

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



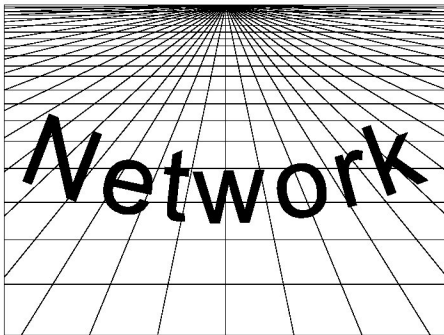
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On 26 April 2004, the Latin American and Caribbean Regional Session on Sustainable Development was held at United Nations headquarters in New York as part of the work agenda of the Twelfth Session of the United Nations Commission on Sustainable Development (CSD). In the context of the regional preparatory activities for the session, ECLAC prepared three reports on the issues under review by the CSD: human settlements, water and sanitation (see "*Publications*").



The paper on water, prepared by the Natural Resources and Infrastructure Division, examines the progress made and the obstacles and challenges faced by the countries of the region with respect to the agreements adopted at the World Summit on Sustainable Development (26 August to 4 September 2002, Johannesburg, South Africa). One of the topics considered in the report is the political and administrative levels (national or central, provincial or municipal) that are best suited for organising the provision of drinking water supply and sanitation services.

The assumption that drinking water supply and sanitation services are better and more efficiently managed when decentralised to the lowest possible appropriate level or to the municipal level has had an enormous impact on the sectoral reforms undertaken in the past two decades by the countries of the region. While the centralising tendency of the 1960s and 1970s may have gone beyond what was economically justifiable, decentralisation to the municipal level, apart from isolated cases, has not led to a more efficient provision of

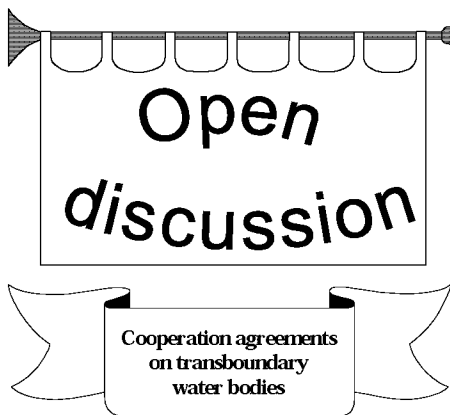
services than in the past, and has in fact very often given rise to serious problems, including the following:

- *Loss of economies of scale.* It is generally recognised that drinking water supply and sanitation services are characterised by significant economies of scale. The vast majority of municipalities in the countries of the region have populations considerably smaller than would be needed to achieve such economies, which results in higher costs.
- *Profusion of providers.* It is clear that excessive operational fragmentation hampers regulatory activities. It is not feasible to assume that hundreds of providers can be regulated or controlled.
- *Reduced potential for cross subsidies.* By reducing the size of the areas where services are provided and, possibly, by making them more homogeneous, the decentralisation process tends to limit the potential for cross subsidies and facilitates cream skimming that leaves low-income segments of the population without access to services.
- *Management and regulation of services based on political rather than technical criteria.* Decentralising service provision to the municipal level subjects it to a relationship with local governments which has quite often resulted in decisions on essentially technical issues being taken from a political standpoint, in addition to misuse of government resources and funds. Moreover, many municipalities lack the resources necessary to deal efficiently with the complexity of the processes inherent in the provision of drinking water supply and sanitation services.
- *Lack of attention to rural areas.* In view of political dynamics at the local level, municipal governments tend to assign higher priority to the needs of the urban population to the detriment of rural communities.
- *Lack of incentives to protect watersheds and control water pollution.* The fact that the political and administrative boundaries of local governments typically overlap and do not coincide with the geographical contours of river basins tends to hinder rather than favour the internalisation of externalities linked to watershed protection and water pollution control.

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As stated by Humberto Peña, member of the South American Technical Advisory Committee (SAMTAC) of the Global Water Partnership (GWP) and Director of the General Department of Water Resources (DGA) in Chile, and Miguel Solanes, ECLAC Regional Advisor on Water Resources Legislation and the Regulation of Public Services and member of the GWP Technical Committee (TEC), these considerations lead one to believe that "*rather than a problem of radical alternatives, it is more importantly a question of structuring balanced systems, where legal and political powers are assigned to the appropriate level of government*" in terms of technical considerations, resource availability and the potential for making full use of the economies of scale.



The Natural Resources and Infrastructure Division recently published a document entitled “*Estudio sobre los convenios y acuerdos de cooperación entre los países de América Latina y el Caribe, en relación con sistemas hídricos y cuerpos de agua transfronterizos*” by María Querol (see “*Publications*”). The study analyses the status of regional cooperation by examining the agreements signed by Latin American and Caribbean countries relating to transboundary water systems and bodies of water.

In this issue we introduce this document. The discussion focuses on a fundamental principle of international water law, namely the right to equitable and reasonable use of water resources.

