the years, ICID has evolved a technology exchange mechanism in cooperation with international partners through training programs, webinars, joint activities, to name a few. In the following paragraphs, a brief summary of the collaborative activities that have been undertaken by ICID with key international and regional partners in fulfilling ICID's vision of "A water secure world, free of poverty and hunger through sustainable rural development" is mentioned.

African-Asian Rural Development Organization (AARDO)



AARDO is one of the organizations set up in 1962 to promote South-South cooperation in the field of agriculture and rural development and is headquartered in New Delhi. ICID has a standing MoU with AARDO identifying areas of mutual cooperation signed in 2015.

On invitation from AARDO, ICID attended the 71st Session of the Liaison Committee of AARDO on 21 March 2018 as an observer at the AARDO Secretariat, New Delhi.

Asian Development Bank (ADB)



ADB is a major technical partner organization of ICID's WIFs, besides being a Direct Member. ADB's Asian Irrigation Forum inspired ICID to conceptualize the World Irrigation Forum, both held triennially with mutual understanding not to overlap each other. ICID has been contributing to Asian Irrigation Forum through the participation of its Office Bearers and Professionals. ADB has also been an expert panelist in ICID webinars on the topic 'Water Accounting and Audit.'



ICID was represented at the Asia Water Forum (AWF) 2018 held from 2-4 October 2018 at ADB Headquarters, Manila, Philippines through Executive Director Harish Kumar Varma. At the sideline of the event, ICID and ADB Officials led by Dr. Thomas Panella, Chief of Water Sector Group held meetings to discuss and deliberate the role and support of ADB during WIF3 in Bali, Indonesia in September 2019. ADB agreed to provide full support to WIF3 and assured the participation of a large delegation consisting of ADB staff, YPs, farmers and officers from ADB projects in different member countries during WIF3. ADB is actively involved in activities of WIF3 as member of International Technical

Advisory Committee for organizing ancillary events and leading team for preparation of background paper for sub-theme 1: 'Enabling Policy Environment for Water, Food and Energy including other activities.'

Asian Institute of Technology (AIT)



Lack of adequate capacity and requisite 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 possibility of partnerships with various regional institutions engaged in AWM in different parts of the world. With this objective, ICID has been exploring the possible areas of cooperation with AIT which has resulted in the increased involvement of AIT in ICID's WIFs. AIT is one of the technical partners of ICID's WIFs and is represented in ITAC for WIFs and contributes effectively to the successful organization of the Forum.

American Society of Agricultural and Biological Engineers (ASABE)



To discuss present and future water security problems, the American Society of Agricultural and Biological Engineers (ASABE) in collaboration with the Indian Society of Agricultural Engineers (ISAE) organized the Global Water Security Conference (GWSC) for Agriculture and Natural Resources from 3-6 October 2018 in Hyderabad, India. ICID, which contributed as a technical partner in the conference, discussed the current and future water security problems through presentations and as session Co-chair. President Felix Reinders in his keynote address on 5 October 2018 gave a presentation on "A Water Secure World Free of Poverty and Hunger: Challenges of the Water-Energy-Food Nexus" and drew the attention of the

audience to find solutions, methodologies and technologies to address the need for increasing the food supply. He urged all to be prepared for the challenges that lie ahead and to ensure that there is enough water and food for the 9+ billion people that will be living on this planet in the next 30-40 years to come.

SG Pandya, co-chaired an important session on “Advanced Waste Water Treatment” under the theme “Identifying, Managing, and Treating Conventional and Alternative Agricultural Water Supplies” along with Dr. A. Anandhi, Associate Professor, Florida A&M University, USA. SG Pandya highlighted the issue of groundwater depletion which is raising the pollutant concentration in dwindling freshwater supplies and suggested an integrated approach to address this issue. PH Prof. Chandra Madramootoo (McGill University, Canada), as one of the key speakers, gave an interesting presentation on “Bridging the Great Productivity Divide: Water and Crops” with an overview of AWM in the context of climate change.



Over 500 delegates from more than 20 countries including various international organizations such as ICARDA, IWMI, ICRISAT, World Bank, etc. participated in the Conference.

African Union Commission (AUC)

The latest partner of ICID from Africa is AUC, where Pr. Er. Bartali El Houssine, Vice President of ANAFIDE, the Moroccan National Committee of ICID, represented ICID in the expert meeting hosted by AUC at their headquarters in Addis Ababa, Ethiopia from 11-12 December 2018. The subject of the workshop was “Validation of the AUC report on Continental Irrigation for Agricultural Development Framework (CIADF)” which was central to the mandate of ICID and Pr. Houssine contributed on ICID’s behalf. The workshop was attended by invited experts in the field of African irrigation agriculture, agricultural policy/strategies and development. ICID is exploring new vistas of cooperation between AUC and ICID for future in the African region towards addressing issues related to irrigation, drainage and flood control activities.



Commonwealth Scientific and Industrial Research Organization (CSIRO)

The objective of CSIRO is 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.



CSIRO-Australia and ICID have signed a Memorandum of Understanding (MoU) for furthering scientific cooperation to encourage joint research and development activities including development of the Basin Futures (BF), a web-based capacity development and planning tool (developed by CSIRO) that helps create various development scenarios in a river basin, particularly in scarce data situations. Both organizations are working closely to explore ways of making newly developed software tools available to developing countries of all regions for better planning and assessment of development interventions in the irrigation and drainage sector.

CSIRO gave a presentation on web-based capacity development and planning tool called Basin Futures (BF) to participants from Australia, India, Iran, Iraq, Nepal, Pakistan, Sri Lanka, Tajikistan, Thailand, Uzbekistan, Korea, Indonesia, Myanmar and Iran, who attended the five-day YP training programme organized by ICID from 9-13 April 2018 in Beijing, China. ICID Young Professionals found the tools very interesting and useful in their professional sphere.

Mr. Amit Parashar, Principal Research Consultant, CSIRO Land and Water (Australia) and his team, comprising of Mr. Carmel Pollino, Mr. Peter Taylor and Mr. Tony Slatyer gave a live demo presentation on BF on 6 November 2018 at ICID Central Office which was attended by SG Ashwin Pandya, ICID officials and Mr. Abdullahi Hassan Hussein from Somalia. For demonstration, the CSIRO team used the Somalia country data and described various modules for water resource assessment. ICID found the demonstration quite useful and agreed to promote BF



tool to other National Committees of ICID. ICID also plans to partner with CSIRO's Water Cloud, which enables water resources planning using new disruptive technologies.

As part of the MoU, ICID in consultation with CSIRO is exploring ways to jointly promote BF through case studies in ICID member countries. In this direction a workshop on Basin Futures will be organized in April 2019 at the ICID Central Office, New Delhi.

Daugherty Water for Food Global Institute (DWFI)



ICID and DWFI have been collaborating on issues of common interest and DWFI is one of the major technical partners of ICID's WIFs. ICID and DWFI are partners in WASAG and collaborated during WWF8 in organizing the FAO-led Session on 'Water for Food Security' in Brasilia, Brazil in March 2018.



Dr. Peter McCornick, Executive Director of the Daugherty Water for Food Global Institute at the University of Nebraska attended ICID's 69th IEC meeting held at Saskatoon, Canada in August 2018 and addressed the challenges related to increasing food production for a growing world population and reflected on how effective water management is needed in order to ensure a more productive and resilient agricultural sector, wherein he pressed the need for collaborative efforts by ICID and DWFI, among others. Leading a delegation of DWFI officials during his visit to ICID Central Office at New Delhi in the month of January 2019, DWFI Executive Director held discussions with SG Ashwin Pandya and ICID officials and stressed the need for increased cooperation in the areas of common interest such as collective involvement in WASAG. DWFI assured their full support and active participation to the WASAG Working Group on Communication through Ms. Molly Nance, Public Relations and Communications Director (DWFI). The meeting agreed to promote each other's upcoming events, viz. DWFI's 2019 Water for Food Global Conference in Lincoln, Nebraska, USA from 29-30 April 2019 and ICID's WIF3 in Bali, Indonesia from 1-7 September 2019. DWFI evinced their interest to become a technical partner in WIF3, by organizing an ancillary event and also delivering a keynote address.



Dr. McCornick and Dr. Christopher Neale (Director Research) visited ICID Central Office on 21 January 2019 and discussed possible avenues for further cooperation.

Food and Agriculture Organization (FAO)



ICID and FAO have been partnering for decades for promoting sustainable AWM and achieving food security worldwide. FAO is a technical partner in ICID Congresses and World Irrigation Forums. FAO experts also participate in ICID's technical workbodies, including the Advisory Committee for International Programme for Research in Irrigation and Drainage (AC-IRPID). Dr. Marco Arcieri, Secretary-General, ITAL-ICID is designated as ICID's Permanent Observer to FAO meetings, including Council meetings, held in Rome.

World Food Day (WFD), observed every year on 16 October, is a day of action dedicated to tackling global hunger. ICID promoted WFD on the theme "Our Actions are Our Future," worldwide through its membership network and associates to remind the world that 'Zero Hunger' is still achievable, if world leaders and global key players come together and take into account of lessons learned, best practices and all evidence available. Towards this endeavor, ICID Vision 2030 provides an Action Plan to move towards "A water secure world free of poverty and hunger through sustainable rural development." It outlines the strategy to convert the vision into a reality and believes that a 'Zero Hunger' world by 2030 is possible. The challenge of ending poverty and hunger requires greater cooperation and collaboration among actors working in different related sectors through effective partnerships. The Road Map to ICID Vision 2030 is a small contribution for making people aware of food security in days of crisis and importance of agriculture to grow sufficient food to feed the ever-growing population.

ICID is a partner in FAO's initiative on Global Framework on Water Scarcity in Agriculture (WASAG) and also elected as a member of the International Steering Committee of WASAG. The objective of the framework is to benefit farmers and rural communities by making them resilient to increasing water

scarcity while simultaneously creating climate benefits. The initiative plans to build partnerships between water stakeholders at the national level, among countries and among key international bodies involved in agricultural water management. ICID has established a High-Level Advisory Group (HLAG) on “Partnerships for Agriculture Water Management” as an action-oriented multi-stakeholder partnership to facilitate improving agricultural water productivity, especially in irrigated areas where the competition for water is intensifying and/or water supplies are becoming less reliable. The two initiatives can be complimentary and ICID as a partner in WASAG has made efforts to bring synergy between the two initiatives. VP Dr. Arcieri represents ICID in WASAG and is the Focal Point for Working Group on “Sustainable Use of Water Resources” of WASAG led by ICID. ICID is also a member in WASAG WGs on ‘Sustainable Agriculture Water Use’ and ‘Communication Strategy’. In collaboration with Italy and FAO, WASAG held its first International Forum on Water Scarcity in Agriculture at Praia, Cabo Verde from 19-22 March 2019, in which ICID was represented by and contributed through VP Dr. Marco Arcieri.



During the International Conference on “Innovative and Sustainable Agri-Water Management: Adapting to a Variable and Changing Climate,” organized in conjunction with ICID’s 69th IEC meeting in Saskatoon, Canada in 2018, FAO conducted sessions on ‘Hydro-economic modeling for trans-boundary river basin management – Towards more Integrated Approaches’ and ‘Data-driven Improvement of water use efficiency in Small-scale Irrigation.’ The former session deliberated on the challenges pertaining to the sectors competing with agriculture, especially hydropower, particularly in the trans-boundary regions, while the latter session provided case studies from West and East Africa on the techniques being used to improve the agricultural water management in the region.

FAO’s Office for the Near East and North Africa (FAO-RNE) collaborated with ICID for a study tour for a high-level delegation from Tunisia and Egypt held from 6-12 January 2019 on Solar Powered Irrigation Systems (SPIS) in India, as solar irrigation has become increasingly viable for countries as a reliable, clean-energy solution for agricultural water management, especially in areas with high-incident solar radiation, which is further boosted by decreasing investment costs for SPIS. The study tour sought to strengthen institutional capacities for the focal countries (Tunisia and Egypt) with the objective to highlight good practices, provide insights into how the potential of SPIS is realized and how risks are addressed through case studies in India.

In a joint professional collaboration, ICID with its Iran Regional Node of IRPID (IRPID-IRN) and FAO organized an International Workshop on “Water Accounting - Concepts and Tools” from 23-26 February 2019 in Ahwaz, Iran. The workshop introduced the concepts and tools to a wide range of audiences including high-level decision-makers, academics and professionals in the water, agriculture and environmental sectors.



FAO is actively involved in the activities of Third World Irrigation Forum (WIF3) as the member of International Technical Advisory Committee (ITAC) for organizing supporting events, leading team for preparation of background paper for sub-theme 2: Role of Civil Society and NGOs with Focus on Farmers and Extension Facilities besides other activities.

Global Water Partnership (GWP)

GWP and ICID encourage regional and country water partnerships to collaborate with ICID’s NCs wherever possible, thus a stronger GWP-ICID technical collaboration could be evolved. It includes potential joint initiatives for floods, droughts and climate services. GWP agreed to engage with ICID on relevant drought and flood management activities. ICID also collaborates with GWP in Integrated Drought Management Programme (IDMP), being coordinated by WMO and attends GWP’s annual network meetings.



GWP is also a partner organization of ICID’s WIFs and a member of ITAC of WIF3 to be held in September 2019.

ICID and GWP along with IHA led topical group discussions on issues such as research and development, multi-stakeholder dialogue, and international collaboration during a round-table meeting of leaders of water-related international organizations held in Beijing, China, convened to celebrate the 60th

anniversary of WWC member, China Institute of Water Resources and Hydropower Research (IWHR) in October 2018. The discussions, held in the presence of Mr. Xuebin Tian, Vice-Minister of Water Resources of China, centered on the subject of Connectivity for an Innovative Water Future.

International Commission on Large Dams (ICOLD)



ICID and ICOLD have been jointly taking up many issues in global water sector for decades, including WSH Programme, a joint initiative with WWC.

SG Ashwin Pandya chaired the plenary session of the two-day conference on “Storage Dams for Water Security and Sustainable Development” on 24-25 October 2018 in New Delhi, organized by the Indian arm of ICOLD to focus on the various issues related with the creation of more number of storage dams to meet the increasing water demand with greater hydrological variability due to climate change and level of security of water, food and energy. During the session, SG Pandya stated that India, presently at 1.21 billion and reeling under water stressed conditions, just cannot afford to lose even a single drop of water flowing to the sea unproductively. The conference also witnessed participation of ICOLD Board members comprising Mr. Michael F. Rogers, President, ICOLD and dam experts from different regions, who visited ICID Central Office on 22 October 2018 and held brief interaction with SG and ICID officials with the aim to collaborate and widen the scope of mutually beneficial activities. ICOLD delegation reciprocated to give full support and assured active participation during WIF3 of ICID.



International Council on Monuments and Sites (ICOMOS)

ICOMOS is a professional association that works for the conservation and protection of cultural heritage sites around the world and is partnering with ICID’s heritage programs such as World Heritage Irrigation Structures (WHIS) and WSH.



ICID is working closely with ICOMOS-Netherlands to initiate “Water as Heritage” movement by involving experts from both water world and the heritage network. A preparatory workshop entitled “International Conference on Water and Heritage for the Future” organized by ICOMOS-Netherlands in cooperation with TIWE was held from 21-25 May 2018, wherein ICID was represented by Dr. Sahdev Singh, Director (Knowledge Management).

In a webinar on ‘Water as Heritage’ organized by ICID on 14 November 2018, Mr. Henk van Schaik, Ambassador, Water and Heritage, ICOMOS,

The Netherlands shared his experiences in the contemporary world wherein the functional and heritage dimensions of water are typically treated separately.



International Crop Research Institute for the Semi-Arid Tropics (ICRISAT)



ICID and ICRISAT have been collaborating in areas of mutual interest and ICRISAT is an observer in ICID’s WG on WATER and CROP. ICRISAT is one of the leading international partners of ICID in the organization of WIFs and is represented in its ITACs. VPH Laurie Tollefson, is a member of ICRISAT’s Governing Board.

International Fund for Agricultural Development (IFAD)



IFAD has been a partner in ICID’s World Irrigation Forums since its inception in 2013 and contributed to the successful organization of WIFs held so far. Dr. Marco Arcieri, Secretary-General, ITAL-ICID is designated as ICID’s Permanent Observer to IFAD meetings in Rome, while Mr. Mawira Chitima represents IFAD at the International Technical Advisory Committee (ITAC) for WIF3 in Bali, Indonesia in 2019.

IFAD and ICID have an arrangement of deputing their representatives to each other's Council meetings as Observers. ICID was represented at the forty-second session of IFAD which focused on the theme rural innovation and entrepreneurship.

ICID and IFAD are also partners in WASAG, a FAO-led initiative.

International Food Policy Research Institute (IFPRI)

ICID has been collaborating with IFPRI on matters of mutual interest either bilaterally or through its NCs. IFPRI has been participating in ICID's WIFs by way of organizing side events related to the theme of the Forum.

ICID has been elected as one of the members of the 1st WASAG (Global Framework on Water Scarcity in Agriculture) Steering Committee. ICID as one of the partners of WASAG has been contributing as a co-lead in the Working Group (WG) 'Transitions to Sustainable Agriculture Water Use' led by International Food Policy Research Institute (IFPRI).



International Geosynthetics Society (IGS)

There is a standing MoU between ICID and IGS signed on 22 October 2011 with the objective to liaise each other for improvements in the art and techniques of irrigation, drainage management, geosynthetics and to periodically review and evolve progressive strategies in the outlined areas of cooperation. On the basis of the MoU, IGS has been partnering in ICID's Congresses and WIFs by way of organizing sessions on topics of interest to both the organizations.



International Water Association (IWA)

ICID has a standing MoU with IWA which aims at establishing a wastewater reuse network, particularly in safe re-use of water in agriculture sector and urban purposes. The area of cooperation between both the organizations include (i) sharing of Latest Technologies in Water Management and Wastewater Treatment, (ii) holding Workshops and Conferences, (iii) implementation of Research Projects, (iv) preparation of Guidelines and Standards; (v) conducting Training and Educational Courses, (vi) bringing out joint Publications; and (vii) establishing Study Tours.



The MoU is initially being implemented through NCs of ICID and IWA in Iran.

International Water Management Institute (IWMI)

ICID and IWMI have been collaborating on issues of common interest and IWMI contributed as one of the major technical partners of ICID 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 workbodies. IWMI still continues to be represented at the ITAC for WIF3 in 2019. IWMI is a partner in ICID's research programme in irrigation and drainage – IRPID and a member of IRPID Advisory Committee.



IWMI partnered in the 8th Asian Regional Conference (8ARC) of ICID on the theme "Irrigation in Support of an Evergreen Revolution" organized from 2-4 May 2018 in Kathmandu, Nepal with other partners like ADB, International Centre of Excellence in Water Resources Management (ICEWaRM), International Centre for Integrated Mountain Development (ICIMOD) and the World Bank.



Dr. Petra Schmitter, Research Group Leader, Agricultural Water Management, IWMI steered the second IYPeF e-Discussion on 'Solar-Powered Irrigation System: Exploring Opportunities and Threats' held from 15 February-2 March 2019, as mentor. The aim of the e-Discussion was to highlight the vital role that SPIS is poised to play in achieving the Sustainable Development Goals (SDGs) of Agenda 2030 and in solving agriculture's energy challenges whilst increasing reliability and affordability.

IWMI has been partnering with ICID in a number of joint initiatives like WASAG and Water Accounting.

International Water Resources Association (IWRA)



ICID and IWRA signed a MoU in June 2017, agreeing to collaborate to develop strategies for ensuring water and food security duly recognizing the importance of Water-Energy-Food Nexus. The areas of cooperation included (i) understanding the linkages between Water-Energy-Food Nexus and how this approach supplements IWRM approach; (ii) developing decision making tools that help recognize the existence of this nexus; (iii) identifying the critical policy issues that need to be flagged; (iv) identifying the areas of research to benefit from the existence of the nexus; and (v) disseminating the benefits of the nexus approach.

IWRA is invited to be a partner in ICID's WIF meeting in Bali in 2019, where ICID Working Group on Water and Crops (WG-CROPS) plans to hold an international workshop on 'Improving the Water Productivity within the Water-Energy-Food Nexus', with the support from IWRA. IWRA is also a permanent observer in ICID's Working Group on Irrigation and Drainage in the States under Socio-Economic Transformation (WG-IDSST).

International Society of Paddy and Water Environment Engineers (PAWEES)



PAWEES and Asian Regional Working Group (ASRWG) of ICID have been collaborating on various issues of mutual interest. ICID co-sponsored the PAWEES and INWEPF International Conference on "Promoting Sustainable Paddy Farming to Achieve the SDGs" from 20-22 November 2018 in Nara City, Japan. VP Dr. Marco Arceiri represented ICID at the Conference. A joint meeting was

held in order to deliberate and strengthen the mutual cooperation among PAWEES – INWEPF and ICID including other international organizations such as FAO. The outcome of the meeting recognized ICID and FAO as effective partners for future cooperation, greatly contributing to the stronger collaboration in the field of paddy field exploitation, especially under the threat of climate change. The meeting emphasized the need to gain more interesting results in order to achieve better outcomes in terms of yield and sustainability of the cultivation. Besides, Prof. Nobumasa Hatcho, Vice Chair of ICID's Working Group on Environment (WG-ENV) chaired the INWEPF Steering Meeting and policy and technical sessions.

Southern Africa Regional Irrigation Association (SARIA)

Towards achieving ICID's vision in Africa, ICID has drawn up a number of initiatives for African region in collaboration with regional associations like Southern Africa Regional Irrigation Association (SARIA), Alliance for Green Revolution (AGRA), Regional Association on Irrigation and Drainage for West and Central Africa (RAID-ARID) and North African Regional Association for Irrigation and Drainage (NARAID), which is under establishment. ICID's initiatives include Capacity Development Programme and Training Workshops for Young Professionals from the Region and encouraging bilateral cooperation between the NCs of ICID in the region by way of formal MoUs.

Last year, an MoU between the NCs of Morocco and Egypt was signed during Cairo Water Week 2018 and a number of MoUs between NCs within Africa region and elsewhere are also in the pipeline. AFRWG, in which most of these regional associations are Observers, is developing a status report on Green Revolution in Africa, with the support of ANAFIDE and in collaboration with regional organizations such as AGRA. SARIA organized a Workshop on "Agribusiness and Value Chain: A Rapid Transformation of Agri-Food Systems" catering to the countries in SARIA region in May 2018 in KwaZulu-Natal Province of South Africa. A steering committee meeting was also organized where it was decided that from 2019 onwards, regional activities will be combined with NCs and the first initiative will be hosted by SANCID in 2019, with logistical support from SARIA. A number of present and past Office Bearers of ICID are closely associated with these regional associations in Africa.

The World Bank

World Bank has been partnering in ICID Congresses and World Irrigation Forums and is represented effectively in its International Technical Advisory Committees. World Bank supports ICID's International Research Programme on Irrigation and Drainage (IRPID), as a member of AC-IRPID. World Bank is a Permanent Observer in ICID's permanent committees and a member in HLAG on Partnership Process. ICID attended and contributed to the World Bank Group initiative entitled "Enabling the Business of Agriculture (EBA) 2017 Report" presented on 5 April 2018 in New Delhi at a workshop attended by around 30 key players from different stakeholder groups within India's agribusiness sector. Participants included government and non-governmental organizations, private sector, knowledge/research institutes, development agencies, and academia.



