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

United Nations Economic Commission for Latin America and the Caribbean (ECLAC) N° 21 February 2005

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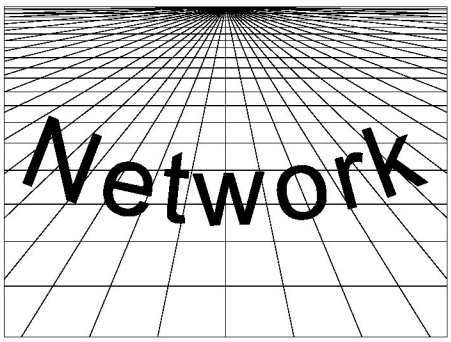
There are many decisions associated with water resources which can enhance or limit their contribution to national economic development. One type of decisions which has a significant potential for distorting water use, and in some cases can even compromise the stability of public finances, is the indiscriminate granting of state subsidies to promote water use without evaluating its impact on the economy or the sustainability of the resource.



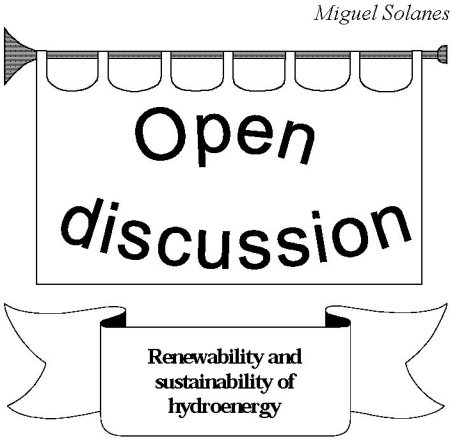
A typical case is agricultural subsidies applied to water used for irrigation. One example of misuse of this type of subsidies was the irrigation subsidies in Argentina. In this case, the subsidies, on the one hand, affected the sustainability of aquifers in places such as Mendoza, and on the other hand, helped to generate a level of agricultural production that exceeded the actual demand for irrigation products, thus resulting in subsidized products, which finally led, in association with other factors, to a serious crisis in public finances and to mass failures in the wine production sector.

Decisions that affect the productive integration of water resources also include those concerning public water-related projects, usually for irrigation, the benefits of which, due to evaluation problems, in many cases, have turned out to be less than the costs, resulting in net losses for the national economies. This problem is more serious when projects are financed in hard currency, while the return is generated in local currency. The net result is impoverishment.

In response to these problems, some countries, such as Chile, have implemented rules on the viability of projects that are publicly financed, so that financing is not allowed below a certain cost-benefit threshold. As for subsidies for private investment in irrigation and drainage works, again in Chile, they are assigned through public competitions and on the basis of objective criteria, in order to promote competition between applicants (see "**SAMTAC**"). Lastly, with regard to water as an agricultural input, its integration in the productive economy, in the case of Chile, has been strengthened by public policies that have considered not only the water use issues, but also the improvement of the quality of products, their timely presentation on external markets and the design of marketing systems appropriate for those purposes.

The conclusion is that the productive and sustainable integration of water requires adequate evaluation of the incentives and subsidies to the private sector, realistic assessments of public projects and due consideration of the national macroeconomic situation, and the integration of the water component in public services and in value added chains.

Miguel Solanes



Fernando Sánchez-Albavera, Director of the Natural Resources and Infrastructure Division, and Hugo Altomonte, Coordinator of the Natural Resources and Energy Unit, presented the document "***Renewable Energy Sources in Latin America and the Caribbean: Situation and Policy Proposals***" (LC/L.2132, 19 May 2004) at the International Conference for Renewable Energies (Bonn, Germany, 1-4 June 2004). This study is part of the effort that ECLAC has been making in the past few years to encourage and support the development of the long-term public policies that are needed for the development of renewable energy sources. At the same time it is responding to the mandates that arose from the World Summit on Sustainable Development (Johannesburg, 26 August-4 September, 2002) and the Latin American and Caribbean Initiative for Sustainable Development, through which a regional target was agreed of using renewable energies to meet at least 10% of total energy consumption by 2010.

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In this connection, the study shows that this objective has been achieved early, as 26% of the total energy supply in the region is currently from renewable sources. The referential framework of the study is designed

to use an integrated perspective; accordingly, the analysis takes into account the significant differences within the region in terms of: (i) the stock of natural resources, and energy supply and consumption structures; and (ii) the institutions and baseline conditions for encouraging policies to promote and ensure the use of renewable energies.

As a result, based on this integrated vision, the study presents four issues and initiatives with concrete proposals for Latin America and the Caribbean:

- a revaluation from an environmental and social perspective of hydropower according to the demands of sustainable development;
- the contribution of renewable sources to the integrated development of rural communities;
- the rational use of fuel wood; and
- the role of biomass and biofuels.

We present below the document's contribution in relation to the first of these issues.