Generally, States seek to use water resources in such a way as to maximise benefits and minimise inconveniences. As in other spheres of international law, States are entitled to an equitable share in the beneficial uses of water. This does not mean, however, that the share in benefits of each country will be identical, as equity is not synonymous with equality. Every State should, all things considered, receive a reasonable share in the benefits so that each may satisfy its respective needs.

The notion of equitable and reasonable use must be considered from two standpoints: one focusing on the use itself, and another involving the sharing of benefits derived from such exploitation.

Reasonable and equitable share in benefits

In general, States regulate their involvement in making use of a particular river or hydrologic system. This is based on conventional practice. By signing these types of treaties, States agree —whether expressly or tacitly— that the use of water resources will be equitable and reasonable. Several authors derive from this practice a rule of international customary law.

The rule of reasonable and equitable use of water resources is a general rule that can be

applied in each particular case, keeping in mind all relevant factors. This is set out in Article 5 of the Helsinki Rules, which provides a non-exhaustive list of the factors to be considered when determining a State’s share in the benefits. The list includes three types of elements:

- First, natural factors, such as the geography and climate of the area, should be taken into account.
- Second, there are “historical” factors to consider, which refer to the past utilisation of the waters of the river, particularly those still in effect.
- Third, there are the socio-economic needs of each State, as well as their capacity to find alternative resources and the associated costs.

Reasonable use

In addition to regulating the sharing of benefits derived from making use of the water resource, States have paid close attention to the selection of projects, aiming to optimise the use of the river. In effect, the reasonableness of a particular use of the watercourse shall not be determined solely on the basis of sharing the benefits among the interested States. How available resources will be used must also be considered.

The rule of equitable and reasonable use is part of conventional practice, both in making use of successive rivers and in cases where, for economic or technical reasons, two States agree to build a joint hydroelectric power plant. With respect to the latter, it is usually stipulated that the energy produced by the plant shall be shared in proportion to the slope of the part of the river in the territory of each State participating in its construction. Another common method is to determine first the portion of the hydraulic power corresponding to each State in proportion to the slope and volume of flow contributed. Then, with that portion in mind, a stretch of the river is awarded to each State for its exclusive use.

Another system inspired by the general rule of equitable and reasonable use is the coordination of hydroelectric use, so that the power plants operate in cascade fashion. In such cases, the States can agree to various modalities. In this regard, they can agree to a dam operation schedule, or even agree that in the territory of one State water storage dams will be built to regulate the river, while the electricity will be generated in that of the other. Likewise, with respect to contiguous rivers, any energy produced tends to be split evenly between the riparian States, irrespective of the international boundary.

As demonstrated, the rule of equitable and reasonable use essentially means that States

are obligated to make use of water resources in such a way as to optimise the benefits without compromising future use.



During the presentation given at the *Meeting on Critical Issues in the Regulation of Drinking Water Supply and Sanitation Services in the Countries of the Region* (Santiago, Chile, 22 September 2003) (see Circular N° 19), Gonzalo Chaves Cubero of the Public Services Regulatory Authority (*Autoridad Regulatoria de los Servicios Públicos — ARESEP*) in Costa Rica mentioned, *inter alia*, the interesting experience of his country with the “water rate” and the “environmental tax on discharges.”

The Regulatory Authority Act states that environmental sustainability must be considered when setting public utility rates. It also establishes the obligation for providers of such services to protect, conserve, restore and make rational use of natural resources utilised in providing public services, in accordance with current legislation.

In the past, rates had been charged to cover the operating costs of the provider, including investment and an extra sum for development. This standpoint has been changing and today a mechanism is sought for establishing both the economic value of water and the internalisation of environmental costs, in addition to generating resources to ensure its sustainability by means of water protection, restoration and conservation programmes. With this new vision, the spirit of the Regulatory Authority Act is adhered to, which establishes and enforces a commitment to the environment for both the regulatory authority and the service provider.

A positive experience: the water rate

The Biodiversity Act establishes that forests serve four environmental functions: they mitigate greenhouse gas emissions, protect water resources, shelter biodiversity and preserve scenic beauty. This Act further establishes that, in virtue of approved sustainability projects, the Regulatory Authority may authorise utilities to add an additional amount to the rate charged to customers, to cover the service provided.

The Heredia Public Services Company (*Empresa de Servicios Públicos de Heredia — ESPH*) is a municipal capital corporation which provides electricity, street lighting, and drinking water supply and sewerage services to the third largest city in Costa Rica. In

November 1999, the company submitted a request for approval of a special rate, known as the water rate, to the Regulatory Authority. The company sought approval for a rate amount that would cover the environmental services provided by the forest to the water resource: forest water catchment or the value of watershed conservation, protection and restoration, the cost of water as a production input and a margin for saving and investment.

With a view to protecting the capacity of forest ecosystems to catch water and maintain the water supply and surface flow, a rate of US\$ 0.005 per cubic meter was authorised, which covers the resource conservation, protection and restoration functions provided by the forest. The resources obtained are used for the environmental service of protection of water resources in groundwater recharge areas. Progress is being made in this difficult task, and with satisfactory results, although they will only become apparent in the long term.

