IWRA Update
Newsletter of the International Water Resources Association

April 2008, Volume 21, Issue 1

Message from the President

When I first wrote to you at the beginning of last year, I was very optimistic about the dynamism and potential of the Association, and looked forward to working with all of you to bring IWRA to new heights.

As it turned out, it was a very turbulent year, with major changes and challenges, but also opportunities and achievements. The offices of the Association, after facing seemingly interminable problems in the wake of their abrupt closure in August, are now operational in separate continents: the Executive Office in South Africa and the Editorial Office in Japan.

Content

The enormous value of this, as I see it, is that the Association has developed new partners and new networks. It has moved out of its niche in North America and has pursued the legacy of Dr. Ven Te Chow into new geographies, climates and cultures. Our North American membership has always been very globally oriented, but this move makes a definitive statement that we are, indeed, an *international* water resources association. This should make us even more attractive to new members in new latitudes and longitudes.

The problems faced by the Association were discussed, argued and solved by a very committed Executive Board. One thing we learnt from last year's difficulties was the value of teamwork; a principle to which the Board is committed. New members have joined us, especially Carl Bruch, who has taken the challenging responsibility as Treasurer. Some other members have assumed overwhelming responsibilities, notably James Nickum, who has been working voluntarily for months on improving the quality of our journal, *Water International*, in the face of a dual challenge to publish the much delayed issues for 2007 under our own brand, and to prepare on time the issues for 2008 with Routledge (Taylor & Francis). At one point, this involved managing five different issues straddling the year, all at the same time. I think you will be pleased with the results. I would also like to express my appreciation to Raja Sengupta and his editorial office team, who have worked hard to make the transition to Jim's leadership a seamless one. Their dedication to the journal and to the IWRA is a prime example of the teamwork that has pulled us through this past year.

We have new partners. One of them, the Water Institute for Southern Africa (WISA) with Wallace Mayne in the front with the invaluable support of Ms. Manoko Selolo, deserves mention because of their enthusiasm, efficiency, and hard work. Both Wally and Manoko are facing the challenge to set up the office and the still not properly functional webpage, in record time for the benefit of all of you. From IWRA, we hope this will be the beginning of a very fruitful partnership.

Our other new partner is Routledge, Taylor & Francis group, with whom we are now co-publishing our journal. It has been with their support that we are able to publish the 2008 March issue with very little delay so that you, as members of the Association, and those interested in the journal, can have access to it. *Water International* has a new look this year, which we are sharing with you in this newsletter.

Preparations for the World Water Congress in Montpellier this September are going extremely well. Our partners, the Montpellier University and Verseau Developpment, with Pierre Chevallier and his team in the front, and with the excellent support of Olli Varis, Scientific Director of the Congress, have been doing remarkable work to prepare an excellent congress. I would like to remind you to register for the Congress since it will be your presence that will ensure the success of our major triennial event.

I would like to take this opportunity to congratulate Dr. John Pigram, past President of the Association, for winning the Ven Te Chow Lecturer Award for 2008. Dr. Pigram has a long and outstanding career both in Australia and internationally. As President of the Association from 2001 to 2003 period, his many contributions are of lasting benefit to us. He is a most deserving winner of the prize.

I would also like to offer our most sincere congratulations to IWRA member Prof. Anthony Allan, for being awarded the 2008 Stockholm Water Prize "for his contributions to the advancement of concepts in the understanding and communication of water issues".

Allow me to make special mention of the work carried out by Ben Dziegielewski for IWRA. For years, as members, we all have witnessed his dedication to keep the Association running, almost single-handedly. I understand but regret both personally and professionally his decision to leave the Board. With his departure, we have lost almost a decade of institutional memory of the Association. Nonetheless, to everything there is a season, and I appreciate his continuing advice. We wish him all success in his professional activities and thank him for his dedication.

Finally, it is with considerable regret that I share with our members the death of Morris Miller, a strong supporter of IWRA over the past several decades. His contributions to water management on a global basis have been very significant throughout the years.

In terms of housekeeping, we are having a lot of difficulties with the membership and subscribers database provided to the Executive Office. Hence I invite you to contact the Executive Office at iwra-office@wisa.org.za, to give us your up-to-date information and to ensure your membership fees are paid up. The Executive Office and I are considering the possibility of a Members Directory as a service to the members and a source of advertising income. We are also exploring the possibility of approaching who can be patron members of the Association.

Those individual and institutional members who paid for a three-year membership in 2006, or for a two-year membership in 2007, will have electronic access to the journal with their membership for 2008.

We would welcome interesting information from all members for inclusion in the webpage and the newsletter, as well as volunteers to help us produce the newsletter. The Executive Office (iwra-office@wisa.org.za) and the Editorial Office (iwrapubs@gmail.com) also welcome your suggestions for improvement. The Association is never

short of ideas, joint work, partners and partnerships.

The way we have pulled through the turmoil of the past year or so leaves me even more optimistic than ever about the dynamism and future of the Association and the dedication of its members. It is a pleasure to work with the Executive Board, the Executive Office, the Editorial Office, and most of all, our members, to bring IWRA to new heights. All doors are open for your positive and constructive contributions.

CECILIA TORTAJADA
PRESIDENT, IWRA, 2007-2009

IWRA/WISA Collaboration and its potential benefits to the Water Sector in Southern Africa and Globally

Water Institute of Southern Africa (WISA) and the water fraternity in Southern Africa are delighted to welcome IWRA to the water sector in Southern Africa. As President of WISA, it was my great pleasure in December 2007 to sign a memorandum of understanding and cooperation with IWRA and for my Board and Council and those of the IWRA to endorse the same. I am confident that this cooperation and support will strengthen the work of the two organizations and serve the members and the sector even better.

WISA's objectives and its profile over the years have clearly demonstrated our ability to serve the sector. We strive each year to improve this service and it's with this in mind that we see this partnership as being beneficial to the sector as a whole. Our business in the last year has gone up almost ten fold and with this comes responsibilities and expectations. We therefore look forward to IWRA assisting us in the tasks ahead.

