

Meeting reports

Special Session on *Water Management Beyond 2020 for a Changing World*, 17 March 2009, World Water Forum, Istanbul, Turkey

The IWRA co-organized a very special session during the 5th World Water Forum in Istanbul on “Water Management Beyond 2020 for a Changing World,” together with the Middle East Technical University of Ankara; the Third World Centre for Water Management of Mexico; the State Hydraulic Works of Turkey; the International Centre for Water and Environment of Zaragoza, Spain; and the Lee Kuan Yew School for Public Policy of Singapore. The speakers and the panelists were all specialists from a variety of sectors around the world who deal with water and water-related issues.

The logic and background of the session were explained by its co-chairs, Professor Dogan Altinbilek of Middle East Technical University and former Director General of State Hydraulic Works of Turkey, and Dr. Cecilia Tortajada, President of the International Water Resources Association, Scientific Director of International Centre for Water and Environment of Zaragoza and Visiting Professor at Lee Kuan Yew School of Public Policy of Singapore. They noted that the rates of global changes during the past 2–3 decades have steadily accelerated, especially compared to the historical past. The current indications are that these rates of change are likely to accelerate very significantly in many areas in the coming decades. This will make water governance processes and practices increasingly more complex than ever before witnessed in human history. Accordingly, “business unusual” solutions are needed to successfully manage the world’s water resources for changing global conditions and much higher levels of uncertainties and risks in the future.

Water management is an integral part of the global system. It has always been affected by the development sectors like food, energy, environment, and industrialization. In turn, the water sector has affected developments in all these related sectors. Future water management thus must be formulated within the context of an overall framework of accelerating changes and increasing interrelations between the relevant development sectors, and regions, institutions and actors, as well as higher levels of risks and uncertainties. What are likely to be different during the next 20 years compared to the earlier two decades will be emerging issues like globalization; free trade; the information and communication revolutions; technological advances in areas like biotechnology and desalination; migration (both inter- and intra-country); HIV/AIDS; concurrent quests for food energy and environmental security at national, regional and international levels; changing water paradigms and increasing uncertainties associated with climate change; and evolving societal expectations, political frameworks and public attitudes and perceptions.

As world conditions change, water governance practices must change to meet these future challenges successfully in a timely and cost-effective manner. It will not to be an easy task, but one that must be accomplished.

Professor Asit K. Biswas, President of the Third World Centre for Water Management of Mexico, and Distinguished Visiting Professor at the Lee Kuan Yew School of Public Policy of Singapore, in setting the overall scene for the session, quoted President Kennedy: "Change is the law of life. And those who look only to the past or present are certain to miss the future". He pointed out that the water profession has been saying at least for the past 35 years that business as usual is not a solution but has been behaving as if there were no other. He pointed out that tomorrow's water problems cannot be identified, let alone solved, with today's mindsets, yesterday's knowledge-base and day before yesterday's solutions. Yet this is mostly the current situation.

The future water problems of the world are likely to be very different from those that have been witnessed in the past, or are being faced at present. They are likely to be of a very different character because many drivers of change will affect them. Unlike in the past, a very significant percentage of these change drivers will come from outside the water sector on which the water profession is likely to have only limited, or even no, control.

These drivers of change can be broadly divided into three categories:

- (i) those that have been historically considered by the water sector, like population or urbanization;
- (ii) those that are considered indirectly or at present, like economic growth or energy generation; and
- (iii) new ones that are totally ignored at present, for example globalization, free trade, migration (both inter- and intra-country), information and communication revolution, HIV/AIDS, technological developments in areas like biotechnology and desalination, changing management paradigms and evolving new social trends, perceptions and expectations.

Even among the first category of drivers that are being considered at present, their future implications are likely to be very different. For example, in the area of population, one area completely ignored at present is the rapidly changing age structure of the population. In the 1950s, the world had 200 million elderly people, or 8% of the global population. By 2050, their number will rise to 2 billion, or 22% of the global population. Between 2005 and 2050, the number of people of 80 years of age or more will increase by 700% in countries like India and China.

The rapidly ageing world will have different water-related implications. For example, elder people have weaker immunological systems, which means they need higher quality water. Because their number will increase very significantly, their demand for higher quality water will become an important social and political consideration. Similarly, a major concern now in a country like Japan is the sudden retirement of a large percentage of experienced baby-boomers beginning in about 5 years time, which will mean sudden and precipitous loss of institutional capacity and memory. There are many other implications. Yet, not even a single institution anywhere in the world is at present working seriously on the implications of ageing on the water sector.

In the area of urbanization, the most serious water and wastewater problems will not be in the megacities of the developing world, which are widely forecasted at present, but in small- to medium-size urban areas of 20,000 to 500,000 people, where the population growth rates are now the highest. Unlike the megacities, where the politically and commercially powerful people live, these small- to middle-size urban areas currently have extremely limited political and economic power, and very limited administrative and management expertise. They will simply be overwhelmed to meet their future water and

wastewater challenges. The problems of these urban centres are now being basically ignored by the water profession.

