

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



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For many, the term "private" is synonymous with efficiency and innovation, while "public" means waste and incompetence. Others, in contrast, associate "private" with a business that neglects unprofitable users, while "public" enterprises defend the poor, minorities and social interests. Reality, as usual, has nuances. Although many arguments, both theoretical and practical, suggest that private drinking water supply and sewerage companies should be more efficient than their public counterparts, the few empirical studies available offer mixed evidence on how ownership affects efficiency in this specific sector.



Economic theory argues that competitive markets provide strong incentives for efficiency. Nevertheless, the main conclusion from the empirical evidence is that, generally speaking, when competition is limited and companies are subject to strong regulation, little evidence justifies preferring one type of ownership over the other. As a result, it is appropriate to evaluate advantages and disadvantages on a case by case basis. In this sector, we can conclude, efficiency depends more on the institutional and structural environment than the type of ownership.

Renationalization of some service providers in the region has occurred in a completely different world from that of the pre-1990s, when water services in government hands were self-regulated and did not always give priority to efficiency in their investments and operations. Now, the perspective has changed due to new institutional frameworks to regulate service provision and the high

value placed on efficiency as a requirement for service operators. Today, independent regulation seeks to ensure that private companies do not neglect socially desirable goals and that municipal or state-owned enterprises are not captured by interest groups pursuing their own agenda. In several cases, moreover, the role of service regulator is separated from that of long-term planner.

In most cases, regulatory frameworks were originally designed for private rather than public sector operators. Private participation, however, has not expanded as expected, and several international private operators have left the region, with some services being renationalized. Political realities and conditions in this sector reveal that in this region, public provision prevails in drinking water supply and sanitation services. An important feature of this transformation has been the emphasis on efficiency, since the complex economic and financial mechanisms intended to encourage it were always developed with a private operator in mind. It is worth asking, then, if the concept of efficiency as used in current regulatory frameworks is sufficient to guarantee that a public service provider—whether municipal or state-owned—will behave appropriately or whether different or complementary controls are needed.

*Michael Hantke-Domas and Andrei Jouraiev*



The study *"Eficiencia y su medición en prestadores de servicios de agua potable y*

*alcantarillado" (Efficiency and its measurement in drinking water and sewerage service provision)* by Gustavo Ferro, Emilio Lentini and Carlos A. Romero (see Circular N° 34) describes how economists have found practical ways to deal with the problem of measuring and evaluating the efficiency of companies providing public services, particularly drinking water and sewerage. The study concludes that performance indicators are useful to document past behaviour, establish starting points for productivity improvement, and to compare service providers. The next step is to identify the data required to compare performance over time and among companies involved in drinking water and sewerage, once the strengths and weaknesses of the different methodologies for measuring efficiency have been analyzed, and then to carry out the relevant studies.

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The following steps are recommended to develop ongoing comparison of partial and global performance indicators:

- **Identify the required information** (operating, accounting and financial data,

figures on outputs, inputs and prices) through a baseline study that establishes objectives, methods and resources, review and evaluation mechanisms. Dedicate human and material resources to develop and maintain the data base, provide well documented working procedures and routines, so the information does not depend solely on who is responsible for collecting it or maintaining the data base.

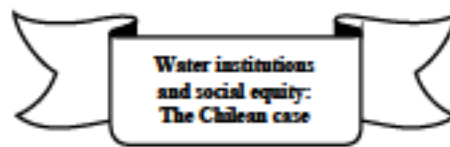
- **Improve the quality of data** required from service providers by: i) applying a systematic approach to the accounting system, based on regulatory requirements or a cost system; and ii) setting regulation procedures and protocols to collect physical indicators of the company's operational management.
- **Apply a system of data collection**, storage and processing, document this process and the collection protocols, set criteria for analysis, and establish mechanisms to repeat these routines.
- **Keep statistics in user-friendly files** and prepare regular analytical reports.
- **Establish models and methods to be used to compare** service provider performance.
- **Choose the comparators.**
- **Prepare or hire analysts responsible for studies**, considering human capital and computer support development.
- Analyze previous studies to **identify starting points**, common difficulties, formulate working hypotheses, establish expected results that can help detect potential irregularities in the analysis.
- Develop studies, include results in reports and **look for coherence in specific methods, and between methods and with the real world.**
- **Show the results** in presentations and publications.
- If there is consensus on the robustness of results, accuracy of figures, quality of the comparative process and conviction of the need to encourage change, **use them for regulatory and management ends.**
- **Make regular and special process reviews**, whenever irregularities in specific observations are noted. As time passes and ongoing sample observations are made data quality will improve, providing insight into data collection methods, drawing attention to dubious values and encouraging new questions about variables initially excluded from studies. Establishing a protocol encourages ongoing improvement.

