



RESEAU INTERNATIONAL  
DES ORGANISMES DE BASSIN

INTERNATIONAL NETWORK  
OF BASIN ORGANIZATIONS

RED INTERNACIONAL  
DE ORGANISMOS DE CUENCA

1<sup>st</sup> QUARTER OF 1998 N° 6

# The network newsletter

## INTERNATIONAL CONFERENCE " WATER AND SUSTAINABLE DEVELOPMENT" PARIS - 20 MARCH 1998 **INBO**

### AN EXPERTS' WORKSHOP ORGANIZED BY INBO

The 1997 **General Assembly** of the International Network of Basin Organizations, accepted, during its meeting of last October in VALENCIA ( Spain), the invitation made by the French Authorities to organize a Workshop, specialized on the topic "**Users' Participation in the Management and Funding of Basin Organizations**", in the Water and Sustainable Development International Conference, that will be held in Pa-



ris (France) on 19, 20 and 21 March 1998 at UNESCO headquarters.

The work of this INBO workshop is based on papers that were requested to the 106 member-organizations which participate in our Network in 43 countries, and will lead to practical recommendations to be presented during the Ministerial Session of the Paris Conference by our Chairman, Mr. Juan Manuel ARAGONES BELTRAN, President of the Jucar Hydrographic Confederation.

The International Network of Basin Organizations was also invited to participate in the seminar of experts that took place in HARARE (Zimbabwe) on 28, 29 and 30 January 1998 by the UN Commission on Sustainable Development (UNCSD) and the European Union.

All the works must contribute to the preparation of a programme for improving water management worldwide to be integrated into the prospects given by AGENDA 21, adopted during the Rio Conference.

It is of particular importance that all member-organizations of INBO are mobilized to contribute to this strategic preparation of the XXI<sup>st</sup> century.

**See article "Water and Sustainable Development" International Conference on page 5.**

#### Information:

Fax : +33 1 40 08 01 45

E-mail : [stp-riob@oieau.fr](mailto:stp-riob@oieau.fr)

#### Next INBO meetings

- ◆ **May 1998**  
2<sup>nd</sup> meeting of the Basin Organizations of Central America and the Caribbean  
**Guatemala City**
- ◆ **September 1998**  
1<sup>st</sup> General Assembly of the Regional Network for Latin America  
**Bogota - Colombia**
- ◆ **2 - 4 December 1998**  
3<sup>rd</sup> General Assembly of INBO  
**Salvador de Bahia - Brazil**

[www.oieau.fr/riob/](http://www.oieau.fr/riob/)

From now on all information on INBO will be available



**on the WEB**

[www.oieau.fr/riob/](http://www.oieau.fr/riob/)

# "FINANCING BASIN ORGANIZATIONS"

**A** "Technical seminar on the financing of Basin Organizations" was organized during the General Assembly of the International Network of Basin Organizations, which was held in VALENCIA (Spain) from October 2 to 4, 1997, at the invitation of the Spanish Authorities.

During this "technical seminar", the delegates of INBO's Member-Organizations had the opportunity to listen to addresses on the on-going experiments in their different Countries and to discuss the suitability and efficiency of the

funding systems adopted or envisaged and on the practical conditions of their setting-up.

At the end of the presentations of case studies and discussions that followed, the delegates adopted the following recommendations, and expressed their wish that those be widely disseminated and sent to the Authorities of the Countries interested or involved in a policy of river basin management and to the large bi- and multilateral cooperation institutions that support programmes of administrative reforms of the water sector based on such an approach.

## REMINDER OF THE RELEVANCE OF INBO'S FOUNDING PRINCIPLES

The works confirmed the relevance of the four principles that are the base to any membership of the International Network of Basin Organizations:

- a global and integrated water resources management that aims at preventing natural hazards, meeting the rightful and sound needs of the various categories of users, controlling pollution of all kinds, protecting and rehabilitating aquatic ecosystems and areas,

- the organization of this management on a consistent scale, that of large watersheds and aquifers,
- the participation in decision-making of the local Authorities concerned and various interested categories of users beside the appropriate Governmental Administrations,
- the implementation of appropriate financing systems, based on the "user-polluter-pays" principle.

## A COMPLETE VISION OF ALL THE TASKS TO BE CARRIED OUT

This global and integrated management of the resource implies that tasks be carried out in a complementary and consistent manner, regarding:

- general administration, security and enforcement,
- structuring developments,
- individual and collective equipment that are directly linked to the use of water for meeting various needs,
- operation, maintenance and management,
- research and studies,
- training, education and awareness raising,
- organization of monitoring and information systems,
- etc.

**All these tasks must be organized in a sustainable manner and their funding in investment and operation must be mobilized and guaranteed whatever the conditions.**

The direct costs of water services are generally the ones to be individualized and therefore visible. The indirect costs, often covered by the Public Authorities, are ignored or under-estimated, and in all cases rarely fully and rigorously estimated together with operation, maintenance and management expenses...

It is very important to get a clear and complete vision of all the costs to be borne.

## THE TRANSPARENCY NECESSARY FOR REACHING A CONSENSUS AND MOBILIZING ALL PARTNERS

All functions are not always assumed by a sole organization and the most frequent case is that of coexistence, in the same basin, of many responsibilities and initia-

tives, either individual or joint, public or private.

A consensus must be found.

.../...

## RECOMMENDATIONS

.../...

It is thus necessary to establish, in a clear, indisputable and transparent manner:

- the role and responsibilities of everyone,
- the state of the resource, either in quantity or quality in all geographical locations,
- the withdrawals and discharges of each user,

- the estimate of expenses to be covered and the follow-up of efficiency of effort as regards improvement.

**The setting up of modern and efficient information systems**, according to the recommendations of INBO's General Assembly of Morelia (Mexico) in March 1996, is a prerequisite to the mobilization of all partners and to the search for a consensus.

## LONG-TERM RULES, OBJECTIVES AND PRIORITIES TO BE PROGRESSIVELY REACHED

Any sound water policy implies **regulations, procedures and standards** that clearly define a **legal framework** and the **commitments** of each party concerned.

The objectives to be reached and the necessary means of all kinds must be identified in **master-plans for development and management**, for a 15 to 20 year-period.

**This policy must indeed be planned in the medium-term**, due to the delays required for mobilizing partners and for the study and implementation of projects,

and, on the other hand, due to the general limitation of available financial means that does not allow the implementation of all projects at once.

The elaboration of successive **Priority Action Programmes (PAP)**, the duration of which must be realistic and may be 5 years, is the instrument for the implementation of this planning.

**Thus, the efforts required and possible implementations must be progressive and sustainable.**

## LIMITS OF TRADITIONAL PUBLIC FUNDING

All analyses converge to show that almost everywhere, it is impossible to meet the needs of the sector with traditional public budgetary means and therefore **it is necessary to set up funding systems that are based on the participation and solidarity of the users.**

Due to the lack of a sole responsibility, **complementary specific means must be envisaged that have also a reducing effect and create an incentive to limit wastage and decontaminate discharges.**

The modern funding systems must be adapted to the proper situation of each country, but may generally rely on:

- **administrative taxes for the issue of authorizations (deed cost) or for the use of State property** (taxes for granule ex-

traction, concession taxes for hydroelectric falls or infrastructure or reservoir land width, taxes on waterway transportation...)

- **penal fines** for non compliance with regulations and standards or for liability in case of an accidental or deliberate action causing damage
- **industrial and commercial tariffing of collective services related to water uses:** It consists in having the consumers and users pay all the direct, and whenever possible the indirect costs, of the collective services, either in investment and maintenance, in proportion to the services provided or to consumption (drinking water, wastewater, industrial raw water, irrigation, etc.)

.../...



INBO's General Assembly gathered in Valencia (Spain) 105 delegates from 27 countries (see page 20)

TECHNICAL SEMINAR  
03 OCTOBER 1997

.../...

These services, organized by either public or private organizations, must balance their expenses with an income.

The setting up of subsidy systems that aim at limiting the exceptionally high costs and/or for equalization between the various categories of users may be adapted to the diversity of the situations encountered.

- **water charges**, that are earmarked taxes to finance actions and equipment for the benefit of the community and whose cost cannot be directly passed to the different water users.

## **BASIN WATER CHARGES: A MEANS FOR FUNDING AND MOBILIZATION IN PARTNERSHIP**

Local water charges systems in particular, organized on the scale of a river basin, have already shown their high efficiency. This does not exclude the advantage of using national water charges systems that are justified by constitutional rule or allow the funding of solidarity between towns and rural areas or between rich and poor basins, or the funding of large inter-basin projects or actions.

In "operational" systems that exist, the "**Basin Committees**" generally set or propose rates for

It is advisable that the basis of such charges be calculated proportionally to consumption and pollution of all kinds, of all categories of users.

They enable the, total or part, but incentive, funding of Priority Action Programmes (PAP).

Successful experiments that have been carried out for several decades, show that all these financial means can mobilize, if efficiently implemented, the huge amounts necessary for the modernization of the water sector and resources conservation.

these water charges, the levy and reallocation of which transit by "Financial Basin Agencies".

**These "Financial Basin Agencies" play the role of mutual-aid funds and levy taxes**, negotiated and even accepted by the users concerned, whose rates are calculated to cover the expenses required for multiannual Priority Action Programmes (PAP).

A small levy (# 15 %) as compared to the direct cost of water services, can mobilize huge

amounts to implement such actions, and, in addition, can help reducing investments.

There is transparency and direct correlation between a real programme and the funds brought in. This approach, which is based on a consensus system, the Basin Committees, is making people highly responsible and is educational.

It is important to show, as soon as these new measures are taken, **the universality principle of levying charges on all uses and pollution**, whatever their importance, even minimal, in order not to make people believe that pollution is allowed and not to create inequalities.

However, in the phases of the system strengthening, that can be long, for reasons of administrative efficiency or for being generally accepted, a "non-levy" of charges can be envisaged below some thresholds, if no risk of serious consequences on resource conservation exists.

**The system must be progressively organized**, in the medium term, to extend the system to more parameters, to more categories of users, to higher and higher rates and to lower and lower thresholds ...

**Modulations** may be envisaged depending on the scarcity of the resource or the sensitivity of the receiving media to pollution.

This can also be organized progressively, using technical criteria, such as the installation of meters to **measure consumption**, starting with the biggest users, then using **standard assessment systems**, and finally **real assessments** of the pollution discharged. The very high cost of meters and sampling, most of the time prevent its systematic implementation in the short term.

**It is always recommended not to theorize the procedures to be established, but to search for a real adaptation to local conditions, which also depends on the possibilities of organizing more and more complex and efficient administrative systems while taking into account the indispensable time factor.**

*The Permanent Technical Secretariat  
IOW - Paris  
Fax: 33.1.40.08.01.45  
E-mail: stp-riob@oieau.fr*

# **INBO: "AQUADOC INTER"**

## **FIRST MEETING OF THE MANAGEMENT COMMITTEE**

The first meeting of "Aquadoc-Inter" Management Committee, was held in Limoges (France) on December 11 and 12, 1997.

The Management Committee of "AQUADOC-INTER", which gathers the National Relay Documentation Centres (NRDC) nominated by INBO's basin organizations, implements the tools necessary for providing the users with a clever reading of information, using identical exchange formats.

It gathered the national focal points of BELGIUM (VMM), FRANCE (IOW), HUNGARY (Vituki), MOROCCO (ONEP), MEXICO (Lerma Chapala Centre), POLAND (IMGW), ROMANIA (Apele Romane) and the CZECH REPUBLIC (Povodi Moravy).

Several other countries are interested in participating in the project: BRAZIL, BURKINA FASO, CHAD, IVORY COAST, KAZAKHSTAN, PERU, RUSSIA and SENEGAL.

### **TRIAL OF THE FIRST MODEL**

The International Office for Water, as INBO's Permanent Technical Secretariat and French NRDC, has implemented a model

for accessing to water-related information and documentation on Internet in the field of river basin management.

This model shows how to strictly arrange information and documents. It comprises tools for a bilingual search of information (English-French). It is a dynamic system which centralizes exchanges, enables on-line debates and the dissemination of news, etc. It enables the follow-up of the new information loaded on the network, thanks to a system called "VIGIE".

It is now accessible, in a static manner, on [www.oieau.fr/eau-doc/abo/aquadoc](http://www.oieau.fr/eau-doc/abo/aquadoc) as a trial.

### **SEARCH ENGINES**

Two European famous bilingual search engines (English-French) are tested.

A query made in a language is translated by the system to search the relevant information in both languages. Extension to the Spanish language is envisaged at the beginning of 1999.

Their efficiency in searching information will grow when dictionaries specific to water will be developed and added.

### **THE INFORMATION STRUCTURE**

In a first phase, the information gathered (about 20 MO) is raw and processed by engines in the following formats: text, html, RTF when images are integrated (optical character recognition -OCR- or word processed electronic documents).

The documents are presented with their title, the degree of relevance as compared to the query, the "supplier" country, their date and the weight of the information (in Ko).

A standardization, "standard for the exchange of documentary information", is however necessary for later feeding the system in all points of the planet from NRDCs.

### **TERMS FOR THE DEVELOPMENT OF THE "AQUADOC-INTER" SYSTEM**

The system is "live" and requires a specific follow-up, with a central webmaster and correspondents in NRDCs.



# INTERNATIONAL WORLD WATER COUNCIL

## FIRST GENERAL ASSEMBLY IN MONTREAL

At its first General Assembly in Montreal, Canada, on 3 September, the World Water Council elected its Board of Governors and approved its Constitution.

Dr. Mahmoud Abu-Zeid, Minister of Public Works and Water Resources of Egypt was elected President of the Council.

The General Assembly was held concurrently with the 9th World Water Congress of the IWRA. A total of 119 World Water Council members from more than 30 countries were represented. There were also 120 observers.

Executive Director, Dr. Guy Le Moigne, emphasized the success of the World Water Forum in Marrakech in March 1997.



