2018 I SECOND QUARTER

ICID NEWS

MANAGING WATER FOR SUSTAINABLE AGRICULTURE

MESSAGE FROM
THE PRESIDENT

Dear Colleagues,

By the time you receive this issue issue of ICID News, we will be together in Saskatoon, the heart of the Canadian Prairies for the International Conference and the 69th IEC Meeting of ICID and I am eagerly looking forward to the occasion as we have a lot to discuss and deliberate upon what is taking place in our sector. Therefore, I find it very timely that the main theme of the Canada event, "Innovative and Sustainable Agri-Water Management: Adapting to a Variable and Changing Climate," addresses the role of technology and new ideas in making agriculture resilient to fast-changing climate when the demand for water is over-stressed.

In June, I was invited to deliver the keynote speech – "The Role of the International Commission on Irrigation and Drainage (ICID) in the Irrigation Industry" – in the Irrigation Australia Conference and Exhibition 2018 held at the magnificent International Convention Centre, Sydney, Australia. It was a huge success, showcasing the largest numbers of exhibitors and products, along with attracting a high volume of quality visitors and conference delegates. The biennial 2018 Irrigation Australia conference, known as the only irrigation conference in Australia and solely dedicated to promoting the entire irrigation industry value chain was attended by participants from more than 25 countries. The event witnessed perspectives on topics such as energy provision and affordability, urban water policy and reform, infrastructure development and drought-management strategies.

ICID Central Office celebrated the 69th ICID Foundation Day in June in New Delhi, India. The event was a matter of great pride and jubilation for the ICID fraternity as it marked the beginning of its 70th year to introduce ICID Vision 2030 and to re-connect with the National Committees by re-dedicating to the mission of ICID through its expanding network of member countries across the globe. To further strengthen and activate ICID network, the Central Office invited the Ambassadors/High Commissioners and their representatives from member countries to join in a warm get-together followed by a cultural event and networking dinner. More than 70 people attended the celebration that witnessed participation from 25 Embassy officials from 16 ICID member countries and dignitaries from MoWR, CWC, AARDO, World Bank, CBIP, Yes Bank, IARI, ICAR, IWF, IWP, IWMI, direct members and retired Office Bearers also graced the occasion with their benign presence. I virtually welcomed the dignitaries live from South Africa and similarly, several other National Committees also interacted with the audience.

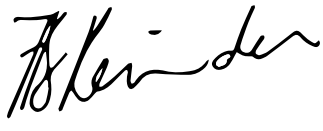
Another major event – the 8th Asian Regional Conference (ARC) was held in picturesque Kathmandu, Nepal in May 2018. Hon'ble Bidya Devi Bhandari, President, Federal Democratic Republic of Nepal, as the chief guest inaugurated the event in the benign presence of our international colleagues from USAID, IWMI, ICIMOD, ICEWaRM, FMIST and the World Bank, who joined us in big numbers to organize their side events. This gave ICID participants a unique opportunity to interact with the international agencies. The technical sessions of the 8th ARC were very well-attended with more than 100 technical and research papers that covered almost the entire spectrum of our domain underscored with the main theme "Irrigation in Support of an Evergreen Revolution." I congratulate our NENCID colleagues for making the regional conference a huge success.

Earlier in March, during the 8th World Water Forum (WWF8) held in Brasilia, Brazil, ICID in collaboration with World Water Council (WWC) organized an exclusive ceremony to recognize three World Water Systems Heritage (WSH) nominations: (i) The Genbegawa Irrigation Canal System, Japan; (ii) Sekikawa Suikei Land Improvement District, Japan; and (iii) Sheikh-Bahaei Water Allocation Scroll, Iran. Prof. Benedito Braga, President, WWC and myself presented the Citation Plaques and Certificates to the representatives. The WSH Program aims at identifying and preserving the people-centred water management systems, organizations, regimes and rules as intangible water heritage considered as outstanding value to humanity and giving them recognition. To continue to highlight the role of heritage in present day planning and management of water resources, ICID also participated in an expert consultation on "Water as Heritage for Future Generations" held in Chinese Taipei in May 2018.

Colleagues, as I conclude, I am pleased to inform that preparations are in full swing for the 3rd World Irrigation Forum to be held in Bali, Indonesia in 2019 and the 24th ICID Congress in Sydney, Australia in 2020. The technical planning is in full stream and we would welcome your suggestions to make them richer and fruitful.

See you all soon and wishing everyone a happy and safe journey to Saskatoon!

