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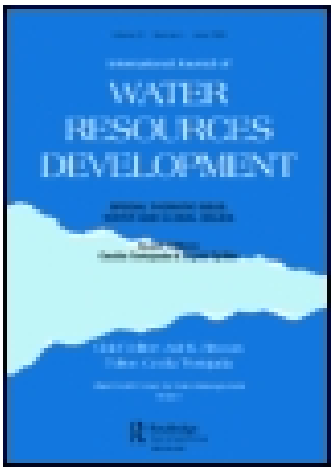

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Conference reports

Malin Falkenmark [a], Asit K. Biswas [b], Dinesh Lal Shrestha [c] & Asit K. Biswas [d]

[a] Stockholm Water Ltd, S-106 35, Stockholm, Sweden

[b] Chairman Committee on International Water, International Water Resources Association, 76 Woodstock Close, Oxford, OX2 8DD, UK

[c] COWEL International, GPO Box 4279, Kathmandu, Nepal

[d] 76 Woodstock Close, Oxford, UK

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Conference Reports

The Stockholm Water Symposium

Stockholm, Sweden, 10–14 August 1992

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Life and Death Issue

Unless means are found to prevent continued water quality deterioration, the fresh-water quality problem may become a threat to human survival. Water, in its many forms, is used—and abused—in a variety of sectors of human society. By virtue of its unique capacity as a solvent, water can carry massive flows of solutes. The role water plays as the bloodstream of the biosphere explains the biological damage and reduced biodiversity inflicted by water pollution.

Pollutants discharged into the water cycle derive from three main sources: human and livestock waste (mainly biodegradable organic products); discarded industrial products and industrial waste (often toxic and accumulating readily in food chains); and agricultural chemicals (fertilizers and pesticides) used to obtain the high yields needed to feed rapidly expanding human populations.

Regional Differences

Current problems vary widely between different regions of the world. In the advanced *western societies*, the problem of human biological waste is solved by wastewater treatment; industrial waste is increasingly being limited by strict quality constraints to minimize the harmful substances entering water systems. Agricultural pollution, on the other hand, is still a largely unsolved problem. The dilemma of the *post-communist societies*, previously comprising the socialist bloc, is the extent to which industrial pollution had been allowed to escalate. The problem here is how to finance the necessary drastic reduction in pollution at source and how to exercise control in the future. In the *southern societies*, the rapidly increasing volume of waste being produced by the expanding urban areas, industry and agriculture, is the new challenge. Acute difficulties emerge wherever high levels of population density on finite water resources are being reached.

Means to Solve

Radical means to solve the world-wide problem of water pollution include:

(1) enlightenment at all levels of society to ensure the necessary change of attitude. It is especially important that the call to action, sounded by water experts, is heeded by economists and politicians;

(2) devising effective ways to achieve a more productive dialogue between scientists and politicians;
(3) transforming a fallible, sectorized administration into an administration responsible for ensuring not only multisectoral integration, but also integration of land use and water management;
(4) replacing obsolete legislation by effective and enforceable laws necessary to bring about a change in attitude;
(5) adequate monitoring of water quality in order to provide the necessary data on which to base political decisions.

Choosing the Future

It is essential to realize that the present generation of decision makers are actually in a decisive stage of choosing the future of our planet. Their degrees of freedom, however, differ widely between regions. In the *western societies*, noxious waste materials and industrial products constitute the main problem. Here, a new 'cradle-to-grave' approach to industrial products needs to be applied in all analyses of the processing industry. Choice of less waste-producing lifestyles is an urgent matter.

In the *post-communist societies*, it is essential to strive toward a closing of the material cycles, in order to avoid repeating the mistakes of the already industrialized countries. Finally, in the *southern societies*, the challenge is to ensure development despite an inevitable population explosion in the short and medium term. It is of the utmost importance to prevent water pollution in water-scarce regions where at the same time the population pressure on existing finite water resources is high. A particular problem for countries in both of these regions is to achieve the massive financial investments entailed.

