ICID•CIID

ICID Newsletter

Managing water for sustainable agriculture

Also at http://www.icid.org 2007/4

Message from the President

Italy and South Africa

Such a lot has happened since the last Newsletter that I cannot possibly do it all justice. This issue has reports on the ICID regional conferences in Pavia, Italy and the Cradle of Humankind, near Johannesburg, South Africa, and the USCID conference that accompanied our Council meeting in Sacramento, USA. I should explain that the Cradle of Humankind describes the environs of Glenburn Lodge where our 2nd African Regional Conference was held, a World Heritage Site blessed with a greater wealth of the prehistory of our species than any other place on Earth.

Pavia is rich with history in the more conventional sense, being the capital of Lombardy and having the second oldest university in Italy, founded in 1361. It was therefore appropriate that our 22nd Regional Conference should be accompanied by a workshop that explored the legacy of the Romans and later regimes on water management in Europe. It was also an opportunity to launch the "Pavia Initiative" under which we propose using Europe as a meeting place for ICID to have dialogue with organisations that have common interests in managing water for sustainable agriculture, several of which are based in Europe.

5th World Water Forum 2009

We also have a brief report in this issue of the Newsletter on the meeting to which ICID was invited, at which WWC President Loic Fauchon set out the objectives of the next World Water Forum to be hosted by Turkey in 2009. President Honoraire Bart Schultz able representation of ICID at this meeting marks an important step in ensuring that the voice of agriculture is heard at the 5th Forum.

Evolution of the Newsletter

I am pleased that we are giving prominence in this issue to this year's two WatSave awards, celebrating water savings achieved in Brazil and South Africa. We also have articles on the MASSCOTE approach to modernising irrigation management, and on inter-basin transfers. Such articles are moving the Newsletter towards filling the gap between the monthly News Update and our professional journal Irrigation and Drainage that hopefully will meet the demand for technical content that can be disseminated free of charge either as a PDF file or in hard copy. If you need printed copies, please contact Central Office about your requirements.

58th International Council Meeting

The Council opened this year in Sacramento by offering our condolences on the deaths of no less than five notable contributors to ICID: Vice Presidents Hon Cor Storsbergen (Netherlands), B P Bhatnager (India) and John Daniel (Malaysia), and also Wayne Deason (USA) and Januz Rydzewski (UK). We are deeply indebted to them all, and respect and remember them with affection.

Young cucumber plants at Graceland Hydroponics Farm, South Africa

On a happier note, I was pleased to welcome Art Walz, Vice President of our sister organisation ICOLD, and also ARID, IPTRID, IWMI and SARIA, all permanent observers on the Council. ARID and SARIA made a big contribution to our regional conference in South Africa and through their efforts we have many more national committees in Africa than might appear on the "active" list. Whilst I would like to see them pay the modest subscription that is due and which make them officially active, I welcome them working further with ARID and SARIA to build up support and become champions in their own countries of managing water for sustainable agriculture.

One thing that is missing from this issue of the Newsletter is a proper reflection on the activities of our technical work bodies that met in Sacramento. We will shortly have the Minutes, but in the meantime I would like to report that the process continues of completing the work of long-standing work bodies, opening new ones and obtaining fresh mandates for those we wish to continue. This has given space for new topics to be tackled, which also has attracted new participants as well as providing fresh interest and better recognition for established contributors.

The workshops on flood management, climate change, poverty alleviation and finance will provide significant contributions towards ICID's preparation for the 5th Forum, coordinated through the task force led by President Hon Aly Shady, which also met in Sacramento. It is the build up to the 5th Forum that will drive much of our activity over the coming months. I look forward to reporting on these activities in future issues.

Peter Lee
President, ICID

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

IN THIS ISSUE

58th IEC and 4th USCID Conference, Sacramento: A Report

Photo: K N Sharma

The 58th International Executive Council (IEC) meeting of ICID and United States National Committee (USCID)'s 4th International Conference on Irrigation and Drainage were successfully held at the Sacramento Convention Centre, California from 30 September to 6 October 2007. The theme of the conference was "The Role of Irrigation and Drainage in a Sustainable Future". Over 450 delegates from 35 countries participated in various events. The IEC was preceded by the meetings of various workbodies, task forces and workshops. The Conference was inaugurated on 3rd October with the keynote addresses of Mr. Robert Quint, Acting Deputy Commissioner for Operations, US Bureau of Reclamation and HE Dr. M Abu-Zeid, Minister for Water Resources and Irrigation, Egypt. Mr. Peter S Lee, President ICID, in his welcome address said that ICID has been at the forefront of addressing the role of irrigation in a sustainable future. He highlighted the necessity of involving commercial farming sector and others in the food chain in the activities of ICID. The proceedings of the conference include some 95 technical papers and were brought out in a CD. The following are the excerpts of the keynote addresses.

H.E. Dr. Abu-Zeid spoke on measures adopted to face major challenges in the Egyptian water sector. He said that the Egyptian Ministry of Water Resources and Irrigation (MWRI) had implemented several policies that aim to better utilize limited water resources and increase the efficiency of water use in all sectors.

'The MWRI expected that in the near future the water supplies available from both conventional and non-conventional resources will not be enough to satisfy the increasing demands for water. Concern, therefore, is now turning to water quality issues. Comprehensive water management programs are being implemented to raise water use efficiency and increase food production. There are also several programs for cost recovery, institutional reforms, laws and legislations, and stakeholders' participation.

The Minister concluded by emphasizing that institutional reforms lies at the heart of the integrated approach for the management of water resources. The institutional reforms aim to strengthen the political, technical, legal, and administrative arrangements that lead to saving water and, in general, maximizing returns from the limited investment available to the water sector.

