

NACIONES UNIDAS  
COMISION ECONOMICA  
PARA AMERICA LATINA  
Y EL CARIBE - CEPAL



Distr.  
GENERAL

LC/G.1573 (Sem.48/3)  
6 de septiembre de 1989

ORIGINAL: ESPAÑOL

---

INFORME DE LA REUNION DE EXPERTOS SOBRE CAPACITACION EN MATERIA DE  
GESTION DE PROYECTOS Y SISTEMAS DE RECURSOS HIDRICOS

(Santiago de Chile, 5 al 7 de abril de 1989)

CONTENTS

	<u>Paragraph</u>	<u>Page</u>
I. ORGANIZATION OF WORK . . . . .	1-8	1
Place and date . . . . .	1	1
Attendance . . . . .	2	1
Agenda . . . . .	3	1
Inaugural meeting . . . . .	4-5	2
II. SUMMARY OF DISCUSSIONS . . . . .	6-12	3
III. RESULTS OF WORKING GROUP DISCUSSIONS . . . . .	13-14	5
IV. CONCLUSIONS AND RECOMMENDATIONS OF MEETING . . . . .	15-16	6
Annex I - LIST OF PARTICIPANTS . . . . .		11
Annex II - LIST OF DOCUMENTS . . . . .		14

## I. ORGANIZATION OF WORK

### Place and date

1. As part of the activities under the project entitled "Training in the Management of Water Resources Projects and Systems", sponsored by the Government of the Federal Republic of Germany, an Expert Meeting on Training in the Management of Water Resources Projects and Systems was held in Chile, from 5-7 April, 1989.

### Attendance

2. Experts from the various countries of the region participated in the meeting. Also in attendance were officials representing international and bilateral organizations (see list of participants in annex I).

### Agenda

3. The meeting adopted the following agenda:

1. Inaugural meeting.
2. Presentation and discussion of the results of the case studies on the supply of and demand for training in the management of water resources projects and systems in selected countries of the region.
3. Courses in management: The Experience of the Inter-American Course on the Juridical, Economic and Administrative Aspects of Water Resources.
4. Proposed plan of activities for the project "Improving the training of personnel responsible for the management of water resources".
5. Guidelines for the preparation of a basic programme for organizing training courses in the management of water resources.

Inaugural meeting

4. The opening meeting was addressed by the Executive Secretary of ECIAC, Mr. Gert Rosenthal, who stressed the significance of the water resources programme in the work of ECIAC.

5. The second speaker was Mr. Adolf Ederer, representing the Government of the Federal Republic of Germany. In his address, he underscored the long tradition of support by his government in this area and the importance of training for development.

## II. SUMMARY OF DISCUSSIONS

Presentation and discussion of the results of the case studies  
on the supply of and demand for training in the management  
of water resources projects and systems in some  
countries of the region (agenda item 2)

6. The discussion on this item was initiated with the presentation by their authors of the eight case studies carried out in the countries of the region, the texts of which are contained in the following documents:

a) Relevamiento de la oferta y demanda de capacitación en gestión de los recursos hídricos en América Latina y el Caribe. Caso Argentina (LC/R.725).

b) Estudo de avaliação da oferta e demanda potencial de capacitação em gestão de recursos hídricos na América Latina e Caribe. Caso Brasil (LC/R.726).

c) Oferta y demanda por capacitación en gestión de recursos hídricos en Perú y Bolivia (LC/R.730).

d) Estudio sobre oferta y demanda de capacitación en gestión de recursos hídricos en Venezuela (LC/R.732).

e) Relevamiento de la oferta y demanda de capacitación en gestión de los recursos hídricos en América Latina y el Caribe. Caso Centroamericano (LC/R.739).

7. The discussion on this subject continued with an evaluation of the current situation of the training system for the management of water resources in the Federal Republic of Germany.

8. The discussion ended with the presentation of a document summarizing the eight regional case studies and the conclusions and recommendations extracted therefrom.

Courses in Management. The Experience of the Inter-American Course  
on the Juridical, Economic and Administrative Aspects of  
Water Resources (agenda item 3)

9. A presentation was made summarizing the scope of the Inter-American Course on the Juridical, Economic and Administrative Aspects of Water Resources, organized by the Inter-American Center for Land and Water Resource Development (CIDIAT), as a contribution to the project. The course, of four weeks duration, was conducted in Mérida, Venezuela, with 30 participants from different countries of Latin America. It was organized with the support of the Centro de Economía, Legislación y Administración del Agua (CELA), of Argentina, the Department of Technical Co-operation for Development, of the United Nations, the Organization of American States (OAS), and a number of Venezuelan institutions, in addition to ECLAC. The results of the course were considered by the students to be very good. Plans are being made for CIDIAT to organize in the near future similar courses in co-operation with ECLAC and other institutions.

