

## Conference Reports

### **Sustainable Development of the Ganges–Brahmaputra Basins**

*Calcutta, India, 18–20 March 1998*

The Ganges–Brahmaputra river system is the third largest freshwater outfall to the world's oceans: it is exceeded only by the Amazon and the Congo rivers. More people live in the Ganges–Brahmaputra basin than in all the countries of Western Europe combined, or the entire North American continent. Because of the magnitude and complexity of the problems associated with the management of this mammoth international river basin of around 1.7 million km<sup>2</sup>, and the critical importance of sustainable management of water, land and the biotic resources on which the livelihoods of millions of people depend, the International Water Resources Association (IWRA), the United Nations University (UNU) and the Ministry of Foreign Affairs of the Government of the Netherlands convened a very high-level Forum in Calcutta, India, in March 1998. This was the fourth such regional forum on sustainable management of international river systems to be convened by the IWRA Committee on International Collaboration. The first three were: the Middle East Water Forum (Cairo, 1993), Asian Water Forum (Bangkok, 1996) and Latin American Water Forum (São Paulo, 1997). The Cairo and Bangkok fora were co-sponsored by the United Nations University. All the three earlier fora resulted in books which are now considered to be the most authoritative texts available on the subjects concerned.

Increasing population and accelerating economic development activities in the basin of the Ganges and the Brahmaputra river system have now made the sustainable water management of the region even more critical than in the past. Historically, water has always been regarded as a very important resource in South Asia, and it is also considered to be a main entry point for economic development of the region. The sharing of water resources of the Ganges–Brahmaputra system has long been a matter of dispute among the four co-basin countries: Bangladesh, Bhutan, India and Nepal. Following the construction of the Farakka Barrage in India in the mid-1970s, sharing of water downstream has become a highly contentious political issue between Bangladesh and India. The development of the Ganges–Brahmaputra river system has been the hydro-political bone of contention in the region for more than three decades. However, two recent treaties on the Ganges (between Bangladesh and India, December 1996) and on the Mahakali (between India and Nepal, signed in 1997) have dramatically changed the political atmosphere of the region in terms of water management.

The main purpose of the Ganges–Brahmaputra Forum, like the three earlier fora, was to provide the countries concerned with an independent platform where senior policy makers and experts could quietly and objectively explore genuine potentials for cooperation for the sustainable development of the water,

land and biotic resources of the region, and also understand and appreciate each other's resource needs.

Participation at this very high-level but low-key forum was strictly restricted to some 30 senior policy makers and experts and was by special invitation only. They were all invited in their personal capacity for a free and frank exchange of ideas, opinions and facts on this complex hydro-political issue. Because of the positions of the participants, the forum refrained from drawing any conclusion or making any recommendation.

Eight background papers were specifically commissioned for the forum. These analysed the historical background of the conflicts as well as collaborations among the co-basin countries, future potential for water resources development in the basin, consideration of flow augmentation in the lean season, review of social, environmental and political conditions, and discussion of possible legal and institutional frameworks for future collaboration between the countries concerned.

Several topics were discussed during the forum, but only a few major ones are mentioned here. In terms of overall water resources requirement for the region, the Ganges has abundant water resources if its total annual flow is considered. The main problem is water scarcity during the lean season, from January to April, which affects both India and Bangladesh. However, only 5% of the total annual flow of the river could solve all the scarcity problems in the downstream reaches during the lean season, provided appropriate storage facilities could be made available in the catchment. Thus, the possibility of low-flow augmentation should receive high priority in the management of the water resources of the region.

While the scarcity problem in the lean season is easy to resolve conceptually, problems arise when a definitive alternative to assure low flow augmentation is to be selected that would be acceptable to all the countries concerned. Historically, Bangladesh has preferred to have reservoirs constructed upstream, in Nepal, while India has suggested construction of a 300-km long canal, through the territory of Bangladesh, to transfer water from the relatively water-rich Brahmaputra basin to the water-scarce Ganges basin. Though several participants suggested the construction of reservoirs in Nepal, it was also noted that only a very large scheme, such as the planned Kosi High Dam, could be effective in augmenting the flow in the lean season within Bangladesh. The idea of water transfer from the Brahmaputra to the Ganges also had a few supporters. This proposal, originally suggested by India, has been objected to by Bangladesh because (a) large number of people in Bangladesh would have to be resettled, (b) many serious environmental and social problems could emerge, and (c) having a canal within the territory of Bangladesh for transfer of water which could also be used for navigation from one part of India to another, through the territory of Bangladesh, could have significant sociopolitical implications for both countries.

The forum participants generally appreciated the idea of the Ganges Barrage, which would be constructed exclusively within Bangladesh. The planned Barrage would have very few political implications since it would be a national project. The international funding organizations, such as the World Bank and the Asian Development Bank, were earlier somewhat reluctant to finance any project on the Ganges, primarily because of the absence of any agreement between the countries for the sharing of its waters. The forum participants overwhelmingly

felt that the feasibility of the Ganges Barrage should seriously be considered by the external funding agencies, especially since a Ganges Treaty now exists between Bangladesh and India.