The MWRI has brought out a paper summarizing the main actions and measures implemented to achieve improved water management and to face future water challenges, and can be viewed at <http://www.icid.org/nletter/nl2007_4_zeid.pdf>.

Commencing with a brief overview of USBR, **Mr. Robert J Quint** went to the current challenges that the water community is facing in the US. USBR has been a longstanding partner of ICID - an organization that has worked tirelessly over the past 57 years to bring the world's attention to the importance of efficient and effective water management in all regions of the world. Mr. Quint focused on the four current challenges viz. (i) urbanization and its impacts on water resources, (ii) efficient infrastructure, (iii) managing draught, and (iii) impact of global climate change on water supply and availability.

Mr. Quint said that in the US, some 1544 billion liters of water are drawn per day from surface and groundwater sources for offstream uses. Irrigation withdrawals are actually decreasing, which may be attributed not only to conservation and technology advances but also to increasing municipal and industrial (M&I) demands.

'The construction of massive projects such as Hoover Dam have turned vast areas of otherwise uninhabitable land into places where people can live and work. However, there is a big challenge of aging dams and infrastructures' said Mr. Quint.

Mr. Quint said that the draughts have presented very serious challenges, resulting into a series of difficult policy trade-offs. 'The storage system initiated by our predecessors is greatly helping to keep us out of crisis. Without this storage capacity, we would have been in deep trouble, he said.

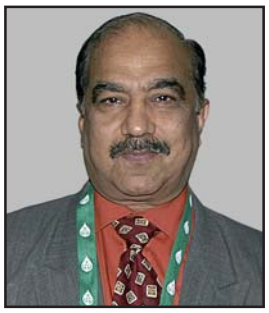
Mr. Quint called on all water resource managers to work hard to meet the challenges imposed by rapid population growth, aging infrastructure, repeated drought and climate variations. The full text of Mr. Quint's speech can be viewed at <http://www.icid.org/nletter/nl2007_4_quint.pdf>

For more information, please contact VPH Larry Stephens, Executive Vice President, USCID at <stephens@uscid.org>.

New Vice Presidents (2007-2010)

Prof. Peter Kovalenko (Ukraine), PhD in Engineering Science (Irrigation and Reclamation), is Director of the Institute for Hydraulic Engineering and Land Reclamation, Ukraine. He is the President of the Ukraine National Committee (UKCID), Vice-Chairman of WG-ON-FARM, member of ERWG and Chairman of the European Work Team on Sustainable Irrigation Management.

Dr. A Hafied A Gany (Indonesia) obtained PhD from Columbia Pacific University, USA and is the Senior HRD Advisor, Ministry of Public Works, Republic of Indonesia. Since 1999, Dr. Gany is the President of Indonesian National Committee (INACID) and has also served as the Secretary General of INACID (1993-1999). He is a member of WG-HIST.



Engr. Dr. Illahi B Shaikh (Pakistan), holds a PhD (Water Resources Management) and a Masters in Business Administration. He is the Chief Engineering Adviser/ Chairman Federal Flood Commission, Government of Pakistan. Dr. Shaikh is the Chairman of Pakistan National Committee (PANCID), Chairman, WG-CAFM, and member of WG-ENV, WG-HIST, and is the Convener of C-CONGR.

To know more about the academic and professional achievements of the new Vice Presidents, please access <http://www.icid.org/ob_biodata.html>

Award Winners 2007

- **Messrs Werner** and **Herbert Arns (Brazil)** have jointly received the WatSave Technology Award (more on page 6).
- **Dr. Abraham Singels (South Africa)** has received the WatSave Innovative Water Management Award (more on page 7).
- **Dr. G R Backeberg (South Africa)** is the receipient of the 'Best Paper Award 2007' in recognition of his outstanding paper titled "Reform of User Charges, Market Pricing and Management of Water: Problem or Opportunity for Irrigated Agriculture" published in Volume 55, No.1 of Irrigation and Drainage – The Journal of ICID.

Dr. Backeberg receiving the Best Paper Award from President Lee

Exhibition and Study Tour

An impressive exhibition showcasing modern technology/ products/ information on irrigation and drainage by over 40 companies and organizations was organized by the USCID. A post conference technical tour was organized from 6-10 October covering Oroville and Shasta dams, Western Canal Water District, Santa Rosa Wastewater Treatment Plant and Reuse, Vineyard irrigation etc. besides other conference tours to places of interest in and around Sacramento.

A fish screen to be installed at the Glenn-Colusa Irrigation District (GCID), Central Valley of California.

President Lee and other delegates visiting the exhibits displayed at the conference venue.

Other Highlights

- Iranian National Committee (IRNCID) will have the honour of hosting the 62nd IEC and 21st ICID Congress in 2011.
- Ukraine National Committee (UKCID) will host the 23rd European Regional Conference in 2009.
- Contract for publishing of ICID Journal by M/S Wiley-Blackwell was extended by another term of 5 years (2009-2013).
- Niger and Uruguay have become new ICID members.
- ICID will provide significant inputs to 5th World Water Forum to be held in Turkey in March 2009.
- Vice President Dr. Gao Zhanyi has taken over as Chairman, PCSPOA and Member, Management Board.

Europe as a Meeting Place to Connect the World of Agricultural Business and Water Management

22nd European Regional Conference with a theme "Water Resources Management and Irrigation and Drainage Systems Development in the European Environment" was held from 2-6 September 2007 at the historic city of Pavia, Italy. Two international workshops viz. "History of Irrigation, Drainage and Flood Control" and "European Framework Directive in the Field of Water Policy" were also held on the ocassion. The Conference was organized by the Italian National Committee (ITAL-ICID) and attended by about 120 participants from 19 countries from Europe and outside. Study tours to Pavia – Novara – Vigevano, and Pavia - Mantova were also organized. Following is an excerpt from President Peter Lee's opening address:

President Peter Lee said that the irrigation and drainage are the two main threads of agricultural water management (AWM), which has two key objectives viz. (1) the "productive", epitomized by the commercial farming sector, and (2) the "developmental" concerned with rural well-being and agriculture's role as one of the principle pathways out of poverty. 'These two objectives are recognized in ICID's motto "water for food and rural development", acknowledging that it is rare to find examples of AWM that do not have, to a degree, both productive and developmental objectives. But there are some systems that are predominantly productive and others that are, predominantly developmental, said the President.