Proposed plan of activities for the project on "Improving  
the training of personnel responsible for the  
management of water resources"  
(agenda item 4)

10. A presentation was made summarizing the activities expected to be carried out under the project entitled "Improving the training of personnel responsible for the management of water resources in Latin America and the Caribbean".

11. The following activities were proposed:

a) Establishment of a working group charged with preparing a basic programme for courses in the management of water resources.

b) Organization of subregional meetings in Central America, the Caribbean, and South America to establish guidelines for the preparation of courses on the management of water resources.

c) Participation in courses organized by management training institutes in the countries of the region.

d) Organization of at least one course to test the effectiveness of the basic programme.

12. In the ensuing discussion, several participants expressed their opinions on the proposed activities and the need to co-ordinate the courses with institutions in the sector.

### III. RESULTS OF DISCUSSIONS IN THE WORKING GROUPS

Guidelines for the preparation of a basic programme  
for organizing training courses in the management  
of water resources (agenda item 5)

13. In order to achieve the objective of analysing this item, the discussion was centered around the following points:

a) Preparation of a management training course for the water resources sector, and

b) Analysis of the content of a basic programme for training courses in the management of water resources.

14. The working groups undertook an in-depth analysis of these two matters and at the end of their discussions, drew a number of conclusions and made several recommendations.

## IV. CONCLUSIONS AND RECOMMENDATIONS OF THE MEETING

15. At the end of their deliberations, the experts reached the following conclusions:

- i) From the presentations of the consultants' reports on the supply of and demand for training in the management of water resources, it is clear that there is a great demand for this type of training. The main problems lie with the supply, which has not been sufficient to adequately meet the need for alternative training of human resources to accomplish the goal of integrated management of water resources.
- ii) Most negative experiences in the management of water resources arise from the lack of administrative skills in many countries of Latin America and the Caribbean.
- iii) There is urgent need to establish a training system in the management of water resources on the basis of a network of institutions that include CIDIAT, CELA (Argentina), and the Escola Brasileira de Administração Pública de la Fundação Getúlio Vargas (Brazil).

16. The experts also made the following recommendations on the future activities of ECLAC in the field of training in the management of water resources:

- i) ECLAC should support pilot training courses in the management of water resources, at a region-wide level, with a view to diversifying and expanding the range of management-related issues studied.
- ii) These courses should be aimed at two levels of officials:
  - senior policy makers, and
  - middle-level management and operational personnel.

The first group should be organized into a workshop of not more than one week's duration, and the scope and content of the second group's work should follow the guidelines set out in table 1.



**Table 1**  
**A BASIC COURSE FOR**  
**INTEGRATED WATER RESOURCE MANAGEMENT**

TOPIC	BASIC CONTENT	PROGRAMME	HOURS
CONCEPTUAL AND TECHNICAL ASPECTS	The hydrological system	Functioning of the general and regional system	3
	Definition of water uses and their requirements	Urban supply, irrigation, electricity generation, recreation, navigation, flood control and the available technological options	12
	Water availability	Concepts, forms of estimation with and without regulation	3
	Water quality	The biogeochemical cycle, quality for different uses, environmental indices.	6
INTEGRATED WATER RESOURCE MANAGEMENT	Development and water resources	Problems of development. Regional development. Water resources and development. Instruments for the planning of policies and strategies for water resource development. The management process and public policies	8
ECONOMIC AND FINANCIAL ASPECTS OF WATER RESOURCE MANAGEMENT	Demand for water resources	Basic concepts of demand, economic character of water, characteristics of water users, estimating demand.	6
	Supply of water resources	Production functions, cost derivation, estimating supplies.	8
	Pricing systems	The concept of the market, balance, prices, tariff and tax systems, levies and subsidies	8
	Externalities and hazards	Economic determinants, the example of pollution, recovery costs, economic analysis of flooding, erosion, etc.,	6
	The budget as an instrument of management	Budget concepts, types of budgets and techniques of budget-making, determination of objectives, the budget as a system of information	3
	Management indicators	Types of indicators, the determination of indicators.	3
	Evaluation of investment proposals	The cycle of evaluation, techniques and criteria for evaluation.	6