With regards,



Felix Reinders
President, ICID

INSIDE

ICID•CIID
www.icid.org

Country Profile – Canada

General

Canada extends across the continent of North America, from Newfoundland on the Atlantic coast to British Columbia on the Pacific coast with a population of about 28 million people. Nearly 80% of Canada's population lives within 300 km of the southern border as most of Canada is uninhabited or thinly populated due to rugged terrain and severe climate. Over three-fourths of Canada's people live in cities or towns. Canada has six cultural and economic regions, namely (1) the Atlantic Provinces, (2) Quebec, (3) Ontario, (4) the Prairie Provinces, (5) British Columbia, and (6) the Territories. With its capital in Ottawa, Canada has two official languages; English and French. About 67% speak only English, 17% speak only French, while 15% speak both languages.

Land and Climate

Canada covers more than half of North American continent bordering Alaska on the northwest and the rest of the continental United States on the south. Canada spans over 5,187 kmfrom the rocky coast of Newfoundland in the east to the St. Elias Mountains in the Yukon Territory in the west. Canada has eight major land regions. They are (1) the Pacific Ranges and Lowlands, (2) the Rocky Mountains, (3) the Arctic Islands, (4) the Interior Plains, (5) the Canadian Shield, (6) the Hudson Bay Lowlands, (7) the St. Lawrence Lowlands, and (8) the Appalachian Region. Canada's northern location gives the country a cold climate, but conditions vary considerably from region to region. During the winter, westerly winds bring frigid Arctic air to most of Canada. Average January temperatures are below -18°C in two-thirds of the country. Northern Canada has short, cool summers. In the northern Arctic Islands, July temperatures average below -4o C. Southern Canada has summers that are long and warm enough for growing crops. Summer winds from the Gulf of Mexico often bring hot weather to southern Ontario and the St. Lawrence River Valley. Some coastal areas of British Columbia receive more than 250 cm of precipitation annually, most of which is received during the autumn and winter. The Canadian prairies have from 25 to 50 cm of precipitation a year, mainly as rain during the summer. These conditions help make the prairies ideal for growing grain. South-eastern Canada has a humid climate. The average annual precipitation ranges from about 75 cm in southern Ontario to about 150 cm on the coasts of Newfoundland and Nova Scotia. More than 250 cm of snow covers eastern Canada in winter.

Rivers

Large numbers of rivers, waterfalls, and lakes add to the scenic beauty of the Canadian countryside. Until the first railways were built during the 1800's, the rivers and lakes also provided the only means of reaching Canada's vast interior. Canada has four major drainage areas or basins; (1) the Atlantic Basin, (2) the Hudson Bay and Hudson Strait Basin, (3) the Arctic Basin, and (4) the Pacific Basin. The Atlantic Basin covers about 1.8 million square km in eastern Canada. The most important waterway in this area is the Great Lakes, St. Lawrence River system. The Great Lakes, the largest group of freshwater lakes in the world, cover 244,780 square km.

Water Resources

Canada is extraordinarily rich in water resources. Almost 25% of all surface fresh water in the world is present in Canada. The country has more water per capita than any other large country in the world. The exhibit shown below summarizes water withdrawal and consumption for the year 2013 (see Figure).

According to the Government of Canada, in 2013, approximately 38,300 million cubic metres of water were withdrawn from Canada's rivers, lakes, groundwater and oceans. The thermal power generation industry withdrew the most water, which was used for cooling and to produce steam to drive the turbines that generate electricity. Thermal power generation is followed by the manufacturing, households, commercial and institutional, agriculture, mining and oil and gas sectors. The majority of the water withdrawn is circulated back into the water body from which it was taken.

Total water withdrawal declined from 42,200 million cubic metres of water in 2005 to 38,300 million cubic metres in 2013. The substantial drop in water withdrawal is related, in part, to a decrease in manufacturing production between 2005 and 2013, which resulted in the manufacturing sector withdrawing 31% and consuming 37% less water in 2013 than in 2005.

In 2013, approximately 3600 million cubic metres of water were consumed or were not returned to the original source. Agriculture consumed 1600 million cubic metres, or 80%, of the water withdrawn from water sources. Between 2005 and 2013, water consumption decreased slightly from 3700 million cubic metres to 3600 million cubic metres. Households and thermal power generation experienced reductions in consumption of 16% and 45%, respectively, over the same period.

Water consumption refers to water withdrawn but not returned to its original source. In producing food for Canadians, the agriculture sector in British Columbia, Alberta and Saskatchewan consume the most water overall. In the British Columbia interior and the Prairies, irrigation systems are widely used to improve crop yields because the amount of water in this region is naturally low. Very little of the water used for irrigation is returned directly to its source. The oil and gas sector is also a large consumer of water. Approximately 95% of the water withdrawn is consumed; however, water is recycled and reused wherever possible, avoiding additional withdrawals from surface water and groundwater sources.