The President said that we should not confuse the productive and developmental objectives, and be given due attention to both. 'Although the productive and developmental objectives each have their own constituency, ICID's international meetings tend to be more orientated to the developmental objective and are held in countries where that objective dominates'.

'But ICID must not forget the productive objective, and the second green revolution that is needed to increase global food production by 67% over the next 25-30 years. If ICID is going to contribute properly to this objective it is going to have to look beyond the world of development-orientated institutions, and connect with commercial farmers, agri-business, technology suppliers and the big food and energy companies, many of which have European headquarters or strong links to Europe' said the President.

Photo: K N Sharma

(L to R) Peter S Lee, President, ICID, G Guizzetti, Vice President and Pro-rector, University of Pavia, L Ubertini, President, ITAL-ICID, P Lassini, Representative of the Lombardia region, M Cutonilli, Director of Agriculture Office, Lazio region, C Gattoni, President of the Federation of Land Reclamation Consortium, Lombardia region

The President said that in the span of just 25-30 years, many AWM systems will remain predominantly developmental, whilst much of the increased demand for more food will be met by other systems having predominantly productive objectives. 'These productive systems may co-exist alongside developmental systems, but more likely they will be in different countries and regions, linked to the demand by trade and international food business, and facing competing demands on commercial agriculture for bio-fuels and other non-food produce'.

'European businesses were strongly represented at the Stockholm Water Week this year, exploring new ways to link investors and businesses to the water sector. Even more significantly, several major European food companies have joined together to launch the Sustainable Agriculture Initiative (SAI), a partnership to actively develop and promote sustainable agriculture. This reflects ICID's own primary purpose - managing water for sustainable agriculture'. The President called on National Committees to help ICID to connect better with such businesses and others concerned with the implications of the productive objective on society and the environment, particularly where this would be facilitated by using Europe as a meeting place.

Photo: K N Sharma

President Lee proposed the launching of *'The Pavia Initiative'* to connect ICID with other organisations, particularly Europe-based organisations interested in the global challenge of managing water for sustainable agriculture. With this initiative, Europe has a vital role to play in the 5th World Water Forum to be held in Istanbul in March 2009, said the President.

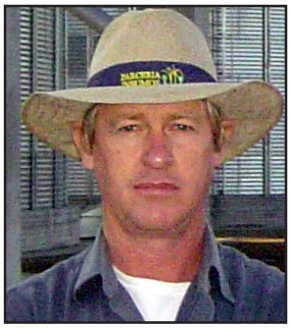
The conference was attended among others by PH Prof Bart Schultz, VPs Dr Georgi Guluyk, Dr Eiko Lubbe, Chair of the European Regional Working Group, Vice Presidents Hon. Dr Ricardo Segura (Spain), Prof Ligetvari (Hungary) and Mr Alain Vidal (France), Mrs Maria Scarascia, Secretary General ITAL-ICID, Er M Gopalakrishnan, Secretary General and Er K N Sharma, Secretary from the Central Office. For proceedings of the conference, please contact Mrs Maria Scarascia, ITAL-ICID, Email: me.scarascia@politeccagricole.it

□

Growing Rice with Center Pivots: A Step towards Water Saving

Messrs Werner and Herbert Arns from Brazil have jointly received the ICID WatSave Technology Award 2007 for their work on water savings in growing rice using center pivot sprinkler system instead of the traditional surface irrigation, where the fields are flooded with water over the growing season. Mr. Werner Arns holds degree in Rural Business Administration and is a farmer by profession. He has 32 years of experience in irrigated rice farming and is a founder of the Club for Direct Planting of Irrigated Rice. Mr. Herbert Arns, farm manager, holds degree in Agronomic Engineering with specialization in the area of irrigated rice including seed science and herbicidology. They have succeeded in reducing irrigation water use by over 50%, besides increase in yields, crop rotation, minimum tillage, and overall reduction in the rice production cost. The following is a summary of Arns' work.

Werner Arns



Herbert Arns

Traditionally, worldwide, rice has been grown using surface irrigation method. Normally, rice fields are flooded with water over the growing season. One of the primary functions of the standing water is to control weed growth. While this practice has proven successful for centuries, the availability of water is becoming scarcer with each season. In an effort to conserve some of the water used in rice growing, Werner Arns, a farmer in the Rio Grande do Sul region of southern Brazil, and his cousin Herbert Arns, an agronomist started experimenting with mechanical move sprinkler irrigation on their rice crop in 1999. They have a total of 1600 hectares farm land and they had been surface irrigating for the past 24 years. As the Arns experienced water shortages in their area, they felt a need to make some significant changes, if they were to remain profitable by growing rice. The Arns began irrigating their field using a single span, 3-hectare Valley center pivot sprinkler system.

Compared to surface irrigation, the Arns' reduced their water use for irrigation by over 50% due to the ability to better manage the water applied to the field with the center pivot. With surface irrigation, the total application depth was 1100 mm, while with pivot irrigation, it is a maximum of 550 mm (Figure1). The center pivot has allowed for even more conservation in the spring months (October-November), when the Arns' only need to irrigate every 2-4 days due to the temperate climate. Another advantage of using center pivots to grow rice is that it facilitates multiple crop rotations over the years, adding valuable nutrients to the soil and improving its texture. This becomes difficult with surface irrigation because of the amount of labor required to prepare the fields from rice to another crop. With center pivots, the Arns were able to grow rice, wheat, soybean and oat in rotation. The Arns have also discovered the benefits of practicing minimum tillage which lead to saving time, reducing runoff, and preserving soil productivity.

