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ICID Newsletter

Managing water for sustainable agriculture

Also at <http://www.icid.org>

2007/1

Which technology has the capability to revolutionise food production so that we can meet the challenge of producing 67% more food with only a modest increase in water use over the next 25-30 years?

It might be argued that the last great boost in food production was due largely to the increased groundwater irrigation, most notably in Asia, and especially coupled to the introduction of higher-yielding varieties (the "green revolution").



What is going to be seen in future as the biggest technological driver of the next revolution?

For the last 20 years or so, the irrigation community has appeared more concerned with process improvements and "soft" technology, whereas our sister organisation ICOLD has witnessed a revolution in dam building based on the introduction of roller compacted concrete (RCC). The dams' community is now asking a question akin to the one posed above: what next?

Of course it is easy to make the excuse that irrigation is more process driven and very dependent on local conditions that make it less likely that a single technology will dominate. Yet it is important that we remain aware of those technologies that may be creeping up on us so that we realise the policy changes and process improvements that may be needed.

There is not much to be gained by talking about this in the abstract, so sticking my neck out, here are ten technologies that I think could be contenders:

1. Farmer controlled water supply, or total channel control or downstream control of canals; call it what you will, but essentially an extension of the control that came with

groundwater, applied to surface sources and large systems.

2. Emitter delivery systems for precision irrigation and for undulating terrain, not just through drip systems but also through centre pivots, especially those that can be moved from centre to centre, and with sweeps programmed to serve typical farm blocks. Such technologies can bring irrigation to areas previously thought capable only of purely rainfed production.

3. Wetting front indicator, a technology recognised for its outstanding potential by a WatSave award, but not yet widely appreciated.

4. Drain controllers, also exemplified by WatSave awards, for their capability to improve control of soil moisture and stimulate sub-irrigation.

5. Wetting-drying rice, another important water saving technology that WatSave has recognised in its widespread application in China.

6. No-till (NT) or minimum tillage technologies already used to conserve erodible soils and nutrients, and save fuel, but which can also conserve water in irrigated as well as rainfed production.



A centre pivot irrigating young coffee plants in Brazil (Almost half of Brazil's 3.44 mha of irrigated land is under pressurized irrigation, and over 40% of that is under centre pivot)

7. Fresh-saline irrigation, where saline and brackish water is used for part of the

growing period without much loss of yield or detriment to the soil structure.

8. Salt and drought tolerant food crops, perhaps used in conjunction with 7, or independently, especially where irrigation is ephemeral or only supplementary.

9. Remote sensing coupled with the Internet and mobile communications to help the farmer with everything from establishing land tenure to operational forecasting.

10. Drainage, an "old" technology but one which we must not forget can improve and sustain production in rather more parts of the world than irrigation on its own.

Such a list illustrates that the technologies that may drive the revolution need not be new or universally applicable, or mutually exclusive to each other or to policy and process interventions. Indeed, it is important that we avoid the pitfalls and lost opportunities of the groundwater revolution (eg. subsidised over-use) by looking at technologies in the wider context. I cannot think of a better forum than ICID to do that. Indeed, we might extend the list very easily if we consider not only water supply and soil moisture management (which is the focus of several of the above technologies), but also virtual water management by means of better post-harvest processing and distribution. Perhaps that is what will be the dominant driver of the next revolution?

It is probably only with hindsight that we will see if we have a technology in irrigation to compare with RCC in dam building, but we need to be thinking hard about the contenders.

Let's have your views.

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.

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News from Member Countries

Egypt

The National Water Research Center (NWRC) in collaboration with the Arab Water Council (AWC), the Ministry of Water Resources and Irrigation (MWRI) of Egypt, organized the 'Third Arab Water Regional Conference' in Cairo from 9 to 11 December 2006. The theme of the conference was "Research Advancement in Managing Limited Water Resources". The Conference presentations and recommendations can be accessed at: <http://www.nwrc-egypt.org/ArabWater2006>.