A new project: an environmental tax on discharges

With the aim of enforcing the constitutional principle of establishing a healthy and ecologically balanced environment, an executive decree was issued that imposed a discharge tax based on the “polluter pays” principle. The tax will be assessed according to the net amount of pollution produced, measured in kilograms, based on the following parameters: Chemical Oxygen Demand (COD) and Total Suspended Solids (TSS). The amount of the tax, assessed over a six-year period, is US\$ 0.22 per COD kilogram and US\$ 0.19 per TSS kilogram. The tax will be applied in increments over a six-year period as follows: 30%, 44%, 72%, 86% and 100%.



REGA is a SAMTAC initiative and is supported by national and regional institutions involved in the area of water resources, including ECLAC, UNESCO, IDB, the World Bank, the Brazilian Water

Resources Association (ABRH), the Argentinean Water Resources Institute (IAHR) and the Paraguayan Water Resources Association (APRH). The executive editors of the magazine are: Carlos Tucci, Chairman of SAMTAC and Professor at the *Universidade Federal do Rio Grande do Sul* (UFRGS) in Brazil, and Andrei Jouravlev, Economic Affairs Officer with the Natural Resources and Infrastructure Division of ECLAC.

The aim of the magazine is to disseminate and exchange knowledge acquired in the Americas on integrated water resources management. Emphasis will be placed on the following aspects:

- comparative results and experiences regarding water resources public policies;
- studies on the productive chain of various water resource sectors;
- integrated water resources management from an interdisciplinary standpoint;
- institutional aspects of water and environmental management; and
- sectors of water users and impacts on society.

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We introduce the document entitled “*Agua, desarrollo y políticas públicas. Estrategias para la inserción del agua en el desarrollo sostenible*”, prepared by Humberto Peña, Marco Luraschi and Soledad Valenzuela for SAMTAC.



The primary aim of the document is to show the link between water resources management and use, relevant public policies and socio-economic development in the case of Chile over the past 20 years. The central idea of the analysis is that approximately two decades ago an economic development model was introduced in Chile that was based principally on maintaining macroeconomic equilibria and on specialising in exports for which the country had comparative advantages. By taking the model into account in the analysis, its impact on water resources management and use can be studied. There is also consideration of the way in which water

resources public policies have evolved to cope with various management challenges posed by the process.

The socio-economic change and its impacts

Broadly speaking, the aforementioned model has produced very buoyant export development, primarily for products such as copper, fresh fruit, cellulose fibre, wood, salmon and wine, *inter alia*.

In the case of agriculture and that of aquiculture, Chile has specialised in supplying products in certain niches in terms of quality, species and supply over time. The availability of effective means of transport has also been a key factor in export success. In the cases of copper and cellulose, the country has specialised in exports with clear comparative advantages, particularly with respect to the availability of raw materials and to exploitation costs. Lastly, in the final stage of the period, Chile has begun to show an upward trend in value-added exports and industrialisation, as demonstrated by the exports of wine and other products associated with lumber, fish, fruits and processed vegetables.

It should be emphasised that most of the goods on which the Chilean export model is based involve the use of water resources at some stage in their production. In other words, sectors of the economy that depend heavily on water resources produce a high percentage of national exports. For example, mining, forestry, agricultural and livestock and cellulose exports account for around 46% of total national exports.

In the case of copper, mining processes use water during many metallurgical processes that must be carried out once the minerals have been extracted from the deposits. In the north of Chile, water resources are very scarce due to the arid climate of the Atacama Desert, which is precisely where the most Chilean copper is produced.

In the case of fresh fruit, irrigation water has been fundamental for production, which mainly occurs in areas where plants would otherwise not be able to develop properly. In the case of wood, although plantations can grow with rainfall alone, water is used in processes carried out after the wood has been obtained, as in the case of the cellulose production industry. Lastly, in the case of farmed salmon, fresh water is needed during the initial stages of life of this species. In conclusion, it may be said that water resources have been pivotal in the overall success of the export model.

The strong growth of export production has prompted significant increases in the

demand for water resources and has thus given rise to great challenges for water resources management. History shows that when a country is not developing economically or socially, the water issue is not a challenge for the society. On the contrary, the situation radically shifts when the country begins to grow. In fact, the information available shows a clear correlation between the growth of a country and its water demand and the emergence of environmental issues linked to natural resources exploitation.

Water policies

Water resources policies are the result of a complex interplay of forces within society, which is clearly demonstrated in the case of Chile. Of all the forces involved, only a few belong to the water sector as such, while the main ones come from other dynamics in society, in particular the prevailing views in terms of ideology and the most appropriate development strategy for the country.

From this standpoint, there was a distinctive period in Chile prior to 1990, when policies were formulated against the backdrop of an authoritarian government with decidedly neoliberal ideas, absolute trust in market forces, very little government intervention, reduced role of the State and need for planning, and a low profile for demands relating to social and environmental issues and to ethnic minorities. During that time, many policies relating to market creation and deregulation, the promotion of private initiative, cost recovery and others of similar nature were formulated.

