



RESEAU INTERNATIONAL  
DES ORGANISMES DE BASSIN

INTERNATIONAL NETWORK  
OF BASIN ORGANIZATIONS

RED INTERNACIONAL  
DE ORGANISMOS DE CUENCA

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The network newsletter

# GENERAL ASSEMBLY OF MORELIA: 68 ORGANIZATIONS FROM 32 COUNTRIES BECAME INBO MEMBERS

**T**he International Network of Basin Organizations (INBO) was created during the constitutive meeting held in May 1994 in Aix-les-Bains (France) at the invitation of the French Ministry for the Environment and the six Water Agencies.

The Network objective is to enable exchanges of experiences between basin organizations on all continents and to implement common activities.

It also aims at promoting the principles of a global and integrated management of water resources while respecting natural media and meeting all requirements.

This management:

- is organized on the **scale of large river basins**,
- is supported by the participation of local authorities and of various categories of users, gathered in **River Basin Committees**, and
- develops a financial solidarity in basins by applying the **"user-polluter-pays"** principle.

These important options are developed in the **"Declaration of Membership"** of INBO, which was officially approved during the **last General Assembly held, from March 27 to 29, 1996, in Morelia (Mexico)** at the invitation of the Mexican Authorities.

The works of this General Assembly, which gathered up to 450 participants, were opened by His Excellency Ernesto ZEDILLO, President of the United States of Mexico.

Mr. Eduardo MESTRE RODRIGUEZ, Regional Manager of the Lerma River - Chapala Lake basin (National Water Commission of Mexico) was elected President of the International Network of Basin Organizations **until the next Assembly to be held in Spain in April 1997.**

The 80 delegates - governmental administrations, river basin organizations and multilateral cooperation agencies, from the 40 countries, **officially approved the "Declaration of Morelia"**.

The **16 interested countries of Latin America** also decided to set up a **regional cooperation subnetwork** among them.

The General Assembly was also the occasion of organizing a working day on the topic **"Information necessary for decision-making"**. This topic is particularly important to design a global policy for water resources management. Recommendations, that will be particularly useful for the new basin organizations being set up in many countries, **were drawn up.**

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Mr. ZEDILLO, President of the United States of Mexico opens INBO'S General Assembly

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# INBO : "DECLARATION OF MORELIA"

ADOPTED BY THE GENERAL ASSEMBLY ON MARCH 29, 1996

Eighty representatives of governmental administrations in charge of water management in their country and of basin organizations that are established or are being set up, in 40 countries, together with interested bi- and multi-lateral cooperation agencies, gathered in Morelia (Mexico) from March 27 to 29, within the frame-

work of the (INBO) **International Network of Basin Organizations'** first General Assembly, in order to reflect upon the most adapted means for attaining a rational, balanced and overall management of inland freshwater resources to ensure the quality of life on our planet and the sustainable socio-economic development of our societies.

## OBJECTIVES OF A GLOBAL WATER MANAGEMENT

The delegates emphasized that the questions brought to light are complex and that the answers must at one and the same time make it possible :

- to control natural catastrophes and the risk of erosion, floods or drought by taking into account the management of water and space,
- to reliably meet the needs of urban and rural populations for water of good quality; in order to improve hygiene, health and to prevent important outbreaks of disease,
- to ensure sufficient food by improving drainage of agricultural lands and irrigation,
- to harmoniously develop industry, energy production, recreational activities and in

certain sectors, tourism and waterway transport,

- to prevent and control pollution of all kinds and origins in order to preserve aquatic ecosystems, especially with a view to protecting fauna and optimizing fish breeding for human consumption, to meet all the requirements of different uses and more generally, to preserve the biodiversity of aquatic media.

It is obvious that these problems can no longer be tackled on a sectoral or local basis, or indeed separately, in fact the search for solutions must transit by an integrated approach, respectful of the natural medium and aiming at a sustainable water resources utilization.

## PRINCIPLES TO BE APPLIED

In accordance with the final resolutions of the constitutive meeting of INBO, May 1994 in Aix-les-Bains (France), the delegates recommended that, in order to reach these objectives, the following procedures regarding the management of inland water resources, which they are already applying or are willing to apply in due time, be implemented all over the World:

- organization of an integrated water resources management at river basin level aimed at preventing dangerous natural risks and catastrophes, at rationally and equitably meeting the different uses for a sustainable economic development, and at protecting and restoring the aquatic media;
- establishment of financial systems based on the "Polluter-User-Pays" principle and on the basin common cause concept for financing

long-term development, equipment and protection programmes;

- establishment of partnership procedures, associating National Authorities and possibly competent international institutions with local Authorities, water users and representative non-governmental organizations to the planning and management of basin organizations;
- building information capacity of those partners' representatives in order for them to fully assume their responsibilities and missions within the framework of the basin policy.

Moreover, they recommended that agreements and strategies, programmes, financial support and monitoring be designed at river basin level and that cooperation agreements be signed between the riparian countries of large trans-boundary rivers, lakes or seas.

## THREE RECOMMENDATIONS

The delegates agreed that they would promote the above-mentioned principles in their own country and to international institutions in which they participate, to bi- and multi-lateral cooperation agencies and, generally speaking, to all interested parties.

During the General Assembly's deliberations, particular attention was drawn to the following items :

- The necessity to found the overall management of water resources on data systems that are complete, reliable, representative and easily accessible, and organized in basin observatories and standardized to allow for syntheses and comparisons to be made both at national level in each country and at international level.

- The benefit of an organized exchange of all useful information to facilitate the creation or the development of basin organizations, with regard to institutional documentation (AQUADOC-INTER network), educational and awareness raising tools, the agenda of interesting events or the list of competent experts to be called upon, in particular.

- The importance of training executives of administrations, basin organizations, of institutions in charge of water management and development and also, under appropriate forms, basin committee members, local elected officials, representatives of users' associations or interested non-governmental organizations.

*E. Mestre-Rodriguez*  
**INBO Chairman**  
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## LIAISON BUREAU

The fourth meeting of INBO's Liaison Bureau was held in Tulcea (Romania) on July 5, 1996 at the invitation of APELE ROMANE. It was chaired by Mr Eduardo MESTRE-ROGRIGUEZ (Mexico).

Messrs Raimundo GARRIDO (Brazil), Amani KOUADIO (Ivory Coast), Gheorghe LASCU (Romania), Enrique NOAIN (Spain), Alain DUCHEIN (France) and Andrzej BADOWSKI (Poland) attended as well as Mr J.F. TALEC (IOW) as member of the Permanent Technical Secretariat. Messrs Mimai POPOVICI, Evgeiy SECARA and also Mrs Gentiana SERBU and Lavinia BERILA, representing the Romanian Authorities, also attended.

The main objective of this meeting was to prepare the works of the Liaison Bureau of November 1996 (Yamoussoukro - Ivory Coast), which has to prepare the meeting of the General Assembly in Spain in Spring 1997.

## PROJECTS TO BE DEVELOPED

Moreover, the Bureau considered that some projects initiated as part of INBO had to be maintained :

- the "network newsletter", the principle of which is excellent, has to be pursued,
- the international training programme dedicated to the establishment of basin organizations which will be coorganized by France and Spain in 1997,
- AQUADOC-INTER for which it is suggested to work with the INTERNET network,
- the establishment of INBO's information base.

## ● 1998 General Assembly

Brazil is candidate for the organization of this event.

The issue of subscriptions was again discussed, an amount of US \$ 1,000 was proposed.

## AFRICAN REGIONAL NETWORK

On the occasion of the next Liaison Bureau of our network, on November 7-8, 1996, the Authorities of Ivory Coast invited the Water Ministers of all countries of West Africa, to study the

means of involving Africa more in INBO's works.

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Meeting of the Liaison Bureau in Morelia

# "INFORMATION NECESSARY FOR DECISION-MAKING"



The representatives of administrations in charge of water management and of basin organizations -established or in the process of being so- of 40 countries, together with the international cooperation agencies concerned, gathered in Morelia (Mexico) on March 28, 1996,

within the framework of INBO's General Assembly. Their aim was an exchange of experiences and a reflection on the best means of access to the "information necessary for decision-making" in the water sector.

are, by far, at medium and long-term, the most important and recurring items of expenditure. Thus, it appears unreasonable to invest without ensuring positive means for optimum and continuous functioning of the systems over a long period of time which, of course, requires substantial, appropriate and unceasing financial resources.

jects, for regulation of public works, warning systems or even for evaluating the results of applied policies and monitoring the environment, finally for informing the general public.

In addition, if the data is to be utilized, it must be made available in the most appropriate forms.

## INFORMATION NEEDS

In order to attain an overall management of water resources, at river basin level in particular, they emphasized the prime importance for decision-makers to have easy access to complete, representative and reliable information on the following:

- **the state of surface and groundwater resources**, from both a quantitative and a qualitative viewpoint, also seasonal and yearly variations,
- **the situation of biotopes and aquatic media** and their degrees of sensitivity,
- **water uses** (withdrawals), drinking water supply for the population in particular, and

pollution sources (discharges) whether point or non-point,

- **the risks of recurring extreme phenomena** such as floods or drought and accidental pollution.

It was established that this information is often dispersed, heterogeneous and incomplete ... and that it is rarely comparable and adapted to the prerequisites for objective decision-making. Moreover, it is a fact that public, para-public and even private organizations can have access to this information but lack of sufficient means for exchanging, gathering, standardizing, summarizing and for capitalizing it amongst them.

It is important to avoid excessive sophistication by using advanced technologies instead of reflecting on a sound organization and straightforward solutions that usually are the most efficient. Information systems only operate when skilled operators are in charge; satellite links, models, automatic analyzers, etc... are only used to facilitate the tasks of the services not to replace them. Solutions are not found by using technological gadgets.

Moreover, if the information is to be useful, it must not remain in the form of raw data, but be retrieved in the form of easy-to-understand data which can be handled by all the different categories of users.