From 12 to 15 February 2007, an international workshop on 'Reservoir Inundation Related Issues' was held at Cairo. The workshop was coordinated by the Third World Water Management Centre, Cairo. Besides MWRI and AWC, other international organizations, viz: IHA, IWRA and ICID participated in the event. The main topics deliberated were 'Green house gas (GHG) emissions from reservoirs', 'Global climate change', and 'Involuntary resettlement and rehabilitation of people affected by inundation due to reservoirs'.

Succeeding to the workshop, a conference on 'National Water Quality and Availability Management' was held from 17 to 19 February in Sharm El-Sheikh. The National Water Quality and Availability Management Project (NAWQAM) was established in 1997 and will be ending in June 2007. For details, please contact: Prof. Dr. Shaden Abdel-Gawad, President, National Water Research Center (NWRC) at E-mail: shaden@nwrc-eg.org; nwrc@nwrc-eg.org or visit <http://www.nawqam.org/nawqam-conf.htm>

Kazakhstan

Kazakhstan located in the Central Asia, has 272.49 million ha of geographical area and a population of 16 million. The country has vast areas of arable land (21.67 million ha) and a thriving agricultural sector contributing about 15% of GDP. Kazakhstan is one of the Aral Sea basin countries and presently only about 0.786 million ha area is irrigated.

Kazakhstan was admitted for ICID



Ryabtsev Anatoly Dmitrievich

Mr. Ryabtsev Anatoly Dmitrievich, the Chairman of the Committee for Water

membership in 1997, but it became active member with effect from July 2006. Recently, the country has firmed up its membership by signing an agreement with ICID. The agreement was signed by

Resources on behalf of the 'National Council on Irrigation and Drainage (NCID), Public Limited Company (PLC)' of the Republic of Kazakhstan, and Mr. K.N. Sharma, Secretary, Central Office, on behalf of ICID. Mr. Dmitrievich is the Chairman and Mr. Askarov Khudaybergen, Director of NCID, PLC, is the General Secretary of the Kazakhstan National Committee (KAZCID). Mr. Khudaybergen may be contacted on email: consultants_astana@nursat.kz

South Africa

The 2nd biennial symposium of the South African National Committee (SANCID) was held from 15 to 17 November 2006 in Mpumalanga Province, South Africa. The theme of the symposium was "The changing face of irrigation in Southern Africa" and was aimed at capturing recent developments in the irrigation sector.

The symposium was attended by 106 delegates from Australia, Nigeria, Swaziland, Zimbabwe, besides

South Africa. A total of 27 papers were presented in seven sessions under the



Executive Committee Members of SANCID

sub-themes: technology development, modeling, water use efficiency, irrigation economics, water harvesting, water quality and environment, and irrigation scheduling.

A technical tour was held to show the functioning of Lower Blyde River Water User Association (LBRWUA). The scheme was recently upgraded from an earthen canal distribution system to a gravity pipeline system to improve distribution efficiency. For more information please visit <http://www.sancid.org.za>

Smallholder Irrigation in South Africa

In South Africa, the term smallholder or small-scale irrigation is mainly used when referring to irrigated agriculture practiced by black people, most of these farming very small plots, primarily to provide food for home consumption. The history of smallholder irrigation schemes was linked to the particular political developments in the country.

South Africa has about 1.3 million ha under irrigation, of which 0.1 million ha is in the hands of smallholders. Smallholder irrigators have been categorized into four groups, namely,

- (i) farmers on irrigation schemes;
- (ii) independent irrigation farmers;
- (iii) community gardeners; and (iv) home gardeners.

The number of smallholder irrigators is estimated between 200,000 and 250,000 covering a combined command area between 46,000 ha and 49,500 ha. This represents about 47% of the total smallholder irrigated area and 3.6% of the countries total area under irrigation. The importance of smallholder irrigation schemes in South Africa arises primarily from the number of participants involved.

It was estimated that the land on smallholder irrigation schemes was held by about 31,000 plot holders, representing about 15% of the total smallholder population. By comparison, the 1.2 million ha of irrigated land in South Africa, which is referred to as large-scale commercial, is held by about 28,350 land holders.