A second phase began in 1990 with democratic governments whose policies, without abandoning the economic structures of the previous phase, tended to assign a larger role to the State, to market regulation, issues relating to the environment and indigenous peoples and the response to social demands. The notion of building partnerships between the public and private sectors was also promoted. These two separate phases were reflected both in institutional and legal initiatives and in the development of public investment. They reflected the relative weight given to the ideological concepts steering the political process in the country, without specific connection with the water issue.

Nevertheless, in addition to the political climate described above, the specific nature of the internal dynamics of the water sector at a given time favours adjustments. Such specific conditions often determine the feasibility of certain changes. One example of this are the changes in the regulatory systems of the drinking water supply and sanitation sector and of the energy sector as a result of the vulnerability that appeared in periods of

drought during the latter half of the 1990s. On that occasion, the powers vested in regulatory authorities and the sizes of the fines for non-compliance increased considerably. In fact, this situation had impacts on related areas, such as compliance with the liquid industrial wastes standards, which already existed, but had been easy to evade.

Lessons to be learned from the case of Chile

Analysis of the case of Chile can contribute to the process of reflection on which strategies are the most effective for promoting a change in the regulatory and institutional spheres. In fact, there is no doubt in the case of Chile that the institutions currently in place originated from societal forces and the challenges that arise alongside growth, and are not the result of an overall design and coherent structure thought out from the start. In other words, the institutions have been fine tuned and balanced until the gaps of the original blueprint were filled in.

Moreover, it can be seen from the Chilean case that both the positive and negative impacts of policies may be very slow to appear and may vary significantly according to the geographical area of the country and the user sector analysed. For example, the increased number of requests for groundwater rights became an explosive issue several years after the pick up in production activity, possibly due to the underutilisation of existing water rights.

The development of an active water market in the agricultural sector, which was planned in the changes of 1981, has yet to materialise barring a few exceptions. Difficulties, however, in connection with the erroneous formulation of legislation in the constitution of original rights appeared almost immediately in the area of hydroelectric generation. Weaknesses in the regulatory framework for the drinking water supply and sanitation and hydroelectric sectors only became evident in times of drought during the latter half of the 1990s.

The above would suggest that, under certain conditions, the appropriate strategy for the water sector might be a step-by-step approach to policy change. It would be governed by realistic and pragmatic criteria to address the most urgent and accessible tasks, rather than being a proposal of global reforms developed as a sort of "water fundamentalism", which aims to resolve all problems, including those that are not urgent or hypothetical situations that might arise in the very distant future, concerning which there is insufficient social awareness (despite the fact that they are obvious to the experts) or for which society does not have the resources to provide an effective solution.

It must be kept in mind that in order to implement policies, the funding issue must be resolved. In poor societies, this is a critical issue, as most beneficiaries of such policies are not in a position to make large contributions. Public resources also tend to be insufficient to cover them due to other large-scale pending demands. In this regard, the Chilean case clearly shows a rigorous increase over time in the social goals of the water sector, although this is probably closely linked to overall political change in the country, rather than being the result of design. Nevertheless, whether by chance or by design, the point is that pollution cleanup investment, for example, is being pursued in the country now that significant advances have been made with respect to other goals (such as drinking water supply and sewerage coverage) and now that the population has doubled its per capita income and the issue of flooding is beginning to gain ground as a priority.

Moreover, the increase in rates for sanitation services was introduced under a new model in which companies charge the actual cost of providing the service. This process, which surprisingly did not meet with any significant social reaction, coincided with a period of economic growth. A growth rate of 7% per annum and strong gains in real wages were recorded. Undoubtedly, the same process would have had a different outcome in a recession. This analysis suggests that great care should be taken in the proposal of policies and social goals to maintain an appropriate balance between the actual possibilities of the country, a consideration that is also valid in relation to designing financing modalities.

Discipline in relation to public investment was another factor of considerable weight. This discipline emerged with the initial reforms and was later maintained by the high level of consensus and the need to maintain macroeconomic equilibria. In practice, this has meant that for both public works and subsidies for privately funded projects of public interest, emphasis has been placed on minimum returns and their contribution to national development, as criteria for approval. Moreover, there is a system that prioritises investments according to economic and social assessments based on a wealth of experience.

Despite various successful experiences, it is important to acknowledge the fact that there has been little success in the agricultural sector in recovering the costs incurred with large hydraulic works. However, given the fact that public investment activities must pass an economic profitability test from a social standpoint, progress is being made with respect to new modalities that will explicitly detail the resulting profitability of such investments. This is done using a system of tenders for the concession of construction,

operation, maintenance and charging users in the case of large-scale irrigation projects.