With reference to the sharing of information among the riparian countries, it was noted that the water experts in one country had surprisingly little access to information from the other co-basin countries. Certain information, which may be freely available in one country, is often not available in the others. Thus, some operational mechanism is needed for wider sharing of meteorological, hydrological, economic and environmental information between the countries concerned. Considering the sensitivities associated with data and information sharing, it may not be an easy task, but one that is essential for ensuring the long-term sustainable development of the region.

Several suggestions were made during the forum on how best to promote sustainable development of the region and how to further enhance the existing collaborations between the co-basin countries. Among these suggestions were the following. While a holistic approach to the problem is desirable, trying to integrate various sectors and involve all the parties concurrently may unnecessarily complicate the overall issue and thus contribute to delays in obtaining any feasible solution. Appropriate small to medium-scale local and national development activities could be promoted even before a basin-wide master plan was prepared. New types of investment possibilities should be investigated, such as cost-sharing between public and private sectors and donor agencies, for dam construction as well as irrigation and agricultural development components. An in-depth review of investment practices of water development schemes currently being used in countries such as Turkey or Brazil would be desirable in order to examine their potential application in the region. Finally, the advantages and disadvantages of establishing a supra-national institution for regional collaboration, such as the Mekong River Commission, to promote an integrated approach for sustainable regional development should be investigated.

As one of the follow-up activities to the forum, it is proposed that the IWRA will convene a small working group, comprising experts from Bangladesh, India and Nepal. The UN University and the Ministry of Foreign Affairs of The Netherlands are likely to support the activities of this Working Group. The Working Group would prepare a macro vision for the future of the Ganges-Brahmaputra-Meghna (G-B-M) basin as a whole. The vision, which would be elaborated by the Working Group, would be discussed by the decision makers and concerned experts of the region, most probably in Dhaka in late 1999. The revised and finalized vision would subsequently be presented at the World Water Forum, which is being organized by the Ministry of Foreign Affairs of The Netherlands in The Hague, in March 2000.

The background papers that were commissioned for the forum are now being edited by Asit K. Biswas, A.J. Diphooorn and Juha I. Uitto, and will be published shortly as a book by the United Nations University Press, Tokyo. Prof. Biswas and Dr Uitto were the convenors of the forum.

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## **Contributions of Women to the Planning and Management of Water Resources in Latin America**

*Mexico City, 21–22 May 1998*

Women, who form approximately half of the world's population, are a critical and essential component for ensuring sustainable human development through their actions on environmental management. In the area of water management, the role of women has thus far been focused primarily as the provider and user of water at the household and community levels. However important and appropriate these roles may be, the contributions of women are not exclusively limited to these activities. Equally important are the significant roles women play, and could play, as decision makers, planners, managers and research scientists in making sustainable water resources development and management possible throughout the world. Sadly, however, the current and potential contributions of women in these important areas have been basically ignored thus far.

The Committee on International Collaboration of the International Water Resources Association (IWRA), Inter-American Institute for Cooperation of Agriculture (IICA) in Brazil, Swedish International Development Agency (SIDA), Global Water Partnership (GWP) and the International Water Management Institute (IWMI), convened jointly the Latin American Workshop on the 'Contribution of Women to the Planning and Management of Water Resources', in Mexico City in May 1998.

The main objective of the workshop was to analyse the roles women play, and could play, in sustainable water resources management, not as an end, but as a means to an end, the end being efficient and integrated water management, which would improve the quality of life of people and simultaneously protect the environment. Another important objective was to provide a forum wherein experiences of senior women decision makers and professionals from the various Latin American countries could be objectively reviewed in order to draw practical and operational lessons from these collective experiences. The workshop was also expected to contribute to the development of an informal network of senior water professionals (both women and men) who are working on, or interested in, water and gender issues in rural and urban areas in different countries of Latin America.

The two-day workshop analysed 12 specially commissioned background papers on the major contributions women are making, and can make, in the overall area of water resources planning, management and decision making in Latin America. Some of the issues analysed were the roles women have played so far in different parts of Latin America, and the roles they should and could play in the future in the management, planning and use of water resources under different conditions, cultures and institutions.

The invited speakers represented 16 national and international organizations, with case studies from diverse countries such as Argentina, Bolivia, Brazil, Costa Rica, Ecuador, El Salvador, Mexico, Panama and Peru. Participation at the workshop was by invitation only. It was restricted to around 40 carefully selected professionals from federal and state governments, the private sector, universities, research institutions and NGOs from different countries of Latin America, as well as some national and international organizations such as the IICA, OEA, UNDP, IDB, CEPAL, Global Water Partnership (GWP), International

Water Management Institute (IWMI), British Council, International Water and Sanitation Centre (IRC), and Mexican Agricultural Trust Fund (FIRCO). All participants were invited in their personal capacity to ensure free and frank discussions.