### ELECTION OF GOVERNORS

The new Board of Governors is composed of 38 members:

- the three founder members, Dr. Abu Zeid, Mr. R. Coulomb and Dr. Aly Shady,
- a representative of the City of Marseilles,
- the representatives of the 10 constituent organizations: IWRA, ICID, the World Bank, IAWQ, IWSA, UNDP, UNESCO, IUCN, WSSCC and the Mediterranean Agro-Institute.
- a further 19 members elected by the General Assembly, including Messrs. J-F. Donzier; General Manager of IOW and representative of INBO's Permanent Technical Secretariat and P-F Ténrière-Buchot, Director of the French Seine-Normandy Water Agency,
- 5 Governors co-opted by the other Governors to help ensure geographical, sectoral, gender diversity.

### STANDING COMMITTEES

Mr. Ténrière-Buchot (Seine-Normandy Water Agency, France) was appointed Chairman of the World Fund for Water which will be a separate entity to receive and manage contributions from foundations, the private sector and other organizations, Mr. Chitale (ICID) presides over the Regional Centres Committee, Mr. A Szollosi-Nagy (UNESCO) over the Publications and Information Committee, Mr. J. Lecornu over the By-Laws Committee and the Treasurer, Mr. L. Bays (IWSA), presides over the Finance Committee.

### COOPERATION

WWC has attained a membership of 152 organizations, representing 34 countries, including 23 international organizations. It cooperates with GWP (Global Water Partnership). WWC aims at becoming a think-tank on world water policy.

*Guy Le Moigne - WWC*  
Fax: 33.4.91.99.40.01

## UNEP THE BASIN-WIDE APPROACH TO PROTECT EUROPEAN SEAS

According to studies conducted in various regions throughout the world, coastal ecosystems, which are twice as biologically productive as inland areas, suffer roughly nine times more environmental damage. This damage is primarily attributed to the high density of human populations along coastal regions and anthropogenic pressure generated in the drainage basins. As a result, both major economic industries and key ecosystems are threatened. To arrest the damage, it will be necessary to limit or prohibit certain kinds of coastal development and reconsider developmental policy in the drainage basins.

Europe was a pioneer in co-operation for protection of marine environment on a sub-regional level. Agreement for Co-operation in Dealing with Pollution of the North Sea by Oil (Bonn, 1969) is the oldest sub-regional legal instrument. Tenth of instruments of this kind were developed and adopted in the world since then. For example, UNEP Regional Seas Programme covers 13 sub-regions world-wide, with the participation of more than 140 coastal States and territories. Four sub-regions in Europe (North

Sea, Baltic, Mediterranean and Black Sea) are covered by regional conventions. An interlocked management of freshwater and marine systems is a new emerging instrument.

The Final Declaration of the First European Seas at Risk Conference (Copenhagen, October 1994) called all European governments, the European Union, and other interested bodies to adopt, as the basis for all future initiatives in the protection of the European seas, integrated ecosystem approach focusing on the re-establishment of natural processes, to deal with the sea, coastal and catchment areas. **The formulation and implementation of policies and programmes for integrated watershed management was assigned a high priority by the Nineteenth Special Session of the United Nations General Assembly.**

UNEP is promoting such an integrated approach in implementing Action Theme "Coastal and Marine Ecosystems" of the Pan-European Biological and Landscape Diversity Strategy.

Practically the whole European region is already covered by some sort of programmes relevant to the protection of biological and landscape diversity of freshwater and marine environment. The most challenging task will be an extension of geographical coverage in order to include hinterland areas.

The "Global Programme of Action for the Protection of Marine Environment from Land-Based Activities" (GPA/LBA) and the "Global International Water Assessment" (GIWA), may be a particularly effective way for promoting and achieving the chosen aims and objectives.

For its analyses, UNEP's Regional Office for Europe relies on the results of a report "Preparation of Sub-regional Programmes in Europe on the Protection of Coastal and Marine Environment based on Watershed Approach".

*I. Zrajevski*  
UNEP's Regional Office for Europe  
Fax: 41.22.797.34.20

## AIDA THE INTERNATIONAL ASSOCIATION FOR WATER LAW

The AIDA Association has consultative status with the ECO-SOC and several United Nations agencies (FAO, WHO, UNESCO, UNEP, the World Bank). It was founded in Washington, during the Water for Peace Conference in 1967, when the need for an NGO to provide a forum for questions concerning water law became evident. Since then the importance of water laws and modern methods of management, basin agencies in particular, has been increasingly emphasized.

A well conceived water legislation constitutes a means to facilitate the rational utilization of water resources and to protect the environment.

Planning, development and management of water resources must be based on sound water law principles which are implemented by clear procedures.

The purposes of the Association are to:

- promote studies and publications on the legal aspects of water management and administration.
- encourage the exchange of ideas and the diffusion of information about water law and administration.
- advance the evolution of water law.
- develop national legislations concerning water.
- sponsor research centers, seminars and working groups in which water law is discussed.

Upon request, the Association provides the names of its experts in national and international water law.

The Association sponsors international conferences which provide an opportunity for participants to make oral or written presentations concerning issues of water law and administration.

The proceedings of each conference are published in the ANNALES JURIS AQUARUM. These proceedings provide an extensive summary of contemporary problems relating to water law and administration in different countries, as discussed.

In addition, the Association publishes "AQUAFORUM" newsletter to keep its members informed of activities, publications of interest and conferences involving water law and administration.

All members and non-members are invited to send a copy of their respective country's water laws to AIDA.

*Dante A. Caponera*  
Tel/Fax: (39-6) 8548932

# International Conference WATER AND SUSTAINABLE DEVELOPMENT



PARIS - 19-20-21 MARCH 1998

**D**uring the United Nations Extraordinary General Assembly held in June 1997, a proposal was made by Mr Jacques CHIRAC, President of the French Republic to host an International Conference in France in March 1998, gathering all the actors involved in water policy.

This Conference will take place in Paris from 19 to 21 March 1998, at the invitation of Mr Hubert VEDRINE, Minister of Foreign Affairs and Mrs Dominique VOYNET, Minister of Spatial Planning and Environment, on behalf of the French Government.

This Conference will gather about 600 participants:

- Ministers and high-level Officials from public bodies in charge of water management in 84 countries, including the members of the Commission on Sustainable Development in particular,
- Representatives of the civil society, of financial institutions and international organizations involved in the water sector.

Built on results already obtained during many previous international water policy meetings, the ministerial recommendations and the experts' proposals, elaborated by the participants of the Paris Conference, will provide matters for discussions during the 6<sup>th</sup> session of the Commission on Sustainable Development.

## OBJECTIVE OF THE CONFERENCE

The objective of the Paris Conference is to contribute actively to the elaboration of strategies necessary for improving freshwater resources conservation and management, in rural and urban areas, to ensure better controlled drinking water supply, sanitation and irrigation, integrating desertification control into these objectives.

## WORK ORGANIZATION

**The Conference is organized in two main phases :**

- A meeting of Experts from Thursday 19 morning to Friday 20 midday
- The Ministerial session, from Friday 20 early afternoon to Saturday 21 midday.

**Discussions will be organized around three topics and workshops :**

### WORKSHOP 1 : IMPROVING KNOWLEDGE OF WATER RESOURCES AND WATER USES FOR SUSTAINABLE MANAGEMENT

Knowledge of the resource and needs assessment are indeed a prerequisite for an overall and balanced management of water resources. It implies the setting up, maintenance and operation of monitoring networks and data banks. The objective, in liaison with International Organizations (WMO and UNESCO in particular), is to lead on to actual projects that will improve monitoring networks or decision-making support systems. The progressive setting up of these networks, with appropriate international funding, would enable each country to better organize sustainable water management planning.

### WORKSHOP 2 : PROMOTING HUMAN RESOURCES AND INSTITUTIONAL CAPACITY BUILDING

The sustainability of investments in the water sector cannot be ensured without establishing consistent institutional systems covering all the phases of the water cycle. This is the case, as much in rural as in urban areas. This also implies the development of training programmes for resource managers and the diffusion of professional training on water management techniques that are appropriate to the different countries as well as actions involving the awareness and education of the users and the public. Such programmes must be considered as an essential complement to investments.

This workshop will assess the necessary progress towards an improved efficient concerted action between public authorities, local communities, public and private service providers and will also examine the means of associating water users.

### WORKSHOP 3 : DEFINING STRATEGIES FOR SUSTAINABLE WATER MANAGEMENT AND IDENTIFYING APPROPRIATE FINANCIAL RESOURCES

The investment requirements in the water sector are considerable and greatly exceed the present means being mobilized at national level and by the international donors' community. It is thus necessary to combine, using innovative approaches such as a policy on demand management, adapting to local conditions, participation of the users, the mobilization of international, national and local financial resources, whether public or private. The objective of developing plans of actions : allocating the resources, decontamination objectives, programmes for the development and maintenance of equipments with the mobilization of the appropriate financing must be assessed within the framework of national and regional strategies for sustainable development.

Two informal workshops will coincide with the Conference : the first on the initiative of the Global Water Partnership (GWP), on 19 March afternoon, the second, on the initiative of the International Network of Basin Organizations (INBO), on 20 March morning, on the topic: "involve-ment of the users in the management and financing of riverbasin organizations".

A call for papers has been launched in order to identify case studies illustrating present situations and on-going reforms, as well as proposals for the application of recommendations resulting from previous International Conferences.

A selection of case studies reflecting innovative experiences of the States, the civil society and the international organizations, will be presented during the Conference.

The World Water Council, in close collaboration with the United Nations Agencies and on the basis of an evaluation of actual situations, has been entrusted with the task of identifying the trends and issues which could lead to new strategies regarding water resources management, both global and regional, for the next twenty years.

**An international Steering Committee has been formed:** for each selected topic, it consists of a Minister of one of the invited countries who will preside over one of the three workshops, and who will be assisted by States representatives, personalities of the civil society, some high-level officials of the United Nations Agencies and main international organizations.

This Committee is responsible for preparing draft recommendations, using the papers received and analyzing the conclusions of the previous international meetings, the Harare experts' group meeting of January 1998 in particular, organized by the CSD Secretariat with the support of the European Union countries. It met in Paris, on 12 and 13 February 1998.

The preliminary conclusions were forwarded to all the countries and organizations invited to the Paris Conference, to be discussed in Paris on 19 and 20 of March within the framework of the experts workshops, taking into account the most enlightening information.

**On 21 March 1998, the Ministers in charge of water management in the participating countries will be invited to officially approve the conclusions of the Conference.**

# ASIA

## UZBEKISTAN

### THE INTERNATIONAL TECHNICAL MEETING ON THE ARAL SEA BASIN PROBLEMS

On October 15-16, Tashkent played host to the International Technical Meeting on the Aral Sea Basin Problems, organized by the **Executive Committee of the International Fund for the Aral Sea (EC-IFAS)** on the initiative of the World Bank and UNDP.

The meeting was attended by the Deputy Prime Ministers of the Central Asian States, heads and specialists from ministries, embassies, representatives of over thirty countries, international banks and foundations, the World Bank, UN organizations, experts and specialists from non-governmental and environmental organizations, over 200 participants in all.

It was pointed out at the meeting that the Aral Sea crisis is a stern warning to the international community and illustrates how fast an environmental disaster can develop which threatens the entire region. 20 years ago no one attached much importance to its portent. Twenty years is but an instant in the life of the planet and, in that instant, the world's fourth largest lake is disappearing from the face of the earth, and a population large enough for a European country finds itself at the epicenter of a crisis, under the extremely negative effects of the biggest environmental disaster of the 20th century.

The participants supported the objectives and the following activities:

- **the rational use of water resources** in the Aral Sea basin will be the highest priority in all the Central Asian States,
- the funds of international agencies, donor countries, national governments, local authorities and the EC-IFAS will be focused on **restoring the ecological balance and protecting the population,**
- **the information on the current status of the crisis** will attract the attention of the world public, international agencies, donor countries, individuals and foundations to the environmental threat to mankind posed by the Aral Sea situation and persuade

them of the need to join efforts in rendering immediate assistance in order to mitigate its impact,

- the Aral Sea tragedy will persuade everyone that, **if nations do not realize the full impact of environmental disasters and do not take practical measures to stop the further irrational use of nature, they will jeopardize all humanity,**
- the implementation of commitments made by the five Central Asian States backed by the assistance of the international community will make it possible to stave off this threat and solve major global environmental problems.

The donors' grants amount to over US \$15 million.

The participants pointed out, however, that despite the magnitude of the work done, interventions aimed at mitigating the after effects of the desiccation of the Aral Sea were insufficient, and urged more assistance to the basin programs and additional priorities in poverty alleviation.

The participants at the meeting noted with satisfaction the establishment by the five Central Asian Countries of a regional organization for coordinating the implementation of all the Aral Sea Basin programs and projects - the International Fund for the Aral Sea with its Executive Committee and branches in all the riparian States.

The Executive Committee assumes all responsibility for cooperation with all donors and is ready to act on their behalf in establishing contacts and securing a targeted use of grants and trust funds, as well as all kinds of direct or indirect assistance to the region.

An independent publication of IFAS will enable the permanent monitoring of the crisis and the informing of the public and specialists. **The "Vestnik Arala" bulletin will be published in Russian biannually, and a quarterly newsletter in English.**

**EC-IFAS**  
**Fax: (8-3712) 410730**

# INDONESIA

## OUR MOTTO: ONE RIVER, ONE PLAN, ONE MANAGEMENT

Since 1960, **Brantas River Basin (12,000 km<sup>2</sup>) has been developed**, starting with the first Master Plan. Up to now, there are six big dams and ten small dams being managed by **Jasa Tirta Public Corporation**. Most of them are multi-purpose dams which serve about 14 million people who live in the basin.

The Corporation receives its income from the water service fee paid by the beneficiaries of the water supply allocated for their businesses.