(Source: *Smallholder Irrigation Schemes in South Africa: Past, Present, and Future* – W Van Averbek and S S Mohamed, Paper presented at the 2nd Symposium of the SANCID)

Challenges of Water Resources Development and Management in Europe

Deciding strategies for sustainable development and management of water resources is a complex task and varies from region to region depending upon the scale of their exploitation, demography, dependence on irrigated agriculture, and more recently on environmental awareness of the society at large. The European region constitutes 46 countries, has 11% of world population and shares about 15% of the world's freshwater resources, but has only 9% of the world's irrigated area. Dr.-Ing. Eiko Lübke, Vice President, ICID and the Chairman of the German National Committee (GECID) and the European Regional Working Group (ERWG) outlines thought-provoking views on the region's emerging scenario of irrigated agriculture and issues and challenges needing attention by the ICID.



ICID through its various workbodies and International Executive Council (IEC) meetings has been discussing for quite sometime on expanding the scope of rural water management within the framework of

ICID activities. Inclusion of ecological aspects like water quality, wetlands, and biodiversity related to agricultural water management has been sought by European representatives as a necessary extension of ICID tasks. This approach is likely to promote increased societal support to ICID in Europe. Presently, in many European countries little attention is paid to irrigation and drainage measures. Some European countries do not participate or are not active any longer in ICID work. What are the reasons for such a situation?

During the last century in Europe, the rural water management was focussed almost exclusively on irrigation and drainage, besides public water supply. In pursuit of increased agricultural productivity, amelioration measures, whenever undertaken, were implemented without consideration of ecological needs. Meanwhile, having reached the stage of relatively excess agricultural production and increased public awareness of the environmental aspects, the focus has been shifted to deformed landscapes, vanishing biodiversity, eroded slopes, degraded fens, and eutrophicated waters rather than towards irrigation and drainage.

During the past decade, Europe has experienced both, years of extreme dryness/ drought and extreme flood events from U.K. to Spain and from France to the Balkans and Ukraine. The global climate change and its consequences are increasingly perceived as a real threat and it is a great challenge for all of us to develop strategies to mitigate its impacts to the extent possible.

In pursuance to the theme of the 4th World Water Forum, Mexico 2006 "Local Actions for a Global Challenge" the following topics are of importance for the rural water management:

- Water scarcity/dryness/droughts affecting crop yields; damages of natural vegetation and biodiversity; drying up of wetlands; lack of drinking water.
- Storms/floods affecting soil erosion and degradation of sites; flooding of cultivated areas; waterlogging of potential arable and grasslands.
- Pollution of waters by point and non point source emissions from agricultural sites - damaging aquatic biotopes and ecosystems; endangering drinking water resources.

With the due consideration to the emerging situation, I consider the following questions among others, as most relevant to our future research work:

Land use systems

- How does global climate and land use will affect availability and quality of waters?
- Will the existence of wetlands be endangered and what are the requirements for its conservation or revitalisation?
- What would be the potential consequences of drying up/degradation of wetlands and waters?
- How can negative impacts of developments, especially those which have surfaced from today's values, be mitigated and turned around by holistic land use concepts and water management measures?



A view of the water courses with weirs and sluices in the Spreewald wetland in North-East Germany

Water management at the local and regional scale

- How can seasonal variations of water availability during periods of water scarcity be compensated by storage of extra water?
- How can conflicts among competing users be solved within the societal context?
- How can treated wastewater be utilised for the sustainable water availability in the peri-urban/ metropolitan areas?
- Which land use strategies are allowed for sustainable flood risk management in inundation zones and polder floodplains?

Ecosystem processes

- How do biochemical processes beneath the root zone and in the aquifer affect retention and mitigation of emissions?
- What are the characteristic features of ecosystem interactions between aquatic biotopes and adjacent terrestrial zones?
- Which model represent a region-specific hydrological behaviour at sufficient accuracy for the considered measures?

Responses/ answers to these questions might be developed within the context of the river basin management plans. Such emerging views and activities in Europe are in line with the interest of many countries of other regions too. Addressing these issues and challenges by ICID might be more appealing for all the countries in Europe, especially to those which are still outside the ICID family.

As a Vice President of ICID, I would like to concentrate my work on these strategies in coming years. I believe that the issues mentioned here are relevant to many countries worldwide and the ICID fraternity should be prepared to tackle these challenges to translate its slogan "Managing Water for Sustainable Agriculture – Water for Food and Rural Development" into action.