Dr. Thomas Mosier (USA), Climate Change Specialist at the World Bank Group was the mentor for the fourth e-Discussion on the topic "Climate Change Impacts on Irrigation and Drainage" organized by ICID Young Professional e-forum (IYPeF) held from 15-30 April 2018. Dr. Mosier emphasized that the diversity in current farming practices brings a wealth of experiences that could enable all to learn from each other and adapt more quickly to the varying agricultural challenges while creating climate benefits. He hoped that initiatives such as e-discussions should be promoted and could further act as a great forum to share experiences from around the world on climate change.

ICID partnered with World Bank for organizing a workshop entitled 'Latest Investigations, Repair & Rehabilitation Technologies for Dams' held from 4-5 October 2018 in New Delhi, India. The objective of the workshop was to generate awareness among the participants on latest technologies available for Investigations; Instrumentation; and, Repair and Rehabilitation of Dams. SG Pandya made a presentation on 'Disasters and Dam Safety Procedures' highlighting the dual role that dams play during disasters and the need to provide technical and legal frameworks for the same.

During the 69th IEC meeting of ICID at Saskatoon, Canada, a Special Seminar on the topic 'Development and Financing Models for Irrigation and Drainage Sector' was organized on 14 August 2018 to understand various options available for development and financing of irrigation infrastructure and its management and to learn from the merits and demerits of models already in use. Mr. Francois Onimus, Sr. Water Resources Management Specialist in the Water Global Practice in the MENA region, World Bank made a keynote speech on "Overview of Development and Financing models," which was quite useful to the participants in the Seminar.

ICID partnering with World Bank and likeminded organizations convened an International Conference on Sustainable Water Management which was organized from 10-12 December 2018 at Mohali, India as part of the World Bank funded National Hydrology project being implemented by the Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India. The meeting was attended by Office Bearers of ICID, including President Er. Felix B. Reinders. In his keynote address, President Reinders emphasized that sustainable development would not be achieved without a water secure world and a water secure world integrates a concern for the intrinsic value of water with a concern for its use for human survival and well-being. The conference witnessed participation of around 400 delegates and a number of experts from reputed organizations from India and other countries such as Australia, United Kingdom, USA, Spain, Netherlands, Republic of Korea, Canada, Germany and Sri Lanka.



The World Bank organized International Dam Safety Conference 2019, as part of the series of Dam Safety Conferences being organized under the aegis of the Dam Rehabilitation and Improvement Project (DRIP), held from 13-14 February 2019 in Bhubaneswar, Odisha, where Er. Harish Kumar Varma, Executive Director represented ICID.

World Bank is actively involved in activities of WIF3 as member of International Technical Advisory Committee, leading team for preparation of background paper for sub-theme 3: Improving Agricultural Water Productivity with Focus on Rural Transformation and other activities.

UNESCO-IHE and ICID have been collaborating to derive specialized educational solutions from the UNESCO-IHE experts to address 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.

Dr. Irina Bokova, Director General, UNESCO and Minister of Education, Culture and Science of the Kingdom of the Netherlands, sought ICID's continued support to UNESCO-IHE to effectively serve its member states in the field of water, in its new form of organizational set up.

Prof. Charlotte de Fraiture, VPH has been named as Vice Rector of the Institute, which further enhances the cooperation between both the institutions.



UN-Water



ICID, being a UN-Water partner, in 2018 actively promoted the observation of UN-declared days: (i) World Water Day, 22 March on the theme "Water for All – Leaving no one behind"; (ii) International Day for Biological Diversity, 22 May with the theme "Celebrating 25 Years of Action for Biodiversity"; (iii) World Environment Day, 05 June on the theme "Beat Plastic Pollution"; (iv) World Day to Combat Desertification, 17 June with the slogan "Land has true value – Invest in it"; and (v) World Soil Day, 05 December on the theme "Be the Solution to Soil Pollution" -- by way of organizing events through its NCs and stakeholders to create awareness about the objectives and importance of these days. ICID and its stakeholders also observed the Earth Day (22 April), World Biofuel Day (10 August) and World Wetlands Day (02 February) through dedicated programme and media channels. This year ICID commemorated the International Women's Day (08 March) on the theme on "Time is Now: Rural and Urban Activists Transforming Women's Lives" so as to empower the women in water sector, with emphasis on women's rights and activism, considering that the majority of laborforce in agricultural sector comprises of women.

UN General Assembly adopted a resolution entitled International Decade for Action "Water for Sustainable Development" (2018-2028). ICID urged its member National Committees to work towards raising the profile of AWM through their governments at the UN level during the International Decade for Action.

ICID partners with the United Nations Convention to Combat Desertification (UNCCD) in the Global Framework on Water Scarcity in Agriculture (WASAG).

ICID is a partner organization in the UN-Water Decade Programme on Capacity Development (UNW-DPC), a multi-year project under UN-Water, with other partners being FAO, WHO, United Nations Environment Programme (UNEP), United Nations University Institute for Water, Environment and Health (UNU-INWEH) and IWMI to promote safe practices in the usage of wastewater in agriculture with a robust policy and institutional framework in developing countries and countries in transition, focusing on multi-disciplinary and trans-ministerial approaches.

UN Decade on Ecosystem Restoration (2021-2030) is another UN activity, in which ICID is partnering with various UN agencies. Ecosystem Restoration is defined as a process of reversing the degradation of ecosystems, such as landscapes, lakes and oceans to regain their ecological functionality; in other words, to improve the productivity and capacity of ecosystems to meet the needs of society in present and in future. The UN Decade on Ecosystem Restoration stresses that ecosystem restoration and conservation contribute to the implementation of the 2030 Agenda for Sustainable Development, as well as other UN related endeavors, such as the Paris Agreement on climate change.



World Meteorological Organization (WMO)

WMO is one of the partners of ICID in bringing together climate and water communities to manage natural disasters like floods and droughts. ICID has a consultative status with WMO while WMO is represented in ICID's technical bodies that interests WMO such as WG-CLIMATE.

ICID has been partnering with WMO in the Integrated Drought Management Programme (IDMP) and acts as a Support Base Partner of the Helpdesk on IDMP.

Dr. Marco Arcieri, Vice President, alternate Focal Point for WMO meetings in Geneva attended and contributed to the Technical Conference and extraordinary session of the Commission for Hydrology (CHy-Ext) held at WMO headquarters in Geneva, Switzerland from 11-14 February 2019. VPH Dr. Mohamed Wahba represented ICID at the 17th session of the Regional Association I (RA I-17) of WMO held in Cairo, Egypt from 21-23 February 2019.

World Water Council (WWC)

ICID has been a founder member of WWC and served its Board of Governors (BoG) twice in the past. ICID has been actively involved in all World Water Fora since its inception and number of ICID associates are functioning as members in the BoG of WWC. WWC has been actively supporting ICID's WIFs since its inception and nominated its representative Dr. Dale Jacobson to the ITAC for WIF3 in 2019. WWC is Permanent Observer to ICID's Permanent Committees on Technical and Organizational Aspects, respectively.

WWC acknowledged the significant contributions of ICID during the release of White Papers on "Water accounting for water governance and sustainable development" and "Policy recommendations on water accounting" by WWC and FAO at the 8th World Water Forum.

One of the key highlights of WWF8 was that WWC-ICID jointly promoted World Water System Heritage (WSH) Programme in Brasilia, Brazil, where WWC and ICID jointly hosted a ceremony to recognize three water management systems – two from Japan and one from Iran – selected under the WSH Programme. Besides the organizations mentioned above, ICID has been working in partnership with UNESCO-IHP, International Union for Conservation of Nature (IUCN), IHA, International Water History Association (IWHA), International Standards Organization (ISO), Association Scientifique et Technique pour l'Eau et l'Environnement (ASTEE), Network of Asian River Basin Organizations (NARBO), CIHEAM-Bari, Ministry of Agriculture, Forestry and Fisheries (MAFF) Japan, Indian Institute of Technologies, Khuzestan Water and Power Authority, China Institute of Water Resources and Hydropower Research (IWHR), Korea Rural Community Corporation (KRC), UNESCO-RCUWM, Hydropower and Dams, etc. in the areas of mutual interest, particularly emerging issues related to ICID's vision, mission and goals.



3

WORKING GROUPS IN ACTION

Securing adequate supplies of clean water in a changing climate is one of the world's most urgent social, political, economic, and environmental challenges. Agriculture places significant pressure on the world's fresh water, accounting for nearly 70% of all water withdrawals. Unless substantial efforts are made to reduce wastage of food and increase the water-use productivity of farming – to get more “crop per drop” – water demands in the agricultural sector are projected to increase in the coming years to keep up with population growth. Climate change influences the availability and quality of water resources. On a hotter planet, extreme and irregular natural disasters such as floods and droughts are becoming more frequent. Adaptation to a changing climate means investing in more resilient water infrastructure, from urban drainage to water storage.

Creating a water-secure world for the planet's 7.5 billion people is a herculean effort, made more grueling by the trials of climate change. The need of the hour is focusing attention on the efficient management of water resources and taking action to tackle the impending water crisis.



A new study – the United Nations World Water Development Report (WWDR 2019) – finds that investing in clean water and sanitation is an economic and social winner, but billions of the world's poorest people still lack access to these basic necessities. Access to safe, affordable and reliable water and sanitation is considered a basic human right, and one of the 17 UN Sustainable Development Goals that the various governments have pledged to achieve by 2030.

The latest UN Report entitled 'Leaving No One Behind' seeks to inform policy and decision-makers, inside and outside the water community, how improvements in water resources management and access to water supply and sanitation services are essential to overcoming poverty and addressing various other social and economic inequities.

ICID as a scientific and engineering network generates, collates and shares knowledge for fulfilling the mission of “A water secure world free of poverty and hunger through sustainable rural development.” This can be achieved by the technical WGs, which are further clubbed into four strategy-oriented 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 revitalization, institutional aspects, irrigation development and management, water saving in agriculture and sustainable drainage;
- (iii) Basin: Basin-wide planning covering various issues such as drought, floods, environment, climate, tidal areas, bio-energy that affect AWM; and
- (iv) Knowledge Management: 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. The following section briefly describes the activities of various ICID workbodies during the year 2018-19:

On-Farm

Irrigation is an integral part of agriculture to achieve increased crop production through reliable, precise and sustainable water application on crop. The management of on-farm water application is critically important for higher productivity, irrigation efficiency, and most importantly sustainability. Both the

farmers and the irrigation managers are key players who need to take prudent decisions, 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; reducing wasteful losses such as evaporation; using certified equipment; ensuring a minimum quality for on-field irrigation; recycling and reusing water including the poor-quality water in case of limited and so on. In order to discuss these issues, ICID has constituted three WGs: WG-WATER & CROPS, WG-NCWRI and WG-SON-FARM.



Water and Crops

The Working Group on Water and Crops (WG-WATER & CROP) was re-established in 2007 with a revised mandate to promote the efficient use of water in crop production; to investigate the use of energy crops for bio-fuel production; to study best techniques for rainwater harvesting; to promote the multi-functionality of water use in paddy (rice) cultivation; to investigate the adaption of agriculture to climate change; and, to promote low input agriculture.

The WG held its 11th meeting in August 2018 at Saskatoon, Canada and reviewed the Action Plan of 'Road Map to ICID Vision 2030' to achieve the goal of enabling higher crop yield with less water and energy, and decided to 'develop guidelines on efficient use of water in crop production' under Goal A (Strategy 5: Supporting water productivity enhancement). WG 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) rain water harvesting and energy crops. So far, the National Committees of China, Indonesia and Philippines have contributed their papers for the Technical Report of the WG.

The WG will organize an International Workshop on 'Improving the Water Productivity within the Water-Energy-Food-Nexus' on 1 September 2019 during the Third World Irrigation Forum (WIF3) in Bali, Indonesia. The objective of the workshop is to bring together experts from all over the world to share information, experience and views on how to apply the principles of water-food-energy nexus in agriculture. The workshop will focus on the following topics: (i) How improved water use efficiency and productivity impact the Nexus; (ii) Water-Food-Energy nexus at field, regional and country scales - Examples of Applications; (iii) How the Environment and ecosystem services benefit from the Nexus; (iv) Economic analysis of food production within the Nexus; (v) Management practices that promote the Nexus; and (vi) Institutional and Governance issues in implementing the Nexus.

WG Chair Dr. VPH Ragab Ragab (U.K) has evolved the latest version of SALTMED 2019 and details of the web-links have been shared in the Group website available at http://www.icid.org/wg_crop.html.

During the WG meeting in Canada (2018), President Hon. Dr. Saeed Nairizi (Iran) introduced a new topic 'Water Use and Productivity' which has now been included in the mandate of the WG to work out the actual water requirements for various crops under greenhouse conditions. A Task Team (TT) composed of VP Dr. K. Yella Reddy, PH Dr. Saeed Nairizi, VPH Dr. Ragab, and Dr. Chung-Feng Ding (Chinese Taipei) has been established to develop the concept paper and action plan with responsibilities. Further, Mr. Syaiful Mahdi (Indonesia) emphasized the importance of 'Effective Rainfall' in Crop Water Requirement as part of the rain-fed agricultural water management.

The 69th IEC meeting (vide its Resolution IEC-2/69) approved merger of the Working Group on Water for Bio-Fuel and Food (WG-BIO-FUEL) with Working Group on Water & Crops (WG-WATER & CROP) in order to consolidate the activities.

Use of Non-Conventional Water Resources for Irrigation

With the rapid development of economy and the increasing growth of population, scarcity of freshwater has assumed global proportions. Agriculture is the biggest water consumer accounting for nearly 70% of the total water supply worldwide. Use of Non-Conventional Water Resources for irrigation (NCWRI) could meet such freshwater shortage. Non-conventional water consists of raw domestic/ industrial wastewater, reclaimed water, agricultural drainage water, mining water, harvested rainwater and brackish/ saline groundwater. In many developing countries, a major part of the wastewater generated by domestic and industrial sectors is used for crop production in an untreated or partly treated form.

The protection of public health and the environment are the main concerns associated with untreated wastewater irrigation. In other words, the quality of food produced, consumer safety and health of farm workers are of great concern. Other concerns include the salinity and heavy metal accumulation and pollution caused by nutrient leaching. In fact, secondary effluent contains dissolved solids, heavy metals, pesticides and pathogens that might jeopardize sustainable agriculture, groundwater quality, soil quality/productivity and human health. However, the plant nutrients contained in such wastewater could be beneficial for agricultural crops.

Keeping in view the importance of non-conventional water resources, the Working Group on Use of Non-Conventional Water Resources for Irrigation (WG-NCWRI) was re-constituted in 2018 with a fresh mandate on the following lines:

- (a) Exchanging knowledge, experience and data as well as networking on the topic in order to be up-to-date with new developments, methods and approaches.
- (b) Preparing comprehensive reviews and prospects with respect to different aspects of NCWR.
- (c) Producing technical manuals, guidelines or standards with respect to all NCWR including waste water, drainage water and saline/brackish water.
- (d) Organizing international workshops, seminars and meetings on the NCWR topic.
- (e) Producing documents on successful case studies with new developments taking into consideration the NCWR presented by the members from different countries.
- (f) Enhancing the membership of the WG by encouraging more member countries where the use of non-conventional water is a common practice for irrigation management.
- (g) Finalizing the publication of a Technical Paper pending from the activities of the erstwhile Working Group on Use of Poor-Quality Water for Irrigation (WG-PQW).

During the meeting in 2018, two interesting presentations viz. "Measurement of soil salinity by hyperspectral reflectance of cotton leaves" by Dr. Takanori Nagano (Japan); and "Pollution potentials and risks of organic pollutants with reclaimed water irrigation" by Dr. Wenyong Wu (China) were made during the Saskatoon meeting. Special Session on "Water reuse and water quality management" was organized during the 69th IEC meeting on 13 August 2018. There were interesting presentations on issues related with monitoring of the pollution discharged to water networks by the industry. As a part of ICID Vision 2030, the WG has plans to produce technical manuals, guidelines or standards with respect to all NCWR topics and also organizing international workshops, seminars and meetings on the same. WG elected Dr. (Ms.) Anna Tedeschi (Italy) as its Chair while Dr. Wenyong Wu (China) is the Secretary of the WG.

Sustainable On-Farm Irrigation System Development

The Working Group on Sustainable On-Farm Irrigation System Development (WG-SON-FARM) was established in 2015 to support research, evidence-based documentation and dissemination of knowledge based on the latest scientifically significant and societal relevant issues. The WG is also expected to make recommendations with respect to design, installation, management and maintenance of on-farm irrigation structures and water distribution system networks. The article titled "Improvement of the on-farm irrigation systems using simple water control, measuring and application devices" and a paper titled "Micro irrigation for smallholders and greenhouses" are ready for publication in the ICID Journal. Dr. Hossein Dehghanisanij (Iran) is finalizing a paper on "Micro irrigation under saline conditions" as part of the ICID Vision 2030.

The 9th International Micro Irrigation Conference (9IMIC) was successfully organized from 16-18 January 2019 in Aurangabad, Maharashtra, India on the theme 'Micro Irrigation in Modern Agriculture.' 9IMIC was hosted by the Indian National Committee on Surface Water (INCSW), which is a part of the Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD&GR), Government of India in association with WAPCOS Limited. The conference was inaugurated by Hon'ble Union Minister

Mr. Nitin Gadkari (Ministry of Road Transport and Highways, Shipping and Water Resources, River Development and Ganga Rejuvenation, Government of India); presided by Hon'ble Chief Minister of Maharashtra Mr. Devendra Fadnavis, and Hon'ble Union Minister Mr. Radha Mohan Singh (Ministry of Agriculture and Farmers Welfare, Government of India); Hon'ble Minister Dr. Mahendra Reddy (Ministry of Agriculture, Rural and Maritime Development and Waterways and Environment, Government of Fiji). Mr. U.P. Singh, Secretary, MoWR, RD&GR, Govt. of India); Mr. S. Masood Hussain, Chairman, (INCSW, Central Water Commission); Er. Felix B. Reinders, President and Er. A.B. Pandya, Secretary General from ICID were also present during the conference.

This conference brought together a large group of eminent international and national experts and local farmers offering them an opportunity to share their experiences in the field of latest development in micro irrigation technology to enhance crop production. It also dwelt on water management for optimal use in agriculture, technical and sociological interventions for sustainable water, food and agriculture.

Dr. Graziano Ghinassi, Researcher, Dept. of Agriculture, University of Florence (Italy) and member of WG-SON-FARM delivered an ICID webinar on the topic 'Smart technology to reduce energy consumption for water spreading and pipe production in hose reel sprinkler irrigation' on 5 December 2018. Mr. Sergio Sacchini (Expert Assistant) joined as a panellist during the webinar which primarily focused on the use and performance of a new device that allows the positioning of an anti-friction plastic tape below the pipe of hose reel machines when sliding over the field surface. Dr. Ghinassi explained that modern hose reel irrigation machines are equipped with increasingly longer and larger pipes in order to improve their irrigation potential. Compared to other field operations, energy used for water lifting during system economical lifetime (i.e. 15 years) is by far the greatest source of monetary cost and GHG emissions. As a case study, Dr. Ghinassi described the irrigation scenario of North Italy. With 2,100 m³/ha of supplied water per season, the potential of the device in reducing both energy use (fuel consumption and GHG emissions) and operation cost amounted to about 25% with the same system performance and under the assumption that economic lifetime of pipe and machine remains the same. As a result, both environment and farm economy will benefit from this effective and simple technology. The proceedings of the webinar are available at <http://www.icid.org/icid_webinar_13.html>.

Schemes

At the 64th IEC Meeting at Mardin, Turkey, 2013, the Strategy Theme "Systems" was renamed as "Schemes." Presently, the irrigation sector is plagued with numerous challenges, including limitations on physical expansion of irrigated area due to limited availability of water; dwindling land resources; fiscal constraints to expansion; competitive use of water from other sectors; deteriorating irrigation infrastructure due to vicious build-neglect-build cycle leading to poor and unreliable performance of the projects; weak institutional foundation both at departmental and farmer levels. If not addressed properly, these issues result in inefficient and sub-optimal use of irrigation projects. Keeping the importance of these inter-related factors, six 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. The Working Group on Rain Water Harvesting was recently formed (WG-RWH) during the 69th IEC meetings held in Canada in August 2018.



Modernization and Revitalization of Irrigation Schemes

It is evident that irrigation is the key component in increasing agricultural production, but it requires significantly large financial resources to create and maintain the infrastructure. New investments in the irrigation sector have drastically reduced in the past few decades. As a result, development of new infrastructure has suffered significantly and the condition of existing infrastructure has undergone serious deterioration due to neglect and poor maintenance. In numerous countries all over the world, setting up new irrigation projects or rehabilitation/ modernization of existing schemes is a component of economic policy. Therefore, there is a long history of government financing of such projects within national or provincial/state budgets. Different development and financing models for the irrigation sector are used in different parts of the world. These include development and management by the public sector, public sector development with private sector management, development and management by the private sector, etc.

Keeping in view, the importance of modernization and revitalization of irrigation schemes, ICID established the Working Group on Modernization and Revitalization of Irrigation Schemes (WG-M&R) in 2015 to 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.

During the 4th meeting of the WG, members presented five case studies. The case studies are intended to provide the evidence base for the proposed paper on the State of Art on Modernization contributing to the development of ICID Guidelines on Modernization of Irrigation and Drainage. In order to bring together researchers and practitioners to discuss the state of the art of modernization of irrigation services and to present further case studies for inclusion in ICID publications, WG is organizing an International Workshop on 'Modernizing Irrigation Services for Water, Food and Nutrition Security' during the Third World Irrigation Forum (WIF3) and 70th International Executive Council (IEC) meeting in September 2019 in Bali, Indonesia. Mr. Herve Plusquellec (USA) is planning to publish an ICID book on the use of geotextiles in irrigation with the support of the WG.

Institutional and Organizational Aspects of Irrigation/Drainage System Management

ICID established the Working Group on Institutional and Organizational Aspects of Irrigation/Drainage System Management (WG-IOA) to scrutinize a variety of institutional and organizational aspects related with irrigation and drainage development and management. The focus of this scrutiny was on mechanism and working improvement in relation to organizational arrangement, 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.

The WG organized an International Workshop on "Institutional and Organizational Setup of Irrigation and Drainage Management System" during the 69th IEC meeting on 12 August 2018 at Saskatoon, Canada. A paper titled "Global Review of Institutional Reforms in the Irrigation Sector for Sustainable Agriculture Water Management, including Water Users Association" was published in Volume 68, Issue 1 (February 2019) in the special issue of Irrigation and Drainage Journal by Wiley Publishers. During the Saskatoon meeting, two papers titled "Irrigation management and participation in Thailand" by Mr. ChaiwatPrechawit, Thanar Sutrawattana, Watchara Suiadee, Vipop Teamsuwan (Thailand) and "Tropical Perennial Rice farming systems (SALIBU technology) for the 2nd Green Revolution against climate change" by Mr. Kazumi Yamaoka (Japan) were also presented.