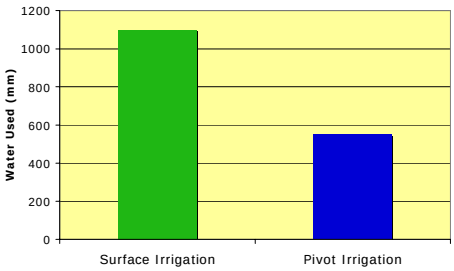


Figure 1. Irrigation water use

As a result of various new practices, the Arns' were able to harvest at least 6500 kg/ha of rice each year, besides reducing pumping water requirements by over 60%. There has also been a decrease in the production cost to the extent of 20% (Figure 2). Despite some increases in crop inputs, overall savings and comparable yields have far outweighed the added costs. With their current savings, the Arns expect to pay off the cost of center pivot machine in five to six years.

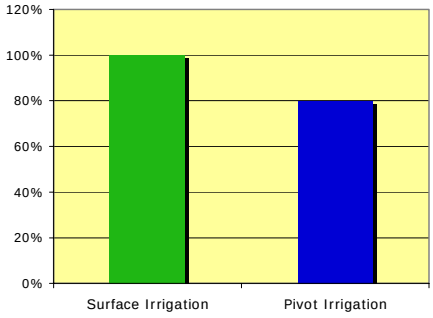


Figure 2. Relative production cost

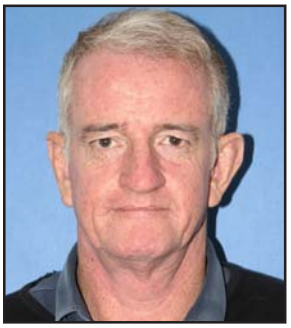
On a global basis, this rice production approach has the potential to provide rice growing opportunities to many regions that may have previously been restricted due to soil or water limitations. To know more about Werner and Herbert Arns' work in water saving, please access <http://www.icid.org/awards.html#t1>.

□

A rice crop irrigated by center pivot system

Water Saving in Sugarcane Irrigation using MyCanesim System

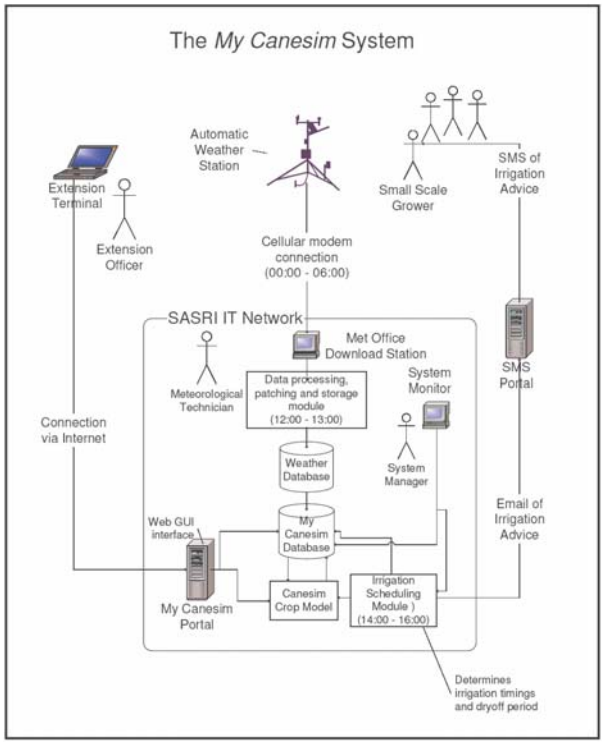
Dr. Abraham Singels, Principal Agronomist at South African Sugarcane Research Institute (SASRI) has received this year's ICID WatSave Innovative Water Management Award for his new approach to developing and implementing a decision support system by deploying the sophisticated information and communication technology combined with participatory methods to achieve substantial improvement in water use efficiency and sugarcane yields for the benefit of small-scale growers. The following is a summary of Dr. Singels' award winning work.



Sugarcane production requires a complex and quick decision making during the growing period. In response to these challenges, Dr Abraham Singels and his team developed a system called *MyCanesim*. *The system* consists of a sugarcane simulation model, an on-line weather database and a communication network, which automatically provides farmers with near real-time field-specific irrigation advice and yield estimates using cell phone text messages (SMS). More extensive information is provided to the advisory support structure by FAX and internet. The approach is now being rolled out to the industry, including commercial growers.

Mr. Mthembu and his daugher measuring water applied through sprinkler irrigation in their sugarcane field in Pongola, South Africa

The main features of the *MyCanesim* are (1) use of state-of-the-art technology, (2) limiting users' exposure to system complexity, and (3) participation of users in system design and implementation. Daily weather data are downloaded from automatic weather stations situated throughout the South African sugar industry. The SMS text messages are sent to the farmers whenever an action is required, but at least once a week. These messages are sent in the growers' mother tongue for easy implementation and comprise a suggestion to start, stop or continue irrigation for their field, with an estimate of current and final cane yield.



The weekly fax summary to advisers contains information for each field in a given scheme on the current irrigation action (irrigating or not), the expected date of the next action (stop or start), the expected date of the last irrigation, current cane yield and rainfall, and irrigation totals to date. Reports containing detailed information such as current and future cane yield, sucrose content and soil water deficit can be downloaded from the website.