Traditionally included among renewable sources, hydroenergy associated with medium-sized and large plants has recently received strong criticism, which has led to its virtual exclusion from the renewable energy context, not because hydroenergy is an inherently non-renewable resource, but because of its environmental and social impacts. Four arguments are used against hydroelectric plants with high capacity and large dams:

- emissions of greenhouse gases (including methane) on account of decomposition of flooded vegetation;
- displacement of populations on account of dam construction and the flooding of vast stretches of land;
- reduction of the speed of currents with associated changes in the biota which can promote the spread of pathogenic vectors; and
- changes in the transport of sediments which adversely affect coastal regions situated downstream of the dam.

At present, with an annual total output of 2.1 million GWh, hydroelectric plants contribute 20% of the global electrical energy supply and their use has displaced emissions from thermoelectric plants of at least one billion tons of carbon and more than 25 million tons of sulphur, which correspond to 15% and 25% respectively of the total of manmade emissions of those gases.

According to estimates from the Latin American Energy Organization (OLADE), the economically usable hydroelectric potential of Latin America and the Caribbean amounts to 504 GW, of which at present only 22% is used. Attention is drawn to the case of the Andean Community, as hydroelectricity accounts for almost 60% of the installed capacity for electricity generation, but these facilities represent less than 10% of the identified potential of 267 GW; and the case of Central America, whose utilized potential is less than 13% of a total of 28 GW. A contrasting situation is found in Brazil, where installed hydroenergy capacity is 155 GW (which represents 60% of its potential of 260 GW). This situation may be compared with the countries of Europe and North America, where over 45% of the hydroelectric potential has already been developed and is in use.

These figures highlight the fact that, notwithstanding the current importance of hydroenergy in the Andean Community, Central America and other subregions, there is still untapped potential which is surprisingly high owing to the particular conditions of topography and existing rainfall patterns. Failure to mainstream these issues within renewable energy sources could be a major damper on their rational development.

It is regrettable that many small and medium-sized hydroelectric plants have fallen into disuse over the last decades, for example in Andean countries, due to the installation of long-distance transmission lines and the expansion of electrical distribution using large centralized generating systems. The most recent changes introduced in the regulation of electricity markets, however, allow independent producers to gain access to the network and market their power surpluses, which could help to bring these plants back to life.

In view of the renewable nature of hydroelectric plants, perhaps it is not so essential to establish a cut-off point for their inclusion as "modern" renewable facilities (usually only small plants are accepted, with capacities that vary between 10 and 30 MW), and instead a minimum standard could be set for categorizing them as sustainable, based on social and environmental indicators.

It is clear that the utilization of hydroenergy through hydroelectric pass-through plants (non-reservoir plants) does not in general have associated environmental impacts. In the case of reservoir plants, they will naturally always cause some kind of impact, but it is simplistic and often mistaken to draw an immediate correlation between environmental problems and hydroelectricity. Some negative impacts from hydropower plants may have been observed, some of which have been irreversible, but they are not intrinsic to the technology. In many cases, the damage is not very extensive or can be mitigated, as evidenced by the thousands of units that have been operating for decades. In addition, attention is drawn to hydroelectric facilities that lend themselves to multiple water uses, which can offer significant advantages: apart from generating electricity, they contribute to *inter alia* fish production, water supply, irrigation, stream flow management (reduction of flooding and alleviation of drought), inland waterways, the promotion of tourism, and the use of local resources.

Perhaps in no other electricity generation technology are there such meaningful and tested opportunities for integration and synergy with non-energy purposes. In fact, many hydroelectric plants from all over the world and especially in Latin America have been a source of important and beneficial impacts in terms of promoting local development, improving agricultural productivity and helping the population to become firmly established in rural areas. The key point is to ensure that such projects adhere to principles of sustainability and make rational use of an available resource, which in the case of the Andean Community is in plentiful supply. Some guiding principles and issues are set forth for a proposed agreement.

Principles

From the perspective of national policy-makers, electrical companies and project developers, projects based on hydroelectricity are the ones that could make the most substantial contribution to the region's electric power supply. Therefore, the initiative for water, forestry and the community is being predicated on the following principles:

- **Hydroelectric projects have a clear and beneficial environmental synergy with forestry**. One of the most important lessons for hydropower plant developers and operators —particularly reservoir plants— is that forestry is indispensable for the existence of this kind of plant. Accordingly, any modern development of hydroelectric plants is already associated with forest management, which may represent a source of environmental synergy that facilitates efforts to reduce greenhouse gas emissions while capturing the carbon associated with these emissions.

- **Hydroelectric projects bolster electrical systems and offer clear operational synergy with wind power projects**. Because of the ease and rapidity with which their capacities can be changed, hydroelectric plants have a key role to play as voltage regulators and thus in ensuring the quality of electrical energy supplied by the underlying grid system. Moreover, the value of the energy produced by wind-power projects increases when they operate

in conjunction with hydroelectric projects, given that this approach can convert these facilities into projects with firm capacity and boost their profitability, with the result that fewer government subsidies are required. At least in Central America, where the wind is stronger when it does not rain and vice versa, the market value of a hydroelectric-wind combination is greater than the value of the sum of the two projects in isolation.