In the second category of drivers, more attention has to be paid in the future to the interrelationships between water, economic development and poverty alleviation (see the *Water International* special issue on this topic, March 2009). Equally, water requirements for the energy sector have to be explicitly considered as an integral component of national water policies or strategies. At present, not a single developing country considers water requirements (both in terms of quantity or quality) of the energy sector, even though water demands of this sector have been steadily increasing in many important countries of the world in the recent years, like in Brazil, China, India, Turkey and the United States. While the energy sector has been the largest user of water in France for decades, in 2009, for the first time in history, the energy sector of the United States will become the largest user of water. As the electricity requirements of many major developing countries have increased by 5–11% a year in recent years, a trend that is likely to continue well into the future, the water management implications of energy generation can no longer be ignored.

Prof. Biswas then went on to indicate how the third category of drivers, including globalization, free trade, information and communication revolutions, migration (inter- and intra-country) HIV/AIDS, and technological developments, are likely to have very significant impacts on water management practices in the future. The Third World Centre for Water Management, International Water Resources Association, and International Centre for Water and Environment has recently initiated a major programme in this overall area. The initial results can be seen in a newly published book *Water Management in 2020 and Beyond* (Biswas, Tortajada and Izquierdo, 2009).

The session had a remarkable panel session, with very high-level panellists, in terms of intellect, expertise, positions and diversity, which the water profession has never seen before. Ahmet C. Bozer, President of Coca Cola for Eurasia and Africa, pointed out that the scope and complexity of water projects of the future will require dialogue, cooperation and collaboration among the main stakeholders, including business, governments and the public. In the twenty-first century, the game has changed for business. Although it is still the role of business to maximize the return to its shareholders over both the short- and the long terms, the way this is done will have to be different in the future. He went on to say that the “health of our business is directly linked to the health of the environment. If the community thrives, business thrives. It is only enlightened self-interest.”

At Coca-Cola, water is a fundamental requirement for its business. By 2020, water is likely to be higher on the international agenda. The main business impacts of current and foreseeable trends are likely to be limited availability of freshwater and rising costs of using, treating and returning water to its natural environment. “It is in our best interest, from both humanitarian and business standpoints, to help ensure supplies of clean freshwater available to us and the communities where we operate.”

In terms of water stewardship, Coca-Cola has outlined a three-prong strategy:

- Reduce – Water efficiency will be increased by 20% by 2012.
- Recycle – By 2010, all manufacturing processes across Coca-Cola’s global system will conform to stringent wastewater treatment standards. Although currently wastewater is treated to locally required regulations and standards, future requirements will mean all wastewater will be treated to fully support aquatic life.
- Replenish – Coca-Cola will expand support of healthy watersheds and sustainable community water programmes to “balance the water used in finished beverage and their products.”

Dr. James Horne, Deputy Secretary of the Australian Department of the Environment, pointed out that the world has not managed its freshwater resources properly over the past decade, and, for the most part, will end the present decade in worse shape than we were in at its beginning. The tasks most governments are now facing are two-fold:

- Address problems arising from weaknesses in existing water management arrangements; and
- Ensure that the revamped arrangements can manage effectively the challenges from the expected impact of climate change over the coming decades.

In Australia, new arrangements are being put in place under a “Water for the Future” vision to provide a blueprint for moving forward in the Murray Darling Basin, which has not been managed optimally in recent decades. The framework involves a learning, iterative process involving attention to detail and concerted action. It has been buttressed by legislation and resourcing that will involve substantial infrastructural enhancement and direct purchasing of water by the government to place the environment and industry on a sustainable level to adapt to climate change in the coming decades.

A key challenge in rural catchments will be how to achieve sustainable water use. Sustainability must involve science and must be built around social and economic considerations. Also important is the need for reliable information on water availability and use, and a socially inclusive discussion on sustainable environment and sustainable agriculture. Both of these are inadequate at present.

How to progress from the present situation in the Murray–Darling Basin will depend on the property right system being used. An important focus has thus been placed on a well-defined property right system that is conceptually not too dissimilar from the property rights system of the surrounding land.

There will be significant challenges in terms of implementation, principal among which are likely to be

- ensuring a fully functional property rights framework, which will not be for the faint-hearted;
- establishing a sustainable integrated cap on water extraction, which will be a major task, scientifically as well as in terms of community consultations;
- establishing a sustainable framework that is implementable and enforceable; and
- making all consumers aware of the value of water, and pricing properly all aspects of water and its delivery to constrain demand and to encourage innovation.

Although the pace of change in water management in Australia has been ramped up substantially over the past year, it will probably take another 5–6 years to break the back of most of the remaining problems.

Benoit Miribel, Director General of Foundation Mérieux, France, succinctly summed up the genesis of the current water situation by quoting the Secretary General of OECD, Angel Gurría: “The irresponsibility of man has made water become one of the main problems in the past century: resolving this problem is now an international priority.”