Optimum Use of Geomembrane Materials in Irrigation Canal Lining

The geosynthetics industry, over the last four decades has developed a wide range of materials that are used in the construction of irrigation and drainage projects. Professionals and agencies dealing with the use of geomembranes are often confronted with the appropriate choice of these materials. Dr. Ian D. Peggs, President of I-CORP INTERNATIONAL, Inc., USA, specializing in geosynthetic materials performance provides some practical tips in selection and use of the geomembrane material in irrigation canal lining through his vast experience in this field.

A few years ago, I was privileged to visit the Tarim Basin in north-west China on behalf of The World Bank to report on geomembrane manufacturers and their on-site installation protocols for high density polyethylene (HDPE) liners in new irrigation canals. While "HDPE" is almost synonymous with "geomembrane", and is the most preferred material, there are many other candidate geomembrane materials, each with its own advantages and disadvantages in different environments. There are even several different HDPEs with differing mechanical and weathering durabilities – a function of the co-polymers and additive package formulations proprietary to each resin and geomembrane manufacturer.

All geomembrane materials, like HDPE, Linear low density polyethylene (LLDPE), Polyvinyl chloride (PVC), Flexible polypropylene (fPP), Chlorosulphonated polyethylene (CSPE), Ethylene-propylene diene monomer (EPDM), bituminous geomembrane (BGM), and Polyurea (PU), are effective in reducing water seepage/leakage and allow increased flow rates. However, in practice, they may not be totally leak-tight. They differ in their abilities to lay and remain flat as temperatures change, in their abilities to conform to rough subgrades and differential settlement without impacting durability, in their tolerance of installation damage, UV radiation and oxidation, and in their abilities to be easily installed and repaired.

There are six basic considerations for the selection of a geomembrane material, viz, (1) New canal or lining of existing unlined canal, (2) Roughness of sub-grade, (3) Weather during installation, (4) Experience of installation personnel, (5) Covered or exposed installation, and (6) Cost of installation.

A new canal may have a well-compacted smooth subgrade that is more suitable for HDPE. Due to its susceptibility to stress cracking the HDPE should only be used as a barrier, not as a load bearing member of the lining system, and not on rough subgrades or where differential settlement might occur. In such situations other materials with higher "yield" strains (LLDPE, fPP) or no yield feature (PVC, EPDM, PU) in the stress/strain curve are preferred.

Leak location surveys have shown that approximately 25% of leaks are caused during installation, mostly at welds. The bulk of the damage occurs when the cover layer is placed on the geomembrane. Thus it may be beneficial to leave a liner uncovered and to minimize the number of seams made in the field. Materials such as HDPE and LLDPE, typically in 7 m roll widths, require all welds be made in the field by specially trained operators. However, materials such as PVC, PP, EPDM, and CSPE can be welded into large panels in the controlled environment of a prefabrication plant thereby minimizing the number of field seams besides reducing installation time. This has also made possible the installation of geomembrane liners without the need to de-water the canal. The availability of spray-applied liners, such as PU, allows the on-site application of a liner without seams, but requires experienced spray personnel. On the other hand, a BGM can be welded by locally trained personnel.



cover. Such damage is not as critical in the more amorphous and more flexible geomembranes, unless exposure to UV, high temperatures, and stress, has caused additives to be consumed or leached out. Thus, PVC and LLDPE should not be left exposed unlike other materials.

The conventional geomembranes are typically attached and sealed to concrete structures using stainless steel batten strips and neoprene gaskets. An improved alternative is to cast an extruded profiled strip made of the same resin as the geomembrane, into the concrete, to which the geomembrane can be welded. The HDPE can be treated in a fluorine gas autoclave so that it can be bonded to a concrete with an adhesive.

In summary, a geomembrane material can be found to suit any combination of subgrade, environmental, and operating conditions. All geomembranes do not have equal performance characteristics in all conditions. For optimum performance the



Section of the 50 year-old canal of the Quincy-Columbia Basin Irrigation District, Washington State, USA repaired in 2003 with composite Ethylene-Vinyl Acetate (EVA) liner (0.5 mm) between two non-woven geotextiles. The composite liner was covered with 75 mm poured concrete. Side slopes are 1.5H: 1V. Photos taken of the same section during repair (left) and when the canal back in service (right) [Photo courtesy: Huesker Inc.]