- **Marginal increases in the capacity of existing dams are a very economical way of reducing greenhouse gas emissions**. Building hydropower plants with small dams can mean reduced local environmental impacts, but also limits the profitability of the projects and at the same time limits the scope for reducing greenhouse gas emissions. Additionally, without increasing installed generating capacity, it is possible to achieve a greater production by building or expanding dams.

- **The electricity that comes from hydroelectric plants has low unit costs**. Although they are more expensive per unit of installed capacity, the unit cost of the energy produced by hydroelectric plants is low, due to the long service life of the projects.

- **The hydroelectric potential is well evaluated and many of the possible projects have already been identified and specified**. For many years, hydroelectric plants were the alternative preferred by national electrical companies and development banks as a way to boost electric power supply. For this reason, hydroelectric resources have been carefully considered and many potentially useful sites (at least those of a medium or large size) have been thoroughly evaluated and have even undergone preliminary specification for construction purposes.

- **Projects have to be developed hand in hand with the communities, not against them**. Some of the many benefits of hydroelectric projects should undoubtedly be bestowed upon the communities in question and compensate them for the negative effects which such activities unavoidably possess. The assessment of these costs and benefits needs to be viewed as the centrepiece of efforts to implement these projects and not as an afterthought.

- **There is technical capacity in the region to execute them**. Precisely because of the importance associated with hydroelectric projects in the region, there is a plentiful supply of the expertise and technical capacity required to design and build them, and this represents an opportunity for business development in the region.

These kinds of projects, however, have serious problems in terms of the public's perception of their environmental and social impacts, particularly in view of the methods used to execute those projects that have relied upon huge dams, given that this has involved the resettlement of communities, the destruction of forests and the flooding of extensive areas of farmland. At the same time, the amortization periods for these kinds of installations are excessively long in relation to the permitted maximum terms of the electricity purchasing contracts established in some of the local laws, which makes it difficult to gain bank approval and financing for them. A social reappraisal is therefore needed, and also an intense public relations effort, in order to do justice to hydroelectric projects.

This brief overview of hydroelectricity in the region highlights the need for suitable consideration of renewable energy and a proper definition of the concepts of sustainability and renewability in the context of Latin American and Caribbean countries. Undoubtedly, seeking the reduction of the widest possible range of polluting emissions while increasing the share of renewable energies entails expanding the use of the resources and attributes of the region where, in addition to solar energy (such as radiation or biomass) and wind power, emphasis should be given to hydroelectricity and geothermal resources.

Elements of the proposal

- **Comprehensive environmental assessment of hydroelectric projects**. Above and beyond their potential impact in terms of reducing greenhouse gas emissions, hydroelectric projects have to be evaluated also in terms of their indirect contribution to forest management, not only on account of how they are developed, but also through the manner in which they help to provide a firm anchor for the neighbouring communities.

- **Establish a code of conduct in relation with communities**. It is both urgent and necessary to spell out a number of rules that are accepted universally and supervised both nationally and internationally so as to commit the project developers to adopting a fresh approach to those communities affected by hydroelectric developments.

- **Establish payments for environmental services**. One way of supporting the communities —as has happened in Costa Rica— is to establish payments to be made by project developers for forest-related environmental services so that they can be channelled as incentives to those who live in those areas.

- **Modify the terms and conditions set forth in energy purchasing contracts**. One way of recognizing the value of hydropower projects is to modify the regulations so as to lengthen the permitted terms of the hydroelectricity purchase and sale contracts in such a way as to obtain better financing terms.

- **Establish mechanisms that highlight the synergy between wind power and hydroelectric projects**. At present, the rules prescribed for electricity markets are established for individual plants and not for comprehensive capacity supply packages. Given the synergy between wind and hydroelectric projects, it would be advisable to revise these rules and if necessary to modify them so as to recognize this synergy and thereby enhance the profitability —with more competitive costs— of these projects.

- **Integrated river basin management policy**. The multiple uses and effects of water are typically internalized within the river basins in which water is captured and from which it flows out to sea. Accordingly, the hydraulic systems should be viewed as river basins in which it is essential to optimize benefits and minimize the negative effects of temporary and territorial shifts in water flows. This calls for establishing a system for measurement and monitoring and decision-making and requires concerted efforts to achieve inter-institutional coordination between central governmental agencies and regional governments.

- **Meet social obligations and resolve existing conflicts**. It is necessary, on the one hand, to finish fulfilling the obligations to the communities resulting from dam construction and, on the other hand, to disentangle major conflicts related to the construction of hydroelectric plants, at least those that have met acceptable criteria according to this new policy.

- **Public outreach and transparency of information**. To bring about a societal reappraisal of these kinds of projects, it is necessary for the initiative to undertake an intensive public relations effort in order to give such projects the credit that they truly deserve at the present time.

The text of this document is available at *http://www.eclac.cl/publicaciones/MedioAmbiente/2/LCL2132/Lcl2132i_s.pdf*.

