SECOND INTERNATIONAL WORKSHOP ON
REGIONAL APPROACHES TO RESERVOIR DEVELOPMENT AND MANAGEMENT
IN THE LA PLATA RIVER BASIN:
FOCUS ON LAKE MANAGEMENT

AUGUST 8 TO 19, 1994
SALTO GRANDE RESERVOIR, CONCORDIA AND BUENOS AIRES
ARGENTINA

SUMMARY REPORT

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2ND. INTERNATIONAL WORKSHOP ON REGIONAL APPROACHES TO RESERVOIR DEVELOPMENT AND MANAGEMENT IN THE LA PLATA RIVER BASIN: FOCUS ON RESERVOIR MANAGEMENT

ORGANIZED BY:

United Nations Center for Regional Development (UNCRD)
International Lake Environment Committee Foundation (ILEC)
United Nations Environment Program (UNEP)

CO-ORGANIZED BY:

REGIONAL

Technical Commission for Salto Grande (CMTSG) (Argentina-Uruguay)
Joint Commission for the Paraná River (COMIP) (Argentina-Paraguay)

ARGENTINA

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FOREWORD

Following the recommendations of the First International Workshop on Regional Approaches for Reservoir Development and Management in the La Plata River Basin, a second meeting focussed in reservoir management was held during August 8/19th, 1994, in Salto Grande, Concordia and Buenos Aires, Argentina.

A number of activities were carried out during those days with the participation of representatives of various organizations of the five countries of the region, highly specialized lecturers and members of the international and local sponsoring entities.

The main components of the workshop comprised short courses on ecological modelling, water quality and reservoir management, fisheries in reservoirs, field visit and presentation of Salto Grande reservoir case study; follow up and institutional seminars and working group sessions.

Those activities made possible to achieve successfully the objectives of the workshop as regards the interchange of experiences among researchers and experts of the region and the constitution of a forum for discussion of the main problems, needs and achievements within the basin. During the workshop participants presented papers that showed partially the state of the art of reservoir research and management in the basin. Also the Workshop stimulated successfully the interactions among the different specialists such as biologists, engineers, geologists, architects, demonstrating that a true multidisciplinary approach had been achieved and developed during the workshop.

The need to enhance interaction and coordination among the organizations dealing with river/reservoir systems management and research in the region was unanimously stressed by all the participants. Thus the conclusions and recommendations of the Workshop centered on the creation and implementation of a Regional Network integrated by focal and affiliated organizations in the La Plata River Basin, which was conceived as a fundamental institutional tool to promote a sound environmental and sustainable development and management of regional water resources.

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1. BACKGROUND AND OBJECTIVES

The first workshop-training course entitled "International Workshop on Regional Approaches to reservoir Development and Management in the La Plata river Basin: Focus on Environmental aspects", held at Sao Carlos e Itaipú, Brazil and Yacyretá (Ituzaingó), Argentina in August 1991 provided a forum for exchange of country experiences and policies in reservoir development and management and proved useful to explore regional strategies and approaches that will facilitate an environmentally sound management of manmade lakes.

The conclusions and recommendations of said First Workshop/ Training Course pointed out the general concern posed by water resource planners and managers regarding technical, social and institutional aspects of lake management such as the need to:

- Improve the understanding of the dynamic linkages between reservoirs and their watersheds (upstream, on-site and downstream influences);
- To promote the use of regionally compatible data acquisition and processing techniques to improve and better coordinate monitoring, surveillance and evaluation activities;
- To widely apply modelling techniques to simulate and predict ecosystems behavior;
- To incorporate an environmental (biogeophysical and social) approach to the management of reservoirs since the early stages of their development;
- To improve the use and development of planning methodologies accounting for environmental, social and political constraints;
- To promote the systematic interchange of information on common regional problems and experiences, based on the implementation of a regional network of specialized organizations; and
- To promote the interjurisdictional harmonization of legal and institutional frameworks to make viable an integrated (natural and social) approach to reservoir development ensuring the participation of the involved communities.

Since the first meeting was convened, accelerated political, economical and social changes had occurred in the region. On one hand, common regional development objectives and market policies agreed by the majority of La Plata river Basin countries call for the rational and sustainable use of shared waters and aquatic resources. Environmentally sound development and management of reservoirs in the region should play a major role towards the achievement of said purposes.

On the other hand decentralization and privatization of State functions and increasing public involvement constitute at present generalized trends in the region as a common response of democratic governments to fight against hyperinflation, inefficiency of public entities and uncontrolled public spending. The discussion about the role of the State and of state-owned agencies has become installed amidst Latin American society. Management of existing reservoirs and planning of future ones had to be necessarily reviewed in the context of such

trends.

In response to these concerns, the second international workshop/training course was organized with the following objectives:

(1) To make a follow up evaluation of the first course to assess the progress made in the implementation of its recommendations and to suggest alternative strategies to induce a more active and straightforward response from decision makers and managers.

(2) To exchange country and international experiences on environmental field and remote sensing data acquisition and processing systems and on the selection and use of lake water quality indicators.

(3) To exchange country and international experiences on management tools - with special attention to modelling techniques - for planning, operating and monitoring of reservoirs in the context of an integrated lake-watershed approach.

(4) To explore institutional (legal and organizational) approaches and strategies at the national and regional levels applicable to the management of existing reservoirs and the planning of future ones in order to harmonize rational and full use of regional and shared water resources. A preliminary discussion about the implementation of a regional network of specialized organizations to promote systematic interchange of information will be started in this context. Present trends of decentralization of State responsibilities and privatization of government owned enterprises will be taken in consideration to this respect.