It is a good idea to start by selecting a small set of indicators highly representative of company management. This way understanding of service providers performance can be consolidated over time, and information about other firms can be obtained for comparison. Likewise, there will be greater "control" over potential deviations or errors in the data base, as analysis of information and results improves and

becomes more precise over time. Steadily improving and extending the data base will reinforce the system.

Countries with a sufficient number and diversity of companies to form panels of representative service providers will be at an advantage for implementing a referential or comparative system using robust benchmarking that can, through regulation, become a suitable instrument for improving service provision efficiency.

Determining the values of indicators should be complemented by a multidisciplinary analysis by experts in technical, operational and economic factors, to interpret results on the basis of deeper knowledge about characteristics and conditions, both temporary and structural, of the services covered by the methodology. For example, a rise in chemical inputs might reflect changes in the water captured, while plant personnel changes in a specific area might reflect changing procedures or outsourcing. Some of these factors cannot be "isolated" from indicators in the short run, but they are useful for developing more insight into indicators as they evolve. Eventually, when appropriate, impacts can be incorporated into the value of indicators or considered in recommendations to improve management or the efficiency of specific processes, equipment or facilities.



Humberto Peña, former General Director of Water in Chile contributed an article on "*Institucionalidad de aguas y equidad social: El caso de Chile*" (*Water institutions and social equity: the Chilean case*), the first section of which is presented here.

The consequences of Chile's water resources management system on social equity have been the object of debate in the country and abroad. Some argue that social aspects are not reflected in legislation, which offers to the water rights allocated by the State a legal protection similar to that granted to private property and allows for reallocating these water rights through the market. It has also been argued that this regime, adopted in 1981, was not modified in the 2005 reform to the Water Code (see Circular N° 22). This raises the question of how realistic this view is and, if it is not, what the true challenges pending might be.

Before entering fully into this analysis, it is useful to examine some general ideas about the relationship between water management and social equity, first developed in the study "*Social Equity and Integrated Water*

*Resources Management*" by Humberto Peña for the Global Water Partnership (GWP):

- Social equity refers to meeting the needs and guaranteeing the rights of individuals, beyond their role as water users, so any analysis of equity in water governance should consider the overall effect of water use sectors (among them, agriculture, drinking water supply and so on) and general (macroeconomic and other) policies and institutions that influence final results for all members of society. Water governance, then, should favour and not obstruct social equity objectives, but results will also reflect public policies, institutions and numerous factors from beyond the water sector.
- In this sense, equity refers to the total distribution of benefits (or costs) associated with water among all, not only direct beneficiaries. Thus, externalities, environmental benefits, employment impacts, State revenues due to taxes and their redistributive effects, among others, should also be considered.
- The relationship between social equity and economic efficiency objectives depends above all on the priority assigned to basic needs and ethical principles generally embraced by society. Beyond this threshold, some policies permit progress on both fronts ("win-win"), while others do not contribute neither to equity nor to efficiency ("lose-lose"). Thus, real life situations where there is a trade-off between them are unusual, and resolution depends on social policy objectives.
- Along with monitoring the equity of the end results of water management, the equity of the process is also relevant (problems of discrimination, capture, etc.).

From this perspective, six key issues offer insights into how Chile's institutions address the social dimension of water. These include: the basic right to water for household purposes; the defence of historic uses by the most vulnerable sectors; the concentration of rights by the market as it hurts those most vulnerable; access to new water resources; access to public goods associated with water (control of pollution, flooding and other elements); and equity in decision-making processes. An analysis of each follows.

