2011/1



Also available at http://www.icid.org Managing water for sustainable agriculture

Message from the President

Dear Friends,

As I write this message, the world is gripped by dramatic political, social, and economic turmoil erupting in various regions. There is no doubt that rising food prices, among poorer segments of the involved populations, have been part of the trigger of some of the political upheavals. The World Bank and the FAO have sounded the alarm bells with respect to current food prices. According to the World Bank's Food Price Index, food prices are nearly 30% higher than a year ago, and guite close to the peak of the 2008 food crisis. The Bank estimates that another 44 million people have been pushed into poverty, as a result of the current food crisis. The impoverished simply do not have the financial resources to purchase basic nutritional needs.

Some of the countries which have seen the largest increases in the price of wheat, rice, beans and maize are also member countries of ICID, where water management is critical for food production. These include: Kyrgyzstan. Bangladesh, Tajikistan, Sri Lanka, Pakistan, Brazil and Argentina. However, the food crisis extends to other countries including Somalia, Burundi, Cameroon, Uganda. There is little doubt that sound irrigation and drainage practices and developments are inextricably linked to food security. Sustainable management of both excesses and shortages of water is crucial to the implementation of long term food production programs in the affected countries. Unfortunately, the irrigation and drainage



community is forced to simultaneously grapple with increased competition for water from other economic and environmental sectors, water quality degradation, and declining groundwater

I am of the view that there are not enough highly skilled people to tackle these complex problems of water and food security. Very little innovative research on water for food production is being undertaken at the small holder level. This is quite alarming given that there are 500 million small holders in the world and they need urgent access to water, finance, farm inputs and technology. In many instances these small holders lack land titles and the resource base to command clout or attention.

ICID has over 30 work bodies, including some dedicated to poverty alleviation, climate change, and financing of water for agriculture. In light of the current turbulent times, ICID workbodies will have to adopt a more vigorous and urgent programmatic agenda, if we are to see both short and long term containment of the world food crisis.

Time is not on our side. As evidenced in the current political debate, people of all ages and socio-economic backgrounds are increasingly restless. They are demanding change. They are pushing for reforms. They are expecting governments to put practices in place to alleviate the personal financial burdens of high food prices. And they want decision makers to be accountable for the alleviation of poverty, and a better standard of living, which includes access to good quality food and water. I hope that ICID can draw on its body of rich and dedicated global minds to devise new paths for water management for food security. This is an absolute necessity, if we are to see a return to political stability in food insecure and water stressed regions of the world.

Yours truly,

Olandra A. Medramotos

Chandra A. Madramootoo President, ICID



UPH Dr. El-Atfy is the new Minister of Water Resources and Irrigation, Egypt

Dr. Hussein Ehsan El-Atfy has been sworn in as the Minister of Water Resources

Vice President Hon. Irrigation of Arab Republic of Egypt on 31st (2000-09). He was presented ICID's WatSave January 2011. Earlier, Dr. El-Atfy was the Award (1998) for his outstanding contribution Deputy Minister, MoWR&I, Egypt.

> Dr. El-Atfy was the Chairman of the Working ICID community extends hearty congratu-Group on Water Saving in Agriculture lations to VPH El-Atfy. [Source: ENCID]

in water saving in agriculture.

International Commission on Irrigation and Drainage (ICID) was established in 1950 as a scientific, technical and voluntary not-for-profit non-governmental international organization. The ICID News is published quarterly by ICID Central Office, New Delhi, India.

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ICID News 2011/1

ICID Awards/ Lecture: Invitation for **Nominations/ Applications**

ICID will present various awards at the 62nd International Executive Council (IEC) meeting scheduled to be held at Tehran, Iran in October 2011. These are - annual WatSave Awards, triennial Best Performing National Committee Award, and Best Performing Workbody Award. The triennial N.D. Gulhati Memorial Lecture will also be delivered on this occasion. Nominations/applications are invited for these awards/ lecture. The following is the brief.

