Greetings!

Dear Colleagues and Friends,

Water is perhaps the greatest unifier in the world in every sense of the word. It helped create human communities among the hunter-gatherer nomads by settling them on the banks of major rivers and other waterscapes. Eventually, these early communities transformed themselves into ancient civilizations over thousands of years and then later into the nations and regions of the world. Water has been a catalyst for partnership development within communities, nations, and regions. It continues to serve as that even now in our globalized world, simply because it is a universal resource requiring cooperation to flourish the human populations. A more explicit meaning of the above statements would become apparent in the rest of my message for this quarter of ICID News.

I am delighted to share a few recent developments that clearly show the expanding horizons of ICID in the Arab world. First, ICID signed a Memorandum of Understanding (MoU) with the Arab Water Council (AWC) during the recently held 5th Arab Water Forum in Dubai from September 21-23, 2021. AWC is working towards an Arab collective role that raises the level of awareness with existing water resources management challenges, intensifies the current effort to confront them, and contributes to the development of the new water culture. I see a significant similarity in the visions of both ICID and AWC, which is conducive to work on a mutually beneficial agenda of better management of water resources.

Along the same lines, the second MoU was also signed between ICID and the International Center for Biosaline Agriculture (ICBA) during the forum. ICBA, with a vision for sustainable livelihoods and food security in marginal environments, is on a mission to work in partnership to deliver agricultural and water scarcity solutions in marginal environments. It is strategically engaged in promoting sustainable management of natural resources, providing climate change solutions, enhancing agricultural value chains to advance sustainable food, feed, and biofuel agri-technologies. Again, I feel the future potential of mutual growth through cooperation and synergistic activities.

The 5th Arab Water Forum in September 2021, where the above two MoUs were signed, served as a perfect platform for ICID and its international partners (FAO, IWMI, ICARDA, among others) to organize several joint thematic sessions during the forum, in which I also participated virtually. The outcomes of these sessions will soon come out and be shared with all.

This issue of ICID News covers technical articles and knowledge agenda of near-future ICID events in Morocco and Australia. Here I would like to highlight the latest initiative that ICID has embarked upon: the establishment of a World Register of Irrigation Projects. The register aims to create a global database of irrigation projects, having an operational area of >5000 ha each, along with their salient features to serve the irrigation communities around the world and facilitate knowledge exchange. The article gives further details. I would like to acknowledge the personal initiative and excellent input and development of this Register by the ICID Secretary General. On your behalf, I would like personally thank him for his creativity and going the extra mile to support ICID.

As you are all must be well aware, the 72nd IEC meeting and related events later this month in Marrakech, Morocco, are around the corner; logistic and technical preparations are now in their final stage, and I take this opportunity to wholeheartedly invite you on behalf of the ICID family. Further details are inside in a dedicated article.

With best regards,

Prof. Dr. Ragab Ragab
President, ICID
ICID periodically organizes regional conferences across the world – African Region, European Region, Asian Region, and Pan-American Region. The African Regional Conference (ARC) series started in April 2004 in Cairo, Egypt addressing agricultural drainage. Because of global restrictions posed due to COVID-19, the 5th conference in the series will be organised on a hybrid model (physical and online participation) by the Moroccan National Committee of ICID (ANAFIDE) from November 23 to 26, 2021 in Marrakech, Morocco with the support of the Directorate of Irrigation and Agricultural Land Planning.

Additionally, the 72nd IEC of ICD will take place from 26 to 30 November 2021 along with a training session for African young water professionals from November 19 to 23 organised by ANAFIDE with support from ICID, Chinese National ICID Committee, Afro Asian Regional Development Organisation, AARDO and Islamic Development Bank, IDB.

A wide range of participants, including policy decision-makers, professionals, academicians and researchers from Africa and beyond working in irrigation and drainage or closely related fields are expected to attend this conference and side events. Morocco, located in North Africa, is a gate to Europe with the Strait of Gibraltar at a distance of 14 km from Spain. In terms of agriculture, Morocco has a long and rich experience in agricultural water mobilisation, agricultural water management, various scales of irrigation schemes, sharing and transferring in the fields of design and management of irrigation schemes, water-saving and valorisation, new technic and systems in irrigation including PPP projects.