Various problems have to be confronted with, such as conflict of interest between hydro-power generation and water demand for irrigation, water pollution, sedimentation in the reservoirs, river bed degradation due to illegal sand mining etc., which are discussed within the Water Management Committee, chaired by the Vice Governor.

Meetings gathering all the members (Local Government, Irrigation Service, Electricity Company, Drinking Water Supply Company, Board of Fisheries, Meteorological Agency, **Jasa Tirta Public Corporation** etc...) are held at least twice a year, to solve any problem that arises within the basin in case of drought or rainy season.

Nowadays, everything has changed compared to conditions of the 1960's. Industrialization, urbanization etc. are taking place within the basin and the water demand increases, the water quality decreases while there is limited water available, so the Corporation considers necessary to review the Master Plan. The question is how to undertake water conservation for our future generations, our children, grandchildren, etc... Up to now, three Master Plans have been issued, those of 1961, 1973 and 1985, all with different purposes.

In this Comprehensive Management Plan for the Water Resources of the Brantas River Basin Study, besides the review of water resources development, watershed conservation, flood control, water quality and water quantity aspects, we consider also the management of the Corporation itself as a company, so that the feasibility of its existence can be justified, as well as the aspects of river environment, community and beneficiaries (users) participation etc.

We are now planning the holistic approach for managing a river basin ...  
**Ir. Kusumarini, Dipl. H.**  
**Jasa Tirta Public Corporation**  
**Fax : (62-341) 551 976**

# NORTH AMERICA

## QUEBEC

### COBARIC PILOT PROJECT - 2<sup>ND</sup> PHASE

On 24 November last, the Ministry for the Environment and Fauna presided over the signing of an agreement on regional development that will enable the continuation of the pilot project for an integrated water management in the Chaudiere river basin.

During its second 24-month mandate, **the Chaudiere River Basin Committee (COBARIC)** will have to prepare a master plan for water that will include, among other things, a priority action plan drawing up objectives for the water course protection, rehabilitation and development as well as a hierarchical organization of uses.

COBARIC will also have to propose legal and financial means for a possible implementation of this master plan for water and consult the population of this hydrographic territory about this new management approach.

The Minister, in the presence of several parties of the municipal, industrial and agricultural sectors, has underlined that this important project was concretizing the will of the Government and its partners to continue their effort to provide Quebec with a modern and inte-

grated method of water management that is adapted to the context of the next millennium.

On the other hand, the Government of Quebec has started elaborating a water policy and organized a symposium on water management in Montreal on 10, 11 and 12 December 1997.

The purpose of this symposium was to be the first step of this approach and to inform the people interested in water management and enable them to exchange their points of view with experts.

The different topics dealt with were integrated river basin management, groundwater management, water trade and export and the management of municipal infrastructures.

A report on the symposium's conclusions and recommendations was forwarded to the Government.

**Jean Maurice Latulippe**  
**Ministry for the Environment and Fauna**  
**Fax : (1-418) 644 2003**

Indonesia view



# AFRICA

## TECCONILE

### A NILE RIVER BASIN ACTION PLAN

TECCONILE, the Technical Cooperation Committee for the Promotion of the Development and Environmental Protection of the Nile Basin, is an intergovernmental organization of the Nile Basin countries.

The organization's long term objectives are to assist participating countries in the development, conservation and use of the Nile Basin water resources in an integrated and sustainable way, through cooperation for the benefit of all. Equally important is the assistance of these countries to determine the equitable entitlement of each riparian country to the use of the Nile river waters.

The organization's short-term objectives are to assist member states, to develop national water master plans and their integration into a Nile Basin Development Action Plan.

Within this framework, all the riparian states developed an elaborate action plan namely the Nile River Basin Action Plan (NRBAP) that comprises 22 projects with a total cost estimated at US\$ 100 million.

The programme is composed of five main components:

- **Integrated Water Resources Planning and Management:** directed towards efficient water use and development, upgrading water quality and protection of the environment within an in-

tegrated approach to water resources planning and management.

- **Capacity building** whose objective is to strengthen the institutional and human resources capabilities at a basin-wide and national level.
- **Training:** directed towards the improvement of individual and group skills that will be required in Nile countries.
- **Regional Cooperation** whose main objective is to develop a basin-wide multidisciplinary framework for legal and institutional arrangements.
- **Environmental protection and enhancement** directed primarily towards the control of environmental degradation, siltation, pollution and water needs in the equatorial lakes and the White Nile.

*Mrisho M. Kivugo*  
**TECCONILE**  
*Fax: (256-42) 20971/20575*

## OMVS

On 11 March 1972, Senegal, Mali and Mauritania decided to create **OMVS (Organization for the Development of the Senegal River)**, and entrusted it the mission of contributing to the optimum development of their economy.

To reach this objective, an infrastructure programme was implemented for the building of the Dama and Manantali dams.

OMVS has a legal framework composed of 4 agreements, including that on the methods for funding common projects.

This agreement defines investment resources and the funds for operating infrastructures.

Investments were funded by loans.

As regards the operation of infrastructures, the principle of tariff-

ing water withdrawals has been applied since 1987, but the low recovery rate (30%) must be underlined. This is caused by the widely spread population and difficulty of identifying all the users and by a too recent experience in the application of tariffing.

It seems necessary to establish a policy to improve recovery rate and income with a policy for the users' awareness raising, a system for a stricter control of withdrawals, a guarantee for the payment of withdrawals, the progressive adjustment of tariffs and a later application of the polluter-pays principle.

*Mamadou LAKH*  
**General Manager - OMVS Senegal**  
*Fax : 221/61 16 31*

# GUINEA

## A NEW WATER POLICY

Water resources have always been a major concern of the Guinean Government in its socio-economic development policy.

Since the World Conference on Drinking Water Supply and Sanitation (New Delhi 1990), the Republic of Guinea has endeavoured to prepare a policy and strategy in the sector of water resources management.

Within such a framework, the Ministries of Natural Resources and Energy, Agriculture, Water and Forestry, and Urban Planning and Housing, that share responsibilities in this sector, elaborated, signed and published, in August 1996, the "Newsletter of the Sectoral Policy on Water and Sanitation in Guinea" after the publication of the Water Law of the Republic of Guinea.

This newsletter describes the development policy of the Country in the water resources sector as well as the strategies and principles for action in the sub-sectors of water management, drinking water supply in urban and rural areas and of sanitation.

The implementation of the development strategy for this sector will involve the following sub-sectors:

- **Water resources management,** executed by the National Water Directorate (DNH),
- **Urban water management,** under the responsibility of the National Water Company of Guinea (SONEG), a public corporation.
- **Rural water management:** The National Department for the Development of Boreholes (SNAPE) aims at developing 15,000 boreholes before year 2005 for a population estimated at 5.4 million inhabitants, i.e. 360 inhabitants/borehole instead of 625 inhabitants/borehole nowadays.
- **Urban sanitation,** whose implementation is ensured by the Directorate for Land Use and Urban Planning (DATU).

*Lansana FOFANA*  
*D.N.H.*  
*Fax : (224) 41 49 13*

## LAKE CHAD BASIN COMMISSION

The Lake Chad Basin Commission (LCBC) was set up by the FORT LAMY (N'DJAMENA) Convention signed on 22 May 1964 by the Heads of States of the four member countries that share the waters of the region neighbouring the lake: Cameroon, Niger, Nigeria and Chad. The Central African Republic joined the group in 1994.

The Commission is led by the Commissioners' Conference composed of two Commissioners per member State. It meets once a year to examine and approve the Commission's activity programme and budget. The Conference is mandated by the Heads of State that also meets once a year.

The Executive Secretariat is the executive body of the Commission. Its headquarters are in N'Djamena.

Functions entrusted to LCBC are as follows:

- prepare common regulations to fully apply the principles stated in the statutes and in the convention and ensure their effective application,
- gather, examine and disseminate information on the projects

prepared by member States and recommend a timetable for common work and joint research programmes in the Lake Chad Basin,

- maintain a liaison between the contracting parties to use the Basin water in the most efficient way,
- follow up the execution of projects and studies in the basin that depend on the convention and inform member States, at least once a year, by processing the systematic and periodic reports that each State has to send the Secretariat,
- elaborate common regulations on shipping,
- establish regulations as regards its staff and monitor their application,
- examine complaints and contribute to the settlement of conflicts,
- monitor the application of the regulations stated in the statutes and the convention.

*Abubakar B. Jauro*  
**Chad Lake Basin Commission**  
*Fax : (235) 52 41 37*

## FIRST MEETING OF THE BASIN ORGANIZATIONS OF CENTRAL AMERICA AND THE CARIBBEAN

COSTA RICA - MAY 1997

Representatives of Mexico, Guatemala, Honduras, Salvador, Panama, Dominican Republic, Cuba, Nicaragua and Costa Rica met in San José (Costa Rica) on May 14, 15 and 16, 1997 to exchange their ideas and experiences on the topics of water resources management and hydrographic basins, with the support of French experts and of the Inter-American Development Bank.

It is a well acknowledged fact that all above-mentioned countries have been making real efforts in order to protect, rehabilitate and manage water resources and also their commitment to safeguard this precious natural heritage for the future generations. The problems and drawbacks faced in managing water are also well known.

The existence of common aims and problems was emphasized during this meeting. Thus, it appears urgent and necessary to reinforce the exchange of experiences and information among countries.

Thus, it was decided to :

- 1 **Promote the creation of a Forum for the Management of Hydrographic Basins** in Central America and the Caribbean within the International Network of Basin Organizations. This Forum will ensure a permanent exchange of experiences and information in the region.
- 2 **Create an Executive Commission** for the Forum, composed of one representative from each member country, which will elaborate a charter of operation and implement concrete forms of communication and participation of all members;
- 3 **Mandate the Forum's Executive Commission to promote regional workshops which would deal with certain topics specific to river basin**

management, such as water saving (thanks to cost recovery, to the applying of the "user-polluter-pays" principle and to an incentive or dissuasive system), water quality standards and monitoring systems, legal bases for managing hydrographic basins, standard of living of the population,

- 4 **the elaboration of a project of cooperation** among all the countries of the region with regard to the training of technical staff specialized in hydrographic basin management,
- 5 **the opening of the Forum** to representatives from the Caribbean countries.
- 6 **Involve private enterprises and the public** in the activities of the Forum.
- 7 **Encourage regional efforts** for the integration, either formal or informal, of environmental education as regards watersheds.
- 8 **Elaborate a Strategic Plan** with an agenda and specific objectives per country and per region that should integrate the Action Plan of Central America for Water Resources Development (PACADIRH).
- 9 **Organize in 1998 in Guatemala, the 2nd Meeting of the Basin Organizations of Central America and the Caribbean.**

The participants thanked the French Government, the Inter-American Development Bank, CAPRE and the German Cooperation Agency in particular, for their financial support and the help of their experts during this meeting.

*Hubert Mendez  
Maureen Ballesterero  
Fax: (506) 666 29 67*

## INBO - RNLA CREATION OF THE REGIONAL NETWORK FOR LATIN AMERICA

**INBO's Latin American Regional Network was set up during the constitutive meeting held in Brasilia on 9 and 10 July 1997, at the invitation of the Brazilian Ministry for the Environment.**

The Constitutive Assembly was carried out under the supervision of INBO's Chairman, Mr. Eduardo Mestre (Mexico), and with the participation of Mrs. Gentiana Serbu (Romania), Mr. Raymundo Garrido (Brazil) and of Mr. Jean-François Donzier (France) and led to the adoption of the following views:

- INBO's Latin American network will hold its first General Assembly in Bogota, Colombia, in September 1998;
- A proposal regarding the contribution of the member organizations, amounting to US\$ 1,500 per year, per organization, will be presented during this Assembly;

The first Managing Bureau was defined as follows: Chairman: Raymundo Garrido (Brazil), Permanent Technical Secretary: Eduardo Mestre (Mexico), Treasurer: Victor Pochat (Argentina), and four associated members: Maureen Ballesterero (Costa Rica), Pedro Basable (Ecuador), Gustavo Escobar (Colombia) and a member from Chile to be nominated later.

Mrs. Gentiana Serbu (Romania), member of INBO's Liaison Bureau, reminded, when talking about contributions, that INBO's members are neither countries nor ministries but include not only representatives from governments but also water users and members of the civil society.

*Raymundo Garrido  
Director for Federal Water Management  
Fax: (55-61) 223 53 66*



## CAPRE TECHNOLOGIES FOR EFFLUENT TREATMENT AND CONTROL

In the region, as in the other parts of the world, water is one of the most important natural resources for the development of the society. Its quality and quantity have direct impacts on uses and on the public health of inhabitants, especially where nothing is done to control pollution in the water courses.

All countries have elaborated more or less precise laws with the best intentions but with few tools to enforce their effective application.

The lack of use of appropriate technologies is to be regretted as well as that of ministerial competences to control the building, operation and maintenance of treatment plants, and the lack of standards for liquid discharges.

CAPRE (Committee for the Regional Coordination of Potable Water and Sanitation Organizations of Central America, Panama and the Dominican Republic), aware of these problems, has envisaged the initiation and development of actions in the field of wastewater, in close collaboration with GTZ project.

These actions are generally initiated by the National Technical Committees (NTC) for Water Quality (CALAGUA) and are integrated into yearly action plans.

A Programme has been recently elaborated in Costa Rica to apply legislation and reduce the pollution of receiving media.

This Programme comprises the establishment of Standards for Wastewaters, by way of a regulation prepared by a multidisciplinary team that represents State institutions, the various polluting sectors and private consultants. It was published in the Official Bulletin on Thursday 19 June 1997.

It defines the quality standards for wastewater discharge towards the receiving media and sewers, while strengthening control and follow-up actions.

The CAPRE-GTZ project with coffee and sugar cane growers, pig breeders and cheese makers and the Ministry of Health and the Association of the treatment plants of Santa Cruz de Turrialba, is one of the successes obtained in this field.

The continuation of these experiments is planned for the rest of the region, owing to the positive results obtained.