**Water for the population: is water for household use guaranteed, especially for the poorest sectors?** Reports consistently recognize the success of Chile's public policies in this respect. Current coverage of drinking water supply services in cities is virtually 100% and the payment system allows for subsidies to the poorest sectors, thus responding to social demand (almost 20% of users receive subsidies). Similarly, rural areas also enjoy very high services coverage, through the rural drinking water supply

programme applied directly by the State since the 1960s, which subsidizes system construction and then transfers the works for self-management to beneficiaries.

Responding to new urban demand is an obligation of the water supply and sewerage companies included in development plans and they are supervised to ensure this happens. Thus, companies plan for new water resources, evaluating different alternatives, including access to the water rights market. This procedure has been in effect since 1981 and has proven both effective and unlikely to produce conflict. For example, since then the population covered in Metropolitan Santiago has risen 50% (by more than 2 million people) without raising public concern.

In any case, foreseeing the possibility that the development of water sources not currently in use could become critical, for lack of alternatives, the 2005 reform to the Water Code empowered the State to reserve resources for this purpose. Moreover, with regard to domestic use, legislation specifically establishes the possibility of expropriating existing water rights.

Thus, water legislation has not hampered compliance with social objectives and it has not been necessary to establish a general preference for domestic use in the allocation of water. Moreover, it is important to note that in the past conflicts between the drinking water supply and agriculture sectors were high, since the preference for domestic use was seen as an abuse that left farmers at the mercy of water supply service providers. The end of this priority responded to the agriculture sector's yearning to eliminate this threat. At the same time, assigning value to water through the market mechanism also encourages the sector to design efficient solutions. In the case of the rural sector, given that these are state-financed programmes, there is no reason for them to function differently.

In summary, there are sufficient legal tools to ensure an ongoing supply of water to the population, including those most vulnerable, provided government programmes and institutions function appropriately in this sense.

**Are there safeguards to ensure that traditional users among those poorest are not placed at risk? Are the ancestral uses of indigenous communities protected?** The water legislation in effect includes a focus on safeguarding existing rights. These include not only those formally registered but also those recognized by law, including customary uses. Thus, the State is required to guarantee that these rights can be exercised through administrative and judicial bodies, including the courts.

Moreover, in the specific case of ancestral rights of the indigenous peoples in northern Chile, which are associated with a way of life and culture based on irrigation, the indigenous law (1993) granted express protection and created a public agency, the national corporation for indigenous development (CONADI), to support their claims and a fund to assist in recovering land and water. In this context, in the altiplano of northern Chile, the rights of indigenous communities to use surface water were legalized before the courts, through programmes developed by CONADI, with support from the General Department of Water (DGA) in the 1990s. Exceptions reflect situations from the 1980s, when the State intervened to guarantee sufficient supply to meet new demands for drinking water (Iquique, Antofagasta) and for mining (Chuquibambilla).

Wetlands reliant on groundwater important to the life of indigenous communities in the altiplano are also subject to special protection, since the 1992 modification of the Water Code, and any activity that might affect them must enter the environmental impact evaluation system. Thus, frequent conflicts involving indigenous communities, especially those related to mining projects or urban water supply, do not reflect gaps in legal protection of rights, but rather controversy over implementation. This subject will be discussed in Circular N° 37.

Another source of conflict arises in attempts by some sectors to achieve recognition of their rights to natural resources located in territories they have historically inhabited, beyond the resources they have always used, as occurs with groundwater. This position reflects a general political aspiration that does not depend on the equity of water legislation itself.

**¿Has the market concentrated water rights in ways that hurt the interests of the poorest?** The water market in Chile was created to respond to the crucial question of how to meet new demands when water is insufficient, considering that the alternative of using administrative methods was not considered suited to the reality of the country.