**Theme and Sub-Themes**

The main theme of the conference is "Sustainable Management of Irrigation for an Improved Resilience of Agriculture in Africa" with the following four sub-themes:

1. Strategies to Cope with Water Scarcity
2. Valorization of Irrigation Water
3. Management of Irrigation Schemes at Different Scales
4. Drainage and Ecological Issues

**Registration Fees**

Registration fees cover the conference proceedings (extended abstracts document and full papers on USB key), coffee breaks, receptions, lunches, sponsored dinners and a 1-day technical tour on November 27th, 2021. Interested participants may register by visiting the website (http://5arcid.ma).

**Conference Venue**

The conference will be held in the City of Marrakech, a very attractive and tourist place with various accommodation options and flight services. Furthermore, the City is centrally located in an arid region where high demand for water uses both for irrigation, domestic supply and tourism promotion requires challenging water management policies. The meeting place is the Mohamed VI Museum for the Water Civilisation in Morocco. Participants will be offered a ticket to visit the museum.

Marrakech is an imperial town with impressive and world-known monuments from the 12th century including, the Koutoubia Mosque and Minaret, the Jemaa El Fna square, the Badie Palace,
the Menara reservoir, the Khettara historical traditional water tunnel, the Saadian tombs. It also includes modern attractive places such as Yves Saint Laurent Museum, Majorelle Garden.

**Technical tour and Post conference trips (optional)**

The technical visit included in the registration fees: One day visit (November 27th) to the Haouz Irrigated area, in the Marrakech region. The technical tour will include small, medium and large irrigation schemes. It will cover design and management aspects to cope with water scarcity management aspects by water, conflicting uses for water (drinking water and agricultural water), the role of users’ associations in managing irrigation schemes and water saving, valorisation of water through the growing of vegetables and fruits.

**Post conference trips (optional) after the 72IEC will last (2 days: 1st and 2nd December 2021)**

**Post conference Tour 1:** to the Souss irrigated area (Southwest of Morocco) and the touristic coastal city of Agadir.

The First Day of the tour includes a visit to the first PPP irrigation project in the world at El Guerdane Scheme, where an area of 10,000 ha is irrigated with drip irrigation, using water taken by gravity from Aoulouz dam as well as a visit to the historical city of Taroudant. The second day of the tour includes a visit to the seawater desalination plant which will produce 400,000 m$^3$ of water per day, half of it will be used to irrigate an area of 15,000 ha with drip irrigation at Chouka scheme and the other half for drinking water use by the city of Agadir. Also, a modern farm growing red fruits for export will be visited.

**Post conference Tour 2:** to the coastal and touristic town of Essaouira, a former Portuguese city called Mogador, west of Marrakech. This tour will include the visits to Qsob dam and irrigation scheme, farms and cooperatives for producing and marketing local and exotic agricultural products such as argan oil, aromatic crops, etc. Participants will like very much the historical city of Essaouira (formerly called Mogador during the Portuguese colonial period)

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http://www.5arcid.ma
https://all-event.ma/5arcid/en/
The Emphasis on Agricultural Water Management in the IPCC Climate Report 2021 and the Role of the International Commission on Irrigation and Drainage

Dr. Ray Shyan Wu*

The UN’s Intergovernmental Panel on Climate Change (IPCC) Working Group I, report released on Aug 9, 2021 is the first part of the IPCC’s Sixth Assessment Report (AR6). The IPCC scientists warned that global warming of 2°C will be exceeded during the 21st century, unless immediate, rapid, and large-scale reductions in greenhouse gas emissions occur in the coming decades, limiting warming to below or close to 1.5°C. 

The report indicated that the human-induced climate change is already affecting many parts of the world through climate extreme events of flood and drought. Climate change is significantly affecting the water cycle, causing intense rainfall and subsequently flooding (e.g. flood in central Europe countries such as Germany, Belgium, Luxemburg, in July 2021), as well as more severe drought in many regions (e.g. USA, Turkey, Greece, Algeria, July-August 2021). Furthermore, it is affecting rainfall patterns as well. In high latitudes, precipitation is likely to increase, while it is projected to decrease over large parts of the subtropics. Changes to monsoon precipitation are expected, which will vary by region. These changes will affect the water resources availability, agriculture and food production.