For example, this cooperation will enable our members to attend many of the high profile IWRA functions as members of IWRA, and which will also hopefully provide platforms where our members can seek and engage in collaborative research with IWRA members wherever they may be. Such collaboration in terms of technology development can only assist in developing technologies that can assist us in the water sector to reduce our costs in the treatment and supply of water and the treatment of the subsequent waste waters. The gains achieved through such collaborative research would in the long run be passed to the consumers, clearly a major and tangible benefit.

The real test in any collaboration is in the actual results. Unfortunately most of mankind is conservative by nature. While such may be appreciated, we need at the same time to weigh the possible benefits of any deal and to move with speed to make the best out of the deal. It is through such aggressive strategies and actions that we can take advantage of opportunities. After all, such opportunities can never remain for long periods. I therefore urge members of both organizations (WISA and IWRA) to move with the necessary speed to operationalise this memorandum of understanding so that we collectively can start to see the benefits trickle to society at large. At the executive level, WISA gives its total support to this and we look forward with excitement to its benefits.

My best wishes to IWRA and to its members. Once again we welcome IWRA to the water fraternity in Southern Africa and may the future be as bright as it can be.

PROF FRED OTIENO, PRENG, FSAICE, FWISA, MBA, PHD (ENG)
WISA PRESIDENT 2007/2008
PRETORIA, SOUTH AFRICA
30th March 2008

Meet Wallace Mayne, the Executive Director

Wallace was born in Klerksdorp, South Africa, in 1954 and was raised on a farm at Ingogo in Northern Natal. After attending boarding school , he went on to study civil engineering at the University of the Witwatersrand (Wits) as a Johannesburg City Council bursar.

Upon graduation in 1978 Wallace joined the Johannesburg City Engineers Department where he gained experience in the fields of engineering design, contract management, construction and maintenance of roads & stormwater infrastructure, and waste management. During this time Wallace studied part-time at the Wits Business School and was awarded an MBA in 1984. When the Department was restructured in 1991, he was appointed as a director in the City's Roads Directorate where he

was responsible for road maintenance in the Eastern half of the City as well as its motorways, asphalt plant, laboratory and training centre. One of his more memorable projects during this period was the R50 million upgrading (€5 million) of the Ellis Park Precinct for the 1995 Rugby World Cup. Wallace was awarded an MSc in civil engineering by Wits in 1995.

With the democratisation and restructuring of local government in 1996 he was appointed as the Strategic Executive responsible for engineering services (including water & wastewater) in the Southern half of Greater Johannesburg including Soweto.: He held this position until January 2001 when he was transferred to Johannesburg Water, the newly established water utility for the City.

At Johannesburg Water, Wallace was exposed to various aspects of managing a water utility and in 2002 was appointed as Executive Manager: Corporate Affairs & Human Resources. After acting for five months as Managing Director of the utility he joined the Johannesburg Fresh Produce Market as Group Executive: Operations.

In May 2005 his application for the position of Chief Executive was approved by the Board of the Water Institute of Southern Africa (WISA). In the three years Wallace has been employed by WISA, it has grown from a R2 to a R8 million per annum operation and membership from 1 500 to 2 200 including 31 patron members.

The 13th IWRA World Water Congress in Montpellier in September – Do not miss it!

Human activities have disturbed the hydrologic cycle in massive ways in the past, but never as much as today. Where we are now is most likely, just an overture to what will come in future decades. Many of the mighty rivers such as the Yellow river or the Indus do not bring much water to the seas any more. Groundwater aquifers are being overdrawn with alarming rates. The water quality problems of surface and groundwater are growing increasingly severe. Land use changes and climate factors cause the increase of damage and calamity due to floods, storms and droughts. With increasing urbanization and congestion of people to very small land areas, the above problems as how they are created and felt by humans are significantly amplified.

The massive transitions in global economy, in social structures, in our environment as well as in the human demography in terms of urbanization, aging of populations, changing educational level, evolving values and mindsets and so forth all are issues that are never disconnected from water.

Recognising the dimension of these pressures to the planet's life-blood—water—and the complexity of the entity is crucial. Recognition is, nevertheless, not enough since the mitigation of this planet's voluminous water-related threats needs action, not just recognition and diagnosis.

IWRA's 13th World Water Congress will take place in Montpellier, France in 1 to 4 September this year. It will be the internationally leading event on water and global changes with an abundant supply of studies and experience on all the above matters. The coverage of congress papers, posters, special sessions and other communications is both geographically as well as topically highly captivating. All the expectations have been surpassed both in terms of quantity and quality of the submissions. At this point we plan to have 63 ordinary oral scientific sessions, 24 special sessions and a rich variety of posters. There will also be unique side events as well as the IWRA General Assembly.

Put **1-4 September 2008** in your calendar. Join us in Montpellier, which is a great city in most attractive surroundings in Southern France. The International Scientific Committee of the Congress is more than happy to work with other organizing entities towards a most attractive week-long programme, and providing participants a unique platform of exchange on global changes and water resources. Do not miss it!

IWRA has been blessed by having an incredibly competent and committed team in Montpellier. Pierre Chevallier's crew has been really a pleasure to work with and our association already greatly appreciates their fluent and efficient collaboration as we head for a landmark conference.

OLLI VARIS
CHAIR, INTERNATIONAL SCIENTIFIC COMMITTEE, IWRA WORLD WATER CONGRESS 2008
VICE PRESIDENT, IWRA, 2007-2009
ESPOO, FINLAND

Note from the Treasurer

Financially, IWRA is recovering from the recent transitions and related challenges. In October 2007, the Board appointed me as the new Treasurer, following the resignation of the previous Treasurer earlier in the year. My goals as Treasurer are discrete. I will work with the Board to restore financial stability to the Association and to introduce some measures to restore financial transparency. The top priorities in recent months have been:

(1) filing past-due tax documents,
(2) updating administration of the IWRA bank accounts (and opening new accounts),
(3) restoring the revenue stream, and
(4) helping to transfer financial management from the former Executive Office at McGill University to the new Executive Office at the Water Institute for Southern Africa.