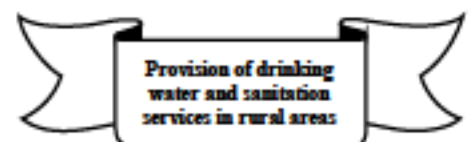
This mechanism operates in a context where consumptive water rights in river basins with shortages (the north and centre of the country) were mostly established during the 19th century. The only areas where these rights were not granted at the time were in those with no agricultural interests and for ground and surface water resources that were available only occasionally. Since the agrarian reforms (1969-1973), which saw the reallocation of both water and land, these rights have been held by more than 350,000 users and follow the pattern of land

distribution relatively closely and homogeneously. Thus, in each valley, water was assigned to thousands of users. The market has had a marginal impact on this initial distribution, reallocating water rights that were underused or not in use at all, mainly in areas of expansion or within the sphere of influence of major cities. In these cases, the main buyers have been water supply and real estate companies.

Thus, transfers of water rights separate from land, which could lead to the abandonment of agriculture, poverty or indigence among sellers, have not appeared. Rather, a very different process has seen water rights transferred together with land, through a general tendency toward concentration in agriculture ownership, which is not directly related to water institutions.

Transfers of water rights from agriculture to the mining sector, which have been covered in the media, are irrelevant, since new projects have used groundwater previously not in use. The only river basin where transfers affect a significant flow is the River Loa, where waters high in salts previously used for irrigation in Calama have been transferred to drinking water supply and mining companies, coinciding with a significant decline in agricultural use due to urban growth. No information or studies support the view that these transfers have reduced quality of life for those who sold their water rights and the opposite may have occurred, given that sales were voluntary, involving lands with low agricultural productivity, and at high prices. Moreover, transferring water rights in ways that significantly boost productivity per cubic metre of water could favour social equity at the country level, if benefits accrue to those most in need through jobs, wages, social expenditures and other indirect benefits. In fact, the alternative costs of water for mining could reach over three dollars per cubic metre, more than one third of which would burden the State, through lost tax revenues.

One aspect typically not considered in debates over this issue, which may affect social equity, is the lack of regulation of potential externalities generated by water transfers, such as the change in the return flow regime, groundwater recharge, water quality and others. These kinds of externalities, which may also appear without transfers and which are independent of the economic situation of users, are not regulated by current legislation and could constitute a source of inequity.



This section presents recommendations from the study *“Políticas públicas para la*

*prestación de los servicios de agua potable y saneamiento en las áreas rurales* (Provision of drinking water supply and sanitation services in rural areas) by William Carrasco Mantilla (see Circular N° 35), which studied public policies for the provision of drinking water supply and sanitation services in rural areas in the countries of Latin America and the Caribbean.

Rural drinking water supply and sanitation services reflect very different features and conditions from those in urban areas, and require countries to develop public policies specific to each case. This section, then, presents some public policy recommendations for drinking water supply and sanitation for rural populations, with the caveat that these are neither exhaustive nor conclusive, and that in every case and for every reality measures should reflect local conditions as much as possible.

#### **Investment and information public policies**

- Defining or clarifying specific levels of service as a baseline and in terms of expectations in the rural sphere. For the water supply, service levels range from access to untreated water obtained directly from source, through household level drinking water supply, with metering, continuity and appropriate pressure, which involve different levels of costs, willingness to pay, administrative capacity and of social acceptance. For sanitation, levels range from disposal of excrement in open field, through individual solutions such as latrines or septic systems, through full access to sewerage, including wastewater treatment.
- Implementing information mechanisms to quantify resources invested to expand coverage or improve rural service quality, separating these allocations from those going to urban zones. Thus, strategic analysis of public policies can examine the effectiveness of investment, costs per beneficiary, for the solutions applied.
- Establish reference unit costs for the different kinds of investment to be made, keeping in mind variables specific to rural areas, such as: population density, beneficiary location, distance from the closest city or supply centre, and kind of access.

#### **Financing schemes**

- Define clear, simple policies to provide subsidies to investment, seeking to encourage economies of scale, wherever possible.
- Establish special subsidy amounts for the most vulnerable populations and ethnic minorities who cannot afford to co-finance investment.

- Establish mechanisms, programmes or specific lines to finance rural areas, to encourage specialization in resource application appropriate to the required interventions and applicable technologies, using the solutions best suited to the rural population.

