

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



\*448000001\*

Network for Cooperation in Integrated Water  
Resource Management..., N° 4 January 1997

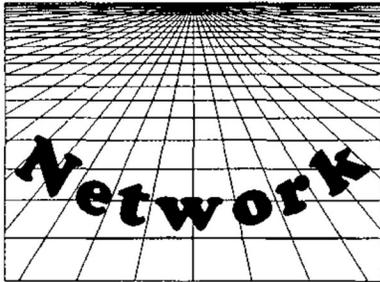
Latin America and the Caribbean (ECLAC)

N° 4 January 1997

## CIRCULAR N° 4

*Santiago, Chile*

The fourth issue of this circular represents a milestone for the Network, since it fulfills our objective of publishing the circular at least twice a year. In this issue, we will continue our discussion on the role of the private sector in the provision of public water-related services.



In the last circular, we analyzed the various alternatives for private-sector participation in water utilities. We now turn our attention to a discussion of some of the alternatives for, and features of, the regulation of private-sector participation in the sector. In this issue, we will look at general aspects of the regulation of natural monopolies and of conduct regulation. In the next issue, we will take a more in-depth look at structure regulation. In later issues, we hope to further the discussion by evaluating the experiences of the countries of the region with private-sector participation in the water industry.

Over the next two years, ECLAC will concentrate its efforts in two fundamental areas: integrated river basin management and the use of prices in water resources management. Planned activities include a regional meeting to discuss experiences and issues relating to river basin management, as well as studies on the countries' experiences in these two areas. It is our hope that both topics are of interest to you. As always, activities will be subject to the budgetary restrictions currently facing the United

Nations, as well as the level of cooperation extended by the countries of the region themselves.

The newly-formed Environment and Development Division is currently preparing a report on the implementation of Agenda 21 in the countries of the region. Water, the number one environmental issue facing the region, is high on the agenda of items to be discussed. Other topics to be dealt with include: intensive development of natural resource uses, their characteristics, prospects and implications for environmental policy; the new legal and institutional context, including recent international environmental agreements and changes in the role of the State; consumption patterns and the environment; international trade and the environment, including such issues as trade agreements and harmonization of environmental standards; policies to promote sustainable human settlements; land use and the environment, including issues related to agricultural development; mountains: a fragile ecosystem; and environmentally sound policies for solid waste management. The report will take an economic approach to the subject and will analyze environmental policy issues in terms of costs and benefits and their impact on competitiveness. The use of economic instruments in environmental management will form an integral part of the report, which is due to be published in the first half of 1997.

We would once again like to express our hope that this circular will serve as more than just a vehicle for disseminating the opinions of ECLAC. We again invite organizations in the region to submit material on activities, whether already held or planned for the future, programmes of work, courses, seminars, publications, as well as any other comments or concerns related to the aim of the Network, which is to promote cooperation among the institutions of the countries of the region in integrated water resources management.

2 9010 1997



The Pan American Information Network on Environmental Health (REPDISCA) recently joined our Network and is offering members its cooperation with respect to their documentation needs.

REPDISCA was established in 1982 with the aim of disseminating available information on issues related to environmental health and sanitary engineering. In order to achieve this objective, REPDISCA selects and analyzes bibliographical material, with a special focus on documents produced in Latin America

### CONTENTS

- **From the Editor.**
- **Welcome!** - We extend a warm welcome to the Pan American Information Network on Environmental Health (REPDISCA), which recently joined the Network.
- **Open discussion:** regulating private participation in water utilities.
- **Meetings.**
  - Meeting on the implementation of Agenda 21.
  - GEMS Water workshop.
- **Network News.**
  - ECLAC on the WWW.
  - Request for information.
  - GWW - Ground Water Software for Windows.
- **Recent ECLAC publications** related to integrated water resources management.

and the Caribbean. It lists research projects, technical reports, theses, conference papers, technical standards, videos, software, teaching materials, etc., which are generally edited and distributed on a limited basis and are therefore difficult to obtain.

In order to access the REPIDISCA data bank via the Internet, perform the following steps:

- Send a message to [listserv@cepis.org.pe](mailto:listserv@cepis.org.pe) with the word INDEX, leaving "Subject" and the rest of the message blank.
- You will receive a message with the contents of the INDEX file, which includes an index with the name, description and size of each of the files available from the CEPIS server.
- Send another message to [listserv@cepis.org.pe](mailto:listserv@cepis.org.pe); in the message box, type GET and the name of the file you want, leaving "Subject" and the rest of the message blank. If you wish to select several files, repeat GET on the next line.
- You will then be sent copies of the requested files.