I would like to brief the membership on each item in turn.

In February 2008, I submitted the "Form 990" for 2006 to the U.S. Internal Revenue Service (IRS). This had been a source of great concern. As a not-for-profit organization that is registered in the United States, IWRA must file an annual tax form with the IRS. IWRA does not pay taxes; this is an informational reporting obligation only. However, the failure to submit this tax form in a timely manner can subject the Association to civil and criminal penalties.

The tax forms for 2006 were due May 15, 2007. In November 2007, the IRS sent a note inquiring about the forms, citing the dialing penalties and more serious penalties for failure to submit timely tax forms. I informed the IRS that IWRA was securing the services of an accounting firm to help prepare the form. There was some delay in the preparation of the tax forms, as we awaited full documentation on financial matters for 2006. As the new Executive Office received the documentation from the former Executive Office, we were able to provide the accounting firm with the information necessary to prepare the tax forms. When we filed the 2006 Form 990, we requested a waiver of penalties in light of the recent institutional turmoil (3 Executive Offices in less than 2 years), our long history of timely filing of tax forms, and our plans to submit the 2007 Form 990 in a timely manner. We have not yet heard back from the IRS.

In the meantime, we have started to prepare the 2007 Form 990. The former Executive Office has produced the financial report for 2007, and we are optimistic that IWRA will be able to file the 2007 tax form on time. I am hopeful, therefore, that by the time of the IWRA Congress later this year that we will be back in good standing with the IRS.

With the transition of the Executive Office, the Association has been setting up new bank accounts and transitioning management of existing accounts. WISA established an account in South Africa for the day-to-day management of the Association, and we are in the process of setting up an interest-bearing investment account in which to retain the remainder of the Association reserves. We have also been communicating with the banks that hold Certificates of Deposit for IWRA to transition control of those dedicated funds.

Another priority has been to restore the revenue stream of the Association. With the structures in place – including a new PayPal option on the IWRA web site, by which members can pay their membership dues – the priority has been on systematically billing members. Members are the life of the Association, practically and financially. The Executive Office and President have updated the membership fees (with consent of the Board) and invoiced the members (based on the updated list of members recently received from the former Executive Office).

In the last two months, the new Executive Office has received most of the paper and electronic records, including financial records, from the former Executive Office. The Executive Office, President, and Treasurer are now sorting the documentation and working on the transition. With this new documentation, a new problem has arisen that we are now managing. A number of institutional subscribers to *Water International* sent 2008 subscription fees to the old Executive Office. Since late 2007, IWRA has an agreement with Taylor & Francis to publish *Water International.* As part of this agreement, institutional subscribers will be billed directly by Taylor & Francis, and the subscription rate has increased from 2007 levels. Dr. Tortajada is working with the institutional subscribers to resolve the matter.

Financially, the Association is currently in a difficult situation. The Association does have dedicated funds consisting of donations to the Association for dedicated purposes, which were placed in two Certificates of Deposit; these funds are intact. The Association has known liabilities whose amounts are as yet unclear, including

(1) amounts still owed to McGill University for the transfer of documentation and other materials to the new Executive Office;
(2) a significant number of institutional subscriptions that need to be refunded or forwarded to Taylor & Francis; and
(3) (3) potential penalties due to the IRS.

The Association does have some unrestricted funds, but it is uncertain whether these are sufficient to cover the liabilities. We hope in the coming months to generate revenues from membership dues as well as the IWRA Congress, determine the precise amounts of the liabilities and to pay those debts, and to

more securely determine the precise financial status of the Association.

Before closing this brief update, I would like to acknowledge the strong support that I have received from Dr. Tortajada, IWRA President, and from Mr. Wallace Mayne, IWRA Executive Director. I am also greatly indebted to Dr. Ben Dziegielewski, past Treasurer, who has been generous in his insights and guidance.

I will prepare a more full financial report for the IWRA membership for the Congress. In the meantime, if anyone has questions, please feel free to contact me at bruch@eli.org.

CARL BRUCH
TREASURER, 2007-2009
WASHINGTON, DC

Note from the Editorial Office

When I attended my first Executive Board meeting as chair-elect of the Publications Committee, listening to the report of the editor-elect on the situation he faced with *Water International*, I was relieved that I had my position and not his. Since September 2007, I have had both, under even more stringent conditions during the transition period to a new Executive Office. Nonetheless, I am pleased to report that we have made considerable progress towards normalization and, dare I say, improvement of our journal.

Thanks in part to our adding a double-sized special issue (CD only, because of costs), the backlog of 70 accepted manuscripts I inherited will be cleared by the September 2008 issue. One of the few advantages of having so many manuscripts to deal with was that we have been able to group them together by theme, beginning with the June 2007 special issue on the Middle East. In September and December, we added a "current directions" commentary by an IWRA expert to introduce each theme: flooding (Kaoru Takara) and DSS approaches (Raja Sengupta) in September, transboundary waters (Anthony Turton), urban water (Olli Varis) and law (Carl Bruch) in December 2007.

The Special Issue 2007 begins with a section of 8 papers on IWRM, lead off by an essay by Asit Biswas restating his call for a reexamination of the concept. Other sections in this issue, unfortunately without initial commentaries due to time constraints, are on African experiences, appropriate technologies and diagnosing sustainability.

At the moment, we are still playing catch-up in getting the 2007 issues out, but all three should be out within the next month or so, as should March 2008, our first issue with Routledge (Taylor & Francis). The themes for that issue are challenges to common wisdom and groundwater. By June, we will be fully back on track with a special issue of articles on survey and other participatory methods (entitled "It Doesn't Hurt to Ask"), with a current directions commentary by IWRA Director Undala Alam.

