

Network for Cooperation in Integrated Water Resource Management for Sustainable Development in Latin America and the Caribbean

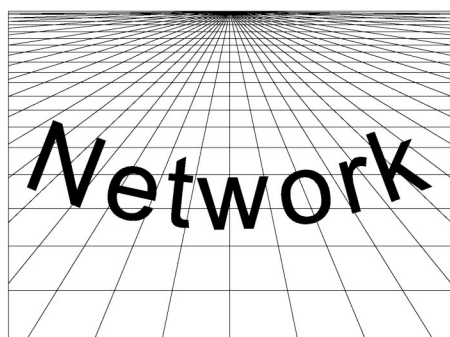


United Nations Economic Commission for Latin America and the Caribbean (ECLAC)

N° 10 October 1999

CIRCULAR N° 10

Following Chile's adoption of a new Water Code in the early 1980s, most of the countries of the region have been redesigning their water legislation and water management systems. Some of them, such as Brazil and Mexico, have already drawn up and adopted new water laws, while in others the reform process is still ongoing.



The debates taking place to advance the process of water-sector reform have been going on for more than a decade in many countries. In some cases, water bill proposals chosen for debate have been a virtual carbon copy of the 1981 Chilean Water Code. Unfortunately however, seldom if ever is any mention made of the problems generated by the implementation of this code, nor of the wide-ranging debate taking place in Chile on its possible amendment. In this edition of the Circular we present our recent study which aims to disseminate this debate (See "*Open Discussion*" and "*Publications*").

Along with legal and institutional reforms, two other processes affecting water management have unfolded. The first is an increase in private participation in the provision of water-related public services, and the second is the complex process of transferring ownership of irrigation systems to their users. In several countries these processes are well advanced, while in others they are still the subject of fierce controversy. There is also a general intention to establish water markets, in the belief that they will improve the

allocation of water resources among competing uses. In most countries these processes take place within a weak regulatory and institutional framework.

In the past, the management of multiple water uses was centralized in State hands. Hence private participation implies changes in the latter's role in this area. The State will have to give up some activities and take on others, and it will need to exercise greater regulatory power and promote the establishment of more participatory systems for multiple water-use management at the river-basin level.

For this and other reasons, the activities of our Division are increasingly concerned with institutional management, defining the roles of the State (in particular as regards privatization and regulatory frameworks), and contributing to the design and application of public policies for integrated water resource management. We are providing advisory services in aspects of the privatization of water-related public services—especially as regards regulating natural monopolies and undertaking the respective studies—and we are also involved in setting up organizations for water management at the river basin level and in drafting water laws.

At the same time there is a clear tendency to assign to the municipalities a series of new roles that were previously carried out at the central level. Many of these are directly related to water management, including water quality control, environmental management and land use planning. This has given rise to several initiatives to promote municipal participation in river-basin management projects, and our Division is also working on this issue. One of the first tasks is to further advance the dissemination and analysis of experiences with regional initiatives to redefine the role of the municipalities. Presentation of the papers "*Participación municipal en actividades de gestión a nivel de cuencas*" at the Third Workshop for River Basin Managers

in Latin America and the Caribbean (Buenos Aires, 16 to 18 November 1998) and "*Participación privada y municipal en la gestión integrada de cuencas: el rol del Estado*" at the Workshop on Integrated River Basin Management in Latin America and the Caribbean (Mexico City, Mexico, 26 to 28 April 1999) are initial steps in this process.

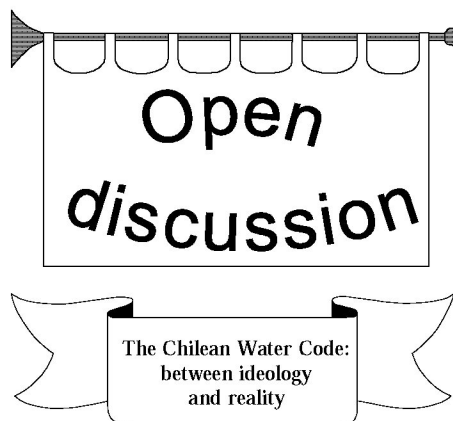
CONTENTS

- Editorial remarks.
- Open discussion.
 - The Chilean Water Code: between ideology and reality.
 - The weakness of current regulatory frameworks.
- Meetings.
 - Water Week in Panama.
 - VI Session of the Chilean National Committee for the International Hydrological Programme.
- Future Activities.
 - Technology Expo and International Symposium on Small Drinking Water and Wastewater Systems.
 - Disinfection 2000: Disinfection of Wastes in the New Millennium.
 - XVIII National Water Congress (Argentina).
 - Water Resources in Extreme Environments.
 - International Commission on Irrigation and Drainage (ICID).
- Internet and WWW News.
- Recent ECLAC publications.