The WG is organizing an International Workshop on 'Participatory Irrigation/ Drainage Management - Transfer, Approaches and condition for successful PIDM' during the Third World Irrigation Forum (WIF3) and 70th International Executive Council (IEC) meeting in September 2019 in Bali, Indonesia. The scope of the workshop will be restricted to institutional and organizational aspects of irrigation drainage management (IDM) schemes for possible updation with the new IOA developments, methodologies and approaches. The workshop will be targeted to managers of irrigation and drainage schemes in the countries or regions that have Organizational Setup with special focus on I&O aspects and having practical experiences on PIDM, IDMT both on conventional irrigation as well as on micro irrigation technology.

Water Saving in Irrigated Areas

The Working Group on Water Saving in Irrigated Areas (WG-WATS) was established in October 2015 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. The Egyptian National Committee on Irrigation and Drainage (ENCID) published a book titled "Water saving in irrigated agriculture in Egypt- case studies and lessons learned" jointly authored by Mohamed Hassan Amer; Sayed Ahmed Abd El-Hafez; and Mohamed Bakr Abdel Ghani. A link to the publication is available http://www.icid.org/WatsrSaving_Egypt.pdf for download. The group is collecting the information from the National Committees/members of the WG for compilation of the draft framework on "Agricultural Water Charging."

In 2018, ten nominations were received for three categories of WatSave Awards (viz. technology, management and young professional) from seven National Committees. The Technology Award was shared jointly by Mr. John Hornbuckle, Mr. Jamie Vleeshouwer and Ms. Janelle Montgomery (Australia) for their work on "IrriSAT, a weather-based irrigation management and benchmarking technology app providing site specific crop water management information across large spatial scales at fine resolution using remote sensing". The Innovative Water Management Award was presented to Mr. Richard Phillips (Canada) for his work on "Alberta Irrigation Management Model (AIMM), a Decision Support System to assist irrigation producers better manage their irrigation water application efficiency and optimize crop production." The Young Professional Award was jointly awarded to Mr. Amiralifatahi and Ms. Fatemeh Sadat Mortazavizadeh (Iran) for their work on "Generated Significant Savings in Irrigation Water by Adding Fuel from Livestock Wastes to Agricultural Land."

The first webinar in the young professional series was held on 3 April 2018. Dr. Mohamed E. El-Hagarey, Researcher at Irrigation and Drainage unit, Desert Research Center (DRC), Egypt and winner of Young Professional WatSave Award (2016) gave his presentation on the innovative work "Save Irrigation Water Using Innovative Machine of Soil and Water Management for Rice Crop Cultivation (SWMR)." Dr. El-Hagarey, Member of WG-WATS is the Vice President of Halayb and the Shalateen research station and records patents in hydraulic devices, especially in fluid mechanics and irrigation sciences.

Irrigation Development and Management

It is estimated that for about 70 percent of the world's poor, who live in rural areas in developing countries, agriculture and related activities are their main source of income and livelihood. A focus on increasing agricultural productivity by sustainably increasing small holder yields and by ensuring access to irrigation will remain a key strategy for alleviating rural poverty and hunger. Depletion and degradation of land and water, uncertainty due to climate change and variability, and uneven distribution of both water and population throughout the world pose serious challenges to produce enough food and other agricultural products to sustain livelihoods, to meet goals on eradicating poverty and hunger, and to improve human nutrition without resource degradation.

Keeping in view the importance of irrigation development, the Working Group on Irrigation Development and Management (WG-IDM) was established to look into the various issues associated with IDM with the broad scope of assessment of water demand; development of water resources including groundwater and economic scarcity of water; social drivers and resistance to development of irrigation and progress in water management.

As part of Road Map to ICID Vision 2030, two draft documents titled "Norms and standards of irrigation development" and "Condensed overview of existing documents and practical examples on water balance approach" have been prepared. Dr. Narges Zohrabi (Iran) made an interesting presentation titled "Water Management and Irrigation Development in Iran" during the 69th IEC meeting in August 2018 at Saskatoon, Canada.

Sustainable Drainage

Irrigated agriculture plays an important role in increasing yields as compared to rainfed agriculture. About 40% of the global food supply is produced on 20% of farmland that is irrigated. However, proper agricultural drainage of irrigated agriculture is necessary for increasing yield potential, reducing variable input and machinery costs, timeliness of availability of land for cropping etc. Therefore, it is of strategic importance to create new infrastructure and maintain existing drainage infrastructure.

Keeping in view the importance of drainage, the Working Group on Sustainable Drainage (WG-SDRG) was established with a mandate to promote drainage as part of integrated water resources management and to promote sustainable approaches for drainage and related projects through a balanced integration of environmental, economic and social and cultural aspects. Dr. Gurbachan Singh (India) brought out the document titled "Bio-drainage for Management of Waterlogging and Soil Salinity" which is available at http://www.icid.org/report_bmw_n_ss.pdf for download. The latest database of drainage area is available at <http://www.icid.org/world-drained-area.pdf>. The WG discussed the organization of 14th International Drainage Workshop (IDW) with interest from Georgian National Committee (GEAMCID) for organizing the workshop.

The workshop on “Dry Drainage and Bioreactors or Green Infrastructures” was organized during the 69th IEC meeting in August 2018 at Saskatoon, Canada with the idea of addressing the techniques to design or manage drainage for improving water quality, controlling quantities of water and preserving the soil quality (controlled drainage, constructed wetlands, bioreactors, green infrastructures). In total, nine papers were presented during the workshop highlighting that drainage, at least in Europe, is polluted by nitrates and pesticides and contribute to floods because of which it is taxed. And, in arid zones, reuse of irrigated water is encouraged as a water saving measure. By contrast, in North America, it projects an acceptable image when promoted as drainage Water Management. However, a well-designed, well-managed and well-used drainage is a powerful regulator runoff and can store water in the soil to ultimately allow regulation of agricultural surface water quality and quantity. Combined with an adapted irrigation design, drainage is an essential tool for managing soil salinity, alkalinity or acidification and, therefore the sustainability of irrigated agriculture.

Basin

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

Environment



The World Environment Day, celebrated on 5 June every year, is the United Nation’s principal vehicle for spreading awareness and encouraging action for protection of flora and fauna. First celebrated in 1974, it has been a flagship campaign for raising awareness on emerging environmental issues from marine pollution, overpopulation, and global warming, to sustainable consumption and wildlife crimes. Every World Environment Day has a different host country, where the official celebrations take place around a theme that focuses attention on a particularly pressing environmental concern of the time. The theme for the World Environment Day 2018 was “Beat Plastic Pollution.” For

the 43rd edition of the World Environment Day, India played the global host for official celebrations. As part of the celebrations, several workshops and thematic sessions on various issues were organized in New Delhi. Prime Minister Narendra Modi chaired a plenary session and underlined that India being named the official host of the World Environment Day celebrations was a recognition of the country’s growing leadership in tackling climate change issues. The theme urged everyone to consider how they can make changes in their everyday lives to reduce the heavy burden of plastic pollution on natural places, wildlife and their own health. In his speech, United Nations Secretary-General Antonio Guterres said that the message is simple: “Reject single-use plastic. Refuse what you can’t reuse. It’s time to act and re-dedicate ourselves to do a lot more this year to fight environmental degradation. The Earth doesn’t belong to us but, we belong to the Earth.”

Keeping in view the importance of environment, the Working Group on Environment (WG-ENV) was established in 2015 with the mandate to provide guidance to policy makers, planners, designers, and managers in the irrigation and drainage sector on the environmental aspects of irrigation and drainage systems and to address concerns to the effects on local, regional and global common goods, such as climate, biodiversity and human health. A document titled “Assessing the environmental impacts and the sustainability of irrigation and drainage systems: the potential contribution of Life Cycle Analysis” authored by Dr. Sylvain Perret (France) was published earlier and is now available for download http://www.icid.org/wg-env_rep_may2018.pdf. Dr. Michael van der Laan from South Africa was elected as Vice Chair of the WG while Dr. Seija Virtanen from Finland was elected as Secretary of the WG in 2018.

The Working Group on Bio-Fuel and Food (WG-BIO-FUEL) was established in 2016 in Chiang Mai, Thailand with a mandate to collect, analyze, and disseminate information on new developments and to formulate recommendations with respect to (a) the assessment, monitoring and predictions of impacts of biofuel production and usage policies on water-food-energy nexus and especially AWM; (b) the national policies for biofuel and its consideration for water-food-energy nexus and especially AWM in different countries; (c) the strategies which agriculture and irrigation authorities can adopt to support

biofuel promotion policies of their government; and (d) the international dialogue on biofuel and AWM between regions and countries.

The WG updated an e-publication of the Technical Report titled “Bio-Energy and Water” based on the mandate of the WG which can be accessed at http://www.icid.org/report_bioenergy.pdf.

The 69th IEC meeting (vide its Resolution IEC-2/69) approved merger of the Working Group on Water for Bio-Fuel and Food (WG-BIO-FUEL) with Working Group on Water & Crops (WG-WATER & CROP) in order to achieve better coordination between the two working groups functioning on similar aspects.

Sustainable Development of Tidal Areas

The Working Group on Sustainable Development of Tidal Areas (WG-SDTA) was re-established in 2017 with a revised mandate: (a) To understand the existing and potential challenges and opportunities of tidal areas for present and future by figuring out underlying issues; (b) To raise awareness of the increasing risk on tidal areas due to global climate change and stimulate interdisciplinary discussions on impacts, mitigation and adaptation; (c) To enhance survey, design techniques and monitoring and management programs for the irrigation and drainage facilities, and to collect information about the tidal area environment around the world; (d) To identify sustainable development and management options in tidal areas, and find a balance between the conservation and development of tidal areas with acknowledgment of ecosystem services; (e) To join the international dialogues and organize international conferences and short courses to promote interdisciplinary and participatory land and water planning and management in tidal areas; (f) To collaborate with other related working groups actively and to exchange relevant experiences amongst NCs and the least developing countries.

In order to strengthen the activities of the WG, it organized a WebEx/Online meeting on 30 January 2019 in which 10 members participated and discussed the new mandate of the group. As a new member, Dr. Ikuo Yoshinaga (Japan) will undertake the MTD terms related to SDTA. The meeting further discussed the steps to execute the activities of WG-SDTA to achieve the Action Plan 2030 (Road Map to ICID Vision 2030). The WG will organize an International Workshop on ‘Integrated Development of Tidal Areas – An Exchange of Expertise from Basin Perspective’ on 1 September 2019 during WIF3 in Bali, Indonesia. The main objectives of the workshop are (a) Furthering the understanding of conservation, management and sustainable use of tidal areas throughout the world from basin perspective; and (2) Enhancing dialogues and partnerships among researchers, practitioners, managers and policy-makers, with the overall goal of improving sustainable management of tidal areas. So far, 12 abstracts have been received from NCs for the workshop of the WG. The WG also proposed to organize a short course on ‘Tidal Prediction and Typhoon Wave Model’ in December 2019.

To leverage the potential of online tools, the WG decided to organize a web-based seminar on ‘Drainage Capacity and Flood Disaster in Tidal Areas under a Variable and Changing Climate’ and e-Discussion on ‘Integration of Drainage tail, Land subsidence, Ground water and management in Tidal Areas’ in 2019. The WG also proposed to study issues related with ‘Ground Water and the Land Subsidence in the Coastal Areas’.

As an activity, emerging from the mandate of the WG, a Special Issue of ICID Journal titled “Sustainable Development of Tidal Areas: Climate Change and Environmental Impacts” (Volume 67, Issue 3) has been published in July 2018.

Ir. Hj. Nor Hisham Bin Mohd Ghazali from Malaysia was elected as Secretary of the WG during the 69th IEC meeting held in August 2018 at Saskatoon, Canada.

Managing Water Scarcity under Conflicting Demands

The Working Group on Managing Water Scarcity under Conflicting Demands (MG-MWSCD) was established in 2016 with a mandate to: (a) collect information, knowledge and, where available, case histories on actions taken to manage water systems to accommodate a change in priority of water use or due to conflicting demands at National, area or basin, and local level; (b) review and analyze information to determine any commonality; (c) prepare and present reports and/or case studies on recent developments in the countries that are represented in the WG; (d) organize international workshop on the topic; and (e) prepare an overview paper on the topic for publication.

During the second meeting of the WG in August 2018 at Saskatoon, Canada, Dr. Jaepil Cho from South Korea was elected as Secretary of the WG. During internal workshop of the WG, four country papers from Australia, Japan, Turkey and USA were presented. The WG is planning to organize an internal workshop titled 'Managing on the National Level, Water Scarcity Resulting from Conflicting Demands' during the 70th IEC meeting in September 2019 in Bali, Indonesia.

Global Climate Change and Agricultural Water Management

To develop efficient and effective measures to adapt to the changing climate and minimize the impacts of climate change on agriculture, it is necessary to gather more reliable information for prediction of future impacts with less uncertainties through innovative impact assessment and share the same with all the stakeholders. Keeping in view the importance of climate change in agricultural water management, the Working Group on Global Climate Change and Agricultural Water Management (WG-CLIMATE) was established with the mandate 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 AWM including irrigation, drainage, and flood control; to promote collection of 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.

As part of ICID Vision 2030, the WG has planned three publications viz. (1) Guidelines for Water Management Practices under Changing Climate (2) Position paper on "Smart Water Management for Mitigating Climate Change" (3) Position paper on "Adaptation to Climate Change." The group decided to combine these documents into one, which will include background, general recognition, case studies and some guides and perspectives. Dr. Jaepil Cho (South Korea) who is working with the APEC Climate Centre as a team leader of Climate Application Team in South Korea, delivered an ICID webinar on the topic 'Seamless Climate Service and Downscaling for Climate Change Adaptation' on 5 July 2018. The webinar focused on climate change adaptation for water resources based on multi-range climate information including sub-seasonal to seasonal (S2S), seasonal forecast and climate change scenarios. Dr. Hyung Il Eum, Alberta Environment and Parks (AEP) and Dr. Tsugihiko Watanabe participated as panelists. Dr. Cho informed that APEC's Integrated Modelling Solution (AIMS) has been developed to downscale climate information and apply various models used in the application field to produce information for the decision-making process. Dr. Waleed Hassan Abou El Hassan (Egypt) updated the terms of MTD, which includes 181 terms of 12 categories.

The PAWEES-INWEPF International Conference 2018 was organized from 20-22 November 2018 in Nara city, Nara prefecture, Japan. The conference was jointly organized by the International Society of Paddy and Water Environment Engineering (PAWEES) and the International Network for Water and Ecosystem in Paddy Fields (INWEPF) in collaboration with the ICID Asian Regional Working Group (ASRWG). Prof. Tsugihiko Watanabe steered a session wherein the participants discussed about irrigation and drainage in Asia to achieve the SDGs.

The WG is also organizing an International Workshop on Innovation of Developing the Strategy for Impact Assessment of and Adaptation to the Climate Change as the "New Norm" during the Third World Irrigation Forum (WIF3) and 70th IEC meeting in September 2019 in Bali, Indonesia. The objective of the workshop is to discuss the strategies for developing the innovative impact assessment of the climate change on agriculture and smart water management for adapting to the climate change. In all, 16 abstracts have been received for the workshop.

Adaptive Flood Management

On completion of the tenure of the Working Group on Comprehensive Approaches to Flood Management (WG-CAFM), the International Executive Council (IEC) during its 69th meeting in August 2018 at Saskatoon, Canada has approved, in principle, the establishment of the Working Group on Adaptive Flood Management (WG-AFM) under Strategy Theme 'Basin' with the following new mandate: to motivate ICID National Committees in various countries to set up their National Working Groups; to provide guidance to compile, publish, update and/or translate documents on adaptive flood management; to promote inter-disciplinary exchange of information, knowledge and experience, as well as networking on the topic for proper understanding of the technological developments in the subject; to organize

seminars at ICID Congresses and meeting to enhance deeper understanding of adaptation to floods and coping with floods including community participation with focus on impact of floods on AWM; to prepare a paper on “Adaptive Flood Management” for publication in Irrigation and Drainage (IRD); and to finalize and publish a book on “Adaptive Flood Management.”

The WG organized an International Workshop titled ‘Adaptive Flood Management: Recent Great Floods and Lessons Learned’ on 12 August 2018 at Saskatoon, Canada wherein four presentations—Evaluation of Emergency Operation Procedures for the Central Arizona Project Canal System (Dr. Brian T. Wahlin, USA); Coping with the Biggest Water Year Ever in 2017 on the Sacramento River in California (Mr. Maurice Roos, USA); 2018 Floods in Japan (Dr. Ikuo Yoshinaga, Japan); and Watershed management in rural area, nutrient runoff from farmland, Water bloom in irrigation pond (Dr. Ikuo Yoshinaga, Japan) -- were made which are now available at <http://www.icid.org/wg_afm.html>.

The Working Group is finalizing a publication titled “Adaptive Flood Risk Management” (covering both structural and non-structural aspects of floods management) based on the workshop papers and country presentations (case studies) on floods. In a new development, the Thai National Committee on Irrigation and Drainage (THAICID) has published a Manual on ‘Non-structural Approaches to Flood Management’ in Thai language and distributed them to various stakeholders.

Knowledge

Knowledge is a very crucial input for successful and sustainable development initiatives in AWM domain. The way knowledge is collected, organized, communicated, shared and improved needs to be given due attention to achieve the mission and vision of the organization. It is equally important that all stakeholders have access to information and knowledge, both traditional and new that is based on thorough scientific analysis. It is the knowledge that empowers individuals to make sound decisions at all levels of AWM, starting from water policy-making to irrigation infrastructure development and operation to farm level water application.



Knowledge also develops by sharing of learning from historical irrigation systems, new research and technology development. Accordingly, ICID organized a number of working groups/task forces under the theme knowledge such as EB-JOUR, WG-HIST, WG-CDTE and TF-VE. Brief activities during the year are as follows:

History of Irrigation, Drainage and Flood Control

Water is vital for life, and its incessant availability has been a concern for mankind since ages. But, rarely do we give a thought to the value of water management as heritage. Interestingly, water professionals do not value water-related heritage in their daily practices. To discuss the same in-depth, Dr. Henk van Schaik, Ambassador, Water and Heritage, ICOMOS, The Netherlands delivered an ICID webinar on the topic ‘Water as Heritage’ on 14 November 2018 to share the experiences in the contemporary world wherein the functional and heritage dimensions of water are treated distinctly. The webinar further deliberated on better connecting heritage and wider water sector organizations in its ambit, including ICID and its World Water System Heritage (WSH) programme as well as Recognition of World Heritage Irrigation Structures (WHIS). The webinar primarily focused on traditional wisdom related to water gained from human experiences over centuries that can be regarded as unique and irreplaceable gift from our ancestors to our generation facing the great challenge of ensuring sustainable development. It delved on three core areas: (i) Water and Sustainability (ii) Case studies of sustainable historical water schemes; and (iii) Water Wisdom of the past and lessons learned.

The Working Group on History of Irrigation, Drainage and Flood Control (WG-HIST) was re-established in 2017 with a new mandate to motivate ICID National Committees in various countries to set up their National WGs on History; to provide guidance to compile, publish, update and/or translate documents on the history of irrigation, drainage and flood management; to prepare a paper on “Historical Water Sustainability” for publication in Irrigation and Drainage and; to finalize a book on “Historical Water Sustainability.”

The Management Board of ICID, in 2018, accepted the proposal of renaming the existing scheme of “Heritage Irrigation Structures (HIS)” as “World Heritage Irrigation Structures (WHIS)”, as the Scheme

was originally conceptualized for providing a worldwide recognition to historical individual structures forming an irrigation system, irrespective of their location. Altogether, 14 World Heritage Irrigation Structures have been recognized and included in the ICID Register of WHIS 2018. A preparatory workshop entitled “International Conference on Water and Heritage for the Future”, organized by ICOMOS-Netherlands in cooperation with TIIWE, was organized from 21-25 May 2018. A group of international experts from water and heritage disciplines representing five continents met in Chinese Taipei to discuss and plan for an International Conference on ‘Water as Heritage’ in 2019. Earlier, an open forum was organized on 23 May 2018 where the international experts made presentations on various physical, socio-economic, cultural and spiritual aspects of water. On 25 May 2018, a documentary on “Water as Heritage” was filmed wherein all the experts expressed their views and opinions. The activities concluded with an expression of support to go ahead with the proposal for an International Scientific group on Water and Heritage for the Future to be discussed at the Scientific Board meeting in 2019.

The WG also organized an International Workshop on “Historical Water Sustainability” during the 69th IEC meeting at Saskatoon, Canada in August 2018. Mr. MukhlisZainolAbidin (Malaysia) made a presentation on WHIS (Mada Irrigation Canal). The WG is also planning, upon suggestion from VP Dr. Marco Arcieri (Italy), to prepare the document on the impact of climate events on ancient civilizations.

Capacity Development, Training and Education

The Working Group on Capacity Development, Training and Education (WG-CDTE) was established in 2015 with the mandate to coordinate and guide the knowledge management activities of ICID and the capacity development activities by various WGs; compile the status of training and educational programs offered in different regions; identify the training and education requirements, and identify gaps in available training programs, explore the feasibility of developing e-Learning programme and prepare guidelines for their development to support education and training programs and webinars; explore the scope of use of ICTs in capacity development including distance learning and implement them where feasible etc.

The WG-CDTE which held its third meeting in August 2018 at Saskatoon, Canada highlighted the importance and need of empowering young professionals, encouraging the membership of the WG and national committees for training programs, seminars, workshops and promote sharing of knowledge (webinar/web-based activities), dissemination of the appropriate modern tools (ICT and e-learning material) to help them develop their capabilities and overcome any knowledge or skill gap. In order to promote the activities of the Technical Support Programme (TSP), the WG appreciated the Korean Rural Community Corporation (KRC) and Korea National Committee of ICID (KCID) for their support to the activities of TSP.

In line with the mandate of the WG, the Nepal National Committee of ICID (NENCID) organized a one-day training programme for Young Professionals (YPs) on 1 May 2018 during the 8th Asian Regional Conference (ARC) from 2-4 May 2018 in Kathmandu, Nepal on the theme “Irrigation in Support of an Evergreen Revolution.” The YP Training programme was aimed at (i) capacitating the young engineers in the area of irrigation and drainage sector and motivate them to work for the national development; (ii) sharing innovative ideas of irrigation and drainage and recent technology from different parts of the world (learning from resource persons, sharing of ideas among the participants and providing opportunity for networking with the international delegates); and (iii) providing young engineers an opportunity to participate in the Conference. The training programme covered two key areas: (i) Water Footprint and Virtual Water Approach as a tool for improved Water Use Efficiency, in addition to the Micro Irrigation for improved land and water productivity, and (ii) Basin Planning, its implementation, and introduction on the basin planning tool -- Basin Futures.

As part of capacity development programme of YPs, ICID jointly with the Chinese National committee (CNCID) organized a training programme on the theme “Performance Assessment of Irrigation Systems” from 9-13 April 2018 at China Hall of Science and Technology in Beijing, China which was attended by 19 participants from 14 countries belonging to the Asian region. ICID will also be organizing an International YP training programme in April 2019 in Seoul, Korea.

The African Regional Working Group of ICID chaired by VPH Dr. Mohamed Abd-El-Moneim Wahba (Egypt) established the African Young Water Professionals Forum (Af-YWPF) which has more than 300 members at present. The Egyptian National Committee of ICID (ENCID) organized the 1st African Young Water Professional’s Forum (Af-YPPF) during the 1st Cairo Water Week (CWW1) from 14-18 October 2018 in Cairo, Egypt. The theme of the Forum was “Water Conservation for Sustainable Development.”