In view of the call of the UNCED Conference in Rio to integrate environment and development, this Symposium stressed the need for a fundamentally new approach to total water problems with their links to the quality of human life and natural ecosystems. In matters concerning deteriorating water quality, principles have to be introduced that allow a successful trans-sectoral integration of land use and water quality management, with the objective of effectively minimizing harmful fluxes from land to water.

Malin Falkenmark
Stockholm Water Ltd
S-106 35 Stockholm, Sweden

Middle East Water Forum

Cairo, Egypt, 7–9 February 1993

The Middle East Water Forum was convened in the Nile Hilton Hotel, Cairo, and was organized by the International Water Resources Association (IWRA) and the United Nations University, with the support of the Saskawa Peace Foundation and the United Nations Environment Programme. The undersigned acted as the Convenor of the forum in his capacity as the Chairman of the Committee on International Waters of IWRA.

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Participation in the Forum was strictly by invitation only. Only 29 leading authorities on Middle East Waters were specifically selected and then invited because of their acknowledged expertise in this field.

The forum was officially opened by Dr Mostafa K. Tolba, former Executive Director of UNEP. In his opening address he pointed out that, before the current changes in Eastern Europe and the former USSR, the number of major river and lake basins shared by two or more countries was estimated to be 214. There are a number of important international river basins in the Middle East region: Euphrates–Tigris, Jordan, Yarmouk and the Nile. In addition, there are many underground aquifers which are shared by two or more countries.

Past and recent experiences indicate that the complex and politically sensitive issues of international river basins cannot be resolved by individual countries unilaterally. They would require genuine cooperation between countries as well as understanding and appreciation of each other's needs. Such cooperation could manifest itself in the form of joint action plans, joint commissions or even treaties. What is needed is regional or subregional cooperation. The regions in this context are not necessarily political regions but rather ecological regions such as a lake or river basin. What is now required is not cooperation in dividing amounts of water but genuine cooperation in the implementation of agreed plans for the integrated development of whole basins for the benefit of each country of that region. Such cooperation can come about only through availability of reliable facts and consideration of feasible options. The complex issues can often best be considered and discussed in a closed non-governmental professional forum like the Cairo Forum where leading technocrats of the region and renowned experts on Middle East Waters from outside the region were specially invited to discuss these multifaceted issues. Dr Tolba also pointed out that the region had great expectations from the deliberations of such a high level of experts.

The Forum agreed to spend about half the time available for discussion of the background papers circulated and the second half on brainstorming on the issues raised and other relevant facts which warrant consideration.

The most exceptional aspect of the Forum was the successful exercise in international relations that it proved to be. The participants discussed, in a scientific and objective manner, the complex problems of sharing limited water resources available in a very arid region, with a rapidly expanding population base due to both natural causes and migration. There were many areas where there were sharp differences of opinions, but these were outlined and discussed in a constructive fashion, without rancour.

The Forum participants primarily focused their attention on the facts and figures available, and the various implications of these. It is clear that there are many data whose reliability are being questioned by one or more parties. Lack of standardization of the data set has created further misunderstanding. For example, 'dunum', a unit of area, has a different value in different Middle East countries.

There was considerable discussion on how mind-sets of decision makers could be changed by indicating that water need not be a zero-sum game for the countries concerned in the region. Many participants felt that the present perception needs to be changed since water availability could be increased through different technical options. Equally, water use and demand patterns could be dramatically changed through better water conservation techniques,

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changing cropping patterns, shifting water use from agricultural to other purposes and consideration of other, similar alternatives.

Several participants felt that many of the implicit but fundamental assumptions on water availability and demand patterns need to be seriously re-examined, not only in the context of the Middle East but also for other arid and semi-arid regions of the world.

Political issues and considerations were mentioned, where these were necessary. It is clear that water policies in a very arid region with limited water supply cannot be divorced or discussed separately from the political issues facing the sovereign states. The overall atmosphere during the entire Forum was generally amiable, even when the participants disagreed with each other.