The information must be organized according to requirements, whether it be for the study of a "white book", master-plans for water management and development, for action programmes, budgetary simulations or the basis for water charges, for delivering administrative authorizations or studying pro-

If it is generally considered that Public Authorities must be the contracting authorities for monitoring networks and associated information systems and that from then on, access to them must be open and free for the various users. However, due to additional costs for processing and circulating the information, it would appear quite normal that the processed data be paid for.

Common standards must also be defined to gather the comparable information produced by different actors in order to organize real observatories at the level of national or trans-boundary river basins and to centralize the summarized information necessary for determining governmental policies.

Information systems for shared rivers and aquifers would be improved by being designed in a global and consistent way on the watershed scale within the framework of agreements between riparian countries.

## PRACTICAL RECOMMENDATIONS

The participants recommended that, in each situation and considering all the national and local characteristics, special reflection should be devoted to the organization of the prime contracting of monitoring networks and data banks, to financing, as well as to a suitable role for specific basin organizations with regard to other possible actors.

It is absolutely necessary to examine the :

- **nature of useful information** (parameters, indexes, integrators, frequency, representativity, standards)
- **means used for collecting, monitoring and analyzing**, as well as for controlling the quality of data produced, of

their transmission (in real-time, when necessary, for major risks forecasting) and for their storage,

- **forms in which information should be made accessible to decision-makers** (data banks, reports, maps, diagrams, ...) or to technicians and scientists,
- **broadcasting and circulating means** (tele-processing, publications, diffusion to the general public, ...),

Real and complete "systems" must be designed and used to assess the resource and uses, especially regarding quality, and organized to constitute global observatories.

## SETTING UP RIVER BASIN OBSERVATORIES

The exact definition of each actor's role as well as the question of financing and its continuity is of prime importance.

Gathering this information, requires a complex and consistent organization of monitoring networks, analyses laboratories, data transmission and their checking and monitoring, management of data banks, their accessibility and their "products".

For this, permanent means must be made available and their optimizing ensured, in order to obtain at minimum public cost, all the relevant information, limiting this however, to the strict necessary.

It should be pointed out that if investment costs for obtaining appropriate information (stations, laboratories, tele-transmission, automatization ...) are high, the qualification of intervening experts (training) and the functioning and operating costs

The participants of the INBO's General Assembly held in Morelia, recommended that concerned Public Authorities and bi- and multi-lateral cooperation agencies supporting projects related to water resources management and utilization:

- **consider that setting up complete information systems**, corresponding to the above-mentioned specifications, is a prerequisite,
- **precise clearly which institutional bodies are responsible** for the permanent organization and operation of such systems,
- **guarantee not only sufficient means for corresponding investments**, but also the compulsory financial techniques which will secure their long-term continuity,

## IN CONCLUSION

- **encourage the development** of means and specific engineering proficiency in this field.
- **support the works that aim at defining common standards and nomenclatures for data administration** in order to exchange, compare and summarize the information between partners at all relevant observation levels,
- **promote the setting up of observatories for water resources and their use** at river basin level, should these basins be national or trans-boundary, and the organization of national and coherent information systems with these basin observatories.

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# TECHNICAL SEMINAR OF MARCH 28, 1996

# INBO: "MASTERPLANS FOR BETTER MANAGING OUR RIVERS"

WORKSHOP ON COMPARATIVE ANALYSIS OF ADMINISTRATIONS, TULCEA 30 AUGUST-2 SEPTEMBER 1996

The first INBO workshop on Comparative Analysis of Administrations took place in Tulcea from August 30 to September 2, 1996, at the invitation of both the Romanian authorities and APELE ROMANE, in coordination with the Francophone Network of River and Lake Ecosystem Managers.

The meeting gathered 32 participants from 12 countries and international organizations whom, at the conclusion of their work, proposed the following recommendations in order to improve the management of national and international rivers, by means of Masterplans in particular.

## THE LEGAL FRAMEWORK

Approaches and procedures should be based on dialogue and a consensus between all interested parties, various governmental administrative departments, local authorities and "users".

The representation of everybody who directly or indirectly needs water for undertaking activities must be ensured and foreseen by legislation. It is important that the participation of the public be recognized in the legal texts and that clear guidelines be defined with respect to its development.

Nevertheless, the legal framework should also provide the mechanisms necessary for solving conflicts which could possibly occur.

Management mechanisms should be established not only for ordinary situations but also to mitigate situations of crisis or emergency and to deal with

accidents or water scarcity.

A better coordination of activities with an objective of integrated river basin management, will be achieved by defining priorities and their hierarchical organization.

Finally, the legal framework, as well as masterplans, must allow evolutions to reflect the realities and diversity of "field" situations.

When the choice is made of setting up a specific basin organization, it is then advisable to accurately study the following points:

- limits of respective responsibilities between this institution and authorities in charge (after simulating a real situation),
- mechanisms to be developed to ensure the preparation and approval of action plans, their control and follow-up and their up-dating.

## USERS' PARTICIPATION

All users concerned should be officially involved in the decision-making process.

### Who is a "User"?

A "user" utilizes water (industrialists, electricity producers, farmers, population). This notion can be extended to people using water for recreational purposes (fishermen, leisure, etc...).

### Why consult the users?

Acceptation and thus the feasibility of a long-term project and its successful completion require the following steps:

- approval of project objectives by the users,
- sharing of the long-term vision,
- definition of priorities by the users,
- getting the means, financial ones in particular, necessary to achieve the objectives.

In addition, during the debates, it appeared that dialogue with the users was the best means to solve conflicts on water use: "Dialogue is the beginning of wisdom".

A dialogue should take into account the impact of the decisions to be made. The more ambitious the project, or far reaching, the more widespread dialogue should be. On the contrary, a project of local interest will need a more reduced and precise dimension.

Dialogue must be organized in the most decentralized way possible while taking local constraints and specificities into account.

### In a general manner:

- The extent of public participation in all planning processes must be unanimously approved.
- Representatives of local elected officials and of all users must participate in the works regarding Development Schemes, with the help of experts from the Administration and specialized consulting firms.
- Information must be clearly distinguished from dialogue. In the first case, the administration shares information with the public, it is a one-way process. Dialogue, implies a two-way

process: the administration listens and takes the formulated comments into account.

- The public participation process must be accessible to a wide range of people concerned: it is an open process that takes the diversity of the interested parties into account (representativeness).
- In some States, it is necessary

to change from a merely centralized approach to a decision-making process based on a wider decentralization.

- Particular attention should be given to NGOs. Some of them are mere protesters, but others are well established in the field and can become partners in programmes involving an active participation of the population.

## INTERNATIONAL COOPERATION

Water has no national or administrative boundary. Managing resources shared between several neighbouring States should take this reality into account and be organized on the scale of the catchment area concerned.

Managing a common resource - which can lead to conflicts - implies the participation of all riparian states to define the rights and duties of each of them.

The consistency of national and international programmes is a prerequisite to optimizing results. It requires the harmonization of:

- objectives that must be consistent,
- actions at sector and multisector levels.

The sectoral and multisectoral interdependence and compatibility are prime notions to be taken into account when preparing national and international programmes.

An informal cooperation can be established between basin organizations of 2 neighbouring countries to efficiently solve a local crisis, but this will never lead to large-scale enterprises nor to the mobilization of important financial means.

Setting up a formal framework can ensure long-term commitments whose constraints will bind the successive local decision-makers.

An international agreement signed by a State might imply a progressive adaptation of national regulations to meet the agreement requirements.

This framework is a prerequisite for mobilizing suitable means at the level of each country. Setting up a structure might be envisaged. The prime condition is that this structure must be given an official status to implement programmes requiring important financial means from various financing agencies.

The setting up of a light structure (secretariat, logistics) is a dynamic and low cost solution.

Setting up a larger international organization implies a pre-definition of the delegation of responsibilities accepted by the States.

The mandate of this organization may comprise:

- information organization and dissemination,
- assistance to operators in a crisis,
- contribution to solving specific problems that exceed the national territory,
- planning of actions at the level of the international basin that will be consistent with national programmes,
- mobilization of national and international financial means.

## FUNDING OF PROJECTS

A reliable document must be prepared with the earliest possible assistance of all potential funding organizations: States, Regions, Departments, Local Communities, Basin Organizations, the European Union and other international Organizations, or NGOs. Loans can also be requested from institutional and private banks.

A request to banks implies that the developer will provide guarantees as to reimbursement, possibly through a financial parti-

cipation of the users. This has a direct impact on the living standard of the population and thus requires that people be properly informed of the positive or negative consequences of the project.

In the case of a joint venture, it is necessary to plan a preliminary agreement for its implementation but also for the management and operation of the infrastructure thus set up.

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# WATER RESOURCES FOR LARGE CITIES

## THE BEIJING DECLARATION

The International Conference on Managing Water Resources for Large Cities and Towns took place in Beijing on 18-21 March 1996. It brought together more than 150 international experts from some 50 countries in order to prepare HABITAT II to be held in Istanbul.

The conference based its considerations on the following principles:

- 1 Freshwater is a finite vulnerable resource, essential to sustain life, development and the environment.** Effective and sustainable water resources management and long-term planning will require:
  - reliable arrangements for data collection, dissemination, monitoring, assessment and forecasting,
  - consideration of the long and short term demands,
  - sustainable development policies with respect to catchment and aquifer systems.
  - legal, technical and financial means, as well as public information and education programmes.

- 2 Water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels, represented at some form of water council or water parliament.**

- 3 The basic unit of water resources management is the river basin.** Effective implementation of an integrated water resources management plan would benefit from the establishment of a public or semi-public autonomous basin organization.

- 4 Women play a central part in the provision, management and safeguarding of water.**

- 5 Water has an economic value in all its competing uses.**

- 6 Mobilizing financial resources is crucial to effective water resources management.**

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## INTEGRATED MANAGEMENT IS DEVELOPING

Latin American countries are strongly involved in the integrated management of their water resources.

Very present during the recent General Assembly of the International Network of Basin Organizations (INBO) in Morelia (Mexico, March 1996), where 16 countries were represented, they decided to es-

tablish a Latin American sub-network as part of INBO.