*Iliana Arce Umaña  
CAPRE  
Fax: (506) 222 3941*



# CUBA

## A NATIONAL GROUNDWATER MONITORING NETWORK

The average exploitable groundwater volume of the Cuban Republic is estimated at 6.457 Hm<sup>3</sup>/year. This represents about 30% of the country's water availability.

This groundwater potential is mainly distributed in the hinterland and coastal plains. The resources are split into 165 aquifer systems.

About 52% of the exploitable groundwater resources are used yearly in the country.

To achieve an efficient management of these resources, the country has a **National Groundwater Monitoring Network** that is managed by the Hydrology and Water Quality Centre of the National

Institute (Ministry) of Water Resources, by way of its National Hydrogeological Office and its branches in the 14 provinces and a Special Municipality that constitute the political divisions of the country.

The objectives to be achieved are to:

- **constitute a computerized base** for the systematic assessment of groundwater resources volumes and quality.
- **be a platform** in order to solve the problems of planning the resources use and protection.

Provide public information on the state of aquifers and enforce

measures to guarantee their protection and sound use.

The National Groundwater Monitoring Network is structured as follows:

- **a network for monthly information** on water levels (579 stations) including water level recording stations (111 wells) and **half-yearly information** on water levels (2,589 stations),
- **a hydrochemical network for mere half-yearly measurements** (1,135 wells) and bathometer recording (358 wells),
- **special networks** for sonding and extraction (about 125 wells).

A systematic automatic management of the groundwater data base has been developed since 1982. This work is orientated according to four axes:

- **design and implementation of data bases** (computerized sys-

tems for basic data acquisition, storage, processing and retrieval),

- **mathematical modelling** of aquifers and groundwater dynamics,
- **development of computerized systems for information acquisition and processing** such as water levels, salinity, groundwater physico-chemistry, assessment and control of withdrawals,
- development of application software.

*L.F. Molerio, O. Barros,  
N. Gomez, J.L. Gelabert*  
**Centre for Hydrology and Water Quality**  
Fax : (537) 24 06 80

# BOLIVIA

## INTEGRATED RIVER BASIN MANAGEMENT IN COCHABAMBA

The **Integrated River Basin Management Programme, PROMIC**, depends on the Prefecture of Cochachamba district and on the Swiss Agency for Development and Cooperation, COSUDE. It was established in 1991 to solve the problems of this Tunani cordillera region that comprises 38 micro-basins, sheltering a population of more than 500,000 inhabitants. The origin of the problem is the state of degradation of the mountain range.

PROMIC comprises three strategic components:

- 1 **the reversion of the environmental degradation processes**, especially soil loss through erosion of agricultural lands, using sustainable practices of water and land use, within a participation framework of social consensus with the village communities,
- 2 **the mitigation of natural hazards** in the central valley in order to protect its production infrastructure and reduce losses thanks to an adequate control of landslides, torrents and sedimentation,
- 3 **the reduction of the deficit** using available measures for water resources conservation and for groundwater recharge in the valley.

Work started with biophysical and socio-economic diagnostics, carried out by a multidisciplinary team that proposed 10 priority basins for action in the next ten years using the complementarity of the analysis of satellite imagery and field work.

This study dealt with elements, for each basin, such as: environmental degradation process, its impact on the valley during the rainy season, populations in hazard-prone areas and the urban or rural infrastructure affected.

An action phase was initiated in 1991 in the Taquiña pilot basin.

The **process of regionalization and transfer to an Integrated River Basin Management (IRBM) started in 1996 in the nine other priority basins**. At present, the basins concerned are those of Pajcha and Pintu Mayu that for years have presented a considerable problem to the main agglomeration of the district.

Thanks to the rainfall of the last rainy season, that exceeded by more than 40% the historical average of the Central Valley of Cochabamba, the positive impact of these actions could be measured and the IRBM reinforced as a true regional option.

*Roberto Mendez - PROMIC*  
FAX : (591-42) 91095

# ECUADOR

## WORKSHOP ON BASIN ORGANIZATION

The National Water Resources Council (CNRH) held from the 2nd to the 6<sup>th</sup> of June 1997, under the auspices of the French Embassy in Ecuador, a Workshop on "Operation of Basin Organizations - Experiences in Latin America" in the cities of Quito and Cuenca, for the purpose of beginning a discussion on and analysis of the experiences, both national and international, and advancing toward a coordination between the institutions in an integrated water resources management in Ecuador.

## PROJECT FOR A BASIN ORGANIZATION FOR THE PAUTE RIVER

In compliance with the current concepts of Sustainable Development, the National Water Resources Council (national institution) together with CREA (regional institution) and ETAPA (local institution), intend to reform the current institutional system and organize water entities or organisms at basin level, that can carry out actions to reach an environmental management based on fundamental principles such as: acknowledging river basins as planning units, the articulation of interinstitutional functions, the respect of interests between big and small water users, self-management and self-funding, the effective participation of the users in decision-making, the development of an updated public information system on the availability, uses and pollution in the basin.

The three institutions are interested in carrying out the **design and execution of the study for the establishment of a pilot river basin entity in the Paute River basin**.

The event relied on the participation of Messrs. Axel Dourojeanni and Dominique Berthon and allowed to establish some criteria in order to achieve a new system of water resources management in Ecuador.

On the other hand, it allowed to elaborate a framework of references on the main aspects that should be included in the new Water Law of Ecuador.

The objectives of the project are to:

- 1 Draw up a proposal for **the prevention, control and monitoring of water resources pollution** in the Paute river basin that promotes the integrated management of the area.
- 2 Draw up a proposal for **the future holistic management** of water resources in the river basins of Ecuador.

More than 600,000 inhabitants live in the Paute pilot basin, in which is located the third largest city of Ecuador (Cuenca) and a Hydroelectric station which provides 70% of the energy of the country.

*Victor Rosado Lua*  
(CNRH-Quito)  
Fax: (593-2) 543092

# BRAZIL

## THE CITIZENS FOR WATER MOVEMENT

### Why a Governmental Initiative?

The citizens for Water Movement is an initiative of the Secretariat of Water Resources of the Ministry for the Environment, Water Resources and the Legal Amazonia Region that acknowledges and reinforces the efforts of people that are carrying out relevant actions for the preservation of water.

The movement will enhance the profile, provide support to and help organize those who actively participate in the management of water resources.

The exercised citizenship which underscores the Movement provides a new approach to the management of water resources that fosters decentralized and autonomous management.

Since water has multiple uses, the Government increasingly tends to coordinate the management of water resources, rather than manage the resources themselves.

The Government of Brazil is officially committed to achieving significant results in the preservation of the environment, as expressed in the Agenda 21, one of the results of the 1992 Rio de Janeiro Conference on Environment and Development. The Brazilian people have faced this challenge as an ethical commitment to enhance the standard of living of the future generations.

## A DELEGATION OF THE PIRACICABA-CAPIVARI CONSORTIUM VISITS FRANCE

A Brazilian delegation from the Piracicaba-Capivari Municipalities Consortium visited French institutions during the week of 6 to 10 October 1997. The purpose of this visit was to acquire a good knowledge of water and industrial solid wastes management in France.

At present, in Brazil, especially in the Sao Paulo State, legislation on water and solid wastes and the institutions necessary for setting up water charges on water use are at the core of the debate. This visit focused on cooperation programmes between the Consortium, the Seine-Normandy Water Agency and the Agency for the Environment and Energy Control (ADEME), with the support of the French Embassy in Brazil.

The Brazilian delegation was composed of 34 persons: mayors, town councillors, technicians, representatives from environmental associations and governmental organizations of the Sao Paulo State and of two representatives from River Basin Committees.

### How to participate in the Citizens for Water Movement?

Who are these citizens? Who participates in the movement? Citizens are the technicians who disseminate information, fishermen who protect the lives of fish, environmentalists committed to the preservation of ecosystems, professors who teach environmental protection, farmers who care for the water within their farms, manufacturers who treat industrial wastes and citizens who dispose adequately of the trash because they know that a plain candy wrapper thrown on the sidewalk, will end up first in the gutter, then in a stream and finally in the river.

Thus, it is more important for each citizen to care for the springs and river heads by means of small actions and preventive work, than it is to deal with large volumes of contaminated water.

What really matters is to act appropriately, according to the same objectives. Bernardo Toro says that "shared mobilization" does not require people to be together, or to know each other. It is essential that they share meaning and significance, i.e., collective certainty that "what I do is done and understood in the same way by my peers".

**Reference Center of the Citizens for Water Movement - Brasilia**  
Fax : (55-61) 317 8201

The delegation went to the Seine-Normandy Water Agency, to the International Office for Water and ADEME, and visited installations for the treatment of industrial solid wastes in Limay (SARP Group and France-Wastes), the delegation of the Water Agency in Compiègne, the station for water quality warning and control of Nandy, and the treatment plant of Valantes. Limay's mayor received the Brazilian delegation to informally talk about the public administration of water supply, sewers and wastes services.

A cooperation agreement whose objectives, among others, will be the assisting in the elaboration of a river contract and environmental education.

**Vitorio Rumberto Antoniazzi, Mayor of Valinbos and President of the Consortium**  
**Joao Jeronimo Monticelli, Technical Coordinator**  
Fax : (55-19) 460 40 43

## DOCE RIVER BASIN TECHNICAL AGENCY MAKES PUBLIC ITS WATER QUALITY RESEARCH

The Doce River Basin Technical Agency has made public the results of eleven water quality surveys that were realized during the years of 1993 and 1996. If compared with those found out during the years of 1985 and 1990, these results reveal an improvement of the water quality in 33% of the monitored sections and a worsening of quality in 21% of these sections.

For each of the 649 samples collected in the Doce River Basin, 25 parameters were analysed, giving a total of 11,225 analyses. Nowadays, the water quality basic network which is in operation, counts on 59 DNAEE stations and 9 which are monitored by the Environment Office of the Espirito Santo State.

## BRAZIL-FRANCE TECHNICAL COOPERATION PROGRAMME

1997 was particularly beneficial for the Brazil-France cooperation on river basin management. The approval of the Brazilian Water Law emphasized the pilot character of this cooperation, especially at the level of the project for establishing a River Basin Agency for the Paraiba do Sul River. This project is coordinated by the National Department of Water and Electric Energy (DNAEE), in partnership with the Secretariat of Water Resources (SHR), of the Ministry for the Environment, Water Resources and Legal Amazonia (MMA).

In June, the French-Brazilian cooperation gave its support to the organization of the constitutive meeting of INBO's regional network for Latin America and received Latin American participants on its premises. A technical visit enabled the presentation of the Light-Guandu system (water transfer from Paraiba do Sul for electricity production and the water supply of Rio de Janeiro Metropolitan Area) and the implementation of the educational water programme in the Rio Claro community.

In September, the French Embassy in Brazil and DBEnvironment organized a mission for technicians and for representatives of users in Rivers basins. The delegation was received by the International Office for Water, the Water Directorate of the Ministry for the Environment, the Loire-Brittany and Artois-Picardy Water Agencies, and by the Federation of Regional Natural Parks.

Part of this delegation participated in INBO's second General Assembly in Valencia (Spain) and visited the Water Company of Barcelona.

In October an official Brazilian delegation, comprising the Secretary

In accordance with the water quality directives established by the Brazilian Government in 1986, the above-mentioned classification takes into account criteria such as physical, chemical and bacteriological parameters as well as the toxic ones (heavy metals, phenol).

In both surveys, the analyses of the collected data show that the pollution sources of larger impact in the Doce River Basin, are the domestic sewage systems, the mining and metallurgy residues and the effluent of substances such as industrial and domestic detergents. The accentuated erosion worsens the situation, since it discharges solid residues into the waters, silting up the river beds.

**Paulo Maciel Junior**  
**Coordinator of the Doce River Basin Technical Agency**  
Fax: (55-31) 261 4009

for Water Resources of MMA, Mr. Paulo Romano, and the Coordinator General of Water Resources of DNAEE, Mr. Vinícius Benevides, went to France in order to study with the French Authorities the means necessary to continue the work that has started on the Rio Doce and Paraiba do Sul basins and transfer these experiments to other priority river basins in the country.

A training course on "River Basin Management" was organized in December by SRH, with the assistance of the International Office for Water, the Technical Agency of Paraiba do Sul River basin, DNAEE and the Company for Research on Mineral Resources (CPRM).

In 1998, the French-Brazilian cooperation agreement will mainly deal with:

- The reinforcement of the Technical Agencies of the Doce and Paraiba do Sul river basins and the installation of the "Viva Terra" software, the setting up of a pilot system of stations for the automatic control of hydrogeochemical parameters; specific hydrogeochemical studies and the evaluation of methods for the analysis of industrial effluents and the control of the biotic conditions in the basin;
- The dissemination of the management model to mayors and users and the implementation of the Educational Water Programme;
- Creation of a training centre for river basin managers;
- Preparation of the first draft of an action plan for the Paraiba do Sul river basin, to be consistent with the plans of Rio de Janeiro, Minas Gerais et São Paulo States.

**Vinicius E Benevides - DNAEE**  
Fax : (55-61) 312 5882/312 5881

# COSTA RICA

## ACTION PLAN FOR THE TEMPISQUE BASIN

The concept of the hydrographic basin used as a regional planning unit for natural resources has strengthened during the last years. Although it was applied at first to water resources, it has now been widened to the management of other natural resources.

**The Association for the Management of the Tempisque River Basin (ASOTEM) in Liberia, Costa Rica, has requested the Tropical Scientific Centre to elaborate an Action Plan that would enable to direct efforts towards activities that would improve the standard of living of the population.**

The Tempisque river basin covers an area of more than 500,000 ha and comprises large agricultural production centres as well as National Parks and protected areas. It produces about half the rice and sugar cane of the country while covering only 10% of the Costarican territory. However, this high production rate has had impacts on the environment that are now being taken into account. Owing to the climate characteristics of this region, water resources are particularly significant as a lengthy drought period has exponentially increased the water value.