All the 12 commissioned papers were operational and well-documented studies, based on years of management and research investigations. General and dogmatic papers were discouraged from the early planning stages of the workshop. It was truly an enlightening experience to listen to the participants from several disciplines, who shared their views on the contributions of women in the field of water, and on how women currently influence water resources management at national level. Most of the participants who were invited to the workshop were senior women decision makers, who mostly had not participated in such meetings earlier. While there was agreement on many issues, there were some disagreements as well.

Probably one of the most noticeable findings was the difference in the mindsets of the senior women professionals working in the water sector compared with the women scientists who are active on gender issues. Every one agreed on the importance of increasing the participation of women, not just in the water sector but also in all the other development sectors as well. Senior women professionals working in the water sector emphasized the achievement of women, whereas those working on gender issues focused primarily on the discrimination faced by women, both real and imaginary. Even though development of concrete proposals for research and study were an integral part of the workshop, the professionals working on gender issues basically agreed that greater participation by women is needed, but were unable to make concrete proposals on how this could be achieved.

It was agreed that water resources management is not only a technical issue, but also includes political and social issues as well. In order to improve the overall water management process, the participation and contributions of all the actors should be objectively analysed. Women are clearly one of the main actors in this field. Their presence has been fundamental historically in the provision and management of water at household, community and agricultural production levels. Women have been increasingly occupying management and decision-making roles only more recently.

Different issues were discussed during the workshop. For example, the principle of increasing women's involvement at all levels has been strongly supported at many major international conferences. Even though this has created a certain momentum, it does not necessarily reflect the many existing realities. Also, only statements by the women themselves are unlikely to improve the situation in the foreseeable future. Thus, official statements should not become a dogma but rather a platform from which it should be possible to analyse objectively their implementation, in terms of achievements or failures, as well as the reasons for it.

It was also noted that women alone cannot play a pivotal role in guarding the environment, but it is the society as a whole that must be concerned with doing so. Similarly, to consider women as only providers and users of water is to stress the fact that women are solely responsible for domestic work. This is unlikely to contribute to significant long-term benefits for society. Society has to be better equipped to deal efficiently with the various water problems and has to be empowered to influence the decision-making processes. Water should be sup-

plied in adequate quantity and quality, and it is the society who should be educated on how best to conserve and manage it.

From the point of view of the water sector as a whole, properly educated and trained women and men are important assets. The case studies from Costa Rica, Panama and Brazil demonstrated that significantly more women are currently joining universities to study water resources. In Brazil, the number of women studying water resources engineering has increased by 40% during the past decade. In Panama, the number of female students in civil engineering has increased from 2% at the beginning of the 1970s to about 47% at present. Analyses from Brazil indicated that more women are now joining water resources-related careers mainly through their own personal choice, and not because of any family or societal coercion.

It was noted that in Panama, currently 37% of the Ministers, Vice-Ministers and Heads of Agencies related to water issues are women, 43% of the academic staff in water sciences at the major universities are female, and a somewhat similar percentage of women work as technicians and engineers in the government and private sector in the water field. It is highly likely that the total number of women working in the water sector in Panama will increase radically within a decade or so, since the women who are studying at present will become the water managers of the future. It is not possible to increase the participation of women in water resources management, until and unless women themselves decide to be educated in that field, and decide to pursue careers in the water area.

Communication, training, formal and non-formal education, transfer of information and interdisciplinary teams were considered to be fundamental issues which could contribute to integrated water development, and also increase the participation of women. The importance of the role of NGOs was also stressed in order to involve the overall population in water resources development programmes.

In rural areas, it is not only women who have carried the load that poverty and water scarcity brings, but also men. The woman's merit is to carry out two different journeys: the one imposed by her responsibilities at home, and the other imposed by her responsibilities as a farmer. It was noted that male emigration has created new roles and responsibilities for women. Their presence as decision makers on irrigated lands increases significantly when men emigrate. It is because of the importance of the role of women as administrators and producers of irrigated lands that managers and users of irrigation districts should redefine the role of women in order to improve overall water resources management. Women should get the necessary technical training needed to plan and manage the water supplies and facilities by themselves.

An important lesson of the workshop was the recognition of the importance of the participation of women in the management, planning, conservation and use of water resources, and also to improve the quality of life of the families and the communities of which they are part. Participation of women is essential for water management. At present, women are being increasingly recognized as important contributors to the water management sector at different levels, even though the change in the mindset has been somewhat gradual. The number of women who are senior decision makers is still low. However, there has been a remarkable increase in the number of women who are planners, supervisors, managers, researchers, operators and technicians. There was a general consensus

that barriers are now open in many Latin American countries and women are already taking advantage of this change. While more could be done, and should be done, the progress already made by women water professionals in many Latin American countries should be clearly recognized. This could serve as a model in the remaining countries of the region as well as to the rest of the developing world.

The specially commissioned papers are now being edited. These will be published with a summary and conclusions of the workshop, in English by the United Nations University Press, Tokyo, Japan, and in Spanish by IICA, Brazil. The sponsors plan to distribute the book extensively worldwide.

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