4th Best Performing National Committee Award

Applications for the 4th Best Performing National Committee Award (BPNCA) are invited from the National Committees. The award is based on the performance of the 'Candidate National Committee' during the 3-year period between 20th and 21st in performance of a National Committee Congresses (2008-2011). The excellence in performance of the National Committee will be judged by a Panel of Judges. The various factors/ facets for rating of excellence

are listed at http://www.icid.org/ awards.html > . Applications from National Committees should reach the ICID Central Office not later than 15 April 2011.

3rd Best Performing Workbody Award

ICID in 2003 instituted the Best Performing Workbody Award (BPWA) to be presented triennially at the time of ICID Congress, based on the various facets demonstrated by the workbody in between two

3rd Best Performing Workbody Award (BPWA-3) from ICID Working Groups / Committees with all requisite information supported by relevant documents so as to

Congresses. Proposals are invited for the reach the Central Office by 10 May 2011. The proposals received will be evaluated by an International Panel of Judges.

WatSave Awards 2011

ICID instituted 'WatSave Awards' in 1997 to recognize outstanding, contribution to water saving/ conservation in agriculture annually, across the world. The awards are given in four categories viz. (i) Technology: (ii) Innovative Water Management; (iii) Young Professionals; and (iv) Farmer.

Nominations are invited for the 'WatSave Awards 2011' from individuals/ team through National Committees/ Committee. The entries are open to all professionals / teams from ICID member countries as well as non-member countries. In case of an entry from a 'non-member' country, the

nomination has to be routed through and validated by an active National Committee of ICID. The deadline for receipt of the entries from the National Committees along with a completed 'Nomination Form' etc. to the ICID Central Office. New Delhi is 30 June 2011.

N.D. Gulhati Memorial Lecture for International Cooperation in **Irrigation and Drainage**

National Committees are invited to send nomination of an eminent expert in the field of irrigation, drainage, flood management, environmental impacts and allied subjects to deliver the 3rd distinguished lecture at the 21st ICID Congress scheduled to be held in Tehran. An honorarium of US\$ 1000 will be given

to the invited distinguished Lecturer from supporting funds received from the family of N.D. Gulhati. The nominating National Committee will undertake to fully sponsor the attendance of the Lecturer, if selected. The paper which will be prepared by the chosen expert for presentation shall be made available to ICID Central Office at

least one month prior to the Congress i.e. 15 September 2011. National Committees are invited to nominate a distinguished personality of eminence from their country in the prescribed form latest by 01 May

The documents to be submitted/ proforma to be filled in and other details for each of the above awards/ lecture are available at http://www.icid.org/awards.html or write to the Executive Secretary, Central Office, ICID, New Delhi on e-mail <icid@icid.org>.

ICID and UNESCO-IHE: A Complementary Partnership

"ICID places a high emphasis on involving young water professionals in its activities, and young water professionals are precisely UNESCO-IHE's audience", explains Dr László Hayde, Vice President of ICID, and Senior Lecturer in Irrigation Engineering at UNESCO-IHE, Delft, The Netherlands. Dr. Hayde who is also the Chair of European Regional Working Group highlights the various facets of complementary partnership between UNESCO-IHE and ICID and its future potential.



Far-Reaching Impacts

The current partnership between ICID and UNESCO-IHE is mutually beneficial and has been in existence since the 1950s. The UNESCO-IHE has been teaching generations of water experts for over half a century. ICID is the largest and only international NGO specializing in management of irrigation, drainage, and flood for food production, since its establishment in 1950 has provided an international platform for networking, policy debates and dialogue. ICID is keen to publish research findings of young water professionals. Its high profile and wide international network can be used to disseminate the knowledge.

"I would like to see a stronger link between ICID and UNESCO-IHE by way of deepening their collaboration on a number of different levels. Several Masters and PhD students are already involved in joint activities, such as the World History of Water Management Short Course at UNESCO-IHE. I certainly believe that the work at ICID complements my work at UNESCO-IHE".