The three-day workshop, included the declaration of the establishment of Af-YWP Forum, hands-on-training workshops, seminars and technical sessions. In order to encourage the activities of the African young professionals in Africa as well as their involvement in ICID activities, SG Pandya stressed to strengthen the ICID Membership Network of the National Committees (NCs) with more involvement and support of YPs in the knowledge management activities, especially the knowledge portal of ICID.

In order to promote the capacity development programme, the International Research Programme for Irrigation and Drainage-Iran Regional Node (IRPID-IRN) organized the International Training Workshop on Water Accounting Concepts and Tools in joint collaboration with FAO and ICID from 23-26 February 2019 in Tehran, Iran. The objective of the workshop was to introduce concepts and tools to a wide range of audience including high-level decision-makers, academics and professionals in the water, agriculture and environmental sectors.

Value Engineering

The Task Force on Value Engineering (TF-VE) was established 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 costs and ensure sustainable irrigated agriculture.

The Task Force organized an Internal Workshop on “Application of Value Engineering in Irrigation and Flood Projects” on 14 August 2018 at Saskatoon, Canada, wherein three presentations i.e. Application Case of VE to the design phase of Irrigation Drainage Project in Japan; Contributions that a member of Japanese National Committee can make to WG-VE; and Institutionalizing Value Management in the Malaysian Government Procurement System were made by the members of WG <http://www.icid.org/tf_ve.html>. The Group has also planned to organize an Internal Workshop during the 70th IEC meeting in September 2019 in Bali, Indonesia.

In order to promote value engineering, the TF is finalizing a draft version of the e-publication titled ‘Value Engineering for Saving in Irrigation, Drainage and Flood Projects’. Dr. Kamran Emami (Iran) chair of the Task Force conducted a one-day training workshop on Value Engineering (VE) on 8 March 2018 in Tehran, Iran. The outcome of the training workshop is available at <http://www.icid.org/nup2018_5.pdf>.

The TF-VE completed its tenure in 2017 and the formation of a new Working Group on Value Engineering (WG-VE) is under process with the following revised mandate: (a) To motivate ICID National Committees in various countries to set up their National Working Groups; (b) To provide guidance to compile, publish, update and/or translate documents on Value engineering projects (irrigation, drainage, flood management, and river engineering); (c) To promote interdisciplinary exchange of information, knowledge and experience, as well as networking on the topic; (d) To organize seminars at ICID Congresses and meeting to enhance awareness regarding the importance of Value Engineering; (e) To prepare a paper on “Application of Value Engineering in Irrigation and Flood Projects” for publication in Irrigation and Drainage (I&D) journal; (f) To finalize a book on Application of Value Engineering in Irrigation and Flood Projects”; and (g) To encourage member countries to publish papers on Value Engineering case studies.



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VP Dr. Brian T. Wahlin

WG on Adaptive Flood Management (WG-AFM)



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TF to Guide ICID Inputs to World Water Forum 9 (TF-WWF9)



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WG on Sustainable On-Farm Irrigation System Development (WG-SON-FARM)



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WG on Use of Non-Conventional Water Resources for Irrigation (WG-NCWRI)



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4

ACTIVITIES AT REGIONAL LEVEL

Development involves a progressive transformation of economy and society. The satisfaction of human needs and aspirations is the major objective of development. Thus, the goals of economic and social development must be defined in terms of sustainability in all countries - developed or developing, market oriented or centrally planned. Arriving at a commonly accepted definition of 'sustainable development' remains a challenge for all the actors in the development process. Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs and offers the best path forward for improving the lives of people everywhere. ICID's mission is to exchange knowledge and technology to promote water security, sustainable rural development and increased crop yields to feed the world. In this endeavor it has established various regional Working Groups (WGs) for bridging the communication process and promoting stronger network among the countries in the region as well as international institutions for enhancing cooperation and coordination.

To achieve the goal of doubling the food production in the region, WGs organize 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 promotes regional cooperation.

African Regional Working Group

The African Regional Working Group (AFRWG) was established 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. In order to assess the capacity development needs, based on Strategy for Capacity Building in Africa, the RWG is collecting data from various NCs through a questionnaire on training needs assessment (TNA) in Africa. RWG is in the process of preparation of the Position Paper on 'Green Revolution in Africa' with the help of National Committees and members of RWG. The Moroccan National Committee (ANAFIDE) had shown their willingness to give support and further facilitate the progress with the position paper.



The first Cairo Water Week (CWW1) was organized from 14-18 October 2018 in Cairo, Egypt by Egypt's Ministry of Water Resources in partnership with the European Union (EU), Food and Agriculture Organization (FAO), the UN Educational, Scientific and Cultural Organization (UNESCO), Global Water Partnership (GWP) and International Water Management Institute (IWMI), and other international partners. CWW1 focused on the theme, 'Water Conservation for Sustainable Development' with the aim to promote water awareness, foster new thinking about the most pressing water-related challenges and take action towards integrated water resources management (IWRM) and conservation for sustainable development.

The opening ceremony was presided by His Excellency Mustafa Madbouli, Prime Minister of Arab Republic of Egypt, Mr. Mohamed Abdel Aty, Egyptian Minister of Water Resources and Irrigation and the Deputy Secretary General of the UN along with some 20 Ministers and more than 40 international delegates. High-level meetings with the President and the Prime Minister of Arab Republic of Egypt, as well as several bilateral meetings were also organized during the event. The event provided a forum to discuss water issues in the Mediterranean with a special focus on equitable and sustainable development through systematic approach of integrated water management and to address water-related tensions and conflicts.

During CWW1, the African Regional Working Group (AFRWG), currently chaired by VPH Dr. Mohamed Abd-El-Moneim Wahba (Egypt), seized the occasion to establish the African Young Water Professionals Forum (Af-YWPF) and organized its first meeting to discuss forum's objectives and mandate. During

Af-YWPF, a three-day workshop was organized from 14-16 October 2018 which included the declaration of the establishment of Af-YWPF Forum, hands-on-training workshops, seminars and technical sessions to provide much needed guidance to the young professionals towards abundant lucrative opportunities in irrigation and agriculture. Af-YWPF is also organizing an e-Discussion on “Prospects and barriers to scaling up technological innovations in irrigation and drainage” from 6-19 April 2019.



To exchange experiences about lessons drawn, innovative technologies and irrigation development strategies to reduce deleterious impacts of climate change on African agriculture, ANAFIDE will be hosting the 5th African Regional Conference on Irrigation and Drainage from 16-18 March 2020 in Marrakech, Morocco on the theme “Sustainable Management of Irrigation for Improved Resilience of Agriculture in Africa.”

Asian Regional Working Group

The Asian continent has the highest area under irrigation. Asia is home to about 60% of the world population. Five most populous countries (China, India, Indonesia, Pakistan and Bangladesh) out of the top 10 in the world are from Asia accounting for 45% of the world population. To feed this ever-increasing population, food production needs to be doubled. And that is only possible by augmenting water resources development and management. To fulfill the task of doubling the food production in the region, the NCs from Asian region have formed the Asian Regional Working Group (ASRWG) to focus on numerous relevant topics of current importance.

The 8th Asian Regional Conference (ARC) on the theme “Irrigation in Support of an Evergreen Revolution” was successfully organized from 2-4 May 2018 in Kathmandu, Nepal. The Nepal National Committee of ICID (NENCID) organized the event in collaboration with Department of Irrigation (DoI), the Government of Nepal and other international and national partners. The conference witnessed participation of renowned professionals from USAID, World Bank, IWMI, International Centre for Integrated Mountain Development (ICIMOD), Farmer Managed Irrigation Systems Promotion Trust (FMIST), ADB, ICEWaRM and others to deliberate on various issues to steer the region’s irrigation and drainage into the 21st century. The inaugural ceremony was organized on 2 May 2018 in the benign presence of Hon’ble Bidya Devi Bhandari, President, Federal Democratic Republic of Nepal as the chief guest. The event was graced by Barsaman Pun, Ministry of Energy, Water Resources and Irrigation (Nepal), ICID President Felix B. Reinders and Secretary General Ashwin B. Pandya.



The event witnessed the launch of Technical Report of the Asian Regional Working Group (ASRWG) titled “Contribution of Agriculture Water to the Rural Development in Asia” compiled by Prof. Kyung Sook Choi (Rep. of Korea), the Chair of WT and others. The publication provided an overview of the status of knowledge and policies related to the relevant issues in Asia and to serve its objective in guiding the National Committees and others on meaningful contribution towards sustainable management of agricultural water for rural development. The technical report compiled by the specialists and professionals from the participating countries will serve as a framework for both policymakers and stakeholders. The e-version of the report is available at http://www.icid.org/8th_arc.html for download.

During the Saskatoon meeting, the Chinese Taipei Committee (CTCID) and the Indonesian National Committee (INACID) inked a five-year bilateral Memorandum of Understanding (MoU) on 14 August 2018 to enhance mutual cooperation in three areas including technology, human resource development and knowledge management. A capacity building Training Programme was organized by the Chinese National Committee on Irrigation and Drainage (CNCID) with support from ICID and the Korean National Committee on Irrigation and Drainage (KCID) and the five-day Young Professional training programme to hone the skills of the budding young professionals on the theme “Performance Assessment of Irrigation Systems” from 9-13 April 2018 in Beijing, China. A total of 19 YPs from 14 countries participated and benefitted from the interactions with experienced irrigation and drainage experts.

The “PAWEES-INWEPF International Conference Nara 2018” (Nara Conference) was organized from 20-22 November 2018 in Nara city, Japan. The Nara Conference was jointly organized by the



International Society of 'Paddy and Water Environment Engineering' (PAWEES) and the International Network for Water and Ecosystem in Paddy Fields (INWEPF) in collaboration with the ICID. About 552 participants including researchers, policy makers, engineers and private sectors from 21 countries and regions and 4 international organizations (ICID, FAO, IWMI and MRC) discussed the issues on paddy farming including water use, water management and water environment under the joint theme "Promoting sustainable paddy farming to achieve the SDGs." The PAWEES and the INWEPF re-acknowledged once again the significance of ensuring the multi-functionality of paddy farming

as well as sustainable and stable food production. For achieving the SDGs, both parties recognized the importance of their mutual cooperation to promote the development of sustainable paddy farming in harmony with the environment, strengthening the partnership among countries and related organizations such as ICID and FAO.

Dr. Yohei Sato, Chair of Japanese National Committee (JNCID) made opening remarks and stressed on the significance of strengthening the collaboration among the three organizations. During the presentation session, Dr. Maher Salman (Senior Land and Water Officer, FAO), Dr. Karim Shiati (Chair-ASRWG) and Mr. Naoki Hayashida (Vice President, ICID) shared their views and experiences in the context of SDGs including role of water in agricultural development, challenges in irrigated agriculture in Asia, innovative/advanced irrigation and drainage technology including other ASRWG activities. The next PAWEES and INWEPF joint international conference will be held in South Korea in November 2019. The ASRWG will further strengthen partnership with the PAWEES and the INWEPF including their cooperation for the next conference.

European Regional Working Group

The European Regional Working Group (ERWG) was established in 1995 with the mandate to promote awareness about critical water issues at all levels relevant to ICID in European region and to pay special attention to the environmentally sustainable water management in the region with representation from 15 countries.

The ERWG held its 24th meeting in August 2018 at Saskatoon, Canada and reviewed the Action Plan of 'Road Map to ICID Vision 2030' towards the milestones in achieving the three goals (i) Supporting development of appropriate policies; (ii) Promoting regional cooperation; and (iii) Enhancing institutional capacity development in member countries. In line with the mandate of the WG and its action plan, the group encouraged its Members to organize knowledge sharing events such as workshops, seminars and conferences. Accordingly, the group proposed to organize a workshop alongside the Baltic region workshop in 2019.

Besides, the French National Committee of ICID (AFEID) is planning to organize a two-day conference in Montpellier, France in 2019 on evaluation of irrigation materials for certification on eligibility for inclusion in applications for subsidies for replacement of irrigation infrastructure for water saving to support regional cooperation and knowledge sharing. The objectives of the conference are: (i) Share the methodologies used in various European countries for the ex-ante evaluation of irrigation materials for potential water savings and eligibility for European subsidy payment; (b) Present the French methodology, establishment by IRSTEA at the request of the Ministry of Agriculture; and (c) Share feedback on water savings achieved by a change of equipment or adoption of piloting tools in different 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 set up to raise the issues related to European region in the respective ICID workbodies and to revert to ERWG on the relevant issues within the scope of focus groups. These focus groups are: (a) Working Group on History (WG-HIST); (b) Working Group on Environment (WG-ENV); (c) Working Group on Sustainable Drainage (WG-SDR); (d) Working Group on Water Related Risks; and (e) Working Group on Irrigation and Drainage in the States under Socio-economic Transformation (WG-IDSST).

The 69th IEC meeting held in August 2019 at Saskatoon, Canada, based on the recommendations of the Group, approved establishment of a Task Force for Legislative Framework on Agricultural Drought Mitigation for European Region. Vice President Dr. Marco Arcieri (Italy), member of the ERWG, has taken the lead in preparing the concept note along with other members of the Group.



5

KEY ICID EVENTS

8th Asian Regional Conference, Kathmandu, Nepal



ICID events are aimed at providing platform for exchange of knowledge and networking among participants and also setting up the agenda, policy and direction for ICID activities. They provide opportunities for sharing experiences among stakeholders and to understand various perspectives of sustainable development. Some of the conspicuous events of the year includes: 8th Asian Regional Conference hosted by Nepal National Committee of ICID (NENCID) at Kathmandu, Nepal in May 2018; 69th International Executive Council (IEC) hosted by the Canadian National Committee (CANCID) in collaboration with the Canadian Water Resources Association (CWRA) along with annual work body meetings held in August 2018 at Saskatoon, Canada; and

9th International Micro Irrigation Conference (9IMIC) held at Aurangabad, Maharashtra, India in January 2019.

The 8th Asian Regional Conference (ARC) was held from 02-04 May 2018 at Kathmandu, Nepal on the theme “Irrigation in Support of an Evergreen Revolution”. The Nepal National Committee of ICID (NENCID) hosted the event in collaboration with Department of Irrigation (DoI), the Government of Nepal and other international and national partners.

More than 700 participants had attended the meeting, which includes participation of renowned professionals from USAID, World Bank, IWMI, ICIMOD, FMIST, ADB, ICE Wa RM and other reputed organizations to deliberate on various issues to steer region’s irrigation and drainage into the 21st century. The inaugural ceremony was held on 2 May 2018 in the benign presence of Hon’ble Bidya Devi Bhandari, President, Federal Democratic Republic of Nepal as the chief guest and graced by Barsaman Pun, Ministry of Energy, Water Resources and Irrigation (Nepal), ICID President Felix B. Reinders and SG Pandya.

The conference covered 15 technical sessions with six plenary symposiums, opening and closing sessions. Symposia related to the sub-themes were organized by USAID, IWMI, ICIMOD, ICEWaRM, FMIST and the World Bank. Additionally, several technical papers (105) were presented and enriching discussions were held on various aspects of the theme. A technical report of the Asian Regional Working Group (ASRWG) titled “Contribution of Agriculture Water to the Rural Development in Asia” was released during the event.

Post-Conference technical field tours were organized on 5-6 May 2018 for the delegates and participants. The participants got an opportunity to understand the history of irrigation development in Nepal and also visit popular and major tourist destinations including Dhulikhel, Nagarkot and oldest irrigation system in ‘Gundu’ located in Bhaktapur district. Other side attractions included trip to famous religious places including Pashupatinath temple and Bouddhanath Stupa.

More details can be accessed at <https://www.icid.org/8th_arc.html>

69th IEC meeting, Saskatoon, Canada

The International Conference and the 69th International Executive Council Meeting of ICID were held from 12-17 August 2018 at Saskatoon, Canada and witnessed more than 500 global experts discussing ways to overcome the most pressing problems of the water sector. The main theme of the conference “Innovation and Sustainable Agri-water Management: Adapting to a Variable and Changing Climate” further explored three sub-themes during the technical sessions held at the Teachers Credit Union (TCU) Place, Saskatoon: Sub-theme I: Competing Water Demands; Sub-theme II: Resilient Agriculture - Adapting Agriculture to Climate Change; Sub-theme III: Irrigation and Drainage in Perspective.

Dr. John Pomeroy, Director of the Global Water Futures Programme, University of Saskatchewan, kicked off the plenary session and provided an overview of some of the key challenges related to climate change including extreme floods and droughts. President Felix Reinders stated that as the water resources in the world remains the same, the population is growing and therefore we need to find solutions, methodologies and technologies to address the need for constant food supply. SG Pandya drew the attention of the members to the Action Plan 2017-21 for the Road Map to ICID Vision 2030, International Research Programme on Irrigation and Drainage (IRPID), role of Technical Support Programme (TSP), Knowledge Management Strategy and other issues that required special consideration during the event.



Dr. Peter McCornick, Executive Director of the Daugherty Water for Food Global Institute (DWFI) at the University of Nebraska talked about challenges related to increasing food production for a growing world population and reflected on how effective water management is needed in order to ensure a more productive and resilient agricultural sector. Mr. Maurice Molony, Executive Director and CEO of the Global Institute for Food Security discussed technologies for crop growth and productivity. Mr. Roger Hohm, President, CANSID gave an overview of irrigation and drainage in Canada stating that the region of Canada has adopted many leading-edge technologies to manage and distribute its limited water resources and further elaborated on the activities undertaken by the CANSID.



Major decisions taken at the IEC meeting and its pre-Council meetings are as follows:

- ◆ **New Vice Presidents:** The Council elected (i) Dr. Marco Arcieri (Italy); (ii) Dr. Kamran Emami (Iran) and (iii) Mr. Ahmed El BOUARI (Morocco) as Vice Presidents of ICID for a three-year term (2018-2021).
- ◆ **Changes in organizational and technical matters of ICID:** Approved the new/existing workbodies with revised mandates on the topics under the Strategic Theme – Basin:
 - i. Re-establishment of the WG on Irrigation and Drainage in the States under Socio-economic Transformation (WG-IDSST)
 - ii. Establishment of the Working Group on Non-Conventional Water Resources for Irrigation (WG-NCWRI)
 - iii. Establishment of Task Force to Guide ICID Inputs to the 9th World Water Forum (TF-WWF9)
 - iv. Establishment of Working Group on Rain Water Harvesting (WG-RWH)
 - v. Task Force on Legislative Framework on Agricultural Drought Mitigation for European Region
- ◆ **In principle approval to the establishment of the new Work Bodies with mandates on the topics:**
 - i. Establishment of Working Group on Adaptive Flood Management (WG-AFM).
 - ii. Task Team on Transboundary Water Management and Effect on Agriculture Water Management (TT-TWM-AWM)
 - iii. Establishment of IRPID Regional Nodes for North Africa proposed by Egypt; Mediterranean countries proposed by Italy; and, Central Asian (CA) and Caucasus Regions proposed by Tajikistan.
- ◆ **Celebration of 70th Year of ICID's Foundation:** The 69th International Executive Council (IEC) meeting held at Saskatoon on 17 August 2018 agreed to the proposal to celebrate the 70th ICID Foundation Day on 24 June 2019 with its conclusion during the 24th ICID Congress and 71st IEC meetings in September 2020 in Sydney, Australia, as proposed during the first meeting of the Management Board (MB-1/18) held on 3 May 2018 in Kathmandu, Nepal. As part of the year-long celebrations, the Central Office has already streamlined the activities presented during the Council meeting in a time bound manner including preparation work for the release of the second edition of "Water Saving in Agriculture", a coffee table book (with photos and major accomplishments of each National Committee, historical background and establishment of ICID including its early years), social media participation (#ICID70), organizing special events and a short video film highlighting the history and journey of ICID, since its inception in 1950.

A promotional video <https://www.youtube.com/watch?v=WzmTrpSJ5Ps#video_1> featuring SG Pandya has been circulated requesting National Committees, Office Bearers, Partner Organizations, Direct Members to actively participate in ICID's 70th anniversary celebrations commencing from 24 June 2019. The celebrations which will conclude at Sydney in September 2020 would provide an excellent opportunity to reconnect with the past and new members of ICID as well as various stakeholders.

9th International Micro Irrigation Conference (9IMIC)



The 9th International Micro Irrigation Conference was organized by the Ministry of Water Resources, River Development and Ganga Rejuvenation (MoWR, RD&GR), Government of India in association with ICID, Indian National Committee on Surface Water (INCSW) and WAPCOS Limited from 16-18 January 2019 in Aurangabad, Maharashtra, India.

'Micro Irrigation in Modern Agriculture,' the theme of the conference aimed to share experiences in the use of new technologies and best management practices in drip, micro-sprinkler and other localized irrigation systems with sub-themes focusing on (i) Design, Innovations and New Techniques for increased Crop Productivity; (ii) Micro-irrigation funding and Government support; (iii) Micro Irrigation for 'Cluster Level Farming and Small farm holders'; and (iv) Operation and Maintenance Services and Capacity Development for the Micro-Irrigation Systems.

Hon'ble Nitin Gadkari, Union Minister of Road Transport and Highways, Shipping and Water Resources, River Development and Ganga Rejuvenation inaugurated the event as the chief guest and was presided by Hon'ble Chief Minister of Maharashtra Mr. Devendra Fadnavis. Union Minister for Agriculture and Farmers Welfare Mr. Radha Mohan Singh, Minister of State for Water Resources, River Development & Ganga Rejuvenation and Parliamentary Affairs Mr. Arjun Ram Meghwal, and Ministers from several state governments also presided as the guest of honour during the event. Hon'ble Minister Dr. Mahendra Reddy (Ministry of Agriculture, Rural and Maritime Development and Waterways and Environment, Government of Fiji) graced the occasion as a Special Invitee.

Guests of Honour included Union Minister of State and Hon'ble Minister of Water Resources, Irrigation and Agriculture from the States of National Capital Territory of Delhi, Goa, Haryana, Himachal Pradesh, Karnataka, Uttar Pradesh and Uttarakhand to name a few.

Mr. U.P. Singh, Secretary, MoWR, RD&GR, Govt. of India; Mr. S. Masood Hussain, Chairman, (INCSW, Central Water Commission); Er. Felix B. Reinders, President and Er. A.B. Pandya, Secretary General from ICID were also present during the conference.

As a part of the conference, Water and Land Management Institute (WALMI), Aurangabad organized a one-day "National Micro Irrigation Workshop for Farmers" on 15 January 2019. Around 200 farmers from various states of the country participated in the event. The event was graced by Mr. Uday Chaudhari, Collector & District Magistrate of Aurangabad; President Reinders and Mr. Giriraj Goyal, Director, MoWR, RD&GR.

President Reinders made a presentation on Micro Irrigation and introduced different practices and technologies used in various countries. At the end of the first session, President Reinders, Vice President Dr. Marco Arcieri and other invited guests also planted saplings in the WALMI complex.

The event initiated a multi-disciplinary dialogue for discussions and deliberation through seminars, exhibitions and sessions and raised awareness regarding large-scale use of micro-irrigation including new techniques in micro-irrigation for increased crop productivity, micro-irrigation in cluster level farming and canal irrigation systems.