All of this is occurring in a context of changing macroeconomic policies and a globalization process in which international capital and transnational corporations are investing in the water industry and, in some cases, entering into competition with indigenous communities and informal users whose water rights are ancestral. At the same time, a number of rural areas are affected by large-scale natural disasters and indigenous and peasant social movements. This situation is made more complicated by increasing concern for the environment, and in particular the need to restore and conserve the quality of surface

and ground water, an issue that is not yet a priority on national agendas.

This year, the former Environment and Development Division was split into the Natural Resources and Infrastructure Division and the Environment and Human Settlements Division. Axel Dourojeanni was appointed Director of the Natural Resources and Infrastructure Division, which now includes the Transport Unit.



Below we present the paper entitled "*El Código de Aguas de Chile: entre la ideología y la realidad*" (LC/R.1897 of 30 March 1999), by Axel Dourojeanni and Andrei Jouravlev, a summary version of which was presented at Water Week in Panama (see "*Meetings*"). The paper analyses three different but interdependent areas around which debates about changing systems of water legislation and administration normally revolve: namely, the water management system, water rights and water markets. This edition of the Circular deals with the first two of these aspects, and the next edition will discuss water markets in greater depth.

Water management

If one compares the Chilean Water Code with the basic minimum principles that water legislation should contain (see Circular N° 9) and with the recommendations made by the main international conferences on water, it is clear that while significant progress has been made, the Code still suffers from equally significant gaps and shortcomings. Many of these result from insufficient consideration being given to technical issues, such as the continuous nature of the hydrological cycle or the random nature of hydrological variables, when drafting legal regulations.

Although the Chilean water sector suffers from institutional dispersion that leads to contradictions and, at times, an overlap of competencies, one of its main advantages is that responsibilities for establishing water rights and generally controlling and planning their use are concentrated in the General Department of Water Resources (DGA) at the Ministry of Public Works (MOP). The DGA is

a non-sectoral entity, independent of user sectors, and does not carry out development work itself. On the other hand, its management and planning functions are in practice nominal, its policing and surveillance activities are very limited, and its capacity for implementing multiple use programmes is slight. There is also a notable dispersion of functions in the area of water quality control.

The DGA is responsible for investigating and assessing water resources. The concentration of assessment, research and administration functions in a single non-sectoral body has advantages for appropriately directing and targeting water resources assessment activities towards the country's most urgent needs. On the other hand, despite the efforts being made, at the present time there is insufficient data on water resources, especially relating to the supply and demand for water in the medium and long term. Moreover, many water rights are not appropriately legalized nor is there a complete registry of their purchase and sale. One of the main limitations of the water resources management system in Chile is that water management is not integrated at the river basin level, and responsibilities for the allocation and management of water resources are separated in ways that do not correspond to their physical features or optimum use. This makes it difficult to deal with the growing competition for water and the huge expansion of water pollution. The lack of an integrated river-basin management system makes it more difficult to manage multiple water uses and control externalities.

Although surface and ground water habitually belong to an integrated hydrogeological system, they are managed separately. There are deficiencies and gaps in the regulations for ground water management. In many rivers, water resources are managed by sections rather than at the river-basin level and this makes it difficult to undertake actions which by nature affect the water system and coastal margins as a whole.

Water use continues to be organized almost exclusively on a sectoral basis: most investment projects in hydraulic installations are carried out by private or public sectoral bodies for specific purposes of irrigation, hydroelectric power generation, drinking-water supply, drainage, etc.; coordination mechanisms are scarce. Although nearly all uses of water can cause pollution, neither the regulation of water quality nor control of pollution are an integral part of water management, and the regulations for protecting water quality are deficient.

The main instrument established in the Water Code to promote multiple water use and deal with the problem of inter-sectoral

relations —non-consumptive water rights— has not worked as had been hoped, and significant shortcomings have been revealed in its handling of multiple water uses. The DGA has weak regulatory attributions and is incapable of solving most water-related disputes, which therefore have to be resolved by user organizations or by the ordinary courts of law. Neither of these, however, have been able to respond effectively to the challenge. On the other hand, despite the fact that in the past Chile has recognized the importance of the river basin, its Water Code does not set up bodies to manage water resources at the river basin level.