- Dr László Hayde

ICID can also help upcoming water professionals, and the industry as a whole, with recruitment drives and advertisements. Uniting the best minds in the field in this way, and giving them an internationally renowned network through which they can exchange knowledge and share best practices about irrigation and drainage is already having a far-

reaching impact on the water sector. UNESCO-IHE presence in ICID is not only important for personal scientific networking, but brings opportunities in advertising its activities in recruiting potential participants for our programmes, short courses and in preparing scientific research proposals of mutual interest, as well. All such opportunities have already been realised and Dr. Hayde hopes to continue these efforts in coming years through networking.

Contribution of UNESCO-IHE Alumni

Many UNESCO-IHE staff and alumni have held high positions on ICID's Executive Council. Dr. Bart Schultz, Professor of Land and Water Development was President of ICID during 1999-2002 and Dato' Ir. Hj. Keizrul bin Abdullah (Malaysia) was President, ICID from 2002 to 2005.

On 24th February, UNESCO-IHE awarded the 100th PhD degree. The title of the thesis is 'Role of sediment transport in operation and maintenance of supply and demand based irrigation canals - Application to Machai Maira Branch Canals' and was supervised by Prof. Bart Schultz. The topic is very relevant to the newly formed ICID Task Force on Sedimentation. The study has been designed to investigate the hydrodynamic relationships which can prevent sediment deposition in downstream controlled demand based irrigation canals, while catering the crop water requirements of the command area. It has been found that the maintenance needs can be minimized by managing sediment transport through better canal operation and management.

As regards ICID's plans for the next biennium, both organizations will forge their efforts and expertise to look at different key issues in the world and identify ways to address the most urgent challenges - such as adapting and managing land and water resources for urban, rural and industrial areas; producing enough food to meet the demands of the expanding population; and improving water safety and flood protection.

President Chandra Madramootoo on ICID and UNESCO-IHE Relationship



UNESCO-IHE has always supported our efforts in a committed and concerted way. Various Rectors and UNESCO-IHE staff have contributed to our work programme, technical activities, and special projects. President Hon Bart Schultz has been a driving force in our Country Policy Support Studies, and also in organising ICID's inputs to the recent World Water Forums. He also Chairs the Editorial Board of the ICID Journal and has been the driving force behind the success of the journal. Now with the recent election of Vice President László Hayde, UNESCO-IHE is poised to play a significant role in building up the European linkages and support for ICID.

"I place a lot of importance on this special relationship between the two institutions. With the active participation of many UNESCO-IHE staff in ICID and our member countries, there is a personal link which forges strong human bonds of friendship and collaboration".

"I hope that IHE can sponsor some special training programmes in different ICID member countries, and also contribute to the new IPTRID by helping our national committees to build and develop their research capacity".

(Excerpt from the interview of President Madramootoo by UNESCO-IHE Water Institute Update Magazine, January 2011, http://epub01.publitas.nl/UNESCO-IHE/12/)

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Recognizing Wastewater as a Resource in Irrigated Agriculture

Dr. Frans P. Huibers, Irrigation and Water Engineering Group at Wageningen University, The Netherlands and Member of ICID Working Group on Use of Poor Quality Waters for Irrigation (WG-PQW) provides an insight to challenges of using wastewater in irrigated agriculture.

The use of (treated) wastewater in irrigated agriculture is increasingly recognized as a distinctive part of the overall wastewater management chain. Its use is also productive and many families



depend on this water source for their livelihoods. An estimated 20 million ha are irrigated with wastewater, worldwide. In view of the unaffordable costs involved in construction and operation of the treatment plants, full treatment before agricultural use is a nonoption in most countries. Emphasis on research and development therefore should be given to make wastewater irrigation as safe and as productive as possible, given the local context.

UN-Water Task Force

The 'rapid response assessment' document 'Sick Water' was launched on World Water Day 2010 by UNEP and UN-HABITAT as an output of the UN-Water Task Force on Wastewater Management. The report describes the central role of wastewater management in sustainable development. Apart from a general decription of issues and facts, the report suggested the following six recommendations for future activities.