A BGM, essentially a custom engineered composite geomembrane, is heavier than most single layer and reinforced thermoplastic/ elastomeric geomembranes and therefore needs less ballasting against uplift in windy environments. It has zero thermal expansion coefficient and therefore does not expand, wrinkle or contract and pull taut, as do the homogeneous materials.

As the HDPE is quite notch sensitive, particular care must be taken against mechanical damage while installing any

material should be selected based on technical merit with cost being the last consideration. After all, the geomembrane is the key component of the lining system, and the cost differential between geomembrane materials, in order to ensure optimum service, is a small fraction of the overall cost of the project. The full article can be viewed at www.icid.org/nletter/nl07pg4rep.pdf.

For more information on geosynthetics, please visit www.geosynthetic.com and www.geosindex.com or contact Dr. Ian D. Peggs on E-mail: icorp@geosynthetic.com. □

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Here is a great news for all those renowned organizations, institutions, companies, service providers, and consultants to give wide publicity to their products and services by advertising in this very 'Newsletter'. ICID is pleased to invite advertisements from all those companies, consultants involved in the irrigation and drainage field/ business for publishing in the ICID Newsletter starting with the current issue. The Newsletter is circulated in over 60 countries, many international organizations and professionals in print format and is viewed on ICID website by thousands of persons worldwide. An advertisement can be inserted in various styles as per the following tariff structure:

Style	Tariff (US\$)	
	For one time insertion	For annual (four times) insertions
Centre spreadsheet	480	1520
Full back page	300	960
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Inside half page	125	400
Back quarter page	75	240
Inside quarter page	65	200
Catalogue	50	200

The above rates are applicable for the current year. Under a promotion scheme all the advertisements will also be given a **FREE** insertion on catalogue section of the ICID website for a similar period.

The advertisement matter may be submitted either in the form of art work or as an electronic file in any popular graphical format (TIFF/PSD/EPS etc.) in high resolution (300 dpi+). The detailed 'terms of references' may be viewed at www.icid.org/nl_ad_tor.pdf, or contact the Secretary, ICID; E-mail: icid@icid.org

ICID WatSave Awards 2007: Invitation for Nominations

ICID instituted 'WatSave Awards' in 1997 to recognise persons for their 'outstanding contribution to water saving in agriculture' across the world. This year ICID will be celebrating the '10th Anniversary of the WatSave Awards'. Entries for the nominations are now open.

Categories: The awards are given annually in three categories viz., (i) Technology, (ii) Innovative Water Management, and (iii) Young Professionals.

The prize: Each Award carries a prize money of US\$ 2000 and a special Citation. The winners are given wide publicity through various ICID publications and the website.

Entry procedure: The entries are open to all individuals/ teams from ICID member countries as well as non-member countries and must be submitted through an ICID National Committee/ Committee. In case of an entry from a 'non-member' country, the entry has to be routed through and validated by an active National Committee. The contact coordinates of the ICID National Committees/ Committee, the 'Nomination Form', 'Conditions and Criteria', 'Check list' of the documents to

be submitted and 'Evaluation Proforma' are available for download at <www.icid.org/awards.html>. The entries should be sent electronically to respective National Committees well in advance of the deadline. The nominations sent directly to the Central Office, ICID will not be entertained. The deadline for receipt of the entries from National Committees to the Central Office ICID, New Delhi is **30 May 2007**. The National Committees/ Committee will submit electronically all the required documents as per the 'checklist' along with the validated 'Nomination Form(s)' to the Central Office.

Selection process: The selection of the winners from amongst the nominations received will be made by an International Panel of Judges.

Presentation: The announcement of winners and the awards will be presented at the 58th meeting of the International Executive Council (IEC) scheduled to be held in September-October 2007 at Sacramento, USA.

Previous winners: Starting with 1998, 22 persons from over 11 countries were bestowed with the award. The excerpts of the contributions by the past award winners can be viewed at <www.icid.org/awards.html>

National Committees are urged to give a wide publicity to these awards in their country through local newspapers, especially among actual farming communities and persons actively engaged in water savings/conservation practices.