REPIDISCA is a decentralized system operating in Latin America and the Caribbean through organizations which serve in each country as National Coordinating Centers. These organizations share responsibility with the REPIDISCA Cooperating Centers for its development in their countries. There are 352 of these REPIDISCA Cooperating Centers in 23 countries of the region. The Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS) undertakes the task of coordination at the regional level and consolidates the information in databases. The participation of REPIDISCA in the "Network of Networks" facilitates access to the documentation of 19 information networks operating throughout the region. In addition, REPIDISCA is in contact with other world information systems in the same field.

The following are some of the databases maintained by REPIDISCA:

- **Bibliographic database:** compiles the references with abstracts of the documents recorded by the cooperating centers. In 1995, the database contained approximately 95,000 references.
- **Directory database:** stores information about organizations, including their address, telephone and fax numbers, electronic mailing address and the names of their directors.
- **Union Serial Catalogue Database:** records the REPIDISCA cooperating centers' collections of journals along with information on each title.
- **Thesaurus database:** features the terminology on environmental health used in the technical literature (in Spanish,

Portuguese, English, German and French).

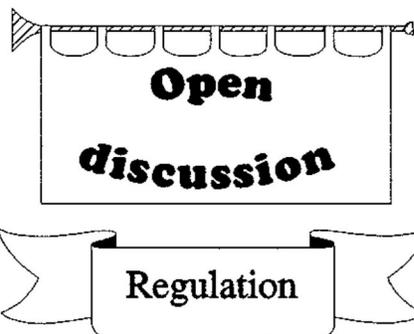
- **IRPTC database:** is the International Register of Potentially Toxic Chemicals, kindly provided by the United Nations Environment Programme.

It is possible to search the different databases on sanitary and environmental engineering via e-mail.

REPIDISCA offers a variety of other services, some of which are provided free of charge and some not. For example, in order to keep users abreast of the latest developments in their respective fields of interest and informed about the latest documents recorded in the database, REPIDISCA has developed the Selected Information Dissemination Service, available via Internet. This "information alert" service is based on user profiles and is tailored to meet the specific needs of individual subscribers. In addition, CEPIS is on the Internet and has developed a Listserver which not only makes it possible to perform searches in REPIDISCA databases via e-mail, but also provides access to the complete text of a number of publications.

For additional information, please contact the following address:

The Pan American Information Network on Environmental Health (REPIDISCA)  
 The Pan American Center for Sanitary Engineering and Environmental Sciences (CEPIS)  
 Los Pinos 259 - Urb. Camacho - Lima 12 - Peru  
 P.O. Box 4337 - Lima 100 - Peru  
 Internet: [cepis@cepis.org.pe](mailto:cepis@cepis.org.pe)  
 Tel: (511) 437-10-77 Fax: (511) 437-82-89



The clear trend towards the privatization of water-related services which is to be observed in most countries of Latin America and the Caribbean has prompted the Environment and Development Division to begin a long-term study on private-sector participation in water utilities (see Circular N° 3).

Last year, we published the first report on the topic, entitled "Private participation in the provision of water services. Volume I.

*Alternative means for private participation in the provision of water services" (LC/R.1576), which analyzes the various alternatives for private-sector involvement in water utilities.*

It is no easy matter to regulate private monopolies; moreover, Governments in the region have little experience in this field, since most water utilities used to be state-owned and there was thus no need for the Government to regulate them. Success stories are even more difficult to come by, as is evidenced by the fact that many of the enterprises currently undergoing privatization were owned by private investors before being nationalized in the 1950s and 1960s. This seems to suggest that the regulatory capacity then in place was not entirely adequate. It is thus valid to ask how we should go about increasing private-sector involvement in the water sector (and reaping the attendant benefits), bearing in mind the limitations of the State's regulatory capacity in Latin America. In view of those considerations and the nature of the public debate in the countries of the region regarding private participation in the water sector, we have prepared a second report, entitled "Regulation of the private provision of public water-related services" (LC/R.1635).

Both economic theory and empirical studies suggest that the benefits of privatization are usually very significant both in theory and in practice, in industries where there is - or it is possible to create - effective competition. The reason for this is that in competitive markets, competition provides a system of powerful incentives that oblige private firms to behave in a way conducive both to internal and allocative efficiency, reconciling the interests of business with those of society in general.

Why then is regulation necessary? Markets should be competitive, transparent and of easy access to take maximum advantage of the possibilities for efficient resource allocation which they offer. The main problem is that some water-related services have special characteristics that give rise to market imperfections or failures which may in turn generate inefficiencies in the allocation of economic resources.

The most common type of situation involves major economies of scale (the larger the firm, the lower the unit costs) over the entire range of production relevant to the market in question, such as the provision of drinking water and sewerage services using conventional technology. Another quite common situation concerns economies of scope or integration (unit costs are lower if services are provided in combination rather than separately), as may be the case with

multi-purpose water engineering projects. In situations such as these, economic activities tend to take on the characteristics of natural monopolies - since it is uneconomical for there to be two or more local networks for the provision of drinking water and sewage disposal services - in which a single provider dominates the market.