- Countries must adopt a multi-sectoral approach to wastewater management as a matter of urgency, incorporating principles of ecosystem-based management from the watersheds into the sea, connecting sectors that benefits from better wastewater management.
- 2) Successful and sustainable management of wastewater requires a cocktail of innovative approaches that engage the public and private sector at local, national and transboundary scales. Planning processes should provide an enabling environment for innovation, including at the community level but require government oversight and public management.
- 3) Innovative financing of appropriate wastewater infrastructure should incorporate design, construction, operation,

m a i n t e n a n c e , upgrading and/or decommissioning. Private sector can have an important role in operational efficiency under appropriate public guidance.

- In light of rapid global change, communities should plan wastewater management against future scenarios and not only for current situations.
- Solutions for smart wastewater management must be socially and culturally appropriate, as well as economically and environmentally viable into the future.
- 6) Education must play a central role in wastewater management and in reducing overall volumes and harmful content of wastewater produced, so that solutions are sustainable.

To be effective, wastewater management and technology should be linked with social and institutional needs and capacities, in which both top-down and bottom-up approaches should be explored. Community perceptions and its changes need to be studied, also to arrive at savings by the use of low-tech solutions. Likewise, work on wastewater management should also generate political messages, advocating good policy in a search

What is wastewater?

Wastewater can mean different things to different people with a large number of definitions in use. However, it can be defined as "a combination of one or more of: domestic effluent consisting of black water (excreta, urine and faecal sludge) and grey water (kitchen and bathing wastewater); water from commercial establishments and institutions, including hospitals; industrial effluent, storm water and other urban run-off; agricultural, horticultural and aquaculture effluent, either dissolved or as suspended matter (source: Sick Water, UNEP, 2010).



Wastewater use for vegetable fields in Accra, Ghana

to change social norms regarding wastewater management.

Given the complexities and the multitude of stakeholders involved, research and further development of proper and realistic wastewater management requires collaboration between UN agencies and other partners. This can easily start through better communication and sharing of lessons learned.

Possible Role of ICID

There is relatively little research on wastewater irrigation by irrigation engineers. ICID's role in this could be to stimulate research on typical field irrigation subjects, such as irrigation techniques and water management using poor quality water; on farm management of nutrient rich water; health issues for farmers and consumers (also beyond harvest); wastewater in the context of IWRM; socio-technical aspects of wastewater irrigation; and long-term effects on soil productivity and groundwater, to name a few urgencies.

Outcomes of such studies would help to develop education programmes targeted at the agricultural sector to promote safe use of wastewater, in which anthropocentric and environmental needs are linked.

Dr. Frans P. Huibers may be contacted at <Frans.Huibers@wur.nl>.



Role of Irrigators Communities in Advancing Irrigation in Spain

'Irrigators Community' in Spain is an autonomous, not-for-profit and legal group of farmers owning an irrigation area. In Spain, the water concession/right is linked to the land and not to the landowner. Irrigators Communities collectively have the obligation to administer the public surface and ground waters they share. Their foremost task is the distribution and regulation of granted waters as per the norms sanctioned by the Public Authority and agreed by the users themselves. Mr. Andrés del Campo, President of the Spanish National Federation of Irrigators Communities (FENACORE) provides a brief on the functioning of this unique participatory irrigation management.

Irrigation in Spain

Spain has an irrigated area of 3.4 million ha (about 14% of the total area under cultivation) and accounting for nearly 60% of the country's agricultural production. The present water withdrawal for



irrigation is 15.3 billion cubic meters which is 63% of the total freshwater withdrawals. Presently, about 69% of area is irrigated by sprinkler and drip irrigation methods. In Spain, irrigation systems have to be ensured through the necessary regulatory infrastructure (reservoirs and / or transfers) and efficiency in energy consumption and the removal of geometric unevenness in irrigation are vital to its economic sustainability.