The meeting provided to senior planners and managers of reservoirs and water resources (hydroelectric) projects, and researchers from five countries of the La Plata River Basin a forum for the exchange of country experiences and the analysis of emerging policy issues in reservoir development and management.

In this opportunity the following points had been stressed:

i) To which extent incorporation of new data acquisition and processing techniques to management of river/reservoir systems in the region can be readily done?

ii) Is it viable to promote a generalized adoption of modelling as a basic tool for the integrated management of the river/reservoir systems ?

iii) Which are the most suitable existing planning methodologies and tools to account for environmental (biogeophysical and social) aspects and still providing an integrated and friendly support for decision making?

iv) Which are the institutional mechanisms that can be adopted to enhance this

incorporation of new techniques and to provide effectiveness to the management?

FOCUS

The proposed workshop/training course will focussed on the environmental (biogeophysical and social) and institutional aspects of reservoir development and management. The incorporation of fundamental ideas, based on research findings, to the planning of new reservoirs and the management of existing ones was at the basis of the workshop/training course. In this respect past experience resulting from the themes developed at the first workshop were included into the discussion and analyzed. Discussions and training activities were developed within the following framework:

i) Lake and reservoir management in response to watershed inputs and reservoir operation in order to preserve biodiversity (fish production, fish stock, techniques to improve biomass production and to restore fish fauna at the reservoir), water uses and human health.

ii) Water quality monitoring: use of regionally compatible techniques and indicators for the systematic evaluation of lake-watershed environmental status. Methodologies, long term studies; existing information; comparison of cases within the region; field work; remote sensing techniques;

iii) Modelling approaches to the understanding and simulation of reservoirs response to watershed inputs, assessing the use of models as tools for decision making. Selection of model complexity. Steady and dynamic models. Lake-reservoir models. Real case studies testing different management strategies. Conceptual approach for development of complex management models.

iv) Review and evaluation of viable institutional arrangements in order to facilitate and improve the incorporation of new management techniques taking in account present trends of decentralization and privatization. Network of specialized organizations for strengthening the institutional harmonization and coordination. Participation of the community in the lake-reservoir/river basin management activities.

2. CONCLUSIONS, RECOMMENDATIONS AND REPORTS

LA PLATA RIVER BASIN REGIONAL NETWORK

The participants concluded that little progress had been made on the effective implementation of the recommendations of the first workshop while the general diagnosis made at that time remained still valid.

The need to enhance systematic communication, cooperation, interchange of information and the optimization of research, planning, operation and management of river/reservoirs was stressed.

It became very clear from the discussions that the establishment, implementation and operation of a regional network in the La Plata basin was an urgent need to develop further the interaction and already existing cooperation and to promote future activities, projects and programmes related to watershed and water resources management, planning, reservoir protection and rehabilitation.

Objectives of the Network

The la Plata Basin network should improve, stimulate and enhance the following activities among its participants:

1) Education, information and communication

- Integration of educational activities to develop formal training courses (postgraduate), in service training, environmental education.

- Exchange of information through publication of newsletters, synthesis and joint papers as a result of cooperative work. General public information.

- Inventory of regional capacities: organizations, research and technology development projects, human resources, teaching and training activities, technology availability (models), data banks, etc..

2) Cooperation

Development of further cooperation among the various institutions in the watershed as a way to stimulate technological transfer, joint research projects, workshops and seminars, both on specific topics or integrated approaches to watershed/reservoirs and water resources management.

3) Integration

Development of integrated activities in the network and among the various regions. The network would provide a "conceptual umbrella", a basic structure with an approach to stimulate integrated management activities. It is becoming more and more evident that to solve the complex problems of water resources and reservoir management it is necessary to develop a true interdisciplinary approach with a systemic and articulated overview of biogeophysical, social and economic problems. The network will have the task to improve and spread this conceptual framework in the basin in order that adequate management of water resources can be achieved as a result of this approach.

4) Coordination

The network will have the function to coordinate activities among its members and also to propose further projects, programmes and training courses. One of the most important objectives of the network is to enhance quality control of the projects; to unify and standardize methodologies, environmental quality indicators, field data collection and processing procedures, geographical information systems development and remote sensing data acquisition techniques; to provide basis for intercalibration, promote ex post evaluation of projects and stimulate interchange of technologies.

Organization of the Network

It was therefore considered as fundamental to design and establish a system operation in order to provide the network with the following capacities: flexibility, facility of information and interaction among its components, fast response to the increasing demands for pollution control, technological transferences, training at various levels, public information, etc.

The following structure was proposed for the efficient operation of this network:

1) A coordinator/executive director that has the main task of preparing and promoting implementation of the action plan of the network for short and medium terms.

2) A small technical committee with representatives of various institutions and countries (4 to 6 members) that will support the work of the coordinator/ executive director.

3) An advisory council integrated by a limited number of experts and representatives of organizations of the various countries of the watershed and international institutions.

4) The network, in principle, should be integrated by a reduced number of nodes or focal organizations in each country. A regional center will coordinate the

relations among focal points which in turn will do so with the affiliate national organizations that may become members of the system. The regional center responsibilities may be carried out sequentially by each national focal organization during fixed periods of time to be determined as part of the project design.

5) Organizations dealing with river reservoir systems operation and research in the basin will all be welcomed as affiliate network members. Particularly reservoir management and development entities, research and technological institutes, water related university units or governmental organizations dealing with water resources administration or management.

