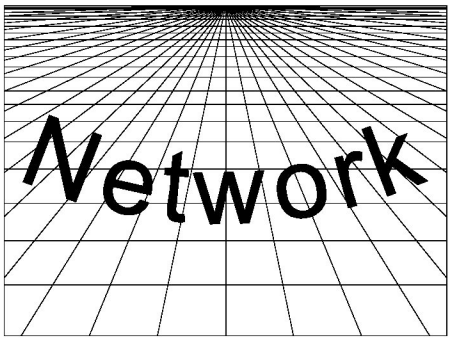
Network for Cooperation in Integrated Water Resource Management for Sustainable Development in Latin America and the Caribbean

United Nations Economic Commission for Latin America and the Caribbean (ECLAC) N° 25 February 2007

CIRCULAR N° 25

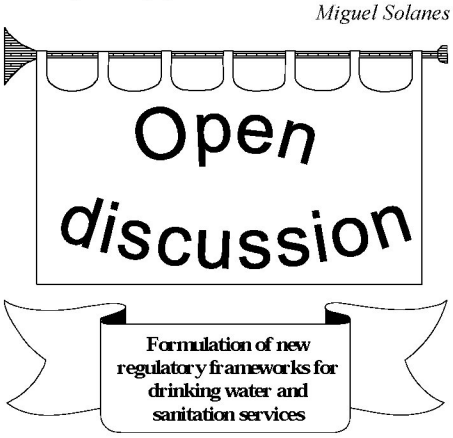
A review of legal elements relevant to the sustainable incorporation of water resources into socioeconomic development leads to the conclusion that water legislation is based on ethical foundations. This stands to reason, as the legislation is intended to realize the common good. The integrated sustainable water resources management is dependent, *inter alia*, on efficiency and equity. Inefficient management has negative effects on equity (especially considering underprivileged groups), as it limits benefits and transfers costs and externalities.



In integrated water management, efficiency and equity are closely related to good governance and ethics. It is a matter of much concern that, mainly due to strong ideological bias, many proposed reforms of water institutions lack an ethical vision. In the light of regional experiences involving lack of information and participation, hoarding and speculation involving water rights, scant regard for the social and environmental roles of water, and flawed assessments of public projects, it is possible to relate ethical factors to some specific regulatory requirements:

- Not to finance public projects with a negative rate of return or grant generalized subsidies, unless this is justified by unquestionable, explicitly stated and proven economic, social and environmental considerations.
- To provide the public with accurate, precise, transparent and timely information.
- Not to undertake public projects or grant exchange rate, revenue and other guarantees, without carefully evaluating the economic, social and environmental repercussions.
- To ensure the ecological sustainability of supply sources.
- To prevent water resources from being manipulated and monopolized by special interests.
- To reserve minimum or ecological flows for the protection of environmental services.
- To ensure that basic needs are satisfied.
- To respect the customary uses and rights of indigenous populations.

Miguel Solanes



Through Miguel Solanes, ECLAC Regional Advisor on Water Resources Legislation and the Regulation of Public Services, the Division of Natural Resources and Infrastructure has cooperated with the governments of several countries of the region in the formulation of new regulatory frameworks for water supply and sanitation services. In this issue, discussion is focused on the current situation in the water supply sector, interjurisdictionality and subsidies. The following issue will concentrate more on other lessons learned from this experience.

Current situation of the water supply sector

For a series of financial, political and economic reasons, some drinking water supply and sanitation systems went from State to private ownership, and then were nationalized following the failure of several privatizations. These new public companies operate in a very complex environment:

- Central or federal governments proactively intervene in some service areas. This intervention involves considerable financial resources, but does not always have nationwide coverage. This means that, in many places, water supply and sanitation infrastructure is far from ideal.
- In some countries, the situation is made even more complicated by disputes between the various levels of government.

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- In many cases, there are still subsidies not justified by the level of income of the beneficiaries, as they are defined on the basis of other criteria.
- This situation is sometimes made worse by inefficient charging systems, mainly due to low levels of metering.
- Proposed regulatory frameworks are often problematic in terms of the incentives for private companies. These incentives are

based on the supposition of a country having a healthy macroeconomic situation, an independent and competent regulator, and a sociopolitical system neutral to the company's interests. If these conditions are not present, the supposed benefits associated with private sector participation in service delivery disappear.