Agriculture

Agriculture accounts for about 3% of Canada's GDP. Canada has about 300,000 farms with an average farm size of 232 hectares. Wheat, beef cattle, milk, and pigs combine to account for more than half of Canada's total farm income. Other leading products include barley, chickens and eggs, maize, and rapeseed. More than three-fourths of Canada's farmland is in the Prairie Provinces. Saskatchewan produces more than half of Canada's wheat, and farmers in Alberta and Manitoba grow most of the remaining crops. Barley, flaxseed, oats, rapeseed, and rye grow in a belt north of Canada's wheat-growing areas.

Irrigation

Of Canada's 50.66 million hectares of arable land, only 1.1 Mha are irrigated. In the province with the most irrigated land, Alberta, 40% of the agricultural output comes

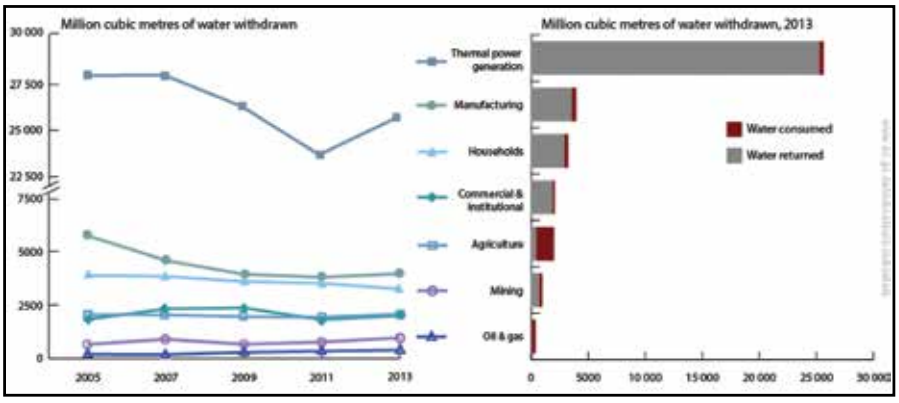


Figure. Water withdrawal by use and consumption in MCM (2013)
[Source: Environmental indicators - www.ec.gc.ca/indicateurs-indicators]

from 4% of the province and arable land that is irrigated. Most of Canada's major crops are irrigated crops, such as cereals, oilseeds, alfalfa, non-cereal forage, sugar beets and potatoes. As the price of land continues to rise, producers are looking to increase crop yields per unit area of land. Irrigation is often the tool used to meet this objective. Table shows province-wise distribution of land irrigated in Canada.

Out of the total water used in agriculture, 85% accounts for irrigation, while 15% for livestock watering. The overall water use efficiency is 75% in the Eastern Irrigation District of Alberta, which is typical for irrigated agriculture in western Canada. Irrigation is needed mainly in the drier parts of Canada, such as the southern regions of Alberta, British Columbia, and Saskatchewan (accounting for 84.5% of all irrigation in Canada). The southern regions of Alberta and Saskatchewan receive less than 350 mm of precipitation per year. In general, without irrigation, a summer fallow rotation must be practiced. Most irrigation in these regions is by use of centre-pivots, side wheel-role systems or flood irrigation for grains, oilseeds, forage crops and sugar beets. In the provinces of Ontario and Quebec which receive about 900 mm of precipitation every year, use of controlled drainage and/or subsurface irrigation is prevalent. It has become common for farmlands that have artificial subsurface drainage systems, to use these buried pipelines to deliver water to the root zone.

Table. Regional Distribution of Irrigated Lands in Canada

Geography	2014	2016
	Hectares	
Canada	585,870	688,780
Atlantic provinces	1,880	2,570
Quebec	10,200	14,440
Ontario	12,190	34,350
Manitoba	19,770	32,390
Saskatchewan	39,370	39,370
Alberta	434,470	489,940
British Columbia	68,000	75,730

Source: Statistics Canada - https://www.statcan.gc.ca/

Drainage

About 9.46 million ha of land in Canada is drained, most of this is under surface drainage. In Ontario and Quebec, more than 2.5 Mha area is subsurface drained. These two provinces have very intensive cereal, grain, forage and vegetable crop production where the soils have very low hydraulic conductivities. In addition, the cropland is very flat and the region (eastern Canada) experiences high amounts of precipitation that occurs mostly during the spring snowmelt period and the fall. Since the soils are very heavy, mainly clays and clay loams with some fine sands and silts, and with the conditions described above, artificial subsurface drainage is necessary. Surface drainage consists mainly of open field ditches, main drains, land levelling or smoothing, bedded lands and ridge and furrow cropping. Subsurface drainage consists of mostly corrugated plastic pipe systems installed to an average depth of about 1.2 m below the soil surface. Generally, 75 or 100 mm diameter pipes are used for lateral drains, and the collectors are 100 mm in diameter and increase as the area drained increases. Most collector outlets are 250-300 mm diameter.