Around 700 delegates including 100 foreign delegates from 30 countries participated in the conference that provided a global platform to professionals and exhibitors to showcase their knowledge and technologies from around the world.





6

REWARDING EXCELLENCE

One of the biggest challenge now a days is how to grow sufficient food to feed rapidly growing population sustainably under uncertainties of the climate change. ICID has food and water security at the core of its mandate. Over the decades ICID has been a constant witness to technological developments in the fields of satellite or sensor-based water measurements such as GIS and tensiometers, efficient water transport and delivery systems such as piped irrigation using surface or sub-surface drips; and scientific management regimes that make precision irrigation possible. To better document and reward such innovations, ICID has instituted a number of awards to recognize the innovative work and encourage the researchers for their outstanding contributions, which promotes judicious use of water in agriculture. All researchers and innovators make use of ICID platform to share benefits of their work that addresses the water productivity improvements in the agriculture sector globally.

WatSave Awards 2018



WatSave Awards, instituted in 1997, are given for proven and robust technology, tool or work that has actually resulted in saving water in agriculture. Like every year, the WatSave Awards were presented during the 69th IEC meeting held at Saskatoon, Canada on 13 August 2018 in three categories (i) Technology (ii) Innovative Management; and (iii) Young professional. Each award consists of an honorarium of US\$ 2000 and a Citation. The research work of the winners awarded during the year is briefly described below:

Technology Award

Mr. John Hornbuckle, Mr. Jamie Vleeshouwer and Ms. Janelle Montgomery (Australia) received the 'WatSave Technology Award 2018' for their works on "IrriSAT, a weather-based irrigation management and benchmarking technology app providing site-specific crop water management information across large spatial scales at fine resolution using remote sensing." IrriSAT calculates crop coefficients (K_c) from relationships with freely available satellite derived Normalized Difference Vegetation Index (NDVI) data. Daily crop water use (E_{Tc}) is determined by multiplying K_c and daily reference evapotranspiration (E_{To}) observations from nearby weather stations or nationally provided gridded E_{To} data. IrriSAT is moving weather-based scheduling into the future. The free IrriSAT app automates satellite processing from both the Landsat NASA satellite platforms and the Sentinel ESA satellite platforms. IrriSAT has been developed using the Google Earth Engine and delivers crop water use information to assist in irrigation scheduling and crop productivity benchmarking. It provides daily crop water use as well as a seven-day crop water use forecast. This allows irrigators and water managers to look at crop water use on individual farms.

Innovative Water Management Award

Mr. Richard Phillips (Canada) received the 'WatSave Innovative Water Management Award 2018' for his work on "Alberta Irrigation Management Model (AIMM), a Decision Support System to assist irrigation producers better manage their irrigation water application efficiency and optimize crop production." This allows the irrigation districts to make more informed water allocation and expansion decisions and ensure that all irrigation producers and other water users receive a fair share of their water allocation. The IDM is used to determine the on-farm water demand for each irrigated parcel of land within each irrigation district, using historic and current weather data and annually updated cropping and on-farm irrigation system data. The model links this data with the irrigation district water distribution Network Management Module, which is used to estimate conveyance losses (return flow, evaporation, and seepage). The IDM was updated in 2017 to provide more accurate assessment of ongoing water demand within the irrigation districts. This decision support software package can be accessed by all irrigation producers to help them make more informed irrigation scheduling. The AIMM software acquires the necessary climate parameters required to calculate evapotranspiration and irrigation recommendations

from a comprehensive network of automated weather stations located throughout the irrigation districts. Producers can choose the closest weather station for their information requirements.

Young Professional Award

Mr. Amirali Fatahi and Ms. Fatemeh Sadat Mortazavizadeh (Iran) received the 'WatSave Young Professional Award 2018' for their work on "Significant savings in irrigation water by adding fuel from livestock wastes to agricultural land." This fuel is still used in many cities and villages of the country (Zanjan, Isfahan, Hamedan, Tabriz, Arak, etc.) as well as other countries such as Turkey. Nominees decided to do research on this type of ash and find scientific reasons for using it. This project investigated in Ghani Beigloo Village, Zanjanrood Department of Zanjan, in 3 blocks and 12 plots. The amount of treatments was selected based on the most effective amount proposed in the sources. In three types of Clay-Loam, Sandy-Loam and Clay soil texture, three treatments weighing 10, 20, 30 tons of ash per hectare were added to the soil area of Clay Loam texture and tests were carried out to estimate the percentage of moisture content, the average rate of water penetration in soil and water basic penetration rate. At first, a soil sample was taken from a depth of 0-30 cm and Soil texture was determined according to the standard hydrometric method - ASTM D422-63. Then, the percentage moisture content of each plot was calculated based on the standard moisture content determination test, AASHTO-T73-293, ASTM D221671 and finally the resulting data were analyzed.

The details of these Awards can be accessed at http://www.icid.org/awards_ws.html#Awards2018

Best Paper Award

ICID promotes and encourages professionals and experts working in the domain of agricultural water management to share their experiences, research outcomes and best practices with others through 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 recognize and incentivize 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 2018 Best Paper Award was jointly awarded to: (i) Abdullah Darzi-Naftchali, Fatemeh Karandish and Ahmad Asgari (Iran) for their paper titled "Diagnosing Drainage Problems in Coastal Areas Using Machine-Learning and Geostatistical Models" published in Volume 66, Issue 3 in July 2017; and (ii) R.E. Abdelraouf (Egypt) and R. Ragab (UK) for their papers titled "The Benefit of using Drainage Water of Fish Farms for Irrigation: Field and Modelling Study Using the Saltmed Model" published in Volume 66, Issue 5 in November 2017 – http://www.icid.org/awards_paper.html The Award was presented during the 69th IEC Plenary Session held on 13 August 2018 at Saskatoon, Canada.

The above papers can be accessed at http://www.icid.org/awards_paper.html

World Heritage Irrigation Structures

The structures or facilities (dams, weirs and other man-made works) that are selected for listing by the ICID as official World Heritage Irrigation Structures (WHIS) need to have an archival value, including being more than 100 years old. To be considered for WHIS recognition, include tracing the history of and understanding the evolution of irrigation in civilizations across the world, and preserving these historical irrigation structures. A feature of WHIS listing is that, unlike some world heritage honours, ICID recognizes these as working structures that not only deserve to be preserved but also require upgrading and maintenance to continue to serve communities.



Keeping in mind, 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 (HIS) later renamed as World Heritage Irrigation Structures (WHIS) and accordingly the scheme was initiated by ICID.

During 2018, 14 Irrigation Structures (WHIS) from 5 countries were recognized and presented plaques by VPH Bong Hoon Lee at the 69th IEC meeting and included in the ICID Register of World Heritage Irrigation Structures. These irrigation structures are:

◆ **China**

1. Changqu (Bai Qi) Canal
2. Dujiangyan Irrigation System
3. Jiangxiyan Irrigation System
4. Lingqu Canal

◆ **India**

1. Large Tank (PeddaCheru)
2. Sadarmatt Anicut

◆ **Italy**

1. Aqua Augusta and Piscina Mirabilis

◆ **Japan**

1. Kitadate Irrigation System
2. Gorobe Irrigation System
3. Tsukidome Irrigation Canal
4. Shirakawa basin Irrigation system

◆ **Sri Lanka**

1. Elahera Anicut
2. KantaleWewa
3. SoraboraWewa

Details of all the approved structures included in the online register of WHIS are available at http://www.icid.org/icid_his1.php





7

KNOWLEDGE MANAGEMENT AND DISSEMINATION

A small dedicated team of professionals formed the Knowledge Management Division (KMD) at the Central Office of ICID in 2017 to manage the knowledge processes within the ICID network. This was based on recommendations emerging from consultations of the ICID Working Groups on Knowledge theme and also from various ICID partners. The Knowledge Management (KM) team reviews the existing KM processes in water management organisations throughout the world and suggests future strategies to be adopted by ICID members, partners and other stakeholders keeping in view the resources available under the existing institutional framework. The KMD is engaged in developing a distribution network for the knowledge base on agricultural water management. It also intends to develop an interactive Knowledge Portal for improved information flow within and outside ICID network.

Irrigation and Drainage Knowledge Portal



So far, a fragmented, static method of organizing information has worked well within ICID. But it makes information dissemination outside ICID network somewhat difficult. This is because of the diverse background and knowledge needs of AWM stakeholders. The inherent rigidity of current information structure consumes significant search time for a specific piece of information. It is also vulnerable to fluctuating nature of constantly changing content providers and users. The new knowledge base framework is described here in brief. This will help develop a comprehensive, flexible, user-friendly, and subject matter-oriented multimedia knowledge base on water resources development and management with primary emphasis on ICID network productions

and mandates as well as those of its members and partners. Public-domain knowledge objects of ICID members and other organizations or networks will be listed in the metadata directory of keywords and hyperlinked for ease of access. It is proposed that the available ICID knowledge is re-structured (in the form of an irrigation and drainage subject matter), expanded (by adding new information and content or hyperlinks to it), and presented as a flexible source to suit varying requirements of a diverse audience.

Available information is being organized as a collection of ICID's knowledge objects. Some examples of a knowledge object are water cycle, irrigation/drainage structures, and crops. A knowledge object will have sub-objects such as components of the water cycle, types of structures, and crop-specific irrigation requirements, and so on. An object, whether main or sub, will have certain attributes, which will be ICID or other productions describing that object. ICID productions such as textual descriptions (special publications, status reports, abstracts of publications, technical articles, theses and dissertations), tables, drawings, computer programs, images, audio/video clips, for all the knowledge objects, sub-objects, and sub-sub-objects would be stored in a database with multiple entry points.

In addition to the knowledge material provided by ICID, its national committees and partner institutions, the ICID knowledge portal would provide avenues to the user to submit their articles/ research papers/ dissertations/ thesis and other relevant material. These contributors can be categorized as experts/ professionals/ researchers; students; decision-makers and so on. Furthermore, ICID will scan the available international and national materials for incorporating in the knowledge base for use of the community with the help of National Committees. The portal also maintain intellectual property rights of the materials being registered in the knowledge base.

This way, the knowledge base would consist of two databases: temporary and permanent. The temporary database would store the incoming material from contributors and would be invisible. The material from this temporary database would move to permanent database upon review and approval. Experts in the relevant field from different national committees will be able to review and approve the materials for quality control of the knowledge base. Accordingly, a hierarchical user structure and workflow process is being developed. Once the knowledge portal is established, the users from the LinkedIn Group can be directed to the website and the portal can serve as a forum for e-discussions. Overall, the knowledge portal would contain different sections for knowledge sharing:

- ◆ Base Resource Write-up (properly organized detailed information about irrigation, drainage, AWM and other relevant topics)
- ◆ ILMs- a repository of the documents available on the ICID website (abstract available on the website and pdf attached) - advanced search enabled
- ◆ To submit potential material (to be approved by the moderator)
- ◆ Identifier Keywords from a standard list of keywords or updated MTD
- ◆ Forum for e-discussions (directed from the LinkedIn group)
- ◆ Detailed Record of Awards Submission for Awards (WatSave, Heritage Irrigation Structures, and World Water Systems Heritage)
- ◆ Technical news articles
- ◆ Webinars (Experts and Young Professionals (YPs))
- ◆ A section dedicated to software tools such as Basin Futures and Design of Micro-irrigation Systems (DOMIS)
- ◆ Experience gained and case studies of project implementation of various types pertaining to the core areas of ICID. MTD can be further developed in the form of an Irrigation Wiki where generally consumable information of common interest can be hosted.
- ◆ Directories of products and services in a classified form for enabling Business to Business (B2B) and Business-Customer type of networking to facilitate the individuals and communities in remote areas.
- ◆ Multilateral financing agencies to be approached for putting in their projects and experience documents on the portal for distributing in a wide manner.

Disseminating Knowledge

Dissemination is an interactive process of communicating knowledge to target audiences so that it may be used to facilitate desired change. The challenge is to improve the accessibility to knowledge assets by users. This means ensuring physical availability of the knowledge asset to a large proportion of the target audience and making the product comprehensible to those who receive it. Disseminating knowledge assets would be an important contribution to the implementation of the new holistic and collaborative approach on which the 2030 Agenda for UN Sustainable Development is based. Indeed, knowledge can break down silos and be the most natural integrative factor system-wide and for all the stakeholders in the implementation of the 2030 Agenda. Thus, dissemination of information, knowledge and sharing of successful experiences in AWM forms an important activity of ICID.

The Commission prioritizes and facilitates the exchange of information among its members and various stakeholders which is achieved through an amalgam of communication tools/technologies like Internet, publications (digital and print format), and social media. ICID through its various technical Working Groups help extract, compile and synthesize this knowledge. The Central Office is assigned the responsibility of facilitating, packaging and sharing this knowledge across a wide spectrum of users by making optimal utilization of the information technology. The effort is to appropriately synthesize the interaction between technology, techniques, and people to apply the knowledge so generated effectively.

To help the members stay updated with the latest data, information and key developments, ICID has taken the initiative to upgrade ICT facilities to meet the growing requirements. An updated info-rich ICID website and flagship publication 'Irrigation and Drainage' Journal are among the main tools in implementing the dissemination strategy. The dissemination is further facilitated by periodicals including weekly e-Bulletin, monthly NEWS UPDATE, and the quarterly ICID NEWS. In addition, ICID also brings out special publications and reports which document the outcome of the activities of workbodies. National Committees also bring out publications both in print/online format 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 for registered ICID members, through the 'Members only' section on the ICID website <<http://www.icid.org/ximlogin/login.php>>.

User Interface for Knowledge Base and Portal

The new interface will be able to handle instruction-related and exploration-related requests from a user. Based on user preference (instruction or exploration), the new interface will retrieve relevant knowledge objects from the knowledge base and dynamically create one of the following three planned views of the search output:

- ♦ Multilevel Subject Matter View for instruction-oriented users;
- ♦ Query-Based View for specific information seeker; or
- ♦ Activity-Based View for use of AWM tools, techniques/methods by the user.

Additional knowledge services that are being offered by the Central Office are mentioned below:

ICID Website



The info-rich and updated ICID website acts as a doorway 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 the year, the website has gone through many additions and changes, which includes Expansion of ICID Register of World Heritage Irrigation Structures (WHIS); Irrigation and Drainage - Products and Services Directory; new Tools/Models; Digital collection of ICID publications/ reports/ transactions; ICID Young Professional's e-Forum (IYPeF); ICID Vision 2030; Live recordings of ICID Webinars; and information on important ICID events. The website is updated on regular basis and attracts good number of visitors per month.

All publications 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.

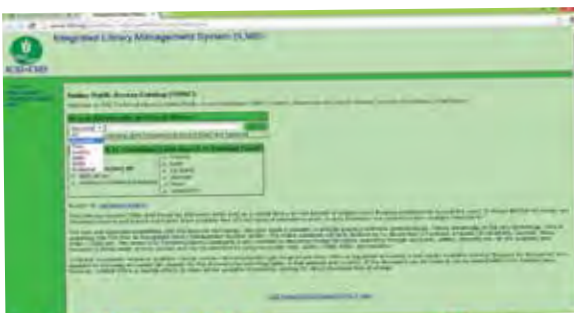
During the recent IEC meetings, work body members were requested to undertake the important topics and sub-topics and further develop them as per their expertise and domain.

The 'Resources' section provides links to open source tools available in the irrigation and drainage sector such as Web based DSS - Design of Micro Irrigation Systems (DOMIS); IrriSEARCH - A tool that aims to bring together all AWM research activities from various NCs on a single forum to help others learn from their experiences; 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 constantly strengthened through voluntary contribution by the experts from various WGs.

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

Other features of the updated ICID website are as follows:

Integrated Library Management System (ILMS)



Established in 2001, the Text Delivery Services (TDS) 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, and Video/DVDs are now a 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. Some NCs have shown their interest to join this network and others are expected to follow suit. ICID Register of World Heritage Irrigation Structures (WHIS)

ICID Register of "World Heritage Irrigation Structures" (WHIS) includes both old operational irrigation structures as well as those having an archival value. A Task Team is set up every year to select historical irrigation/drainage structures as received from various National Committees (NCs) to give recognition to the historical irrigation structures on the lines of World Heritage Sites (as recognized by UNESCO). A milestone from administrative perspective has been earmarked as 15 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 World 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 their nominations directly to the Central Office. For further information on nomination forms, visit http://www.icid.org/icid_his1.php.

At the 69th International Executive Council (IEC) meeting held at Saskatoon, Canada in August 2018, 14 World Heritage Irrigation Structures (WHIS) were approved for inclusion in the ICID Register of World Heritage Irrigation Structures which is now available online at http://www.icid.org/icid_his1.php. The register contains details of now consists of total 74 Structures on its list.

The fifth batch of the Heritage Irrigation Structures to be included in the ICID Register of World Heritage Structures will be presented a "Plaque," citing the salient features of the WHIS during the 70th IEC meeting in Bali, Indonesia from 1-7 September 2019.

Irrigation and Drainage Products and Services Directory

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



The information is presently listed in the following categories and sub-categories: (a) Consultancy Services (1. Individuals/ Experts/ Freelancers; 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. Farmers' Associations; 3. Funding Agencies; 4. Government/Non-Governmental Organizations (NGO)/Not-for-Profit Organizations; 5. Research Institutions; 6. Training Institutions); and (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 take advantage of the services.

Social media

Social media makes human interaction much more convenient and faster than real life human interaction. It makes globalization a reality. Never before were human beings connected to each other as in today's world. Social media has made communication a lot easier than ever before. Now, with a touch of a button people can communicate with anybody anywhere in the world through various social media sites such as Facebook, Twitter, LinkedIn, and so on.



Organizations worldwide are beginning to understand the importance of social media, which provides an opportunity for exchange of ideas between members, partners and other stakeholders. As part of the social media initiative, ICID through its LinkedIn page <www.linkedin.com/in/icidonline>, has a direct membership of more than 3000 AWM professionals from around the world and their connections, which goes nearly 10000. In addition, ICID LinkedIn page is part of around 35 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](https://www.linkedin.com/groups/6990321)>, African Young Water Professionals e-Forum - AfYWPeF<<https://www.linkedin.com/groups/12143964>> as part of the professional network which is open for enriching and interactive discussions in the public domain.

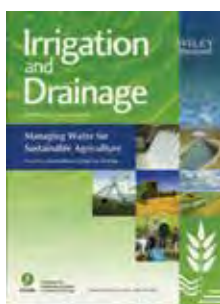
ICID YouTube channel <<http://www.youtube.com/icidonline>> is growing fast from the contributions received from members and partners. The new addition includes the 69th IEC Meeting and International

Conference recordings, 9th International Micro Irrigation Conference, ICID video, subscribed collection of partner organizations; World Heritage irrigation structures, Collection on irrigation technologies; and Webinar recordings. Slide Share account < <http://www.slideshare.net/icidciid>> has also been enriched with many new presentations made at various ICID events providing a versatile medium to share information widely. In addition, a good collection of playlists related to various past events, Knowledge collection, and recording of past ICID webinars.

ICID's 'Facebook' page <<http://www.facebook.com/icidat>> has grown steadily for informal communication between members with common interest thereby promoting their activities. All the latest developments relating to events, seminars, conferences are widely circulated through this medium. All NCs are invited to make good use of these new platforms.

Publications

Irrigation and Drainage Journal



'Irrigation and Drainage' is not only the official international journal but also the flagship publication of ICID. It is a prestigious, peer-reviewed specialized publication that publishes technical papers on all scientific, engineering, environmental and socio-economic issues associated with irrigation, drainage and flood management. The journal is an authoritative publication which doubles up as a rich resource of reference to professionals, engineers, researchers, university professors and students of irrigation, drainage and agriculture disciplines. Since 2002, 'Irrigation and Drainage' has entered the ISSN series (ISSN 1531-0353) and appears in the categories 'Water Resources' and 'Agronomy'. ICID Journal is guided by an International Editorial Board (EB-JOUR) established in 1994, which is currently chaired by President Hon. Prof. Dr. Bart Schultz (The Netherlands). Five issues of the Journal are published every year along with one or two 'Special Issues' focusing on the current topics of significance every year. Special Issues of 13th International Drainage Workshop (Volume 67, Issue S2), and 23rd ICID Congress (Volume 68.1) were published in August 2018 and February 2019, respectively. Another Special Issue titled "Sustainable Development of Tidal Areas: Climate Change and Environmental Impacts" (Volume 67, Issue 3) was published in July 2018.

In addition, articles by SG Pandya published quarterly in the Irrigation and Drainage Journal (2018-19) are cited below:

1. Water Accounting as an Agricultural Water Management Tool (Published: 2 April 2018)
2. Why Communication is Key to Sustainable Agricultural Water Management (Published: 8 June 2018)
3. Capacity Development for Promoting Micro-irrigation Systems–Missing Communication (Published: 8 October 2018)
4. Irrigation in Support of an Evergreen Revolution (Published: 7 December 2018)
5. Innovative and Sustainable Water Management: Adapting to a Variable and Changing Climate (Published: 15 February 2019)

The impact factor of Irrigation and Drainage Journal was 0.707 in 2017, with the five-year impact factor of 0.849. In order to expand the accessibility (online only) to ICID Journal on Irrigation and Drainage, M/s. Wiley created a new category - 'Individual member of the National Committees' for providing free copies of IRD to all individual members of the NCs. The Journal can be subscribed by contacting Ms. Anita Sye, Marketing Manager of M/s. Wiley-Blackwell, E-mail: asye@wiley.com.

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).

The Journal is accessible online at more than 12,000 institutions worldwide, of which about 7500 are in developing countries. ICID Journal can be accessed through Wiley's 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.

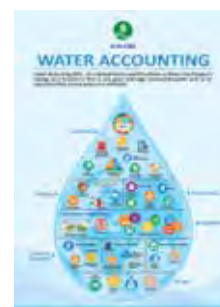
Institutional Reforms in Irrigation Sector for Sustainable Agriculture Water Management

The ICID Working Group on Institutional and Organizational Aspects (WG-IOA) organized an international symposium on the theme 'Global Review of Institutional Reforms in Irrigation Sector for Sustainable Agriculture Water Management, including WUA' chaired by VPH Hafied Gany, Indonesia during the 23rd ICID Congress in Mexico City, Mexico (8-14 October 2017).

Keeping in view the interest generated amongst irrigation community on the subject and to share the outcome with a wider audience, a special issue of the Irrigation and Drainage Journal was published with selected papers of the Mexico ICID Congress, including a synthesis paper on the above symposium, written by VPH Dr. Hafied Gany, Ms. Prachi Sharma (ICID Knowledge Officer) and Dr. Sahdev Singh (ICID Director-Knowledge Management). The paper evaluates the global review of institutional reforms in irrigation sector for sustainable agricultural water management of 14 countries and regions, including Australia, China, India, Indonesia, Iran, Japan, Malaysia, Mexico, Nepal, South Korea, Sudan, Chinese Taipei, Turkey, and Ukraine. These countries and regions represent a vast diversity of geography, climate, governance, socio-economic conditions, and level of development. The evaluation addressed the issues related with institutional and organizational reforms with a special focus on the legal and organizational framework structure including WUA for Water Supply Services; Participatory Irrigation Management (PIM) and Management Transfer; and Public-Private-Partnership (PPP) towards sustainable Irrigation and drainage and agricultural water management.