- The problem is that public companies lack the incentives of shareholder profit and control. This raises questions about competitiveness, efficiency, transparency, capture and conflicts of interests.
- Public companies, with or without union involvement, do not escape potential conflicts of interest in terms of contracts and transfer prices. Only the potential beneficiaries change: under private ownership, shareholders and associated companies benefit, while under public ownership, benefits are reaped by employees.
- In some cases, mixed public-private companies are proposed. This approach has considerable potential vulnerabilities, such as lack of transparency, conflicts of interest and problems with controlling the use of public funds. This is further complicated by the fact that the State is both shareholder and regulator, especially when the level of private participation is low. There is therefore a need for a strong and independent regulator and adequate and strict regulation.
- In some re-nationalizations, an attempt is made to apply regulatory characteristics of the failed privatizations to the new situation, which seems ill advised.
- It should be borne in mind that, it is not usually worth having a concession contract unless there is a large component of private investment. Without that factor, it would be more appropriate to use a management, operation and maintenance contract or some similar approach. Given that what is involved is basically State capital, it would be more practical to consider the contract as an authorization or licence with reduced transaction costs and minimized exposure to legal action for the State.

Economies of scale and interjurisdictionality

- In many countries, there are often several political jurisdictions involved in a service that is characterized by significant economies of scale and scope, and that would entail high opportunity and transaction costs were it to be fragmented.
- As far as the economies of scale and scope are concerned (see Circular N° 20), in many cases, even the systems based on the municipalization of services are making serious efforts to aggregate and consolidate service provision at a significant scale. It is noteworthy that Chile, probably the most successful country in the region in terms of efficiency and coverage of drinking water supply and sanitation services, adopted a model based on regional companies covering a significant area in order to achieve economies of scale. This is also the reason why the United Kingdom and many other countries structure their services by region.
- Two arguments put forward in favour of multiple providers are contestable markets and the need for comparisons among providers (benchmark or yardstick competition). The first argument is unconvincing for public services, as market entry involves huge sunk costs and incumbents can employ a wide range of strategic instruments to deter entry. The second argument is more relevant, and countries need to assess what the right balance is between economies of scale, asymmetries of information and transaction costs in specific cases.
- Evidence for economies of scale in the drinking water supply and sanitation sector is overwhelming, and public policy should therefore aim to make optimum use of those economies and avoid excessive fragmentation, as comparisons between systems of completely different sizes are of limited value. The public authorities can use various arguments to request municipal systems to consolidate to take advantage of economies of scale, for example, as a condition to benefit from State financing, protection of the interests of the local population, environmental regulations, etc. Consolidation also reduces transaction costs for the regulator.

Subsidies

- Subsidies are often based on categories of beneficiaries. This kind of subsidy only seems to have a symbolic or ideological justification, and has little to do with equity or efficiency.
- Systems should move towards means-tested subsidies based on pre-established levels of poverty. Such subsidies could be financed from State revenues or using a system of cross subsidies, whereby high-income consumers pay for subsidies targeted at poorer groups. In the latter case, it would be advisable to do this by enacting a law, in order to ensure the legal soundness of the system.

The previous edition presented the document, "***Integrando economía, legislación y administración en la gestión del agua y sus servicios en América Latina y el Caribe***" (*Integrating economics, legislation and administration in water and water services management in Latin America and the Caribbean*) (LC/L.2397-P, October 2005, *Natural resources and infrastructure series* N° 101) by Miguel Solanes and Andrei Jouravlev (available in Spanish only). The previous issue focused on decision-making criteria, while this edition analyses the legal elements relevant for urban areas.

Throughout the region, demographic growth has been accompanied by a significant concentration of the population in urban areas: from 42% in 1950 to 75% in 2000, with the figure expected to reach 81% by 2015. Latin America and the Caribbean has therefore become the most urbanized region in the developing world, with levels that rival those in many industrialized countries.

There is a whole series of issues relevant to the relation between water resources and urban areas.

Water rights

Cities need to have access to water resources to provide drinking water supply services. In some cases, the service providers are responsible for obtaining and having at their disposal the necessary water rights. Failure to have the sufficient water rights is taken as a breach of concessionary duties. In other systems, the city itself (through its municipalities) requests water rights to provide services. These rights do not necessarily have to be fully used from the moment they are granted, but rather are used as and when needed. Other systems allow rights to be reserved for future requirements. Particularly important legal norms in this respect include:

- priority for drinking water supply services; and
- power of municipalities to expropriate water rights when there is no unappropriated water available.