The Water Code strengthens user organizations and gives them great autonomy. Practically all management decisions relating to water use are in the hands of water users or their organizations. These are responsible for managing and distributing the water to which their members are entitled, and exploiting and maintaining common water infrastructure. Water-user organizations currently own most drainage and irrigation works. In many cases, these have been constructed by the users themselves, but installations that were built with public funds have subsequently been transferred to irrigators for their use and maintenance. Such organizations, however, have failed to progress beyond their limited traditional scope: neither in the resolution of intersectoral disputes, nor in the integrated management of surface and ground water supply, nor in the management of river basins —a task assigned to the National Forestry Corporation (CONAF)—, nor in the control of the evacuation and treatment of waste waters; still less in addressing environmental issues in a holistic manner. In general, user organizations have hardly changed since the nineteenth century, despite the very different situations that exist in rivers today, and many of them are facing serious problems.

Although the Water Code considers water above all as an economic good, it confines itself to merely declaring the existence of a water market without addressing the issues of charges for water use, taxes specifically linked to water, or payments for the discharge of waste water. In general, the maintenance and use of water rights, along with the generation of related externalities, are all cost-free to the holder — a situation that is almost unique in the world and acts against the market dynamics it sets out to achieve, by encouraging speculation, hoarding and monopolies.

Water rights

When considering the topic of water rights, it is helpful to distinguish two groups of norms: structural and regulatory. *Structural norms* govern the stability and flexibility of water rights granted to economic agents and aim to

ensure private investment to develop the economic potential of water. *Regulatory norms*, on the other hand, relate to the physical, chemical and biological characteristics of water and aim to ensure its efficient and managed use, making it possible to adequately control it in line with economic, environmental and social goals. The challenge is to find the appropriate balance between the two types of norms. On the one hand, the application of structural norms should not result in monopolies or speculation, nor cause social or environmental deterioration; regulatory norms, on the other hand, should not suffocate the economic system nor perpetuate antiquated patterns of use that conflict with efficient water allocation.

The system of water rights in Chile is heavily biased in favour of the protection of property rights over the concession to use water, which —due to the way such concessions are granted— in practice becomes a property right over water. According to the Water Code, water is national property of public use, which private individuals are given the right to exploit subject to the Code's provisions. Nevertheless, both the rights granted by the State and those recognized thereby enjoy robust and wide-ranging protection and are covered by constitutional guarantees on property rights.

Article 24 of the Political Constitution of Chile states that “*the rights of individuals over water, recognized or constituted in accordance with the law, shall grant their holders ownership thereof*”. This is the only country in the region where such a provision is specifically mentioned in the Constitution, and people who hold such rights and oppose any amendment to the Water Code obviously resort to it. This acts as an extremely tight constraint when modifying regulatory frameworks with a view to ensure the effective and beneficial use of water, and also for the very water markets it is intended to encourage.

The Water Code grants holders of water rights permanent and total freedom over their use. Among other things, holders of such rights may: (i) use the rights or not, and assign them to the ends or types of use they see fit; (ii) transfer them separately from the land for use elsewhere; and (iii) trade them through normal market mechanisms (sale, rental, mortgage, etc.). All such concessions are granted subject to few and weak regulatory norms: (i) the DGA has very limited faculties and is obliged to grant rights to new petitioners subject to the conditions that the request be legally valid, that available water resources technically exist, and that their assignment does not affect the rights of third parties; (ii) holders of water rights are not required to make effective use of the corresponding water

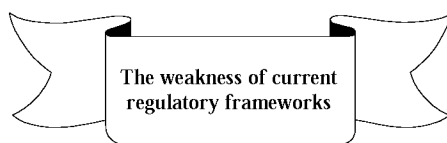
flows or build installations, nor are they subject to any tax, tariff or charge for holding the right or using the corresponding water; (iii) there are no priorities or preferences in water allocation, nor any explicit environmental standards that have to be complied with; (iv) the transfer and transmission of water rights, and their acquisition or loss by prescription, is regulated by the Civil Code unless covered by the Water Code; and (v) dominion over water rights cannot be extinguished except by the causes and in the ways set out under common law.