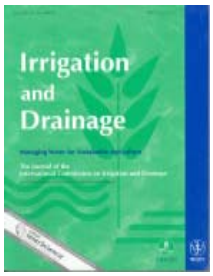
The *MyCanesim* system was implemented on a pilot scale on two small-scale irrigation schemes at Pongola and Makhathini, using semi-permanent and portable sprinkler irrigation systems. The project started with 7 farmers in 2004, which gradually increased to 39 farmers, cultivating some 400 ha of sugarcane. A participatory approach was adopted to ensure relevance and practicality. Farmers, extension staff and mill cane supply management contributed to the design of the web interface, the advice and the reports generated by the system. Problems and progress were discussed at regular implementation and evaluation workshops.

Interviews conducted with participating growers in 2007 showed that 75% of them regard the system as very valuable and follow the advice as far as possible. As regards water savings and yield effects, simulations suggested up to 25% water saving as compared to the previous practice without affecting yields. Some yield gains could be attributed to reduced leaching of plant nutrients.

In addition to these direct benefits from the irrigation advice, the *MyCanesim* system is used by extension staff as a basis for discussion with growers during field visits, and to identify agronomic practices that limit yields such as poor crop stand, insufficient weed control, erratic movements of sprinklers, and excessive sprinkler setting times. To know more about the *MyCanesim*, please access <http://www.icid.org/awards.html#m1>. □

WILEY InterScience® Discover something great

Take Advantage of *'Irrigation and Drainage'* Online



The 'Irrigation and Drainage' is a prestigious, peer-reviewed Journal of ICID, publishing original papers on scientific, engineering, environmental and socio-economic issues associated with irrigation, drainage and flood management.

A Special Issue of *Irrigation and Drainage* on *'Drainage an Essential Element of Integrated Water Management'* will be published in December 2007. The Special Issue will contain 20 papers from all over the world on the various aspects of drainage.

The Journal is also available online FREE via Wiley InterScience® for all ICID Office Bearers (OB), work body members and subscribers.

The Journal is published by M/s. Wiley-Blackwell, UK. To subscribe the Journal please access: http://www.interscience.wiley.com/journal/ird. You may sign up for free Wiley InterScience Alerts - receive the table of contents via email as soon as an issue is published online.

The Rivers of Greater Himalayas and the Likely Trends due to Global Climate Change

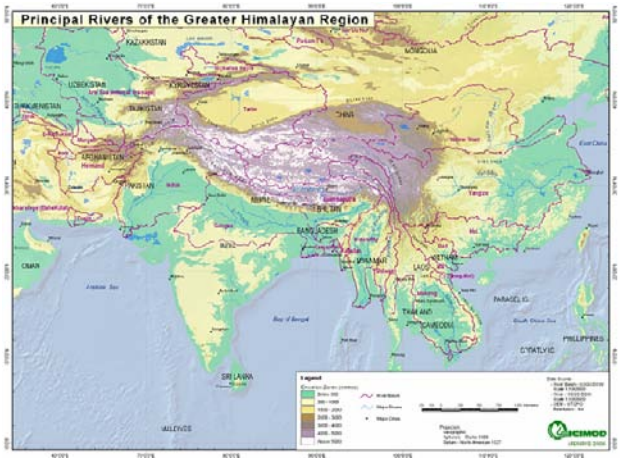
Secretary General M.Gopalakrishnan joined the World Bank-facilitated dialogue process in July this year in Bangkok aimed to consider Himalayan Waters and the possible cooperation between the partner States in South Asia. The initiative viz, Abu Dhabi Dialogue stemmed from the First International Conference on Southern Asia Water Cooperation, a regional meeting of senior government, academic, and civil society members from Afghanistan, Bangladesh, Bhutan, China, India, Nepal, and Pakistan, convened in Abu Dhabi in September 2006 by the International Institute of Strategic Studies with the support of the UK Foreign and Commonwealth Office. It was highlighted that the melting of glaciers and dry season flows could impact adversely the agriculture in Indo Gangetic/ Brahmaputra plains: A report.

Key participants from the seven countries, with the support of the World Bank, agreed to sustain the momentum and continue the engagement on water cooperation in South Asia. They established the "Abu Dhabi Dialogue" as an informal consultative process. The "2nd Abu Dhabi Dialogue" was organized with the theme "The rivers of the Greater Himalayas: the changing conditions in the headwaters, the pressures in the floodplains and deltas, and the challenges of, and opportunities for, regional cooperation".

The conference followed an informal and non-attributable format and required no consensus outcome. Nevertheless, there was remarkable convergence on common themes - to sustain group dialogue, to promote awareness and participation, to undertake joint research studies and training, to promote data sharing, to build/ strengthen institutions, to focus on the major rivers rising in the Himalayas as a common theme, and to seek World Bank support. A few key aspects of the initiative and its outcome are reflected below.

The scale of the challenge

About 1.5 billion people live within the basins of the rivers which rise in the Greater Himalayas; over 700 million people live within the Indus and Ganges-Brahmaputra basins, and over 500 million people live within the Yellow and Yangtze basins. Many more people – almost half of the world's population – live within countries that depend on economic production (e.g., food, energy, industrial production) sustained by these rivers. These populations are growing, and their water demand is growing even faster, in parallel with economic growth. The Himalayan glaciers contain the largest body of ice outside the polar regions, providing critical dry-season and long-term water storage. In the case of the Indus, about 45% of river flow is directly from glacier melt (this figure is about 9% for the Ganges and 12% for the Brahmaputra). Flood impacts in the region – population affected and number of deaths – are higher than in any other region.