**In the first phase, the plan consists in establishing a diagnostics of the conditions of the basin resources, using existing information and a 1/200.000 scale. It comprises partial reports on hydrology, forestry, forest life, protected areas, wetlands, sociology, economy and pollution.**

In the second phase, the Action Plan will be prepared, based on this technical diagnostics and on a series of participative seminars. This plan will identify priority areas for action where benefits will be most significant and will propose guidelines for the implementation of investments for the environment.

**The basic research criterion is the maximization of the Costarican society's quality of life.** The plan will be designed to take into account the fact that it will not be implemented by a sole group or institution but will be a useful tool for everyone interested in undertaking actions favouring the sound use of the Tempisque river basin resources.

In order to modify land use that is carried out in an unrealistic manner and without any viability, this plan will be flexible and will identify critical areas and propose specific actions for each case. It will also acknowledge the importance of economic production and the search for harmony between economic development and conservation, while providing non centralized

strategic solutions. In addition, the information gathered during this research will be able to improve knowledge on topics of interest. The results will be summarized in a series of digitized maps that will be available to researchers and the general public.

### Dialogue with the Civil Society

Besides the consultants' work, a dialogue with the civil society will be initiated, focusing on the problems encountered in the basin and potential solutions. The results of this dialogue at community level will be the following: a) global description of the problem, objectives, solutions and levels of institutional responsibility, b) work of the institutions in this area, c) dissemination of information to the community representatives, institutions and the project's prime contractors. Three workshops and a regional workshop will be organized. They will gather representatives from all groups, institutions and communities. The regional workshop will present the conclusions and the consultants' achievements. ASOTEM, and representatives from institutions and NGOs will actively participate. The regional workshop will have to standardize information gathered in the workshops and by the consultants in order to classify problems and solutions by priorities and to define the role of the institutions and NGOs. Finally, a regional workshop will be organized to present the proposed Action Plan.

### Elaboration of an Action Plan

This plan will be based on the conclusions of the local and regional workshops, on the consultants' recommendations and on a dialogue with the organizations or institutions the most concerned by this problem. In addition, experts in environmental policy, legislation and economy will be consulted to identify the most suitable actions, define strategies for their implementation and the possible incentives and pilot projects that would aim at promoting real actions. The Tropical Scientific Centre and ASOTEM will propose advisers.

**Jaime Echeverria**  
**Environmental Economic**  
**Programme**  
**Tropical Research Centre**  
**E.mail : [economia@cct.or.cr](mailto:economia@cct.or.cr)**

## REORGANIZATION OF THE INSTITUTIONAL WATER SECTOR

**The Water Law of August 1942, still in force in the country, stated that water is a public good and that its use and development must therefore be regulated in order to ensure its sustainability. This law created the Water Department (Departamento de Aguas) in the old National Electricity Department.**

The Law of 28 March 1996 that created the Regulatory Authority for Public Services, stipulates that **the Water Department be transferred to the Ministry for the Environment and Energy (MINAE).** This transfer, including personnel, assets and powers, was completed on October 5, 1997.

Thus, the reorganization ended at the planned date, and the MINAE competences relative to natural resources have been reinforced, not only regarding the preparation of policies but also management, protection and conservation.

**The Water Department is now located in the National Meteorological Institute (IMN), organization of MINAE, and is responsible for "the sound and efficient management and development of water resources on the whole national territory, while ensuring sustainable development".**

It will be in charge, among other things, of defining the national water policy, controlling and managing the national water resources, ensuring their monitoring, studying the concession applica-

tions for the development of hydro-power and hydroelectricity and of managing the permits for well drilling for groundwater extraction.

In addition, it will have to settle, as a second priority, the conflicts between water and watercourse uses, allocate permits for the building or implementation of hydraulic works on government owned watercourses (mains, diversion works, dredging, cleaning, ...).

**The setting up of a Water Commission is also envisaged.** It would be composed of representatives from the Costarican Institute for Aqueducts and Sewers (AyA), the National Irrigation and Drainage Department (SENARA), NGOs, the civil society, public Universities and from the Water Department that would assume its chairmanship.

The aim of this reorganization is to have a real organization to head the national water sector in order to enable an efficient water management and the environmental management necessary for hydrographic basin protection and rehabilitation; to ensure the participation of the different sectors of the society and of the users; and to set up an appropriate legal framework to achieve the proposed objectives.

**Maureen Ballesterio V.**  
**ASOTEM**  
**Fax : (506) 257 0697**

## PANAMA

### AN ENVIRONMENTAL REHABILITATION IN TROPICAL REGIONS

Observations that have been made for more than 80 years show that professional ecological NGOs can be an alternative to the rehabilitation and permanent protection of environmental resources: forests, rivers, fauna, land and air. This is probably caused by the fact that NGOs have a specific objective, that of the natural resources.

The ecological NGOs have achieved most of the objectives adopted during INBO's General Assembly held in Morelia (Mexico) in 1996.

The international donor organizations are favourable to such groups, in tropical regions as well, and plan to request, as a prerequisite to project funding, that the funds be administered by NGOs.

In Panama, the **Foundation for the Protection of Rivers** comprises the Centre for Research and the Rehabilitation of Aquatic Ecosystems. It is organized to accomplish important technical tasks, but economic support is lacking to enable it to assume its role: the rehabilitation of this vital ecosystem that are the natural freshwater sources and their environment.

**Eduardo Castro**  
**Foundation for River Protection**  
**Fax : (507) 770 5484**

# VENEZUELA

## BLACK TIDE IN THE GULF OF VENEZUELA

On Friday 28 February 1997, the Greek tanker "Nissos Amorgos" that came from the Port Miranda pipe-line terminal, collided with a reef and was grounded in the external passage of the Maracaibo Lake. Breaches appeared in three tanks and 25,406 barrels of crude oil were released in the Gulf waters. The Simulation Laboratory of the Engineering Faculty of Zulia University, in cooperation with ICLAM (Institute for the Conservation of Maracaibo Lake), immediately realized a projection of the path followed by the tide that reached the shore.

The National Emergency Plan (PNC), of which the LAGOVEN company, a branch of Petróleos de Venezuela S.A., is responsible, was immediately implemented to clean the beaches. The SCAT (Shoreline Cleanup Assessment Technique) method was systematically used by ICLAM in the areas

affected by the black tide in order to follow up the daily progress of the cleaning and sanitation activities.

The results of 28 samples made in the navigable passage bed showed that the risk of pollution had been avoided outside the reef area of the Gulf of Venezuela.

A method, locally developed and called "SCAT SUB-ACUATICO", was implemented in this sandy area and enabled the localization of the oil that would have otherwise been unaccounted for, and its extraction using amphibious equipment.

At the same time, ICLAM systematically monitored the water and sediments of the whole coastline to assess environmental quality. Biotopes have been continuously monitored since the black tide.



*Black tide : cleaning of beaches*

## THE FIRST "1997 INDUSTRIAL ENVIRONMENT" EXHIBITION

The first "1997 Industrial Environment" Exhibition was held in Maracaibo from 14 to 17 October 1997. It was organized by the Institute for the Conservation of Maracaibo Lake (ICLAM), the Ministry for the Environment and Renewable Natural Resources (MARNR), Petróleos de Venezuela S.A. and Protocolo C.A.

The restructuring of economy that the country has started implies the use of different management systems and new technologies, the reinforcement and increase of industrial activity and the opening of exchanges with sustainable technical and environmental prospects.

This event was the first exhibition on environment in which participated national and international industrialists.

## THE SOUTH WASTEWATER TREATMENT SYSTEM OF MARACAIBO CITY

Lake Maracaibo suffers from serious pollution, caused by the direct discharges of domestic and industrial waste waters, those from oil, petrochemical and dairy industries in particular, and of solid wastes, chemical products issued from agricultural activities, gradual salt intrusion caused by pipes. However, domestic waste water causes the most disturbing pollution due to its immediate effect.

In order to face this situation, ICLAM has undertaken some works that represent the first significant effort to prevent these discharges into the lake and thus start a rehabilitation process. The "South wastewater system of Maracaibo City" is one of these efforts. The cities of Maracaibo and San Francisco in Zulia State, whose effluents cause the highest pollution, share this system. They regroup 55 % of the State population, about 3 million inhabitants.

This plant will treat the waste water of a population of 800,000 inhabitants. It is an essential item of the Environmental Sanitation Programme for Maracaibo Lake. It plans the building of three other treatment plants: Maracaibo North, Cabimas and Ciudad Ojeda.

This first phase of the programme requires an investment amounting to 65 million dollars, paid by the Ministry for Environment and Renewable Natural Resources and LAGOVEN Company, branch of Petróleos de Venezuela.

## MUNICIPAL INTEGRATED SANITATION PROGRAMME FOR MARACAIBO LAKE BASIN

The main components of the Municipal Integrated Sanitation Programme for Maracaibo Lake Basin are: **environmental management, institutional capacity building and investment for a social infrastructure.**

**Environmental management** deals with the finding of solutions in an integrated manner. **Institutional capacity building** proposes a municipal government with the political and technical responsibilities necessary for environmental management. It seems indispensable that the Municipality becomes an entity able to manage social issues at local level and to start a dialogue with the users and initiate their participation.

**Investment for a social infrastructure** concerns the basic sectors of sanitation and public health. They are measured, on one hand, by mortality and morbidity indicators, and on the other, by coverage indicators, for water-related diseases in particular and their consequences on children less than four years old.

The programme proposes the networking of national, regional and local organizations, either public or private, that intervene on the territory of the Maracaibo Lake basin. They would regroup their competences in order to strengthen integrated and sustainable resources management in the basin.

A significant strengthening of the institutional competences of the basin's Mayors is necessary at local level.

A first one-year phase is necessary to identify the critical situations in the sanitation sector, to select the cases for experimentation and start a pilot programme. The cost of this first phase would amount to US\$ 336,400.

The setting-up of a Fund has been proposed to develop the programme with the participation of four entities: the Multilateral Bank (IDB/CAF), the National Government, the State Government and the Municipalities.

The fund will have to **encourage the municipalities to start an environmental management that is technically and financially self-reliant.**

**Lenin Herrera**  
ICLAM  
Fax : (58-061) 221 702/923 782



# NATIONAL INVENTORY OF RIVER BASINS

The Autonomous Department for Soil and Watershed Conservation (SACSCH) is responsible for the preparation and execution of management and conservation plans that envisage a rational relationship between human activities and natural resources protection at the level of river basins.

The choice of the basins to be included in the management plans will depend on their importance, their degradation and on the existing information. In fact, a classification of river basins is necessary and will be undertaken within the National Inventory of River Basins. The latter will identify those where sanitation and rehabilitation are priorities.

This work will be carried out in several phases:

- **The gathering of information** to create a data base on the river basins.
- **The formulation of dynamic and practical methods**, easy to use, that integrate all aspects determining the importance of each basin and its degradation.
- **The implementation of a computerization programme** to determine the priorities of each basin and the importance given to each variable, graded according to the results obtained.
- **The preparation of a list of the river basins, graded according to priorities**, where the actions to be undertaken will be given by order of magnitude as well as the most representative indicators for follow-up and evaluation.

## A standardized technical format

A basic format will be used to orientate the collection of information. This format, used for the first time in the country, will be improved as work is progressing. The most representative data of each river basin will be entered into a data base (physical, natural, social, economic, political aspects as well as studies and plans already implemented).

## A cartographic base

It will consist of a graphic representation of each basin and will make available an outline of the area under study, its geographic interpretation, its limits and possible difficulties to be encountered in collecting certain data.

The scales to be used will be 1/100,000 for the basin of less than 8,000 km<sup>2</sup> and 1/250,000 for the others.

Thanks to this National Inventory of River Basins, it is expected to draw up a hierarchy list of the 446 basins that have already been entered into the preliminary list made by SACSCH.

The aim of this study is to correct, up-date and assess the choice of the parameters that will be used and that will determine the importance of each basin. The computer programme will also be modified, if necessary, when action is dynamic and achieves SACSCH purposes.

## MARNR - IDB PROJECT

A Basin Conservation Project has been developed by the Ministry for Environment (MARNR) and partly financed by the Inter-American Development Bank. It deals with the upper basins of the Rio Bocono in Trujillo State, the Rio Tocuyo in Lara State, upstream of the Dos Cerritos Dam, and of the Rio Yaracuy, upstream of Urachiche.

**The overall objective of soil conservation programmes is to control erosion:**

- by informing rural populations on the agricultural practices that do not degrade the environment and that can improve the socio-economic conditions of the households as well,
- by executing environmental education programmes on the cohabitation of man and its environment.

The problems presently encountered in these basins are the protection, conservation and upgrading of water quality in large dams such as that of Dos Cerritos, main source of water supply for Barquisimeto, Quibor, El Tocuyo in Lara State, but also of Cumaripa in Yaracuy State.

Therefore, the building of dike systems has been envisaged to reduce the speed of the water flow and stop the sediments thus improving the functioning of dams.

The project also comprises the afforestation of very degraded areas in the upper basins, using native species.

**The preparation of an "Emergency Plan in case of Floods" is also envisaged for protecting the population.** It will include the building of structures on the critical water courses and the setting up of "warning systems" based on the measurement of rainfall and water flow rates to warn the authorities when any risk may occur, for them to take the necessary measures to protect the lives and properties of the inhabitants.

Training courses have been organized for the technical staff of the Basin Agencies within the "Follow-up and Evaluation" component of the programme. They dealt with the acquisition, processing and management of the data of the financial management system.

Finally, a transfer of technologies focusing on maize sowing, market possibilities, planting of coffee and fruit trees in areas deprived of any vegetable cover and with steep slopes has enabled the awareness raising of local producers in order to ensure **soil conservation.**

Activity areas were identified in 1997. About 500 producers were selected and the training of 9 conservation committees regrouping 170 producers and of two farmer associations regrouping 60 producers were envisaged.