Apart from the Chilean Water Code and water law proposals inspired by the Chilean system in a number of other countries in the region, there is almost no country in the entire world where water rights are assigned unconditionally. The most important regulatory elements in the legislation aim to ensure effective and beneficial use of water, protect the resource base in terms of quality and quantity, and prevent the transfer of negative externalities —either direct or indirect— between users.

The fundamental bias in the structure of the system of water rights established in the Water Code has several negative consequences:

- It encourages speculation and hoarding, adversely affects regional development, and promotes the transfer to private parties of a public property with high economic, social, environmental and strategic importance — very often without any recompense in terms of increased economic activity in the short or medium term. Moreover, private holders of water rights can earn profits therefrom, without having to pay or risk anything. The system also allows water rights to be used to exercise power in markets for goods and services in which water is an input; and it has significant effects on the resource base, third parties and the environment.
- The system makes it difficult to introduce amendments to the Water Code, and opposition to change tends to be expressed in ideological or very general terms. Naturally, all proposals for amending the Water Code have provoked extreme contrary reactions by people and groups who currently hold such rights.

Axel Dourojeanni and Andrei Jouravlev



The lengthy electrical power outages that have occurred in Buenos Aires, Argentina and much of Chile, along with the controversies that have

arisen in recent years in the drinking water and sanitation sectors of certain countries of the region, have focused public attention on the consequences and effects of privatizing water-related public utility companies and on the need to improve existing regulatory frameworks.

One way or another, since the 1970s governments in the region have been transferring public enterprises and other State institutions to the local and transnational private sector. Privatization has now reached almost all sectors of the economy, including water-related public utilities. Until recently, this massive transfer of public services to the private sector has been based largely on ideological or philosophical concepts, short-run economic conditions, pressure from abroad and a belief that the “private sector will fix everything”. In this process it has very often been forgotten that while private-sector participation does provide potentially significant efficiency improvements, it does not, in itself, guarantee a lasting improvement in social welfare in the absence of a competitive market. Without this, the outcome depends on the regulatory regime in which industries operate, the efficiency of which depends on the capacity of governments to create appropriate institutional and regulatory conditions to oblige firms to be efficient and responsive to their customers’ needs.

Drawing up suitable regulatory frameworks for privatized sectors has posed great challenges for the governments of the region, because of the need to balance public and private interests, and owing to the fact that regulation can only be learnt by experience. Many countries do not have this experience, for most water-related public service companies were for many years in State hands and never had to be regulated. Still less can any experiences be considered successful: after all, many of the firms currently in the process of privatization, or those that have been privatized already, belonged to private-sector investors before being nationalized in the 1950s and 1960s. This suggests that regulatory capacity at that time was not entirely satisfactory.

A variety of studies among the countries of the region have drawn attention to the speed with which privatization programmes have been carried out, the poor quality of existing operational information and insufficient knowledge about the actual condition of the asset base. Studies have also highlighted the low level of charges prior to privatization, which subsequently had to be raised considerably, together with inefficient tariff structures, macroeconomic instability, the inherent complexity of water-service regulation given its natural monopoly characteristics, the

lack of government experience in regulation and the poor design of regulatory institutions, which in some cases undermines their political independence. These characteristics of the process have given rise to disputes and failures and have also resulted in the original contracts being amended or renegotiated.

In some cases, the need to attract private capital has resulted in quite permissive regulatory frameworks being adopted, especially in terms of the regulation of service quality and participation by consumers in the regulatory process. It is important to remember that a reduction in product quality, or in levels of service, is equivalent to an increase in price. Without adequate control of service quality, price regulation may be ineffective since consumers can be exploited equally well either by providing a deficient service or by charging high rates.

Our Division has recently published a report entitled "*Las debilidades del marco regulatorio eléctrico en materia de los derechos del consumidor: identificación de problemas y recomendaciones de política*" ("*Weaknesses in the regulatory framework of the electrical sector with respect to consumer rights: identification of problems and policy recommendations*"). This study, published as N° 14 in the series *Serie Medio Ambiente y Desarrollo* (LC/L.1164), was written by Patricio Rozas Balbontín, in the framework of the project entitled "*Promoción del Uso Eficiente de la Energía en América Latina*" ("*Promotion of Efficient Energy Use in Latin America*"), undertaken jointly with the European Commission.