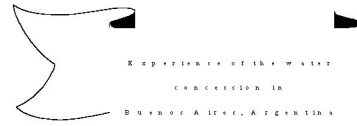
Another notable feature of the evolution of development and public policy in Chile is the issue of the environment. A contradiction frequently tends to be seen between environmental conservation and economic development. The experience of Chile in this area in the water resources sector does not seem to validate that assumption, although the quantitative information available on the status and progression of water pollution is insufficient to draw definitive conclusions.

Threats to the environment are certainly increasing as a result of greater demand for natural resources, for example in relation to the sustainable use of groundwater and the generation of potential pollutants; investment in pollution clean-up is also being substantially increased and there is greater concern for policy-making and implementation oriented to controlling environmental impacts. The process of globalisation itself plays a significant role in this response of water policy, in the sense that it allows the transfer of experiences and technology from more developed countries and encourages the establishment of international standards. As a result of the above, if the levels of water pollution seen in the 1980s are compared to current levels, the current situation is clearly more favourable.



The fourth international seminar of CYTED-XVII, “*An integrated approach for sustainable water management. Experiences in water management and valuation*” was held from 29 to 31 March 2004 in San José, Costa Rica. The primary objectives of the meeting were to: (i) discuss and promote cooperation among research and development centres and water management and planning entities in Latin America; and (ii) analyse and discuss successful experiences in integrated management and valuation of water resources. The debates centred on the following subject matters: (i) the river basin as a planning and management unit; (ii) the social, economic and cultural value of water resources; (iii) scientific research: basis for water management and valuation; and (iv) the

institutional and legal framework for integrated water resources management. There were two participants from our division: Miguel Solanes gave a presentation on basic features of water legislation and Andrei Jouravlev gave a presentation on water markets.



The document “*La participación privada en los servicios de agua y alcantarillado. La experiencia de la concesión de Buenos Aires*” was prepared for the seminar by Emilio Lentini, Sectoral Economy Manager of the Tripartite Entity of Sanitation Works and Services (*Ente Tripartito de Obras y Servicios Sanitarios — ETOSS*), Buenos Aires, Argentina, in collaboration with Leandro Rodríguez. The aim of the document was to identify, based on the experience of the concession in Buenos Aires, the main problems and achievements, as well as to draw several lessons that may be of use in refining public policy strategies and actions carried out in this sphere. These lessons would be relevant to Argentina and to other countries of the region which, in somewhat comparable situations, are facing great challenges in resolving the problems of providing drinking water supply and sanitation services to the community.

Government management, at least in the case of Argentina, was unable to meet the social demands for drinking water supply and sewerage services. Lax management and low rates set subject to political criteria caused chronic and structural financial deficits that led to a decrease in the quality of the services provided, scant investment and, worst of all, a lack of service for a large percentage of the low-income segments of the population, as well as serious damage to the environment. These shortcomings in services seen in the early 1990s facilitated the process of privatisation, which resulted in:

- improvements in the levels of efficiency but with significant hikes in rates and excessive private rents;
- increased investment and quality of service but targets undertaken contractually were not met;
- service extended to new consumers but not enough to prevent the exclusion of a significant number of low-income families; and
- conflicts with distribution of benefits and costs, both private and social.

Concession performance indicators

Although the provision of services has improved compared to the former level under

government management, targets set in the concession agreement have not been fulfilled. Drinking water supply services are available to 79% of residents within the concession area compared to the target of 88% stipulated in the original contract (a difference of 800,000 residents). The lag in sewerage services is at around 1 million residents, as 63% receive sewerage services compared to 74% set out in the original contract. The lag in provision of sewage treatment is even more serious. According to the original contract, primary wastewater treatment should by now cover 74% of the population, but the level achieved is only 7%.

Investments in infrastructure rehabilitation and renovation have not been effective in reducing losses. This inefficiency has resulted in problems of low water pressure for almost 70% of the drinking water network. With regard to customer service, *Agua Argentinas* has demonstrated a high level of efficiency in settling claims that do not affect its profits and a low level of efficiency with regard to claims that do affect them.

Rate and billing changes and profitability and indebtedness indicators

The average bill paid by residential customers increased between May 1993 and January 2002 by 88%, which is far above the retail price inflation rate of 7.3% for the same period. This increase was primarily the result of contractual renegotiations that, for the most part, were favourable to the concessionaire.

In terms of accounting profitability, rate hikes have resulted in highly satisfactory figures for a company operating in a regulated market with a guaranteed average demand for services. This is evident if the company’s profitability is measured in terms of sales (annual average of 13% during 1994-2001) and its net assets (21%). Moreover, *Agua Argentinas* opted for a capital structure with a level of indebtedness that is high (a ratio of debt to net assets equivalent to 2.4), even in relation to levels acceptable for this type of companies at the international level. Although this structure minimised the cost of capital for the company, it resulted in a structure different to what had been offered, and also led to a critical debt situation following the devaluation in 2002.