The water crisis is primarily because of the way this resource is being used at present, and less because of the lack of its availability. Globally, water has been extensively mismanaged in the past, including much wastage, absence of extensive recycling practices and poor governance. Current water use patterns are unsustainable. A culture of responsibility has to be developed among all its users. It is necessary to promote new governance

practices, based on good experiences from different parts of the world, encourage development and implementation of new and cost-effective technologies that would promote recycling, and increase very significantly the efficiency of water use. Increased networking between different countries and sectors is necessary to identify a set of good practices that are replicable and implementable, and thus increase the global capacity for efficient water management. Availability of adequate quantities and qualities of water worldwide will improve human health. When public health improves, general living standards and quality of life will also improve.

Aalt Leusink, a specialist on water and climate, focused on climate change and its potential implications on water management for deltaic areas like those in the Netherlands. Among the severe threats the country is likely to face in the future are

- rising sea levels, requiring that additional measures be taken to prevent coastal flooding;
- increasing river discharges compared with those observed in the past;
- high pressure on the physical environment, which would require mindset changes from fighting against water to living with water;
- shortages of freshwater in 15–20 years time because of longer dry periods in the summer, which will adversely affect current water storage systems; and
- saltwater intrusion because of rising sea water levels, both in terms of brackish groundwater intrusion in the western parts of the country, which are more than 6 m below sea level, and also increased invasion of salt water from the mouth of the rivers.

The challenge facing the Netherlands is how to ensure that the country can be made safe against flooding while remaining an attractive place in which to live and work. The strategy proposed for the future rests on two pillars: flood protection and sustainability. Measures taken must be cost-effective, produce additional value for society, be flexible, be implementable gradually, create new opportunities, contribute to efficient use of water and energy, and improve environmental quality. It will not be an easy task to satisfy all these requirements concurrently, but it has to be accomplished.

The present National Water Plan envisages that €65 billion will be needed over the next 40 years to implement a sound Delta Programme.

The main water-related challenges facing the deltaic areas of the world in the future are likely to be the following:

- to coordinate/integrate conflicting objectives and spatial claims with prevailing actors in the social and institutional domains, in order to formulate and implement strategies;
- to make all infrastructure and investment robust and economically attractive in view of large future uncertainties; and
- to build resilient water governance organizations that can manage multi-level and multi-sectoral processes to ensure spatially consistent regional development.

Dr. Jonathan Woolley, Director of the Challenge Programme on Water and Food (CPWF), noted that 70–90% of water diversions in developing countries are for agricultural use. Yet some 80% of farmland does not have any conventional irrigation infrastructure. Thus, improving the productivity of rainfed agriculture, through innovations such as conservation agriculture, water harvesting and supplemental irrigation would represent a

major opportunity because of its sheer scale. This is especially true for Africa where irrigation infrastructure is minimal. Rainwater management has a high potential for increasing livelihood resilience through better production of crops, fisheries and livestock.

In the future, scientific advances in terms of salt-tolerant and drought-resistant crops, and improved crop management practices will increase food production per unit of land. The expansion of multiple-use water systems for production and household use should also be an important consideration.

Win-win situations for different users are rare in water management, especially as basins become more stressed. There is thus a need to share water, but even beyond sharing, to assign water to higher value uses, and share the benefits with those who have to give up water. Local examples of this can be seen in the institutional innovation of urban-based trust funds, developed in Ecuador and Peru, that invest in conservation agriculture by upland farmers, where upland communities also withdraw from use of vulnerable areas needed to maintain flow of quality water to urban areas.

These innovations step beyond research-for-development as usually practised; they require much broader communities of researchers, development experts, policy makers, producers and consumers. They require not only technical complexity (coordinating expertise across many disciplines) but also dealing with social complexity (building relationships and creating common agreements). As we tackle such challenges in the future, the formulaic solutions of the past will have limited applicability; expertise can help but will not be sufficient; relationships will be key; and even with all this in place, outcomes will remain uncertain.

Overall, the session proved to be a remarkable one, primarily because of its high intellectual content, pragmatic approach, and representative viewpoints from academic, government, business and NGO leaders. The focus was on the future, not on the past. The organizers provided plenty of time for discussions, which proved to be equally lively and stimulating.

A common theme that ran through the entire session is that even though the water problems the world is facing at present are serious, many of them stem primarily from past and current mismanagement of the resource. The amount of water available in the world may be limited, but it is still significant. Equally, water is not like a non-renewable resource like oil or coal, which once used cannot be used again. In contrast, with proper management practices, water can be reused many, many times. We already have enough knowledge, experience and technology to solve the water problems of the world, provided the current management practices and processes can be improved significantly. The mood of the overall session on the world's water future was one of cautious optimism, if we follow the suggestion of the eighteenth century British philosopher and statesman, Edmund Burke: "You can never plan for the future by the past."

Reference

Biswas, A.K., Tortajada, C. and Izquierdo, R., 2009, *Water management in 2020 and beyond*. Berlin: Springer.

*Asit K. Biswas, Cecilia Tortajada
Third World Centre for Water Management, Mexico City, Mexico
and Dogan Altinbilek
Middle East Technical University, Ankara, Turkey*