This will permit to develop the exchange of information and experiences in order to strengthen river basin structures in Latin American countries.

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# UNITED NATIONS

## MEETING OF THE SPECIAL WORKING GROUP ON SHARED WATER RESOURCES, NEW YORK, MAY 14 - 15, 1996

The meeting permitted to present several representative cases located in different regions in the world, in particular: in Europe, the Rhine and the Danube; in Africa, the Nile, the Senegal, Gambia, Niger rivers and Lake Chad; in Asia, the Indus and the Mekong; in North America, the boundary waters of the United-States with Canada and Mexico; in South America, the lake Titicaca; in Australia, the hydraulic development of the Snowy Mountains.

This highlighted the evolution of the concepts and practices in this complex and sensitive field which raises more

and more problems in all regions in the world.

If useful lessons can be drawn from each case, Southern Africa represents a particularly interesting and innovating experience as regards the management of shared water resources, through the 1995 agreements as part of the SADC.

Two series of resolutions were prepared for the Natural Resources Committee and the U. N. Social and Economical Council.

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Opening ceremony of INBO's General Assembly in Morelia on March 27, 1996

# ILEC

## INTERNATIONAL LAKE ENVIRONMENT COMMITTEE FOUNDATION

ILEC will organize, in cooperation with Argentinian authorities, the 7th International Conference on the Conservation and Management of Lakes, on October 27-31, 1997.

The city of "San Martin de los Andes", on the upstream end of Lake Lácar, has been designated as the venue of this meeting, which for the first time will be held in South America.

The Conference is particularly concerned with the role of environmental education and public information as well as with lake water resources assessment and monitoring, sustainable utilization of lakes, and with the design, construction and management of man-made reservoirs.

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## EURO-MEDITERRANEAN CONFERENCE ON LOCAL WATER MANAGEMENT

At the invitation of the French Government and the European Commission, a Euro-Mediterranean Conference on local water management is to be held in Marseilles on November 25-26, 1996, and will gather the concerned Ministers of the 15 countries of the European Union and their counterparts from the 12 other riparian countries of the Mediterranean who signed the Barcelona declaration.

Experts will prepare some reflections during four workshops dealing with such topics as agricultural water management, domestic and industrial water, training for water professionals and the strengthening of institutions.

A preparatory meeting of the experts took place in Cairo on October 21-22, 1996.

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# NORTH AMERICA

## QUEBEC

### THE CHAUDIERE RIVER BASIN AGENCY

The Chaudiere River Basin Committee presented its final report on March 26, 1996. It made public eight guiding principles for a real integrated and global water management in Quebec. The Committee considers that the government adhesion to these principles and their application by a suitable structure will lead to an important redefining of water management and preservation for the citizens of Quebec. These principles are as follows:

① A watercourse river basin is the most appropriate natural unit for water management.

② A complete and up-dated knowledge of the state of the river basin water resources is a prerequisite to effective management.

③ Water management must take into account the interdependence of several uses on the river basin territory, while promoting dialogue with all users.

④ Water policy and management must aim at protecting and restoring the ecosystems to health.

⑤ As water is an essential resource for life, users have to pay for its use or deterioration.

⑥ A responsible water management of the river basin must aim at a complete operational and financial autonomy.

⑦ The main trends in water management must be supported by population involvement.

⑧ Local, regional and national legislation must be adapted to achieve these objectives.

Among the recommendations made, we must retain the establishment of the first Water Agency in Quebec, as a pilot project which will be presented to the National Assembly in autumn 1996 for validation.

The project of the Chaudiere Water Agency has established, after a public consultation, a water masterplan (SDE) taking into account all water uses of the territory.

The project of the Chaudiere Water Agency will permit to assess whether it is pertinent or not to equip Quebec with other agencies for the 10 main river basins.

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# AFRICA

## MAURITIUS

### INTERMINISTERIAL SEMINAR ON WATER MANAGEMENT

A seminar on "integrated management of water resources", jointly organized by the Ministry of Energy and Water Resources of Mauritius and the Mission for Cooperation and Cultural Action of the French Embassy, was held in Grand Baie from May 29 to 31, 1996. It gathered about sixty participants representing the different Ministries concerned and the categories of water users (farmers, consumers, industrialists, NGOs ...)

IOW's experts presented the French example of management by catchment area, with the testimonies of two members of French River Basin Committees: Mr LANDAIS, industrialist (SEINE-NORMANDY) and

Mr GLASEL, farmer (RHONE-MEDITERRANEAN-CORSICA).

In addition, the current experience carried out in the French neighbouring Reunion island for setting up a River Basin Committee and a SDAGE (Masterplan for Water Development and Management) was also widely discussed.

The adopted recommendations will be soon submitted to the Ministers' Council of Mauritius.

The participants of the seminar particularly insisted on the creation of a "National Water Committee".

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## GUINEA

### LEGAL FRAMEWORK FOR WATER RESOURCES MANAGEMENT

Guinea has almost 1,070 classified watercourses among which are found thirteen main international rivers of West Africa whose hydrographic basins are shared by Guinea and most States of the region. Owing to its particular climatic and geographic characteristics Guinea is called the "Water reservoir" of West Africa. This led Guinea to assume its responsibilities in a more determined manner than in the past as well as the rights inherent in this situation on a national or international scale.

This explains why Guinea has become a member of the regional organizations for river basin management (Organization for the Development of Gambia River - OMVG, Authority of Niger River Basin - ABN...).

Since 1987, Guinea has also endeavoured to redefine its legislation on natural resources.

A new Water Law could be prepared thanks to the assistance provided by FAO. It was passed on February 14, 1994. This law states the general framework of the country's water resources management.

This Law sets up the appropriate national institutions necessary for its application, such as: the National Water Directorate in charge of water resources assessment, planning, legislation and regulation, as well as of international cooperation, under the supervision of the Ministry of Natural Resources and Energy; the National Water Commission (interministerial and advisory organization), the Hydraulic Fund...

The main texts of application that are already written will shortly be submitted to the Government for approval.

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# BURKINA FASO

### NAKANBE RIVER (WHITE VOLTA), A DELICATE CONTEXT:

It has to meet the water needs of Ouagadougou, it is equipped with more than 450 installations and reservoirs on its catchment area, and a large dam (200 Mm<sup>3</sup>) is under study... all this on a non perennial river which only flows from June to October!!!

Such a context requires coordination and dialogue within strong structures that widely associate water users.

The Burkinabe Ministry of Water and Environment therefore requested the International Office for Water and Adour-Garonne Water Agency, with the

support of the French Ministry of Cooperation, to design a new institutional organization to meet the needs of public decision-makers, users and NGOs.

The setting up of a Basin Committee on the Nakanbe and of a self-supporting body, managing the resource at basin level,

is now envisaged.

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# ASIA INDONESIA

## "CLEAN RIVER" PROGRAMME (PROKASIH) IN EAST JAVA

Indonesia, as one of the most densely populated countries in the world, is now entering the era of industrialization. Industrial development had a good impact on the economic development of the country and on the working opportunities for the population. But, because of limited treatment facilities and urbanization, development had a dangerous impact on the environment. The water quality of certain rivers has significantly deteriorated.

Thus, a crash programme became necessary. The Minister of State for Population and Environment in cooperation with the Minister of Home Affairs and the Governors of the eight priority provinces established PROKASIH, abbreviation of PROGRAMME KALI BERSIH (Clean River Programme) in June 1989. Its objective is to improve river water quality by decreasing the pollution load entering riverbeds during the dry season and by creating public awareness on a

clean and healthy environment.

Nowadays, PROKASIH is implemented on more than 40 rivers in 17 provinces in Indonesia, including 6 rivers in East Java. It is focussing on controlling point-sources of water pollution from industries and will be followed by other sources such as domestic and agricultural pollution sources.

In 1993, Jasa Tirta launched the Clean River Campaign (Safari Kali Bersih) along the Brantas river.

After six years, PROKASIH has managed to reduce industrial pollution and to improve river water quality. Although the standards of pollution abatement mentioned in the masterplan have not yet been achieved, the positive point of the programme is effective pollution control activities based on a high commitment of Local Governments and on public participation.

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## COST RECOVERY SYSTEM

Perum Jasa Tirta (PJT) is a public corporation established by the Governmental Decree of 1990. It is a public service for the utilization of the water potential in the Kali Brantas basin to meet the demands of many people.

However, as a public corporation, PJT has to follow the principle of business management in order to make profits to be used in the public interest.

PJT has been levying a "water service fee" from users since 1991 under a "cost recovery

system" to cover the costs of operation and maintenance of water resources structures in the area.

So far, flood control and water quality management are still exempted from this operation and maintenance fee. The parties that participate are the State Electricity Company (PLN), Local Government Water Enterprises (PDAM), industries and commercial agriculture.

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# INDIA

## PURNA RIVER BASIN

A national symposium on "Integrated approach to the management of water and soil in Purna river basin" was organized in Nagpur on February 2-4, 1996.

Purna River Basin has unique features, as out of the 7,500 sq.km watershed, an area of about 3,000 sq.km is occupied by saline groundwater. The situation of drinking water supply is highly critical.

Surface water development in the region is negligible, in spite of the fact that average rainfall is 800 mm per year. Thus, the region is lagging in socio-

economic development. This situation can only improve if efforts are made by all concerned, by integrated planning and by developing water resources in the area.

The symposium reasserted the principle laid down in the National Water Resources Policy (1987), that all development projects should be formulated within the framework of a masterplan for a river basin/sub-basin.

**Dr. S. M. Dhabadgaonkar**  
**Visvesvaraya Regional College**  
**of Engineering**  
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# CENTRAL ASIA

## THE ARAL SEA

The Scientific Information Centre (SIC) of the Interstate Coordination Water Commission (ICWC) for the Aral Sea Basin was established on December 5, 1992.