Environmental and Ecological Concerns

Irrigation may lead to water quality problems. Improper irrigation practices may degrade the soil structure and quality (soil salinity problems), thus compounding many of the water quality issues that are associated with agriculture. Challenge before the water resources sector in Canada is to minimize the negative effect of agriculture and agri-food sector on the water quality and increase water use efficiency. To address these concerns, water laws and policies exist in Canada. For example, the Federal Irrigation Act is the original water law in Western Canada; Water Resources and the Environmental Protection Acts in Ontario; while in Quebec a new water management policy is being prepared by taking a holistic view towards water resources management in the province of Quebec.

Integrated Watershed Management

In Canada, 10 themes are being considered for integrated water management. These are - sustainability, stewardship, the ecosystem approach, enhancing effectiveness and efficiency, information and understanding, partnerships and stakeholders, impact assessment, adaptive management, anticipation and prevention, and alternative dispute resolution. Several provinces including Quebec and Ontario are undertaking integrated watershed management projects. Agricultural producers are being encouraged to develop and implement farm conservation plans. Some provinces now require fertilizer management plans. The Canadian Constitution gives the provinces the responsibility of managing the majority of all the natural resources, including water. Although Canada may appear to have a favourable water supply-demand balance, in reality the situation is disguised by wide variations. More than 60% of river flow goes north where only 10% of the Canadian population lives.

ICID and Canada

Canada became a member of ICID in 1956 and has been ever since pursuing the ICID mission actively through its National Committee and its members. Mr. Aly M. Shady has been the President of ICID for the tenure 1996-1999 and Dr. Chandra A. Madramootoo for the tenure 2008-2011. In addition, a total of seven Vice Presidents - Dr K.W. Hill (1960-63), Dr. T.H. Anstey (1974-77), Mr. C.J. McAndrews (1980-83), Dr. H.M. Hill (1987-90), Mr. Aly M. Shady (1990-93), Dr. Chandra A. Madramootoo (2000-2003); and Mr. Laurie C. Tollefson (2012-15) have served the Commission.

The Canadian National Committee of ICID (CANCID) has had the distinction of successfully hosting the 27th IEC meeting in Banff, 1976; 40th IEC meeting in Ottawa, 1989; and 53rd IEC meeting and 18th International Congress on Irrigation and Drainage, Montreal in 2002. In conjunction with the 40th IEC meeting, the 2nd Pan-American Regional Conference was also organized in 1989. The 69th IEC Meeting and International Conference on Innovative and Sustainable Agri-water Management: Adapting to a Variable and Changing Climate are scheduled from 12–17 August, 2018 in Saskatoon.

Irrigation in Support of an Evergreen Revolution

Dr. Vishnu Pandey[1] and Madhav Belbase[2]

The 8th Asian Regional Conference (ARC-8) on the theme "Irrigation in Support of an Evergeen Revolution", was organized during 2-4 May 2018 in Kathmandu, Nepal by the Government of Nepal (Department of Irrigation & 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.

The 8th Asian Regional Conference (ARC-8) witnessed participation of renowned professionals from United States Agency for International Developmen (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 (ICE WaRM) and other reputed organizations to deliberate on various issues to steer 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. Opening remarks were delivered by the President Felix B. Reinders, and Vice President Madhav Belbase. More than 520 participants from 22 countries attended the conference which include approximately 100 international participants. Over 100 abstracts were accepted for the oral presentation, which were presented in 15 technical sessions.

The theme of the conference was further sub-divided into five sub-themes. During the conference, each sub-theme was deliberated upon via several technical sessions during which the key components were discussed. The conclusive remarks are summarized in Table.

The opening plenary was moderated by Dipak Gyawali, the Chair of Technical Advisory Committee (TAC) of the ARC-8. It was divided into two parts. In the first part, Mr. Gyawali provided context of the conference as well as technical highlights. Six high level speakers delivered keynote speeches in the session. The speakers include, Arnaud Cauchaous (Senior Water Resources Specialist, Asian Development Bank), Carol Jenkins (Head of SEED Office, USAID), Saroj Pandit (Director General, Department of Irrigation, Government of Nepal), Secretary General Ashwin B. Pandya, and Ahmed Shawky (Senior Water Resources Specialist, World Bank).

The second part of the opening session included release of the Technical Report of ASRWG-WT titled "Contribution of Agriculture Water to the Rural Development of Asia". The ICID President and Vice-Presidents jointly released the report.