At the same time, legal systems must also have appropriate rules and procedures so that municipalities and drinking water supply and sanitation companies may protect or request protection (qualitative and quantitative) for their water supply sources.

Water markets

Water markets allow cities and companies to purchase the water rights they need to cover their requirements, with the rights for peripheral irrigation areas around the city often bought as urban areas expand. In Chile, for instance, the market has enabled water rights to be smoothly reallocated from agricultural to urban use in areas undergoing urbanization. From an administrative point of view, it is very difficult to track down all the unused agricultural water rights in order to

reassign them as cities grow. The market mechanism, however, makes it possible to generate incentives so that these water rights can be reassigned without major intervention from the authorities, using an easy and non-antagonistic procedure.

Urban wastewater discharge controls

The provision of sanitation services (especially the collection and disposal of wastewater) affects the quality of water resources available for cities and other water users located downstream in the same river basin; hence the importance of rules that set out the obligations of drinking water supply and sanitation service providers in terms of wastewater discharges, their conditions, treatment and locations.

Public services in urban areas

Public health and order depend on the quality of drinking water supply and sanitation services and on the balance of their regulatory systems. Recent experiences in the region, such as in the province of Tucumán in Argentina and the city of Cochabamba in Bolivia, suggest that serious shortcomings in service provision (visible deterioration in drinking water quality, for instance) or tariff increases (especially sudden and poorly informed) beyond the payment capacity of the population have the potential to generate explosive and even violent political and social reactions. In this sense, the region needs to take a second and very careful look at the assumptions underlying some concessions and service regulations. Aspects that require greater attention include the idea that there could be direct market competition in the provision of these services; contestable markets; basic regulatory principles regarding service quality, reasonable tariffs and profits, reporting and access to information for users and regulators; and setting up, functions and financing the relevant bodies.

Land use

This issue is so important that, since Roman times, it has been said that no one shall alter water flows to the detriment of properties situated downstream by concentrating or blocking water upstream. This principle underlies all civil codes in the world. Its violation, and land use and development in the upper part of river basins, as well as their deforestation, increase risk and disasters in lower lying areas. The experiences of Andean and Central American countries illustrate this point. However, little is being done in the region to implement the legal principles enforced by the Romans over two thousand years ago. Ideological factors, the capture of decision-making processes and weak State management are all factors that go some way towards explaining these shortcomings.

Another related issue is that, as urban areas are exposed to flooding, they need urban-planning and building rules aimed at minimizing the negative impact of urban development. This is the legitimate exercise of the police power of the State, and does not constitute undue interference in private property. There are countries that regulate not only land use according to flood risk, but also have a classification of flood prone areas recorded in land registers with the obligation to inform purchasers of the potential risk. In some countries, insurance policies have been set up for floods and resulting damage. When cities protect inhabitants by diverting flood waters to farm land, those landowners should be compensated for any losses caused.

Cities as institutional water users

Urban water supplies are often affected by agricultural, industrial, mining and other users located upstream from city intakes. On the other hand, cities themselves commonly contaminate and interfere with water destined for users downstream. In densely populated river basins, one city often discharges its wastewaters only a few kilometres above the intakes of other municipalities, which means insufficient time for natural decomposition and dispersion processes to operate. Furthermore, sand and gravel extraction and forestry activities in the river basin affect how well cities are protected from floods. Lastly, cities are major users of common resources such as water, and are therefore mainly concerned with their own requirements.

This shows that cities are major institutional users of water, that transfer the externalities they generate to others, while also being themselves affected by the externalities of other parties. This leads to the following conclusions:

- in terms of common resources and transfer of externalities, city governments are no different from other users and need to be subjected to outside control;
- this control could be exercised by water authorities or river basin entities providing a forum for more consensual and participative management;
- city governments, or the drinking water supply and sanitation companies that serve them, must contribute to the costs of managing water resources and river basin agencies;
- when owners and users upstream are required to make special sacrifices in order to supply or protect cities, city governments must contribute to a river basin budget to cover the appropriate compensation payments; and
- city governments must have the legal authority to demand termination of activities that threaten the safety of the city.