Since 17 of the 27 participants in the Forum are now associated with the bilateral and multilateral negotiations for the Middle East Peace Talks, the Forum unanimously agreed that it should not make specific recommendations which could affect the progress of the Peace Talks. However, the simple fact that these negotiators could meet each other in an informal setting and get a better understanding of the reasons or rationale behind many of the negotiating situations, can only augur well for future discussions on water within the context of the Middle East Peace Talks.

The Forum participants had not previously had an opportunity to interact with each other in a personal and informal manner. The unanimous conclusion of the participants was that they found the Forum most useful in term of developing personal contacts, new ideas and better understanding of many technical facts. They felt that professional NGOs such as the IWRA have a major role to play in the management of international waters. They encouraged IWRA to convene a similar well-focused and well-planned Forum for South and Southeast Asia and later for Africa. Such forums would facilitate negotiations and development of international water bodies in the regions concerned.

The background papers specifically commissioned for the Forum are being published as a book by Oxford University Press. The book should be available by September 1993.

Asit K. Biswas, Chairman
Committee on International Water
International Water Resources Association
76 Woodstock Close
Oxford OX2 8DD, UK

International Symposium on Snow and Glacier Hydrology

Kathmandu, Nepal, 16–21 November 1992

Norman Dyhrenfurth, the leader of the 1963 American Scientific Expedition to Everest, called the Himalayas 'a third pole' for their summits covered by perennial snow and ice above 5000 m altitude resembling the environment existing in Arctic and Antarctic polar regions. The Himalayas are the highest but the youngest mountain belt on earth with more than 90 peaks above 6000 m and they contain about 50% of all glaciers outside polar regions. The Himalayan region, since its birth, has been supporting civilizations unlike the 'two other poles'. The region constitutes developing countries, most of them least

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developed, and shelters billions of peoples. Being one of the least explored geographical regions, therefore, the Himalayas deserve a renewed thrust from the international scientific community.

This was the first Symposium addressing a subject of immense importance to the peoples in this region ever held in the foothills of the Himalayas. The objectives of the Symposium were to focus on the challenge to incorporate the vast potential of snow and glaciers into the use and management of water resources, to highlight studies carried out on the hydrological characteristics of snow and glacier-dominated mountain watersheds, to study the possible effect of climate change on snow and glaciers, to foster linkages between those involved in snow and glacier hydrology and to provide a common platform to relate experiences and share knowledge.

The six-day Symposium hosted by the Ministry of Water Resources, Department of Hydrology and Meteorology, Nepal and by German Technical Cooperation (GTZ) was attended by over 70 scientists, engineers and researchers from 11 countries. Altogether 38 papers were presented under six different themes.

This was a unique Symposium in which glaciologists and water resources engineers from the Himalayan region and from Europe, Japan and the USA sat together to discuss and find ways to understand the peculiarities of snow and glacier regimes, particularly in the Himalayas; to assess their potentials; and to utilize and manage the abundant water trapped in the snow and glaciers.

The Symposium was successful in revealing some important considerations to be made while developing water resources in the Himalayan rivers. Several papers stressed the need to understand, monitor and analyze potential hazards from glacial lake outburst floods (GLOF) which are a common phenomenon in the Himalayan watersheds. Some papers also reported an excessively high proportion of sediment concentration observed in the rivers originating from the glaciated basins in the Himalayas.

Although there were some papers based on studies from Alps, central Asia and the USA, as expected, most of the papers reported results obtained from experiments and research conducted in the Himalayas. Nevertheless, it was felt that the studies on snow cover and glaciers in the Himalayas, so far, have been insignificant and are still in a primitive stage. Very little is known about the characteristics and processes of this component of the hydrologic cycle in the Himalayas. As such , the participants were convinced that however small it may be, a strong thrust is needed to promote studies on the Himalayan watersheds on a regular basis.