The future, climate change and adaptation

Climate has always been changing, but the recent rate of temperature increase across the world is very high in relative terms. In addition, it is apparent that temperature is increasing even faster at high altitudes. In the Greater Himalayan region, models predict rising temperatures and decreasing snow and ice. Data since 1960 confirm this, indicating that glacier retreat is taking place more rapidly in the Himalayas than the global average, and apparently faster than in any other major mountain range. Increased precipitation is also predicted in the region, with higher variability and extremes, resulting in greater flood and drought shocks. As a consequence of the loss of glacier storage, overall flows of major rivers are expected to increase in the short run, and then to decrease due to the reduction of meltwater, in some cases potentially very dramatically. There is little certainty, however, over these predictions. What is certain is that growing water demand and temporal and spatial changes in water availability within the floodplains of the rivers of the Greater Himalayas will require livelihood changes and social and economic adaptation measures.

Uncertainty, non-cooperation and the IPCC "hole"

The prognosis for the rivers of the Greater Himalayas suffers from a serious lack of data for an area of the world whose rivers serve a large proportion of the global population. The lack of data is so serious that there is a blank spot ('no data') in the Intergovernmental Panel on Climate Change (IPCC) AR4 report. Reasons for this are the extremely limited density of hydrometeorological stations, the lack of regional cooperation in observation network design and management, and the absence of any pooling of data, knowledge and research. While this lack of cooperation extends to the whole area of the management and development of international waters in Asia, limiting the range and scale of benefits that can be derived and shared, it is particularly serious in the case of the Rivers of the Greater Himalayas due to the scale of uncertainty and the risks to future livelihoods and growth.

A consensus vision: ten years hence

"A cooperative and knowledge-based partnership of states in fairly managing and developing the Himalayan River systems to bring economic prosperity, peace and social harmony, and environmental sustainability from the source to the sea."

What needs to be done?

Three areas of need were framed by participants for discussion: 1) the need to reduce scientific uncertainty through partnerships and data sharing; 2) the need to define and promote common interests, such as shared data networks and data-bases, joint research, and coordinated hazard forecasting and management; and 3) the need to build upon the 'intrinsic connectivity' of the Rivers of the Greater Himalayas, by sharing the costs and benefits of optimized water management and development, and promoting cooperation 'beyond the river,' such as regional trade facilitation.

□

Modernizing Irrigation Management of Large Canal Systems: The MASSCOTE Approach

Irrigation modernization is often misunderstood and associated exclusively with inputs such as high technology, costly automation or canal lining on the one hand, and institutional reforms on the other. FAO considers that the modern management should be more outcome oriented and respond to the current users needs with the best use of available resources and technologies while anticipating the future needs of different users and uses at the scheme and river basin levels. The critical question is how to translate this concept of modernization into practical and effective technical solutions and management arrangements. Daniel Renault, Thierry Facon and Robina Wahaj of the FAO (NRLW) briefly present the MASSCOTE methodology, recently formalized by FAO, to assist technical experts, irrigation managers and professionals, in addressing present and future needs, issues and challenges of modernization of medium and large irrigation canal systems.

The MASSCOTE approach

Although water is increasingly becoming a globally debated topic, the actual managers of irrigation systems are not provided with practical solutions and tools that could assist them in addressing complex situations and requirements.

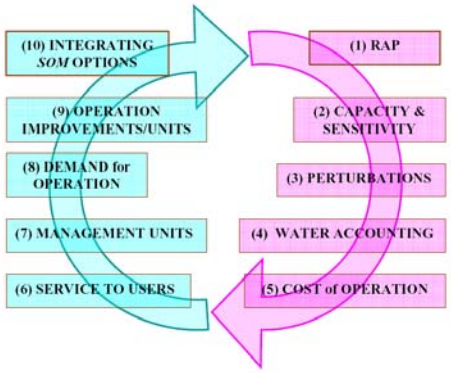
MASSCOTE stands for "Mapping System and Services for Canal Operation Techniques". The entry point of MASSCOTE is canal operation but the scope is modernization and the goal is to promote Service Oriented Management (SOM) with specific targets that are explicit in terms of cost, water and other resources use effectiveness, and for the environment. Dedicated to medium and large irrigation canal systems, the methodology helps in analyzing all the associated details, and embarking upon the difficult road of modernization or re-engineering of irrigation management, with practical and detailed objectives, plans and solutions.

The methodology builds on the evaluation of a large number of irrigation systems carried out in recent years by FAO as part of capacity development programs on modernization and also on contributions from other institutions. During the last decade, FAO has trained more than 900 engineers in Asia. Thus, the approach presented here has largely been developed in close collaboration with irrigation managers in the field, for whom this product has been developed.

The MASSCOTE process

The MASSCOTE methodology seeks to stimulate the critical sense of engineers in evaluating irrigation system performance; diagnosing constraints and opportunities; and developing a coherent modernization strategy. MASSCOTE is designed with a step-wise approach in order to convert the complexity into simple and straightforward elements. These are then explored in a recursive process leading progressively to an improved management setup and better canal operation in order to facilitate the shift towards more effective water management and improved water delivery service

MASSCOTE consists of 10 steps (see figure) leading to the ultimate step of the vision and plan for modernization, and monitoring and evaluation.



Schematic framework of MASSCOTE

The framework is divided into two main parts: (A) baseline information and detailed appraisal; and (B) a vision of water services and a modernization plan for canal operation. The part (A) comprises (1) Rapid Appraisal Procedure (RAP), (2) System capacity and behaviour (sensitivity), (3) Perturbations that are likely to occur along the irrigation canal systems, (4) Water accounting and water balances, and (5) Cost of operating the system. The part (B) consists of (6) Service to users, (7) Reorganizing the management setup and defining spatial units (partitioning management units), (8) Service-oriented management (SOM) that is best adapted to user demand, (9) Options for modernization improvements, and (10) Integrating SOM options. Monitoring and evaluation of performance are genuinely considered at this level as an essential management tool.

A clear vision of the water services should be the starting point from which other steps are carried out (different time horizons may be considered, for instance the mid term, say 5-10 years and the long term 10-25 years). The vision allows us to define the future demand for services. The operation is the entry point of MASSCOTE but the ultimate scope is much broader, thus options for improvements are not only concerning operation but cover all aspects of management (soft and hard). This includes all changes that allow operating effectively and move towards an improved management setup.