The agricultural and ecological drought events increased in 12 regions: Western North America, North-Eastern South America, Western and Central Europe, Mediterranean, Western Africa, Central Africa, West Southern Africa, East Southern Africa, West Central Asia, East Central Asia, East Asia, Southern Australia, respectively, but only decreased in Northern Australia region. In the future, several changes in the climate system will become greater in response to the increasing global warming. Such changes will include an increases in the frequency and severity of agricultural and ecological droughts in some regions.

The scientists emphasized in their report that the future of the planet will depend to large extent on the choices the humanity is making today. Since agriculture globally accounts for 70% of fresh water resources use and contributes up to 30% of greenhouse gas emissions, it contributes to and is threatened by climate change. Adaptation and enhancing the resilience of water management system, policies and practices to the climate variability are the way forward. A number of tasks are currently carried out by the WG-Climate and the other Working Groups of ICID including: Enhancing weather forecasting and monitoring, applying improved water harvesting and storage, supplementing the water requirement for rain-fed crops, adopting highly efficient irrigation systems and best water management practices. These activities are essential to address the increasing variability of rainfall, and to reduce the adverse impacts of extreme events of floods and droughts.

Given the importance of the Climate Change impact on Agriculture, ICID addressed these issues by establishing a dedicated Working Group on Climate Change and Agricultural Water Management (WG-CLIMATE). Given the climate change is a cross cutting subject, ICID’s other Working Groups also deal with relevant issues of climate change impact and adaptation. The Working Group on Climate is dedicated to the mitigation and adaptation of agricultural water management to the changing climate. The working group is gathering useful information and case studies on climate change for practical use especially in improving the impact assessment and adaptation development. In line with Climate Urgency, currently the working group is preparing an important publication entitled “A Guide to Innovative Irrigation and Drainage Management under the Changing Climate”, scheduled to be released by the end of the year 2021. This Guide will include case studies from 25 member countries and report their successful practices of adaptation to the climate change impact.

* President, Chinese Taipei Committee (CTCID) and Chairman of WG-CLIMATE
Remote Sensing Based Irrigation Intelligence With Manna Software

Dr. Sangita Ladha*

PRECISION FARMING TO SMART FARMING

Increasing population and abrupt weather fluctuations around the world has put huge pressure on agricultural food products for quality and sustainable food production. In 2050, our planet will need to provide food for an estimated 9 to 10 billion people. To produce anything like that figure, we’re going to need a lot of water. Achieving food security in the future while sustainably using water resources is a major challenge for this and the next generations. The big question is: how can we increase water productivity so that we can grow more crops per drop?

Precision Farming is defined as managing variations in the field accurately for higher productivity with fewer resources thereby reducing input and production costs. By increasing water use efficiency, we can increase the number of crops grown with the same amount of water and can provide food for a larger population. The advent of Micro Irrigation Systems has enabled precision in the application of water and fertilizers at the right place and in the right way. Whereas Smart Farming is an emerging concept that refers to managing farms using modern Information and Communication Technologies to increase the quantity and quality of products while optimizing the resources.

Today’s growing challenges in agriculture urge a shift from precision farming to smart farming to maximize food production while reducing the resources invested.

The goal of smart agriculture research is to enable a decision-making support system for farm management. The precise application of this technology along with the Internet of Things (IoT) is supposed to be a helpful technology for farmers to uplift their living standards, with high production and profit and also can be a good indicator for food security. Data helps account for water use in agriculture, a key part of sustainably feeding a growing population. The novel technologies are quite efficient but still require the consistent attention of researchers, scientists and government bodies for better application and output of this technology.

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Manna Irrigation: The Concept of Intelligence Software

The challenge facing all humanity: maximizing food production while reducing the resources invested. Manna seeks to meet this challenge, by striving to develop a solution that contributes to efficient water usage in the field of irrigation.

Irrigation Decision Support from Outer Space: MANNA IRRIGATION, a system in particular is recognized where irrigation is critical to crop development, and water availability is declining due to climate changes.

