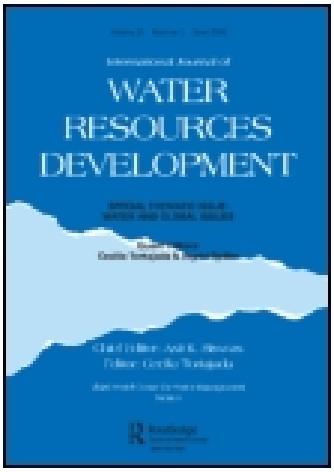

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Conference Report

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Conference Report

Third International Workshop on Water Quality Management, Zaragoza, Spain, 9–11 November 2009

A 3-day meeting of international experts was held in Centro Internacional del Agua y Medio Ambiente (CIAMA), in Zaragoza, Spain, 9–11 November 2009, to discuss water quality management. Some 30 leading international experts from 12 countries, including the United States, Canada, Japan, China, the United Kingdom, France, Sweden, Switzerland, Turkey, Egypt, and Mexico, took part in these discussions. It was co-sponsored by CIAMA, International Water Resources Association, and Third World Centre for Water Management. Participation in the workshop was by invitation only. The experts discussed comprehensively the current water quality problems facing the world, and how these problems are being solved. They also considered emerging water quality problems and their potential solutions, including the need for institutional innovations.

The participants agreed that the main water problems facing the world in the future are likely to be because of water quality rather than due to actual physical scarcities of water. At present, the world's physical water scarcity problems can be solved with the existing knowledge, technology and funding availability. Water management practices in the world are generally becoming more and more efficient, especially in terms of water quantity. For example, the United States now uses 5% less water for all purposes, compared to 1975, in spite of a much higher level of population and more than doubling of its economic activities. Efficiency gains are allowing many countries to use the same quantity of water for more and more activities.

In contrast, water quality management has not made commensurate progress. In Western Europe and North America, point sources of pollution from domestic and industrial sources have been mostly resolved. Even then, more than 9,400 of the 25,000 sewage systems in the United States have violated the Clean Water Act of 1972 in recent years by discharging partially treated wastewater into the environment. Improvements are necessary because of ageing and inadequate infrastructure in most of the developed world. In addition, non-point sources of pollution, primarily from agricultural sources, still continue to be a serious problem. The nitrate and phosphate contents of most rivers of the developed countries are still on the high side, and have to be reduced in the future. How this can be achieved technically, cost-effectively and in a timely manner is still to be determined.

Unfortunately, all over the developing world, neither point sources nor non-point sources are being managed properly. For example, in Latin America as a whole, research carried out by the Third World Centre for Water Management indicates that only about 10–12% of point sources are now being properly treated and then discharged to the environment. The situation is likely to be somewhat similar in Asia, but probably worse in Africa. As a result of the continuous neglect of good water quality management, most

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water bodies in and around urban areas of the developing world are now severely contaminated.

In terms of water quality management, the optimal solution invariably is to control the sources of pollution so that the pollutants do not contaminate the water. Once the pollutants enter water, it is often difficult and expensive to take them out.

A major water quality problem of the developed world is now emerging—contaminants such as pharmaceutical products, natural and synthetic hormones, drugs with hormonal side effects, and pesticides. These are now present in river waters and wastewater in minute quantities. While their impacts on aquatic ecosystems like fish have been observed to be harmful, their health impacts on human being are basically unknown. This is an area that will require further research in the future. Because of the paucity of data and the methodological problems associated with the establishment of cause and effect relationships, it is impossible to reliably predict the effects of sustained, very low dosages of the emerging contaminants on humans. Such relationships are invariably complex.

The complexity of water quality management, compared to water quantity, was noted. For example, whereas only about half a dozen parameters have to be monitored for water quantity management at every monitoring station, the situation for managing water quality is very different. Even 25–30 years ago, cities of the developed world had to monitor around 40 water quality parameters. This number has now come closer to 400, a 10-fold increase in only three decades. In addition, with technological advances, it is now possible to measure parts per billion (ppb) compared to parts per million (ppm) earlier. For very toxic substances, it is necessary to measure ppb, and the processes used are expensive and need considerable expertise.

A major problem for the developing world is the availability of resources and expertise to monitor water quality parameters, which are becoming increasingly expensive and sophisticated. Equally, considerable expertise is required to analyse and interpret the data collected so that they are used for planning and decision-making purposes. What is needed is to formulate a cost-effective and implementable monitoring plan, which may vary from one country to another, and may even vary from one part of a country to another. Such plans will have to be revisited with time, since as the countries develop, new pollutants are often discharged to the environment which did not exist before.

Case studies were presented from China, Egypt, Mexico, Japan and Turkey. The participants listened with interest to how the water contamination problems of the Golden Horn in Istanbul have been successfully resolved. However, similar success stories in most of the developing world are now very limited.

The water quality management problems of Aragon and how they are being tackled by the regional government were also discussed. The significant progress made by Aragon to use private sector funding for managing wastewater for small towns was noted. The private sector has now contributed over one billion euros through public-private partnerships for treatment of wastewater for small towns.

Finally, the participants agreed that to formulate and implement a proper water quality management plan, the following seven concurrent or sequential steps have to be considered:

(1) awareness and understanding of the various aspects of water quality management, including risks and vulnerabilities associated with different types and levels of contamination;

(2) policy development in terms of legislation, enforcement, incentives and sanctions;
(3) identification of appropriate actions that are technically and economically feasible and socially and environmentally acceptable;
(4) financing mechanisms like a polluters-pay-principle, user charges, taxation, and governmental funding have to be considered;
(5) political will, complemented by social pressure, to act intelligently and in a timely manner;
(6) identification of institutions and actors who would take necessary actions; and
(7) well-defined, unambiguous and doable implementation mechanisms for the plan.

The papers, discussions and recommendations of this workshop will shortly be published as books in English and Spanish so that the knowledge generated can be used on a global basis.

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