Regional Irrigation Boards: an interesting experience in Uruguay

The publication entitled "***Documento sobre Recursos Hídricos — Informe Nacional —***

Uruguay 2002" [*national report on water resources, Uruguay 2002*], produced by the National Directorate of Hydrography (DNH) of the Ministry of Transport and Public Works (MTOP) of Uruguay, refers to various issues, including the interesting experience of that country with its Regional Irrigation Boards (since 1997, Regional Irrigation Advisory Boards).

Although these entities are only concerned with the use of water for irrigation, they have much in common with river basin organizations such as the River Basin Committees in Brazil, the River Basin Councils in Mexico and the Autonomous Authorities for River Basins in Peru, as well as with similar entities created or proposed in various other countries of the region. As little is generally known about this experience, we reproduce below a summary of the section of the document dealing with the organization of integrated water resources management at the river basin level.

In 1970, Regional Irrigation Boards were set up in those river basins where there was the highest demand for irrigation water (in the east and north of the country), in order to bring together water-using producers and landowners in the administration of the resource. The Boards were created because at some water courses the flows at extreme low water were not sufficient to supply the established water users and because in dry years there had been conflicts and problems that had not been resolved in an appropriate or timely manner. It was thought that the experience of the water users themselves could contribute to identifying and applying the most adequate measures for dealing with these problems. The Regional Irrigation Advisory Boards were included in the irrigation act of 1997.

Eleven Irrigation Boards have been established since 1970, with jurisdiction over most of the territory. The joint participation of the relevant public bodies (MTOP and the Ministry of Livestock, Agriculture and Fisheries — MGAP) and private sector agents that are directly involved (agricultural producers who require irrigation and others who do not require irrigation, but do carry out productive activities in each river basin) has helped to achieve a significant improvement in the administration of the available water resources. This has been possible because of the direct and continuous links and communication between the accredited representatives of the interested parties. At the regional level, which is where the public and private members are active and conduct their activities, decentralization has been possible, together with a growing level of local participation and the increasingly effective application of the relevant principles and laws.

Main tasks

The main tasks of the Irrigation Boards are as follows:

- To coordinate, with the users, the equitable distribution of the water available during periods of shortages.
- To issue opinions concerning new requests for concessions or water extraction permits.
- To advise on works and measures to be implemented by the authority and the irrigators, in order to increase the availability of flows for irrigation and to encourage their best use.
- To collaborate with MTOP in the organization and constant updating of a register of hydraulic works.
- To supervise the use of hydraulic works and, where necessary, to inform MTOP of any violation of the regulations applying to their use.
- To advise, where necessary, on the establishment of a shift system for the capture of public waters for irrigation.

Organization and functioning

The Regional Irrigation Advisory Boards are mixed organizations, as they consist of both State and private representatives. Their membership is made up as follows: one representative of MTOP, who acts as Chair; one representative of MGAP, who acts as Secretary; a minimum of two representatives of the irrigators in the area, who must be registered in the roster established for that purpose and are appointed in accordance with the particular characteristics of each region or basin; and at least two representatives of landowners in the area, who are designated by the rural development commissions or societies to which they belong.

These organizations are advisory in nature, and the final decisions are taken by the relevant ministries. Nevertheless, the advice of the Boards has generally been taken into account in decision-making and no decision has been taken that is counter to their advice. In times of crisis, if shifts have to be organized for irrigation, the decisions are taken by these entities, but in the presence of the Chair and the Secretary, who are the State representatives.

Water management and environmental management

The ministry responsible for environmental management in Uruguay is not represented on the Irrigation Advisory Boards. Water management and environmental management are carried out independently. This is partly due to the fact that most of the hydraulic works that are considered by the Irrigation Boards do not require prior environmental authorization. Moreover, most water courses are not contaminated and, in the case of any doubt, MGAP analyses their suitability for agricultural irrigation. In any case, it would be advisable for the agency responsible for environmental management to be represented on the Irrigation Boards, in order to facilitate integrated water resources management.

Water management and regional planning

Management and planning with regard to river basins and regional planning is carried out by the executive branch, which is the national authority on water issues.

Financing of the Regional Irrigation Advisory Boards

The Irrigation Advisory Boards do not receive any economic resources, and so they do not make investments. The members do not receive fees and the expenditures made in carrying out their tasks are financed by the State organizations which are members of the Boards, or by the delegates of the private organizations. The meetings of the Irrigation Boards, the invitations to attend them and other communications are made through the offices of MTOP.

Participation and commitment of their members

The State representatives have a high level of responsibility, as participation in the Regional Irrigation Advisory Boards is part of their duties. They feel that their actions are supported because all users are obliged to comply with the decisions. The responsibility of the private sector is variable, depending on the area of the country. In basins where there are usually problems, they have a very high level of responsibility. In basins where there are not normally any conflicts, the private sector has less responsibility, but in any case the representatives are designated and they play an active role in the work of the Irrigation Boards.

Public perception

As river basin organizations in Uruguay are usually linked to irrigation, the general public is mostly unaware of their existence and the role they play in society. The Irrigation Boards should evolve into river basin organizations by modifying their membership, and thus allow the participation of other users, not involved in irrigation, such as drinking water supply and sanitation services, hydroelectric generation, industries, environmental representatives, etc. When this occurs, the general public will be more aware of the organizations and will get involved in their activities.