Data collection, using the lists drawn up by field agents for the follow-up and evaluation system, has raised transcription problems that disturb the Agency. Indeed, the management of the written information gathered by the agents is difficult should reliable results be obtained to follow up the activities of the recipient producers.

**E. I. Salazar**  
**Soil and Watershed Conservation Department**  
**Ministry for Environment and Renewable Natural Resources (MARNR)**  
**Fax : (58-2) 545 2021**

# COLOMBIA

## THE TROPICAL RAIN FOREST: BIODIVERSITY PROTECTION

The tropical rain forest of the Pacific coast covers 49,500 km<sup>2</sup> from Manglares Cape to Darien Panameno Cape. It shelters rivers that have relatively high flow rates and up to 640 flora species per ha, the greatest diversity of butterflies and the second bird diversity of the planet. The rivers slowly flow into the ocean inside a marvelous triangle of estuaries where white mangroves, acacias, red convolvulaceae and precious wood grow on the beaches, reefs and deltas, integrating corral systems with a marine life in the coves, bays and at the foot of the cliffs.

Woods cover the mountain slopes down to the seashore and emerge again, splendid and mysterious, on the Gorgona and Gorgonilla islands, emeralds of the Pacific, with the same biodiversity. Translucent and crystalline seas are visited by the humpbacked whales that migrate from the Antarctic to breed and give the first swimming lessons to the calves.

Rainfall exceeds 7,000 mm in some regions of the rain forest. The ecological balance is threatened by projects for the building of roads, canals and dredging that will seriously affect the life of the

black and native community and especially the ecological balance of the forest. The ancestral knowledge of the ethnic populations of the species' molecular biology is very important for Colombia and humanity.

**It is essential to protect the river basins of the West of Colombia:** Mira, Naya, San Juan, Anchicaya, Raposo, Aguaclara, Baudo, Atrato and the infinite number of sources that belong to this particular ecosystem with marshes and lagoons.

**UNESCO has requested the Colombian Government to manage the Pacific region as the heritage of humanity.**

This topic was presented during the Latin American Congress on hydrographic basins in Venezuela in 1994.

**Oscar Rivera Luna**  
**Palmira Municipality**  
**Member of the Committees for the Protection of the Rio Nima and Rio Amaine Basins**  
**Fax : (57-23) 396 168/304 080**

# GUATEMALA

## THE AUTHORITY FOR THE SUSTAINABLE MANAGEMENT OF THE AMATITLAN LAKE BASIN

The Government of the Republic of Guatemala has assumed the responsibility of stopping the destruction of forests, of assessing and preserving the air we breathe and drinking water and of developing the land that provides food products, as well as protecting the diversity in order to restore and clean damaged ecosystems such as the Amatitlan Lake.

Ecological management in Guatemala started with the enforcement of the Law for the Protection and Improvement of the Environment, Decree of the Republic's Congress Number 68-86, which has the purpose of maintaining the ecological balance and the quality of the environment, in order to improve the living standards of the inhabitants. Since its origin, some important difficulties were encountered in its application.

For this, the Republic's Congress created the Law on the Authority for the Sustainable Management of the Basin and the Amatitlan Lake - AMSA - in September 1996. This is a legal tool to plan the use of the

resources, the recovery and protection of the Lake, supporting the Integrated Plan of Management of the Basin and the Amatitlan Lake (PLANDEAMAT).

The Authority's programme includes: the reduction of the environmental pollution introducing measures that impulse the domestic waste water treatment with appropriate methods; promoting the communities participation in all these actions; establishing a permanent programme of waste water control; promoting the participation of private companies in the waste water treatment programmes, especially in the case of the Master Plan for sanitation in the municipalities that are part of the Amatitlan Lake Basin and also environmental education and awareness-raising campaigns to make citizens conscious of the situation.

AMSA has established its contribution according to the following goals:

- To promote the participation of the municipalities, communities and communal organizations of the Basin,

- To promote the development of educational programmes on the environment that include health education,
- To transfer clean technologies in order to improve productivity and to develop technical and environmental standards to preserve the ecosystems,
- To promote private enterprises such as those of the inhabitants of the basin with regard to afforestation and resource protection.

At the same time, the creation of basin organizations is planned for all tributaries that flow into the lake.

*Evelyn Reyna Chacon*  
AMSA  
Fax: (502) 360 6797  
E.mail: arrla@quate.net

## MEXICO

### HOW TO PREVENT THE EFFECTS OF DROUGHT IN THE LAGOON AREA

It is necessary to implement actions in order to decrease the social, economic and environmental effects of lengthy droughts that occur in regions that suffer from unfavourable climatic conditions.

Water planning in Mexico is implemented within the framework of a 1995-2000 National Hydrological Program that has been drawn up in accordance with the 1995-2000 National Development Plan and with the Organic Law of the Federal Administration, with the Law on Planning and the Decree that created the National Water Commission. **The modernization of the country's water sector is planning water management by way of river basins and the division of the national territory in 13 administrative regions that correspond to these hydrological criteria.**

Another aspect of this modernization process is **the decentralization and transfer of functions to the States and municipalities**, together with a decrease of the presence of the National Water Commission in the States. Thus, **the creation of 13 River Basin Committees** is planned, one for each region. According to the National Water Law, they will be entities for coordination and dialogue between the National Water Commission, federal and States organizations or municipalities and the representatives of users. Their objective is to formulate and implement programs and actions for better water management, develop hydraulic infrastructures and respective services and resources conservation.

The "lagoon area" will take part in the Basin Committee of Region VII that comprises the hydrological areas: "Mapimi", "Nazas-Aguanaval" and "El Salado". It is planned to set up a Local Water Committee that will

regroup representatives of users, legislative organizations at the three governmental levels.

This Local Water Committee will have to formulate a Hydrological Program. It will be mainly composed of strategies to solve the problems posed by the lack of resource availability and its collateral effects, of specific recommendations such as: efficient water use in agriculture, rehabilitation and replacement of pipes in distribution systems, reduction of water losses in the distribution systems, the development of a "water culture" and water reuse in industry.

There is a determination of all partners concerned to solve, in a concerted manner, the problems caused by drought, without affecting the main production activities and the traditions of the "lagoon area", although no reliable scientific methods and technologies are available or proved to stimulate rainfall.

*Raul Cuellar Chavez (CNA)*  
Regional Directorate North  
Fax: (52-17) 17 50 04  
E. mail:  
siga@halcon.laguna.ual.mx

### BASIN ADMINISTRATIVE DIVISION



# EUROPE

## EGS

### CONFERENCE ON WATER RESOURCES OF INTERNATIONAL RIVER BASINS NICE - APRIL 1998

The **European Geophysical Society (EGS)** is a large scientific association with a focus on earth sciences. Annually it organizes a General Assembly in Europe attended by thousands of scientists from different fields. EGS is organizing a conference on "Water Resources of International River Basins" during its General Assembly in Nice (France) next April. This conference will deal with the influence of environmental and anthropogenic change and

land use on flood processes, on moisture feedback and continental rainfall; water scarcity; sustainable development of watersheds and river processes.

EGS meetings are open to all: authors can submit a short paper (5-10 pages) for this Conference.

**Hubert Savenljie**  
IHE  
Fax : (31-15) 212 2921

# SPAIN

## THE HYDROLOGICAL BASIN PLANS

Owing to its hydrographic and climatic conditions, Spain has been the first country to undertake actions for water resources management and development by way of river basins. This management has been based on planning since the beginning.

The **1985 Water Law (Ley de Aguas)**, when drawing up Hydrological Basin Plans and the National Hydrological Plan, confirmed the importance of hydrological planning to face the new situation caused by the more intensive use of water and by the need to improve this resource development.

## EBRO HYDROGRAPHIC CONFEDERATION

In accordance with the Spanish water legislation relative to planning, the Water Council of Ebro river basin, composed of representatives from the different users and administrations, accepted in 1996 a Proposal for a Hydrological Plan of the Basin that will have to be approved by Decree by the Council of Ministers. The two most significant aspects of this proposal are the new distribution of water allocations, the improvement of its efficiency and low flow replenishment.

The water utilization right is sometimes as important as land ownership in most basins situated in arid or semi-arid areas, which is the case in a large part of Ebro river basin.

Utilization rights have existed from time immemorial and condition the hydrological planning of many water courses. In certain cases, these rights do not correspond, for many reasons, to the current necessary uses.

Owing to such a situation, one of the significant aspects of the proposal for a Hydrological Plan is the new distribution of water allocations for irrigation (and implicit improvement of efficiency) for all kinds of cultivation and

for the different areas of the basin. This new distribution of allocations will take future demands into account and will be used as a benchmark to adapt utilization rights to present needs while improving efficiency, thanks to the present technologies of rehabilitation of old infrastructures.

This adaptation will generate considerable costs for the modernization of infrastructures, but will have a double positive impact:

- **the improvement of the quality of waste water that is discharged** into water courses by reducing pollution loads,
- **efficiency improvement** which will allow a larger resource to be made available for other uses, environmental in particular.

Another significant problem that is dealt with in the plan proposal is that of low water replenishment in the various water courses. From a technical viewpoint, many specific studies will be necessary due to the variety of water courses: the methodology will have to be adapted to each river.

An appropriate low flow replenishment cannot be achieved without affecting the present water

utilization rights and thus have consequences on jobs and the economy. Expropriation will be necessary and compensation for production loss and costly economic impacts will have to be thought of.

## JUCAR HYDROGRAPHIC CONFEDERATION

In the case of the Hydrological Plan for the Jucar river basin, the Basin Water Council unanimously adopted the Plan Proposal during its meeting of 6 August 1997. The representative character of the Council, composed of, in three parts, representatives from the central government, representatives from the autonomous administration and representatives of the different users, gave this decision a particular significance.

Here are some characteristics of this Hydrological Plan, whose activity area corresponds to that of the Jucar Hydrographic Confederation. It comprises the catchment areas of rivers that flow into the Mediterranean Sea and covers a surface of 43,000 km<sup>2</sup> over 4 Autonomous Communities: Aragon, Castilla-la-Mancha, Catalugna and the Valencia Community. It concerns a population of 4,100,000 inhabitants and an irrigated area of 370,000 ha. The total average resources are 3,800 Hm<sup>3</sup> per year to meet a demand of the same order of magnitude.

This area is divided into 9 Exploitation Systems: Cenia-Maestrazgo, Mijares-Plana de Castellon, Palancia-Los Valles, Turia, Jucar, Serpis, Marina Alta, Marina Baja and Vinalopo-Alacanti, that regroup 22 dams with a total capacity of 3,165 Hm<sup>3</sup>, as well as the large quaternary aquifers of the Coastal Plains of Castellon and Valencia and the karstic aquifer of the Western Mancha.

The Plan's objectives cover 10 and 20-year periods and define the basic principles that aim at meeting present and future water demands and at achieving the appropriate objectives of inland water quality and flood control, while trying to increase resource

## TAGUS HYDROGRAPHIC CONFEDERATION

The Water Council of the Tagus river basin, that regroups 63 members, adopted, on 18 April 1997, the Plan proposal made by the Basin Organization with 61 votes against 1. Apart from the representatives of the central, autonomous and local administrations (for the water supply sector), this Council gathers representatives of irrigation and hydroelectricity users, of agricultural organizations and ecological groups.

Once approved, the Plan proposal was submitted to the government through the Ministry for the Environment in order to be officially adopted by Royal Decree and

The implementation of this proposal is necessary for the future in spite of these difficulties.

**Antonio Coch Flotats**  
Hebro Hydrographic Confederation  
Fax : (34-976) 23 43 06

availability thanks to the improvement of irrigation infrastructures, treated water reuse for agricultural uses and the setting-up of drip irrigation systems, while respecting the environment.

The problems mainly concern the Jucar, Marina Baja and Vinalopo-Alacanti basins that encounter difficulties in ensuring urban water supply in drought periods. As regards the Vinalopo-Alacanti basin, aquifers are over-exploited and water allocations for irrigation are obviously insufficient.

The basic criteria for the management of the Jucar water resources are as follows:

- **Allocation of the resources necessary to meet present uses** and to reinforce the existing uses rather than favour new infrastructures, while respecting the minimal flow rates necessary for the environment, and finally mobilizing the surplus resources to mitigate aquifer overexploitation and the deficit of water supply of the Vinalopó-Alacanti and Marina Baja regions.
- **Reserve of resources necessary to meet foreseeable future demands**, while taking into account the present availability of these resources and of those generated by water savings, by the improvement of infrastructures or by the possible strengthening of regulations.

**Juan Manuel Aragonés Beltrán**  
Jucar Hydrographic Confederation  
Fax : (34-6) 393.88.02

published in the official bulletin for its application after meeting all conditions, the most important of which being the reporting to the National Water Council.

This Plan proposes a set of solutions for foreseeable 10 and 20-year scenarios. The principles chosen to best meet the demand are: the sound use of water, sustainability of infrastructures and harmony with the environment.

**José Antonio Llanos Blasco**  
Tagus Hydrographic Confederation  
Fax : (34 -1) 554 93 00

# FRANCE

## ADOUR-GARONNE

### PARTNERSHIP BETWEEN THE AGRICULTURAL COMMUNITY AND THE BASIN AGENCIES

In the Adour-Garonne Basin in the South-West of France, agriculture represents a growing share of the region's general economy. This has affected water quality in a basin well provided for as regards water, but where levels are extremely low from the end of Spring onwards.

Thirty per cent of the surface area of the basin has been classified as a sensitive zone with regard to pollution by nitrates and the eutrophication of rivers. Water drawn for irrigation "creates a deficit" of 300 million m<sup>3</sup> to the hydrological balance.

Although representatives of the agricultural community have been associated with the work of the Water Agencies since their creation, they have only recently become aware that it was in their own interest to develop active and responsible participation within these bodies in order to contribute to water conservation and protection.