#### **Sustainability and institutional structure**

- Establish an institutional structure that at the least formulates public policies, and provides planning and technical assistance, developing instruments and methodologies specific to rural contexts.
- Promote community participation in formulating, designing and implementing infrastructure (not just as labour).
- Implement sustainable approaches to support rural areas at the intermediate or municipal level, to which nationally developed programmes, instruments and methods can be transferred, thereby ensuring that training and technical assistance can cascade downward from the national to the local level.
- Support legal constitution of community bodies to take on service provision. Promote regional arrangements wherever possible.
- Develop standards and guidelines for selecting, designing and building unconventional technologies and solutions to provide drinking water and sanitation, which include community participation in every phase of the project cycle.
- Establish subsidies for technical assistance and maintaining drinking water and sanitation solutions to support the most vulnerable and dispersed population, where it is not possible to charge fees to help cover administration, operations and maintenance costs.

#### **Regulation, control and oversight**

- Establish a special regulatory framework for service provision in rural areas, focusing on simplified tariff formulae and methods, and secondary regulations that clearly define relations mainly between service providers and users.
- Define simple, easily applied tariff methods that guarantee sufficient funding (and economic efficiency) for service provision (for example, floor and ceiling rates as a function of the technologies in use).
- Establish mechanisms that permit subsidies for users that are least able to pay.
- Establish a simple, friendly information system that keeps the most important service provision data up to date, to constantly formulate or adjust public policies.
- Develop clear regulations for relations between service providers and users

(rights, duties and obligation to respond to requests, complaints, appeals, among others).



This section offers a brief summary of the study *“La ecologización de la regulación económica de los servicios de agua potable y saneamiento en Perú. Lecciones aprendidas de la implementación de un esquema de pago por servicios ambientales. Caso EPS Moyobamba”* (Ecologizing economic regulation of drinking water and sanitation in Peru. Lessons from implementing a payment scheme for environmental services. EPS Moyobamba case) by José Salazar, which was debated at the International Conference “Water in the Green Economy in Practice: Towards Rio +20” (see Circular N° 35).

In Peru, economic regulation of drinking water supply and sanitation services emerged in the 1990s as a market substitute in a sector which is a natural monopoly, focusing on tariffs to maximize efficiency in service provision. This type of regulation, however, whose main actor was a neutral, independent regulatory body, now faces problems arising from the urgent need to manage environmental conflicts, risk of natural disasters in the context of climate change, and governance issues, which together demand a new vision for regulation that links economic with social and environmental concerns.

The National Superintendence of Sanitation Services (SUNASS), which regulates the drinking water supply and sanitation sector in Peru (see Circular N° 12), is ecologizing economic regulation by introducing: projects that recognize the complementary nature of providing water supply and sanitation services (infrastructure) and making them sustainable (conserving water sources); economic-financial payment mechanisms for environmental services, to protect water sources; natural disasters risk management as they affect service providers; and governance structures that give priority to the experience and participation of diverse actors. This model recognizes the following principles: the city depends on the countryside

to survive; utility tariffs should reflect environmental externalities; intangible benefits inherent in water and watershed conservation should be considered; physical, financial and human capital depend on the hydro-ecological functions of the water cycle (natural capital of the watershed); and users are citizens with political rights.



The Natural Resources and Infrastructure Division cooperated, through Caridad Canales, Economic Affairs Officer, in the First Regional Consultation in Latin America and the Caribbean for the project *“Groundwater Governance: A Global Framework for Country Action”* (Montevideo, Uruguay, 18 to 20 April 2012), which is the result of cooperation between the International Hydrological Programme (IHP) of the United Nations Educational, Scientific and Cultural Organization (UNESCO), the Global Environmental Fund (GEF), the United Nations Food and Agriculture Organization (FAO), the International Association of Hydrogeologists (IAH) and the World Bank. The project is expected to define a Shared Vision and Global Framework for Action on Groundwater Governance. These will be derived from: i) an examination of the state of governance in relation to groundwater supply and demand; and ii) the development of regional groundwater governance diagnostics integrating local and national experiences together with perspectives for management at local, national and transboundary levels.