ICID Position Paper on Water Accounting as a Sustainable Agricultural Water Management Framework, 2019

Owing to fast-paced demographic and climate changes, water scarcity has become a critical issue that needs to be quantified in a systematic manner at various spatial and temporal levels. Most countries lack coordination between water governance, management and technological initiatives due to lack of appropriate water information systems resulting in inefficient agricultural water management. To remedy this, based on the water balance approach, a framework for water accounting (WA) and auditing is proposed to systematically report the water resources and associated hydrological information comprehensively to facilitate the decision-making for sustainable agricultural water management (AWM). Considering the potential utility of water accounting (WA) as an agricultural water management tool, ICID as part of the World Water Council (WWC) Members' initiative on water accounting, facilitated by FAO, has developed this detailed position paper parallelly for decision-making in the agricultural sector, based on the ICID work on "water balance approach" over the last several years and its ongoing activities, for sharing with its national members as well as international partners including WWC and FAO. This paper provides coverage starting from how to define WA, how it should be implemented to who can benefit from it and how. Another important objective is to establish a common understanding of the basic terminology used by practitioners from different sectors working to avoid confusion during decision-making towards a common goal of efficient water management.



The WWC White Paper was launched during the 8th World Water Forum in March 2018. This initiative further contributes to the work plan of the Global Framework on Water Scarcity (currently named as Water Scarcity in Agriculture, WASAG) launched at the Marrakech climate conference in 2016. Recently the ICID position paper was disseminated amongst the participants during the International Training Workshop on Water Accounting (23-26 February 2019) organized by International Research Programme for Irrigation and Drainage-Iran Regional Node (IRPID-IRN) in collaboration with FAO and ICID in Ahwaz, Iran. The ICID Position Paper on WA Framework can be requested from icid@icid.org or downloaded at <http://irpid-iran.org/articles/show/3b62d594-e5af-4430-a0e1-1559594a047d>. Water management in water stressed regions, 2018

The e-Publication jointly compiled by the Theme Leaders selected from ICID Working Group on Water Management in Water Stressed Regions (WG-DROUGHT) deals with the strategies of the irrigation water management under drought/water scarcity situations. The main focus of this publication is on the "strategies." There are various interpretations for strategy. But this report focuses on objectives and actions or measures taken to achieve those objectives. For classification purposes, it is suggested that strategies could be classified into three levels, namely—the National Level, Area Level and Local Level. Although there can be no hard and fast rules, most countries can be classified into these three levels. There is clear distinction among the strategies (or objectives in specific) of these three levels. Once the

objectives are determined, their corresponding actions or measures based on their conditions could be chosen, decided, and then applied. The report mainly deals with the strategies of the irrigation water management under drought/water scarcity situations



Weekly e-Bulletin

The latest developments around the world in the domain of agriculture, climate change, drainage, droughts, floods, food security, irrigation and water resources management are circulated on a weekly basis via e-Bulletin. Latest news items are hyperlinked so that the reader may access the detailed story by clicking on the link. Additionally, it also includes information on upcoming events, latest publications, webinars, editorials and opinions and employment opportunities for the ICID fraternity. More than fifty issues of ICID e-Bulletins have been compiled and sent to NCs, Office Bearers, Work body Members, International Organizations and other subscribers. NCs on their part are encouraged to provide the contact details of their members and interested institutions so that e-Bulletin services could be directly provided to them by the Central Office. Past issues of e-Bulletin can be accessed from <http://www.icid.org/ebulletin.html>.



Monthly News Update

ICID publishes the monthly round-up of important news and events in the 'News Update' to offer an insight into the latest developments and various decisions taken by IEC. The issue provides an updated overview of activities that ICID periodically carries out, including international events/conferences/workshops/seminars; new collaborations and engagements; News from National Committees, Direct Members, International Partners and major upcoming events from around the world. Past issues of the News Update can be viewed at www.icid.org/icid_newsupdate.html.



Quarterly ICID News

Published quarterly, ICID News includes brief technical articles from eminent professionals on special request pertaining to current topics related to AWM. The aim is to disseminate the technical write-ups to non-technical stakeholders. Here are some of the articles published during April 2018 – March 2019:

- ◆ Water as Heritage (Henk van Schaik)
- ◆ Enabling Business of Agriculture: India (Dr. Arvind Kumar)
- ◆ Value Engineering in Irrigation and Drainage (Dr. Kamran Emami)
- ◆ Negotiations for Resolution of Transboundary Water Conflicts (Hon. Karlene Maywald)
- ◆ Innovative and Sustainable Water Management: Adapting to a Variable and Changing Climate – ICID
- ◆ The Benefit of using Drainage Water of Fish Farms for Irrigation: Field and Modelling Study using the SALTMED Model (R.E. Abdelraouf and R. Ragab)
- ◆ ICID Advocates Water Accounting Framework – ICID
- ◆ Micro Irrigation in Modern Agriculture – ICID
- ◆ Rice Cultivation in Italy under the Threat of Climatic Change: Trends, Technologies and Research Gaps (Dr. Marco Arcieri)
- ◆ Diagnosing Drainage Problems in Coastal Areas Using Machine-Learning and Geostatistical Models (Abdullah Darzi-Naftchali, Fatemeh Karandish, and Ahmad Asgari)
- ◆ Business as usual is not an option to manage our water, energy and food sectors (Dr. Olcay Ünver)

Back issues of ICID News can be accessed at http://www.icid.org/news_icidnews.html.

National Committee Publications

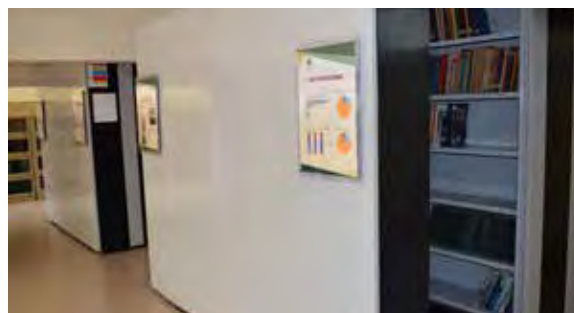
- ◆ 'Irrigation Australia' the official publication of Irrigation Australia Limited/ ICID NCA and is published quarterly < <https://www.irrigationaustralia.com.au/publications/ial-journal>>

- ◆ ABID, Brazil: Brought out 'Irrigacao&TecnologiaModerna – ITEM' journal published in Portuguese language <<http://www.abid.org.br/revista.asp>>
- ◆ IWF/ICID.UK: brings out News & Views twice a year <<https://iwaterforum.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/newsletter.html>
- ◆ JALANSH -- Monthly Newsletter of Central Water Commission <<http://cwc.gov.in/Jalansh>>

Technical Library

The Technical Library of the ICID Central Office comprises a large collection of technical books, reports, proceedings and periodicals, besides ICID's own publications. All ICID publications including the technical books, reports, proceedings, and workshops, etc. are digitized and available on request.

The Library receives about 21 periodicals on a complimentary basis and has more than 32,000 technical reference documents such as development, operation, maintenance, and rehabilitation of irrigation works; flood and drought management; climate change, to name a few. To expand the scope of the library catalogue, NCs can join the 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.



In addition, the 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.





Due to population growth, rapid urbanization and changing dietary habits competition for water among various sectors (domestic, industrial, agriculture, ecological etc.) is leading to increased number of conflicts. Agriculture sector accounts for use of more than 70% water on a global scale. It is always a challenge to grow more food with less water. In order to increase water use efficiencies and water productivity across various stakeholders, especially in agriculture sector, adoption of newer and latest technologies and techniques will play a key and significant role. However, lack of capacity is constraining the sustainable development of irrigated agriculture and many countries are facing a

shortage of qualified technical persons in Agricultural Water Management (AWM). So, it is necessary to provide thrust towards capacity development of professionals, particularly young professionals so as to assure high utilization standards of water (and other) resources. Keeping in view the above, ICID has initiated a number of new initiatives and programs to support capacity development of professionals in AWM sector.

Technical Support Programme

In order to provide technical support and guidance to the National Committees, ICID in its 68th International Executive Council (IEC) meeting held in October 2017 in Mexico City, Mexico, approved a comprehensive Technical Support Programme (TSP) to be implemented by the Technical Support Unit (TSU) (<http://www.icid.org/tsu.html>). The objective of the programme is to “Undertake capacity development activities in the field of Agricultural Water Management (AWM) in support of rural development” with abroad scope of work and outputs/deliverables for TSP.

- (a) To support the member countries in:
 - (i) general assessment of gaps in AWM capacities within the countries and suggest possible solutions;
 - (ii) developing feasibility reports for small and medium irrigation, drainage and flood management proposals;
 - (iii) assessment of training needs; and
 - (iv) undertaking capacity development programme
- (b) To coordinate and execute capacity development programs of ICID under the overall guidance of WG-CDTE and administrative directions of the Core group; and
- (c) To develop a knowledge base of AWM with the help of ICID working groups, partner institutions and member countries.

TSP is being implemented through a distributed network of short and long term expert volunteers from NCs as well as professionals/experts from partner institutions A ‘Core Group’ headed by the President, ICID and Chair PCTA, PCSO, AFRWG, ASRWG, WG-CDTE as Members and Secretary General, ICID as Convener finalize and prioritize the work programme of TSU; review and monitor progress of activities related to TSU; take administrative and financial decisions regarding the engagement of volunteers and other experts; and support mobilization of resources.

In order to ensure smooth functioning of TSU, a ‘Capacity Development Fund’ has been established and the Korean National Committee of ICID (KCID) has donated an initial amount of US\$ 5,000 towards this fund. The 69th IEC meeting held at Saskatoon, Canada, requested NCs to contribute towards the Fund created for undertaking activities under TSP.

During the year, ICID supported an international workshop on ‘Water Accounting’ jointly organized by FAO, ICID, and IRPID-IRN during February 23-26, 2019 at two major cities of Tehran and Ahwaz (Khuzestan) in Islamic Republic of Iran under TSP. The workshop aimed to introduce global experiences, international activities and state-of-the-art knowledge on water accounting; discuss challenges in

developing and implementing water accounting frameworks; highlight the need to apply water accounting frameworks for efficient water resources management at different geographical scales (from farm to catchment); and draw the attention of decision-makers at the national level to the use of new concepts and tools for better water resource management. ICID facilitated participation of Dr. Amgad (Australia) as a Resource Person.

Training Programme for Young Professionals in Beijing, China | April 2018

As a part of capacity development of Young Professionals, ICID in association with the Chinese National Committee on Irrigation and Drainage (CNCID) and support from the Korean National Committee on Irrigation and Drainage (KCID) organized a five-day Young Professional training programme to hone the skills of the budding young professionals on the theme “Performance Assessment of Irrigation Systems” from 9-13 April 2018 at China Hall of Science and Technology in Beijing, China. The training programme mainly focused on the physical, institutional, organizational and participatory management aspects of the irrigation systems. Participants from National Committees of Australia, Democratic Republic of Korea (DPRK), India, Indonesia, Iran, Iraq, Korea, Myanmar, Nepal, Pakistan, Sri Lanka, Tajikistan, Thailand and Uzbekistan attended the training programme. Topics such as need for and framework for performance assessment of irrigation and drainage systems; modernization approach and overview; techniques and tools for performance assessment; Rapid appraisal procedure, MASSCOTE and MASSMUS approach; strategies of rehabilitation and modernization of irrigation systems including structural, non-structural and management interventions in modernization of irrigation systems; measurement devices, canal lining, and water management practices etc. were covered during the training programme.



In continuation to the training programme, CNCID organized a two-day workshop entitled “Innovations of Irrigation Technology” from 14-15 April 2018 wherein Young Professionals shared experiences from their respective countries. All presentations related to Young Professionals’ Training Programme and workshop are available at <http://www.icid.org/cdtraining.html>.

Training Programme for Young Professionals in Kathmandu, Nepal | May 2018

The 8th Asian Regional Conference (8 ARC) on the theme “Irrigation in Support of an Evergreen Revolution” was organized from 2-4 May 2018 in Kathmandu, Nepal. The Nepal National Committee of ICID (NENCID) hosted the event in collaboration with Department of Irrigation (DoI), Government of Nepal and other international and national partners.



During the 8 ARC, a one-day-training-programme for YPs was also organized by NENCID on 1 May 2018 with the aim of (i) capacitating the young engineers in the area of irrigation and drainage sector and motivating them to work for the national development; (ii) sharing innovative ideas of irrigation and drainage and recent technology from different parts of the world (learning from resource persons, sharing of ideas among the participants and providing opportunity for networking with the international delegates); and (iii) providing young engineers an opportunity to participate in the Conference. The training programme covered two key areas: (i) Water Footprint and Virtual Water Approach as a tool for improved Water Use Efficiency, in addition to the Micro Irrigation for improved land and water productivity, and (ii) Basin planning, its implementation, and introduction on the basin planning tool: Basin Futures. VP Dr. K. Yella Reddy, Director, WALAMTARI, Hyderabad, India conducted the technical session on “Water Footprint and Virtual Water Approach as a tool for improved Water Use Efficiency” while second session was conducted by Commonwealth Scientific and Industrial Research Organisation (CSIRO), Australia. 25 Young Professionals (YPs) from Asian countries participated in the training programme.

Training Workshop for Young Professionals at Saskatoon, Canada | August 2018



During the 69th IEC meeting held in August 2018 at Saskatoon, Canada a full-day training workshop was held on 16 August 2018 for the young professionals on the topic “Irrigation in Western Canada – from the Mountains to the Plains.” The goal of the workshop was to provide an overview of agricultural water management in Western Canada since early 1900s, with a focus on how water source (mountain snowmelt) has affected infrastructure development and organization/legislation of water distribution. It was a great opportunity to discuss lessons learned in Western Canada and their potential application in other regions of the world and to share insights from the region that could be applied to water management.

In the morning session, Mr. Roger Hohm, President, CANCID outlined the Irrigation water demand and supply in Western Canada while Jennifer Nitschelm (Alberta Agriculture & Forestry) demonstrated the organization and legislation of irrigation in Western Canada. During the afternoon session, a field trip was organized for the YPs to explain the solar irrigation systems, horticultural irrigation and need for precision agriculture and irrigation followed by a hands-on experience in soil sampling and to learn about innovative technology in irrigation scheduling such as the use of a ground conductivity meter (EM 38) for field mapping and using unmanned aerial vehicles for remote sensing. The various activities outlined in the training workshop roved around innovative and practical aspects of agricultural water management and culminated with rich interactive discussions and feedback from the YPs.

African Young Water Professional Forum (Af-YWPF) in Cairo, Egypt | October 2018

In order to strengthen the activities of African Regional Working Group (AFRWG), VPH Dr. Mohamed Abd-El-MoneimWabha (Egypt), Chairman of AFRWG, promoted and established the African Young Water Professional Forum (Af-WYPF), hosted by the Egyptian National Committee on Irrigation and Drainage (ENCID) to create awareness among Young Professionals on water resources, irrigation and drainage challenges and capacity development to facilitate sharing of experiences in water related fields.

The Af-YWPF was held from 14 -16 October 2018 under the auspices of the AFRWG of the International Committee on Irrigation and Drainage and the Egyptian National Committee on Irrigation and Drainage (ENCID) supported by Ministry of Water Resources and Irrigation of Egypt (MWRI), International Commission on Irrigation and Drainage (ICID), Korea Rural Community (KRC), International Water Management Institute (IWMI), Global Water Partnership-Mediterranean (GWP-MED), the Nile Basin Capacity Building Networks (NBCBN) as well as National Committees on Irrigation and Drainage of Morocco, Italy and South Africa. The three-day training workshop brought together 24 African future water leaders from 12 African countries including Sudan, Morocco, Ethiopia, Kenya, Mauritania, South Africa, Uganda, Nigeria, Malawi, Tanzania, Ghana and Egypt. The workshop exposed participants to important issues such as Water-Energy-Food Nexus, value engineering, current trends, technologies and research gaps in water resources, irrigation and drainage as well as simulation modelling in irrigation and drainage. Discussions ranged from climate change impacts and vulnerability assessments in the Arab Region to using solar energy in irrigation. During the forum, SG Pandya stressed on strengthening the ICID membership network of the National Committees with more involvement and support of YPs in the knowledge management activities, especially knowledge portal of ICID.

International Training Workshop on Water Accounting in Tehran, Iran | February 2019

The International Research Programme for Irrigation and Drainage-Iran Regional Node (IRPID-IRN) organized the International Training Workshop on “Water Accounting Concepts and Tools”, in collaboration with FAO and ICID from 23-26 February 2019 in Tehran, Iran. The aim of the workshop was to introduce concepts and tools to a wide range of audiences including high-level decision-makers, academics and professionals in the water, agriculture and environmental sectors. The workshop witnessed a wide range of audiences including high-level decision-makers, academics and professionals in the water, agriculture and environmental sectors.

The Water Accounting (WA) workshop intended to: (i) Introduce global experiences, international activities and state-of-the-art of knowledge on water accounting; (ii) Discuss challenges in developing and implementing water accounting frameworks; (iii) Highlight the need to apply water accounting frameworks for efficient water resources management at different geographical scales (from farm to catchment); and (iv) Draw the attention of decision-makers at the national level to the use of new concepts and tools for better water resource management. Presentations and booklet for the Water Accounting workshop are available at <http://irpid-iran.org/> for download.



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 AWM by encouraging interdisciplinary approaches to irrigation and drainage management” in line with the UN Sustainable Development Goals Agenda 2030. 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. A number of approaches and tools are available to undertake capacity development and sharing of knowledge which includes conducting training programs, developing e-Learning modules, organizing webinars (or web-based seminars). 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 Dr. Mohamed E. El-Hagarey (Egypt) on 3 April 2018 on the topic ‘Save Irrigation Water Using the Innovative Machine of Soil and Water Management for Rice Crop Cultivation (SWMR)’ (http://www.icid.org/icid_webinar_8.html). During the year, eight webinars with focus on crop productivity, geo-spatial tools, transboundary water conflicts and water as heritage were organized. The following are the details of the webinars:

- ◆ Using System Rice Intensification to Increase Water Productivity in Nile Delta by Dr. Arnulfo Gonzalez-Meza and Ms. Sabah Khalifa (Egypt); 13 June 2018 (http://www.icid.org/icid_webinar_9.html)
- ◆ Seamless Climate Service and Downscaling for Climate Change Adaptation by Dr. Jaepil CHO (USA); 5 July 2018 (http://www.icid.org/icid_webinar_10.html)
- ◆ Negotiations for Resolution of Transboundary Water Conflicts by Hon. Karlene Maywald (Australia); 1 August 2018 (http://www.icid.org/icid_webinar_11.html)
- ◆ Water and Heritage by Henk van Schaik (ICOMOS Netherlands) and Tino Mager (TU Delft / Centre for Global Heritage and Development); 14 November 2018 (http://www.icid.org/icid_webinar_12.html)
- ◆ Smart technology to reduce energy consumption for water spreading and pipe production in hose reel sprinkler irrigation by Dr. Graziano Ghinassi (Italy) and Sergio Sacchini (Expert Assistant); 5 December 2018 (http://www.icid.org/icid_webinar_13.html)
- ◆ Open Source Geo-Spatial Tools and Mobile Device for Canal Network Digitization by Er. Paavan Kumar Reddy Gollapalli (India); 14 December 2018 (http://www.icid.org/icid_webinar_14.html)
- ◆ Webinar on Crop Water Productivity in Afghanistan by Mr. Najumuddin (Afghanistan); 28 February 2019 (http://www.icid.org/icid_webinar_15.html)

Live recordings of the above webinars are available on ICID website and have also been shared via social media for wider dissemination to benefit water sector professionals who could not attend due to time constraints.

ICID Young Professionals e-Forum (IYPeF)



At the 65th International Executive Council (IEC) held at Gwangju, Korea, in September 2014, the Council approved establishing an ICID Young Professional's e-Forum (IYPeF) with open membership in order to engage all the Young Professionals interested in AWM issues on ICID platform. The e-Forum established as a new LinkedIn Group (<https://www.linkedin.com/groups/6990321>) is an open online membership consisting of more than 500 members to encourage and promote a high standard of professional development amongst the young professionals and network with the national and international youth having interest in water-related subjects or the activities, relevant to ICID objectives.

IYPeF will not only act as a virtual meeting place but also a platform that would serve as a stepping stone to ICID annual events and provide opportunities to the budding professionals for interaction with the best professionals in irrigation and drainage sector, present papers, avail the latest information and join various technical working groups.

The IYPeF is composed of one coordinator and five joint-coordinators, including Mrs. Kathleen Murray (Australia), Mr. Amali Abraham Amali (Nigeria), Ms. Sahar Norouzi (Iran), Ms. Adey N. Mersha (Ethiopia), Ms. Eman Ragab (Egypt) and Mr. Shoaib M. Saboory (Afghanistan). To encourage and intensify the active participation of Young Professionals in ICID activities in the domain of irrigation, drainage and flood management, IYPeF is organizing a series of e-discussions and webinars as per their mandate. Accordingly, five e-discussions, as indicated below, have been finalized for 2019 to enable the young professionals to contribute their views on the topics of interest with a specific focus on the theme "Development for water, food and nutrition security in a competitive environment" for the upcoming Third World Irrigation Forum (WIF3) and 70th IEC Meeting to be held from 1-7 September 2019 in Bali, Indonesia. The topics and their lead IYPeF coordinators are: (i) Non-conventional water use/reuse in irrigation (Ms. Eman Ragab), (ii) Solar-Powered Irrigation System: Exploring Opportunities and Threats (Mr. Amali Abraham Amali), (iii) Soil conditions to ensure sustainable agriculture and coping with climate change (Mrs. Kathleen and Mr. Shoaib Saboory), (iv) Flood management in agriculture (Ms. Sahar Norouzi), and (v) Cost-effectiveness of Agricultural field drainage (Mrs. Adey Mersha and Mrs. Kathleen Murray).

Accordingly, three e-discussions coordinated by lead IYPeF coordinators were successfully held from January-March 2019. Additionally, webinars are also planned in the Young Professional series (IYPeF) during 2019 on the following topics: (i) Crop Water Productivity in Afghanistan by Mr. Najumuddin (Afghanistan); (ii) Basin Futures by CSIRO (Australia) and; (iii) Flash floods early warning systems: Experience from Egypt by Mr. AlaaKotb.

Rendezvous with Prof. Biswas, Distinguished Professor at Lee Kuan Yew School of Public Policy, Singapore



Prof. Asit K. Biswas, one of the world's leading authorities on water and environment and Distinguished Professor at Lee Kuan Yew School of Public Policy, Singapore, visited ICID Central Office on 19 November 2018 to share his views and experiences on 'Water crisis in India' as part of an interactive interview for a documentary on 'Asian water crisis' for Channel News Asia (CNA), Singapore.

The live interactive discussion organized by Secretary General Ashwin B. Pandya brought together more than 30 water experts from government and private agencies including Central Water Commission (CWC), Central Board on Irrigation and Power (CBIP), Centre for Policy Research, World Bank, International Water Management Institute (IWMI), Indian Council of Agricultural Research (ICAR) - Indian Agricultural Research Institute (IARI) to name a few to share their expertise and experiences around the table and engage with Prof. Biswas in a stimulating and interactive discussion to facilitate a knowledge transfer environment, especially in the context of existing global challenges impacting water security and governance.