TOPIC	BASIC CONTENT	PROGRAMME	HOURS
ORGANIZATIONAL ASPECTS OF WATER RESOURCE MANAGEMENT	Organization as a system	The concept of a system, characteristics of water resource organizations, relationship to its environment, subsystems of an organization	3
	The administrative process	Planning, organization, management and control.	4
	Information systems for management	The value of information. Designing information systems. Relationship to economic instruments, planning and control	6
	Management capabilities	Technical, conceptual and human capabilities. Capacity to negotiate. Organizational policy. Conflict management, organizational culture.	9
	Decision making	Stages in the process of decision making. Techniques, criteria and value systems	6
INSTITUTIONAL AND JURIDICAL ASPECTS	Institutional options for the management of water resources	The most common types of institutions in Latin America. Centralization vs. decentralization, advantages and disadvantages. The inter-institutional network, problems of competition.	6
	Legal systems for water resources	Private systems, state systems, coexistence of private and public elements. Conversion of pre-existing systems of rights and licences.	4
	Juridical mechanisms for the allocation, creation and transfer of water rights	Civil law. Water law. Transfer and cession of rights. Preferences and priorities.	4
	Legal aspects of water management	Planning, categories and criteria to be considered. Register of water sources and water rights. Public and private engineering works, specific and multiple uses. Cost recovery.	4
<b>TOTAL</b>			<b>120</b>

Intended for personnel responsible for projects, research, management, development and education, with some specialization or equivalent experience (professional level), and for technical personnel responsible for decisions at a high institutional level, generally with university education and post-graduate specialization or equivalent work experience

Workshops on policies and strategies with the participation of senior officials should be geared towards fulfilling the objectives and completing the contents set out below.

a) Objectives

- To discuss the formulation of policies for the integral management of water resources.

- To lay down guidelines for the establishment and continuous review and updating of training programmes for personnel working in the water resources sector.

b) Target group

Policy-making officials in institutions, linked to national and State systems of management (ministers, State governors, cabinet advisors, chairmen, heads of water services enterprises, etc).

c) Duration:

Three 8 hour days - total of 24 hours.

d) Methodology:

Research-action.

e) Thematic contents:

i) Management of policy-making:

- Political, social and economic contexts.
- Balance between supply and demand for water use.
- Management of conflicts in the allocation of water-uses.
- Management of conflicts inherent in the exploitation of water for different uses.
- Importance of strategic planning at the interregional and national levels.

ii) Management and implementation of policies:

- Evaluation of the effectiveness of inter-institutional, intersectoral, inter-organizational and international co-ordination mechanisms.
- Review of the systems for the training of human resources at the decision-making levels, as a strategic element of management.

iii) Discussion of the advisability of establishing a team of specialists to design a model training programme for Latin America on the basis of the following general guidelines:

a) Objective

To train middle-level and operational cadres for the integral management of water resources.

b) Target group

The professional training required and the organizational level of the participants must be established for each group, based on the concept of interdisciplinary teams.

c) Nature of the courses

Courses designed to diversify and expand the range of problems examined in the field of the management of water resources.

d) Instructors

It is recommended that instructors be trained to handle modern techniques of teaching, learning, transmission of attitudes and values, aspects of behaviour and other teaching instruments of adult pedagogy in the field of management.

e) Design of programmes

In this connection, two main criteria should be kept in mind:

- A balance must be maintained between the distribution of teaching hours, the discussion of cases, workshops and the work in the institution to which the students belong.
- The allocation of the scarce human resources (instructors) and the implementation costs (travel, scholarships) should be rationalized as far as possible.

f) Focus of programmes

An effort should be made to ensure that programmes focus on socio-economic, technological and behavioural-institutional issues.

g) Basic contents

Definition of the basic contents of the course (table 1).

## Annex I

## LIST OF PARTICIPANTS

Tomás Bander Rodríguez  
Director Nacional  
Centro Interamericano de Desarrollo Integral  
de Aguas y Tierras (CIDIAT)  
Parque La Isla, Edif. CIDIAT  
Mérida, Venezuela

Alberto Jorge Calamante  
Presidente  
Instituto Nacional de Ciencia y Técnica Hídricas (INCYTH)  
Lima 767  
Buenos Aires, Argentina

Bianor S. Cavalcanti  
Diretor da EBAP/Fundación Getulio Vargas,  
Praia de Botafogo 190  
Rio de Janeiro, Brasil

Elsa Correa de Pavón  
Jefe, Departamento de Capacitación,  
Centro de Economía, Legislación y Administración del  
Agua (CELA-INCYTH),  
Belgrano 210 Oeste  
(5500) Mendoza, Argentina

Fradique Chacón Mendoza  
Ingeniero-Planificador Jefe de División,  
Dirección de Planificación de los Recursos Hidráulicos,  
Ministerio del Ambiente y de los Recursos Naturales  
Renovables (MARNR),  
Torre Sur, Centro Simón Bolívar, piso 9,  
Caracas, Venezuela