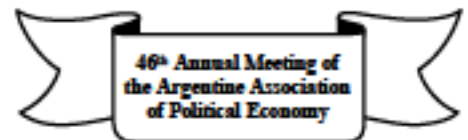
During the working session on groundwater policy and governance, debates focused on the following principles:

- **Sustainable use.** A general notion of “sustainability” in terms of simple recharge and withdrawal budgets is not sufficient. A more informed appreciation of how governance arrangements can be used to manage or relax aquifers under pressure is called for. These will necessarily involve quite subjective criteria as to what social, economic and environmental consequences are acceptable for a particular system of groundwater supply and use. In addition, the time over which aquifers respond to

development or become imprinted with pollution presents a particular governance challenge when considering long terms sustainability of groundwater use.

- **Transparency.** Make the invisible visible: more could be done to socialize groundwater information and groundwater dynamics. Basic aquifer system behaviour in relation to supply (recharge) and demand (abstraction) still has to be modelled to fully appreciate storage depletion in particular. But how these sophisticated messages get across to groundwater users remains problematic.
- **Participation.** Engage with users at the aquifer scale to monitor and agree drawdown limits or acceptable limits to pollution. The clear presentation of locally relevant groundwater information can be combined with participatory monitoring of the state of the aquifer to agree acceptable levels of drawdown or groundwater quality.
- **Accountability.** More can be done to stress the social and economic benefits of governance, but only if the costs or consequences of use — including the impacts of poor drilling and borehole construction norms and standards — are identified. Determining who benefits and who stands to lose as a result of use is fundamental — along with a system of allocating groundwater use. More problematic is the identification of those who cause groundwater pollution but do not use groundwater. A polluter-pays principle may work well for all water users, but not necessarily for those who change land-use or apply agrochemicals.
- **Integration.** An explicit shift from conjunctive use to conjunctive management is expected to yield benefits where the buffering and storage advantages of groundwater can be realised across landscapes and economic sectors. In this sense groundwater management needs to become more integrated with groundwater use in conjunction with surface water supplies and wastewater flows management, through imaginative use of other instruments (such as payment for environmental services) and collaboration with other water sector players.
- **Assess and attribute groundwater risks.** Beyond the basic dissemination of groundwater data, the use of groundwater information and knowledge to assess risks of groundwater depletion and pollution will be key in assigning levels of acceptable risk. It is essential to anticipate the evolution of groundwater quality and hydraulic state over time.
- **Protect recharge areas and processes.** It makes sound economic and public health sense to identify and protect recharge areas and recharge processes. As it is hard to improve natural processes of groundwater recharge and water quality, maintaining the

integrity of land-aquifer processes, where possible, will be a key concern in a crowded world.



At the regulation panel held during the *46th Annual Meeting of the Argentine Association of Political Economy* (National University of Mar del Plata, Argentina, 16 to 18 November 2011), Andrei Jouravlev, Economic Affairs Officer with the Natural Resources and Infrastructure Division, presented the results of recent division work on the efficient horizontal industrial structure of the drinking water supply and sewerage sector (see Circular N° 34), along with preliminary results from a current study on *“The factors that shape industry structure”*, being conducted by Gonzalo Delacámara. A summary of early results follows.

It is essential to define what is understood by industrial or market structure for the drinking water supply and sewerage sector (the two tend to be used as synonyms), particularly since in the literature these refer to at least two different meanings:

- One use refers to the level of service aggregation in space (fragmented systems at the municipal scale, inter-municipal systems, regional structures, national companies, etc.).
- The other use refers to legal responsibility for service management (direct and delegated public management, direct and delegated private management), with close ties to financial models for these services. From this perspective, the literature typically refers to the British, French and German models. These three models reflect complete privatization, privatization through delegated management, and partial privatization. In addition, these three models shape specific competitive schemes: competition through comparison (*“benchmarking”*), competition for the right to temporary operation; and competition in goods and services markets.

Four basic factors explain the evolution of the industrial structure of the sector in Western Europe: how these services have evolved; the development of environmental legislation and resource management policies; the emergence of new actors (greater concern for public health and the environment); and other considerations, such as geography, hydrology and some restrictions on local development (which define quantitative and qualitative availability, determine the spatial dimension and the technical complexity of infrastructure). In Latin America, these factors (as the development of environmental

legislation) have had a more limited impact to date, but this may change in the near future.