MASSCOTE applications

Since 2006, MASSCOTE has been applied with successful outcomes in 12 large irrigation systems in China, India, Morocco, Nepal and Thailand. Some variations of the earlier version of the methodology were applied in Sri Lanka and Pakistan earlier.

The MASSCOTE document is published as the FAO Irrigation and drainage Paper no 63, including 2 CD-ROMs (technical documents and training material) and is also available online or upon request. Contact: Daniel Renault at Daniel.Renault@fao.org; Thierry Facon at Thierry.Facon@fao.org; and Robina Wahaj at Robina.Wahaj@fao.org.

Discussion with canal operators during a field visit of the MASSCOTE workshop (Bhadra irrigation scheme, Karnataka, India)

□

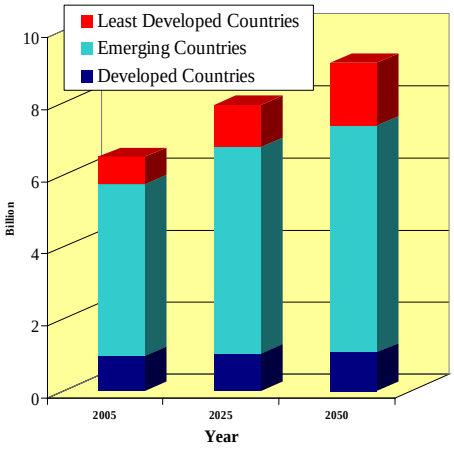
Inter Basin Water Transfers for Irrigation, Drainage and Flood Management

Inter Basin Water Transfers (IBWT) are in operation, especially in several developed and emerging countries. IBWT are applied, or developed not only for irrigated agriculture but also for hydropower, municipal and industrial water supply, flood management, and in a few cases for other purposes such as navigation and wild life preservation. However, debates on such transfers are on-going at national and international levels due to the complexities attached to it. Prof. Bart Schultz, Chairman, ICID Task Force on Inter Basin Water Transfers for Irrigation, Drainage, and Flood Management (TF-IBWT) and Mrs. Jancy Vijayan, Joint Director, ICID Central Office provide an overview of the report to be published next year.

ICID has set up a Task Force on Inter Basin Water Transfers for Irrigation, Drainage, and Flood Management (TF-IBWT) in 2003 with the main objective of compiling the global experience of IBWT. The TF has kept two criteria in view while compiling the information, viz. (i) Diverted flow does not return to the stream of origin, or to the same river basin or sub-basin downstream, and (ii) Mean annual diverted flow is not less than 1 m^3/s, or 30 million cubic meters per year (MCM/yr).

The report starts with a background information and a continent and country wise inventory of existing and proposed IBWT schemes. Mention is also made to the settings as to whether the scheme is within a developed, emerging, or least developed country. Based on the analyses globally, the available information and recommendations for good practices are attempted.

As far as development of IBWT for irrigation, drainage, or flood management is concerned, the increase in world's population, standard of living and disparity in availability of water resources with respect to time and space are the entry points. Population growth will further take place particularly in emerging and least developed countries (see figure).



World population and growth

This implies that these countries will need to conserve and manage additional water for more food production in their own region, may be in combination with increased imports. There is a belief that 80-90% of the required addition will have to be acquired from existing cultivated land and 10-20% from newly reclaimed land.

It is expected that within next 50 years, 80% of the world's population will live in flood prone areas - the majority of them in urban settlements. The two important characteristics of the flood prone areas are: (i) flood protection levels are generally far below the economic optimum, and (ii) there is a serious risk of loss of a large number of human lives when an extreme flood event occurs. The existing and proposed IBWT for irrigated agriculture, drainage and flood management may have to be considered and dealt with in light of these findings and corresponding realizations.

IBWT schemes exist in all continents. The oldest scheme probably is the Dujiang Weir in China that originated around 300 BC. It was built for irrigation and flood management. The scheme, although in a modified form, is still in operation demonstrating harmonious existance of irrigation development and natural ecosystems.

The total existing and proposed transfers in the world are of the order of about 595 billion cubic meters per year (BCM/yr) and 1,100 BCM/yr respectively developed from about 220 and 80 schemes spread in 35 countries world wide (see table).

Continent (No of countries)	Existing IBWT		Proposed IBWT	
	Number of schemes	Transfer (BCM/yr)	Number of schemes	Transfer (BCM/yr)
Asia (10)	62	293	46	315
Americas (5)	78	164	11	700
Europe (11)	52	126	11	35
Africa (8)	21	9	9	37
Oceania (1)	6	5	2	2
Total (35)	**219**	**597**	**79**	**1089**

Most of the existing IBWT schemes (127) are located in the developed countries with a total transfer of about 195 BCM/yr followed by emerging countries (86 schemes) with a total transfer of about 400 BCM/yr. In the least developed countries only one transfer was identified in Lesotho, while most of the proposed schemes (59) are planned in the emerging countries with a total proposed transfer of about 380 BCM/yr, predominantly in China and India. In the developed countries there are 15 proposed schemes, with a total proposed transfer of about 700 BCM/yr. These, to a large extent, are located in Canada and USA. In the least developed countries only 4 proposed transfers stand identified, with an envisaged transfer of about 7 BCM/yr.

Since many schemes are for multi-purpose in the existing category, it is quite difficult to identify the quantities of a transfer that are exclusively assignable to irrigation, flood management or other purposes. There are only a few IBWTs for drainage. It can be said that about half of the total existing transfers (say 300-350 BCM/yr) are mainly for irrigation and to a certain extent for flood management purposes. As far as the proposed IBWTs are concerned, the majority are multi-purpose schemes; most of them are at conceptual stage. While there is an uncertainity on allocation of flows for irrigation, or flood management, a guess is possible. If we assume that half of the total transfers are for irrigation and flood management, the flows will be about 500 BCM/yr for this category.