The main purpose of this study is to analyse the Chilean regulatory framework, from the consumer rights standpoint, in the two basic areas comprising the provision of public electricity services and the sale of goods using electrical power as an input. The analysis carried out in the study reveals significant progress has been made both in terms of establishing consumer rights and in ensuring consistency between the rules governing activity in the electrical power sector and those which set up and guarantee such rights under Chilean law. Nevertheless, the gaps remain in the regulatory legal framework. Hence it is not yet feasible in Chile to promote a public policy of efficient electric power use that would enable users to fully exercise their basic consumer rights and make decisions in a free and informed manner about the best way of satisfying their energy needs.

The deficiencies noted above reveal the extent of the impact caused by the reforms implemented in the 1980s, which weakened the regulatory framework in the electrical power sector and led to a reduction in consumer

surplus in favour of providers of electrical power and suppliers of associated equipment. This reduction occurred largely as a result of the tariff system that was adopted and the absence of rules to guarantee service quality and efficient electrical power consumption. The report proposes a number of important amendments to the regulatory framework aimed at permitting a better exercise of consumer rights.

This study underlines the need to pay attention to the regulation of service quality and participation by consumers in the regulatory process. Later, we hope to further the discussion by appraising the experiences of countries that have progressed most in regulating service quality and consumer participation in the drinking water and sanitation sector.

This and other studies of the series *Serie Medio Ambiente y Desarrollo* are available in PDF format at the ECLAC web site.



In the week of 21 to 25 March 1999, several international events concerning water were held in Panama City. Miguel Solanes and Axel Dourojeanni participated from our Division. Axel Dourojeanni presented a summary of the paper "*El Código de Aguas de Chile: entre la ideología y la realidad*". Miguel Solanes and Axel Dourojeanni jointly contributed to the Water Vision in the Americas Workshop.

The most important event in Water Week was the *Third Inter-American Dialogue on Water Management "Facing the Emerging Water Crisis in the 21st Century"*, which continued the debate initiated in the First Dialogue held in Miami in 1993 and the Second Dialogue held in Buenos Aires (1996) (see Circular N° 9). Its main aims were: (i) to identify and propose practical recommendations and guidelines for the equitable use of water resources in the countries of the region; (ii) to facilitate and strengthen the implementation of Agenda 21 recommendations, which have been reconfirmed in a number of regional and

international meetings on water; (iii) to provide a forum for water policymakers, scientists, private-sector representatives, etc., to exchange ideas, experiences and information on water-related issues; and (iv) to chart new directions for solving the deepening water crisis in our region.

At the Third Dialogue several hundred senior water managers and policymakers discussed the need for future actions to improve the implementation of integrated water resources management in a number of high priority areas including water and health, transboundary water management, the economic valuation of water, public participation, and the response to impacts of global change. Using case studies and round table discussions, the Dialogue sought to assign priorities to these actions which will encourage water managers to take action in their own countries at the local level and which will foster political support for these initiatives by the governments of the countries of the region and multilateral funding agencies at the hemispheric level.

Drafts of most reports presented at the Third Inter-American Dialogue on Water Management are available in PDF format at the web site of the Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC). The address is www.cathalac.org/papers.htm.

At the same time as the Dialogue, several other important international water-related events were held, including:

- The *Second International Colloquium on Hydrology and Water Management in the Humid Tropics* assembled approximately 100 leading researchers and water managers working in the humid tropics region from around the world to discuss the relation of their research to the needs of water managers for hydrologic understanding upon which to base sound management decisions.
- At the *Inter-American Water Resources Network (IWRN) Twelfth Meeting of the Advisory Council*, some 40 to 50 participants discussed the future activities of the network and plans to support the World Water Vision in a series of regional workshops.
- The Committee for the Water Vision of the Americas (CWVA), an ad hoc committee formed to facilitate and coordinate the World Water Council's Water Vision activity in the Americas, held the first *Water Vision in the Americas Workshop* in which a group of more than 70 water policymakers discussed how economic, social, demographic and scientific forces

and trends will impact the availability and supply of fresh water in the next century.

CONAPHI - Chile

From 25 to 27 March 1999, the *Sixth Session of the Chilean National Committee for the International Hydrological Programme* (CONAPHI - Chile) was held at ECLAC headquarters. Debates centred around the following issues: (i) evaluation and monitoring of water resources; (ii) water and the environment; (iii) legal and economic aspects of water resources management; and (iv) education and water resources. The technical analyses carried out at this meeting served as basic information for the meeting of the National Committees for the International Hydrological Programme of Latin America, which was held following the CONAPHI session on 27 and 28 May 1999.