6) Such a network, in a complex and varied watershed as the La Plata basin, should operate, at least during its initial stages, with the supply of funds of international agencies.

Synthesis of Network activities

Table 1, based on the recommendations of Working Group 5 "Planning and Evaluation" presents a preliminary identification of network activities to be carried out within different time horizons.

GENERAL RECOMMENDATIONS

(1) Based on the recommendations of the First International Workshop, strengthened by the findings of this International Second Workshop it is strongly recommended to create and start the operation of the LA PLATA RIVER BASIN NETWORK FOR SOUND ENVIRONMENTAL MANAGEMENT OF RIVER/RESERVOIR SYSTEMS (LA PLATA RIVER RESERVOIR NETWORK) according to the objectives and organizational guidelines described above.

TABLE 1.-SYNTHESIS OF PROPOSED NETWORK ACTIVITIES

	Short-term	Mid-term	Long-term
Education			
Primary & secondary schools	x		
In-service training	x		
Technical short course		x	
Short courses for NGOs		x	
Public seminars		x	
Post-graduate course			x
Information			
Newsletter	x		
Directory	x		
Communication/Public relations	x		
Promotional video		x	
Databank		x	
GIS		x	
Interaction			
Technical meetings		x	x
Public meetings		x	x
Seminars/workshops		x	x
Exchange visits		x	x
Coordination			
Networking (informal)	x		
Cooperation			
Collaborative researches			x
New projects of technical cooperation		x	
Search for funding support			x

Note: Short-term - within six (6) months
Mid-term - one (1) year
Long-term - two (2) years

Source: From the recommendations of Working Group 5 "Planning and Evaluation"

(2) In order to successfully achieve a sound implementation and to start full operational capability of the network within reasonable short terms, a three stages procedure is recommended as follows:

a) Obtention of necessary funds to develop a **network feasibility and implementation project** by appointing a qualified specialist. The help of UNCRD and ILEC as well as from other patronizing organizations within the region will be sought to endorse the submission of the corresponding project proposal to funding agencies like UNDP, IDB, WB or UNEP to apply for the limited amount of money needed to carry out the study.

b) Design of the feasibility project including network objectives, components, structure, functioning, budget and action plan for the short and medium terms.

i) The design and implementation of the network should be carried out on the basis of a review and consultation of the existing organizations in the basin devoted to research, technology development or operation of river/reservoir systems in order to evaluate their capacity and willingness to participate and contribute to its objectives.

ii) The reports of the Working Group and the resource papers presented to the Seminars should be taken as base guidelines for the elaboration of the Network Project /[1], together with the conclusions and recommendations of the First International Workshop.

c) Submission of the project to supporting organizations, to the recommended focal and regional proposed institutions and to the governments in order to proceed with the formal implementation of the network.

(3) At the same time that formal design and implementation of the network is carried out, it is recommended to initiate network activities with the aid of the representatives participating in the workshop and their organizations, depending upon their capabilities and possibilities. A technical committee integrated by a small number of persons and chaired by one of its members should coordinate and promote these starting activities.

(4) In order to coordinate and carry out initial organizational activities comprising the elaboration and submittal of the network feasibility and implementation project to

[1] A particular reference should be made to the "Proposal for the Design of a Regional Network of Institutions for the Environmentally Appropriate Management of River/Reservoir Systems at the La Plata River Basin" by Conrado Bauer and Lorenzo Gonzalez Videla.

possible funding agencies and the starting of short term network activities, the Plenary approved the creation of a technical committee integrated by the following members elected by consensus among the participants:

Coordinator: CALCAGNO, Alberto (IARH/ILEC)

Members:
BAUER, Conrado (WFEO/ILEC)
CALAMANTE, Alberto (COMIP)
BRUNA, Gilda Collet (FAU, USP)
NERY HUERTA, Eduardo (ITAIPU)
OTAEGUI, Alejandro (CTM Salto Grande)
TUNDISI, Jose Galizia (EESC-USP/ILEC)

REPORTS OF THE WORKING GROUPS

General outlines established for the working groups discussions and the elaboration of recommendations

a) Inputs for the discussions:

i) Use of the general and sectoral conclusions and recommendations of the 1st. Workshop as a starting point.

ii) Incorporation of the new findings from the short course, participants' presentations and discussions and Seminars.

iii) Critical problems of water resources management

b) Expected outputs:

i) Recommendations for the general and sectoral objectives of a regional network.

ii) Recommendations for concrete actions to be carried out by the network.

c) Basic points to be considered for the elaboration of the recommendations:

i) Education

Environmental education programmes.
Training of human resources.
Formal (i.e. postgraduate courses)
In service training.

ii) Information

Newsletter.
Inventory of institutions, research and application projects.
Data banks.
Tools (i.e. models) exchange.

iii) Interaction

Stimulus of bilateral activities (joint courses, seminars, field work) and

joint research projects.

iv) Coordination

Quality enhancement.
Optimization of on going and future works.
Proposal/promotion of new projects.

v) Cooperation

Support to cooperation among institutions.
Enhancement and stimulation of technological exchange.

List of working groups and their themes

Working Group 1: Social aspects. Population resettlement of urban and rural population

Working Group 2: Flow regulation and water quality

Working Group 3: Reservoirs and human health

Working Group 4: Bioproductivity

Working Group 5: Planning and evaluation

Working group 6: Institutional aspects

REPORT OF
WORKING GROUP 1 "SOCIAL ASPECTS" AND WORKING GROUP 3:
"RESERVOIRS AND HUMAN HEALTH"

Chairperson and
Rapporteur: Leopoldo Bartolomé

Members: Cándido Frade Varela
Fernando Lozano
Cristina Martinez

(1) The recommendations and diagnosis given in the 1st Workshop are still valid. Some progress has been achieved, mainly in Brazil, particularly in relation to regulation and setting of standards for the resettlement of populations. In the remainder of the region no general guidelines had been implemented and the procedures are dependent on each specific project.