In addition, a total five symposiums were organized as part of plenary sessions: (1) "Modernization of Irrigation Systems", jointly organized by Department of Irrigation (DoI) and the World Bank. The session was addressed by three keynote speakers (President Hon. Prof. dr. Bart Schulz, Vice President Ian Makin, and Mr. Kyu Sung Choi); (2) "Irrigation,

1 Research Fellow (Water), Asian Institute of Technology (AIT), E-mail: vishnu.pandey@gmail.com

2 Vice President, ICID, President, NENCID, Joint Secretary, Water and Energy Commission Secretariat, Nepal, Email: belbasem@gmail.com

Table. Sub-themes of the conference

Sub-Theme	Components	Key Message
Enabling small holders' capacity to obviate farmers' distress	enhancing access to appropriate technology and non-conventional banking services; promoting asset management of small holders'; innovative and workable financing mechanisms; addressing to low productivity and market uncertainty; legal and institutional arrangements for collective farming of small holders' organization; etc	Consolidating collective farming, not just physical, but in terms of their social capacity to demand services; and risk transfer approach (e.g., insurance mechanism) may help to obviate farmers' distress.
Coping with recurring droughts and floods in the context of climate change	characterizing climate variability/change and climatic extremes; climate change impacts on water availability and demand; issues/challenges of land and water management; developing resilience to climatic variability and extreme events; crop insurance; etc.	focus on multiple storage approaches, including artificial groundwater recharge, could be workable coping strategies/ mechanism in semi-arid Asia.
Modernizing irrigation systems for better services	multi-perspective evaluation of irrigation systems; approaches of irrigation system modernization for achieving SDGs; innovation and technical advances for water-energy-food security; system automation for efficient/effective management options; institutional reforms of large scale irrigation systems; mainstreaming modernization process through various reforms; etc.	solar pumping is a key emerging factor in modernization, but it can be both blessing and curse. Focus on multi-purpose projects (e.g. hydropower + irrigation + others) will be a key impetus to sustainable modernization.
Enabling Water Users Institutions (WUIs) for sustainability of irrigation systems	performance assessment, enterprising, and sustainability of WUIs; institutional and policy landscape of irrigation/ drainage sectors; process and procedure of participatory irrigation development/ operation/ maintenance in various countries; role of irrigation/ farmers/water users' organization in improved irrigation system performance; etc.	farmlands are not only the food producing units, but they also have multi-functional role, such as education, recreation, etc. Water use institutions will be better empowered when they are linked intrinsically with other important social functions of farms.
Irrigation, ecosystem services, and aquatic biodiversity	assessment of trade-offs between and optimization of consumptive uses of water and environmental flows; water-related natural infrastructure and ecosystem services in the water-energy-food nexus; impact of irrigation on water-related ecosystem services; contributions of traditional knowledge to understanding and managing irrigation ecosystems; using information from valuation and other assessments in decision-making for long-term ecological sustainability.	biodiversity conservation and irrigation have hitherto worked at cross-purposes creating sub-optimal conditions for both sectors. Two communities (irrigation & biodiversity conservation) should interact closely from the very conceptualization stage to assure healthy development both.

Ecosystem Services and Aquatic Biodiversity", organized by USAID's PAANI project. The session include keynote speech of Prof. Jeff Opperman; (3) "Sustainable Irrigation", organized jointly by IWMI and ICIMOD. A high level panel, focused on technological and institutional innovations aimed at improving efficiency, equity and sustainability of irrigation systems in Asia, consisted of Hon. Karlene Mayward, Former Minister, Australia, Dr. David Molden, Director General, ICIMOD, Nepal, Dr. Vadim Sokolov, Head of the International Fund for Saving the Aral Sea (IFAS), Central Asia, President Felix Reinders, and Vice President Ian Makin, Asia Director, IWMI; (4) "Nexus Challenges in Irrigation Institutions", organized by Farmer Managed Irrigation System Promotion Trust (FMIST) and facilitated by Dr. Prachanda Pradhan. The session includes key note speeches of Prof. Asit Biswas, Dr. Douglas Merrey, and Mr. Devesh; (5) "Climate Change and Adaptation/Mitigation to Floods/Droughts", organized by ICEWaRM. Dr. David Molden delivered keynote speech.

As part of plenary session 7, Bheri Babai Diversion Multipurpose Project (BBDMP) under the Department of Irrigation (DoI), the Government of Nepal, organized "Inter-Basin Water Transfer in Bheri-Babai Irrigation Project – Experience Sharing".