Important ruling on indigenous water rights by the Supreme Court of Chile

The document "***Fundamentos jurídicos para el reconocimiento de derechos indígenas al agua: análisis normativo, jurisprudencial y de casos en el contexto chileno***" (*Legal bases for the recognition of indigenous water rights: analysis of regulations, jurisprudence and cases in the context of Chile*), produced by consultant Nancy Yañez (available in Spanish only) as part of the project "Water Law and Indigenous Rights" (WALIR) (see Circular N° 24), includes an analysis of the recent ruling on indigenous water rights by the Supreme Court of Chile.

On 4 October 1995, the consultancy Purifica began the process of regularizing the water rights for 100 litres per second in favour of the Toconce indigenous community. The regularization process is carried out by the National Indigenous Development Corporation (CONADI), as part of the water rights regularization programme implemented by CONADI in conjunction with the General Department of Water (DGA) and in accordance with the provisions of Law N° 19.253, of 5 October 1993, which establishes rules on the protection, promotion and development of indigenous peoples.

The first-instance ruling granted water rights for 30 litres per second to the indigenous community. An aqueduct easement was also granted. Both the indigenous community and the Sanitary Services Company of Antofagasta (ESSAN) appealed against the ruling. The appeals were resolved by the Court of Appeals of Antofagasta, which ruled in favour of the indigenous community. The Court confirmed the regularization of water rights in favour of the community, but also declared that the rights should be for 100 litres per second. ESSAN then submitted motion to vacate the judgement on the grounds of errors in substance and procedures, this time to the Supreme Court.

The Supreme Court recognized the indigenous community's ancestral ownership of the water rights in question and ruled that the ancestral indigenous ownership of water based on customary practices constitutes fee simple: it is impossible to describe as illegal the unauthorized, that is unlicensed, use of water if that use derives from customary practices.

The ruling declares that the indigenous community of Toconce is the ancestral owner of the water rights in question, in other words, that it is the owner according to the word of the law, as provided for in Law N° 19.253. The reasoning of the court is based on Decree Law N° 2.603 of 1979, which preceded the Water Code, and which explicitly recognized the customary use of water as a right. Such rights then received constitutional protection in the 1980 Constitution. Accordingly, the rules of the Water Code that establish the regularization procedure are therefore not intended to constitute water rights, but simply to regularize and register them. The *de facto* bases for the ruling that were recorded as unquestioned facts were as follows:

- Regularization is based on the fact that the Toconce indigenous community is the ancestral owner of the water rights in question, under the terms of Law N° 19.253. As stated in the ruling, the fact that the community was deprived of using the resource as a result of the registered rights exercised by the concessionary is no obstacle to the existence of an ancestral property right.

- It was also established that the inhabitants of the community have always made constant use of the waters of the river Toconce for human and animal consumption and for irrigation, and they have unquestionably exercised these rights with the intention to be owners.

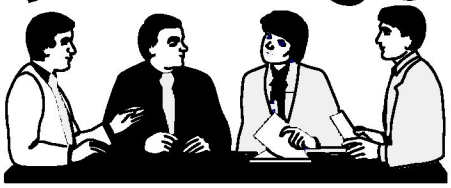
- Since ancestral times, the indigenous community has made use of the waters of the river Toconce, as demonstrated by the large amount of terrace cropping in the area, the irrigation channels and outlets and the inveterate use of the waters for the purposes of agriculture, pasture and human consumption.

- This ancestral property right has been exercised non-violently, openly and constantly, which is shown by the fact that the defendant company never filed a complaint for usurpation of waters against the indigenous community of Toconce.

- Lastly, the rights of both parties may coexist. This means that ESSAN does not use all its water. It is public knowledge that the defendant supplies its excess water to another company. Depopulation in the area is due to the clouding of the water by mining, while it has also been established that it is the lack of water that has reduced the cultivated areas of agricultural land within the community, thereby contributing to migration.

Information on the WALIR project, its activities and documents is available at *http://www.eclac.org/drni/proyectos/walir*.