A detailed report, including analyses and recommendations will be published on the occasion of ICID's Lahore Congress, October 2008. The draft report, is updated from time to time and is available on the ICID web site <http://www.icid.org/ibwt_draft_aug06.pdf>. Readers are requested to send observation or additional information to Mrs. Jancy Vijayan at <icid@icid.org>.

□

5th World Water Forum Coordinators Meeting, Istanbul: A Report

The 5th World Water Forum Coordinators preparatory meeting was held on 5-6 November 2007 at Istanbul. The meeting was attended by 120 delegates representing international civil societies and professional organizations like FAO, ICID, ICOLD, IWA, IHA, IAHS, UNEP, IUCN,WWF, World Bank, and African Development Bank. ICID has established a Task Force to provide inputs to the Forum. Pres. Hon. Prof. Bart Schultz represented ICID at the meeting. The following is a summary of the speech of Mr. Loïc FAUCHON, President, World Water Council, made at the opening ceremony of the meeting.

'The World Water Forum is a multi-stakeholder dialogue and the World Water Council's objective is to call for awareness of the importance of water issues, not only in our water family, but beyond the political and economic decision-makers side, and in the media and public-at-large. The whole water community and people are looking at us for the solutions - that are concrete, sustainable, adaptable, and understandable'.

'We have technical solutions to the problems, emanated as a result of the amazing work accomplished by scientists and technicians across the world. However, our main difficulties are, slowness and insufficiencies, due essentially to political reasons. We should guarantee the availability of water, sharing and giving it back to nature. It means being able to finance its access, assure its management, and value its governance. These are first and foremost political acts'.

'The 5th World Water Forum aims to bridge divides between technical and political issues, between politicians themselves, between politicians from different countries, from different levels of competences, from different themes, and of different political persuasions'.

'Although, the climate change is at the core of all concerns, our responsibility lies in analyzing its consequences on the water situation. The World Water Council would take an initiative in this field by contributing to create a 'Panel in-charge' of assessing the consequences and proposing appropriate solutions. But the climate change should not be blamed for increasing in the world's population by one billion every twelve years, a terrifying level of pollution in many mega cities, slow progress in implementing right to water, and water governance. So, besides climate, let's work also with as much enthusiasm on all other issues and changes in order to provide water for economic development, water for food, water for health, and water for education. Thus not only the climate, but also the demography, pollutions, and migrations are the issues of great concerns'.

'The World Water Council is participating through the "Panel on Water and Disasters". There is an urgent need to have water (and sanitation) placed at the core of the priorities of reconstruction processes after water disasters. There is also a need of "water for energy", as well as "energy for water "policies. These policies will express the virtual obligation for political decision makers to foresee, in the long run, the part of the cost of energy necessary for the access to water, for its maintenance as well as its use for development'.

The full text of President Loïc FAUCHON's speech can be obtained by contacting the WWC at <d.bostrom@worldwatercouncil.org>

Forthcoming ICID Events

Urbanization of Irrigated Land and Water Transfers, 28-31 May 2008, Scottsdale, Arizona. The Conference is organized by the United States National Committee (USCID). Please visit www.uscid.org/08conf.html for details.

10th International Drainage Workshop in Helsinki and Tallinn from 6-11 July 2008. The main theme of the workshop is 'Agricultural Drainage and Environment'. The workshop will deliberate on six sub-themes viz., (i) Agricultural drainage and environment in different farming policies; (ii) Technical solutions to prevent leaching from agricultural drainage systems; (iii) Agricultural water management, decision support methods and technology; (iv) Drainage in the context of environmental river engineering, (v) Extreme weather conditions, drainage, flood management and land use, and (vi) Closing session: Drainage, the driver of sustainable environments. The workshop will focus on the effects of agricultural drainage on water quality and the methods of preventing leaching of nutrients and other elements to surface and ground water. The online registration will be available from 1st January 2008. For details regarding programme, technical tours, accommodation, etc. please visit www.fincid.fi/idw2008 or Contact - Mr. Pertti Vakkilainen, Chairman, FINCID <fincid@fincid.fi> and Mr. Mati Tonismae, Chairman, ESTCID <mati.tonismae@agri.ee>

Managing Water in a Climate Changing World: Implications for Irrigation, Drainage and Flood Control, 17-20 September 2008, Portland, Oregon. The Conference is organized by the United States National Committee (USCID). For details, please visit www.uscid.org/08gcc.html.

20th International Congress on Irrigation and Drainage of ICID will be held in Lahore, Pakistan from 13 to 19 October 2008. The theme of the Congress is 'Participatory Integrated Water Resources Management – From Concepts to Actions'. The topics for the two Questions, Special Session, Symposium and Seminar along with other relevant information are available at ICID website: www.icid.org.

Please note the following deadlines: Submission of comprehensive "*summary and conclusions*" of about 500-600 words: **30 November 2007**; Intimation of acceptance of "*summary and conclusions*": **15 January 2008**; Receipt of full text of accepted papers: **01 March 2008.** For details, please contact the Conference Secretariat: 506 WAPDA House, Lahore, Pakistan. Tel: +92 42 9202538, Fax: +92 42 9202154, E-mail: <icid@icid2008.org>, Website: http://www.icid2008.org; or Mr. Syed Raghib Abbas Shah, Secretary General, Organizing Committee, E-mail: <gmcmw@wapda.gov.pk>, and/or the Secretary, ICID, E-mail: <icid@icid.org>

Editor: Dr S A Kulkarni, Director - I, DTP: Madhu Mohanan, ICID Central Office, New Delhi, India