Our next big task will be to address the large backlog of over 70 papers that have been submitted and whose authors have been waiting to hear from us with varying degrees of patience. Here we can afford to be very selective, so that we can bring the time from submission to publication for future submissions down to an acceptable level. Since the quality of the manuscripts submitted to us is generally quite high, it is going to be quite a challenge to us to select those that best meet our criteria: technical soundness, policy relevance, importance, and of interest across national and disciplinary boundaries.

This will call for drawing fully upon the collective wisdom of IWRA members and others who are willing to spare their time

to do timely reviews of manuscripts submitted to us. For new submissions, we do an in-house review of manuscripts by an editorial core group to reduce the burden on external review and give authors quick feedback if their manuscripts are not acceptable, or require significant revision before submission. We will also be restoring a book review section and attempting some new or renewed ways of bringing *Water International* into the information age as an author-friendly publication that people will want to read and cite. We are not fully recovered yet, but with your support, we are well on our way.

JAMES E. NICKUM
CHAIR, IWRA PUBLICATIONS COMMITTEE, 2007-2009
EDITOR-IN-CHIEF, *WATER INTERNATIONAL*
TOKYO, JAPAN
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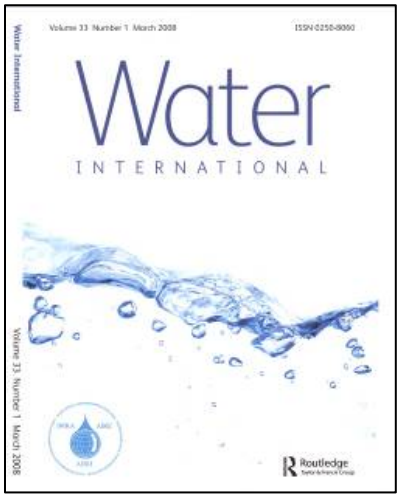
New look of Water International



Ven Te Chow Lecture Award

The Ven Te Chow Lecture has been awarded to Dr. John Pigram. Professor Pigram has over 40 years experience in applied research, teaching and administration, in water policy, water reform and water resources management in Australia and internationally. He is the recipient of major grants from the Australian Research Council; Land and Water Resources R&D Corporation; Murray- Darling Basin Commission; Environment Protection Authority; Government Agencies; Greenhouse Information Program; US National Science Foundation; and the World Water Council.

In 1987, Professor Pigram, with Professor Warren Musgrave and Professor John Burton, received an award of $750 000 from the Australian Government to establish the Centre for Water Policy Research at the University of New England, Australia. Professor Pigram was Executive Director and Director of the Centre until 2001, and had overall responsibility for management of a diverse program of applied research, fostering excellence in scholarship and professional activity at the cutting edge of water policy. This research has had a lasting impact on the process of water reform in Australia and in the wider international scene. Under his leadership, the Centre carried out major studies in rural and urban water policy and practice in both the public and private sector.

Professor Pigram was a Founding Member of the Board of Governors of theWorld Water Council and the Club of Tokyo (modelled on the Club of Rome), He was also President, 2001-3, of the International Water Resources Association and chaired the Organising Committee for the Xth World Water Congress of the Association in Melbourne, Australia in March 2000. In 2005, Professor Pigram was appointed Fellow of the International Water Resources Association, the highest rank of membership in the Association. In 2006, Professor Pigram was the recipient of the Distinguished Service Award of the International Water Resources Association for outstanding contributions in the field of water policy and exceptional academic leadership in water resources management and water reform in Australia and other regions of the world.

Professor Pigram remains actively associated with the University of New England. He is engaged in research and supervision of graduate students in the Centre for Ecological Economics and Water Policy Research and maintains a demanding schedule of involvement in leading international water organisations.

Professor Pigram is the author, co-author and editor of a large number of scholarly publications, including six books (two in 2006), two encyclopaedia, 19 major edited works, and 32 monographs and research reports. He has produced numerous book chapters and articles in leading refereed journals and has made over 70 presentations to national and international conferences. Professor Pigram also serves on the Editorial Boards of international journals and acts as reviewer, assessor and examiner for higher degree theses, and in funding applications and research submissions

Call for Nominations for the Crystal Drop Award

The Crystal Drop Award is awarded to individuals or organizations in recognition of their laudable contribution to the improvement of the world's water situation. IWRA hopes that the award will encourage the recipient's continued efforts and will also promote public awareness of the urgent need for cooperative efforts to manage the world's water resources. The Crystal Drop Award is awarded once every three years and presented at the IWRA World Water Congress organized by IWRA.

Past recipients of the Award have been:
1985 - UNICEF (Brussels)
1988 - UNEP and its Executive Director, Dr. Mostafa K. Tolba (Ottawa)
1991 - Yahia Abdel Mageed (Rabat)
1994 - Prof. Asit K. Biswas (Cairo)
1997 - Rotary International (Montreal)
2000 - Prof. Yutaka Takahasi (Melbourne)
2003 - Prof. Benedito Braga (Madrid)
2006 - Prof. Malin Falkenmark (Delhi)

The Executive Office of IWRA is pleased to receive nominations for the forthcoming IWRA Triennial World Congress to be

held in Montpellier in September 1-4, 2008. Nominations should be sent to the Executive Office no later than 31 May 2008, at the following address: iwra-office@wisa.org.za.

Water news

CSIR Activities

"The CSIR has agreed to co-brand a forthcoming Special Edition of the International Journal of Water Resources Development entitled "Reflections on Water in South(ern) Africa" with the IWRA. This is done in recognition of the key role that the IWRA plays as a global platform for technical expertise in the field of water resources management.