**The Master Plan for Water Development and Management (SDAGE) recently implemented by the Adour-Garonne Basin Committee, prescribes measures to mitigate the adverse effects of agricultural practices on water.** This master plan has paved the way for a contractual agreement with the agricultural profession, which stipulates both water charges and financial aid for the next 5 years (1997-2001).

All hectares that are irrigated above a threshold of 5,000 m<sup>3</sup>/year are submitted to these "withdrawal" charges.

The charge rate will remain unchanged for 5 years if the volumes drawn are metered, but rates will increase each year if a lump charge is calculated in accordance with the formula given in the contractual agreement.

Two rates have been introduced: a basic rate for groundwater, hill lakes and rivers which are not artificially recharged, and a higher rate for artificially replenished water courses.

**The "pollution" charge will be applied when stock breeders do not respect a schedule for the standardization of wastewater discharges.**

As a compensation, the total amount of financial aid has been fixed at 235 MF for 5 years, for pro-

jects estimated at 745 MF (excluding the creation of new reserves). This programme concerns:

- water resources development,
- an encouragement for the agricultural community to measure water use (meters), save (irrigation, in particular), and protect water,
- the involvement of farmers in river planning and maintenance,
- the setting up and monitoring of a pollution reduction programme, based on the improvement of cultivation practices and the pollution control of farm and wine cellars,
- the implementation of the programme to eliminate plant sludge through land treatment,
- the recuperation and treatment of toxic agricultural wastes,
- a clearly identifiable message.

**Through its differentiated charges, the Agency is emphasizing the obligation to meter the water used for irrigation and the resulting savings in water use.** The higher charges for refilled rivers justify the use of public funds for replenishing low water levels that are adversely affected by farming practices.

Through its expanded aid programmes, the Agency is demonstrating its concern for all aspects of farming and thus is involved in most of the basin's 200,000 farms.

The adhesion of agricultural representatives to this framework agreement should not hide the reservations and hesitation of certain farmers that the Agency must endeavour to overcome through appropriate communications strategies.

*Alain Duchein  
Adour-Garonne Water agency  
Fax : (33 5) 61 36 36 77*



# LOIRE-BRITTANY

## GROUNDWATER RESOURCE MANAGEMENT

### IN THE LOIRE-BRITTANY RIVER BASIN

The strong increase in water consumption in France, essentially for irrigation, since the last fifteen years in addition to marked drought phenomena underscored the flimsiness of the available water resources, particularly from groundwater.

Over the whole Loire-Brittany river basin which covers a total surface amounting to 155,000 square kilometers, the yearly abstracted volumes by all categories of users amount on average to 1.7 billion cubic meters, out of which almost 1 billion for domestic use, 250 million cubic meters for industrial use and the remaining, i.e. 450 million cubic meters for the development of irrigation. It should be noticed at this stage that water withdrawn for irrigation purposes takes place during a comparatively short period (dry season) with therefore a heavier impact on the available water resources. 44 % of the abstracted volumes are drawn from surface water, 56 % come from groundwater.

Taking into consideration the evolution of the drawn volumes in Loire-Brittany for each type of use over the last ten years, **one can see that only the abstracted volumes for irrigation do increase, whatever the origin, surface or ground water**, due to:

- the drilling of new bore-holes,
- the increase in the withdrawn volumes,
- the extension of the annual exploitation length (introducing irrigation of cultivated lands in the Spring).

From 1988 to 1992, severe winter droughts put the emphasis on the fact that the limits for exploiting some aquifers were locally reached or so.

Such phenomena led the Loire-Brittany Water Agency to classify these aquifers in what was called **I.E.T. (Intensely Exploited Tables)**. Are considered as such the units where abstraction of groundwater presents an average ratio above 200 m<sup>3</sup> per hectare per year and where conflicting uses and drying up of permanent streams are frequently observed in the summertime.

**In the long term, the predictable consequences will be extremely detrimental to the environment if no measure is taken to alleviate the problem.**

In order to cope with this issue, the Masterplan for Water Resources Development and



Management (SDAGE) of the Loire-Brittany river basin, a real reference and orientation document for the water policy over the next 15 to 20 years, recommends a better management of these aquifers.

Thus, for the Beauce aquifer, a vast programme for data collection is launched so as to implement a management model.

A representative indicator of the aquifer's general situation was defined using the average of reference piezometers' levels and successive alert thresholds have been established.

The Water Law of January 1992 stipulates that pumping devices must be equipped with appropriate measurement or assessment of the abstracted volumes.

**The metering of the concerned volumes also contributes to a better utilization of the available resource and makes it possible the setting-up of general rules for distribution and fixing of a price scale that would be both efficient and equitable.**

325,000 hectares are irrigated in the Loire-Brittany river basin. Installing a meter by an authorized fitter is subsidized by the river basin agency at a rate of 75 %. Almost 50 % of the total irrigated surface of the river basin are equipped with meters.

The Water Agency also intervenes for a better management of the overexploited groundwater by way of a financial incentive. The abstraction charge is one major tool : it is advisable that it should progressively head towards values that would be more representative of the collective costs generated by excessive abstractions.

The Loire-Brittany Water Agency implemented such a system in 1997 over the intensely exploited aquifers of its territory. A double incentive is planned in order to achieve this : there will be a progressive increase of the abstraction charge, on the other hand, the financial assistance will be raised, including specific interventions, so as to make the local parties concerned aware of their responsibilities and to orientate behaviours in a way that would better correspond to common interest.

This policy is led in close consultation both within the River Basin Committee and with representatives of the farmers.

*Jean-Louis Besème  
Loire-Brittany Water Agency  
Fax : (33-2) 38 51 74 27*

# RHINE-MEUSE

## BULK ASSESSMENT OF POLLUTION



The social acceptability of the "polluter-pays" principle or of its corollary "who decontaminates is helped" depends on their widest application.

As regards heavy industry, the calculation of water charges is made according to the pollution produced and the Agency must carry out measurements and analyses using the best technology available to assess pollution loads: sampling teams who sometimes work 24 hours a day, sophisticated methods of analyses in laboratories, etc...

But this practice cannot be applied to all economic "small" parties concerned, due to their great number and dispersion.

A means of solving this problem has been found and accepted by the industrialists concerned which is entitled the "table of bulk assessment" (TBA).

The example chosen to illustrate this TBA is that of the Alsatian vine growers.

Vine growing in Alsace is characterized by the great number of producers (one thousand) and by its seasonal character. Pollution is produced during the grape gathering period (2 weeks per year).

It is impossible to send teams in the field to the 1,000 producers, to measure the pollution produced in such a short time.

On the other hand, simple and easily measurable indicators enable an assessment to be made.

In reality, as all producers work in the same manner, a statistical measurement campaign can thus be implemented during the activity period and the results discussed and accepted by the professional representatives

For example, the table below gives some pollution ratios per type of activity.

Therefore it is only necessary to know the quantities produced to assess, without costly analyses, the generated pollution and levy the corresponding pollution charge.

It must not be forgotten that, in France, the "polluter-pays" principle goes hand in hand with the "who decontaminates is helped" principle and that the payment of pollution charges enables aid to be obtained for pollution control. It is obvious that the TBA is then lowered to take the efforts made into account.

This bulk assessment system is a simple system that requires few means to be implemented and that enables a better acceptance of the charge-aid system. Thanks to this system, heavy industry is not considered as the only polluter but also most economic partners, and which is just.

**Denis Besozzi**  
Rhine-Meuse Water Agency  
Fax : (33-3) 87 60 49 85

| ALSATIAN WINE                                       | CHARACTERISTIC VOLUME       | SS (g) | OM (g) | N (g) | P (g) |
|---|-----------------------------|--------|--------|-------|-------|
| Wine gathering, masking, staking, pressing          | Hectolitre of must produced | 10     | 60     | 1     | 0,1   |
| Wine conditioning                                   | Hectolitre of wine          | 15     | 50     | 0,1   | -     |
| Reception, storage and expedition of extra-dry wine | Hectolitre                  | 3      | 15     | 0,1   | -     |
| Manufacture of wine-based aperitif                  | Litre produced              | 0,8    | 4,4    | -     | -     |



# RHONE-MEDITERRANEAN-CORSICA



## AN EXEMPLARY " CONTRACT FOR AN AQUIFER " IN THE LANGUEDOC

### The Astian aquifer: an essential but threatened water reservoir

The groundwater table in the astian sands (marine Pliocene) constitutes an essential resource of the coastal plain situated between Beziers and Agde towns. It is a confined and artesian aquifer, isolated from the upper aquifers by an argillaceous layer. It is fed by infiltration in the northern cropping out areas, by peripheral aquifers and by the the alluvial groundwater of the coastal Herault river in its northern part.

Its high quality water is used at 75 % for drinking water supply, mainly during the tourist season, and at 12 % for vine growing.

Unfortunately, this confined aquifer is threatened by many boreholes that are haphazardly located and whose bad implementation has connected it with upper aquifers and the decrease in artesian pressure makes its contamination possible

Its water level at the coastal rim has lowered with a serious risk of salt intrusion.

### The collective preparation of a global safeguard plan

Aware of the risks faced by this resource, the users have gathered into a Multipurpose Syndicate for Studies and Infrastructures related to the Astian Aquifer (SMETA) whose mission is to establish a balance and to implement a global and patrimonial management of the Astian aquifer. The communities concerned (about fifteen of them), professional chambers (chamber of agriculture, chamber of commerce and industry) and the Herault Department participate in this syndicate.

This syndicate carries out :

- studies, follow-up operations for water resources and uses,
- information and awareness campaigns for the different parties concerned on the need for good resource management,
- dialogue in order to define a global management policy,
- advice to the users (communities, camp grounds, farmers, ...) for the building of infrastructures that reduce impact on the aquifer (well designed boreholes, connections with other resources, ...).

The different diagnostic studies and the dialogue between the parties concerned have led to the identification of the following objectives:

- balance of abstractions between the different available resources to avoid overexploitation and protect the Astian aquifer against salt intrusion on the coastal border,
- continuation of the aquifer exploration whenever possible,
- conservation of its high quality by reducing the connections with upper aquifers,
- overall economic management.

### A "contract for the aquifer"

A 5-year action plan has been elaborated to achieve these objectives. It concerns:

- works for changing the supply of the golf course of Agde town using other resources and wastewater reuse,
- expertise, filling up or rehabilitation of bad boreholes,
- water savings: installation of meters, reduction of leaks in the networks,
- complementary studies of the resource,
- recruitment of a hydrogeologist to monitor the aquifer and uses, to give technical advice to the parties concerned, to organize information and awareness campaigns for the whole population.

This programme which includes a "contract for the aquifer" signed by the parties concerned, is estimated at FF 16 million.

### An exemplary approach

In France, this programme is one of the first projects for the patrimonial management of an aquifer. It is in keeping with the new 1992 water law.

**J.L. Prime**  
Rhône-Méditerranée-Corsica Water Agency  
Fax : (33-4) 72 71 26 01

# SEINE-NORMANDY



## A "POLLUTEC INDUSTRY 91" SYMPOSIUM ORGANIZED BY THE SEINE-NORMANDY WATER AGENCY

This symposium gathered 180 participants. The European Commission, in particular, was able to express its views on the evolution of the aid policy for enterprises in the environmental field. The river basin management principle was clearly confirmed. The implementation of preventive ac-

tions and adapted environmental management methods and audits were widely illustrated. The symposium proceedings are available at the Agency.

**Contact:**  
**Nathalie THOMASSIN**

## EUROPEAN PROSPECTS FOR THE AGENCY

In addition to the development of a partnership network in the form of twinning agreements with "sister" organizations in the countries of the European Union (the last was signed on 15 October 1997 with the Confederacion Hidrografica del Guadalquivir in Sevilla), the Seine-Normandy Water Agency has initiated, together with other partners, the creation of a European Forum for Economy and Water, a site for meetings and debates between the parties concerned and the European Commission (DG XI) on legal and economic problems in particular (application of the polluter-pays principle) but also technical issues (systems for water

quality assessment) on water management in river basins.

**Contact:**  
**Xavier DURAND-DELACRE**

The seminar, organized by the Water Agencies in Strasbourg on 5 and 6 November 1997 on the topic "Concerted river basin management, from dialogue to joint decision-making", is in keeping with this policy. INBO was widely represented.

**P. F. Ténrière-Buchot**  
**Seine-Normandy Water Agency**  
**Fax : (33-1) 41 20 16 09**  
**E.mail : dai@aesn.fr**

# HUNGARY

## EUROWATER-CEC PROJECT

Under the patronage of the Hungarian National Water Authority (OVF) and the European Working Group of ICID, an international workshop was organized in Siófok (Hungary) on 18-21 October 1997, with participants from Belgium, Bulgaria, Croatia, Czech Republic, Germany, Lithuania, The Netherlands, Poland, Portugal, Romania, Slovakia, Slovenia, the United Kingdom and Hungary.

The workshop was supported by the EUROWATER Project, the Hungarian and German national committees of ICID, the German Association for Water Resources and Land Improvement (DVWK), the Hungarian Hydrological Society and TECHWARE.

The EUROWATER Project, sponsored by the European Commission and implemented in five EU countries (France, Germany, The Netherlands, Portugal and the United Kingdom) is a guiding model to assess the institutional and organizational structures and mechanisms in Central and Eastern European countries.

**The main goals of the EURO-WATER-CEC Project are to prepare a well detailed survey of water resources management in several CEC countries and to elaborate ten comparative studies according to the subjects.**

In this way, a detailed analysis will be prepared on the situation of the water resources information policy, river basin management (RBM) and transboundary issues in the CEC area (e.g. Danube, Elbe and Odra rivers). The RBM planning methods (guidelines for planning, the consultation process, public participation, etc...), the role of basin organizations will be described and compared in connection with river basin management. During the workshop, information on the International Network of Basin Organizations (INBO) was given to participants by the OVF representative.