The Symposium concluded with a lively floor discussion leading to an adaptation of the following ten recommendations:

(1) Scientific studies to further the understanding of snow and ice processes including glacier dynamics and the atmospheric processes influencing them in the high mountain environment to be promoted and encouraged in the Hindu Kush-Himalaya (HKH) region.
(2) Long-term monitoring programmes on snow and ice resources as well as on changing climatic conditions based on already existing programmes, taking account of local conditions and utilizing local expertise, to be actively promoted.

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(3) Models and other techniques for forecasting water supply, sediment load and flood hazards relative to the HKH region to be further developed and applied with particular attention to mitigating glacier lake outburst floods.
(4) Databases on snow and glacier hydrology should be developed for practical end-uses and should be made freely available so that rational water management decisions may be made.
(5) Innovative techniques including remote sensing and GIS to be encouraged in order to collect, store and analyse data efficiently.
(6) Consideration to be given by the countries of the region, in cooperation with international agencies, to conducting a Himalayan Experiment similar to the ALPEX initiative in the Alps.
(7) Setting up experimental watersheds to include glacierized areas to be actively encouraged to promote integrated watershed management and to facilitate environmental impact assessments.
(8) Dialogue between scientists and water managers to be encouraged through the holding of meetings, workshops and symposia on a regular basis.
(9) Training of technicians and managers to be undertaken on an ongoing basis through a structured programme.
(10) Coordination of scientific monitoring and training activities to be promoted at a central location with the active involvement of ICIMOD, WMO, UNESCO, governments and institutions of the region and external support agencies as appropriate.

Dinesh Lal Shrestha
COWEL International
GPO Box 4279
Kathmandu, Nepal

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Second Mediterranean Conference on Water

Rome, Italy, 28–30 October 1992

The above Conference was organized by the Italian Government and the Commission of the European Communities. Hydrocontrol of Cagliari, Italy, assisted the Italian Government with the organization of this Conference. During the Conference, the Ministers of the appropriate governments approved the following Mediterranean Charter for Water.

The Ministers responsible for Water in the States of the Mediterranean Basin and the representative of the Commission of the European Community meeting in Rome from 28th to 30th October 1992:

- *fully aware* of the fact that water resources are of vital importance for man and his environment and can constitute a positive factor in the cooperation among countries while representing an economic good for them all;
- *convinced* that, at national and regional levels, water resources form the foundation of a balanced and sustainable economic development;
- *aware* of the responsibilities of Mediterranean States to ensure rational development of all their water resources in the Mediterranean watershed—whether surface of underground—and permanent protection of these resources from all forms of deterioration and pollution;
- *considering* that the preparation of long-term national strategies for water

resources development is essential for an integrated water management ensuring equitable satisfaction of various requirements and preserving the natural ecological role of water;

- *considering* the Genoa Declaration on the Second Decade of the Mediterranean Action Plan (1985), the Declaration of the Algiers Meeting on Water (1990), the Nicosia Charter (1990) and its follow-up at the Cairo Meeting (1992), the Action Programme adopted by the Mar del Plata Conference (1977), the Declaration of the International Conference on Water and Environment of Dublin (1992), the results of the World Conference of Environment and Development in Rio de Janeiro (1992); hereby agree to adopt and endeavour to implement the following.

On Water Planning

Evaluation of resources. To continue and improve evaluations of all fresh and brackish water resources, in terms of quantity and quality, in order to determine the best possibilities for their mobilization, use and potential reuse through:

- strengthening of institutions and means for the measurement and collection of information and data;
- regular inventory and evaluation of available resources;
- development of techniques for hydrological data collection, processing and storage;
- improvement of access to data by the various users such as those in charge:
  (a) of the design or operation of hydraulic facilities;
  (b) of assessing the risks of flooding or drought and pollution;
  (c) of evaluation of water resources.

Evaluation of demand. To continue and improve the quantitative and qualitative evaluation of drinking water requirements of urban, peri-urban and rural populations, industrial water requirements and irrigation water requirements, as well as sanitary supplies, suitable low flow in the river:

- by establishing data banks on water consumption and uses;
- by regularly updating medium- and long-term forecasts of water quantity and quality demand.