For further information, please contact Secretary General, ICID at icid@icid.org.

20th International Congress on Irrigation and Drainage – Call for Papers



ICID's 20th Congress is scheduled to be held at Lahore, Pakistan from 13-19 October, 2008. The theme of the Congress is 'Participatory Integrated Water Resources Management – from Concepts to Actions'. The papers will be presented and discussed for the two Questions, a Special Session, a Symposium, and many Workshops. For the Questions, authors can submit papers through their National Committees, or through the International Organizations active in the field of irrigation and drainage. For the Special Session, Symposium and Seminar - only one paper per country can be submitted. The following are the topics for these events:

A. Congress Questions

Question 54: Sustainable Integrated Water Resources Management with five sub-questions:

54.1 Knowledge base, information management and dissemination of research in developing countries; **54.2** Design and operation of irrigation systems for use of treated and partially treated wastewater, saline water or soils - limitations and opportunities; **54.3** Conjunctive operation of storage reservoirs for multi-purposes; **54.4** Experiences on impacts of climate changes on water resources; and **54.5** Mineral tolerant plants in water-logged and saline lands.

Question 55: Role of Public and Private Sectors in Water Resources Development and Management with three sub-question:

55.1 Performance of irrigation and drainage systems after modernization/ privatization; **55.2** Socio-economic aspects of agricultural production in developing countries; and **55.3** Technical, technological, economic and legal aspects of development, management and use of water resources of transboundary (interstate) rivers.

B. Special Session: Implication of Global Changes on Irrigation and Drainage System Development and Management

C. Symposium: Integrated Water Management in the River Basin Context

D. Seminar: Lessons to Learn from the History of Water Management in Large River Basins and Drought

Deadlines for submissions

National Committees to intimate the name(s) of the prospective author(s) of papers by **1 August 2007**, and submit a comprehensive "summary and conclusions" of the paper in about 500-600 words by **1 September 2007** to the Central Office, ICID, New Delhi. The full 'Call for Papers' giving details on scope of topics and sub-topics, submission and selection of papers, guidelines for preparation of papers and proforma for authors and more can be viewed at www.icid.org and www.icid2008.org.

World Water Day 2007 : Coping with Water Scarcity



The international observance of World Water Day (WWD) is an initiative that grew out of the United Nations Conference on Environment and Development (UNCED) held in 1992 in Rio de Janeiro. ICID is one of the key water related international organizations supporting the observance of the WWD.

This year's theme of the WWD is 'Coping with Water Scarcity' and highlights the increasing significance of water scarcity worldwide and the need for increased integration and cooperation to ensure sustainable, efficient and equitable management of scarce water resources, both at international and local levels.

The increasing stress on freshwater resources brought about by ever rising demand and profligate use as well as by growing pollution worldwide, is of serious concern. Imbalances between availability and demand, the degradation of groundwater and surface water quality, inter-sectoral competition, inter-regional and international disputes all center around the question of how to cope with scarce water resources.

There are several ways of defining water scarcity. The definition used by the UN WATER refers to water scarcity as 'the point at which the aggregate impact of all users impinges on the supply or quality of water under prevailing institutional arrangements to the extent that the

demand by all sectors, including the environment, cannot be satisfied fully'.