Inter-American Water Day (IAWD)

Inter-American Water Day (IAWD) has been held on the first Saturday of October of each year since 1993 (see Circular N° 16). The main objective of this initiative is to increase public awareness of the importance of conserving this valuable natural resource known as water.

Each year attention is focused on specific themes and materials are produced for distribution throughout the Americas for use by the different countries. The theme of IAWD for 2004 is "*Water and disasters: focusing on services*".

IAWD 2004 has been given this theme in order to focus efforts on recognition of the urgent need to reduce the vulnerability of drinking water supply and sanitation services in order to ensure their availability and quality in times of disaster or emergency. In a geographical area that has a high risk level, such as Latin America and the Caribbean, IAWD 2004 is also seeking to evaluate the socio-economic and health impact of disasters and to advocate intersectoral actions to expedite appropriate risk management in the region's water supply and sanitation systems.

We invite you to visit *http://www.cepis.ops-oms.org/bvsadiaa/diaa/index.html*, where you will find more information on IAWD and on the theme of water and disasters.

SAMTAC

The document entitled "***Fomento a la inversión privada en obras menores de riego y drenaje. El caso de Chile***" [*promotion of private investment in minor irrigation and drainage works — the case of Chile*] was produced by Nelson Pereira, Chief of the Department of Irrigation Studies and Policies, National Irrigation Commission (CNR) of Chile, and Marcelo Gross, external consultant with CNR, for the South American Technical Advisory Committee (SAMTAC) of the Global Water Partnership (GWP).

Promotion of private investment in minor irrigation works

The document refers to the application of Law N° 18.450, of 30 October 1985, on the promotion of private investment in irrigation and drainage works. Implementation of this Law is handled by CNR, an organization that is connected with the Government through the Ministry of Agriculture and has the task of coordinating the formulation and implementation of national irrigation policy, in order to ensure optimal use of the country's water resources with emphasis on irrigation and drainage. The objective is to increase the surface area under irrigation, improve the supply of water to areas where irrigation is insufficient, improve the efficiency of the application of irrigation water and bring new areas into agricultural use, either by remedying poor drainage or facilitating irrigation development.

The State, through this Law, manages a programme of minor irrigation and drainage works which operates as a system of public competitions through which farmers can apply for a state subsidy. This subsidy, according to the provisions of the Marrakech Agreement of the World Trade Organization (WTO), is a support and transfer to improve the productivity of the agricultural factors, and as such is classified in the "green box" category, that is, it is not considered discriminatory or against the rules of international trade.

Construction of the works is financed from private and state contributions. The State contribution is assigned through a competitive mechanism and project selection takes place through the allocation of points in accordance with the following factors: the financial contribution offered by the applicant, the surface area to benefit from the work to be carried out and the cost of the work. The projects are selected in order of priority according to the points obtained and the requests for fiscal support are covered by the resources available for the specific competition.

Projects may be awarded a subsidy of up to 75% of the cost of the work. The maximum cost for a project for submission to the competition is about US$ 330,000 in the case of projects that benefit just one farm holding, and US$ 660,000 for collective projects and water users' organizations. A number of competitions are announced each year for specific irrigation or drainage purposes.

The operating procedure for implementing the Law includes the following principal characteristics:

- Farmers apply at the regional level.
- Project selection is based on the three factors referred to above, on which basis they are assigned a particular number of points.
- Construction of the works may begin prior to the announcement of the competition, before the completion of the competition or after award of the subsidy. If the works begin prior to completion of the competition, the responsibility for financing is exclusively that of the user.
- The maximum period for construction is one year, which may be extended for a similar period if there is appropriate justification.
- The subsidy is paid when the work is approved by CNR.

In 1990, the Council of Ministers found that, although there had been compliance with the general direction of the Law, the system had not facilitated mass participation from the strata of small producers. In fact, as the State makes the payment of the subsidy once the work has been carried out, the irrigator must pre-finance the construction from his own resources or apply to the financial system. As small farmers do not have access to adequate financing, in practice they are unable to apply for the subsidy.

This observation led to a significant change of policy with the creation of a Subprogramme for Irrigation for Small Farmers, managed by the National Institute for Agricultural Development (INDAP), an organization that is part of the system of the Ministry of Agriculture, which now complements Law N° 18.450 by pre-financing the construction of the works and subsidizing the cost of producing the project studies.

In 1994, the changes of policy were approved by Parliament, giving rise to a modification of Law N° 18.450, which has provided for competitions to be held separately for entrepreneurs and small farmers and other types of producers, by area, by type of works, etc. In general, these changes have made it possible to focus the subsidies in accordance with the different socio-economic situations that exist in the country's agricultural sector.

In the 18 years that have passed since the promulgation of Law N° 18.450, almost eight thousand projects have been approved, benefiting a total of 168,000 farmers. The total cost of the projects is almost US$ 500 million, of which about US$ 280 million have been provided by the State (57%). The total surface area affected by this Act is over one million hectares, which is the sum of the surface areas benefiting from new irrigation works, repairs to works, construction and

commissioning of deep wells, the use of irrigation technology, and other works. The state contribution to irrigation and drainage investments has shown significant and sustained growth since 1999, and in 2003 reached a total of almost US$ 38 million.