FENACORE

Spanish National Federation of Irrigators Communities (FENACORE) was founded in 1955 with the objective of protecting Irrigator Communities interest and rights. It is a non-political organization and acts as a bridge between Irrigators Communities and the Government. FENACORE carries out a wide range of activities like representing irrigators' communities concerning the management improvement and modernization of organization, advising the Irrigators in judicial, practical and technical matters, information dissemination, training the irrigators in new technologies and international communication by participating in international fora. It has also contributed to the Spain Water Policy. Presently, FENACORE has about 700,000 irrigators covering some 2 million ha and about 50% of the irrigated land. FENACORE organizational structure consists of General Board, Director Board, Permanent Commission, President and General Secretary.

Key achievements

To protect the interest and rights of the Irrigators Communities, FENACORE performs a wide range of technical activities and legal advice to the Irrigators Communities, like capacity development through training, short courses and seminars and developing collaboration with different Civil Service Agencies.

In the mid-eighties, FENACORE negotiated with the Ministries of Environment and Agriculture in developing the current Spanish Water Law and regulations; one key aspect of which was the economic and financial regime of 'Water Law'. Through FENACORE, a favorable condition for repayment of reservoirs and waterworks from Irrigators Communities that made use of these infrastructures could be achieved.

Another major achievement of the FENACORE has been that it is not mandatory to pay the VAT of the infrastructures by the members of the Irrigators Communities. VAT law was developed after Spain became part of the European Union, which required the implementation of VAT in all business activities. As 'Irrigators Communities' are not business entities, they were not incorporated into the VAT law, exempting their Community Members' from the additional tax.

In past, there was a system based on special power tariff for various sectors, including irrigation. However, since 2006, the Spanish Government sought to eliminate the special rates for all sectors. Through FENACOREs intervention, it was possible to get two-year extension (until 2008) allowing the Irrigators Communities to adapt to the new situation of free electricity market.

Factors for success

The key factors for the success of participatory irrigation management are - (i) the Irrigators Communities/ Water User Associations must be politically independent, and (ii) the association's structure and operation should be versatile and flexible so as to adapt to different types of irrigation - traditional or

new, ground or surface waters, and an abundance or scarcity of resources.

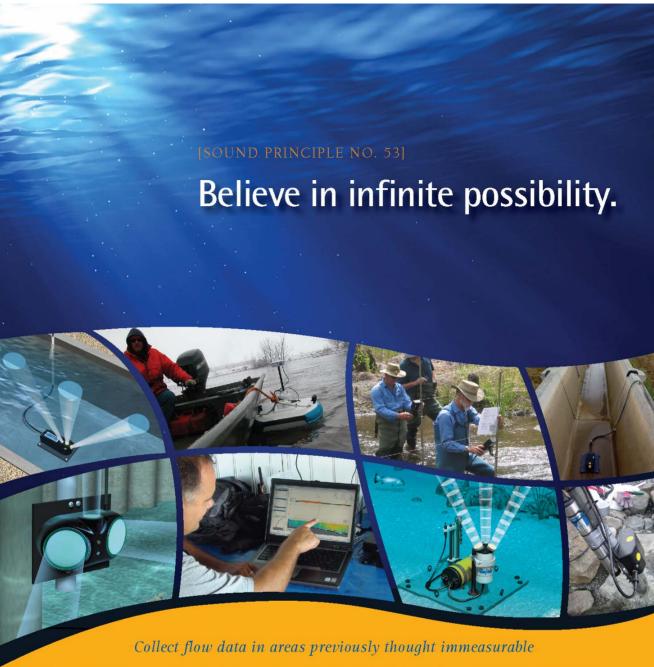
The Irrigation Community is a flexible, open and democratic model and has the following advantages in context of Spain.

- The nature of the Communities of Irrigators as Corporations of Public Right is compatible with private management of the Community and therefore are more efficient and effective.
- The collection of the operation and exploitation of water costs becomes easier for the Government. European member States have to take into account the 'Cost Recovery Principle of the Water Framework Directive',
- Irrigation Community has better control on the use and abuse of water and its administration. It allows better enforcement of laws in the daily management of water,
- Allow users to participate in governing bodies, management and participation in the River Basin assuming responsibility,
- Provides an opportunity to hold rights of public water to a single entity and not to each individual user.
- Make water management easier by distributing equitably and resolving conflicts in the water use, and
- Makes easier to the State to adopt the principle "to manage the closer of who's interested".