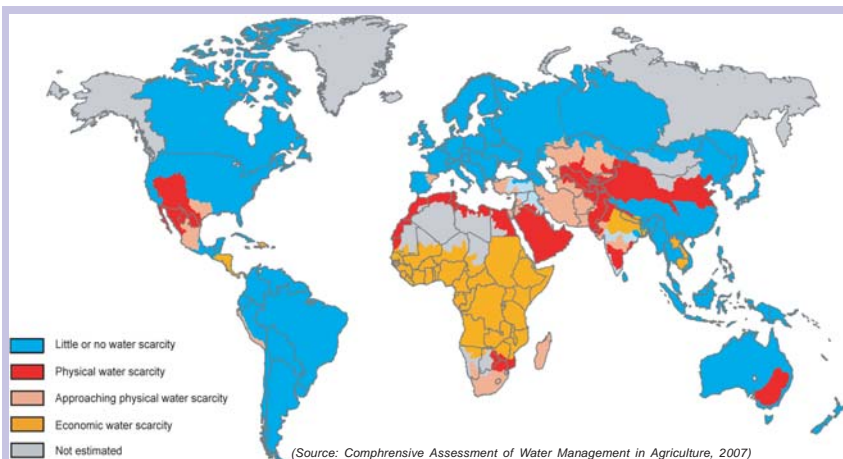
Water scarcity is a relative concept and can occur at any level of supply or demand. Scarcity may be a social construct or the consequence of altered supply patterns stemming from climate change. Scarcity has various causes, most of which are capable of being remedied or alleviated. However, scarcity often has its roots in water shortage, and it is in the arid and semi-arid regions affected by droughts and wide climate variability, combined with population growth and economic development, that the problems of water scarcity are most acute.

Most countries in the Near East and North Africa suffer from acute water scarcity, as do countries such as Mexico, Pakistan, South Africa, and large parts of China and India. Irrigated agriculture, which represents the bulk of the demand for water in these countries, is also usually the first sector affected by water shortage and increased scarcity, resulting in a decreased capacity to maintain per capita

food production while meeting water needs for domestic, industrial and environmental purposes. In order to sustain their needs, these countries need to focus on the efficient use of all water sources (groundwater, surface water and rainfall) and on water allocation strategies that maximize the economic and social returns to limited water resources, and at the same time enhance the water productivity of all sectors. In this endeavor, there needs to be a special focus on issues relating to equity in access to water and on the social impacts of water allocation policies.

The FAO is acting as the coordinator on behalf of all the UN Agencies and Programmes members of UN-Water for the celebration of the WWD 2007. For related documents, posters, desktop backgrounds, screen savers, etc., please visit the websites <http://www.worldwaterday07.org/> and <http://www.unwater.org/wwd07/>.

Central Office looks forward from all National Committees/ Committee for their feedback on the WWD activities.



Little or No Water Scarcity: Abundant water resources relative to use: less than 25% of water from rivers is withdrawn for human purposes.

Physical Water Scarcity: More than 75% of the river flows are allocated to agriculture, industries or domestic purposes (accounting for recycling of return flows). This definition of scarcity - relating water availability to water demand - implies that dry areas are not necessarily water scarce.

Approaching Physical Water Scarcity: More than 60% of river flows are allocated. These basins will experience physical water scarcity in the near future.

Economic Water Scarcity: Water resources are abundant relative to water use, with less than 25% of water from rivers withdrawn for human purposes, but malnutrition exists. These areas could benefit by development of additional water resources, but human and financial capacity are limiting.

Turkey to Host the 5th World Water Forum in 2009

The 5th World Water Forum (5th WWF) will be held in Istanbul, Turkey from 16-22 March 2009. This was announced at the signing ceremony between the Govt. of Turkey and the World Water Council (WWC) held in Ankara on 18 January.

The overarching theme of the 5th WWF will be "**Bridging Divides for Water**" which is expected to create an enhanced

understanding and improved information exchange amongst the water users, decision makers, and water practitioners at local, regional and global levels.

An official kick-off meeting for the 5th WWF is scheduled to be held on 19-20 March 2007 in Istanbul. President Lee and Secretary General Gopalakrishnan have

been invited to participate in the meeting.

The WWF is organized by the WWC triennially in association with the authorities of the host country and is the largest international event in the field of water. The 4th World Water Forum was held in Mexico in March 2006.

Key ICID Events 2007



4th Asian Regional Conference (4th ARC), 10th International Seminar on Participatory Irrigation Management (PIM), and the International History Seminar on Irrigation and Drainage, 2 - 5 May 2007, Tehran, Iran:

Parallel to these events, interim meetings of the Task Force for Least Developed Countries in Asia (TF-LDCsAS), Working Group on Irrigated Agriculture Under Drought and Water Scarcity (WG-IADWS),

and 'Irrigation, Drainage, Water and Agriculture Exhibition' will be held. These events are organized by Iranian National Committee on Irrigation and Drainage (IRNCID) in collaboration with INPIM, IWMI and The World Bank.