Additionally, a Young Professional Training Program was held during the conference. The 1st session was conducted by Vice President Dr. K. Yella Reddy focusing on the concept of water footprint and virtual water approach as a tool for improved water use efficiency. The second session of the training was conducted by Mr. Andrew Johnson, Dr. Dave Penton, Ms. Carmel Pollino and Mr. Amit Parashar from CSIRO (Australia). The content was focused on basin planning, its implementation, and introduction on the basin planning tool 'Basin Futures'. The conference was concluded successfully on 4th May 2018 with a closing remarks by the Minister for Energy, Water Resources and Irrigation, the Government of Nepal with a very positive response from all the participants and stakeholders.

Way Forward

Following the technical sessions and deliberations, a broad consensus emerged among the participants that to move forward a multi-pronged approach is needed which will require a continuous dialogue among the policy makers, water resources planners and managers, farmers and water user groups, NGOs and international agencies as well as stakeholders at large. In a nutshell, partnership is the keyword.

Water as Heritage

Henk van Schaik*

Water is vital for life, and its availability has been a concern for mankind throughout the ages. But have you ever given a thought to the value of water management as heritage? If not, then you are not alone. Interestingly, water professionals do not value water-related heritage in their daily practises. But, is this wise? Irina Bokova, Former Director General of UNESCO, writes: "As a basic element of life, our relationship with water is complex, entailing material, and spiritual dimensions, and embodied in heritage that is both tangible and intangible. This relationship has always been a source of inspiration and a wellspring for innovation and creativity, leading us to think not only the present but also the future and the security of future generations."[1]

Enthused by these thoughts a group of concerned water and heritage experts from different continents and organizations, including ICID, recently met in Chinese Taipei to organize an international conference "Water as Heritage" to be held in May 2019 in Chinese Taipei.

The conference specific focus is to bring together prominent water-focused organizations (NGOs and government agencies) and heritage groups in order to develop networks and build working relationships between these two sectors and disciplinary fields.

Why Water-as-Heritage?

In the contemporary world, the functional and heritage dimensions of water are typically treated separately. Thus, engineers are concerned with supplying/treating water and governments with regulating water supply and use; local communities may use water for recreation as well as for rituals and ceremonies and heritage experts are interested in studying and conserving past water icons but have little concern for the values of water heritage for the present and the future.

Context

The 'Water-as-Heritage' International Conference is a part of a series of activities of ICOMOS NL aimed at better connecting heritage organizations and wider water sector organizations in its ambit, including ICID and its World Water System Heritage (WSH) programme as well as its World Heritage Irrigation Structures programme (WHIS). Earlies ICOMOS NL organized conferences on Water and Heritage that took place in Amsterdam (2013)[2] and Delft (2016)[3].

ICID made presentations on its water heritage initiatives, WHIS and WSH, in an open forum in which more than 80 international and local stakeholders participated. It was a good opportunity to highlight the distinction between the two programs as WHIS focuses on physical irrigation structures and their engineering characteristics, while the WSH considers people-centered approaches to water governance and management of irrigation infrastructure.

The proposed conference will focus on the broad topic of 'Water and Heritage for the Future'. Beyond exploring the topic, the conference is supporting the creation of an ICOMOS International Scientific Committee on 'Water and Heritage', that was proposed during a meeting of the ICOMOS Scientific Council held in December 2017 in New Delhi, India,[4] and received unanimous support

The conference will also discuss contributions to the:

- 20th ICOMOS General Assembly (Australia, October 2020 on the theme 'Shared Heritage')[5]
- 9th World Water Form (Senegal, 2021 on the theme 'Water Security for Peace and Development')[6]

Objectives

The 2019 Water-as-Heritage International Conference has three primary objectives:

1. To foster cooperation between organizations and researchers working on water management and on water heritage.
2. To bring together a diversity of communities of practice (engineers, chemists, hydrologists, planners, historians, architects, anthropologists, economists, and lawyers, for example) to stimulate working together with communities of interest (indigenous groups, farmers, and neighbourhood groups, for example).

   To continue to work towards the creation of a scientific group on the topic 'Water and Heritage for the Future' within the umbrella organization ICOMOS (International Council on Monuments and Sites).

Scope and format

The conference will focus on five water-related themes: (i) water for services; (ii) waterscapes; (iii) waterways; (iv) water for power, power of water; and (v) worldviews on water. Each theme will be explored through a series of cross-sector and cross-disciplinary discussions facilitated by representatives of three sectors from heritage organizations, other water sector organizations, and a related agency based in Chinese Taipei.

Additionally, the conference will include keynotes, a field trip and the development of a statement on the work and outputs of the conference. Selected papers will be published and the outcomes will entail the establishment of networks of organizations and communities that can work in cohesion and synergy for the care and safeguarding of life critical resource - WATER.