Water resources development and management plans. To draw up and implement water resources development plans and projects based on short, medium- and long-term resources—demand balances, according to a procedure that will be:

- interactive, by organizing dialogue and finding a basis for consensus between policy makers and water users, at all stages of preparation of development plans;
- dynamic, by updating quantitative and qualitative data, assessing the results of development plans and tuning them to current requirements. The water resources development plans will take into account both the benefits for economic and social development and their impact on the environment.

National large water transfer projects within each country may be considered as appropriate means to reduce water shortage specifically for domestic uses

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within certain parts of the country. The national experiences gained in the Mediterranean area should provide valuable information on this alternative solution for water resources development.

On Water Management

By actions at technical, financial, institutional and legislative level, to make best possible use of surface and groundwater resources, by preserving their quality and their sustainability and by developing economies in all different uses.

Technical measures. With respect to production, conveyance and distribution facilities:

- attenuate the dwindling storage capacities of impounding structures by controlling catchment area erosion and reservoir siltation;
- reduce losses in irrigation and domestic/industrial water networks and improve their efficiency; With respect to water demand:
- promote technologies and measures for rationalizing and minimizing water consumption in all sectors;
- increase water resource potential while reducing pollution at the same time, by recycling industrial water and reuse of treated wastewater for irrigation and non-domestic urban uses.

Economic and financial measures. These should:

- establish conditions for an economical and rational use of water and long-term financial viability of the water sector, by setting up tariffing systems allowing cost recovery, including the cost of sewerage and wastewater treatment in urban areas, and provision of domestic as well as irrigation water to underprivileged populations;
- evaluate the advisability of associating the private sector with the management of water resources, in economic, social and financial terms.

Institutional and legislative measures. These should be implemented to:

- decentralize water management as much as possible to ensure wider participation of users and local institutions;
- establish or strengthen coordination on a national scale in order to draw up and monitor national strategies for the development and management of water resources;
- prepare and implement programmes for educating and informing all categories of users, in particular with the support of non-governmental organizations, making them fully aware of their responsibilities, with particular emphasis being placed on improper use of water, waste and pollution, as well as the impact on environment and health;
- improve university, professional and on-the-job training of personnel involved in water resources management by adapting training programmes to the specific features of the Mediterranean (scarcity and vulnerability of resources);
- promote legislative and regulatory texts necessary for rational water management and, in particular, protection of these resources from all forms of

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pollution, making sure these texts are implemented. The Ministers and the representative of the Commission of the European Communities agree to encourage cooperation between the countries of the Mediterranean Basin in the area of the management and development of water resources, taking into account the domestic legislation.

On Regional Cooperation

They agree to promote and organize at regional level:

- information exchange on such aspects as resource and demand assessment, methods and techniques for planning, management and protection of water resources, standards and regulations, tariffing;
- research and experimentation, especially with regard to the development of non-conventional resources, such as recycling, reusing urban and industrial wastewater and desalinization of brackish and sea water;
- knowledge transfer by training and exchange of experiences, concerted researches for development of new technologies. They believe it to be worth, in order to successfully implement this cooperation, creating a Mediterranean Water Network.

This cooperation in the water field will be organized consistently and in connection with ongoing Mediterranean programmes such as the Mediterranean Action Plan.

On International and Euro–Mediterranean Cooperation

They believe that the situation of the environment in the Mediterranean—and specifically of water—is a world challenge and that it is the responsibility of all riparian countries to mobilize the appropriate cooperation means.

They urge in this respect all donors, including those outside the region and the regional and international development and funding institutions, to pay particular attention to the water resources issues in their technical and financial assistance programmes.

Within the framework of the existing cooperation instruments or agreements between the European Community and Mediterranean Countries, particular attention shall be devoted to projects specifically dealing with:

- the strengthening of institutions and organizations for water management;
- the development of national management capacities;
- the identification and development of approaches appropriate to the Mediterranean context;
- the adaptation and implementation of standards and regulations;
- the organization and circulation of information among countries;
- the development of partnerships.

Asit K. Biswas
76 Woodstock Close
Oxford, UK

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