Meetings



Poverty, desertification and degradation of natural resources

At the ***workshop on sustainability in the fight against desertification: process monitoring and impact assessment***, held at the ECLAC headquarters in Santiago, Chile, from 13 to 15 June 2006, the following book was presented: "***Pobreza, desertificación y degradación de los recursos naturales***" (*Poverty, desertification and degradation of natural resources*) (LC/G.2277-P, December 2005, *ECLAC books* N° 87, available in Spanish only). This book was produced by César Morales and Soledad Parada (editors) from the Agricultural Development Unit of the ECLAC Division of Production, Productivity and Management, as part of the project on indicators of the socioeconomic impact of desertification and land degradation implemented by ECLAC in conjunction with the German Agency for Technical Cooperation (GTZ) and financed by the Federal Ministry for Economic Cooperation and Development (BMZ) of Germany:

- The first chapter of the book deals with the causal relations between poverty, desertification and land degradation in the countries of the region.
- The second chapter analyses desertification as a factor in the loss of sustainability, efficiency and equity in the allocation of resources and the transgenerational distribution of well-being.
- Chapter 3 offers a detailed presentation of econometric models and presents the results of their application in a case study in Chile.
- The fourth chapter is concerned with the economics of desertification.
- Chapter 5 presents the system of socioeconomic indicators of desertification formulated during the project, the tools used to process them (especially the ECLAC programme for the retrieval of data for small areas by microcomputer (REDATAM)) and ways of accessing the information.
- The sixth chapter describes the consultation process with the population of the affected areas, in accordance with the United Nations Convention to Combat Desertification, which stipulates that implementation and planning should be carried with the participation of all actors, and especially the community.
- Chapter 7 focuses on the socioeconomic aspects of desertification using methodology based on indicators that measure social aspects in the context of local degradation processes, with a view to laying the foundations for future intervention policies.
- In the eighth and final chapter, a case study on the arid region of the southern border of the Atacama desert in Chile is used to show how to construct a system of indicators for assessing and measuring (in understandable language) the environmental and human dimensions of phenomena related to land degradation, thereby providing support to the decision-making process at the private, local and national levels.

This publication can be downloaded from *http://www.eclac.cl/publicaciones*.

Inter-American Water Day (IAWD)

Since 1993, the ***Inter-American Water Day*** (IAWD) has been held on the first Saturday of October (see Circular N° 21). The main objective of this initiative is to raise public awareness about the importance of preserving the valuable natural resource that is water. Each year attention is focused on a specific theme. The slogan of the 2006 IAWD is "***Towards a new water culture***". With a view to achieving efficient water resources management, a new paradigm of social and environmental sustainability is put forward, one that involves promoting profound changes in our system of values and lifestyles as part of moves towards a new water culture.

A coordinated proposal is being formulated to develop a more long-term strategy for defining the IAWD themes for a five-year period, in keeping with the International Decade for Action, "Water for Life" (see Circular N° 22) and the Millennium Development Goals.

We invite you to visit *http://www.bvsde.paho.org/bvsadiaa/diaa2006/diaa*2006.html, where you will find more information on this initiative.

National Water Fund (FONAGUA) in Peru

In Peru, Law N° 28823, published on 22 July 2006, created the ***National Water Fund*** (FONAGUA) to promote the integral and sustainable water resources management. The functions of the Fund are to:

- Develop training activities aimed at strengthening agencies and organizations with water management responsibilities.
- Promote research intended to increase the efficient use of water.
- Promote educational and awareness-raising campaigns on the social, economic and environmental value of water.
- Provide constant technical assistance to water users in terms of efficient and sustainable use and the preservation of water resources.
- Promote the development of technological service markets related to the efficient and sustainable use of water.
- Promote a culture of water saving and efficient use of water resources.
- Partly finance, through grant funds, the implementation of water-saving investment projects.

The FONAGUA is run by a Governing Board comprising representatives of the Ministry of Agriculture; Ministry of Housing, Construction and Sanitation; Intendant for Water Resources of the National Institute of Natural Resources (INRENA); La Molina Agrarian University; National Board of Irrigation District Users; National Mining, Petroleum and Energy Association; National Association of Industries; National Association of Sanitation Service Providers; and the Ministry of Education. The Governing Board appoints the Executive Director of the FONAGUA, who is responsible for implementing the plans, programmes, projects and other decisions of the Board.

Law N° 28823 can be consulted at the INRENA website at *http://www.inrena.gob.pe*.