It is necessary to take in account effective tools for the economic and social rehabilitation of the population besides those criteria already mentioned in the 1st. Workshop regarding the relocation of population as a consequence of the construction of reservoirs or other development projects in the basin.

Every relocation project should be planned as an integral development project and subject to consensus so as to maximize the participation of the local population in its benefits.

(2) It is necessary to achieve an effectively integrated approach of social, environmental and health aspects. Some specific actions are suggested below aiming to that purpose.

(3) Social and ecological costs need to be considered as a component of the cost of opportunity of the project, not merely of its budget. It should be taken in account that any social investment included as part of a project budget, yields revenues or benefits which are accrued by society although they cannot be duly registered in the project accounts.

(4) No substantial progress has been achieved since the diagnosis formulated in the First seminar regarding reservoirs and human health. Some partial improvements have been produced, mainly in Brazil, in what concerns the use of biological indicators, but they have not been articulated with the rest of the Basin.

(5) The issues identified in the First Workshop have become more urgent and critical due to the significant increase in the total toxicity in the Basin as well as in the transmission of illnesses, viruses, algae, etc. The completion of many of the projects planned for the near future will increase the interconnectivity in the Basin and therefore the health risks.

Recommendations for the network

(1) One of the objectives to be achieved by the network is to formulate a common conceptual framework for approaching social aspects at a regional level. It existences will make possible to promote measures for basin management not only based upon sound scientific and technical grounds but also to have them indorsed at a regional level.

(2) The network will be able to carry out the important task of spreading out these vital aspects related to basin management to the public, besides its basic role of linking and disseminating these issues among the specific technical centres in the region.

(3) The following activities are recommended, among others, for the near future:

(a) To carry out a workshop and a seminar aiming to promote the elaboration of truly systemic diagnosis taking in account the social, environmental, ecological, etc. aspects involved in basin management issues.

(b) To carry out a workshop/seminar for the discussion of subjects related to the promotion of private initiatives in order to improve the potential for employment opportunities in the framework of large development projects. These workshops should be oriented either to specific issues (domestic refuse recycling, reforestation, etc.) or address the subject globally.

(c) A seminar/workshop for the study of effective mechanisms to promote technology transfer at a regional level. This transfer could be achieved by means of technical cooperation agreements, courses, assistantships, etc.

REPORT OF
WORKING GROUP 2 "FLOW REGULATION AND WATER QUALITY"

Chairperson and Rapporteur: Carlos Gomez

Members: Magdalena Mandía
Leonarda Lescar
Eduardo Nery Huerta
Guillermo Blassetti
Linor Carignano
Nestor Gabellone
Yosuke Yamashiki

(1) Information

(a) Survey of capacities

(i) Organizations, institutions, universities.

(ii) Projects

(iii) Human resources

(iv) Teaching and training activities

(v) Identification of technology availability

It is recommended to carry out these activities by means of a consultant service to be contracted before the end of 1994. The report could be produced during the first semester of 1995.

(b) Monitoring

The National Institute for Water Science and Technology (INCYTH) of Argentina, will make available the Handbook for Monitoring and Analytic Quality Control of the GEMS-WATER Programme to all the organizations participating in the Workshop

(c) Methodology for the assessment of water quality problems to be applied in the basin

The selection of a proper tool to accomplish with this objective is considered

necessary. To this end the group understands that a mathematical model will fulfil the requirements.

(2) Education

(a) To carry out during the second semester of 1995 a Seminar on Analytic Quality Control, with the support of the GEMS-WATER Programme. The Seminar venue will be INCYTH facilities and support from the Programme will be sought in terms of consultants and fellowships for the participants.

This activity, together with the interchange of monitoring and analytic quality control handbooks aims to the development of intercalibration methodologies among the laboratories of the various organizations within the Basin.

(b) To support and participate in the project on determination of toxic transport in sediments to be developed with the sponsorship of the GEMS Programme of UNEP.

(c) Five pre-congress courses will be held in July 1995 in the framework of XXVI Congress of the International Association of Theoretical and Applied Limnology:

i. Transport processes in lakes
ii. Ecological modelling
iii. Wetland modelling and management
iv. Water quality control modelling
v. Sediment toxicity

(3) Interaction

The stimulation of joint research projects among the various organizations within the basin and the identification of common interest projects is considered of fundamental importance to achieve a harmonious growth of the scientific development.

REPORT OF
WORKING GROUP 4 "BIOPRODUCTIVITY"

Chairperson and
Rapporteur: Alejandro Otaegui

Members: Fernan Carbonar
Oscar Delfino

Introduction

The ichthyofauna of the La Plata River Basin has evolved in spatially integrated and strongly interrelated context, where reservoir development, beside producing local impacts, can affect the bioproductivity of the system as a whole.

The existing references concerning fish behaviour and reproduction in the various ambients of the basin continue to be scarce although the progress achieved in some reservoirs is encouraging.

Likewise, there are not enough scientific outputs regarding the benefits and problems derived from the accidental o voluntary introduction of species either exotic or brought from other basins.