During the discussion, Prof. Biswas deliberated on the impending loom of 'water crisis in India' with specific focus on importance of water governance, transboundary water sharing, groundwater depletion

and climate change impact on water resources. He dived into these arenas related to water and humanity's relationship with this life-sustaining liquid.

During the discussion, SG Pandya stated that in India, the traditional techniques of flood irrigation are followed which involve flooding of field with water. Such techniques involve ample waste of water. Modern irrigation techniques like drip and sprinkler are found to be more efficient one where wastage of water is minimum thereby increasing the productivity of land. He further added that to meet the need of the skilled manpower in the water sector, regular training and academic courses in water management should be promoted. These training and academic institutions should be regularly updated by developing infrastructure and promoting applied research, which would help to improve the current procedures of analysis and informed decision making.

At the end of the discussion, all water professionals unanimously agreed that a general awareness about water management is needed to be created and the community must proactively involve itself in the conservation of most vital resource of earth for its sustainable development.

As a token of appreciation, Prof. Biswas, gifted his recently published books to ICID technical library and expressed great pleasure to meet and interact with his colleagues of longstanding association from water sector in India.

ICID, FAO-RNE study tour on Solar Powered Irrigation Systems in India

In recent years, solar irrigation has become increasingly viable for countries as a reliable, clean-energy solution for agricultural water management, especially in areas with high-incident solar radiation. As investment costs for solar-powered irrigation systems (SPIS) are decreasing, SPIS technologies are becoming a viable option for many farmers.



Towards this endeavor, FAO-RNE collaborated with ICID to organize a study tour to India for a high-level delegation from Tunisia and Egypt from 6-12 January 2019. The study tour aimed to strengthen institutional capacities for the focal countries (Tunisia and Egypt) with the objective to highlight good practices, provide insights into how the potential of SPIS is realized and how risks are addressed.

As part of reconnaissance, SG Pandya and Dr. Singh visited WTC, Indian Agricultural Research Institute (IARI) as well as Indian Council of Agricultural Research (ICAR) on 9 October 2018 and were briefed by Dr. T. B. S. Rajput, Emeritus Scientist, Water Technology Centre (WTC), IARI and Dr. Neelam Patel, In-charge, Principal Scientist, Soil and Water Conservation Engineering about various projects by WTC with SPIS being the most successful, as they reduce the need for electricity to operate pressurized irrigation systems and can be easily installed in remote areas with erratic electricity supply. The technology has been tested both on the research farms of WTC as well as farmers' fields in various states of India.

On 26 October 2018, SG Pandya, ED Varma and Dr. Singh held an interaction with Jain Irrigation Systems Ltd. - a globally emerging leader on micro irrigation systems and a direct member of ICID - for arranging a study visit to their irrigation projects on SPIS in various parts of India including community level project in Talwara district in Punjab state. The ICID officials also visited the Talwara project and interacted with the project implementation team, the local government officials and farmers who are benefitting from the project. The FAO-RNE delegation visited all the above sites and interacted with public and private functionaries at various levels and beneficiaries at the ground level.

As a part of the study tour, ICID prepared a comprehensive report on technical, financial and operational aspects of SPIS using case studies from several Indian states. Dr. Rajput contributed to the report on 'Risks and Benefits for the Solar Powered Irrigation Systems' based on his three decades of professional experience in the domain of micro irrigation and SPIS. The report served as the primary reference for the delegation sponsored by FAO to visit India to observe the current status of SPIS in selected Indian projects and demonstrating their applicability in other parts of the world. The draft report was further improved and finalized by Dr. Sahdev Singh and Ms. Prachi Sharma, and the final report was submitted to FAO-RNE.

The main outcomes of the study tour aimed to achieve the following: (i) learning from existing experiences in India to understand how to promote and regulate the use of SPIS; (ii) providing field knowledge from Indian experiences for visiting technical experts to act as multipliers of knowledge.

Dr. Witsoe discusses implementation challenges of Bisalpur Water Project in Rajasthan, India



Dr. Jeffrey Witsoe, Assistant Professor of Anthropology at Union College, Schenectady, New York visited ICID Central Office with his six students on 15 March 2019 to share his findings from a field survey on the implementation challenges of the Bisalpur Water Project in rural Rajasthan, India. The discussion was attended by Dr. Srinivas Chokkakula, Research Professor and Mr. Partha Mukhopadhyay, Senior Fellow from Centre for Policy Research, New Delhi, India. Dr. Sahdev Singh, Director (Knowledge Management) and Er. B.A Chivate, Director (Technical) from ICID joined the discussion. Dr. Witsoe shared his insights on Bisalpur Water Project that provides

clean drinking water from Bisalpur Dam to urban and rural Rajasthan in response to an increasingly contaminated groundwater supply. The research team examined the various factors related to policy design and implementation that resulted in denial of water to thousands of people. One of the major issues identified in the survey was the arbitrariness in water fee collection from households for domestic supply. Fluoride contaminated groundwater has been a very serious issue in this project area for a long time. The findings stated that access to water is usually linked to distortions in policies, planning and management structures. The presentation was followed by an open discussion which deliberated on the key findings and recognized the critical need for supplying safe drinking water to the people, especially in a vastly water scarce state as Rajasthan.





9

FINANCIAL MANAGEMENT

Judicious, prudent and sagacious financial management of an international professional network of voluntary experts is the 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, associate and direct members and special contributions by the host National Committees organizing ICID events. Currently, ICID network is spread over 78 countries across Africa, Americas, Asia, Oceania and Europe, covering over 95% of the irrigated area of the world. The Commission also receives special subscriptions from NCs and various International Organizations to support specific activities to further the ICID objectives.

Financial Accounts of the Commission are regularly audited on an annual basis by a Statutory Auditor meaning qualified chartered accountant, appointed by IEC, as per the Societies Registration Act, 1860 following the Indian Accounting Standards by a qualified accountant of the Institute of Chartered Accountants of India (ICAI) and are complying with The Foreign Exchange Management Act, 1999 (FEMA); and Direct Tax Law and Indirect Tax (The Goods & Services Tax Act, 2017) Law of the country.

Duly audited consolidated financial statements which include Balance Sheet, Income and Expenditure Account and Receipts and Payments Account for the Financial Year starting from 1 April 2018 to 31 March 2019 are presented on page 88.



FINANCIAL STATEMENTS

BALANCE SHEET AS ON 31ST MARCH 2019

ASSET		2018-19 (Amount in INR)	2017-18 (Amount in INR)
1	Property & Equipment	9,829,590	11,016,757
2	Receivables	24,699,765	13,856,911
3	Bank Balances & Cash in Hand	84,149,599	75,930,397
4	Subscription Accrued	-	3,422,773
	Total Assets	118,678,954	104,226,838

LIABILITIES		2018-19 (Amount in INR)	2017-18 (Amount in INR)
1	Gulhati Memorial Lecture Fund	358,255	256,327
2	General Fund	57,043,515	47,781,706
3	Gratuity Fund	9,060,800	7,874,160
4	Leave Encashment Fund	7,103,806	6,258,806
5	Corpus Fund-WID Prizes	2,835,550	2,607,098
6	Exchange Fluctuation Reserve Fund	724,446	-
7	Security From Tenant	24,632,200	24,632,200
8	Unrealized Subscription	12,181,160	2,373,520
9	Sundry Creditor, Payables & Provisions	4,069,442	10,929,975
10	Duties & Taxes Payable	669,779	1,513,046
	Total Liabilities	118,678,954	104,226,838

INCOME AND EXPENDITURE ACCOUNT FROM 01 APRIL 2018 TO 31 MARCH 2019

INCOME		2018-19 (Amount in INR)	2017-18 (Amount in INR)
1	Membership & Subscriptions	19,490,246	16,673,089
2	Sale of Publication	13,418	1,063,971
3	Special Contribution to the Budget	6,178,416	62,700
4	Interest on Fixed Deposits	4,870,889	4,607,794
5	Other Incomes	1,041,088	23,918
6	Rent and Provision of Services on Let Out Property	49,263,828	49,263,828
7	Special Subscriptions	343,700	-
	Total Incomes	81,201,585	71,695,300

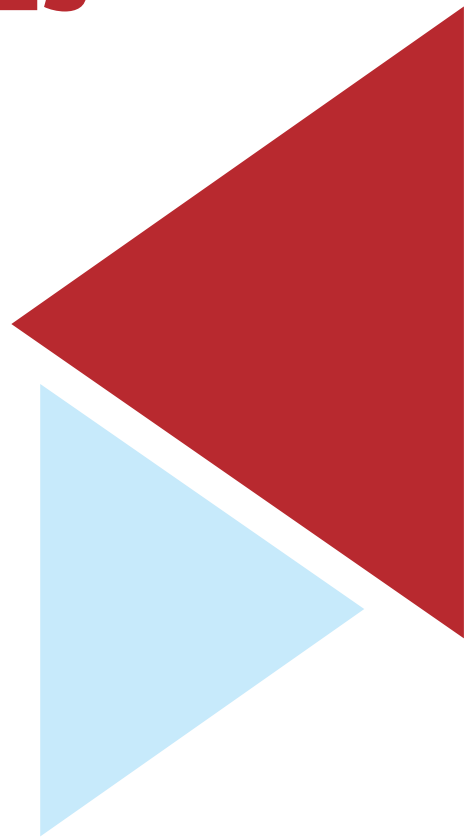
EXPENDITURE		2018-19 (Amount in INR)	2017-18 (Amount in INR)
1	Opening Stock of Publications	-	251,130
2	Compensation for Secretary General	4,035,597	3,938,238
3	Salaries & Allowances	22,773,901	28,538,103
4	Superannuation Relief to Retd. Employees	4,416,948	3,397,226
5	Service & Maintenance	8,423,441	5,052,653
6	Taxes and Utilities	16,870,566	16,978,262
7	Rehabilitation or Refurbishing and Maintenance of ICID Center Office Building	283,072	3,529,600
8	Publication, Knowledge Management and Dissemination	3,513,626	4,156,766
9	Conference Expenditure	1,809,468	2,527,464
10	Cooperation with Other Organization	-	23,305
11	Travel Expenditure	1,653,563	1,303,723
12	Depreciation on Fixed Assets	1,378,293	1,486,452
13	Workshop, Training and Studies	4,908,560	956,568
14	Other Expenditure	193,485	5,705,712
15	Excess of Income over Expenditures	10,941,066	(6,149,902)
	Total Expenditures	81,201,585	71,695,300

RECEIPT AND PAYMENT ACCOUNT FROM 01 APRIL 2018 TO 31 MARCH 2019

RECEIPTS		2018-19 (Amount in INR)	2017-18 (Amount in INR)
1	Cash & Bank (Balance Brought Forward)	75,930,397	75,760,429
2	Membership Subscriptions	17,709,864	16,742,447
3	Sale of Publications	13,418	1,089,818
4	Special Contribution to the Budget	6,680,016	62,700
5	Interest on Fixed Deposits	5,112,321	4,797,114
6	Special Subscription	343,700	-
7	Other Receipts	1,429,669	1,459,371
8	Rent and Provision of Services on Let Out Property	48,401,695	47,789,130
9	Income Tax Refund	1,150,720	-
	Total Receipts	156,771,800	147,701,010

PAYMENT		2018-19 (Amount in INR)	2017-18 (Amount in INR)
1	Compensation package for Secretary General	4,035,597	3,938,238
2	Salaries and Allowances	22,410,162	27,224,770
3	Superannuation Relief to Retired Employees	4,416,948	3,397,226
4	Services & Maintenances	8,452,786	5,103,228
5	Taxes and Utilities	16,793,137	16,983,611
6	Rehabilitation or Refurbishing and Maintenance Of ICID CO Building	283,072	3,529,600
7	Publications, Knowledge Management and Disseminations	3,506,298	4,158,824
8	Conference Expenditure	1,809,468	2,243,164
9	Cooperation with Other Organisation	-	23,305
10	Travel Expenditure	1,653,563	1,303,723
12	Workshops, Trainings and Studies	5,122,457	1,016,574
13	Purchase of Fixed Assets	191,127	1,276,721
14	Other Payments	3,947,587	1,571,629
15	Cash & Banks (Balance Carry Forward)	84,149,599	75,930,397
	Total Payments	156,771,800	147,701,010

ANNEXTURES





ACKNOWLEDGEMENTS

Country-wise Membership in Workbodies

About 323 professionals from 47 countries contribute to various Committees, Working Groups, and Task Forces directly. Also represented by 17 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.

Country	Membership in workbody
Afghanistan	Mr. M. Shoaib Saboory, Joint Coordinator –IYPeF
Australia	Mr. V. C. Ballard (Vice-Chair, WG-MWSCD), WG-ENV Mr. Bryan Ward (Chairman, C-CONGR) Dr. Tapas Kumar Biswas (WG-NCWRI) Ms. Kathleen Heuvel (Vice-Chair, PCSO), Coordinator, IYeF, (WG-RWH) Mr. Stephen Mills (ASRWG) Mr. Carl Walters (Vice-Chair, WG-SON-FARM) Mr. Geoff Harvey (Chair, WG-RWH) Mr. Michael Smit (WG-RWH) Dr. Amgad Elmahdi (WG-IDM) Prof. Dr. Hector Malano (VPH) (EB-JOUR) Dr. Biju George (EB-JOUR)
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China	Ms. Wang Shaoli (WG-SDRG) Mrs. Xuming Tan (WG-HIST) Prof. Wang Aiguo (ASRWG) Prof. Zhang Zhanyu (WG-SDTA) Dr. Fuqiang Tian, (Secretary, WG-CLIMATE), WG-ENV Dr. Wu Jingwei (WG-IDM) Mrs. Jianxin Mu (WG-WATS, Provisional Member) WG-MWSCD Dr. Dong Bin (Vice-Chairman of WG-M&R) Mr. Yao Bin (WG-SON-FARM) Dr. Zhang Guohua, Young Professional (WG-SON-FARM)

Country	Membership in workbody
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	Dr. R C Jain (WG-RWH)
	Dr. Gurbachan Singh (WG-SDRG)
	Dr. P. Soman -Direct Member, JISL (WG-WATS)

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	(VP) Dr. K. Emami (Chair, WG-AFM & WG-HIST, WG-VE & PCSO)	

Country	Membership in workbody
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	Mr. Raad F. AmeinTaha (WG-CDTE)
	Mrs. Shatha Salim Maged (YP) (WG-W&C) provisional member
	Mrs. Dahile Abdulqader Abdul Hameed (YP for WG-CDTE) provisional member
	Mr. Rafat Nael Al-Intaki (IYeF), Joint Coordinator
	Mr. Ahmed Aziz (WG-ENV)
	Mr. Usamah Hashim Witwit (Provisional Member, WG-ENV)
	Mr. Jafer Kathom AlwanAlamiryi - Young Professional (Provisional Member, WG-CLIMATE)
	Mr. Ghassan Lutfi Ahmed (Provisional Member, WG-IOA)
	Mrs. Hend Emad Alhendy - Young Professional (Provisional Member, WG-IOA)
	Mr. Ali Omran Ali (Provisional Member, WG-M&R)
	Mr. Firas Husain Ali - Young Professional (Provisional Member, WG-M&R)
	Dr. Hanan Hussien Abbood (Provisional Member, WG-IDM)
	Ms. Maryam Naeem Odaa Al-Obaidy - Young Professional (Provisional Member, WG-IDM)
	Mr. Mohammed Alaa Dheyaa - Young Professional (Provisional Member, WG-WATS)
	Eng. Ghanim Hameed Hassan - (Provisional Member, WG-SDTA)
	Ms. Dahile Abdulqader Abdulhameed (YP) (WG-CDTE)
Mr. Raad F AmeinTaha (WG-CDTE)	

Ireland	Mr. John Martin (ERWG)
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Italy	Dr. Anna Tedeshi (Chair, WG-NCWRI)
	Prof. Michele Permiola (PCTA, WG-WATS)
	Mr. Antonio Linoli (WG-HIST)
	(VP) Dr. Marco Arcieri (PFC, WG-CROP, ERWG and PCSO)
	Dr. Graziano Ghinassi (PCTA, WG-SON-FARM & MWSCD, EB-JOUR) (EB-JOUR)
Prof. Daniele de Wrachien (EB-JOUR) (EB-JOUR)	

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	Dr. Takao Masumoto, EB-JOUR
	Dr. Shinji Fukuda (WG-CDTE, WG-M&R)
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	Dr. Tasuku Kato (WG-NCWRI & WG-SDRG)
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	Dr. Keigo Noda (WG-IYPeF)
	Dr. Ikuo Yoshinaga (Vice-Chair, WG-AFM) WG-SDTA
	Dr. Katsuyuki Shimizu (WG-IDSST) (Secretary, WG-IDM)
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	Dr. Toshihiko Kuno (WG-VE, WG-WATER & CROP)
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	Engr. Mohd Anuar Musardar Bin Yusoff (WG-SDRG)
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Ir. Mat Hussin Bin Ghani (Provisional Member-WG-IDM)	
	Ir. Syed Abdul Hamid bin Syed Shuib (ASRWG)

Mali	(VPH) Dr. Adama Sangare (Vice Chairman, WG-WATS)
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	Ms. Sara Boularbagh - Young Professional (AFRWG)
	(VPH) Dr. Abdelhafid Debbarh (PCSO) (Chairman, WG-CDTE)
	Mr. Prof. Muhammed Bin Musa (PFC)
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Mr. Mohamed Ouhssain (WG-NCWRI)	

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	(VPH) Ir. Manuel Contijoch Escontria
	(VPH) Ing. Alberto Barnetche Gonzalez
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	Mr. Bashu Dev Lohanee (ASRWG, WG-SON-FARM and C-CONGR)
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	Dr. Pol Hakstege (ERWG)
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	Mr. Ahmed Kamal (ASRWG)
	Mr. Tariq Altaf (WG-IDM)
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Thailand	Mr. Arthon Suttigarn (ASRWG)
	(VPH) Mr. Chaiwat Prechawit (PCTA, WG-HIST)

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	Mr. Ahmet Şeren (WG-IDM)
	Mr. Yalçın Dalgın (Provisional Member, WG-WATS)
	Mr. Hasan Basri Yuksel (WG-IOA) (WG-CDTE Provisional Member)
	Mr. Meral Çiçek (WG-M&R)
Mrs. Remziye Yıldız Gulaga, Vice-Chair of WG-VE	

Country	Membership in workbody
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	VPH Peter Kovalenko (Chair, WG-IDSST) (Vice-Chair, ERWG),

United Kingdom	Mr. Charles L. Abernethy (WG-HIST)
	Mr. Simon Howarth (EB-JOUR)
	Dr. Guy Jobbins (WG-CLIMATE)
	Mr. Philip J. Riddell (WG-IOA)
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	(VPH) Dr. Ragab (Chair WG-WATER & CROP), WG-NWRI, WG- MWSCD, WG-RWH
	(PH) Mr. Peter S Lee (PCTA)

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	Mr. Michael Davidson (WG-CLIMATE)
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	(VP) Dr. Brian T. Wahlin, Chair of PCSO (Provisional Member, WG-IOA)
	Mr. Larry D. Stephens (VPH), (EB-JOUR)
	Dr. Bryan P. Thoreson (EB-JOUR)
	Prof. Dr. Kristoph-Dietrich Kinzli P.E. (EB-JOUR)
	Prof. Kendall C. DeJonge, Associated Editor (EB-JOUR)
	Prof. Saleh Taghvaejan, Associate Editor (EB-JOUR)
	Prof. Luis Garcia (EB-JOUR)

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	Mr. Jo'rayevllhom Usmanovich (ASRWG), Provisional Member
	Dr. Shukhrat Mukhamedjanov (Secy, WG-IDSST)

Vietnam	Dr. Dao Trong Tu (Provisional Member, ASRWG)
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Zambia	Mr. Mulako Cornelius Sitali (AFRWG)
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International Organisations

International Organizations	Represented in ICID work body as Permanent Observer
ADB	TF-MTD
AgWA	AFRWG, PCTA
ARID	AFRWG
CIGR	Mr. Herbert H. Van Lier, WG-WATER&CROP
CPWF	PCTA
FAO	PCSO, AFRWG, WG-IDSST, PCTA, WG-CLIMATE, TF-MTD, WG-NCWRI, WG-SON-FARM, WG-WATER & CROP; (Mr. Harry Denecke, WG-SDTA); (Ms. Robina Wahaj, WG-M&R and WG-WATS)
GWP	PCSO
ICBA	WG-NCWRI
ICRISAT	WG-WATER & CROP
ISO	PCTA; WG-SON-FARM
IWHA	WG-HIST
IWMI	PCTA, WG-CLIMATE, TF-MTD, WG-WATS
IWRA	WG-IDSST
SARIA	AFRWG
WMO	WG-CLIMATE
World Bank	PCSO, AFRWG, WG-IDSST, PCTA
WWC	PCSO, PCTA

2

FACTS AND FIGURES

World Irrigated Area

S. No.	Country	Total Cultivated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
DEVELOPED COUNTRIES						
1	Australia	47.307	2.15	4.544781956	ICID-NC	2017
2	Austria	1.417	0.119	8.398023994	FAO	2013
3	Bahmas	0.012	0.001	8.333333333	FAO	2012
4	Bahrain	0.0046	0.004	86.95652174	FAO	2001
5	Barbados	0.012	0.005	41.66666667	FAO	2005
6	Belgium	0.8393	0.019	2.263791255	FAO	2013
7	Canada	50.656	1.053	2.0787271	ICID-NC	2017
8	Chile	1.746	1.109	63.51660939	FAO	2007
9	China, Hong Kong	NA	0.002	NA	FAO	2011
10	Croatia	0.8908	0.025	2.806466098	FAO	2014
11	Cyprus	0.1063	0.055	51.74035748	ICID-NC	2005
12	Czech Republic	3.219	0.153	4.753028891	FAO	2011
13	Denmark	2.436	0.439	18.02134647	ICID-NC	2013
14	Estonia	0.6543	0.003	0.458505273	ICID-NC	2017
15	Finland	2.3	0.073	3.173913043	ICID-NC	2018
16	France	19.328	2.6	13.45198675	ICID-NC	2017
17	Germany	12.074	0.639	5.292363757	FAO	2010
18	Greece	3.725	1.517	40.72483221	ICID-NC	2013
19	Hungary	4.585	0.22	4.79825518	ICID-NC	2008
20	Ireland	1.059	0.1	9.442870633	ICID-NC	2010
21	Israel	0.3977	0.225	56.57530802	ICID-NC	2004
22	Italy	9.121	2.42	26.53217849	ICID-NC	2013
23	Japan	4.519	2.929	64.81522461	ICID-NC	2017
24	Korea, Republic of	1.691	1.036	61.26552336	ICID-NC	2015
25	Kuwait	0.0161	0.01	62.11180124	FAO	2006
26	Latvia	1.215	0.001	0.082304527	ICID-NC	2013
27	Lithuania	2.384	0.004	0.167785235	FAO	2011
28	Malta	0.01023	0.004	39.10068426	FAO	2013
29	Netherlands	1.081	0.486	44.95837188	FAO	2014
30	New Zealand	0.657	0.619	94.21613394	FAO	2007
31	Norway	0.8111	0.099	12.20564665	FAO	2013
32	Oman	0.0688	0.059	85.75581395	FAO	2004
33	Poland	11.304	0.075	0.663481953	FAO	2013