For further information on the conference, please follow the latest news updates from ICID or visit the website ICOMOS.NL (https://www.icomos.nl/)

* Ambassador Water and Heritage, ICOMOS, The Netherlands, E-mail:henk.vanschaik19447@gmail.com

1 Willems, W. and van Schaik, H. (eds) (2015). Water and Heritage: Material, Conceptual and Spiritual Connections. Sidestone Press; 2 Willems, W. and van Schaik, H. (eds) (2015). Water and Heritage: Material, Conceptual and Spiritual Connections. Sidestone Press; 3 Hein, C. (ed.) (in press, 2018). Adaptive Strategies for Water Heritage. Springer.; 4 Agenda item 5-3, Meeting of the ICOMOS Scientific Council, 10 December 2017; 5 Key water and heritage-related aims for this event include: 1. Formally establish an ICOMOS International Committee on Water and Heritage for the Future; 2. Participate in the Scientific Symposium through presentations, workshops, and/or roundtable discussions; and 3. Promote work on the water-as-heritage theme across ICOMOS.; 6 Efforts will be made to have the Water-as-Heritage Conference recognised as a preparatory event for the 9th World Water Forum to be held in Dakar, Senegal in 2021.

Enabling Business of Agriculture: India

Dr. Arvind Kumar*

With the global population projected to reach nine billion by 2050, growing demand for food is estimated to increase by about 20% worldwide in the next decade-and-a-half. This necessitates the urgency for enhancing the productivity, profitability and sustainability of agriculture to fight hunger and eradicate poverty. According to broad estimates, agriculture is the economic and social mainstay of about half a billion smallholder farmers and agriculture constitutes the largest source of income, livelihood and food security in most of the developing countries.

Experts opine that sustainable food supply calls for a more productive and efficient way of growing food, adoption of policies and regulations that foster growth in the agriculture and food sectors, well-functioning markets, and thriving agribusinesses that make more food available in rural and urban spaces.

Enabling the Business of Agriculture (EBA)

World Bank's project, Enablingthe Business of Agriculture (EBA)aims at making agriculture as a driver of growth and a tool to alleviate poverty, the investments and performance of key players across agricultural value chains, i.e, from farmers to large and small agricultural businesses. According to the World Bank, by providing key data on regulatory frameworks that are globally comparable and actionable, EBA strengthens the information base that can be used for policy dialogue and reform. As per the World Bank, EBA seeks to improve knowledge and understanding of this business environment, which can help governments to establish appropriate regulatory systems that ensure the safety and quality of agricultural goods and services without being overly costly or burdensome on market actors.

The World Bank EBA Report 2017, released in February 2018 was the third report of the series. The 2017 Report presented data that evaluate legal barriers for businesses operating in agriculture sector in 62 countries and across 12 issues. It provides quantitative indicators of regulation for seed, fertilizer, machinery, finance, markets, transport, information and communication technology (ICT), and

water. India's ranking on seed indicator is at 21, fertilizers at 18, machinery at 21, finance at 15, market at 43, transport at 49, water at 53 and ICT at 18. However, there is growing criticism of the EBA's sub-indicators which evaluate seed regulations. It is argued that a vast majority of farmers in developing countries source their seeds within farmer-managed seed systems, which are maintained by farmers' own work to recycle and save seeds from their crops, and by farmer-to-farmer gifts, exchanges, and trade. Farmer-managed seed systems provide a rich diversity of seeds, including varieties that are affordable and adapted to local environmental conditions. They are vital to support agro-biodiversity, food security, and resilience against climate and economic shocks.

According to some experts, the EBA's narrow set of 'good practices'to regulate seeds systems restricts policymaking in facilitating private development and marketing of industrial seeds. The EBA uses slightly misleading language by calling industrial seeds 'quality seeds'and conveys the perception that farmers' seeds are unworthy of policy support. The resultant impact is that such some project pushes governments to adopt intellectual property rights framework, which restricts farmers' rights to save, exchange, and sell seeds. It advocates for reforms to accelerate and minimize the cost of releasing industrial seeds; and places private and public corporations at the centre of every aspect of seed systems.

While ruling out the possible benefits accruing to the majority of farmers from such EBA reforms, these critics opine that on the contrary these reforms will increase the profits of a handful of private companies. Replacing farmers' seeds with a few uniform industrial varieties contributes to the rapid erosion of global agro-biodiversity, which is crucial to address the climate change crisis. Thus, they have called for putting an immediate end to the EBA project in order to protect farmers, food security, and the planet.

Indian Context

Undoubtedly, food-grain production in India has increased five-fold over the last six decades; nonetheless, with the average Indian farm half as large as it used to be five decades ago and yields among the lowest even in developing economies, both the agriculture sector and farmers have been driven to the brink. India's low crop yield in pulses and cereal is attributed to excessive dependence on monsoons, which are becoming more erratic owing to rapidly changing climate.