Combining both meanings, Western Europe shows some tendency to increase private participation in management (reinforced by public utility service cuts), regionalization processes (aggregating municipalities and increasing the scale of service provision) and the design of new regulatory systems. This trend is not as apparent in Latin America, where most countries have chosen fragmented models, typically justified as part of broader administrative and political decentralization.

It is interesting to note that the world economic crisis has been driving this regionalization trend: budget cuts to meet challenging public deficit reduction targets. Italy and Spain, for example, have already brought into public debate the question not of eliminating, but rather of aggregating municipalities. This agenda directly affects drinking water supply and sanitation services (which in both countries were already provided in some cases by associations of municipalities). Based on efforts to reduce public expenditure, conditions are emerging to capitalize on economies of scale. This was not an explicit objective but could emerge from this process.

There has been some evolution away from an extensive model of service provision (inter-basin transfers, dams and other massive works) toward an intensive model that emphasizes pollution control and wastewater treatment. Some factors favouring this transition include: the cost of the extensive model, the social response to building major works, local environmental degradation of raw water sources, and rising demand for water in urban areas. This transition, however, is not clear, given the mismatch with economic development agendas.

In the case of Western Europe, trends in water policy have had important consequences on three levels: accelerating

In both cases, this led to increased privatization. The higher complexity in water and sanitation (essentially treatment) systems turned out to be unmanageable (hard to finance and incomprehensible) for many municipalities. Private sector involvement is much lower in Germany and the Netherlands, where environmental legislation was better and infrastructure more developed. Notwithstanding, the increase in private sector involvement has led to mixed capital companies in Germany. In the Netherlands, this resulted in the growing dependence on external funding, but privatization of water services is expressly prohibited.

From the perspective of the sector's spatial organization, however, European legislation has been a factor that has driven a shift in the scale of services. In Italy, for example, national (the Galli law) rather than EU legislation fostered concentration. In the cases of Germany and France, no tendency toward agglomeration has appeared. In the Netherlands, the EU guidelines, however, seem to be driving a steady increase in scale, which is more evident in England and Wales.



The purpose of the *Regional Forum on Biofuels* (San Salvador, El Salvador, 30 November to 1 December 2011), organized by the Natural Resources and Infrastructure Division together with the Natural Resource and Energy Unit of ECLAC's Subregional Headquarters in Mexico, was to present results of the project "Strengthening National Capacities to Design and Implement Sustainable Energy Policies for the Production and Use of Biofuels in Latin America and the Caribbean", and proposals for creating close cooperation to harmonize and promote sustainable biofuel policies. During this event, a study on the implications of biofuel development for water management and use was presented (see "Publications").

Caribbean contributed by the Natural Resources and Infrastructure Division and is now available at <http://www.unesco.org>. While providing a comprehensive assessment of the world's water resources the report also introduces a strong thematic element. Building on the WWDR3 in the recognition of the externalities, the WWDR4 elaborates on the interactions between water and the drivers of change. The WWDR4 describes the major changes, uncertainties, and risks taking place in the world and their links to water resources. It gives account of the status and the trends related to water supplies, uses, management, institutions and financing, highlights regional hotspots, and addresses issues such as gender equality, water-related disasters, health and the role of ecosystems.

- The *WaterLex "Human Right to Water and Sanitation" Online Legal Database* is a worldwide multi-stakeholder initiative pursuing the objective to gather all laws and policies at international and national level which are aligned and contribute to the realization of the human right to water and sanitation (<http://www.waterlex.org>). The database provides also links to all original sources and case law references.
- Under the new water resource law (see Circular N° 30), Peru has created *water resource councils for the Chira-Piura, Chancay-Lambayeque, Quica-Chili and Chancay-Huavel river basins* (<http://gsagua.com>), as ongoing bodies belonging to the national water authority (Autoridad Nacional del Agua, ANA), which prepare and implement river basin management plans to make water use more sustainable through improved coordination and consensus-building.
- The *Key Water Indicator Portal* (KWIP) provides access to: official UN-Water indicators, world rankings for any of these indicators, maps and graphs based on them, up-to-date data, additional

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