Located in Tashkent (Uzbekistan), SIC carries out scientific investigations for Central Asian States in order to improve environmental and water management in the basin: common water management policy, common programme for saving and increasing water resources in the Amudarya and Syrdarya river basins, water transfers from other basins into the Aral Sea, environmental sanitation of the

region and how to overcome the consequences of the Aral Sea deterioration and of water resources depletion, monitoring systems for both river basins.

In addition, SIC ICWC is responsible for: cooperation on the use of water saving technologies and on the improvement of irrigation systems, publishing a periodical to inform regional water organizations, and for the coordination of international projects on regional water management in Central Asian States.

**Victor A. Dukhovny**  
**(SIC ICWC)**  
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*Cleaning of a river in Indonesia*

# WESTERN SIBERIA

## NEW ORGANIZATIONS IN THE TOM RIVER BASIN IN RUSSIA

The Tom River basin covers 6 Russian regions and belongs to the Ob basin, the longest Russian river. Its surface area reaches 62,000 km<sup>2</sup>, its length is over 800 km. This basin comprises 342 rivers of more than 10 km. Population is 3 million inhabitants and 90 % of the total surface area is located on Keremovo and Tomsk territories.

Intensive use of natural resources, especially coal, has caused the present crisis. Due to water resources depletion and pollution, the Tom has become the "dirtiest" river of Russia.

More than 2,100 million of m<sup>3</sup> of wastewater are yearly discharged, 474 of which are badly treated and 83 are not treated at all. Water is polluted by petroleum based products, nitrates, nitrites, nitrogenous materials and phenols which cause the deterioration of the population's health.

Tomsk and Keremovo Administrations have decided to improve the structure for water resources management. Therefore, an agreement was signed by the French and Russian Ministries for the Environment to set up an experimental River Basin Agency for Tom river. An Executive Directorate for water supply in the basin was established in 1994 and will be reorganized as a River Basin Agency.

Then, the Tom River Basin

Committee was created in November 1994 with the assistance of French specialists and of Tomsk and Keremovo Roskomvods.

The committee members are representatives of the most important users, from Regional administrations and State organizations in charge of water management.

In compliance with the cooperation programme, 3 groups of experts participated in a training programme in France in order to study the experience and activities of the Water Agencies.

A seminar and a study tour were organized in 1995 to study the English, German and Dutch experiences.

Following this training, some principles were laid down: need to improve management structures (creation of River Basin Agencies), monitoring of all tributaries, preparation and implementation of priority programmes and planning, measures for water protection.

The River Basin Committee also carried out, with the French enterprise "Bature-Environment", an evaluation of potable water and wastewater treatment in Keremovo, Tomsk and Novokouznetsk towns, within the framework of TACIS programme.

**Valentin Najdanov**  
**Tom River Basin Committee**  
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# LATIN AMERICA

## COLOMBIA

### CHECUA PROJECT

The objective of the Checu Project is to control erosion and rehabilitate degraded soils.

In phase I, the project has centered its work on the reclamation of an area located 80 km North of Bogota which includes the hydrographic basins of Checu, Sutatausa and Ubaté rivers, and Cucunuba Lagoon at a height above sea level comprised between 2,600 and 3,400 m and with a surface area of 60,700 ha.

Phase II, whose duration will be 4 years (1995-1998), aims at protecting the basin of Fuquene Lagoon, located 20 km North of above area, a surface area of 9,000 ha in which installations will be built to control the erosion process.

In the past, rural populations used lands in an inadequate manner and generally exerted an abnormal and harmful pressure on natural resources. This led to a strong erosion on most of the basin area. But, thanks to the measures developed by the

project, 17,000 ha of Checu basin could be reclaimed and 43,000 ha are at present in the course of being rehabilitated in the other basins.

It has been necessary to interest the inhabitants of the region in environmental issues. Thus, rural communities have been associated since the beginning to the planning and application of methods for erosion control and reforestation. Up to now, 8,000 households, i.e. 40,000 persons, have participated in the project implementation.

The important advantages that will result from the project can be summarized as follows: increase in agricultural land potential, improvement of the food supply for the population, decrease in flood hazards in downstream areas, reduction of sediment transport as well as a reduction of the cost of water treatment for human consumption.

**Diego Bravo Borda**  
Regional Autonomous  
Corporation of Cundinamarca  
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## ECLAC

The United Nations Economic Commission for Latin America and the Caribbean has recently published documents which are of interest to INBO:

- Management procedures for sustainable development,
- Public Policies for sustainable development : integrated river basin management,
- Report of an experts' group meeting on the implementation of Agenda 21 as regards integrated water resources management in Latin America and the Caribbean,
- Progress made in the application of the recommendations gi-

ven in Chapter 18 of Agenda 21 on integrated water resources management in Latin America and the Caribbean.

**THE CIRCULAR LETTER N° 4 OF ECLAC** continues the discussions on the participation of the private sector in public water services.

ECLAC is also announcing that its work will be centered on integrated water resources management at the level of hydrographic basins and on price use in water resources management.

**Axel Dourojeanni, Terence R. Lee & Andrei S. Jouravlev**  
(ECLAC)  
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## BRAZIL

### A BASIN COMMITTEE FOR ITAJAÍ-AÇU RIVER

A new body will take charge of the main river of this region of Santa Catarina State and of its tributaries. It is the Regional Committee for the Management and Monitoring of the Itajaí-Açu river basin.

Its establishment was decided in March 1996 during a meeting of the Blumenau Industrial

and Commercial Association (ACIB) which gathered representatives of the State and of the 47 municipalities concerned to find solutions to the problems encountered in the maintenance of three dams with a system of flood control, and to organize dialogue.

**Extract of the "Santa Catarina Newspaper" of March 9, 1996.**

## COSTA RICA

### THE TEMPISQUE RIVER BASIN

The Tempisque River basin, located in the North-West of Costa Rica, covers 5,454 km<sup>2</sup>, i.e. more than 54 % of the Guanacaste province with 190,400 inhabitants.

The main problems encountered in the basin are: the uncontrolled use of the resources, the lack of planning for the development of production activities, the use of pesticides and agrochemical products that cause pollution, discharges from sugar factories.

Destruction of wetlands, deforestation, soil compaction or monocultivation have led to the loss of rain water and thus to resource scarcity.

A commission for the rehabilitation of Tempisque river was created in April 1993. In September 1994, the Ministry of Natural Resources, Energy and Mines (MINAE today) decided to set up an inter-institutional and multi-disciplinary "Management Unit" to carry out basin management.

The creation of the CIVIL COUNCIL OF TEMPISQUE BASIN in which representatives of municipalities, enterprises and NGOs participate, has led to works being started again in the basin and to a permanent follow up of the sustainable management project.

Actions will be carried out to assist communities' projects, especially in the most degraded areas, and an environmental education and professional training programme will be implemented to provide the communities with the necessary management tools.

The **Management Unit** has participated in several projects on the Liberia river and Piches and Panteon torrents with the Lower-Tempisque communities and in the management of wetlands in Balsan district.

**Mrs Maureen Ballestero**  
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## VENEZUELA

### MONITORING THE QUALITY OF RIO TUY WATER

The Ministry for the Environment and Renewable Natural Resources has set up, through the Sole Authority of Rio Tuy basin, a system for monitoring surface water quality in Rio Tuy basin.

A first monitoring programme started in November 1995 and continued up to April 1996, with 25 weeks of uninterrupted work. 75 samples were withdrawn, with a total of 1,336 measurements dealing with solids, chemical oxygen demand (COD) and biochemical oxygen demand (BOD). It has been the start of a permanent monitoring system based on

on-site measurements and analyses in laboratories.

The monitoring network comprises 9 stations on the rivers and deals with the industrial discharges chosen to comply with a priority action programme.

A multiparameter equipment is used for the field measurement of pH, conductivity, dissolved oxygen and temperature of air and water. Observations necessary for result interpretation are also noted.

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Rio Tuy Basin Agency  
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## PANAMA

### TERRITORIAL ENVIRONMENT AND WATER COMMISSION OF BUGABA

The first basin organization, called the Territorial Environment and Water Commission, was established in Panama by the municipal decree of May 14, 1996 and was ratified by Mr. Manuel Aquiles Caballero, mayor of Bugaba, and Mrs. Milagrosa Ortega, executive secretary.

It is an autonomous body which depends on the municipality of Bugaba and is supported by the Ministry of Health, the National Institute of Drinking Water Supply and Sanitation, the National Institute of Renewable Natu-

ral Resources, the Council of Municipal Representatives, the Ministry of Rural Development and the Institute of Water Resources and Electricity.

This Commission is to be an example so that other regions protect and rehabilitate their aquatic ecosystems.

From the legislative point of view, the #35 decree of September 22, 1996 created the new National Water Commission.

**Eduardo Castro**  
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# CAPRE

Presently, CAPRE is working on the preparation and follow up of training programmes for member countries in the potable water supply and sanitation sector.

For more than a year, CAPRE has been implementing a training programme with the assistance of the Institute of Potable Water Pipes and Sewage Mains of Costa Rica. This programme is financed by IDB and French Cooperation, within a Cooperation Agreement with NANCIE. A training course on wastewater was held in France from September 2 to November 15, 1996 for 16 participants of the region.

It consisted in training trainers on design and maintenance of sewage networks and wastewater pumping systems, waste-

water treatment plants, monitoring of receiving media and on systems for industrial effluent treatment.

CAPRE also organized two important meetings at regional level:

- The V<sup>th</sup> Meeting of the Regional, Technical Training Committee that was held in San José de Costa Rica from June 24 to 27, 1996.
- The VI<sup>th</sup> Meeting of the Regional Technical Committee for Water Quality, organized in Tegucigalpa - Honduras, from August 18 to 21. This enabled both Committees to adjust their programmes to meet regional priorities.

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# EL SALVADOR

## THE RIO ACELHUATE BASIN

The basin of Acelhuate river, a tributary of the Lempa, the longest river of the country, approximately covers 733 km<sup>2</sup>, i.e. 3.5 % of the national territory. It is mainly composed of dry plains surrounded by volcanoes.