Market forces are not able to allocate resources efficiently in monopoly situations. There are two main problems. First, monopolistic firms can arbitrarily raise prices and reduce the quality of goods and services because they do not have to compete with other providers and their customers are not in a position to go elsewhere. The more inelastic demand is - as it is in the case of the overwhelming majority of water-related products and services - the more serious this problem will be. Furthermore, as competitive pressures are weak or non-existent, there is little incentive for business efficiency and innovation. As Adam Smith said in 1776, "*Monopoly ... is a great enemy to good management, which can never be universally established but in consequence of the free and universal competition which forces every body to leave recourse to it for the sake of self-defence*".

Thus, where a monopoly exists, the need arises for the State to adopt a regulatory policy that influences the behaviour of private monopolies by setting up a suitable system of incentives to guide monopolies' economic decisions in accordance with the broader interests of society as a whole. Such a system should be capable of, on the one hand, preventing monopolistic firms from exploiting consumers by charging excessive prices or reducing quality and, on the other - and this is often overlooked - providing them with incentives for improving their efficiency and introducing innovations.

Since, as the theoretical literature suggests and empirical studies confirm, regulation in the real world is as yet an imperfect mechanism which uses up scarce resources, any study into whether it is appropriate to introduce regulation must necessarily take into account both the potential benefits to be derived from averting likely monopolistic abuses and the costs occasioned by imperfect regulation. These costs include both the direct costs of regulation, which reflect the opportunity cost of the economic resources used in the regulatory process, and the indirect ones, which tend to be greater and stem from the inefficiencies in resource allocation caused by imperfect regulation. In other words, an appropriate regulatory framework should maximize the benefits of regulation relative to the costs it imposes on

society. As with any other form of State intervention, regulation will be appropriate only when its costs, both direct and indirect, are lower than those of the market failures it seeks to correct.

There are two modes of regulation of natural monopolies: *structure regulation*, which determines which organizations or types of organizations can engage in what types of activities; and *conduct or behavioral regulation*, which concerns the permitted patterns of behaviour of firms in a given industry. The main aspects of conduct regulation are discussed below, while the issue of structure regulation will be addressed in Circular Nº 5.

### CONDUCT REGULATION

Even though, as a general rule, the most appropriate policy for promoting efficiency calls for structural reforms designed to encourage competition, the characteristics of many water uses especially in relatively small, developing countries, are such that the potential for this kind of restructuring is quite limited. Conduct regulation is the most useful tool in such situations.

Conduct regulation is concerned with different aspects of the behaviour of regulated firms, such as their pricing policies, the quality of the products and services they offer, investments, etc. The aim of conduct regulation is to reproduce, in a monopoly industry, the same kind of outcome as would be found in a competitive situation and to create the same type of incentives as competitors would have generated in a competitive market. Conduct regulation has traditionally focused on activities such as monitoring, control and auditing. It bears a close resemblance to the relationship which exists between a government-owned monopoly and the ministry which oversees it. The more modern approach to conduct regulation emphasizes economic incentives that compel regulated firms to operate efficiently.

#### *Asymmetric information*

Conduct regulation in the real world is extremely difficult, in the first place due to the asymmetry of information that always exists between the regulatory agency and the company it regulates. Owing to their proximity to clients and the production process and to their greater human, financial and other resources, regulated firms invariably have better information than the regulator about demand conditions and consumption patterns, current costs and their structure, the scope for reducing costs, and other factors. The regulator normally obtains

most of this information from the firms it regulates. In addition, the regulator is not able to observe the regulated firm's level of cost-reducing effort and is thus not in a position to determine whether its expenses are justified. The problem is particularly acute because firms have strong incentives to distort and manipulate the information they provide to the regulator to their own strategic advantage, while the regulator does not always have at its disposal independent sources to verify this information.

Imperfect information makes it difficult to regulate natural monopolies and among other things, requires the designers of regulatory frameworks to:

- ensure that incentives work both in the interest of the regulator and the regulatee by in some way seeing to it that the firm share in the benefits derived from regulation; and
- take into account the need for the regulator to have greater access to information.

The most common methods used to reduce informational asymmetries are:

- Direct market competition or *ex post* competition: in industries such as electricity generation, where structural reforms can create the necessary conditions for effective competition, direct competition is the most effective instrument for reducing informational asymmetries. In competitive markets, competition operates as a disclosure mechanism for the information gathered by firms operating in the industry.
- Competition for the market (*ex ante*) or franchising: competition among firms for the right to be a monopoly service-provider reduces informational asymmetries because the terms of the contract are determined by means of competition rather than administrative procedures.
- Competition based on threat of entry: the theory of contestable markets suggests that the entry and progress of new rivals in a market, or at least the threat thereof, can help to overcome the informational advantages enjoyed by a monopoly and impose the discipline of competition upon it.
- Benchmark or yardstick competition: where several firms operate under similar conditions and the same regulatory framework (and here it is important to remember that most water utilities in the region have already been decentralized), perhaps the best solution for the problem of the asymmetry of information lies in making each firm's reward contingent on

both its own performance and that of other firms. Provided there is no collusion, it will be much more difficult for each firm to distort and manipulate the information it provides to the regulator; in many instances, distorting information will be of benefit only to a firm's competitors, but not to the firm itself.