The installation of facilities for fish passage in reservoirs or the development of fishculture projects have been and still are scarcely discussed alternatives in the context of the integrated management or development of fisheries.

The increasing alteration of water quality is perceived as a medium term threaten for fish production while its effects on fish reproduction are considered to be probable.

The operation of hydro powerplants involves a certain degree of environmental stress which interferes with phytoplankton succession, primary productivity and the structure of fish community, thus affecting fish production.

General recommendations

(1) To incorporate the concept of autochthonous biodiversity into the planning process as a guiding criteria for decisions.

(2) Specialists in ecology, limnology and ichthyology should participate in the planning stage of water resources development for energy purposes

(3) Likewise, the environmental team pertaining to each project should participate in the scheduling of powerplants operation.

(4) An organized system of consulting, information interchange and cooperation, i.e. a network, should be implemented so as to guide towards the rational and integrated operation of projects in their respective basins.

(5) The regulation of any kind of fishing activities should be based on biological grounds.

Particular recommendations

(1) The studies concerning the behaviour, reproduction and distribution of fish communities in the fluvial systems of the La Plata River Basin in order to determine their insertion in the trophic network, should be stressed.

(2) Research and assessment activities in reservoirs should be oriented to:

(a) Population structure of at least the most important fish species, selecting those more representatives of the various trophic levels.

(b) Reproduction strategies, their limitations and possibilities regarding the operation of hydro powerplants.

(c) Population dynamics of key species

(d) Assessment and analysis of the operation of fish passage facilities; their selective operation and their management.

(e) Structure and dynamics of species of fishing importance. Impact analysis.

(f) Alternatives for fisheries management. Induction of the development of selected species. Integrated management: fishculture, operation and fish passage. Flow and water level regulation.

(g) Breeding areas protection

(h) Assessment of upstream reservoir areas, particularly those considered to be actual or potential breeding areas.

(i) Assessment of downstream effects. Influence in fisheries.

(j) Development of fish production models. Their insertion in regional economy. Importance and perspectives.

(k) Assessment of training and upgrading requirements.

(l) Implementation of an integrated databank

(m) Evaluation of self supporting fisheries.

(n) Generation of biological grounds for fisheries regulations.

Concrete actions

(1) Education

(a) To carry out post graduate training activities by the incorporation of fellowships holders or passants to working groups or operation teams in reservoirs. Mutual benefit agreements may be implemented between reservoir management organizations, which may provide basic infrastructure and place and research institutions and universities which provide scientific guidance and background. Existing teams dedicated to field, laboratory, assessment and research may incorporate apprentices.

(b) To provide subsidies and fellowships through universities and research institutes (like INCYTH and CONICET in Argentina, USP in Brazil); water project entities (like CTM Salto Grande, provincial organizations and others); off region organizations (like UNU, UNEP, etc.).

(c) To carry out short training courses for officials and experts (like these workshops organized by ILEC/UNCRD/UNEP).

(2) Information

(a) To start the elaboration of a preliminary directory of names, addresses, activities, publications, data, etc., in standard word processing format and diskette storage. The task should be readily initiated to be completed by December 1994.

(b) The database should be periodically updated by means of a newsletter issued periodically. A compact disk format may be consider as the medium term goal for disseminating the data base.

(3) Interaction

(a) To implement agreements for cooperation among related organizations and enhance existing ones (like CTM Salto Grande and Entidad Binacional Yacyreta; CTM Salto grande and CARU; CTM Salto Grande and UROU)

(b) To promote horizontal communication among related organizations

(4) Coordination

(a) Network organization should provide a centralized coordination through focal

organizations in each country acting as referents.

(5) Cooperation

(a) Cooperation activities among related organizations should be preferently based on the utilization of their own resources in terms of infrastructure, personnel and information.

(b) Distribution of subsidies and fellowships

REPORT OF
WORKING GROUP 5 "PLANNING AND EVALUATION"

Chairperson and rapporteur: Gilda Collet Bruna

Members: Remberto Callejas Rocha
Antonio L. Fernandez
Terence R. Lee
Miguel Noronha
Hiroyuki Takeda

Introduction

The topic, planning and evaluation, is expanded to include not only the ex ante or pre-project activities, but also the ex post or operational planning issues related to the development of reservoir projects.

Objectives of the network:

General Goal - The improvement of the management of the La Plata river basin through interaction and cooperation among research and planning entities and institutions, both public and private.

Sectoral Objectives

(1) To integrate local and regional levels of planning and managing the water resources of the basin, in particular, the development and management of reservoirs;

(2) To promote the development of monitoring of environmental and social variables for the whole basin;

(3) To encourage greater community awareness and involvement in the planning and management of the river basin (both land and water resources); and,

(4) To promote the development and application of planning approaches, tools and methodologies, as well as the evaluation of their implementation.

General Activities -

(1) Establishing regional priorities;

(2) Synchronizing activities of members and institutions represented; and,

(3) Integrating activities and approaches.

Recommendations:

The recommendations are in the form of activities pertaining to education, information, interaction, coordination, and cooperation with respect to what the members of the network can do or accomplish within the short-term, mid-term and long-term.