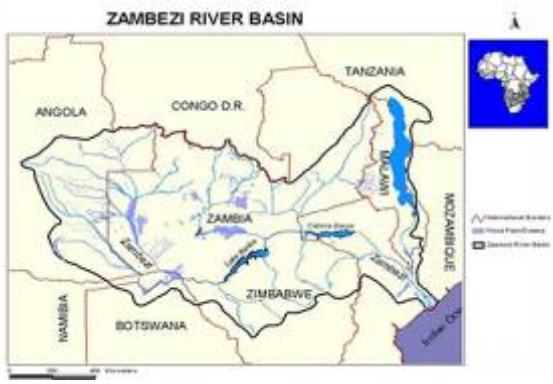
The CSIR is also engaged in negotiations with the President of the IWRA with a view to expanding support to current and future projects that have a regional scope. One area of possible cooperation is in the area of what the CSIR calls "management paradigms". This is a research program that the CSIR is running designed to investigate the appropriateness of IWRM as a management paradigm in a diverse economy that is fundamentally water-constrained. This opens the door to wider cooperation, and more importantly, to co-learning between institutions that are confronted by the vexing problem of the need to grow an economy by creating employment against a fundamental environmental constraint of endemic water-scarcity.

Related to this is the issue of water management arising from pollution caused by mining activities. Acid Mine Drainage (AMD) is being regarded by some as a major problem in the water sector with a global reach. Many developing countries have mining-based economies, and where that economy is also located in an arid or semi-arid climate, then the pollution plume causes major damage by reducing water quality. The loss of dilution makes this a specifically complex problem, needing a range of skills to manage. For example, AMD caused by coal mining in South Africa is causing certain rivers to have a pH as low as 1.8 (the lowest yet recorded) with elevated levels of sulphate. Conventional wisdom suggests that treatment involves neutralization by means of limestone, but recent and as yet uncompleted research indicates that this can cause blooms of cyanobacteria that have an adverse effect on mammals under specific sets of circumstances. Little is known of this at technical level, so the IWRA can play a major role in creating a global network of professionals across disciplines capable of investigating this problem. A separate but related issue is that of gold mining, which is also a major generator of AMD, but has the additional problem of heavy metal and radionuclide contamination of sediments in rivers as well. In this regard the CSIR is initiating a project that will use human deciduous teeth to sample for potential radioactive contamination in off-mine populations living alongside rivers known to have been polluted by heavy metals. This has been dubbed the "Tooth Fairy Project".

The CSIR believes that the IWRA is uniquely placed to create trans-disciplinary platforms on which technical expertise can be generated, and for this reason supports the IWRA fully.

Evolution of Cooperation on a Shared International Watercourse – The case of the Zambezi Watercourse in Southern Africa

The Zambezi River Basin covers an area of about 1.3 million square kilometers and is shared by eight of the fourteen member states of the Southern African Development Community (SADC). The countries sharing the Zambezi River Basin are Angola, Botswana, Malawi, Mozambique, Namibia, Tanzania, Zambia and Zimbabwe. The total geographic area of the riparian countries is estimated at 5 million square kilometers. The Zambezi River Basin covers 26% of the total geographic area of the riparian countries. The total population of the riparian countries is estimated at more than 100 million people and about 40 million live within the basin. The Zambezi River Basin is the largest shared basin falling entirely within the SADC region and is the fourth largest (basin area) in Africa after the Congo, the Nile and the Niger.



Source: Zambesi River Authority

The Victoria Falls (one of the seven wonders of the world); and the artificial lakes of Kariba and Cahora Bassa, which supply some of the countries in the region with hydropower, are on the Zambezi River. Major economic activities include agriculture, mining, tourism, timber production and fishing. The main river has a length of approximately 2700 Km. The mean annual flow at the sea (Indian Ocean) is 3600 m^3/s.

A noticeable feature of the basin is the significant variation among the riparian countries in the economic status, population, size, water availability and institutional capacity. These differences pose special challenges for cooperation.

The Southern African Development Community (SADC)

The Southern African Development Community (SADC) brings together about 200 million people in southern Africa spread over 14 member states. The SADC Declaration and Treaty call upon all countries and people of southern Africa to develop a vision of a shared future, a future within a regional community that will ensure economic well being, improvement of the standards of living and quality of life; freedom and social justice; and peace and security for the peoples of southern Africa. The common vision includes, among its statements, the promotion of the sustainable utilization of natural resources. Water happens to be an important and critical natural resource for the development of southern Africa more so since the SADC is a region of shared water resources. The Zambezi River Basin therefore presents a major test case or opportunity for cooperation in managing shared water resources for regional economic development and integration in southern Africa.

The Policy, Legal and Institutional Context of Water Resources Management in Southern Africa

The Southern African Vision for Water, Life and the Environment that was adopted in 2000 aims at ensuring that there is equitable and sustainable utilization of water for social, environmental justice, and economic benefit for present and future generations. The vision is underpinned by a regional water policy, a regional water strategy and an action plan endorsed by all member states. In addition, member states are party to the Revised SADC Protocol on Shared Watercourses which came into force in 2003. The Protocol aims at formally fostering closer cooperation for the judicious, sustainable and coordinated management, protection and utilization of

shared watercourses and advances the SADC agenda for regional integration and poverty reduction. The Protocol is being implemented through the SADC Secretariat and overseen by a Committee of Ministers who are in turn supported by a Committee of Senior Officials. The Agreement for the establishment of the Zambezi Watercourse Commission (ZAMCOM) was concluded within the framework of the Revised SADC Protocol on Shared Watercourses. The Agreement was signed in 2004 and is currently undergoing ratification by the riparian states. The objective of ZAMCOM is to promote equitable and reasonable utilization of the water resources of the Zambezi Watercourse as well as the efficient management and sustainable development of the same.

Challenges and Constraints of Water Resources Management and Development in the Zambezi River Basin

The Zambezi River Basin is characterized by extreme temporal and spatial rainfall variability; and deteriorating watersheds and water quality. This is against a human population that is rapidly growing and urbanizing leading to increased water scarcity and pollution.

The basin is still faced with significant water governance constraints particularly as they relate to the generally inadequate legal and regulatory frameworks; weak institutions; poor data collection, management and dissemination systems; weak stakeholder participation; and more importantly, inadequate infrastructure in most of the riparian countries be it for irrigation, hydropower, domestic water supply, sanitation, industrial water supply, flood control or drainage.