It crosses the metropolitan area of San Salvador (MASS), whose present population reaches 1.5 million inhabitants. The basin lands are mostly used for agricultural production, mainly coffee, sugar cane and cereals. The pressure exerted by the population on land and urbanization have caused the erosion of soils and torrent beds and water pollution.

At present, the Acelhuate is an open sewer as many informal urban settlements have developed on its banks.

### SUSTAINABLE MANAGEMENT OF ACELHUATE RIVER BASIN: A "SHARED MANAGEMENT"

Three governmental institutions share Acelhuate basin management: the Ministry of Public Works (MOP) in charge of urban sewerage, the Ministry of Agriculture and Stockbreeding

(MAG) responsible for erosion control and the National Administration of Potable Water Supply and Sanitation (ANSA) in charge of wastewater discharges.

There is no institution responsible for land use regulation.

Up to now, municipalities and communities have not intervened in the present management scheme, nor the Lempa Executive Commission (LEC) responsible for energy production.

A pilot programme has been proposed.

But, owing to the institutional context of the country, a reduced action has been retained to progressively lead to permanent larger actions.

The works should be carried out with the active collaboration of communities which would establish a project coordination council, directed by San Salvador municipality.

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# REDNAMAC

## IV<sup>TH</sup> NATIONAL MEETING

The National River Basin Management Network (REDNAMAC), created by the Ministerial Resolution of May 31, 1993, is a coordinating body in charge of promoting and disseminating actions related to river basin management. REDNAMAC has already organized national meetings in the cities of Lima, Huaraz and Cajamarca.

The largest irrigation systems of the country: Poechoa, San Lorenzo, Tinajones; conservation units such as the national reserve of Manglares de Tumbas, the national park of Cerros de Amotapa as well as dry woods, soil erosion problems and land desertification in the upstream part of basins, Ayabaca and Huancabamba for

# CUBA

## CAUTO RIVER BASIN

The Cauto is the largest Cuban river. With a length of 343 km, its drainage basin covers 8,969 sq. km. and comprises the territories of several provinces, Santiago de Cuba, where it springs, Holguin, Las Tunas and Granma, its mouth being located in the latter.

Water regulation has been reached with hydraulic infrastructures built to meet water demands for irrigation, industry and human consumption.

Salinity increase is one of the main problems encountered in the Cauto as regards its water quality.

Hydraulic infrastructures and monitoring networks are being independently operated by each province involved. Water balance -quantity and quality- is measured at national level.

The country's economic development and its human impact on natural resources have led to the creation of a "Focal Point" in charge of:

- quantity and quality control, management supervision and water resources planning,
- controlling water allocation to users,
- coordinating the actions of the basin provinces to improve the operation of monitoring and observation networks,
- operating hydrologic forecasting systems, and improving the geological and hydrogeological knowledge with an integrated and multidisciplinary approach.

**Daniela Mercedes Arellano Acosta**  
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instance, are regional aspects that could benefit from an analysis within the framework of river basin management at national level.

REDNAMAC organized its fourth meeting from October 22 to 26 in Piura with the support of the Regional Institute of Water Resources Management (IRAGER). It dealt with the pre-

cise definition of the role of the national network and of regional sub-networks, and exchanged experiences on the various aspects of basin management in Peru in order to encourage the setting up of as many regional networks as possible.

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# LATIN AMERICA

## MEXICO

### THE RIVER BASIN COUNCIL OF MEXICO VALLEY

Mexico City's metropolitan area, one of the most densely populated regions in the world with almost 18 million inhabitants, that is 19.4 % of the Mexican population, is located in Mexico Valley, a closed basin covering 9,600 km<sup>2</sup>.

In order to meet the increasing demand, it is necessary to import water from neighbouring basins, overcoming a height of 1,100 m by pumping and conveying it by pipes over a distance of 120 km.

The basin, which remained closed until 1789, has nowadays 3 outlets draining 46.5 m<sup>3</sup>/s of waste and storm water to be used in an irrigation project of 85,000 ha located 90 km NW of the city. One of these outlets, the modern Sistema de Drenaje Profundo (Deep Drainage System) features a central tunnel 50 km long, ranging from 100 to 217 m in depth along with a network of lesser ducts with a joint length of 70 km.

Hopefully, by the end of the year 2000, 4 treatment plants should have been installed and working within the metropolitan area with a joint capacity of 73.5 m<sup>3</sup>/s.

These facts have turned Mexico Valley into a top priority area regarding pollution control and regulation.

#### CREATION OF THE BASIN COUNCIL

On August 16, 1995, authorities from the Federal Government, the Federal District and the States of Hidalgo, Mexico, Puebla and Tlaxcala signed a coordination agreement to set up a Basin Council for Mexico Valley.

This Council was established as a bureau that will coordinate joint actions undertaken by the National Water Commission (CNA), government offices at all levels and private users in the basin to guarantee present and future potable water availability, to undertake sanitation projects in Mexico Valley and Tula river watershed, to generate emergency reserve storage and to arrange the financial support needed for these accomplishments, in accordance with Mexico's new planning instruments: the 1995-2000 National Water Plan and the Water Resources Management Project.

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#### Basin council of MEXICO Valley



### LOCAL WATER COMMISSIONS IN THE NORTH BORDER REGION

The 1995-2000 National Water Plan is reorganizing the water sector in Mexico according to a new division of the national territory into 13 administrative basin regions which include the 37 hydrological regions of the country.

According to the 1995-2000 National Water Plan, the "North Border" region is composed of the hydrological regions "Bravo-Conchos" and "Cuencas Cerradas del Norte". At the beginning of 1994, a coordination agreement was signed between the Federal Government and the five States concerned regarding the creation of the Rio Bravo Basin Council.

This region is the largest of the country with a surface area of 315,403 km<sup>2</sup>. It justifies the creation of a Local Water Commission (LWC) in each basin : Casa Grandes, Conchos, San Juan, Upper-Bravo and Lower-Bravo river basins.

These Local Water Commissions will be composed of representatives of all users of the river

basin, of representatives from federal and state authorities and from municipalities. Their objective will be to establish a dialogue on actions for an integrated water resources management and to strengthen financial solidarity in order to solve the water problems of the river basin.

The Local Water Commission of each river basin will be composed of a quarter of representatives of the users, the Federal government, the State government and from the municipalities.

One of the main duties of the Local Water Commissions will be to elaborate local water plans.

The period needed to elaborate local water plans, to be approved and implemented, has to be long enough so that studies and dialogue are properly carried out but sufficiently short so that members of Local Water Commissions are not demotivated.

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## PERU

### THE SANTA RIVER BASIN

In order to meet the food demands of the population, the Peruvian State has just implemented two special irrigation projects in the Santa river basin to develop new lands: Chincas (44,420 ha) and Chavimochio (130,553 ha).

However, the water volume necessary for irrigation exceeds the Santa flow rate in the low water season.

The new withdrawals may cause a serious decrease in the volume of water brought to the sea and disrupt the biological balance of the Chimbote port coastline.

Faced by these problems, the Peruvian Government set up the Autonomous Authority of Santa River Basin on December 14, 1994. It is entrusted with the planning, coordination and promotion of activities for a sound development and use of natural

resources but also with carrying out an evaluation and making propositions to improve water and soil management and environmental conservation.

The Charter for the organization and operation of the Autonomous Authority was approved on March 29, 1996.

It considers that lagoon development in the upstream part of the basin is an alternative solution for better allocating the resources between the basin projects. Therefore, INADE and ELECTROPERU have evaluated the development of the 8 lagoons of the White Cordillera to store, in a first phase, a water volume of 227 Mm<sup>3</sup> for energy and agricultural purposes.

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Autonomous Authority of Santa River Basin  
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## EQUATOR : WATER LAW DRAFT

After the establishment of the new institutional organization of the water sector and the setting up of the National Council for Water Resources (CNRH), Equator is undertaking legal and institutional reforms for an integrated water resources management.

By adopting a new Water Law, the Government expect to:

- pass from local and sectoral water planning and projects to an **integrated and multisectoral approach by taking the hydrographic basin as management unit** in accordance with the general environmental protection policy,
- **organize River Basin Councils** which would be organizations responsible for regional planning

and coordination and would benefit from the participation of the different basin actors,

- **strengthen the authority** in charge of protection, control and penalties regarding the pollution of wastewater discharged into the rivers,
- **transfer operational functions to regional organizations and reinforce their ca-**

**capacity for commercial management,**

- **organize awareness campaigns** to encourage water savings and water quality protection,
- **encourage the intervention of private investors** for a sound use of water rights.

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# THE MEDITERRANEAN SPAIN

## THE RIVER BASIN, FRAMEWORK FOR WATER MANAGEMENT

Due to the particular climatic conditions of the greater part of the Spanish territory, water availability with suitable quality is the basic constraint to development. A secure water supply has been, is and will be the prerequisite to any activity.

Handicapped by an unfavourable hydrological context, the Spanish society endeavoured to palliate its water shortage by making huge efforts to improve the scarce and irregular water resources.

Many hydraulic infrastructures were built by original institutions. The role played by Syndicates of irrigation users is well known as they ensure the efficiency of irrigation systems and their organization and operation have been a model for many irrigation schemes over the world.

Yet, the long Spanish tradition of river basin management, that the Water Administration had to adopt in order to solve the conflicts generated by the complex hydraulic problems, is less known.

The Royal Decree of March 5,

1926, established Hydrographic Confederations, and another Decree passed at the same period created the Ebro River Basin Confederation, the Ebro being the main river of the Spanish territory.

The principle of respecting river basin unity, was the essential element of water resources management in the new Water Law of 1985. In order to reconcile this basic principle with the new Spanish territorial organization, which provided Regional Autonomous Communities with wider power, the new Water Law differentiates the case of a river entirely located on the territory of a sole Community which is entrusted with its management, from the Hydrographic Confederations which are responsible for the management of intercommunity river basins.

In the future, the Hydrographic Confederations will have to adapt themselves to the new conditions imposed by a dynamic environment.