According to the experts, small and marginal farmers face the dual plight of affordability and difficulty of adopting modern techniques of irrigation and crop production on small plots. Thus, burdened by indebtedness due to successive crop failures and low yields, the farmers in some areas are becoming miserable to the extent that in some cases they are pushed to the brink to end their lives. Hence, more smallholder-centric reforms in the agriculture sector are needed before the EBA model is widely applied in India.

* President, India Water Foundation, E-mail: drarvind@indiawaterfoundation.org

Value Engineering in Irrigation and Drainage

Dr. Kamran Emami*

Value Engineering (VE) is an intensive, interdisciplinary problem-solving methodology that focuses on improving the value of the functions that are required to accomplish a goal or objective of any product, process, service, project or organization. VE began at General Electric Co. during World War II. Because of the war, there were shortages of skilled labour, raw materials, and component parts. Lawrence Miles and Harry Erlicher at G.E. looked for acceptable substitutes. They noticed that these substitutions often reduced costs, improved the product, or both. What started out as an accident of necessity was turned into a systematic process. They called their technique "value analysis."

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

Large and medium scale irrigation systems worldwide account for about 60 percent of the irrigated areas but are the one that present the most severe gap between expected and actual performance. Efforts to improve the performance of these systems have been mixed because of a number of misconceptions of the problems. ICID has formed a Task Force on Application of Value Engineering in Irrigation and Drainage Projects to promote the application of Value Methodology (Value Engineering, Value Analysis, Value Planning, Value Management and Value Engineering Change Proposal (VECP)) in irrigation, drainage and flood management projects to increase benefits, reduce cost and ensure sustainable irrigated agriculture.

TF-VE, upon concluding its activities in 2017, took the initiative to establish a new Working Group on Value Engineering (WG-VE) with mandate as: (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 inter-disciplinary 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 of 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 (IRD); (f) To finalize a book on Application of Value Engineering in Irrigation and Flood Projects". (g) To encourage member countries to produce papers on Value Engineering case studies.

Accordingly, a successful VE workshop was organised for a group of 25 participants (including staffs and international students) engaged in the water and agricultural sector from the Institute for Technology and Resources Management in the Tropics and Subtropics (ITT) of Technical University of Cologne Germany, Agricultural Sciences and Resource Management in the Tropics and Subtropics (ARTS) of the University of Bonn, Germany and Environmental Sciences Research Institute of the Shahid Beheshti University Tehran, Iran.

On a journey to learn from the problems and solutions of water resources management in dryland agriculture, it was important to establish a foundation for which water resources projects can be improved. Despite restless flight hours and jetlag from difference in time zones, high curiosity was raised about the concepts and methodology of VE and its application across development projects.

From the concept of creativity and ethics, to cost saving in projects, the VE workshop was one of the highlights of the trip as attested by the participants. Heralding the study visit, it formed the basis for assessing current and traditional water resources projects as they travelled across the different cities in Iran.

Coming from Germany, a country with less than 5% of its it's cultivated land under irrigation, it was interesting to see irrigation development at such a large scale and predominantly dependent on groundwater resources. Having studied in theory and learned first-hand about the dynamics of our host terrain, VE provided a basis for evaluating water resources management, water use efficiency, and productivity in our visit to the different irrigation schemes across the country with varying irrigation practices. This raised questions and opened doors for collaborations towards practices that leads to improvement of water resource management as well as ignited a thirst to upscale VE beyond the scope of water resources to the SDGs.

Although not too late, the participants acknowledged that this concept would have made more impact if it had come at an earlier point of our academic and professional career. Hence, the need to advocate it in their various capacities for an earlier inclusion along the learning chain and across spheres of education.

Finally, the workshop helped the participants to; see the importance of VE in water resources projects and beyond, emphasised the role of traditional and natural infrastructure in water resources management (Qanats) and provided an avenue to introduce the ICID Young Professionals e-Forum to the participants and encourage their involvement in ICID activities.

* Chairman, TF-VE, and Managing Director, Kurit Kara Consulting Engineers, Iran, Email : kkemami@gmail.com

ICID•CIID

International Commission on Irrigation and Drainage (ICID) established in 1950 as a scientific, technical and voluntary not-for-profit professional international organization.

The ICID News is published quarterly by ICID Central Office, New Delhi, India.

Editor-in-Chief:
Er. Ashwin B. Pandya, Secretary General, ICID
Editorial Team: Dr. Sahdev Singh, Director (KM)
Madhu Mohanan, Communication Officer
Ms. Prachi Sharma, Knowledge Officer
ICID, 48 Nyaya Marg, Chanakyapuri, New Delhi, India
E-mail: icid@icid.org, Website: http://www.icid.org