It is essential that the Irrigators Communities act as bridge between users and public administration to facilitate better water management and good governance of the water - the scarce and valued resource.

Spain is one of the active members of the ICID since 1955. We appreciate the good work that is being done by ICID in promoting the model of the Irrigators Communities adopted in Spain all over the world.

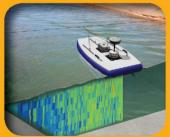
Mr. Andrés del Campo can be contacted at



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Key ICID Events in 2011

This year ICID will have major events in Africa, Asia and Europe. There will be a regional conference in Africa, two regional conferences in Europe, 62nd International Executive Council (IEC), 21st triennial Congress, and 8th International Micro Irrigation Congress in Tehran, Iran. The following is the brief.

24th European Regional Conference (ERC), Orléans, France, 14-16 March



Groundwater is an essential source of freshwater for the planet. It provides more than 50% of drinking water, 40% of industrial water

and 20% of irrigation water. The low costs of installing and operating tube wells along with the resulting agricultural boom have been the main reasons for the considerable worldwide expansion of groundwater use over the past 40 years.

But, unlike surface water, groundwater is not easily measurable and manageable. In most cases it is used by a large number of independent users, including farmers, who have direct and individual access to water. The same goes for diffuse pollutions. The complexity of aquifers functioning on large time and space scales hampers collective action as well as the perception of the impacts on the environment.

However, formal or informal solutions emerge locally. Governance modes and regulations have been experimented in several environments worldwide. What are these solutions? In what conditions are they

are future opportunities for a sustainable management of groundwater resources?

For more than ten years, the Beauce region, which hosts the conference, has experimented a volumetric management system of groundwater. Experience gained by stakeholders and users of the Beauce groundwater will be presented and discussed at the conference.

The conference will take place at the Conference Centre of Orleans, close to Paris. The conference will combine plenary sessions, working sessions and roundtables. A field trip will be organised on 16th March.

The theme of the Conference is 'Groundwater Management' and the subtopics are as follows:

- 1. Hydro-geological studies how do they contribute to explain links between resources and uses and design sustainable management rules?
- 2. Conjunctive use of ground and surface water - which integrated solutions to combine agricultural dynamics and sustainability?

- implemented? How effective are they? What 3. Collective action and multi-actors processes - pathways to sustainability?
 - 4. The EU Water Framework Directive and Groundwater Daughter Directive - which experience feedback? Which issues for the new cycle?
 - 5. Economic approaches how effective are they in reducing groundwater use and pollution?
 - 6. Groundwater use and quality requirements what solutions and accompanying measures to reconcile groundwater quality and local development?

The Conference is open to a wide public of researchers, water basin or managers of irrigation schemes, SME, users' representatives and stakeholders. The registration to the conference is managed by the Tourism Center of Orleans which is in charge of rooms booking, participation fees, touristic tours of March 14 and 15, 2011, technical visit of March 16, 2011.

For details, please access the conference website at < http://www.groundwater-2011.net>, or contact Dr. Sami Bouarfa, Scientific Committee Chair, < sami.bouarfa@cemagref.fr > .

25th European Regional Conference, Groningen, the Netherlands, 16-20 May

Coastal areas are of strategic importance for integrated water management for multiple land use, such as food production, urban and industrial areas, recreation and nature conservation. In these geographical areas water management is related to flood risk management, land reclamation, rural reconstruction, salt water intrusion and habitat conservation. The institutional settings for water management are also important prerequisites for success. In Europe the complex requirements in order to comply with the various relevant EU Directives, notably the Water Frame Work Directive and the Flood Directive, have become an important policy issue. The European countries develop plans and programs to respond to the recent challenges to coastal and tidal management. How can



they mutually benefit from various European, national and regional perspectives and views? The proposed program of the 25th ICID European Regional Conference offers a mix of key note speeches, paper presentations, session workshops, panel discussion, and excursions.