**Kálmán Papp**  
**National Water Authority (OVF)**  
**Fax : (36 1) 212 07 75**

# POLAND

## WARSAW RZGW

## DROUGHT THREATS ON THE TERRITORY OF WARSAW WATER AGENCY (RZGW)

The Warsaw Water Agency, created in 1991, covers 111,000 km<sup>2</sup> (one third of Poland). It comprises 25 whole or part voivodships and almost 900 communities.

Droughts are frequent in Poland. Water resources are not usually large and regular. The average water resource per inhabitant per year is three times less than that in Western Europe. The northern region, where the numerous Mazurian lakes are located, has the largest water resources but the central region (Mazovia plain and Lublin Plateau) has the greatest deficit in surface water due to insufficient rainfall.

**Upon the request of the Water Agency, the Warsaw Institute for Meteorology and Water Management has carried out a survey to identify the regions that are the most threatened by drought.**

The drought survey was carried out using data coming from 62 rain gauging stations, 27 heat gauging stations, 96 water level indicators, 83 gauging stations for groundwater levels. These data were collected during the 1951-1995 period.

The multi-annual rainfall average of the Water Agency territory varies between 467 mm (in Sulejow) and 733 mm (in Pilica City). The major part of this territory receives between 550 mm and 600 mm of mean rainfall.

Generally speaking, a particular drought period usually lasts 1 to 2 months. However, droughts, lasting more than 3 months, 8 months even, were observed between 1966 and 1995.

Observations were systematically made from 1951 onwards to analyze the evolution of the water flow on the territory of the Warsaw Water Agency. An increasing trend was observed in most of the eastern and northern parts of the region.

However, most of the south-western part of the region is characterized by negative coefficients and the highest decrease in the resources occurred in the Pilica and Bzura river basins.

Shallow groundwater directly feeds surface water. The water level in most wells does not exceed 7.5 m and is most often lower than 5 m.

In order to continue assessing the trends in the evolution of groundwater levels, the mean yearly level was calculated in gauging stations having longer observation periods: the negative coefficients were found in the southern part of the region and reached -3 m in the central part of the Lublin Plateau, this means a relatively high decrease in the groundwater level.

The evolution of groundwater levels is the best indicator of constant and lasting changes in water resources quantities.

## CONCLUSIONS OF THE SURVEY

- **Atmospheric droughts**, characterized by insufficient rainfalls as compared to normal ones, **are frequent.**
- **Droughts are most often of short duration:** from 1 to 2 months. The droughts lasting several months (meteorological droughts) or even exceeding 24 months (soil droughts) have been exceptionally observed. Droughts in rivers are short however and rarely exceed 3 months.
- **The Lublin region is the most threatened** of the territory of the Warsaw Water Agency.
- **Particular attention should be paid to the Pilica and Bzura river basins** where the long-term trend of the evolution of groundwater flows and levels is negative. The same has been observed in the evolution of groundwater levels and water quantity in rivers in the southern and south-western regions. This is a threat for the future.

**Andrzej Badowski**  
**WARSAW RZGW**  
**Fax : (48-22) 846 61 97**

# RUSSIAN FEDERATION

## TOMSK STUDENTS MASTER A NEW SYSTEM FOR WATER RESOURCES MANAGEMENT

The River Tom is a large West Siberian river: its average flow rate is 1,130 m<sup>3</sup>/s, its length 827 km, its basin area 62,000 km<sup>2</sup>. The largest of the exploited coal mines of Russia, the Kuznetsk, is located in its basin as well as many chemical, metallurgical, petrochemical, machine-manufacturing and atomic industries in the Kemerovo and Tomsk regions. As a result, the Tom has become one of the most polluted rivers. It has practically lost its significance for drinking water supply and fishing purposes. In the winter months, the minimal monthly flow consists of waste water by almost 80%, the total volume of which exceeds 2,000 million m<sup>3</sup>/year. More than 300 tons of petroleum products, almost 70 tons of formaldehyde, 230 tons of iron are annually discharged into the Tom, without taking into account its tributaries.

**New management structures were organized in 1994, operating like the French ones, namely: the Committee and Directorate (agency) of the Tom basin.**

The main aims of this new management system are:

- the improvement of the environment in the basin;

- the supply of a high-quality drinking water to the population;
- a better waste water treatment,
- the training of the new executives,
- the adaptation of the French system to the Siberian conditions.

**Within the "Siberian agreement", uniting all the regions of Siberia, a decision has been made to create a similar management structure in the whole Ob river basin, the area of which makes up 4.8 million km<sup>2</sup> with a living population of nearly 30 million people. Management for such a large basin is an incredibly complicated task and implies the training of the relevant executives. Therefore, the Russian Federation Committee for Higher Education has made the decision to train engineers in this field at the Tomsk Polytechnic University. It is obvious that the solution to the economic and environmental problems of the Siberian river basins depends first on the effective training of its executives.**

**S.I. Shvartsev, O.G. Savichev  
Tomsk Polytechnic University**



# CZECH REPUBLIC

## DEVASTATING SUMMER FLOODS IN THE MORAVA RIVER BASIN

It was Friday the 4th of July and many people were bent on spending their weekend and holidays anywhere in nice Moravian and Silesian country.

During the weekend, heavy rain fell in the spring area of the Morava river. Maximum daily rainfall reached about 200 mm and made up about 13% of the yearly average, and for 5 days, the maximum rainfall ran to about 30% of the average yearly amount (around 500 mm). Floods started on Saturday 6th, and continued on the 7th and 8th of July. Peak flow in rivers was often higher than Q100yr: Strákonice on the Morava river reached 850 m<sup>3</sup>/s, Dluhonice on the Beèva river 840 m<sup>3</sup>/s.

A similar situation also affected the Odra River Catchment Area in the Czech Republic, Poland and north-eastern Germany and partly some regions of the Elbe River Basin in the Czech Republic.

The total flooded area was between 520 and 560 km<sup>2</sup> (almost 3% of the basin) and the consequences of heavy rainfall, floods, erosion in the Morava River Basin were unprecedented.

Floods caused 20 deaths and 3,000 citizens were homeless. 150 towns and villages were partly or entirely flooded, 15,000 houses were damaged and 1,000 flats fully destroyed. 30 alluvial water sources were devastated.

Non-point pollution was massive and more than 20 wastes disposal sites were washed out into the rivers. Structures and devices for water management were damaged or are now non operating (destroyed water intakes, broken-down water supply systems, choked or scoured sewers, flooded waste water treatment plants).

Threat of epidemics (hepatitis A, leptospirosis etc.) and heavy mosquito calamities had to be controlled.

About 200,000 domestic and wild animals died. Crops were devastated causing losses in agriculture.

About 500 km of roads and 150 km of railway were destroyed.

The estimate of the damage and losses amounts to about 800 - 850 million USD.

It was the "biblical deluge" that fell on our region!

**Ladislav Pavlovsky  
Povodí Moravy, a.s.  
Fax : (420-5) 746 244**

# The network newsletter

## Secretariat :

*International Office for Water*  
21, rue de Madrid  
75008 PARIS - FRANCE

Tel. : +33 1 44 90 88 60  
Fax : +33 1 40 08 01 45  
E Mail : stp-riob@oieau.fr

The "Network Newsletter  
is published with the support  
of the French Water Agencies



*Agences de l'Eau*

Publishing Director  
J.F. DONZIER

Editor  
A. BERNARD

Editorial Assistant  
G. SINE

Production  
Eau & Développement international  
ESTER - Technopole  
87069 LIMOGES Cedex - FRANCE

Printing  
Chastanet Imprimeur - LIMOGES



On the Web:

<http://www.oieau.fr/riob/>

N° ISSN : 1265-4027

The 1997 General Assembly of the International Network of Basin Organizations took place in Valencia - Spain - from October 2 to 4 at the invitation of the Spanish Authorities.

The works were honoured by the presence of Mrs. Isabel Tocino, Spanish Minister for the Environment, who officially opened the debates, as well as Rita Barbera, Mayoress of Valencia.

**The Assembly gathered 105 delegates who represented 61 Member-Organizations from 27 countries.**

The General Assembly took note that **102 Organizations of 42 countries have, up to now, expressed their interest in becoming either full "Members" or "Observers"**.

The delegates reaffirmed their support to INBO's Charter principles and decided that becoming a member would be, from now on, subjected to the payment of an annual subscription amounting to US\$ 1,000 for 1998 that aims to cover the expenditure of the Network management and the publication of the "Network Newsletter" as a priority.

The French Water Agencies confirmed their commitment to help financially the Secretariat in 1998, during this phase after which the number of subscriptions should increase.

The Assembly congratulated the Mexican Authorities, Messrs. MESTRE and CHAVEZ, his successor, in particular for their way of carrying out the Chairmanship of INBO since the Morelia General Assembly in March 1996.

The Assembly unanimously nominated **Mr. Juan Manuel ARAGONÉS BELTRÁN**, President of the Jucar Hydrographic Confederation, as **new INBO Chairman** until the next General Assembly in 1998.

It also nominated the following **members of the Liaison Bureau:**

- Africa: Mr. A. KOUADIO (Ivory Coast),
- America: Mr. H. MENDEZ ACOSTA, regular member, and Mrs. M. BALLESTERO VARGAS, substitute member (Costa Rica), Mr. R. GARRIDO (Brazil), regular member, and Mr. V. ROSADO LUIA (Ecuador), substitute member, Mr. D. BRAVO (Colombia), regular member, and Mr. J.-M. LATU-LIPPE (Quebec), substitute member, Mr. R. GARCIA MAYEN (Mexico), regular member, and Mr. V. BENEVIDES (Brazil) substitute member,
- Asia: Mr. R. USMAN (Indonesia),
- Western Europe: Mr. J. M. SANTA FE, regular member and J. A. LLANOS BLASCO, substitute member (Spain), Mr. J.-P. CHIROUZE, regular member, and A. DUCHEIN, substitute member (France),
- Central and Eastern Europe: Mr. A. BADOWSKI (Poland) and Mrs. A. M. PELIN (Romania).
- Mr. G. CHAVEZ ZARATE (Mexico), Mr. M. OSTOJSKI (Poland), as former Chairmen, Mr. J.-F. DONZIER (IOW) who represents the Permanent Technical Secretariat.

The Assembly also decided that Mrs. G. SERBU (Romania), Messrs. E. MESTRE (Mexico), G. LASCU (Romania) and E. NOAIN (Spain) would be "Honorary Advisers" of INBO as former Chairmen or members of the Liaison Bureau, thus acknowledging their efforts to widen the scope of the Network.

The General Assembly expressed a great interest for the French initiative of organizing, from 19 to 21 March 1998 in France, an International Conference on Water and

## FINAL RESOLUTIONS

Sustainable Development at Ministerial level, within the framework of the Commission on Sustainable Development. It expressed the wish that INBO be officially associated to this Conference, as an international organization specialized in the sector. The Assembly thanked the Organization Committee for organizing, during the Conference, an INBO workshop on river basin management.

The delegates were informed of the initiatives of the "Global Water Partnership" and the "World Water Council". They asked the Chairman to examine how to create a link with these organizations.

The Assembly was pleased with the unquestionable success of the "Network Newsletter" publication and the opening of the Internet site:  
<http://www.oieau.fr/riob>

It insisted on the advantage for the Member-Organizations of contributing to the "newsletter" and extending the Web site with the requested information on the "Member-Organizations", the agenda of events and seminars, the identification of educational materials and available information, the inventory of competent consulting firms and service providers, and a **new file of Member-Organizations capable of mobilizing experts at international level for missions of general interest for INBO** as well as a list of experts (International College).

It requested the Permanent Technical Secretariat (IOW) to direct "discussion forums" on the WEB in 1998, especially on the topics already dealt with by INBO:

- "the funding of basin Organizations" (Valencia General Assembly),
- "Information necessary for decision-making" (Morelia General Assembly)
- "Masterplans for better managing our rivers" (Constanza workshop);
- as well as on other important topics such as the "water users' participation"

The Assembly adopted the recommendations presented at the end of the **technical seminar of October 3, 1997, on "the financing of Basin Organizations"** and mandated the Chairman to ensure that a wide dissemination is made to the interested International Organizations and to the Organization Committee of the next International Water Conference in France.

The delegates examined the progress of the "AQUADOC-INTER" project for the dissemination of institutional documentation between Member-Organizations and they saw a demonstration of the experimental model presented by IOW, which is to become operational on Internet before the end of 1997.

They insisted that the Organizations of the Countries quickly nominate their "National Relay Documentation Centre" (NRDC), if they have not already done so, and on the importance of participating in the first Aquadoc-Inter Management Committee, which was subsequently held in Limoges, FRANCE, on December 11-12, 1997 (see page 3).

Finally, the delegates approved the programme of the first INBO's "International training course" on the topic "Creation of Basin Organizations", which would be co-organized by Spain and France in 1998.

Simulations of the provisional programme as well as of the registration conditions will be sent to the Member-Organizations and to bi- and multilateral Cooperation Organizations so that they can envisage sponsorships to make this project successful.

The Assembly thankfully retained the invitation of the Brazilian Authorities to host the **next INBO General Assembly in San Salvador de Bahia (Brazil) from 2 to 4 December 1998** as well as the meeting of the Liaison Bureau that will precede this Assembly by several months. It also noted the proposal of **Poland for 1999** and **Colombia for 2000** that will be examined by the Bureau.

The General Assembly underlined the advantage of strengthening technical seminars and chose the following main topics for the Paris workshop: "users' participation in water management and the funding of the latter".

They were also pleased with the setting up of a **first Regional Network for Latin America (RR-LA/RIOC)**, following the Constitutive Assembly in Brasilia (Brazil) on July 9-10, 1997 and the preliminary meeting in Costa Rica of the Organizations of Central America and the Caribbean on May 14-16, 1997.

It encouraged the African Member-Organizations, following the first meeting in Abidjan (Ivory Coast) in November 1996, to set up one or several INBO's Regional Networks, whatever the geographical territory.



Mrs. Isabel TOCINO, Spanish Minister for the Environment opened the INBO General Assembly