Axel Dourojeanni, Miguel Solanes and Andrei Jouravlev attended from our Division. Axel Dourojeanni and Andrei Jouravlev presented a paper entitled "*La regulación de los mercados de agua*" ("*The regulation of water markets*"). This document explains that many of the region's countries are interested in creating conditions for water markets to operate, believing that this would improve the allocation of water resources. Although the creation of such markets provides opportunities for greater efficiency, the chances of efficient allocation actually occurring depend, among other things, on the market having competitive characteristics. Unfortunately, the debates driving this process forward usually ignore this fact. Market failures (externalities, market power, etc.) raise the possibility that a transfer of water rights could be beneficial for buyers and sellers but inefficient from a global social and environmental standpoint.

In fact, water-rights transfers can adversely affect people who do not form part of the decision-making or negotiating process, or else may harm the environment or affect social stability. Inasmuch as transfers of water rights are unavoidably associated with significant externalities, market prices will deviate from the true opportunity cost of water. As a result, they will fail to transmit precise market signals or encourage efficient decisions in the use or transfer of water rights. Economic theory assigns to governments the task of intervening to correct any external effect, in order to restore or create the conditions needed for economic efficiency.

This paper is available on request from the Natural Resources and Infrastructure Division.

Future activities

1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

Small Drinking Water and Wastewater Systems

The *Technology Expo and International Symposium on Small Drinking Water and Wastewater Systems "Technology for the 21st Century"* will be held from 12 to 15 January 2000, in Phoenix, Arizona, the United States. This symposium, produced jointly by NSF International and the Rural Water Research & Education Foundation (RWREF), will focus on the latest practical technological, operational and management solutions and regulatory issues tailored specifically to the special challenges which small water systems encounter in providing both drinking water and wastewater treatment. Topics to be discussed include: drinking water treatment (disinfection; membranes and filtration; innovative technologies); decentralized and on-site wastewater systems; regulatory and compliance issues; innovative wastewater treatment; drinking water operations, distribution and resources; system management; environmental technology verification programs for drinking water and wastewater; drinking water and wastewater analysis and monitoring; assistance and assessment; and international issues in drinking water and wastewater small systems.

Additional information may be obtained from:

Wendy Raeder (for registration information)
NSF International

Tel: 734-827-6888
E-mail: raeder@nsf.org
WWW: <http://www.nsf.org/symposium/>

Disinfection 2000

The Water Environment Federation is sponsoring the conference *Disinfection 2000: Disinfection of Wastes in the New Millennium*, to be held from 15 to 18 March 2000, in New Orleans, Louisiana, the United States. The conference, to be held in cooperation with the Louisiana Water Environment Association and the Lake Pontchartrain Basin Foundation, will focus on

wastewater effluents; urban and agricultural runoff; aquaculture; combined sewer overflows; residuals and disinfection of manures; biosolids and compost; and air contamination due to waste treatment processes. Its specific aims are: (i) to elucidate uses and advances in technology including ultraviolet, chlorination, ozonation, other oxidant disinfection and combined processes; (ii) to evaluate the use of wetlands for control of pathogenic contaminants; (iii) to describe the development of watershed management for urban and rural runoff assessment with respect to disinfection needs, best management practices and application experiences; and (iv) to assess disinfection approaches for combined sewer overflows.

Additional information may be obtained from:

Technical Programs, Disinfection 2000 Abstracts
601 Wythe Street
Alexandria, VA, U.S.A. 22314-1994
Tel: 703-684-2442
WWW: www.wef.org/docs/disinfection2000.htm

XVIII National Water Congress

The Institute of Water Resources at the Faculty of Exact Sciences and Technology at the University of Santiago del Estero, Argentina, is organizing the *XVIII National Water Congress* to be held at Termas del Río Hondo, Santiago del Estero, Argentina, from 12 to 16 June 2000. The aims of the congress are as follows: (i) to provide a suitable forum for discussing and disseminating scientific, technical, juridical and legal progress made in the areas of management, operation and use of water resources; (ii) to promote an exchange of knowledge and experiences between specialists in the water-resources field; (iii) to provide a forum for presenting and demonstrating the new technologies and tools developed for water use and management; and (iv) to help perpetuate the country's most far-reaching technical and scientific meeting on water issues. The debates to be held will focus on the following topics: surface hydrology; groundwater hydrology; irrigation and drainage; infrastructure, dams, reservoirs and minor works; hydraulics; environment and

Additional information may be obtained from:

IRHi-FCET-UNSE
Av. Belgrano (S) N° 1912
(4200) Santiago del Estero, Argentina

Tel: (54) (385) 450 9560 ext. 1841
Fax: (54) (385) 422 2595
E-mail: hfarias@bigfoot.com and
mborse@bigfoot.com

WWW: <http://members.xoom.com/agua2000/>,
<http://members.tripod.com/~agua2000/>

water quality; water legislation and administration; water resources planning and management; geomorphology, erosion and sedimentation; and special topics (urban hydrology, hydro-informatics, modelling and experimental techniques).