	Short-term	Mid-term	Long-term
Education			
Primary & secondary schools	x		
In-service training		x	
Technical short course			x
Short courses for NGOs			x
Public seminars		x	
Post-graduate course			x
Information			
Newsletter		x	
Directory		x	
Communication/Public relations	x		
Promotional video			x
Databank		x	
GIS		x	
Interaction			
Technical meetings		x	x
Public meetings		x	x
Seminars/workshops		x	x
Exchange visits		x	x
Coordination			
Networking (informal)	x		
Cooperation			
Collaborative researches			x
New projects of technical cooperation		x	
Search for funding support			x

Note: Short-term - within six (6) months
Mid-term - one (1) year
Long-term - two (2) years

REPORT OF
WORKING GROUP 6 "INSTITUTIONAL ASPECTS"

Chairperson and rapporteur: Terence Lee

Members: Dino Bellorio
Jorge Badino
Leonardo De Benedictis

Objectives of the network;

(a) General Objectives:

promote the relation, coordination and complementation among natural and social sciences on the basis of projects and programmes of research and information in the La Plata river Basin

(b) Sectoral Objectives:

Support the collection of information on, and the knowledge of, regional and national norms and agreements of the countries which form part of the network.

Recommendations

(1) Education

(a) Training of human resources (staff) of the institutions which are members of the network in environmental policies and law.

(b) Promotion of environmental education at all levels of education - primary, secondary and university - including elements of legal training and obligations derived from the legal norms as well the necessity of their application

(2) Information

(a) The newsletter must include information on legal matters, specially on the character of current law - supranational, international, regional and national of the countries in the basin -. It should also include cases of application of legal norms and of the solution of controversies as well as of international and national jurisprudence.

(b) Support and promote inventories of institutions which specialize in environmental law; of legal libraries; professional associations; foundations; universities; schools of law and of individual lawyers active in environmental

law.

(c) The network should ensure the utilization of the data bases already in existence in the institutions of the basin. It should also encourage the foundation of new data bases so that other institutions can produce their own information.

(3) Interaction

The network should encourage seminars among the universities and other educational institutions as well as joint projects in the area of environmental law.

(4) Coordination

The network should promote coordination agreements among member institutions to the end of achieving a better coordination.

(5) Cooperation

The network should promote mutual or horizontal cooperation in the development of joint projects on the study of the normative base for undertaking development projects in the basin.

(6) Operation

Once in operation the network should give priority to the study of the diverse legal concepts in the countries of the basin. Specific attention should be given to:

(a) The study of the legal viability of alternative legal approaches which may be acceptable to the participating regional organizations and to the countries of the basin.

(b) Development of legal criteria which will aid in the development and approval of projects.

ANNEX A

WORKSHOP PROGRAMME

Sunday, August 7th

18.30 hs.	Reception of participants at Concordia Airport. Transportation to Ayuí Hotel.
	Registration of participants and delivery of Workshop documents.

Monday, August 8th

9.30 hs.	Reception of participants at Concordia Airport. Transportation to Ayuí Hotel.
10.30 hs.	Registration of participants and delivery of Workshop documents.
11.30 hs.	Opening Ceremony Speakers: Mr. Carlos Máscimo (CTM Salto Grande) Mr. Akira Kurata (ILEC/IETC/UNEP) Mr. Jose Tundisi (CRHEA/EESC-USP-Workshop Coordinator) Mr. Alberto Calcagno (ILEC-Workshop Coordinator)
12.00 - 13.00 hs.	COURSE 1: Ecological Modelling in Reservoirs Prof. Sven E. Jorgensen
13.00 - 14.00 hs.	Lunch
14.30 - 15.30 hs.	COURSE 1: Ecological Modelling in Reservoirs Prof. Sven E. Jorgensen
15.30 - 16.00 hs.	Coffee break
16.00 - 18.00 hs.	COURSE 2: Water Quality and Lake/reservoir Management Prof. José Tundisi
18.00 - 18.30 hs.	Coffe break

18.30	"Inland water fisheries in Japan" Presentation by Dr. Akira Kurata - ILEC Senior Scientist.

Tuesday, August 9th

9.00 - 10.00 hs.	Presentation of papers by the participants
10.00 - 13.00 hs.	COURSE 1: Ecological Modelling in Reservoirs Prof. Sven E. Jorgensen
13.00 - 14.30 hs.	Lunch
14.30 - 17.00 hs.	COURSE 2: Water Quality and Lake/reservoir Management Prof. José Tundisi
17.00 - 17.30 hs.	Coffee break
17.30 - 19.00 hs.	COURSE 3: Fisheries in reservoirs Prof. Norberto Oldani
19.00 hs.	"The pollution of Lakes and Reservoirs" . Dr. Akira Kurata - ILEC Senior Scientist

Wednesday, August 10th

9.00 - 10.00 hs.	Presentation of papers by the participants
10.00 - 12.30 hs.	COURSE 1: Ecological Modelling in Reservoirs Prof. Sven E. Jorgensen
12.30 - 14.00 hs.	Lunch
14.00 - 15.30 hs.	COURSE 1: Ecological Modelling in Reservoirs - Computer Demonstration Prof. Sven E. Jorgensen
15.30 - 17.00 hs.	COURSE 2: Water Quality and Lake/reservoir Management Prof. José Tundisi
17.00 - 17.20 hs.	Coffee break
17.20 - 19.00 hs.	COURSE 3: Fisheries in reservoirs Prof. Alberto Espinach Ross

19.00 hs.	Presentation of papers by the participants

Thursday, August 11th

9.00 - 10.00 hs.	Presentation of papers by the participants
10.00 - 12.30 hs.	COURSE 1: Ecological Modelling in Reservoirs Prof. Sven E. Jorgensen
12.30 - 14.00 hs.	Lunch
14.00 - 15.30 hs.	COURSE 1: Ecological Modelling in Reservoirs - Computer Demonstration Prof. Sven E. Jorgensen
15.30 - 17.00 hs.	COURSE 2: Water Quality and Lake/reservoir Management Prof. José Tundisi
17.00 - 17.20 hs.	Coffee break
17.20 - 19.00 hs.	COURSE 3: Fisheries in reservoirs Prof. Miguel Petrere
19.00 hs.	Presentation of "Salto Grande" study case