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## DOURO BASIN

### AUTOMATIC SYSTEM FOR HYDROLOGICAL INFORMATION

The Hydrographic Confederations must adapt the natural resource to requirements in order to achieve an always more efficient management of water use, from water supply, irrigation, hydropower and industry, etc., to flood control in rivers.

Thus, it is necessary to have a widespread, quick and real system for getting information on the flowrate evolution in rivers and dam-reservoirs to take the necessary operating measures.

Thanks to new technologies, based on mathematical models and computerized support, an ambitious automatic information programme could be implemented. It takes into account the specific characteristics of Douro river basin. Rainfalls are scarce and mainly under the form of snow in the mountains.

Floods occur even when no rain falls as they are caused by a rise in temperature that melts snow.

### THE "HYDRODOURO" NETWORK

The Hydrodouro Network was built during these last 3 years as an integrated part of the SAIH system that the General Directorate of Hydraulic

Works is in the process of installing in all the river basins of the peninsula. This system is used at basin level.

The first studies of this project were initiated in May 1991 and work started in December 1992. The system became operational in April 1994, when the irrigation campaign was launched.

Thanks to the Hydrodouro Network, the knowledge of parameters necessary for properly operating the State canals can be obtained by remote sensing and in real-time.

All data converge by telecommunication means into a Data Processing Centre, housed in the restored building of lock 42 on the Canal of Castille near Valladolid. This centre also houses a small hydraulic museum.

Investment now amounts to 1,700 million pesetas. It has been financed by the General Directorate of Hydraulic Works. Information is to be used by all people, starting with the teams of the Douro Hydrographic Confederation, going on with Syndicates of irrigation users, Administrations and civil defence departments, to finally end with Universities and research teams.

**Antonio J. Alonso Burgos**  
*Douro Hydrographic Confederation*  
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## TAGUS BASIN

The Hydrographic Confederations have managed Spanish water resources for more than 70 years. Pioneers of river basin organizations, they have kept an operation scheme close to the present one all along their history. At first, these organizations belonged to the Ministry of Development, then to the Ministry of Public Works and now, for the first time, they are added on the organizational chart of the new Ministry for the Environment, created by the Royal Decree of

March 5, 1996.

The new Ministry comprises a State Secretariat for Water and Coastal Areas composed of the General Directorate of Hydraulic Works and Water Quality which supervises the Hydrographic Confederations, the General Directorate of Coastal Areas and the Spanish Technological and Geomines Institute.

**José Antonio Llanos Blasco**  
*Tagus Hydrographic Confederation*  
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## ALGERIA STATUTES AND MISSIONS OF BASIN ORGANIZATIONS

The decree of the Government Council of March 6, 1996 defined the river basins and laid down the statutes of public management institutions as well as those related to the 5 River Basin Committees and the National Water Council.

① The 5 River Basin Agencies are public institutions which operate under an industrial and commercial management and which carry out a mission of public service linked to water resources management.

② The River Basin Committees

form the adapted framework for dialogue in which members are commissioned to discuss and express their views on all water-related issues in the river basin.

Each River Basin Committee has 24 members and is equally made up of representatives from the Administration, local authorities, and of the different potential users.

③ The National Water Council completes this institutional structure. It is chaired by the Head of Government and composed of the Ministers of all sectors concerned with water.

## NEW WATER POLICY

After a long period of reflection and dialogue, the Ministry of Public Works and Regional Planning has just completed a whole stock of statutory measures which will enable it to implement the new water policy.

These texts bring innovations of great importance on the following points:

- Consideration of water as property of the national community.
- Integrated water resources management on the scale of the river basin.
- Strengthening of arrangements aiming at water re-

sources preservation, laying down obligations as regards the treatment of urban and industrial effluents.

- Setting up of planning tools, such as masterplans on national and regional scale.
- Strengthening of the sanitation obligation.
- State incentive and assistance as regards water saving.
- Widening the system of concession of public services to private legal entities having the necessary qualifications.

**Ahmed Ajabi**  
*Ministry of Public Works and Regional Planning*  
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## MOROCCO

### SIGNING OF AN AGREEMENT ON WATER

On the occasion of the visit of Mrs C. LEPAGE, French Minister for the Environment, on last 18 and 19 April to her Moroccan counterparts, Messrs BENOMAR, Minister for the Environment, and MEZIANE, Minister of Public Works, a cooperation agreement on Global Water Management was signed by Messrs JELLALI, Director General of Water, and P. ROUSSEL, Director of Water.

The main projects that were retained are the setting up of a pilot organization for the management of OUM ER R'BIA basin, of which the International Office for Water will be coordinator on the French side in collaboration with NANCIE, and flood prevention.

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# EUROPE FRANCE RHINE-MEUSE

## A TRANSBOUNDARY SCIENTIFIC COOPERATION



### A GOOD EXAMPLE OF AN APPROACH TO THE STUDY OF MOSELLE AND SARRE RIVERS

High decreases in dissolved oxygen content have been observed these last few years in the Sarre and especially in the Moselle. They occurred in low water periods, during summer, and were accompanied by the sudden disappearance of planktonic algae. These had not been seen before.

Beyond borders, the technical organizations of all countries concerned have been cooperating since 1961 within International Commissions for the protection of Moselle and Sarre rivers (CIPMS).

The first investigations led to:

- outline the geographic extent of the problem,
- observe that our present knowledge is insufficient to check whether the actions of pollution control that have started are enough to sufficiently improve the situation and to decide on possible additional actions.

The partners have agreed on the necessity for a 3-year research programme, the implementation and coordination of

which was entrusted to the International Water Centre (NANCIE), whose multidisciplinary competence is well-known.

German, French and Belgian research teams, specialized in modelling, biology and hydrology, are involved in this programme.

The States also strengthened the routine measurements made in these watercourses. The Rhineland-Palatinate Lander made its laboratory boat available.

This cooperation is a good example of the management of transboundary watercourses.

The mutual skills of the teams involved and technology transfer have demonstrated the importance of developing this type of partnership regarding scientific as well as cultural and political aspects.

The results of this work should be available in 1997. The expertise capacity and experience that developed during this project can be used in other geographic areas that face the same difficulties.

**Jean-Pierre Schmitt**  
NANCIE  
**Daniel Assfeld**  
Secretary to CIPMS  
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## INTERNATIONAL COMMISSION FOR THE PROTECTION OF MEUSE RIVER

### THE RHINE-MEUSE RIVER BASIN COMMITTEE COMMITS ITSELF

Keeping up with the spirit of Helsinki Agreement of March 17, 1992, an international cooperation agreement was signed on April 26, 1994 in Charleville-Mezieres (France) for protecting the Meuse, thus creating an International Commission.

One of the original aspects of this agreement is that the signatories to this agreement are the Belgian Regions and not the Federal Realm of Belgium, at the side of the French Republic and Kingdom of the Netherlands.

It is the first international agreement that commits the Belgian Regions, due to the recent changes in the Constitution.

Another important aspect to be noted is that one of the signatories to this agreement, the Brussels-Capital Region, is not located in the Meuse River

basin but almost a third of its inhabitants drink Meuse water.

Due to these particularities, local decision-makers and economic actors-water users had to be associated to the Commission on the French side.

The Rhine-Meuse River Basin Committee, real local water parliament, fitted the bill. Therefore, the French delegation comprises two personalities chosen by the Rhine-Meuse River Basin Committee in addition to its Chairman at the side of State representatives.

This experience in international cooperation is not new for the Rhine-Meuse river basin, as it has been involved for several decades in international work regarding the protection of the Rhine, Moselle and Sarre rivers.

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# ADOUR-GARONNE

## A COMMON TECHNICAL MISSION BETWEEN "ELECTRICITY OF FRANCE" AND THE WATER AGENCY



In 1991, "Electricity of France" (EDF) and Adour-Garonne Water Agency signed a partnership agreement for sharing the management of the basin resources and especially planned to:

- adapt the equipment and management of some hydroelectric installations of EDF, in order to find medium-term solutions for recharging the low water flow in a few bad sections of the basin by relay-reservoir discharges.
- establish the conditions for EDF to provide the Agency with its technical and scientific skills related to the Agency field of action.

### AN ORIGINAL ORGANIZATION

The establishment of a Common Technical Mission (CTM) EDF-Water Agency is certainly one of the most innovative aspects of this agreement.

In reality, its action covers the following topics:

- **Comparison of water needs with available resources** to carry out discharges of relay-storage reservoirs,
- **Execution and coordination of the studies** decided in common. CTM can act as a common office by directly carrying out studies.
- **Role of observer and watcher.**

The Common Technical Mission is a joint team making decisions with one accord. It is composed of representatives of both organizations and of a full-time EDF engineer on secondment to the Agency who coordinates, or-

ganizes and manages activities on his own and with impartiality.

The financial means necessary for the good running of this structure and for the implementation of its programme are equally provided by both organizations.

### A RICH AND DIVERSIFIED ACTIVITY

The covenant between EDF and the Agency was signed at a time when a serious drought hit the Adour-Garonne Basin. So this agreement first dealt with low water replenishment and water resources mobilization.

Some changes have occurred since. It was particularly the case of the water law of January 3, 1992 which dealt with the preparation of the Masterplan for Water Development and Management (SDAGE).

Within this framework, CTM saw its field of action widened by taking into account the qualitative and ecological aspects of aquatic media.

Among the main topics which were discussed, agreements on reservoir discharge, follow up of sluicing and flushing of dams, or also the drawing up of plans for the collection and treatment of floating wastes, were retained.

The Common Technical Mission is an original organization, without any equivalent in France. It enables privileged and permanent exchanges between both organizations and ensures the consistency of their action policies.

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THE MEUSE River

## GENEVA LAKE : A FRANCO-SWISS TRANSBOUNDARY COOPERATION

Since 1950, French and Swiss specialists have been gathered in the General Union of people of the Rhone and applied themselves to describe the state of the waters of Geneva Lake and of the Rhone, with a view to incite riparian States to control pollution.

The International Commission for the Protection of Geneva Lake Water (CIPEL) was born in 1960 on these foundations. It is an organization that sprung from the will of France and Switzerland to work together for defining and managing the monitoring programme of the largest alpine lake and its watershed.