- Regulators can lessen the problem posed by asymmetrical information by improving their access to a firm's internal information; for example, they can undertake audits of operating costs, capital employed, etc.
- Finally, it is important for regulators to use all sources of information that are exogenous to the relevant companies, including general cost trends and information on economic efficiency in general, independent experts' appraisals, international comparisons, etc.

The slower the rate of change in technological and market conditions, the more likely it is that the regulator can obtain more and better information and the less likely it is that there will be a new entrant. A rapid pace of change causes the regulator's information to become obsolete very quickly, which hampers conduct regulation. On the other hand, rapid change makes the prospect of entry attractive to competitors, and this makes structure regulation the more appropriate mechanism.

Another important factor is the nature of the component(s) of the water-related infrastructure that define a firm as a natural monopoly. Where these facilities are local in nature - as is the case, for example, in drinking water and sewerage systems in almost all but the smallest countries - the regulator has at its disposal multiple sources of information, and this makes it possible to implement a more efficient regulatory framework. Conversely, if the facility is national in nature, i.e., there is only one firm and it cannot be split up due to the type of technology being employed, then conduct regulation will prove more difficult.

#### *Price regulation*

Perhaps the most visible form of conduct regulation is price regulation. There are many price regulation mechanisms, but all fall somewhere along a continuum between the extremes of cost-of-service or "rate-of-return" regulation and "price-cap" regulation.

Rate-of-return regulation, which is very common in the United States, has been criticized on the grounds that it does not provide incentives to minimize costs,

discourages the adoption of new technologies, and encourages the regulated firm to engage in excessive capital expansion and inefficient diversification. On the other hand, rate-of-return regulation provides investors with a solid guarantee of a fair rate of return on invested capital and is thus likely to have a downward impact on the cost of capital for the regulated industry. It also creates a type of long-run commitment, without which it would be very difficult to attract private capital, and performs well in the presence of extreme uncertainty, a factor of major importance in countries with a long history of macroeconomic instability. Finally, it protects society from opportunistic behaviour by the regulated firm and from the effects of shortcomings or inexperience on the part of regulators, another significant factor in countries that have little experience with the regulation of natural monopolies.

The alternative approach to regulation, developed in the United Kingdom, is price-cap regulation, which represents an attempt to correct the problems associated with rate-of-return regulation and ensure more precise targeting of State intervention. A major advantage of this approach is that it provides strong incentives to reduce costs and use advanced technology, which is a particularly important consideration immediately after privatization. Moreover, price-cap regulation encourages a regulated company to diversify only when it is efficient to do so. Perhaps the most serious drawbacks of this option have to do with the establishment of price adjustment factors and the uncertainty surrounding the process, which can translate into greater capital costs and discourage investment; above all, however, there is the fact that under this mechanism, a firm's profits can diverge considerably from normal or reasonable levels.

Although, in their "pure" forms these two mechanisms may appear very different, their characteristics in terms of incentives to reduce costs and invest efficiently are very similar in the real world, where either mechanism usually includes aspects of the other, with the result that their strong points and weaknesses tend to be very similar. For instance, regulatory lags and automatic price adjustments reinforce the incentives under rate-of-return regulation and cause it to more closely resemble price-cap regulation, while the need to guarantee private investors a reasonable rate of return on their capital brings price-cap regulation closer to rate-of-return regulation and introduces the same flaws. What matters is not what the system is called, but rather such factors as the length of the regulatory lag and the

expectations that the system generates among investors as to how and on what basis prices are to be readjusted.

The tariff-setting process currently used in Chile for drinking water supply and sewerage services is a good example. The process incorporates aspects of at least three different approaches.

First, rates are determined on the basis of a simulation of a "model firm", which is defined as a firm whose aim is to provide sanitation services efficiently, within the prevailing regulatory framework, taking into account the geographical, demographic and technological constraints under which the firm must operate. This represents a form of benchmark competition since the costs considered in the pricing process are those which the model firm would incur rather than those of its real-world counterpart, and this, at least in theory, prevents the institutionalization of inefficiencies and encourages regulated firms to improve productivity. The drawback of this approach arises out of the basic problem of asymmetric information: if the regulatory agency uses the actual costs of the real-world firm, it validates any of the firm's possible inefficiencies and gives it an incentive to manipulate the information it provides to the regulator. Accordingly, the regulator will be obliged to use other sources of information which are not perfect either.