The Zambezi Action Plan and the Proposed Zambezi Watercourse Commission

In the context of regional cooperation and integration and in recognition of the importance of sustainable management and development of water and related resources, the countries of the Southern Africa under the then Southern Africa Development Coordinating Conference (SADCC) adopted the Zambezi River Action Plan (ZACPLAN) way back in 1987. The objective of ZACPLAN was to achieve environmentally sound planning and management of water and related resources in the Zambezi River Basin. A current major project under ZACPLAN is the Zambezi Action Plan Project 6 whose objective is to improve integrated water resources management to facilitate social and economic development and protection against floods, droughts, water resources pollution and environmental degradation in the Zambezi River Basin. Under the project, three major areas of work are being undertaken more or less in parallel. These are:

(a) Facilitating the establishment of an enabling environment (regional and national) for strategic and integrated water resources management for the Zambezi River Basin. A major component of the enabling environment is the proposed Zambezi Watercourse Commission (ZAMCOM).

The process of negotiating the ZAMCOM Agreement was long and protracted. Negotiations initially started in the early 1990s. After several suspensions, the negotiations were only concluded in 2004. The Agreement is now in the process of being ratified by the riparian states and preparatory work for the establishment of the Commission is continuing. Once the Agreement comes into force, the implementation of the Zambezi River Basin Integrated Water Resources Management Strategy –which is under preparation through a joint consultative process –will begin in earnest.

(b) Development of systems and tools for water resources management and development in the Zambezi River Basin

A Zambezi Water Resources Information system(ZAMWIS) is being cooperatively developed and a rapid water resources assessment study is also being jointly undertaken. The cooperative assessments and the disclosure of national agendas are expected to help the riparian countries build much need confidence and trust;

reach common understanding and achieve information symmetry.

(c) Formulation (Definition) of an Integrated Water Resources Management (IWRM) Strategy and Implementation Plan for the Zambezi River Basin.

The objective of the IWRM Strategy for the Zambezi River Basin is to define medium and long term measures in support of integrated water resources management and protection against floods, droughts, pollution and environmental degradation in the river basin.

The process of preparing the IWRM strategy through a consultative and cooperative process is underway and is expected to be completed by early 2008.

Concluding Remarks

The journey toward cooperation on the Zambezi Watercourse has benefited from the regional framework provided by the SADC Treaty and Declaration; and the Revised SADC Protocol on Shared Watercourses. As the coming into force of the ZAMCOM Agreement is awaited, cooperative assessments and other confidence building activities are expected to catalyse the process of moving away from unilateral national action – which can have an undermining effect on one another's development and plans- to integrated and coordinated basin-wide cooperation in order to secure the integrity of the basin and its resources. This is in recognition of the fact that basin-wide water resources management is an important aspect of sustainable development. In the context of international watercourses, efforts towards integrated management can not materialize without international cooperation. Obviously there will be challenges along the way. These will include operationalising and sustaining ZAMCOM; operationalising the principle of equitable and reasonable utilization (ERU) in the context of the basin; agreeing on the rules of notification of planned measures/projects; and sustaining and growing the Zambezi Water Information System (ZAMWIS). The prospects for cooperation - which is increasingly being seen as an imperative rather than an option – appear promising if the current momentum is sustained.

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Climate change 2.0 and water management – some simple thoughts on a complex issue!

"Climate is what we expect, weather is what we get". Mark Twain.

Climate Change[1] 2.0 is now upon us and the 21st century climate challenges will require 21st century perspectives from water professionals. If we are to believe the current media hysteria – nothing in our lives will ever be the same. Is it really so? Do the climate change predictions of, for instance, the IPCC (2007) really mean so much new for water resources planning? As water professionals we plan based on reality rather than predictions. What are we to do now then?

The new climate x-change: bank on it!

Put simply, rain –freely falling or stored, possible inflow from groundwater and human water diversion– is the credit side of the water resources balance ledger in a basin; evapo-transpiration, runoff and water demand are the debits. Changes to any of these will impact, more or less, directly on water resources availability. Climate variability and change influences our water resources planning as loan interest rates influence your private economy. It adds uncertainty. Raise the interest rate (less precipitation, more evapotranspiration and/or higher

[1] Climate change is used as synonymous with human induced global warming. Climate variability is used when referring to natural climate (change).

consumptive human use) and your budget is strained and less flexible; decrease the interest (more precipitation, decreased evapotranspiration, and/or less consumptive human use) and you've got more room to manoeuvre.

But, we are not helpless, since we can "supplement" our capacity to cope with changes, just as if we increase our income by taking a second job (improved water management, infrastructure development) or live more frugally and improve our ability to cope with negative change (water demand management, increased water efficiency, less water consumptive activities). It is only when money burns a hole in our pocket (high ratio of our income, i.e. high water use relative to renewable average availability) that we become seriously vulnerable and, perhaps, risk even bankrupting ourselves.
A critical question for water professionals, therefore, is if climate change will really force us to have a paradigm shift in our thinking and planning for water resources management and use (as an economist in red-hot economic times would plan for survival in a stalled economy)? Climate change, combined with bursting urban populations, growing per capita water use, overbuilt coastal areas and other land use changes, may imply large or even disastrous water resources changes. This is the generally agreed perception today, but as we see, climate is but one among several different change factors.

Revolutionising our revolutionary changes

To be sure, revolutionary changes occurred already during the 20th century. Over that century, human water use has increased at least 6-fold (with human population increasing "only" 3-fold) (Cosgrove and Rijsberman, 2000; Gleick, 2003). This increase in human water use has also been accompanied by increased pollution loads and deterioration of aquatic ecosystems (e.g. Turner and Rabalais, 1994; Nixon, 1995; Koplin et al., 2002; Kavanaugh et al., 3003; ERMITE, 2005; Baresel and Destouni, 2006; Lindgren et al., 2007).