Contractual renegotiations

Shortcomings in the design and instrumentation of the privatisation process and the resulting weaknesses of the institutional and legal framework had a part in the problems faced by the concession. To a large extent, such shortcomings originated from the economic policy and privatisation model prevailing at the time of sectoral

transformation. In this context, two noteworthy elements were not adequately considered when designing the privatisation strategy:

- The deficits in service coverage, which mean that considerable investment is needed to expand coverage to areas inhabited mainly by low-income groups. There is no particular incentive for a private operator to offer services in such areas.
- The lack of an active government policy with effective measures to alleviate the problems faced by low-income segments of the population in accessing services.

There was inadequate consideration of these issues when granting the concession, as well as of measures to avoid any undesirable actions on the part of any of those involved in the concessioning process (mainly the concession authority, the regulatory body and the concessionaire). According to theory and practice in the field, these elements were foreseeable and were the causes of the crises that occurred shortly after the concession had been initiated and led to contract changes. The changes were a response to requests on the part of the service provider, and were generally made in exchange for a commitment to higher levels of investment, which did not subsequently materialise, in order to justify the rate hikes.

Conclusions and lessons

After ten years in the hands of the private sector, there is still a significant shortfall in drinking water supply and sanitation services, and great efforts will be needed in the future to remedy the situation. In order to meet the service needs of the community and protect the environment, investments will be needed to cover expansion of drinking water supply services for around 2 million individuals, sewerage services to 3.5 million and wastewater treatment to 8.6 million. It is estimated that an investment of approximately US\$ 2.2 billion will be needed over the next ten years to meet these goals. This investment requirement appears excessive in relation to the income generated from the rates charged in view of the payment capacity of the population, particularly those who will benefit from the expansion of services.

In this context, the urgent requirements for drinking water supply and sanitation services cannot be met by the methodologies and schemes established in the 1990s. In the case of services in Greater Buenos Aires, it is not feasible to continue with a system that depends exclusively on integrated and monopolistic management by the private sector and on absolute cost recovery in the short or medium term through rates charged to customers. This is particularly the case

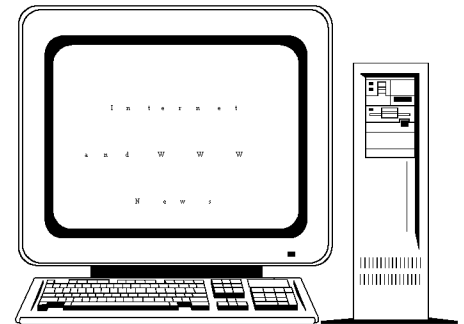
because, given current circumstances, private-sector companies would demand even higher levels of risk coverage for their capital investments than in the previous round. It is this coverage that results in high profit levels and higher utility rates that bear no relation to the payment capacity of most of the population.

As for the improvement and strengthening of the regulatory framework for concessions, in a way that is applicable to other countries of the region, the solutions should include the following approaches and instruments:

- Refining of the competition mechanisms for awarding the monopoly, with the aim of avoiding bid offers with predatory tariffs (to win now and negotiate later) and allow for a capital contribution from the successful bidder that represents a level of risk appropriate to the venture undertaken.
- Analysis of the technological and economic feasibility of a vertical or horizontal separation of systems in order to award the concession to more than one operator. Inclusion of competition mechanisms—contestable markets—to be applied in particular in the areas subject to expansion.
- Improvement of the contractual framework by ensuring adequate legal security and establishing rules and regulations with the technical specifications needed to create a legal framework that includes well-defined mechanisms to be applied objectively and to minimise negotiations with service providers.
- Inclusion in the contract design of adequate incentives and signals.
- Use of methods to limit the renegotiation of contracts and inclusion of competition mechanisms to settle conflicts that cannot be resolved by the terms and conditions of the contract.
- Development of mechanisms to guarantee the use of funds earmarked for investment, such as setting up a trust fund for the funds committed, which will be released when the corresponding certificates of works are presented.
- Implementation of active government policies, particularly with regard to providing direct subsidies for low-income groups so as to ensure universal access to such services in the shortest period possible.
- Refining of the information systems used for regulation on the basis of: (a) proper diagnostic assessment and technical modelling of the service systems;

(b) regulatory accounting; and (c) formats for providing periodic information.

- Restructuring and improvement of the organisation of regulatory entities. Improvement of their degree of independence and technical capacity.
- Implementation of procedures to control procurement and contracting efforts on the part of the private service provider, with a view to ensuring transparency, competition and cost-effectiveness by conducting specific follow-up to the operations with related companies in order to avoid any occurrence of the mechanism of “transfer pricing”.
- Improvement and increased use of methods for encouraging community involvement. Emphasis on making this type of involvement professional and specialised. Increased use of public hearings. Enhancement of information systems according to the needs of customers and public opinion.