Furthermore, the international agreement invested the Commission with the responsibility to prepare every year a series of operational recommendations, based on the monitoring of the state of Geneva Lake, to propose trends of action to both countries as regards pollution control.

### THE ROLE OF THE WATER AGENCY

The Rhone-Mediterranean-Corsica Water Agency (RMC) plays an essential role in the Commission:

#### ● In the political field

Its Director is an ex-officio member of the Plenary Commit-

tee, alternately chaired by a representative of each government, which gathers every year the most important administrative and political authorities of the three Swiss cantons (Geneva, Vaud and Valais) and of the two French riparian departments (Ain, Upper-Savoy). He is also Chairman of the Technical Subcommittee for a three-year period.

#### ● In the technical field

Specialists from the Water Agency participate in the Technical Subcommittee and in working groups.

Thereby, the Agency is in the most favourable position to ensure the consistency of the actions carried out by CIPEL within its action programme on the eutrophication control of the Lake.

#### ● In the financial field

Switzerland and France respectively provide 3/4 and 1/4 of the financing. The Agency ensures, equally with the French Ministry for the Environment, the financing of the French share (MFF 2.5) of the monitoring programme. The Ministry for Foreign Affairs bears the French contribution to the financing of the secretariat.

The Agency is the essential relay between local, departmen-

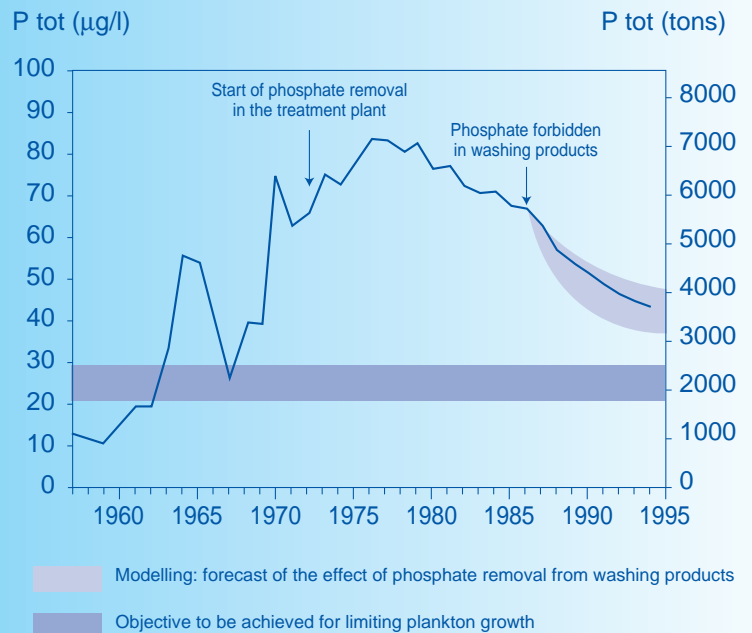
tal, regional and even national decision-makers, in order to apply the stated recommendations.

It does so by referring to its action programme and to Geneva Lake Action Plan for year

2000, called "Lake Geneva, tomorrow" which is one of the main components.

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### Evolution of Phosphorus content in GENEVA LAKE



## SEINE-NORMANDY

### THE WATER ACADEMY

The Water Academy was established in March 1994 on the initiative of the French Ministry for the Environment and Water Agencies. It is entrusted with the organization of a prospective and multidisciplinary reflection on water resources management, while directing a platform for information exchange and for a scientific watch. Its secretariat is run by the Seine-Normandy Water Agency.

The Academy members, chaired by Pr DAUSSET, Nobel Prize of Medicine, have defined twenty or so topics of reflection to be developed in the future.



One of the topics chosen during their meeting in Toulouse on March 1, 1996 is of particular interest to INBO members. **It deals with the comparison of experiences gained in river basin organization all over the world.** Case studies should be written on INBO river basins from the available documentation. It concerns the analysis of structures and means of action set up in these test river basins (the Rio Bio Bio in Chile, the Rio Doce or the Paraiba do Sul in Brazil, the Valencia Lake in Venezuela, the Rio Grande of Tárcoles in Costa Rica, the Rio Lerma in Mexico, the Brantas in Indonesia, in Poland, Hungary and Russia) in order to compare them with management experiences which have been existing for a long time in France, England, Spain and the Ruhr.

A first analysis should permit to present, by the end of 1996, a report to be submitted to the reactions of the different actors concerned and which could be used as a basis for a reflection on new trends, encountered difficulties and corrective actions to be taken.

It also seems interesting to thoroughly examine the practices of the industrial sector. This category of water users is one of the first concerned when a water charge system is implemented in a river basin.

Industrial discharges are concentrated and localized. This increases their impact on the environment but make their treatment easier, and industry is in a better position to integrate environmental costs. As an example, industrial discharges in the Seine-Normandy river basin are

nearly equivalent to domestic discharges, but 90% of them are controlled as compared to only 40 % for communities which have to cope with the problem of collecting effluents.

The reflection topic that was mostly put forward by the Academy members concerns the relations between water, town and town planning. 23 towns throughout the world have already been studied. The results of these observations will be presented during a symposium at UNESCO on April 10 and 11, 1997.

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# HUNGARY

## WATER RESOURCES MANAGEMENT

About 96 % of Hungarian surface water resources originate from the upstream neighbouring countries.

Groundwater recharge areas also extend beyond the borders of the country, expanding to the ridges of the Carpathian Mountains.

About 80 % of the country's surface water resources come from the Danube and Drava rivers, while the Tisza river provides 20 % of the resources, although it covers 50 % of the country's territory.

Hungary can hardly control the quality of the water arriving in the country from abroad. Unfortunately, all transboundary waters are polluted to a certain extent, with the exception of those from Austria.

### ORGANIZATION

The Ministry of Transport, Communication and Water Management is in charge of water quantity and quality protection, water utilization control, flood and land drainage control, river and lake development, prevention of damages caused by water.

Three administrative bodies, headed by a Deputy State Secretary, are responsible for the administration of water affairs within this Ministry.

The National Water Authority (OVF) is a nation-wide organization of the Ministry of Transport, Communication and Water Management. In addition to its own duties, OVF provides administrative and professional guidance and supervises the

Regional Water Authorities.

There are 12 Regional Water Authorities, one for each catchment area. They are the real "basin" organizations. Their main administrative task is the management of water resources in accordance with the Water Law and their main regulatory task is water right licensing.

They also have major technical duties such as water distribution, operation and maintenance of watercourses, flood control and protection of infrastructures and water reservoirs of national importance, and river navigation.

A national organization, the Flood Defence and Land Drainage Control Organization (ABKSZ), is also under the supervision of the National Water Authority.

Water quality control of surface and ground waters, including related regulatory and supervisory tasks, is within the competence of the Ministry for the Environment and Regional Policy, which has established 12 Environmental Inspectorates, whose borders are also based on catchment areas.

The Regional Water Authorities and the Environmental Inspectorates cooperate in making water resources available and in studying the issue of withdrawal licenses.

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## THE USE OF EMERGENCY FLOOD RETENTION RESERVOIRS

23% of the 93,000 km<sup>2</sup> of the Hungarian territory are endangered by floods. This area includes a quarter of the population and one third of cultivable land. Flood threat is the greatest after the Netherlands in Europe.

Owing to the climatic and geographic conditions of the Carpathian basin and surrounding mountains, floods can occur all year round. Floods, caused by ice melt, are also very dangerous and must be reckoned with. These rivers have a torrent regime upstream and in the event of a quick snow melt or heavy rainfalls their water level can rise quickly by several metres, sometimes within a few hours. The Koros rivers are particularly dangerous because their level can rise by 8-10 metres within 28-36 hours.

As topographic conditions prevent flood storage in mountainous regions, earth dikes have been built on 4,000 km along the rivers. Floods are thus held and the water level can be 3 to 8 metres higher than the surround-

ing area, that is to say that the population is exposed to a constant danger.

The dikes are mainly exploited by State water services but only 58% of them meet safety standards. Therefore, it has been necessary to retain the peak flood of torrents. Thus, the system of emergency flood retention reservoirs was developed.

The reservoir is a flat area, limited by circular dikes, that can only be used in an extreme situation to avoid disaster. Otherwise, it is used for agricultural and silvicultural purposes.

In Hungary, there are ten sites for retention reservoirs representing a total area of 218 km<sup>2</sup> and a total volume of 363 million of m<sup>3</sup>. They had to be used eight times between 1966 and 1995. This method has proven to be successful and efficient.

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## VISIT OF A MEXICAN PARLIAMENTARY DELEGATION

Following INBO's General Assembly, a Mexican parliamentary delegation, headed by Mr. Montes, Chairman of the Water Commission, and composed of Messrs Almada, Cordoba and Castillo and Mrs Casco, studied the Hungarian experiences in water management from August 13 to 15, 1996.

On August 13, the delegation was received by the Hungarian Parliamentary Committee for Environmental Protection.

The programme of visits was organized by the National Water

Authority: the Parliament members visited Siófok city where the water development of Balaton Lake was presented, then Keszthely town, at the centre of the Small Balaton technical services in Western Transdanubia. They were impressed by the large surface areas devoted to the protection of Balaton Lake water quality.

The visit of the Metropolitan Water Supply Company of Budapest ended the programme.

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# SLOVAKIA

## PROJECT FOR THE MORAVA REHABILITATION

"POVODIE DUNAJA", the Danube River Basin company was established in 1966. A State-owned company since 1990, it deals with the management and maintenance of watercourses and operation of hydraulic works. It administers a territory of 5,896 km<sup>2</sup>, representing 12% of Slovakia.

The company deals with the management of water works, protection against floods, supply of surface water and control of its quality, project investment, design and implementation.

The project for rehabilitating the Morava between Tvrdonice and Devín (STP Morava) is an example of the relation between water management and the environment. The Danube River Basin Company has been working on

this project since 1994 in cooperation with the Research Institute of Water Management (Vyskumny ústav vodného hospodárstva) in Bratislava and the Institute of Zoology and Eco-zoology of the Slovak Academy of Sciences.