Manna Irrigation is a leading Israeli company & is backed by Rivulis Irrigation which is one of the world’s leading Micro Irrigation Companies. Manna Irrigation offers Irrigation Intelligence Software to Individual farmers using Remote Sensing Techniques & Agronomy. Manna offers irrigation intelligence solutions to help growers decide when and how much to irrigate.

Manna Irrigation with its sensor-free, software-only approach, leverages high-resolution, frequently updated satellite data and hyper-local weather information to deliver highly affordable and accessible site-specific irrigation recommendations.

The system relies on satellite imagery analysis combined with precise meteorological data and an agronomy model. Satellite images are received from three different satellite systems every day; the Manna system analyzes the satellite data to determine the exact and current crop conditions vegetation vigour, water potential and more.

In other words, it includes software only, without sensors or hardware in the field, and therefore is easily adopted by users. Its goal is to support the farmer’s decisions; when and how much to irrigate, without the need for physical contact with the soil or the plant.

Weather data is based on a virtual-station, hyper-local weather service that provides historic, current and forecast conditions at the farm level. The agronomy models are adapted to each crop (currently supporting about 50 crops) and geographic location. The system combines all these factors in parameters of the soil and irrigation system and provides precise and dynamic irrigation recommendations (daily/weekly).

The software enables individual farmers, receive recommendations through Web / Mobile includes:

(a) Daily/Weekly Irrigation Recommendation
(b) Real-time Crop Monitoring Maps/ Images
(c) Daily weather Forecast

Benefits of Software

By using, actionable information by Manna Intelligence Software, farmers can effectively manage irrigation Scheduling Decisions with the below benefits

- Real-time, a daily reliable estimate of the water requirement of the crop helps in applying an accurate amount of water
- Real-time hyper-local weather data (on daily basis) including reference evapotranspiration helps grower/farmer in taking decisions such as Irrigation planning and scheduling
- Daily satellite images help farmers in analysing different portions of their farm area for crop uniformity & take suitable decisions
- Sensor free & easy to use accurate solution helping farmers to access his farm from anywhere and anytime i.e., Real-time & dynamic

Two major impacts of using such a tool and achieved in major crops of India is:

- A significant amount of water and electricity saved
- Increase in yield and water use efficiency

Manna’s accessibility

Every grower in the world has direct access to personalized and affordable irrigation intelligence on the smartphone which they can use daily for optimized and confident irrigation decisions.

Way Forward

Agriculture production is experiencing a modern revolution and has involved the use of communication and information technology. The use of modern agricultural technologies is a must. This can be a powerful tool for farmers for the efficient use of resources and real-time management.

Manna software computes the amount of water lost to evapotranspiration that should be provided by irrigation systems with input on crop data and planting date information. Using remote sensing satellite data, soil moisture level at the root zone level is estimated, without deploying any physical sensors in the farm. The assimilation of high-resolution weather data from meteorological stations provides customized precise calculations on water application to every farm. Without any doubt, smart farming is helpful for the farming community with real-time alerts thereby assisting the grower in farm management with the precise use of agricultural resources for sustainable food production. Such an inexpensive, effective and innovative technology that has outreach anywhere in the country can enable growers to adapt to smart farming even with limited knowledge and skills.

Manna software is a way forward for transformation from Precision farming with Micro Irrigation to Smart and Digital farming.
Need for a Global View

Irrigated agriculture forms the kingpin of the food and water security of the country and the region. Systematic irrigation is practised through irrigation projects of various sizes, which provide the assured source for a sustainable and timely water supply. Thus, an irrigation project forms the atomic unit of irrigation and water resources development. Across the world, irrigation is practised under varying agro-climatic conditions and topography and area appropriate solutions for the same determine the features of individual irrigation projects.

A global view of the irrigation and drainage projects provide great insights into various development approaches followed across the world, their success and their performance. It is observed that the topographic, hydrologic, agronomic, and social conditions form a unique combination in which an irrigation project gets planned and implemented. Hence, there is a need to have a global view of the developments which show us the measures adopted and their contexts under a multi-dimensional environment. Attempts are made by various researchers and practitioners to examine specific issues but examination of a project as a whole in a global context requires a repository of information through which the individual projects of interest can be visualised and approached for lessons.