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

- Mexico’s new *Ley de Aguas Nacionales* (*National Water Act*), approved on 29 April 2004, is available online at http://www.cna.gob.mx/publica/doctos/leye_s/lan2004.pdf.
- *Medioambiente.cu* is a Cuban environment portal. It provides access to news, courses, events, legislation, publications and much more information on environmental issues. A noteworthy feature of this web site (<http://www.medioambiente.cu>) is the full text of Decree Law N° 138 “*De las Aguas Terrestres*”.
- In Costa Rica, the Ministry of Environment and Energy (MINAE) is the national water authority. Within MINAE, this responsibility falls to the *Departamento de Aguas* (*Water Department*), an office of the National Meteorological Institute. The mission of the Water Department is to efficiently manage water resources nationwide in a timely fashion, pursuing

- sustainable development through regulation and rational management. Various materials relating to the issue of water in Costa Rica are available on the web site of the department (<http://www.aguas.imn.ac.cr>); for example, “*Primeros 100 años de marco legal del recurso hídrico en Costa Rica 1884-1984*” and “*Propuesta de proyecto de Ley del Recurso Hídrico*”.
- The magazine *Agua Yaku*, which addresses issues relating to the drinking water supply and sanitation sector in Ecuador, is available online at http://www.wsp.org/publications/lac_agua_laku.pdf.
 - The **Ground Water Modelling** group is a forum for the communication on all aspects of ground water modelling including technical discussions, announcement of new software, conference and workshop announcements and summaries of research results, recent publications and case studies (<http://groups.yahoo.com/group/gwmodel>).
 - The **Regulatory Unit for Energy and Water Services** (URSEA) is the regulatory body for energy (electricity, gas and liquid fuels) and drinking water supply and sanitation services in Uruguay. Detailed information on its activities, the regulatory framework of the sector and various documents of interest are available on its web site (<http://www.uree.gub.uy>).
 - The purpose of the **Interinstitutional Water Council** (CONIAG) of Bolivia, established on 20 April 2002, is to provide a forum for dialogue and consensus-building activities between the government and economic and social organisations in order to adjust the legal, institutional and technical framework for water issues, so as to structure and regulate water resources management (<http://www.aguabolivia.org/coniag>).
 - In Jamaica, the **Water Resources Authority** (WRA) is responsible for the management, protection, and controlled allocation and use of water resources (<http://www.wra-ja.org>). Its mission is to ensure the sustainability of Jamaica's water resources through continual assessment and proper management, promotion of conservation and protection, and optimal development of these resources; to achieve rational and equitable allocation of the nation's water resources; and to reduce conflicts among water users.
 - Materials from the e-conference “*Sistemas de Pago por Servicios Ambientales en Latinoamérica y el Caribe en el Ambiente de Cuencas Hidrográficas*” (12 April to 21 May 2004), organised by the FAO Regional Office for Latin America and the Caribbean, are available on the web site <http://www.rlc.fao.org/foro/psa>.
 - The **National Drinking Water Supply and Sewerage Administration** (ANDA) is the primary drinking water supply and sewerage services provider in El Salvador (<http://www.anda.gob.sv>).
 - **Aguayambiente** is a discussion list created for students and educators of the Department of Water Resources and Environmental Management of the *Universidad Central* in Colombia (<http://espanol.groups.yahoo.com/group/aguayambiente>).
 - The **IMO** e-mail list is a communication means which encourages academics, professionals and other stakeholders to share knowledge, experiences and ideas on institutional issues in the drinking water supply and sanitation sector (<http://www.jiscmail.ac.uk/lists/IMO.html>).
 - The newsletter **CHAC**, which addresses issues relating to the drinking water supply and sanitation sector in Honduras, is available online at <http://www.wsp.org/publications/CHAC.pdf>.
 - **EcoPortal.net** is a portal specialising in issues relating to the environment, nature, human rights and the quality of life (<http://ecoportal.net>). The portal also allows users to subscribe to the weekly magazine *Ambiente y Sociedad*.
 - **Kumar Links to Hydrology Resources** is an excellent catalogue of hydrology-related resources available on the web (<http://www.angelfire.com/nh/cpkumar/hydrology.html>).
 - The web site of the **Association of Water and Sanitation Regulatory Entities of the Americas** (ADERASA) has been launched (<http://www.aderasa.org>) (see Circular N° 15). The IV Meeting of ADERASA will be held from 20 to 22 October 2004 in Tafi del Valle, Province of Tucumán, Argentina.
 - The interesting **Boletín del Agua**, published by the Institute for the Promotion of Water Management (IPROGA) of Peru (see Circular N° 18) can be subscribed to by sending a request to iproga@amauta.rcp.net.pe.
 - The **Water and Sewerage Authority** (WASA) of Trinidad and Tobago was formed in 1965 (<http://www.wasa.gov.tt>). It is the largest public utility in the country. The Authority serves over 90% of the population with pipe-borne water through private house connections and standpipes.
 - The review **Caudal**, which focuses on drinking water supply and sanitation issues in Bolivia, is available online at http://www.wsp.org/publications/REVISTA_CAUDAL3.pdf.
 - The papers presented at **Colombia's Third National Water Forum** (Bogotá, Colombia, 29 September to 1 October 2003), organised by the School of Water Resources and Environmental Management of the *Universidad Central*, in coordination with the Institute for Hydrology, Meteorology and Environmental Studies (IDEAM), are available online at <http://www.ucentral.edu.co/pregrado/escuela%20inge/hidricos/ingrecursos.htm>.
 - About 90 universities in the United States and throughout the world comprise the **Universities Council on Water Resources** (UCOWR) organisation. Member institutions engage in education, research, public service, international activities, and information support for policy development related to water resources. Further information is available at <http://ucowr.siu.edu>.
 - The **Water Portal of the Americas** (WPoA) is a water information service, including a web site and other initiatives that enhance the availability of quality water information (<http://www.waterportal-america.org>). The goal is to provide an entryway to water information, and to create a water information network, community, and resource that will provide qualified, trusted, and verifiable information and contacts.