Second, maximum rates are fixed for a period of five years. In order to make this relatively long regulatory lag feasible, rates are indexed in order to maintain their real value over time. These characteristics introduce some features of price-cap regulation into the set-up, since regulated firms stand to benefit from any cost-cutting they implement before the next periodic review. The system thus provides strong incentives to reduce costs. Periodic reviews make it possible to incorporate any improvements in efficiency that the relevant firms achieve during this period and to gradually pass them on to consumers.

Third, since rates should be such as to allow the firms to make a reasonable profit, they are calculated in such a way as to generate a return on assets of no less than 7 per cent. Moreover, if before the next periodic review, it is shown that the basic assumptions used for pricing have changed significantly, then the rate-setting formulae may be modified by mutual consent of the regulator and the firm in question. All of this means that certain features of rate-of-return regulation are also incorporated into the scheme.

It should be pointed out that in some cases, particularly where competition is possible but takes time to develop, the explicit regulation of prices or other aspects of behaviour may not be necessary, with the State being able to achieve the same objective merely by threatening to intervene; this is known as "potential regulation" or "regulation by threat". Under this system, there is no explicit price control, but the State monitors the behaviour of firms and there is a credible threat of regulatory intervention in respect of some types of behaviour if prices rise above what is considered to be reasonable, if quality is compromised or if customers are not reasonably satisfied with the quality and prices of the goods and services they receive.

### Quality regulation

Whereas in a competitive market, a drop in quality normally entails lower prices and reduced profits for the relevant firm, which works to the direct benefit of its competitors, in markets where competition is lacking, a firm can lower the quality of the services it provides without suffering a decline in its earning. In addition, markets for water-related services are typically characterized by informational asymmetries between suppliers and consumers, since consumers are unable to detect or accurately assess some aspects of quality, such as certain types of water pollution, changes in water pressure and voltage, etc. This asymmetry of information gives suppliers an incentive to reduce quality arbitrarily and may forestall the emergency of mutually advantageous trades involving high-quality products and services. The most common methods of quality regulation used in the water sector are:

- The publication and dissemination of information on service quality is a simple and inexpensive way to put public pressure on any company providing substandard service and may also encourage new competitors to enter the market. It provides few incentives to improve quality, however.
- Liability-based schemes provide strong incentives for high-quality performance. They provide for compensation to customers who have been harmed as a result of poor service and are very flexible because they offer the regulated firm a wide range of options. However, such schemes are more suited to bulk consumers because they are costly and difficult to implement. In the case of the average consumer - for whom quality is usually a more important consideration - compensatory schemes are

often more appropriate; such an approach is particularly suitable when quality-related problems are readily observable, as for example in the case of outages or cut-offs.

- Minimum quality standards are more appropriate in situations where there are informational asymmetries and where small changes in quality can do considerable harm. In order to be effective, they should be backed up by fines or other sanctions. Their main drawback is that they provide no incentive whatsoever to improve quality beyond the minimum level established by the regulations in place.
- In theory, the most effective approach would be to incorporate quality standards in a system of price regulation. The advantages of this approach lie in its ability to mimic the results of a competitive market, its flexibility and the dynamic incentives it provides to raise quality to optimum levels. However, many practical details of this mechanism are difficult to resolve. In any case, the pricing process should take into account the quality-related aspects of the regulated products and services, and the regulator should therefore monitor the relevant firm to ensure that it meets the quality standards specified in the tariffs.

### Regulating investment

Another major problem concerns the difficulty of executing long-term regulatory contracts (and legally guaranteeing their enforcement) that are both comprehensive and will instil confidence in investors as well as the associated potential for *ex post* opportunism. In the case of the water sector, it would be impossible to foresee all the possible contingencies at the time the regulatory framework is established. Moreover, regulation has a political dimension. In many countries of the region, regulators have enjoyed little autonomy from the authorities and have been subject to influence and pressure from political circles, as well as other special interest groups; this has prevented regulatory agencies from doing their job properly and has made them vulnerable to political pressure.

The economic life of many of the components of water-related infrastructure is extremely long; furthermore, these structures cannot be relocated to other areas, nor do they have alternative uses; for all these reasons, the profitability of an investment depends not so much on the initial regulatory framework, as it does on the decisions the regulator takes along the way, after the investment (or privatization) has been carried out. This is what creates an

incentive for opportunistic behaviour on the part of the regulator.

The regulator can arbitrarily reduce the earnings of a firm by refusing to honour its commitment to ensure a reasonable return on invested capital, whereas the firm will be obliged to continue operating because the nature of the investment is such that it can neither transfer its facilities elsewhere nor put them to an alternative use. Over the lengthy period of time that water infrastructure does not require replacement, a country will have a succession of administrations with different views and priorities; accordingly changes may be made in the terms and conditions established in the original regulatory framework with regard to pricing, quality of service, taxes, general environmental guidelines, etc. With each change in the regulatory framework, the cost of supplying water-related services and products also changes.