Enrique García M.  
Director General de Aguas (S),  
Dirección General de Aguas,  
Morandé 59, oficina 802,  
Santiago de Chile

Alicia Gorri  
Investigadora de CELA-INCYTH,  
Belgrano 210 Oeste,  
(5500) Mendoza, Argentina

Miroslav Kovacic  
Jefe del Departamento de Derechos de Aguas,  
Dirección General de Aguas,  
Morandé 59, piso 7,  
Santiago de Chile

Helmut Lauterjung  
Consultor del organismo alemán para la cooperación  
técnica (GTZ),  
Am Rehmanager 4 d  
D-3340 Wolfenbüttel  
República Federal de Alemania

Armando Llop  
Director del Centro de Economía, Legislación y  
Administración del Agua (CELA),  
Belgrano 210 Oeste  
(5500) Mendoza, Argentina

José Ortiz Castillo  
Director de Cuencas Hidrográficas,  
Ministerio de Asuntos Campesinos y Agropecuarios,  
La Paz, Bolivia

Gonzalo Pajares T.  
Director Ejecutivo,  
Programa Nacional de Manejo de Cuencas y Conservación  
de Suelos,  
Jirón Washington 1894, oficina 1104,  
Lima 1, Perú

Eladio Prado  
Presidente Ejecutivo,  
Instituto Costarricense de Acueductos y Alcantarillados,  
San José, Costa Rica

Carlos Enrique Secaira Pinto  
Director del Programa de Apoyo a la Reestructuración  
de la Administración Pública,  
Av. Reforma 10-00, Zona 9,  
Ciudad de Guatemala, Guatemala

Goki Tsuzuki  
Diretor da Divisão de Controle de Recursos Hídricos,  
Setor de Radio e T.V. Sul,  
Edifício do Palácio do Radio,  
Bloco 1, 3er. andar  
CEP 70.330 Brasília, D.F.,  
Brasil

José Carlos Vera La Torre  
Profesor-Investigador-Economista,  
ESAN,  
Alonso de Molina s/n,  
Monterrico, Surco,  
Lima, Perú

United Nations Educational, Scientific and Cultural Organization (UNESCO)

Carlos Fernández-Jáuregui  
Especialista de Programa,  
Ciencias de Agua y Medio Ambiente,  
UNESCO, Oficina Regional de Ciencia y Tecnología (ORCYT)  
Casilla 859,  
Montevideo, Uruguay

Secretariat

Economic Commission for Latin America and the Caribbean

Axel Dourojeanni  
Oficial a cargo  
División de Recursos Naturales y Energía

Terence R. Lee  
Unidad de Recursos Hídricos  
División de Recursos Naturales y Energía

Andrei Jouravlev  
Unidad de Recursos Hídricos  
División de Recursos Naturales y Energía

Juan José Calderón  
Unidad de Recursos Hídricos  
División de Recursos Naturales y Energía

Matías Renard  
Unidad de Recursos Hídricos  
División de Recursos Naturales y Energía

## Annex II

## LIST OF DOCUMENTS

Working documents

1. Provisional agenda, Reunión de Expertos sobre Capacitación en materia de Proyectos y Sistemas de Recursos Hídricos, Santiago, Chile, 5-7 April, 1989 (LC/R.738(Sem.48/1)), 27 January 1989.
2. Capacitación en gestión de los recursos hídricos en América Latina y el Caribe: diagnóstico y propuestas (LC/R.741(Sem.48/2)), 14 March, 1989.

Reference documents

3. Relevamiento de la oferta y demanda de capacitación en gestión de los recursos hídricos en América Latina y el Caribe. Caso Argentina (LC/R.725), 29 December 1988.
4. Estudo de avaliação da oferta e demanda potencial de capacitação em gestão de recursos hídricos na América Latina e Caribe. Caso Brasil (LC/R.726), 2 January 1989.
5. Oferta y demanda por capacitación en gestión de recursos hídricos en Perú y Bolivia (LC/R.730), 24 January 1989.
6. Estudio sobre oferta y demanda de capacitación en gestión de recursos hídricos en Venezuela (LC/R.732), 6 January 1989.
7. Relevamiento de la oferta y demanda de capacitación en gestión de los recursos hídricos en América Latina y el Caribe. Caso centroamericano (LC/R.739), 16 February 1989.
8. Capacitación para la gestión de recursos hídricos en la República Federal de Alemania (LC/R.746/Rev.1), 22 June 1989.