Publications



Recent publications of the Natural Resources and Infrastructure Division related to water resources management and water utility regulation in Latin America and the Caribbean:

- “*Estudio sobre los convenios y acuerdos de cooperación entre los países de América Latina y el Caribe, en relación con sistemas hídricos y cuerpos de agua transfronterizos*” by María Querol (LC/L.2002-P, November 2003, *Recursos Naturales e Infraestructura Series* N° 64) (see “*Open Discussion*”) (available in Spanish only). The study is divided into two sections, the first of which analyses the

current international law framework governing transboundary water issues. An analysis of State practice shows the existence of certain customary rules relating to transboundary water systems and bodies of water. The doctrine has also contributed to the development and precision of such rules, which have been and continue to be applied on a case-law basis. The second part of the study focuses particularly on specific cooperation agreements signed by the countries of the region. To this end, six representative cases were selected and special emphasis was placed on the creation of standing joint committees responsible for executing such agreements, on conflict settlement mechanisms and on the treatment of environmental aspects of transboundary water resources. Lastly, several conclusions are drawn.

- “*Los municipios y la gestión de los recursos hídricos*” by Andrei Jouravlev (LC/L.2003-P, November 2003, *Recursos Naturales e Infraestructura Series* N° 66) (available in Spanish only). The closing decades of the 20th century in Latin American and Caribbean countries were marked by strong, conflict-ridden processes for decentralising various activities and responsibilities to the municipal level. In several countries, such processes are still ongoing today. As a result of such reforms, the traditional involvement of the municipal level in the provision of water-related services has been strengthened in many countries, which makes them important institutional users of the resource. Moreover, many activities and responsibilities at the municipal level, while not directly related

to water management, have a strong influence both on water resources and river basins and on the uses and users of the resource. This situation gives rise to questions regarding the appropriate modalities of municipal participation in the water management system. The response forms part of a broader issue regarding what levels are suitable for water management and service provision. The purpose of this report is to contribute to the debate being held in the countries of the region on such issues. Emphasis is being placed on water resources management, on the modalities for its decentralisation with municipal participation and their inherent limitations and on the potential contributions of the municipal level of government in this area, with particular emphasis on watershed management.

- “*Informe de la reunión sobre temas críticos de la regulación de los servicios de agua potable y saneamiento en los países de la región. Santiago de Chile, 22 de septiembre de 2003*” by Andrei Jouravlev (LC/L.2017-P, November 2003, *Seminarios y Conferencias Series* N° 34) (available in Spanish only). The meeting on critical regulatory issues in the regulation of drinking water supply and sanitation services in the countries of the region was organised by the Natural Resources and Infrastructure Division under the auspices of the Superintendency of Sanitary Services (SISS) of Chile (see Circular N° 19). The primary purpose of the meeting was to analyse topics of growing importance in the regulation of drinking water supply and sanitation services in Latin American and Caribbean countries. The debates centred on the

following subjects: (i) the influence of international agreements to protect investment and trade on the national capacity to regulate public services; (ii) urgent issues in the regulation of drinking water supply and sanitation services in the countries of the region; (iii) lessons from rate-of-return regulation in the United States; and (iv) the integration of natural disaster mitigation in the regulatory frameworks for the drinking water supply and sanitation sector. This report contains a summary of debates, conclusions and recommendations, the agenda, the list of participants and several presentations delivered at the meeting.

- “*Progress of the Latin American and the Caribbean region towards sustainable development in the issues: human settlements, sanitation, water. Regional preparatory process for the Twelfth Session of the Commission on Sustainable Development*” (LC/R.2121, 16 April 2004) (also available in Spanish). This report was prepared in the context of the regional preparatory activities for the Twelfth Session of the CSD (see “*Editorial remarks*”).

The publications of the Natural Resources and Infrastructure Division are available free of charge in two formats: (i) as printed documents, single copies of which are sent by airmail (while supplies last); and (ii) as electronic files (Microsoft Word or PDF formats) which are sent as e-mail attachments, or may be downloaded from <http://www.eclac.org/drni>. Requests should be sent to ajouravlev@eclac.cl or *Natural Resources and Infrastructure Division, ECLAC, Casilla 179-D, Santiago, Chile.*

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