The lack of a long-term commitment constitutes a major obstacle to investment and, hence, innovation; it raises the cost of capital, promotes rent-seeking, and may produce distortions in the pattern of investment. These considerations underline the importance of ensuring transparent and stable regulatory standards which will uphold the State's commitment to recognize the need for a long-term level of profitability acceptable to the private investor. In addition, the regulatory framework should be flexible enough to adapt to changes in markets, as well as in the economic, institutional, social and technological spheres.

Terence R. Lee and Andrei S. Jouraviev

## Meetings



### Agenda 21

As part of the follow-up activities to the recommendations contained in the Dublin Statement and in Agenda 21 adopted at the United Nations Conference on Environment and Development, a meeting of a group of experts on the implementation of the recommendations made in chapter 18 of Agenda 21 with respect to integrated water resources management in Latin America and the Caribbean was held in Santiago, Chile, from 12 to 14 December 1995. This meeting

was attended by experts from Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Guatemala, Jamaica, Mexico, Peru, Saint Lucia and Venezuela.

At the meeting, a background paper was presented entitled "*Progress achieved by the Latin American and Caribbean countries in the implementation of the recommendations made in chapter 18 of Agenda 21 on integrated water resources management*" (LC/G.1917). At the plenary meetings, the experts presented reports on the experiences of their own countries and on actions carried out by Governments on matters related to the agreements set forth in chapter 18. The participants agreed on the need for water management at all levels, bearing in mind that water was no longer an unlimited resource - in terms of either time or space - but had instead become a resource with an economic value.

It was stressed that all countries in the Latin American and Caribbean region should incorporate environmental considerations into their national policies. Emphasis was also placed on the progress made by the countries of the region towards implementing the recommendations made in chapter 18 concerning the expansion of the coverage of drinking water and environmental health services; improvement of the efficiency of irrigation systems; inclusion of the community in actions and decision-making regarding water resources management; progress in developing water resources management systems at the river basin level; progress in quality control of both surface and ground waters and, in general, monitoring of the water cycle and applied research on water resources.

During the discussion on progress achieved by the countries of the region in pursuance of the recommendations made in chapter 18, it was pointed out that many of the problems faced by different countries were due to shortcomings in the mechanisms for financing water resources management systems. Reference was made to the need to ensure that commercial water services were self-supporting.

The experts proposed that any reforms that might be made in water resources management systems, together with the corresponding changes in legislation, should be conceptually based on the main principles of chapter 18 and geared towards:

- (i) meeting the most crucial social needs;
- (ii) respecting the culture, habits and customs of the relevant service area;
- (iii) guaranteeing, based on clear and stable ground rules, that water use rights are

effective use; (iv) promoting decentralization and administrative efficiency and ensuring that sectoral activities are self-supporting; (v) promoting integrated water resources management at the river basin level with emphasis on preventing pollution; and (vi) ensuring that water resources management policies view water as a vital and irreplaceable resource and as an "economic good".

The experts made the following recommendations with regard to programme areas covered in chapter 18:

#### ***Integrated water resources development and management***

- An integrated water resources management system should be created which is coordinated at the national level.
- Each water-use sector should be required to meet its obligations in full, in particular with regard to the following: to coordinate its activities with those of the national water authorities and with other sectors; to meet demands, in terms of time, form and quality; to plan the improvement and expansion of the services required to meet reasonable goals; to become self-supporting through the adoption of suitable pricing systems; and to generate resources in order to remedy or mitigate the different types of environmental impacts produced by the sector.
- Effective mechanisms should be established for institutional coordination among the main actors involved in the relevant river basin or water system.

#### ***Water resources assessment***

- The importance of specific data on the quantity and availability of water should be recognized as a basis for all management systems.
- Consideration should be given to the possibility of requiring all users to supply relevant information to the public agency responsible for water resources assessment.
- Governments should consider the possibility of financing, at least partially, through a mechanism of water use permits the cost of constructing and maintaining water resources assessment systems.

#### ***Protection of water resources, water quality and aquatic ecosystems***

- Governments should reinforce their activities aimed at controlling water pollution taking into consideration desired quality standards and with a view to

#### ***Drinking water supply and sanitation***

- In order to achieve the levels of coverage envisaged in chapter 18, drinking water systems and sanitation services must be economically and financially viable. It was stressed that the rate-setting process must ensure that utility companies are able to operate efficiently.
- Consideration should be given to the possibility of private-sector participation in the provision of services. The involvement of the private-sector does not relieve the State of its responsibility to supply such services, but rather changes the nature of its responsibilities in this regard.

Further information regarding the meeting is provided in the "*Report of the meeting of the group of experts on the implementation of Agenda 21 with respect to integrated water resources management in Latin America and the Caribbean (Santiago, Chile, 12-14 December 1995)*" (LC/G.1927(SEM.85/3)).