The functioning of Law N° 18.450 has been evaluated by a consulting firm and its results were found to be very positive. This development programme has broad acceptance from the productive sector, and has brought a significant increase in the surface area irrigated and in the use of irrigation technology.

There has been a significant impact on land use conversion, with an increase in the surface area devoted to intensive sectors such as fruit, vegetables and flowers and vineyards, at the expense of cereals and natural meadows. The impact on employment has been very significant, both in terms of temporary and permanent employment, and in environmental terms, the consequences have tended to be positive. Lastly, the economic evaluation of the programme shows very positive indicators.

The consulting agency offered some recommendations to improve the application of Law N° 18.450:

- To make the resource allocation strategy more explicit, by establishing medium-term criteria (and short-term reviews) for ranking competition priorities by region or macro area, type of producer, type of project, or specific local situations.
- To establish more extensive requirements for basic information, in order to be aware of the economic projections for the proposed irrigation projects, as well as their possible links with other production development tools.
- To avoid, as far as possible, the use of the programme resources for the regular conservation or maintenance of the works. The availability of groundwater should be reviewed more rigorously in projects for well construction and pressurized irrigation.
- To analyse the strategy for allocating more budgetary resources to irrigation subsidies for small farmers' projects and for projects in the eighth region and the regions further south.

Experience would indicate that the implementation of Law N° 18.450 has given a boost to Chilean agriculture. It has received broad acceptance and is made use of by producers of different strata according to property size. The success of this legal initiative is due to the application of a policy that is different to the policy traditionally followed in the countries of the region, where the State takes on the major role in the planning and implementation of irrigation programmes. In this case, the initiative for implementing small irrigation works is left in the hands of private farmers and the State takes on the role of encouraging such investment. Other characteristics of this development tool include the following:

- the subsidies are focused on economically and socially viable projects, so that the private party must contribute part of the total cost of the project and fully finance implementation of the project before receiving the subsidy; and
- the system is transparent, as the subsidies are allocated through public competitions that are duly publicized.

More information on Law N° 18.450, and on irrigation in Chile, is available form the CNR website at *http://www.chileriego.cl*.

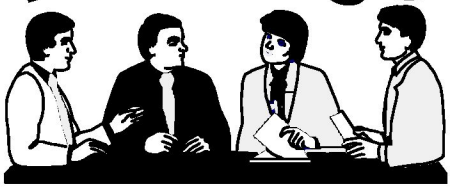
Prevention and reduction of the danger posed by natural disasters

From 3 to 4 August 2004, in Lima, Peru, an international panel met to discuss the theory and practice of risk management in Latin America and the Caribbean. This meeting is the last public activity of the project "***Prevention and reduction of the danger posed by natural disasters***" (see Circulars N° 16 to 19), which is implemented by ECLAC, through the Natural Resources and Infrastructure Division, with financing from the German Agency for Technical Cooperation (GTZ). The main objective of the panel was to identify, analyse and propose guidelines for strengthening public system mechanisms for prevention and mitigation of disasters, based on the case studies carried out in Argentina, Chile, Colombia and Peru.

In addition, as part of the activities of the project, a guide book is being written with a view to meeting the urgent need to strengthen local and national policies and programmes for integrated risk management. This document has been designed to help municipal authorities to develop an effective local risk management system and thus to reduce the loss of human life and material damages.

The guide book is intended to contribute to the education, management and training of all actors in society, in order to deal with socio-natural risks through a preventive, rather than reactionary, approach. The aim is to reduce vulnerability, which is the main deciding factor in the damage caused by disasters, thus strengthening sustainable development strategies.

Meetings



Plans for Integrated Water Management in Latin America

The ***Meeting on Plans for Integrated Water Resources Management in Latin America*** was held on 28 and 29 July 2004 in Buenos Aires, Argentina, as an event organized by ECLAC, GWP/SAMTAC and the Inter-American Development Bank (IDB). Experts from Argentina, Brazil, Chile, Costa Rica, Ecuador and Peru took part, as well as representatives of regional and international organizations.

The meeting coordinator was Miguel Solanes, Regional Advisor on Water Law and Public Service Regulation of ECLAC and a member of the Technical Committee (TEC) of GWP. In his presentation, he referred to: (i) the relevance of macroeconomic factors in private investment to develop the economic potential of water resources and for the sustainability of public water-related services; and (ii) the need for compulsory procedures to quantify economic, social and environmental impacts before taking decisions relating to water.

The main objective of the meeting was to discuss the topic of water resources planning in the countries of the region, and to analyse the current situation in order to design a proposal that would contribute to the availability, for 2005, of a basis for planning processes that are appropriate to the regional situation, and the integration of water in the processes of economic development, social improvement and poverty reduction, and environmental sustainability. The debates focused on the following issues:

- macroeconomic policies and impacts on water resources, both in the development and in the conservation and sustainability of the related services;
- criteria for decision-making and approval of water plans and programmes: economic, environmental and social criteria;
- practical needs for the implementation of plans and strategies to achieve efficiency and integrated management: legal, institutional and financial needs; and
- other relevant topics, for example, international investment protection agreements.