Friday, August 12th

9.00 - 10.00 hs.	Presentation of "Salto Grande" study case (Continued)
10.00 - 12.30 hs.	COURSE 1: Ecological Modelling in Reservoirs - Computer Demonstration Prof. Sven E. Jorgensen
12.30 - 14.00 hs.	Lunch
14.00 - 15.00 hs.	COURSE 1: Ecological Modelling in Reservoirs - Computer Demonstration Prof. Sven E. Jorgensen
15.00 - 17.00 hs.	COURSE 2: Water Quality and Lake/reservoir Management

	Prof. José Tundisi
17.00 - 17.20 hs.	Coffee break
17.20 - 19.00 hs.	COURSE 3: Fisheries in reservoirs Prof. Miguel Petrere
19.00 hs.	Presentation of "Salto Grande" study case (continued)

Saturday, August 13th

9 - 18 hs.	Presentation of Salto Grande Project Visit to the facilities and to Salto Grande reservoir areas of particular interest. Presentation and final discussion of Salto Grande case study

Sunday, August 14th

9 - 18 hs.	Departure by bus to Buenos Aires Guided visit to the National Natural Park El Palmar, on the Uruguay river shore. Lunch Arrival to Buenos Aires

Monday, August 15th

9.30 - 12.00 hs.	Guided Tour of Buenos Aires city.
12.00 - 14.00 hs.	Lunch
14.00 - 18.00 hs.	Free afternoon

Tuesday, August 16th	FOLLOW UP SEMINAR Venue: Auditorium "Raúl Prebisch" - Siege of the INTERAMERICAN DEVELOPMENT BANK Representation - Buenos Aires
9.30 - 10.00	Registration of participants
10.00 - 10.30	Follow Up seminar: Objectives and Organization Mr. Alberto Calcagno - Mr. Jose Tundisi
10.30 - 11.30 hs.	Working Group Nº 1: "Social Aspects"

	Resource paper: Mr. Leopoldo Bartolomé
11.30 - 11.45	Coffee break
11.45 - 13.00	Working Group Nº 2: "Flow Regulation and water quality" Resource paper: Mr. Carlos Gomez
13.00 - 14.30 hs.	Lunch
14.30 - 15.00 hs.	Working Group Nº 3: "Human Health and reservoirs" Presentation: Mr. Jose Tundisi
15.00 - 16.00 hs.	Working Group Nº 4: "Bioproductivity" Resource paper: Mr. Alejandro Otaegui
16.00 - 16.15	Coffee break
16.15 - 16.45 hs.	Working Group Nº 5: "Planning and Evaluation" Presentation: Mr. Alberto Calcagno
16.45 - 17.45 hs.	Working Group Nº 6: "Institutional aspects" Resource paper: Mr. Dino Bellorio
17.45 - 18.00 hs.	Coffee break
18.00 - 19.00 hs.	Round table and final discussion

Wednesday, August 17th	**INSTITUTIONAL SEMINAR**
9.30 - 11.00 hs.	Interferences of the human activities on the environment - Billings reservoir area. Mrs. Gilda Collet Bruna (FAU-USP) Mr. Miguel Noronha (ELETROPAULO) Mr. Jose Tundisi (CRHEA-USP)
11.00 - 11.15 hs.	Coffee break
11.15 - 12.00 hs.	The management of reservoirs Mr. Terence Lee (CEPAL)
12.00 - 12.45 hs.	Review of environmental aspects management in hydroelectric projects financed by the IDB Mr. Paul Dulin (IDB)
12.45 - 14.30 hs.	Lunch

14.30 - 15.15 hs.	Institutional and Organizational Mechanisms in River Lake Basin Management Mr. Antonio Fernandez (UNCRD)
15.15 - 16.00 hs.	Reservoir management in La Plata River Basin - Coordination Mechanisms. Mr. Víctor Pochat (DNRH-MEOSP)
16.00 - 16.15 hs	Coffee break
16.15 - 17.00 hs.	A proposal for the design of a regional network of institutions for the environmentally appropriate management of the River/reservoir systems in the La Plata River Basin. Mr. Conrado Bauer (WFEO/ILEC) Mr. Gonzalez Videla
17.00 - 17.45 hs.	Interferences of the human activities on the environment - Billings reservoir area. (Continued) Mr. Jose Tundisi (CRHEA-USP)
17.45 - 18.00 hs.	Coffee break
18.00 - 18.30 hs.	Round table and final discussion

Thursday, August 18th

9.00 hs.	Departure to the Instituto Nacional de Ciencia y Técnica Hídricas (INCYTH) - Ezeiza - Province of Buenos Aires.
9.30 - 11.30 hs.	Visit to the facilities of the Institut.
11.30 - 13.00 hs	Organization and integration of the working groups. Initiation of working groups sessions.
13.00 - 14.00 hs.	Lunch
14.00 - 16.30 hs.	Working groups sessions.
16.30 - 17.30 hs.	Elaboration of the final conclusions and recommendations of each working group.
17.30 hs.	Return to Buenos Aires

Friday, August 19th	Plenary and Closing Sessions Auditorium "Raúl Prebisch" - Siege of the

	INTERAMERICAN DEVELOPMENT BANK Representation
9.30 - 12.00 hs.	Plenary Session Presentation of working groups conclusions. Discussion and formulation of general conclusions and recommendations.
12.30 - 13.00 hs.	Final Plenary session and Closing ceremony. Speakers: Mr. Akira Kurata (ILEC/IETC/UNEP) Mr. Antonio Fernandez (UNCRD) Mr. Paul Dulin (IDB) Mr. Victor Pochat (DNRH/MEOSP)
13.00 hs.	Farewell cocktail.