- It is important to strengthen the regulatory role of the State by creating clearly delineated, efficient regulatory agencies to guarantee the existence of the conditions necessary to ensure competitiveness, effectiveness and equity in the operations of the organizations subject to regulation.

#### ***Water and sustainable urban development***

- Many of the problems currently facing the Latin American and Caribbean countries in water resources management in urban areas are due, to a large extent, to the fact that the process is still geared towards certain uses rather than being governed by institutions specifically designed for water management purposes. This highlights the importance of pursuing water resources management at the river basin level.

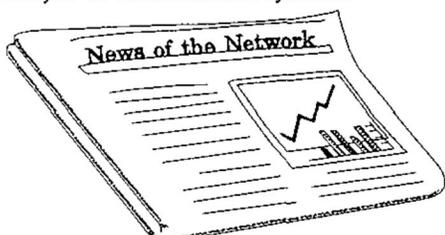
#### ***Water for sustainable food production and rural development***

- For food production to be sustainable over time, irrigation and drainage systems must be economically and financially viable. The social role performed by many of these projects at the present time was also recognized, however.
- Although irrigation farming is still subsidized in many countries, it is important to consider the opportunity cost of the funds used for such subsidies. The

actual demand for subsidized products must also be taken into account. Although as a general rule, new subsidies should not be granted, the continuation of existing subsidies may be justified, provided that they are viewed as a temporary social policy measure.

## GEMS Water

A regional workshop was held by the GEMS (Global Environment Monitoring System) Water project for Latin America and the Caribbean in Santiago, Chile, on 15 December 1995. The meeting was attended by specialists from Brazil, Canada, Chile, Cuba, Guatemala, Mexico and Peru. The discussion dealt with the problems encountered in implementing the GEMS Water project in the region, national organizations' needs as they relate to the project, project implementation at the national level, the need for coordination at the regional level, and proposals for actions to ensure project effectiveness in the region. Participants analyzed environmental priorities in the region, with special emphasis on water quality and information systems. A presentation was also given on the RAISON (Regional Analysis by Intelligent Systems on a Microcomputer) programme, which has been developed in Canada for use in the analysis of environmental systems.



## ECLAC on the WWW

In early 1996, the Economic Commission for Latin America and the Caribbean (ECLAC) made its debut on the World Wide Web (WWW). The address is <http://www.eclac.cl>. Our page on the Web includes our main documents and publications as well as a range of additional information.

## Request for information

The Environment and Development Division is currently preparing a report on integrated water resources management policies at the river basin level in the countries of the region. The report will present a series of

case studies drawing on the experiences of the countries which have made the most progress in this area. The Division is therefore requesting members of the Network to please send any information on the experiences in their countries or any comments they may wish to make on the subject.

## GWW

The *Ground Water Software for Windows (GWW)* programme is now available. This programme was developed by the United Nations for use in analyzing problems related to ground water.

Requests for additional information about the programme and how to obtain it should be sent to the following address:

The Chief of the Natural Resources Environment Planning and Management Branch  
United Nations, New York, N.Y., 10017, USA

## Publications



Recent publications of the Environment and Development Division related to integrated water resources management:

- *"Conceptualización, modelaje y operacionalización del desarrollo sustentable: ¿Tarea factible?"* (LC/R.1620), 22 January 1996 (available in Spanish only). This study was prepared as a discussion paper for the Seminar-Workshop on Sustainable Development and Population, held in Santiago, Chile, from 5 to 7 December 1995. The study opens with an attempt to define scenarios and goals in keeping with the principle of sustainable development. This concept does not refer to a target to be achieved in a specific time period and place, but rather to the possibility of maintaining a balance associated with a given (yet constantly evolving and ever-changing) level of human development. Sustainable development is the end result of a series of decisions and processes implemented by generations of human beings for their own well-being under constantly changing living conditions. The study contributes new ideas to the discussion, such as: the

concept of the trilogy - economic growth, growth with social equity and environmental sustainability - which needs to be taken into account if sustainable development is to be attained; the inexorable globalization of economic, social and environmental processes; the notion of categories or scales in sustainable development; the sustainable development dynamics, taking into consideration one or more areas; and the variables underlying conflict management and potential dispute settlement procedures. The study also explains the fledgling efforts now being made to carry forward processes that will ensure sustainable development, both in theory and practice, as well as the serious constraints affecting such initiatives. It also discusses the as yet incipient efforts being made to measure social, environmental and economic variables using a common yardstick; the limits of neoclassical economics and its attempts to internalize effects perceived but not taken into consideration; the impact of globalization in social and environmental terms; and, above all, the urgent need to understand the working of the natural ecosystems now being used for export production.