The theme of the conference is 'Integrated water management for multiple land use in flat coastal areas' and will be dealt through the following four subtopics:

- 1. Multiple land use: Integrated water management for multiple land use in flat, low lying coastal areas; developments with respect to land use planning and changes in land use in densely populated coastal areas.
- 2. Fresh water management and salt intrusion: In coastal areas fresh water/

- saline water interactions and their consequences for ecology and water quality generally play an important role in coastal zone management.
- 3. Flood risk management: Flood risk management in flat coastal areas under the influence of changes in land use, possible increase in storm surges, subsidence and impacts of climatic change, as well as the role of ecology and habitats.
- 4. Institutional arrangements and history: Institutional arrangements for water management and flood protection and the role of central government, provinces, communities and non-governmental organizations; the role of the European Directives, and historical perspectives for developments in flat coastal areas.

One of the special sessions will demonstrate a regional integrated planning project for water management, nature development, flood management and spatial rehabilitation. Other special sessions offer in-depth discussions on flood protection, emission-control programs in an agricultural area, water and education, and a comparative assessment of the vulnerability and resilience in ten deltas. The conference will be concluded on Friday with a panel discussion on the theme water and food, introduced with a speech under the Dutch Ministry of Water Management.

For further details, please access the conference website at http://www.icid2011.nl, or contact Dr. Bert Toussaint, Chairman of Organizing Committee of 25th ERC at bert.toussaint@rws.nl.

62nd IEC, 21st Congress and 8th International Micro Irrigation Congress Tehran, Iran, 15-23 October



The theme of the Congress is "Water productivity towards food security" and will be held on Question 56 – Water and land p r o d u c t i v i t y challenges; Question

57 – Water management in rainfed agriculture; Special session on Modernization of water management schemes; Symposium on Climate change impacts on soil and water resources; and History Seminar on Possibilities of using traditional methods in modern water management systems. The 8th International Micro Irrigation Congress will be held during 21-23 October on the theme

"Innovation in technology and management of micro irrigation for enhanced crop and water productivity". Other events viz. International Workshop (TF-FIN), Special Sessions on "FAO-ICID-IRNCID" and "Australia" have also been planned.

Central Office has received a large number of abstracts of papers for these events. Abstracts are being reviewed and authors will be informed accordingly, shortly.

Post conference tours for participants are also arranged for participants to - Shiraz, Isfahan, Khuzestan, and Mazandaran.

The early bird (**prior to 1 June 2011**) registration fees is US\$750 for ICID member country delegate, US\$ 800 for non-member

country delegate, US\$400 for young professional (under 40 years) and US\$300 for accompanying person. Registration amount can be paid through bank transfer or through credit card or onsite.

For more details, please contact: Dr. S.A. Assadollahi, Secretary General, Congress Secretary, Iranian National Committee on Irrigation and Drainage (IRNCID), No. 1, Shahrsaz Alley, Kargozar St., Zafar Ave., Tehran, Iran, Postal Code: 19198-34453. Tel: (+9821) 2225 7348 - 22250162, Fax: (+9821) 2227 2285, E-mail: < i r n c i d @ g m a i l . c o m > , < icid2011@gmail.com > , Website: < http://www.icid2011.org > .

3rd African Regional Conference, Bamako, Mali, December

The main theme of the Conference is "Food security in Africa and climate change: Improving the contribution of irrigation" and subthemes are - the impacts of climate change on irrigation development in Africa; Policies and strategies to improve the contribution of irrigation and drainage to

food security in Africa in the context of climate change; and Productivity of water for agriculture and the challenges of climate change. In addition, two panels of experts and to special sessions will be organized. Contact: Dr. Adama SANGARE, Secretary General, Association Malienne des

Irrigations et du Drainage (AMID), Au Modibo Keita, Im Sulla and Fils, BP 1840, BAMAKO, Mali. Tel: (223) 222 75 21, Mobile No: (223)674 08 94, Fax: (223) 223 48 82, E-mail: <a.sangare@betico.net>; <betico@betico.net>.

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