50th anniversary of the Colorado River Conference, Argentina

In a recently published article in the ***Environmental Law Supplement*** of Argentina's ***Online Legal Library*** (*http://www.eldial.com*), Mario Valls wrote that the Colorado River conference marked a dramatic turning point in the policies and legal approach concerning Argentina's interprovincial rivers and river basins. This interesting experience is analysed in a recent document published by the Natural Resources and Infrastructure Division entitled "***Entidades de gestión del agua a nivel de cuencas: experiencia de Argentina***" (*Water management entities at the river basin level: the experience of Argentina*) by Víctor Pochat (available in Spanish only) (see Circular N° 23).

The Colorado River basin covers the provinces of Mendoza, Neuquén, La Pampa, Río Negro and Buenos Aires, spanning Argentine Patagonia from the Andes to the Atlantic Ocean. In 1956, those five provinces met to discuss how to use the river, agreed that they had the right to regulate its use by means of an interprovincial agreement and set up the Interprovincial Technical Commission for the Colorado River (COTIRC).

The basic problem was that land with irrigation potential required much higher flows than those provided by the average water availability. The provinces chose to resolve their differences by using technical analyses to plan an optimal use of water resources. After ordering several studies and carrying out fieldwork on potential project sites, at the Fourth Conference of Governors in 1969 the provinces reached an unprecedented agreement to draw up a single programme for the organized and harmonious use and allocation of water for all the river basin, and requested the then Secretariat of Water Resources (SRH), which had recently been set up, to study a river development plan. The Secretariat concluded an agreement with the Massachusetts Institute of Technology (MIT) on the application of water system planning techniques that would be used for the decision-making process, particularly in choosing between various development plans.

The results of these optimization and simulation models were used by the representatives of the five provinces as technical criteria that enabled them, after many comments and amendments, to eventually agree on a single programme for establishing irrigation areas and flow allocation for the Colorado River, plus a staggered programme of construction work. The treaty itself was signed by the governors of the five riparian provinces and the Ministry of the Interior at the Sixth Conference of Governors of the Colorado River in October 1976. The Conference approved the single programme and allocated provinces with water quotas in accordance with their possibilities, with the option of extending use by diverting excess flows from the River Negro. To ensure implementation of the treaty, the Interjurisdictional Committee of the Colorado River (COIRCO) was set up, comprising representatives of the five provinces and the national government.

The Committee is now well established and in its thirtieth year of existence. It is nationally respected and is known to serve its purpose. The fact that its statutes have been amended to extend its authority confirms that this interjurisdictional body has the capacity and attitude to adapt to the demands of developing the river basin. Its active work spanning three decades is in itself the first achievement that should be mentioned. However, its greatest achievement and contribution to the smooth management of the country's water resources is undoubtedly the creation of a forum for constant discussion and harmonization of interests among provinces, some of which are involved in legal proceedings against each other in Argentina's Supreme Court.

Water Councils by River Basins in Paraguay

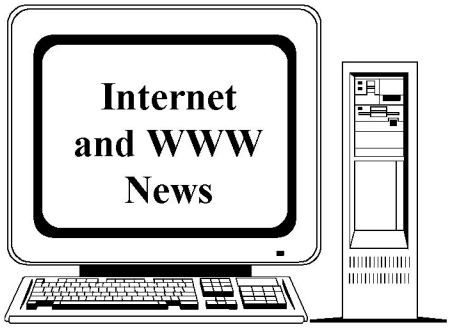
As part of Paraguay's National Environment Policy, the Department of the Environment (SEAM) has developed a water resources management policy. The policy is being implemented through the General Department for Water Resources Protection and Conservation (DGPCRH). It is oriented at the management and sustainable use of water resources, with the river basin as planning unit. To apply water resource management regulations, and in the light of decentralized and participative policy, it was decided to set up ***Water Councils by River Basins and Sub-basins***.

The Water Council by River Basin is made up of representatives of: (i) the Executive Branch, SEAM and governorships; (ii) National Congress (environmental matters); (iii) municipalities; (iv) civil-society organizations related to water resources; and (v) various sectors of large water users. In its capacity as a regional and policy-making body, the Water Council by River Basin is responsible for: (i) promoting discussion of water resource related issues and coordinating the actions of the relevant public agencies; (ii) arbitrating, in the first instance, in disputes relating to water resources; (iii) approving the river basin plan; (iv) monitoring the river basin plan and making suggestions for the achievement of its objectives; (v) proposing criteria for the granting of water rights; (vi) submitting proposals to the authorities on the infrastructure needed to plan the use and maintenance of the resource; and (vii) suggesting to the national water resources management system how the use of water could be optimized, on the basis of probabilistic studies and pre-established criteria and multiple-use works, while requesting subsidies for water saving.