In relation to future activities, the participants made the following recommendations:

- For 2005 a strategy for water resources management should be prepared with the objective of strengthening the contribution of water to sustainable socio-economic development, with special attention to poverty reduction, within a framework of environmental sustainability.

- This strategy should include consideration of efficiency in terms of an input-output relation, in which the return on the public investment should be higher than the costs. In this sense, the investment should be economically efficient, without precluding the addition of social objectives, with their own justification and rationale. But in this case it is not a matter of investment efficiency, but rather of social expenditure.

- In devising the strategy, the analyses should break with the hydraulic scheme; that is, they should not be restricted to the status of water resources, but also refer in particular to framework conditions, including social, cultural, political and macroeconomic conditions and other supporting or restricting factors.

- Special attention should be given to an objective, and if possible numerical, demonstration, of the links between water projects and the value that they add in terms of achieving national development objectives and the goals for different uses at the users level, all in the language of decision-makers at the budgetary level: that is, ministries of finance, economy and planning. This includes adopting compulsory criteria for multi-objective assessments and minimum prerequisites for project approval.

- Participation should be organized by decision-making levels, from consultation to the actual decision-making.

- Consensuses should be sought, from the analysis to the solution stage; the consensuses should be disseminated.

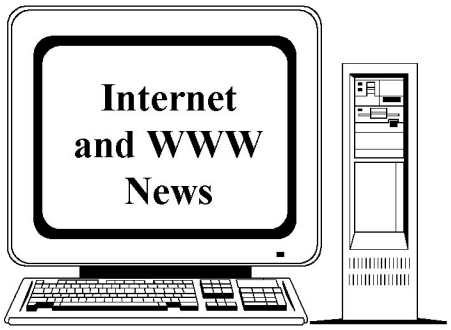
First Meeting of the Regional Working Group on Regulatory Accounting

The Association of Regulatory Agencies for Water Supply and Sanitation Services in the Americas (ADERASA) (see Circular N° 15) held the ***First Meeting of the Regional Working Group on Regulatory Accounting*** on 5 and 6 August 2004, at ECLAC headquarters in Santiago, Chile. This event brought together experts from Argentina, Bolivia, Brazil, Chile, Costa Rica, Honduras, Panama, Paraguay, Peru and Uruguay and international speakers with a vast experience in this area. The participant from our Division was Economic Affairs Officer Andrei Jouravlev, who spoke on information asymmetry in the regulation of drinking water supply and sanitation companies.

The main objectives of this event, which was organized by the Superintendence of Sanitary Services (SISS) of Chile, were the following:

- to define the conceptual framework for applying regulatory accounting, the problems to be resolved in relation to its implementation and the potential it offers for effective regulation;
- to conduct an analysis for each country and establish the feasibility of the goals to be achieved by each regulatory agency; and
- to devise a programme of work for the group.

More information on the event and the presentations made can be found on the web site of ADERASA at *http://www.aderasa.org*.



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

- The documents presented at the ***Regional Workshop on Sustainable Sewage Treatment*** (26-28 May 2004, San Pedro Sula, Honduras) can be found on the web site of the Regional Water and Sanitation Network for Central America (RRAS-CA) at *http://www.rrasca.org/trt/index.html* (see Circular N° 12).

- The ***fourth meeting of ADERASA*** was held from 20 to 22 October 2004 in Tafí del Valle, Tucumán Province, Argentina. All the presentations made at that event are available at *http://www.aderasa.org*.

- The ***Initiative for Integrated Water Resources Management in Paraguay*** is an entity consisting of four non-governmental organizations involved in water management in Paraguay. Its purpose is to promote joint actions oriented to establishing principles for integrated water resources management in that country (*http://www.foroagua.org.py*). Its web site contains a link to a library with interesting documents such as, "*La gestión integrada de los recursos hídricos: marco conceptual*", "*Informe sectorial del agua, Paraguay*" and "*Informe final del taller: los gobiernos locales y la gestión integrada de los recursos hídricos*".

- The ***Latin American Workshop on Reducing the Vulnerability of Drinking Water Systems*** was held from 21 to 23 April 2004 in Managua, Nicaragua. It was organized by the Pan American Health Organization (PAHO). Its main objectives were: (i) to identify common problems and initiatives to reduce the vulnerability of drinking water supply and sanitation services; (ii) to devise a plan of action for the decade 2005-2015 to ensure the sustainability of these services and to facilitate decision-making by the institutions which regulate, manage and operate drinking water supply systems; and, (iii) to allow the systematic implementation of highly effective and low-cost mitigation actions for drinking water supply services in Latin America and the Caribbean. The report of the workshop can be found at *http://www.cepis.ops-oms.org/bvsade/fulltext/tallermanagua.pdf*.