A tributary of the Danube, the Morava has a relatively low flowrate and when it began to be used intensely in Central Europe, the river basin became a forbidden frontier zone with Austria and the Czech Republic, with strictly controlled activities. The river was shortened by building up dams and, today, the flood-prone areas between the dams only represent 20% of the initial threatened area. In 1993, the Slovak basin was entered on the list of the world's most important marshlands (Ramsar convention).

The objectives of STP Morava, the completion of which is scheduled for 1998, are:

- to compare the current state of the environment and water-development regulations with those existing at the beginning of the twentieth century and to find out the main trends in the development of the river system,
- to determine the optimum values of biotic indicators to be secured when implementing essential water-management activities,
- to find model solutions and prognoses for developing the area that are compatible with environmental protection and rehabilitation,

- to establish environmental management, rehabilitation and revitalization measures compatible with flow regulation.

The results of the research will be the basis for an alternative development of the Morava and its river basin. The limits of the actions planned in this territory will be stated in the final report, that is why this project will become a basic document for regulating activities and modifications of any kind within the territorial unit considered.

The STP Morava is linked to the project for "biodiversity protection" of the World Bank.

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# ROMANIA

## THE RIVER BASIN COMMITTEE : A NEW INSTITUTION FOR WATER MANAGEMENT

Romania is a country with relatively scarce water resources, a great variety of runoffs in time and an irregular distribution over the territory. Such a situation explains the concern of the Romanian State since the beginning of the 20th century, for a judicious regulation of water resources use and protection. The first law on "Water Regime in Romania" was therefore adopted in 1926.

After 1944, owing to the social and economic development, a new water policy became necessary to meet the more and more important demands. This new policy was put into a concrete form with the elaboration of masterplans and with the adoption of the river basin as a basic unit for the quantitative and qualitative management of water resources.

Thanks to this new arrangement, all necessary measures were better integrated to meet water demands, water resources quality and quantity conservation and the protection against water harmful effects.

After 1989, the new socio-economic conditions in Romania led to the establishment of the Autonomous Water Authority "Apele Romane" with the objective of a water management based on modern principles.

These changes in structure and concept on the scale of the society and water sector resulted in changes and adaptations of the legislation. Accordingly, a new water law was drawn up and approved by Parliament.

This new "Water Law" took into account the elements of former legislations, while introducing new concepts : the "polluter-pays" principle, public participation in decision making, financial and economic mechanism, creation of River Basin Committees.

## CLEANUP PROCESSES FOR WASTE-WATER DISCHARGES BY REFINERIES AND OTHER CHEMICAL INDUSTRIES

The Autonomous Water Authority "Apele Romane" of Ploesti administrates the Prahova and Teleajen rivers. In this region, chemical and petrochemical industries have negative effects on water pollution.

Both rivers were very polluted until a short time ago, especially by hydrocarbons and iron ash.

But the situation has chan-

Thanks to the establishment of River Basin Committees, the cooperation which already existed between water management units and their main beneficiaries was institutionalized. A decentralization of decisions and a better involvement of the public will become effective with time. Thereby, River Basin Committees are composed of representatives of local governmental authorities, local authorities, non-governmental organizations, water management units and users.

They will be able to influence water management policies in general and make decisions at river basin level. Owing to the wide range of interests represented in the River Basin Committee, from the agent responsible for environmental protection to the user, all aspects of the water management issue will be known and thus making better decisions will be possible to achieve a better use of water resources.

In the same way, the participation of the public, who will therefore be better informed, will lead to an awareness of problems and to the acceptance of measures, works proposed and solidarity between users.

Although River Basin Committees are recent institutional structures in Romania, we hope that all interested parties will adapt rapidly. We are grateful to the countries which have supported us for a quick integration of the River Basin Committee in water management in our country, to France, Great-Britain and the United-States in particular.

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ged with facilities designed with the support of Apele Romane.

Thanks to these installations, the concentration of hydrocarbons in wastewater has been reduced from 80-120 mg/l to 2-4 mg/l and iron ash from 1200-1600 mg/l to 30-60 mg/l. They are also used for water aeration.

**V. Calamaz**  
**"Apele Romane", Ploesti.**

## NEW LAW ON ENVIRONMENTAL PROTECTION

The new law on environmental protection of December 29, 1995 is based on a few basic strategic principles and elements such as caution during decision making, prevention of ecological risks, preservation of biodiversity and specific ecosystems, priority removal of pollutants which directly threaten human health, establishment of the national environmental integrated monitoring system, protection and improvement of environmental quality and rehabilitation of degraded zones, as well as the development of international cooperation.

The law plans the application of the "polluter-pays" principle and the possibility for the Government to grant tax cuts or exemptions and other fiscal terms to industrialists who replace dangerous substances in manufacturing processes or who in-

vest in clean technologies or other special measures for ecological protection or rehabilitation.

The principles of the new law ensure a sustainable development and the access to information for the population and non-governmental organizations who may appeal to the court within the environmental protection framework, whomever may be the person who has been wronged.

The new water law, which has just been approved by Parliament, has been drawn up in close correlation with this environmental law of December 29, 1995.

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# UKRAINE

## PILOT SOUTH BUG RIVER BASIN: REFORM OF THE FINANCING SYSTEM FOR WATER PROTECTION

In 1995, Ukraine established measures for financing the implementation of the new river basin system. A Governmental Decree was drafted by the 7 Regional Administrations of the South Bug river basin to create the State Regional Environmental Commission with the aim of drawing up a strategy for water resources management.

Under the conditions of economic reform, with the new market economy, a special mechanism was needed to finance water protection. In accordance with the existing legislation, the funds coming from payments for water utilization, water pollution and for violations of water legislation go to the budgets of some 600 governmental bodies of the basin. But, under conditions of economic crisis, this income is used for different purposes than water protection.

Therefore, this income must be centralized into a special account, and appropriate changes in the existing legislation are needed.

Another problem is the lack of a clear delimitation of responsibilities between ministries

regarding water resources management. The State Committee for Water Management is responsible for building hydraulic works, regulating flowrates in the basin rivers and controlling water resources utilization. The Water Management Departments of the South Bug river basin are supervised by this Committee and have such tasks as: work planning, exploitation of water systems, monitoring, water allocation and authorizations for water withdrawals.

The research on the possibility of establishing a financial river basin agency, while taking into account the existing legislation and the limited financial resources of the new economy, underlined the necessity of adding new functions to the existing river basin management bodies such as levying and collecting the costs of water protection. The right to manage and use these amounts was given to the State Environmental Commission. ...

... UKRAINE (cont.)

This Commission will be composed of representatives from the 7 regional administrations of the South Bug river basin and the main water user ministries. It will be headed by the representative from the Ministry for Environmental Protection and Nuclear Safety. In the future, the Commission could be opened to other water users such as municipalities and non-governmental organizations.

The transformation of the institutional structures for water management will require efforts to make changes from the traditional to the territorial principle.

Prerequisites for the setting up of this reform could be drawn up from the work of Ukrainian and French specialists. They are: changes in the country's legislation, raising the interest of enterprises and population in a more efficient use of water charges, setting up relations between the public and the management bodies.

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## POLAND KRAKOW RZGW

### WATER QUALITY CONTROL IN THE UPPER VISTULA BASIN

Independently of its usual duties, RZGW is responsible for launching the "Planning and Administration of Water Management" project, which is a component of the "Strategy of Environmental Management" programme, financed by the World Bank and by the Ministry for Environmental Protection, Natural Resources and Forestry, and whose objective is to control groundwater quality and to build protection areas for municipal intakes.

The regional network for groundwater water quality control (MRQES) was set up in 1991 in the Upper Vistula river basin and the Krakow Academy of Mines was entrusted with the preparation of economic and technical terms and with the survey coordination. In 1993, an equipment was acquired by RZGW to carry out field measures and prepare samples. It consisted of laboratory-vans fitted out with a material to carry out withdrawals and basic mea-

asures on site. The Academy of Mines, the Geology Company of Krakow and the Geology Institute of Kielce have been carrying out field measures. These surveys were financed on the Phare programme budget.

The project objectives are: identification and permanent control of groundwater quality, evaluation of groundwater resistance to surface water pollution, forecasting of water quality changes in a pluriannual cycle, identification of impacts of natural and anthropogenic processes on water quality.

MRQES network should be used to check the simulation models necessary for preparing regulations for the use of the river basin water.

In 1993, Krakow RZGW, in cooperation with the Water Management and Meteorological Institute (IMGE) and the Krakow ODGW, also set up on the "Kosciuszko" waterfall, the first pilot station to monitor the salinity of the Vistula water.

The results are automatically transmitted to the RZGW data base and are used by large industries: Skawina and Polaniec power stations, Krakow Leg thermal power station, Sendzimir smelting works.

During 1994 and 1995 summers, in low water period, Krakow RZGW transmitted every day information on the Vistula salinity and flowrate to Krakow Regional Inspectorate for Environmental Protection (IRPE).

The possibility of using Polish equipment for water control and automatic data transmission is under study.

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## WROCLAW RZGW

### CONFERENCE ON "SMALL RESERVOIRS AND ENVIRONMENTAL MANAGEMENT"

This scientific conference was held in Wroclaw on June 14 and 15, 1996.

Twenty-six papers presented an overview of the present state of knowledge on the possibilities of improving water supply for agriculture with small reservoirs.

It has been demonstrated that ponding water with a controlled outflow in early spring significantly reduced the low-

ring of the groundwater table.

The conference was the first national forum that followed the 21 December 1995 Agreement between the Minister of Agriculture and the Minister of Environmental Protection, Natural Resources and Forestry regarding cooperation on a small retention programme. Reference to the Agreement was made in the paper "Small Retention Reservoirs in the

Upper and Middle Odra River Basin", which presented priority projects based on retention reservoirs with proposed locations and hydrological criteria.

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# The network newsletter

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