In May 2006, in the city of Caazapá, the first Water Council by River Basin for the River Tebicuary met for the first time to elect

its presiding officers. The meeting was attended by representatives from local governments, producers, non-government organizations (NGOs) and civil society. The council is responsible for regulating activities relating to fishing, agriculture, livestock, industry and the environment that use water from the Tebicuary River as a source of supply.

Additional information is available at the SEAM's website: *http://www.seam.gov.py.*



Some of the web sites worth visiting for information on water resources management and use and related subjects include the following:

- The ***Administrative Commission of the River Uruguay*** (CARU) is an international agency created by Argentina and Uruguay as both countries wished to institutionalize an overall management system for the stretch of the Uruguay River they share (*http://caru.org.uy*). The commission was set up by the Statute of the River Uruguay, which the two countries signed on 26 February 1975, which was adopted in accordance with the 1961 treaty defining the boundary on the River Uruguay between Argentina and Uruguay, which provided for the establishment of a joint regime for the use of the river. The commission was created as a mechanism for the optimum and rational use of the river.

- In Uruguay, there are two ministries responsible for water: the ***Ministry of*** *and institutional framework*) by Ana María Vidal, available from the ***Iberoamerican Water Information System (SIAGUA) — Uruguay*** at *http://www.dnh.gub.uy/siagua*, which aims to concentrate most information on water in Uruguay (national water policy, legislation, main agencies, river basins, etc.). The document also describes the experiences of the Regional Irrigation Advisory Boards (see Circular N° 21).

- ***Polis***, journal of the Universidad Bolivariana in Chile, seeks to further the development of an "extended university", in which the university or academics no longer have the monopoly on knowledge creation, which becomes instead a collective task of society as a whole (*http://www.revistapolis.cl*). Issue 14 is devoted to ***water culture***.

- ***Agro-MAPS*** is a global spatial database of agricultural land-use statistics aggregated by subnational administrative districts. It contains statistics on food crop production, harvested area and yields for more than 130 countries. The data are being used, among others, in studies on land degradation, climate change, policy formulation, land-use planning and investments in sustainable agriculture. Users can interactively query the database, display search results as maps, and download data in a variety of formats. It is available at the web site of the Land and Water Development Division of the Food and Agriculture Organization of the United Nations (FAO) at *http://www.fao.org/landandwater*.

- The ***Irrigation Equipment Supply*** (IES) database is a joint initiative of the Water Resources, Development and Management Service of the FAO and the International Programme for Technology and Research in Irrigation and Drainage (IPTRID) (*http://www.fao.org/landandwater/ies*). It has been developed as part of FAO's mandate to provide information on

environmental data, in addition to carrying out studies, research, inventories and information processing activities for the purposes of environmental policy-making and environmental land use planning, and the management and use of the country's natural biophysical resources. Its website (*http://www.ideam.gov.co*) includes several interesting documents, such as, "*Selección de tecnologías para el control de la contaminación por aguas residuales domésticas en poblaciones entre 500 y 30.000 habitantes*" (*Selection of technologies for controlling water pollution from domestic wastewaters in towns with between 500 and 30,000 inhabitants*) and "*Estudio nacional del agua*" (*National water study*). The national water study analyses the overall conditions of the water balance in Colombia, the relationship between supply and demand and the scarcity index in large river basins, municipalities and catchment areas that supply the country's urban centres. The study assesses the state of water resources in terms of intermediate and dry climate conditions and annual variation. The document presents estimates for the years 2015 and 2025, and predicts how supply shortfalls might worsen.

- The ***Transboundary Freshwater Dispute Database*** website provides access to the following projects: (i) Atlas of International Freshwater Agreements (a historical overview of international river basin management; a detailed listing of more than 400 international freshwater agreements; and a collection of thematic maps); (ii) International Freshwater Treaties Database (a searchable database of more than 400 international, freshwater-related agreements, covering the years 1820 to 2002); (iii) Transboundary Freshwater Spatial Database (biophysical, socioeconomic, and geopolitical data relating to the world's international river basins are accessible and searchable through spatial and tabular formats); (iv) International Water Event Database (a