Water Resources in Extreme Environments

The American Water Resources Association (AWRA) **Conference on Water Resources in Extreme Environments** will be held from 30 April to 4 May 2000, in Anchorage, Alaska, the United States. The discussions to be carried out will be organized around the following themes: process related hydrologic research; unique water resources engineering design problems; water management issues; data collection; and hydrologic processes in extreme environments of global significance.

Additional information may be obtained from:

Douglas Kane
Technical Program Committee Chair
University of Alaska Fairbanks, Institute of
Northern Engineering
Water and Environmental Research Center
Fairbanks, AK 99775-1760, U.S.A.

Tel: (907) 474-7808
Fax: (907) 474-7979
E-mail: ffdlk@uaf.edu

ICID

The 51st Meeting of the International Executive Council (IEC) of the **International Commission on Irrigation and Drainage (ICID)** will take place in Cape Town, South Africa from 22 to 27 October 2000. The 6th International Micro-Irrigation Congress (MICRO 2000) will be held in parallel with the IEC meeting. The congress will focus on the



White Book on Water in Spain

Recently a book has been published entitled "**Libro Blanco del Agua en España**" ("**White Book on Water in Spain**"). The basic reason for writing this book was the authors' detection of a need to make a calm and collective effort at common reflection, to unify viewpoints, integrate and help clarify current confusion. The book is not a formal text setting out rules and regulations, but more open and flexible, while also aiming at rigour, dialog and readability. It provides useful criteria for society and uses more reliable and updated technical data to report on situations, criteria and problems relating to water which are frequently not well known, or at least not brought together systematically and critically in a widely published text for debate. Topics analysed cover the physical and biotic framework, population and tourism, irrigation, the institutional framework, the current situation and existing problems, water quality, uses and demands, water management, the current system of use, experience with water transfers, water economics, public water administration, protection and recovery of the public hydraulic domain, hydraulic infrastructures, droughts, land and mudslides and flooding, the international context, foundations for a new water policy and hydrological planning, among other things.

A synthesis document, which summarizes

- Information on the activities of the **Comisión Trinacional para el Desarrollo de la Cuenca del Río Pilcomayo** is available at <http://www.pilcomayo.org.py>. This trinational commission, set up by the governments of Argentina, Bolivia and Paraguay, has the task of studying and executing joint projects for the development of the Pilcomayo river basin. The eighth meeting of the council of commission's delegates, held in Salta on 18 May 1998, established the following lines of action: (i) treatment of the issues of erosion, soil conservation and sediment management; (ii) treatment of pollution; (iii) current use and hydrological balance in the lower river basin; (iv) identification of the technological services needed for the commission's work; and (v) identification of international cooperation programmes with a view to holding a seminar to draw attention to the importance and significance of the Pilcomayo river.

- **Jamaica's Water Sector Policy Paper**, prepared by the Ministry of Water, Jamaica, is available at the web site of the Water Resources Authority of Jamaica (<http://www.wra-ja.org/index.htm>). Topics analysed cover water resources management, urban water and sewerage, rural water and sanitation, urban drainage, and irrigation.
- The **Coastal Regions and Small Islands (CSI)** web site is an endeavour of the United Nations Educational, Scientific and Cultural Organization (UNESCO) launched in January 1996 (<http://www.unesco.org/csi/index.htm>). Its goal is to assist member States towards environmentally-sound, socially-equitable and culturally-appropriate development in coastal regions and in small islands. Many publications, documents and articles on the Caribbean have recently been added to the CSI web site ("Managing beach resources in the smaller Caribbean Islands", "Coast and beach stability in the Caribbean Islands", "Planning for coastline

预览已结束，完整报告链接和二维码如下：

https://www.yunbaogao.cn/report/index/report?reportId=5_3328