- *"Regulation of the private provision of public water-related services"* (LC/R.1635), 8 April 1996 (a Spanish translation is being prepared). This paper is the second in a series of documents (see *"Open discussion"*) dealing with the topic of private participation in water utilities and focuses on how to regulate such participation. Economic theory and empirical studies concur that privatization entails very significant theoretical and practical benefits in industries where there is competition but that these benefits are less notable in sectors such as the water sector, whose industrial structure is such that effective competition does not or cannot exist. In these situations, the impact of privatization on social welfare will be closely linked to the public sector's ability to regulate private enterprise. Based on a survey of the vast array of theoretical literature on the topic, as well as of the experiences of countries that have successfully managed to give the private sector a role in the operation of water utilities, the report outlines the principles which need to be considered when formulating regulatory frameworks for companies in this sector. Using examples of regulatory systems currently in effect, the report takes an in-depth look at such issues as the different mechanisms for regulating prices, product and service quality, investment, quantity, etc.; methods for overcoming problems stemming from

informational asymmetry, including benchmark or yardstick competition, and how it ties in with mergers, conflicts that arise in situations where there are several regulators with differing or incompatible priorities, responsibilities and preferences, the impossibility of ensuring the existence of stable regulatory frameworks over the long run, the diversification of regulated firms into other activities - regulated or otherwise - and of unregulated firms into regulated activities, etc.; consumer involvement in the regulatory process; and the potential for promoting competition and enhancing regulation in the water sector by means of reforms affecting the industry's horizontal and vertical structures. In addition, the report considers the political economy aspects of regulatory processes, including the questions of rent-seeking and regulatory capture.

- "Report of the meeting of the group of experts on the implementation of Agenda 21 with respect to integrated water resources management in Latin America and the Caribbean (Santiago, Chile, 12-14 December 1995)" (LC/G.1927(SEM.85/3)), 22 July 1996 (see "Meetings").
- "Progress achieved by the Latin American and Caribbean countries in the implementation of the recommendations made in chapter 18 of Agenda 21 on integrated water resources management" (LC/G.1917), 19 June 1996. The report provides information about the progress achieved by the countries of the region in implementing the recommendations made in chapter 18 of Agenda 21 as part of their water policies. Most of this report is devoted to a group of case studies on six countries: Argentina, Brazil, Chile, Colombia, Mexico and Venezuela. A brief description is also given of the progress

made in five other countries - Costa Rica, Cuba, Guatemala, Peru and Saint Lucia - based on papers presented at the meeting (see "Meetings").

- "Progress in the privatization of water-related public services: a country-by-country review for Mexico, Central America and the Caribbean" (LC/R.1697), 30 December 1996. The report examines recent developments in private sector participation in the drinking water supply and sanitation, electricity, irrigation and drainage, and inland water transport sectors in Belize, Costa Rica, Cuba, Dominica, Dominican Republic, El Salvador, Guatemala, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Puerto Rico, and Trinidad and Tobago. The information given for each country includes statistical data on the sectors discussed. Private sector participation is still incipient in most countries and the greater part of the infrastructure is still managed by the public sector, but some examples can be found and there are ambitious plans. These examples are few in the provision of drinking water supply and sanitation services, where they are largely limited to Dominica, Mexico, Puerto Rico, and Trinidad and Tobago, while in other countries the main forms of private sector participation are small private companies and subcontracting. Reforms are much more advanced in the power sector, where many countries follow an evolutionary process of reform by gradually introducing competition in generation.
- "Progress in the privatization of water-related public services: a country-by-country review for South America" (LC/R.1697/Add.1), 2 January 1997. The report examines recent developments in private sector participation in the drinking water supply

and sanitation, electricity, irrigation and drainage, and inland water transport sectors in Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay, and Venezuela. The information given for each country includes statistical data on the sectors discussed. Private sector participation is still incipient in most countries and limited to subcontracting. The greater part of the infrastructure is still managed by the public sector. Examples of private management of infrastructure are few in the provision of drinking water supply and sanitation services, where they are largely limited to Argentina, which has transferred the responsibility for major drinking water supply and sanitation systems to private companies. Reforms are much more advanced in the power sector, particularly in Argentina, Bolivia, Chile, and Peru, where many countries have decided to break up the existing public monopolies into separate generating, transmission and distribution entities; to privatize them in whole or in part; and to use electricity pools and long-term contracts to introduce competition in electricity generation.

These publications, as well as previous issues of the Circular, may be requested from the ECLAC Environment and Development Division.

Unofficial versions of some publications may be obtained in electronic form, as a WordPerfect 5.1 for DOS file, through the following INTERNET addresses:

tleee@eclac.cl  
or  
ajouravlev@eclac.cl

UNITED NATIONS

NACIONES UNIDAS



NATIONS UNIES

Economic Commission for Latin America and the Caribbean  
Environment and Development Division  
Casilla 179-D  
Santiago  
Chile

PRINTED MATTER  
AIR MAIL