- The objective of the ***Provincial Water Administration*** (APA) of the Province of La Rioja, Argentina, is to satisfy water users, and to promote a balance between users' demands and the water supply, with the ultimate aim of contributing to the sustainable development of the province (*http://www.larioja.gov.ar/apa*).

- The papers presented at the seminar "***Gestión Integral en Cuencas Hídricas: Teoría y Práctica***" [*integrated management of river basins: theory and practice*] (Mexico City, 9-10 June 2004) are available from the web site of the Integrated Watershed Management Department of the National Ecology Institute (INE) of Mexico (*http://www.ine.gob.mx/dgoece/cuencas/ponencias_cuencas.html*), for example, "*Si sabemos tanto sobre qué hacer en materia de gestión integrada del agua y cuencas ¿por qué no lo podemos hacer?*" [*if we know so much about what to do in relation to integrated water and river basin management, why can't we do it?*] by Axel Dourojeanni.

- The ***Network for Social Studies on Disaster Prevention in Latin America*** (LA RED) was set up in 1992, in the city of Limón, Costa Rica, in response to the need to stimulate and strengthen social studies on risk issues and on that basis to define new forms of intervention and management in the area of risk mitigation and prevention. Initially conceived as a

mechanism to facilitate comparative research on disasters from a social perspective, this network has become a meeting place for hundreds of individuals and institutions involved in risk and disaster management in the countries of Latin America and the Caribbean and in other regions of the world (*http://www.desenredando.org*).

- The ***Irrigation Promotion and Support Act*** (Law N° 2878) was promulgated in Bolivia on 8 October 2004. Its purpose is to establish policy and regulations for the sustainable use of water resources in irrigation activities for agricultural and forestry production, and the institutional, regulatory and management framework for irrigation. It also establishes and recognizes rights, establishes obligations and procedures for conflict resolution, and guarantees the security of community, family, public and private investment. The complete text of Law N° 2878 can be found at *http://www.aguabolivia.org/legisaguasX/Leyes/LeyRiego.htm*.

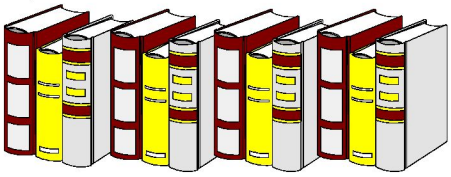
- The ***National Water Works and Sewerage Services*** (IDAAN) of Panama is an autonomous State entity, responsible for providing drinking water supply services, and for the collection and safe disposal of wastewaters in communities of over 1,500 inhabitants (*http://www.idaan.gob.pa*).

- Recently the first issue was published of the ***Review of the School of Natural Resources and Environmental Engineering*** (EIDENAR) of the Universidad del Valle, Cali, Colombia (*http://revistaeidenar.univalle.edu.co*).

- The document entitled "***Proceedings of the Symposium. The Pantanal: Scientific and Institutional Challenges in Management of a Large and Complex Wetland Ecosystem. 24th Annual Meeting of the Society of Wetlands Scientists, 8-13 June 2003, New Orleans, Louisiana***" is available at *http://libweb.wes.army.mil/uhtbin/hyperion/SR-04-1.pdf*. The purpose of the symposium was to exchange information of mutual interest on innovative approaches to enhancing environmental sustainability in a large, complex ecosystem. The papers presented at the symposium address a full spectrum of ecological, socio-economic, and socio-political issues relevant to the Pantanal.

- You are invited to consult the most recent issue of the bulletin "***Disasters: preparedness and mitigation in the Americas***" of the Pan American Health Organization (OPS) at *http://www.disaster-info.net/newsletter/97*.

Publications



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

- "***Drinking water supply and sanitation services on the threshold of the XXI century***" (LC/L.2169-P, July 2004, *Recursos naturales e infraestructura series* N° 74) by Andrei Jouravlev. The focus of the paper is to analyse the status of drinking water supply and sanitation services in the countries of Latin America and the Caribbean at the beginning of the twenty-first century. For this purpose, and for methodological reasons, the study is divided into two parts. The first section contains an analysis of access to services and their quality. The levels of coverage achieved in the region may be considered reasonable, with the possible exception of wastewater treatment. There are still serious deficiencies, however, in access to services, which disproportionately affect low-income groups and rural areas. The insufficient coverage and the poor quality of services not only have negative impacts on the health of the population but also affect the environment, the economy, foreign trade and the availability of water for various uses. The second part of the study analyses the reforms carried out by the countries of the region in recent years. Despite the differences that can be expected in a region that includes very different countries, the reforms have many characteristics in common, such as institutional separation of the functions of sectoral policy-making, economic regulation and systems administration; the extension and consolidation of the decentralization processes in the provision of services; a general interest in promoting private sector participation; the formulation of new regulatory frameworks; and the requirement, born of the crisis of the 1980s, that the services should move towards being self-financing, and when that occurs, that subsidy arrangements should be set up for low-income groups. Finally, some conclusions are drawn, concerning both: (i) the current situation of the drinking water supply and sanitation services in the region; and (ii) the main priorities in reforming this sector.

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

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