34	Portugal	1.885	0.54	28.64721485	FAO	2014
35	Puerto Rico	0.111	0.022	19.81981982	FAO	2005
36	Qatar	0.0156	0.013	83.33333333	FAO	2004
37	Saudi Arabia	3.647	1.62	44.42007129	FAO	2014
38	Slovakia	1.413	0.099	7.006369427	ICID-NC	2013
39	Slovenia	0.2373	0.007	2.949852507	ICID-NC	2011
40	Spain	17.188	3.636	21.15429369	ICID-NC	2015
41	Sweden	2.597	0.155	5.968425106	FAO	2013
42	Switzerland	0.4257	0.04	9.396288466	ICID-NC	2007
43	UK	6.279	0.15	2.388915432	ICID-NC	2017
44	United Arab Emirates	NA	0.092	NA	FAO	2010
45	Uruguay	2.45	0.238	9.714285714	FAO	2011
46	USA	129.516	23.48	18.12903425	USDA	2017 & 2013
			48.345			

S. No.	Country	Total Cultivated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
EMERGING/ DEVELOPING COUNTRIES						
1	Albania	0.7	0.337	48.4	FAO	2013
2	Algeria	8.4	1.23	14.6	FAO	2012
3	Angola	5.2	0.086	1.7	FAO	2005
4	Argentina	40.2	2.357	5.9	FAO	2010
5	Azerbaijan	2.2	1.43	66.2	ICID-NC	2013
6	Bangladesh	8.5	5.217	61.4	ICID-NC	2017
7	Belarus	5.8	0.03	0.5	FAO	2011
8	Belize	0.1	0.003	2.7	FAO	2005
9	Benin	3.2	0.023	0.7	FAO	2008
10	Bhutan	0.1	0.032	28.4	FAO	2010
11	Bolivia	4.7	0.297	6.3	FAO	2011
12	Bosnia and Herzegovina	1.1	0.003	0.3	FAO	2010
13	Botswana	0.4	0.001	0.2	FAO	2002
14	Brazil	86.6	5.8	6.7	ICID-NC	2013
15	Bulgaria	3.6	0.115	3.2	FAO	2013

S. No.	Country	Total Cultivated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
EMERGING/ DEVELOPING COUNTRIES						
16	Cambodia	4.0	0.354	9.0	FAO	2005
17	Cameroon	7.8	0.025	0.3	FAO	2000
18	China	122.5	65.87	53.8	ICID - NC	2017
19	Chinese Taipei	0.4	0.375	100.0	ICID - NC	2017
20	Colombia	3.5	1.087	30.6	ICID - NC	2011
21	Congo, Rep.	0.6	0.002	0.3	FAO	2011
22	Costa Rica	0.5	0.101	18.5	FAO	2013
23	Cuba	3.5	0.557	15.8	FAO	2012
24	Djibouti	0.0	0.001	50.0	FAO	2011
25	Dominican Republic	1.2	0.307	26.6	FAO	2009
26	Ecuador	2.5	1.5	60.5	FAO	2010
27	Egypt	3.7	3.65	97.5	ICID - NC	2017
28	El Salvador	1.0	0.045	4.7	FAO	2012
29	Fiji Island	0.3	0.004	1.6	FAO	2014
30	Gabon	0.5	0.004	0.8	FAO	2011
31	Georgia	0.6	0.432	70.0	FAO	2007
32	Ghana	7.4	0.03	0.4	FAO	2000
33	Guatemala	2.0	0.337	16.9	FAO	2012
34	Guyana	0.5	0.143	31.8	FAO	2012
35	Honduras	1.5	0.088	6.0	FAO	2009
36	India	169.4	62	36.6	ICID - NC	2010
37	Indonesia	46.0	6.722	14.6	FAO	2014
38	Iran	13.9	8.46	61.0	ICID - NC	2019
39	Iraq	5.3	3.55	67.4	ICID - NC	2017
40	Jamaica	0.2	0.03	14.0	FAO	2010
41	Jordan	0.3	0.083	25.8	FAO	2010
42	Kazakhstan	29.5	1.2	4.1	ICID - NC	2013
43	Kenya	6.3	0.15	2.4	FAO	2010
44	Kyrgystan	1.4	1.02	75.2	FAO	2011
45	Lao People DR	1.7	0.31	18.3	FAO	2005
46	Lebanon	0.3	0.104	40.3	FAO	1998
47	Libya	2.1	0.4	19.5	FAO	2008
48	Macedonia	0.5	0.128	28.3	FAO	2004
49	Malaysia	7.6	0.385	5.1	ICID - NC	2009
50	Mauritania	0.5	0.045	9.8	FAO	2011
51	Mauritius	0.1	0.021	26.6	FAO	2002
52	Mexico	25.7	6.5	25.3	FAO	2014
53	Moldova Republic	2.1	0.228	10.8	FAO	2014
54	Mongolia	0.6	0.084	14.7	FAO	1993
55	Morocco	9.6	1.458	15.2	ICID - NC	2017
56	Myanmar	12.3	2.295	18.6	FAO	2014
57	Namibia	0.8	0.008	1.0	FAO	2002
58	Nicaragua	1.8	0.199	11.1	FAO	2011
59	Nigeria	40.5	0.293	0.7	FAO	2014
60	Pakistan	31.3	19.08	61.1	ICID - NC	2015
61	Panama	0.7	0.032	4.3	FAO	2009
62	Paraguay	4.9	0.136	2.8	FAO	2012
63	Peru	5.5	2.58	46.6	FAO	2012
64	Phillipines	10.9	1.52	13.9	ICID - NC	2008
65	Romania	9.2	3.149	34.2	FAO	2014
66	Russia	124.7	4.5	3.6	ICID - NC	2012
67	Serbia, Republic of	2.8	0.092	3.3	FAO	2011
68	South Africa	12.9	1.6	12.4	ICID - NC	2017
69	Sri Lanka	2.3	0.595	25.9	ICID - NC	2017
70	St. Vincent	0.0	0.001	12.5	FAO	2011
71	Suriname	0.1	0.057	80.3	FAO	2011
72	Swaziland	0.2	0.049	25.8	FAO	2010
73	Syria	5.7	1.341	23.4	FAO	2010
74	Tajikistan	0.9	0.804	92.4	ICID - NC	2013
75	Thailand	21.3	4.736	22.2	ICID - NC	2011
76	Trinidad and Tobago	0.0	0.007	14.9	FAO	2004
77	Tunisia	5.2	0.486	9.3	FAO	2012
78	Turkey	23.9	6.6	27.6	ICID - NC	2018
79	Turkmenistan	2.0	1.869	93.5	ICID - NC	2013
80	Ukraine	33.4	0.55	1.6	ICID - NC	2017
81	Uzbekistan	4.8	4.312	90.4	ICID - NC	2016
82	Venezuela	3.4	1.055	31.0	FAO	2008
83	Vietnam	10.2	4.585	44.8	FAO	2011
84	Yemen	1.5	0.68	44.0	FAO	2004
85	Zambia	3.8	0.156	4.1	ICID - NC	2017
				248.118		

S. No.	Country	Total Cultivated Area (arable land + permanent crops) (Mha)	Irrigated Area (Mha)	% irrigated area	Source	Year
LEAST DEVELOPED COUNTRIES						
1	Afghanistan	7.9	3.208	40.6	FAO	2002
2	Burkina Faso	6.1	0.040	0.7	ICID-NC	2015
3	Burundi	1.6	0.023	1.5	ICID-NC	2011
4	Chad	4.9	0.030	0.6	FAO	2014
5	Congo, Dem Rep of	8.0	0.010	0.1	FAO	2011
6	Eritrea	0.7	0.021	3.0	FAO	2011
7	Ethiopia	16.3	0.539	3.3	ICID-NC	2005
8	Gambia	0.4	0.005	1.1	ICID-NC	2011
9	Guineabissau	0.6	0.025	4.5	FAO	2011
10	Haiti	1.4	0.097	7.2	FAO	2009
11	Korea, DP Rep.	2.6	0.806	31.2	FAO	2011
12	Lesotho	0.3	0.002	0.7	FAO	2011
13	Liberia	0.7	0.002	0.3	FAO	2011
14	Madagascar	4.1	1.086	26.4	FAO	2014
15	Malawi	3.9	0.074	1.9	FAO	2014
16	Mali	6.6	0.378	5.8	FAO	2014
17	Mozambique	6.0	0.118	2.0	FAO	2010
18	Nepal	2.3	0.472	20.3	ICID-NC	2017
19	Niger	16.0	0.100	0.6	FAO	2014
20	Rwanda	1.4	0.009	0.6	FAO	2011
21	Senegal	3.3	0.119	3.6	FAO	2011
22	Sierra Leone	1.7	0.030	1.7	FAO	1992
23	Somalia	1.1	0.200	17.8	ICID-NC	2017
24	Sudan	20.0	NA	NA	ICID-NC	2017
25	Tanzania	15.7	0.184	1.2	FAO	2014
26	Togo	2.8	0.007	0.2	FAO	2011
27	Uganda	9.1	0.014	0.2	FAO	2012
28	Zimbabwe	4.1	0.153	3.7	ICID-NC	2017

World Drained Area

S. No.	Country	Total Drained Area (Mha)	Year	Source
DEVELOPED COUNTRIES				
1	Australia	2.17	2017	ICID-NC
2	Austria	0.2	1997	Annual Report ICID 2016-2017
3	Belgium	0.07	1996	Annual Report ICID 2016-2017
4	Canada	9.46	2017	ICID-NC
5	Chile	0.035	2006	Annual Report ICID 2016-2017
6	Croatia	0.76	1990	CEMAGREF
7	Cyprus	0.02	2000	Annual Report ICID 2016-2017
8	Czech Republic	1.07	2011	Annual Report ICID 2016-2017
9	Denmark	1.77	2012	Annual Report ICID 2016-2017
10	Estonia	0.64	2017	ICID-NC
11	Finland	2	2017	ICID-NC
12	France	3	2017	ICID-NC
13	Germany	4.9	1993	Annual Report ICID 2016-2017
14	Greece	0.52	2002	Annual Report ICID 2016-2017
15	Hungary	2.3	2003	ICID-NC
16	Ireland	0.254	2010	ICID-NC
17	Israel	0.1	1987	Annual Report ICID 2016-2017
18	Italy	5.3	2005	ICID-NC
19	Japan	3.032	2017	ICID-NC
20	Korea, Republic of	1.15	2016	ICID-NC
21	Latvia	1.58	1995	Annual Report ICID 2016-2017
22	Lithuania	2.58	2011	Annual Report ICID 2016-2017
23	Netherlands	3	2010	ICID-NC
24	Norway	0.61	2012	Annual Report ICID 2016-2017
25	Poland	4.21	1999	Annual Report ICID 2016-2017
26	Portugal	0.04	2002	CEMAGREF
27	Puerto Rico	0.02	2000	Annual Report ICID 2016-2017
28	Saudi Arabia	0.04	1992	CEMAGREF
29	Slovakia	0.6	1997	Annual Report ICID 2016-2017
30	Slovenia	0.08	2007	ICID-NC
31	Spain	0.3	2014	CEMAGREF
32	Sweden	1.1	1996	Annual Report ICID 2016-2017
33	Switzerland	0.16	2002	CEMAGREF
34	UK	1.2	2017	ICID-NC
35	USA	47.5	2017	ICID-NC
		101.771		

S. No.	Country	Total Drained Area (Mha)	Year	Source
EMERGING/ DEVELOPING COUNTRIES				
1	Albania	0.28	1999	Annual Report ICID 2016-2017
2	Algeria	0.06	1999	Annual Report ICID 2016-2017
3	Argentina	0.13	2002	Annual Report ICID 2016-2017
4	Azerbaijan	0.61	2013	Annual Report ICID 2016-2017
5	Bangladesh	1.5	2017	ICID-NC
6	Belarus	3	1993	Annual Report ICID 2016-2017
7	Bolivia	0.02	2000	Annual Report ICID 2016-2017
8	Brazil	1.08	2013	ICID-NC
9	Bulgaria	0.08	2000	Annual Report ICID 2016-2017
10	China	21.14	2017	ICID-NC
11	Chinese Taipei	0.375	2012	Annual Report ICID 2016-2017
12	Colombia	0.23	1989	Annual Report ICID 2016-2017
13	Costa Rica	0.04	1999	Annual Report ICID 2016-2017
14	Cuba	0.33	1997	Annual Report ICID 2016-2017
15	Dominican Republic	0.03	2000	Annual Report ICID 2016-2017
16	Ecuador	0.05	1998	Annual Report ICID 2016-2017
17	Egypt	3.36	2017	ICID-NC
18	El Salvador	0.01	1997	Annual Report ICID 2016-2017
19	Fiji Island	0.01	2000	CEMAGREF
20	Georgia	0.16	1996	Annual Report ICID 2016-2017
21	Guyana	0.15	1991	Annual Report ICID 2016-2017
22	Honduras	0.06	1991	Annual Report ICID 2016-2017
23	India	5.8	1991	CEMAGREF
24	Indonesia	3.35	1990	CEMAGREF
25	Iran	0.39	2019	ICID-NC
26	Iraq	1.367	2017	ICID-NC
27	Jordan	0.01	2008	Annual Report ICID 2016-2017
28	Kazakhstan	0.45	2013	ICID-NC
29	Kenya	0.03	2003	Annual Report ICID 2016-2017
30	Kyrgyzstan	0.2	2013	Annual Report ICID 2016-2017
31	Lebanon	0.01	2001	Annual Report ICID 2016-2017
32	Libya	0.01	2000	Annual Report ICID 2016-2017

S. No.	Country	Total Drained Area (Mha)	Year	Source
EMERGING/ DEVELOPING COUNTRIES				
33	Malaysia	6	2009	Annual Report ICID 2016-2017
34	Mexico	5.2	1997	CEMAGREF
35	Mongolia	1.5	2000	Annual Report ICID 2016-2017
36	Morocco	0.2	2017	ICID-NC
37	Myanmar	0.19	1994	CEMAGREF
38	Pakistan	7.86	2015	ICID-NC
39	Paraguay	0.01	2000	Annual Report ICID 2016-2017
40	Peru	0.08	2000	Annual Report ICID 2016-2017
41	Phillipines	2.72	2008	ICID-NC
42	Romania	1.83	2008	ICID-NC
43	Russia	4.78	2007	ICID-NC
44	Serbia, Republic of	0.4	2000	Annual Report ICID 2016-2017
45	South Africa	0.06	2017	ICID
46	Sri Lanka	0.03	2017	ICID-NC
47	Suriname	0.05	1998	Annual Report ICID 2016-2017
48	Syria	0.27	1993	Annual Report ICID 2016-2017
49	Tajikistan	0.33	2013	ICID-NC
50	Thailand	0.16	1997	CEMAGREF
51	Tunisia	0.2	2000	Annual Report ICID 2016-2017
52	Turkey	3.44	2018	ICID-NC
53	Turkmenistan	1.1	2013	Annual Report ICID 2016-2017
54	Ukraine	3.33	2017	ICID-NC
55	Uzbekistan	3.3	2014	ICID-NC
56	Venezuela	0.31	2002	Annual Report ICID 2016-2017
57	Vietnam	1	1994	Annual Report ICID 2016-2017
58	Yemen	1.5	2000	Annual Report ICID 2016-2017
		90.172		

S. No.	Country	Total Drained Area (Mha)	Year	Source
LEAST DEVELOPED COUNTRIES				
1	Afghanistan	0.01	2000	FAO-2015
2	Ethiopia	0.03	1987	CEMAGREF
3	Madagascar	0.11	2000	CEMAGREF
4	Malawi			ICID-NC
5	Nepal	0.09	2017	ICID-NC
6	Rwanda	0.09	2000	Annual Report ICID 2016-2017
7	Sudan	0.56	2017	ICID-NC
8	Zimbabwe	0.025	2017	ICID-NC
		0.765		

Sprinkler and Micro Irrigated area

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

S.No.	Country	Total irrigated area	Sprinkler irrigation	Micro Irrigation	Total sprinkler and micro irrigation	% of total irrigated area	Year of reporting
		(Mha)	Hectares				
1	USA	23.480	14,121,157	1,978,879	16,100,036	68.6	2017&2013
2	China	65.870	3,730,000	5,270,000	9,000,000	13.7	2017
3	India	62.000	3,044,940	1,897,280	4,942,220	8.0	2010
4	Brazil	5.797	3,857,104	621,346	4,478,450	77.3	2013
5	Spain	3.636	885,000	1,793,000	2,678,000	73.7	2015
6	Russia	4.500	2,500,000	47,000	2,547,000	56.6	2012
7	France	2.600	1,379,800	103,300	1,483,100	57.0	2017
8	Iran	8.460	1,002,309	1,015,577	2,017,886	23.9	2019
9	Italy	2.420	958,535	422,534	1,381,069	57.1	2013
10	South Africa	1.670	920,059	365,342	1,285,401	77.0	2017
11	Australia	2.150	820,000	217,000	1,037,000	48.2	2017
12	Turkey	6.600	1,386,000	1,122,000	2,508,000	38.0	2019
13	Saudi Arabia	1.620	716,000	198,000	914,000	56.4	2004
14	Canada	1.053	683,029	6,034	689,063	65.4	2017
15	Azerbaijan	1.437	610,000	100	610,100	42.5	2018
16	Mexico	6.200	400,000	200,000	600,000	9.7	1999
17	Egypt	3.650	450,000	104,000	554,000	15.2	2017
18	Germany	0.540	525,000	5,000	530,000	98.1	2005
19	Japan	2.929	430,000	60,000	490,000	16.7	2015
20	Ukraine	0.550	412,000	70,000	482,000	87.6	2017
21	Romania	1.500	448,000	4,000	452,000	30.1	2008
22	Slovak Rep.	0.313	310,000	2,650	312,650	99.9	2000
23	Israel	0.231	60,000	170,000	230,000	99.6	2000
24	Morocco	1.458	189,750	8,250	198,000	13.6	2014
25	Hungary	0.220	185,000	7,000	192,000	87.3	2008
26	Iraq	3.550	166,000	16,000	182,000	5.1	2017
27	Moldova	0.228	145,000	15,000	160,000	70.2	2012
28	Syria	1.280	93,000	62,000	155,000	12.1	2000
29	Korea, Rep. of	1.036	71,000	64,000	135,000	13.0	2015
30	UK	0.150	105,000	6,000	111,000	74.0	2017
31	Finland	0.073	60,000	10,000	70,000	95.9	2017
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	0.375	13,000	11,000	24,000	6.4	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	0.472	-	-	5,000	1.1	2017
45	Burkina Faso	0.040	4,500	280	4,780	12.0	2015

46	Estonia	0.003	100	500	600	20.0	2017
	Total	228.864	40,878,651	15,957,157	56,840,808	24.84	

DEVELOPED COUNTRIES

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

S.No.	Country	Total irrigated area	Sprinkler irrigation	Micro Irrigation	Total sprinkler and micro irrigation	% of total irrigated area	Year of reporting
		(Mha)	Hectares				
1	USA	23.480	14121157.000	1978879.000	16100036.000	68.569	2017&2013
2	Spain	3.636	885,000	1,793,000	2,678,000	73.7	2015
3	France	2.600	1,379,800	103,300	1,483,100	57.0	2017
4	Italy	2.420	958,535	422,534	1,381,069	57.1	2013
5	Australia	2.150	820,000	217,000	1,037,000	48.2	2017
6	Saudi Arabia	1.620	716,000	198,000	914,000	56.4	2004
7	Canada	1.053	683,029	6,034	689,063	65.4	2017
8	Germany	0.540	525,000	5,000	530,000	98.1	2005
9	Japan	2.929	430,000	60,000	490,000	16.7	2015
10	Slovak Rep.	0.313	310,000	2,650	312,650	99.9	2000
11	Israel	0.231	60,000	170,000	230,000	99.6	2000
12	Hungary	0.220	185,000	7,000	192,000	87.3	2008
13	Korea, Rep. of	1.036	71,000	64,000	135,000	13.0	2015
14	UK	0.150	105,000	6,000	111,000	74.0	2017
15	Finland	0.073	60,000	10,000	70,000	95.9	2017
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	2017
	Sub-total	44.427	21,381,621	5,104,897	26,486,518	59.6	

EMERGING/DEVELOPING COUNTRIES

S.No.	Country	Total irrigated area	Sprinkler irrigation	Micro Irrigation	Total sprinkler and micro irrigation	% of total irrigated area	Year of reporting
		(Mha)	Hectares				
1	China	65.870	3,730,000	5,270,000	9,000,000	13.7	2017
2	India	62.000	3,044,940	1,897,280	4,942,220	8.0	2010
3	Brazil	5.797	3,857,104	621,346	4,478,450	77.3	2013
4	Russia	4.500	2,500,000	47,000	2,547,000	56.6	2012
5	Iran	8.460	1,002,309	1,015,577	2,017,886	23.9	2019
6	South Africa	1.670	920,059	365,342	1,285,401	77.0	2017
7	Turkey	6.600	1,386,000	1,122,000	2,508,000	38.0	2019
8	Azerbaijan	1.437	610,000	100	610,100	42.5	2018
9	Mexico	6.200	400,000	200,000	600,000	9.7	1999
10	Egypt	3.650	450,000	104,000	554,000	15.2	2017
11	Ukraine	0.550	412,000	70,000	482,000	87.6	2017
12	Romania	1.500	448,000	4,000	452,000	30.1	2008
13	Morocco	1.458	189,750	8,250	198,000	13.6	2014
14	Iraq	3.550	166,000	16,000	182,000	5.1	2017
15	Moldova	0.228	145,000	15,000	160,000	70.2	2012
16	Syria	1.280	93,000	62,000	155,000	12.1	2000

17	Sudan	1.890	42,000	-	42,000	2.2	2012
18	Chinese Taipei	0.375	13,000	11,000	24,000	6.4	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	183.870	19,449,337	10,846,530	30,295,867	16.48	

LEAST DEVELOPED COUNTRIES

S.No.	Country	Total irrigated area	Sprinkler irrigation	Micro Irrigation	Total sprinkler and micro irrigation	% of total irrigated area	Year of reporting
		(Mha)	Hectares				
1	Malawi	0.055	43,193	5,450	48,643	88.4	2000
2	Nepal	0.472	-	-	5,000	1.1	2017
3	Burkina Faso	0.040	4,500	280	4,780	12.0	2015
	Sub-total	0.567	47,693	5,730	58,423	10.30	

COUNTRY CATEGORY

S.No.	Country	Total Irrigated area	Sprinkler irrigation	Micro Irrigation	Total sprinkler and micro irrigation	% of total irrigated area	% Sprinkler	% Micro Irrigation	% Total sprinkler and micro irrigation
		(Mha)	(Hectares)						
1	Developed Countries	44.427	21,381,621	5,104,897	26,486,518	59.62	52.31	31.99	46.60
2	Emerging/ Developing Countries	183.870	19,449,337	10,846,530	30,295,867	16.48	47.58	67.97	53.30
3	Least Developed Countries	0.567	47,693	5,730	58,423	10.30	0.12	0.04	0.10
	Total	228.864	40,878,651	15,957,157	56,840,808	24.84	100.00	100.00	100.00
					56.84				



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