ANNEX B

LIST OF PAPERS PRESENTED AT THE 2ND. INTERNATIONAL WORKSHOP ON REGIONAL APPROACHES FOR RESERVOIR DEVELOPMENT AND MANAGEMENT IN THE LA PLATA RIVER BASIN: FOCUS ON RESERVOIR MANAGEMENT

(1) "A Proposal for the Design of a Regional Network of Institutions for the Environmentally Appropriate Management of the River/Reservoir Systems at the La Plata River Basin"
Bauer, Conrado ; Gonzalez Videla, Lorenzo.

(2) "Institutional and Organizational Mechanisms in River/Lake Basin Management"
Fernandez, Antonio; Oya, Kenji.

(3) "Reservoir Population Resettlement: A Regional progress report"
Bartolome, Leopoldo

(4) "A Review of Environmental Management Aspects in Hydroelectric Projects Financed by the Interamerican Development Bank" (Reseña sobre la Gestión de los Aspectos Ambientales en los Proyectos Hidroeléctricos financiados por el Banco Interamericano de Desarrollo)
Dulin, Paul - In spanish.

(5) Assessment and Proposals Report concerning Institutional Aspects - Working Group 6" (Informe de Evaluación y Propuestas referente a Aspectos Institucionales - Grupo de Trabajo Nº 6)
Bellorio, Dino - In spanish.

(6) "The Management of Reservoirs"
Lee, Terence

(7) "Interferences of the Human Activities on the Environment: Billings Reservoir Area"
Bruna, Gilda Collet; Tundisi, José Galizia

(8) " Master Plan for Environmental Surveillance - Salto Grande Reservoir - Action Plan 1992-1997" (Plan Director de Vigilancia Ambiental - Embalse de Salto Grande - Plan de Acciones 1992-97)
Comisión Mixta Técnica de Salto Grande - Departamento de Ecología y Medio Ambiente - In spanish.

(9) "Water Quality Studies in Salto Grande Reservoir" (Estudios sobre Calidad de Agua en el Embalse de Salto Grande)
Comisión Mixta Técnica de Salto Grande - Departamento de Ecología y Medio Ambiente - In spanish.

(10) "Eutrophication Assessment in Salto Grande Reservoir" (Evaluación de la Eutroficación del Embalse de Salto Grande)
Comisión Mixta Técnica de Salto Grande - Departamento de Ecología y Medio Ambiente - In spanish.

(11) "Health Interest Fauna I - Studies on the possible expansion of Schisostomiasis in the Salto Grande Reservoir Area" (Fauna de Interés Sanitario I - Estudios sobre la Posible Expansión de la Esquistosomiasis en el Area del Embalse de Salto Grande]
Comisión Mixta Técnica de Salto Grande - Departamento de Ecología y Medio Ambiente - In spanish.

(12) "Health Interest Fauna II - Study on Hemathophagous Insects" (Fauna de Interés Sanitario II - Estudios sobre Dípteros Hematófagos)
Comisión Mixta Técnica de Salto Grande - Departamento de Ecología y Medio Ambiente - In spanish.

(13) "Salto Grande Reservoir Water Quality - Eutrophication: Physical-chemical indicators; reference values" (Calidad de Aguas del Embalse de Salto Grande - Eutroficación: Indicadores Físico-Químicos; Valores de Referencia)
Comisión Mixta Técnica de Salto Grande - Departamento de Ecología y Medio Ambiente - In spanish

(14) "Mathematical Model for Calculation of Thermal Stratification in Reservoirs" (Modelo Matemático para el Cálculo de la Estratificación Térmica en Embalses)
Trento, Alfredo; Venturini V. et als. - Faculty of Engineering and Water Sciences, UNL. - In spanish.

(15) "Situation with new water management operation rules- Neuquén River - Pellegrini Lake System" (Situación con Nuevas Normas de Manejo de Aguas - Sistema Río Neuquén - Lago Pellegrini)
Asensio, Aníbal; Losano, Fernando et al. - Limay, Neuquén and Negro Rivers Basin Interjurisdictional Authority, Law 23896 - In spanish.

(16) "Aspects and Problems of Inland Fisheries and Aquacultures in Japan"
Kurata, Akira - ILEC

(17) "Reservoir Management in La Plata River Basin - Coordination Mechanisms" (Gestión de Embalses en la Cuenca del Plata - Mecanismos de Coordinación)
Pochat, Víctor - In spanish.

(18) "Biological Basis for the Development of Fisheries in La Plata River Basin Reservoirs" (Bases Biológicas para el desarrollo de los Recursos Pesqueros en Embalses de la Cuenca del Plata)
Otaegui, Alejandro - In spanish.

(19) "The ichthyofauna of Salto Grande Reservoir" (La Fauna Ictica del Embalse de Salto Grande).

Comisión Mixta Técnica de Salto Grande - Departamento de Ecología y Medio Ambiente - In spanish.

ANNEX C

LIST OF PARTICIPANTS, LECTURERS AND RESOURCE PERSONS

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