That's the direct water factors! In addition deforestation and agricultural expansion reshaped the planetary surface. Added to that, in 2007 humans became for the first time a more urban than rural people (see Figure 1) (United Nations, 2005). Urbanisation adds complexity by impacting water consumption and management. And vulnerability increases. One in 10 humans lives in costal areas at less than ten metres above sea level (McGranahan *et al*., 2007). Lest we forget, these people are not now suddenly living at risk. They've always been at risk in these areas; climate change simply changes the dynamic.

These realities thus necessitate that adaptation and mitigation measures include a multitude of aspects, as adapting to a single factor or implementing one measure otherwise may counteract another. At the centre stage of such efforts is the understanding of the total effects on water resources from a range of impacting factors.

As water professionals, we need to accept that climate change has reshuffled the deck. We must redefine what we do and how we do it; we need participate actively in the ongoing debates on environment, development and policy in perpetuity. (How long climate change remains the media flavour of the day remains to be seen.) Water professionals must make sure the debate is widened, made realistic and not watered down, pardon the pun, with simplicity but addressing the multiple causes behind changes. We must, in essence, become educators. Here's some food for thought:

Change, not stability, should always be the starting point for all (water) planning. The saying says that perception is reality. Unfortunately, far too many planners and decision makers outside of the water sector perceive climate change as something completely new. That perception goes something like this: for centuries, the relative tranquillity and calm seen by civilised societies over the last two millennia is the natural, stable state of things, while the climate changes that are being emphasised now and which are predicted to increase in the future is far

more dramatic, disastrous and deadly. The reality is somewhat different.

The natural climate has always been changing. It is, at least partly, our inability to observe, acknowledge and account for this fundamental truth (in particular over the last few decades) that has caused many of the problems that we see today in the water sector. The "stable-climate thinking" has weakened the sector's coping capabilities for current problems and future challenges. If we would have planned for the ever ongoing natural variability, we would today be better equipped to cope also with human induced changes.

An example, glaciers are receding dramatically in most regions of the world, with tremendous impact on water resources (more water now – less in the future, lost storage capacity, etc). Is this situation unique? Maybe on average global level, but have a look on Figure 2 exemplifying highly variable regional glacier conditions in the Alps. The late 20th century global warming is evident, but so is also an extended period before 1970 with a regionally similar situation, followed, interestingly, by a trend with more general glacier advance. In fact, media hysteria in the 1970s and 80s quite often focused on a "new ice-age". As water professionals, we must provide better explanations, through graphs such as these, why changes in recent decade(s) have other driving forces (such as human induced climate change) than earlier (and similar) trends. This is absolutely not to argue against human-induced global warming, but assessments have to be more transparent and explanatory on the complexity of the climate-water link and that natural variability is high, has always been so, and must be factored in and understood. And even more important, we should also, after the long period of earlier recession, have been better prepared for such a variable situation in this region. It is, evidently, not unique even under natural conditions.

The problem in naturally water scarce countries (or countries with great variability) is that water resource planning strategies resemble the way fish catch quotas are determined. First, scientists determine what the sustainable fish catch should be. Then, a political process begins (a process considering a range of social and economic factors, often short term) that almost always ends up with a much higher quota. The result is declining stocks and increased vulnerability to natural changes. As for water, many countries in dry regions or regions with high variability use far beyond what could be considered sustainable in the long term and under such conditions. Considering your bank loan again – if you use 90% of your income to pay your interest rates, a small increase of such rates may be devastating. This is what many countries do today and if/when they run into problems, the blame should not only be put on climate change!

Complexity is part of the natural system. Water management has been complex in the past, and will certainly be so also in the future, with or without human induced climate change. Too often, over-simplistic speculations such as "it will get dryer where it is already dry and it will get wetter where it is already wet" are too easily dragged out in the media (often, unfortunately, also by some water professionals) as a basis for making fast water resources planning decisions. Such over over-simplifications should not be accepted as a basis for planning. As water professionals, we need to investigate the significant reality and complexity on the appropriate spatial-temporal scales for water resources management, rather than for global climate modelling.

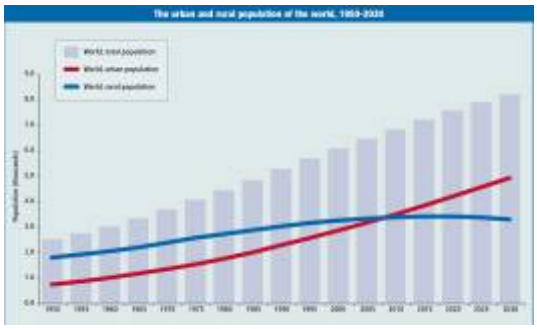
Non-climatic factors are significant parts of the water resource equation. Factors beyond climate, including availability, temporal and spatial distribution, etc., influence water resources and need to be an integral part of water resource planning and management as well as in the discussions on global change (which include much more than just climate change) effects on water. Land use changes, large-scale water diversions, changes in consumption patterns, changes in production (agriculture, industry), changes in population and population patterns, etc., may influence both water resources and local-regional climate in various complex ways even more than the local-regional manifestation of the global climate change (Darracq et al. 2005;

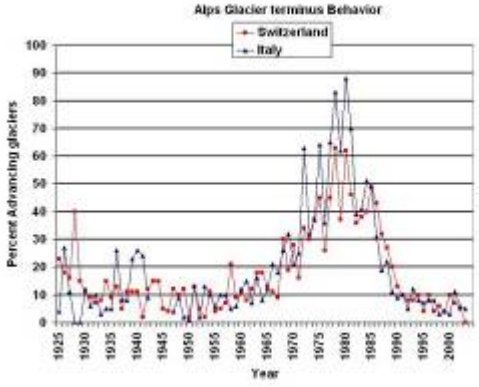
Shibuo, 2007). Feedback systems in reality become an intrinsic web of relationships and outcomes. Understanding such links forms the foundation for any understanding of the water-climate interface. As water professionals, we have a responsibility to be far more engaged and drive discussions on local-global change effects on water resources than what is currently the case.