ICID is the only major international scientific and technical organisation that, through its membership network, spans across more than 90% of the irrigated areas of the world. The necessity for having a global view of projects devoted to irrigation and drainage is greatly felt by the member countries and across the world by various agencies. ICID has, therefore, taken initiative to collect and provide a community knowledge base of irrigation and drainage projects which can work as a common pool resource for understanding the status of development and approaches used for the development and management project under varying conditions.

Setting up a Register of World Irrigation Projects

Various registers exist in the field of engineering structures and other entities, the most notable from the water resources angle being the World Register of Dams being maintained by the International Commission on Large Dams (ICOLD). ICID is also maintaining a World Register of Heritage Irrigation Structures and awards recognition to the structures meeting the eligibility criteria.

Most registers examined are about structures and individual components of a system and none recording the features of irrigation and/or drainage project on a worldwide scale. It is, therefore, felt that such a register should be established for irrigation projects and ICID being a key player in the fields of irrigation and drainage is the most suitable agency for the establishment of a Register on “World Irrigation Projects”. The authenticity of the projects in the register will be obtained through ICID National Committees.

The facility is presently located at www.icidevents.org/WorldIrrPrjs/Default.aspx and is in the development phase. At the appropriate time, once a critical mass of data is available, the same will be migrated to a dedicated domain duly registered.

Hope that you have already registered and made all arrangements to witness this important event taking place in this region after a gap of 34 years. In case your country is going through international travel restrictions, ANAFIDE has made all the arrangements to help you participate in this important event using their Hybrid platform.

ICID and ANAFIDE invites all its members and stakeholders to join actively and support the first physical event after the Covid-19 lockdown. REGISTRATION LINK: https://sagaspace.ma/product/5e-arc-conseil/

Hybrid Registration Link will be made available on ICID website shortly. The opening ceremony and other main events will be live streamed on YouTube channel for wider reach.

Come let’s meet at Marrakech!

A Message from Irrigation Australia

COVID-19 disrupted events on a global scale and Irrigation Australia was not immune from the impact of this pandemic. We were very disappointed to have to hold the 24th ICID Congress & 73rd IEC Meeting, combined with the Irrigation Australia Conference & Exhibition, as scheduled in 2020. After our efforts to use the crisis to host this event and the extensive planning and work undertaken, we were very determined that the event could still be held in a post-pandemic environment. The date and venue may have changed but the enthusiasm, commitment and warm hospitality of the organizing committee has not.

Accordingly, on behalf of Irrigation Australia and the ICI National Committee (IACID), we extend a warm invitation to you to participate in the 24th ICID Congress & 73rd IEC Congress, combined with the Irrigation Australia National Conference & Exhibition to be held in Melbourne, Australia from 5 October to 10 October 2021.

The Australian irrigation industry is delighted to have the opportunity to host this event and showcase our irrigated agriculture industry to the world. To add value to your participation in the International Congress, we have combined it with our biennial Irrigation Australia Conference and Exhibition, the biggest irrigation event in the southern hemisphere. ICID themes will be able to attend the local conference sessions and our large international exhibition in addition to the comprehensive IACID program.

The theme for the 24th ICID Congress is Innovation and research in agricultural water management to achieve sustainable development. Australia is a direct beneficiary of the efficient use of water at the forefront of our efforts and strategies to expand our domestic production of food products and maintain our reputation as an exporter of high-quality foods to a growing world population.

The event will be hosted in Adelaide, which is Australia’s 3rd largest city and home to a vibrant culture of arts, culture and great food. It is renowned for its beautiful parks and historic buildings, some of the most advanced agricultural production in the world.

The event will be held in the heart of Adelaide’s cultural and historic district, full of the many museums and galleries, providing a unique cultural experience for all visitors.

The organizing committee will be engaging a selection of interesting and informative experts and further details on these will be released during 2021. This Congress and Exhibition is a great opportunity to submit abstracts as it will be an exciting and important event on the international irrigation calendar.

It is a great privilege to be awarded the opportunity to host the International Congress, which is being held in southern hemisphere for the first time since its inception in ICI. We hope that you and your team will be able to attend this event and we look forward to welcoming you to the historic city of Melbourne.

If you have any questions or require assistance, please do not hesitate to contact us via email at icid@icid.org.

We look forward to seeing you in 2022 in Adelaide.