The preparations for these events are in full swing. There is an overwhelming response for submission of papers. More than 600 persons are expected to attend these events. A free technical tour to visit Qazvin Irrigation and Drainage Network and Water User Associations on 5 May and post-

conference package tour to wonderful cities of Shiraz and Isfahan on 6-7 May will be organized. The IRNCID has an excellent website where one can find details regarding travel, tour, registration, exhibition and much more.

For further information please contact Mr. S.A. Assadollahi, Secretary General, or Mr. E. Ehsani, Secretary, IRNCID, Tehran, Iran. Tel: 0098 21 22257348, or visit the websites: <http://www.irncid.org>, <http://www.pim2007.org>.



22nd European Regional Conference, 2-6 September 2007, Pavia, Italy: The Conference will be held at the University of Pavia, located in Northern Italy.

The theme of the

Conference is "Water Resources Management and Irrigation and Drainage Systems Development in the European Environment" with the four thematic topics: (1) Impacts of Extreme Hydrological Events on Irrigation and Drainage Systems, (2) Energy Saving Technology in Advanced Irrigation Systems, (3) Conjunctive Use of Surface and Groundwater, and

(4) Participatory Management and Economic Policies for Irrigation and Drainage Development. Besides the Conference, two workshops namely, 'History of Irrigation, Drainage and Flood Control', and 'European Framework Directive in the Field of Water Policy' will also be held. The Conference is organized by the Italian National Committee (ITAL-ICID) in cooperation with the Agriculture General Direction, and the Ministry of Agriculture and Forestry Policies, Italy.

About 120 paper abstracts have been received so far from all over the Europe. Pavia offers many historical, environmental

and food attractions, and its University is one of the oldest in the world.

Technical study tours to the irrigation schemes of North-West Italy (Novara) and to a land reclamation area near Mantova will be arranged.

For more information about the programme, registration, accommodation, please contact Ms. M. Elisa Venezian Scarascia, General Secretary, ITAL-ICID, Rome, Italy. Tel: +39 06 488 4728, E-mail: erc2007@italicid.it, me.scarascia@politecheagricole.it, Website: <http://www.italicid.org/erc2007>.



58th International Executive Council (IEC) Meeting and USCID's 4th International Conference on Irrigation and Drainage, Sacramento, California USA, 30 September to 5 October 2007. The theme of the Conference is 'The Role of Irrigation and Drainage in a

Sustainable Future' and explored through the three main topics viz., (1) Developing Sustainable Irrigation and Drainage

Systems, (2) Using Technology to Improve Irrigation and Drainage Systems, and (3) Improving the Interaction of Irrigation and Drainage Systems with the Wider Society. The list of accepted papers for oral and poster presentations has been posted on the USCID website. The papers will be presented in 15 concurrent technical sessions.

The due date for submission of the full length papers is kept as **1 March 2007**

which will be reviewed and authors are expected to submit the final version of the paper by **1 July 2007**. The guidelines for preparing manuscript can be viewed on the website. The online registration will be available by **1 April 2007**. For details, please contact Mr. Larry D. Stephens, Vice President, US Committee on Irrigation and Drainage (USCID), Tel: 303 628 5430, E-mail: stephens@uscid.org, or visit the website: <http://www.icid2007.org>.



2nd African Regional Conference, 6-9 November 2007, Johannesburg, South Africa. The conference is organized by the South African National Committee (SANCID) together with the

Southern African Regional Irrigation

Association (SARIA), the Department of Agriculture and the Water Research Commission. The conference theme is "Contribution of rainfed and irrigated agriculture to poverty alleviation through increased productivity in Africa" and will be explored through sub-themes which focus on: natural, social, human, physical, and financial capital. The deadline for submission of abstract(s) is **30 April 2007**.

For detail information regarding the programme, abstract submission, registration, accommodation etc. please contact: Monica Chipeta, Global Conferences Africa. Tel: +27 (0) 11 6763453, E-mail: monica@globalconf.co.za or Dr. Gerhard R. Backeberg, Chairman, SANCID. E-mail: gerhardb@wrc.org.za or visit the website: <http://www.sancid.org.za>.

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