Let us take one concrete example. The dramatic shrinking of Lake Chad is often referred to as evidence of what dramatic climate change may lead to. A study by Coe and Foley (2001), however, clearly pointed out that the observed changes in the regional climate since the 1960s have had only minor impacts on the dramatic changes of the lake compared to other factors (many of which are also human induced). Similar findings are also reported for the dramatic Aral Sea shrinkage over the same time period (Shibuo, 2007). Also for the considerably less dramatic, yet also important expected future development of nutrient loading within and from the major Swedish Norrström drainage basin (including also the capital Stockholm) to the Baltic Sea, other change and development factors have been found to be more important than climate change (Darracq et al., 2005). Are these examples arguments for that climate change is not important? Absolutely not! What they show is that climate change should not always be considered as the major factor, since also other, non-climate development and change factors can significantly or even dramatically affect water resources! Thus, if we focus only on climate, on the expense of other factors, we will be in trouble. To add complexity, other scientists may argue that climate change is indeed the main driver in for instance Lake Chad (Evans, 1996). Nothing is simple in the world of water!

Concluding remarks

We have discussed here some perspectives that need to be better understood and incorporated in the climate change research and debate to better reflect the water dimensions. Climate change should, and will, influence the way we conduct our business as water professionals but if we could get planners, policy makers and decision makers to also better recognise and understand the natural variability and full range of other factors that impact on water, our societies would clearly be in a much better state to cope with unexpected and severe future changes. Improved understanding of the climate-water links is an integral and fundamental prerequisite for all development. It is therefore a critical factor if we are meet the Millennium Development Goals (MDGs) and secure food production, industrial development and eco-system services. It all depends on water, and water is the critical link between the climate and human society. We hope that this short intervention will spur some healthy debate!





indicating the percentage of advancing glaciers. The terminus data is from the Swiss and Italian Glacier Commissions. (Pelto: www.nichols.edu/departments/glacier/) and the graph is reproduced from Wikimedia Commons.

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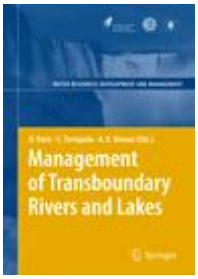
New publications

Management of Transboundary Rivers and Lakes



Transboundary rivers and lakes are often the remaining new sources of water that can be developed for human uses. These water sources were not utilized in the past because of the complexities associated with their development and management. However, as water scarcity increases, there are increasing social, economic and political pressures to utilize such water sources. Series: Water Resources Development and Management. Varis, Olli; Tortajada, Cecilia; Biswas, Asit K. (Eds.) 2008, XX, 304 p. 27 illus., Hardcover. ISBN: 978-3-540-74926-4

Issues on Asian River Basin Management

The CREST Asian River Basin Water Policy Scenario Team headed by Professor Kengo Sunada of the Yamanashi University of Japan completed their research on major Asian rivers. *Issues on Asian River Basin Management* was published in February 2008. The team is planning to publish an English language edition later this year. For particulars, please contact sunada@yamanashi.ac.jp

Modern Myths of the Mekong

Helsinki University of Technology's Water and Development Research Group headed by Professor Olli Varis has completed a book presenting a critical account of the various simple truths, or modern myths related to development and water resources management in the Mekong Region, webpage http://www.water.tkk.fi/global/publications/. Series: Water & Development Publications. Helsinki University of Technology. Kummu, M., Keskinen, M. & Varis, O. (Eds.) 2008. Modern Myths of the Mekong -- A critical review of development concepts, principles and policies. TKK-WD-01 187 p. Paperback ISBN 978-951-22-9102-1. The electronic version of the complete book (in English) is available free of charge in the following pages: http://www.water.tkk.fi/English/wr/research/global/publications_myth. html. A summary volume is available on the following languages: English, Chinese (Mandarin), Khmer, Lao, Burmese, Thai, and Vietnamese.

IWRA News

Board members

Prof Jennifer McKay is in Oxford on study leave working on socio legal theory and water management laws and will then go to UC Berkeley on a Fulbright Senior fellowship to work on judicial interpretation of environmental sustainable developments laws in the US Australia, Canada, UK and EU. She is co-editor (with Potter EC, Mackinnon A and McKenzie S) of *Fresh water- new perspectives on water in Australia-is water a resource or the source?* (Melbourne University Press 2007)

(www.mup.com.au) and author of Chapter 7, Water, rivers and ecologically sustainable development p 90 -104. She was also the joint editor of "The global importance of groundwater in the 21st Century: Proceedings of the International Symposium on Groundwater Sustainability," published by the National Groundwater Association of USA in conjunction with the Spanish Academy of Sciences, IUCN, UNESCO, and UniSA USA. She authored the chapter on "Groundwater as the Cinderella of water laws policies and institutions in Australia". In February she put together a photo exhibition called "Picturing Water Use and Justice" for the Adelaide festival fringe that will be touring Australia, the US and the UK

Forthcoming events

International Conference on Water Resources Systems Management under Extreme Conditions, June 4-6, 2008. For further information, visit the webpage: www.ecwatech.com.

IWRA WORLD WATER CONGRESS, "Global Changes and Water Resources: confronting the expanding and diversifying pressures", September 1-4, 2008. For further information, visit the webpage: ww.worldwatercongress2008.org

Water and urban development paradigms: Towards an integration of engineering, design and management approaches, Katholieke Universiteit Leuven, 5-19 September 2008. For further information, please visit the website http://www.urbanwaterconference.be

2nd Annual China Water Congress. For further information, please visit the website: http://www.chinawatercongress.com/

Safety Evaluation and Visual Inspection of Existing Dams. International Technical Seminar and Study Tour (formerly Dam Safety, Operation and Maintenance Seminar) September 15-25-2008. For further information contact: Leanna Principe, International Affairs, D-86-43100, Bureau of Reclamation, P.O. Box 25007, Denver, CO 80225, Telephone 1-303-445-2127, fax 1-303-445-6322. E-mail: Lprincipe@do.usbr.gov, www.usbr.gov. For electronic information please visit: http://www.usbr.gov/international/damsafety.html

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