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REPORT OF THE REGIONAL SEMINAR ON ENVIRONMENTAL MANAGEMENT AND LARGE WATER RESOURCE PROJECTS

(Concordia, Argentina, 1 to 3 October 1981)

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CONTENTS

/Preamble

Preamble

The present report contains the conclusions and recommendations of the Regional Seminar on Environmental Management and Large Water Resource Projects, held at Concordia, Argentina, from 1 to 3 October 1981. This Seminar was the culmination of the studies on one of the four processes of interaction between development and environment considered under the CEPAL/UNEP Project on Horizontal Co-operation in Latin America relating to styles of development and environment. The other three processes being studied are: the expansion of the agricultural frontier, metropolitanization and urban policies, and peasant life in highland ecosystems.

The Seminar was conducted on the basis of close co-operation between the Joint CEPAL/UNEP Development and Environment Unit and the CEPAL Natural Resources Division, through its Water Resources Unit. At all stages extensive support was received from the institutions participating in the project, particularly from the Salto Grande Mixed Technical Commission (CTM) of Argentina and Uruguay.

For a number of years, jointly with UNEP, CEPAL has been focussing a large proportion of its activities in the field of water resources on increasing the understanding of the interrelationship between water, development and the environment. The most important project undertaken by CEPAL in that area so far was the project entitled "Water Management, Development and the Environment", better known as ADEMA, the results of which were published in July 1980.1/ Subsequently other related studies were carried out, the most important being a study on the Salto Grande Project.2/ A CEPAL/UNEP Project on Horizontal Co-operation in Latin America relating to Styles of Development and Environment has permitted follow up to the theme subjects initially taken up under the ADEMA project, with a view to preparing recommendations for practical implementation in the management of large-scale projects to exploit water resources.

Water resources are playing an increasingly important and crucial role in the economic development of the Latin American continent, at a time when the processes of urbanization, industrialization, agricultural modernization and energy development are advancing at an accelerated pace. The region's major water resources are beginning to be used in an increasingly decisive and systematic manner. Surface and ground water exploitation has confronted the Latin American countries with new problems that must be resolved in order to guarantee that this renewable resource is used in a safe, consistent and rational manner.

Large dams continue to be constructed chiefly in order to produce energy, to irrigate, and to control excessive discharges of water. Generally owing to a narrow, short-term perspective and to unsufficiently comprehensive planning the many environmental and social effects in vast areas and sectors and the systemic nature of the project in question have been ignored, both from the point of view of their undesired effects, and from the point of view of unexploited potential benefits.

1/ CEPAL/UNEP, Water management and environment in Latin America, Santiago, Chile, July 1980.

2/ Análisis global del sistema involucrado en proyectos de grandes presas con dimensiones ambientales y de desarrollo regional, CTM/CEPAL Agreement, Concordia, Argentina, 1978 (Document 5 RDA/78/0.5).

/For CEPAL,

For CEPAL, the impact of the construction of large dams is regarded as a concrete manifestation of changes in the environment that alter the existing relationships between population, natural resources and the development of the region. It is considered that the Seminar provides an opportunity to promote the institutionalization of specific and continuing horizontal co-operation among the countries of the region, with a view to permitting those responsible for implementation of such large-scale water exploitation projects to share the experience they have been gaining in implementing those projects. More specifically, such co-operation could trigger major progress in regional development planning, in optimum territorial use, in prevention of many of the harmful and undesired lateral effects of large dams, and in environmental management in general.

The purpose of the Seminar on Environmental Management and Large Dams was to consider one of the most important forms of human intervention in the environment, which is rapidly becoming more extensive and increasing in Latin America, and which in many cases results in projects of a very large scale. It was expected that from the experience already gained it would be possible to derive more appropriate methods and procedures, particularly in connexion with the management of such large projects, with a view to integrating them to a great extent into global and, above all, regional development policy, and to achieving the maximum sustainable exploitation of the resources created as a result of the project, while at the same time minimizing its negative social and environmental impact.

With a view to achieving that goal the following three case studies were prepared: (a) the Tinajones Project, Peru; (b) development of the San Francisco Valley (with special emphasis on the Sobradinho dam), Brazil; and (c) the Salto Grande binational Project (Argentina/Uruguay). Furthermore, a general interpretative report containing a preliminary study devoted specifically to a proposed methodology for environmental management was prepared.

For the purpose of facilitating at the Seminar the formulation of specific recommendations on the basis of the basic documents, the case studies and participants' experience, a list of factors to be taken into account during consideration of the items on the agenda was drawn up:

(a) Conceptualization of large water resource projects as specific manifestations of environmental management, for development;

(b) Relationships between regional planning and the planning of large-scale water resource projects;

(c) The geographic, social and economic spheres in which water resource projects are implemented;

(d) Technical actions on the environment and the chain effects that they originate;

(e) Institutional problems relating to environmental management within the project area;

(f) The interaction between management actions of institutions and technical actions on the environment;

(g) Dynamic variables in project implementation: the time factor and stages of studies, construction and operation of a large-scale water resource project;

(h) Organization of project management, with due consideration being given to consideration of environmental questions;

(i) Economic and financial issues in the environmental management of large-scale water resource projects;

(j) Ecological indicators and, in general, means of monitoring environmental management during the operational stage of the project.

/I. ORGANIZATION

I. ORGANIZATION OF WORK

Place and date

1. The Regional Seminar on Environmental Management and Large Dams took place at Concordia, Argentina, from 1 to 3 October 1981. It was sponsored by the Economic Commission for Latin America (CEPAL) and the United Nations Environment Programme (UNEP) in co-operation with the Salto Grande Mixed Technical Commission (CTM).

Attendance 3/

2. Representatives of the following institutions attended the Seminar: Commission for the Study of the Development of the Rio Guayas Basin (CEDEGE), Ecuador; Salto Grande Mixed Technical Commission (CTM), Argentina/Uruguay; San Francisco Valley Development Corporation (CODEVASF), Brazil; National Electricity Company (ENDESA), Chile; Yacyretá Binational Agency, Argentina/Paraguay; Foundation for Environmental Development (FUDAM), Argentina; National Development Foundation, Peru; National Research and Fisheries Development Institute (INIDEP), Argentina; Mid-Paraná Project, Argentina; and the Lambayeque Development Body (ORDELAM), through the Tinajones Special Irrigation Project, Peru.

3. The Water Resources Unit of the CEPAL Natural Resources Division and the Joint CEPAL/UNEP Development and Environment Units participated in the work of the Seminar.

Agenda

4. The following agenda was considered at the Seminar:
   1. Inauguration;
   2. Presentation and consideration of the conceptual/methodological framework;
   3. Presentation of project case studies:
      (a) Tinajones Irrigation Project (Peru)
      (b) Development of the San Francisco Valley (Brazil)
      (c) Salto Grande Binational Project (Argentina/Uruguay)
   4. Analysis and consideration of case studies and exchange of experience;
   5. Conclusions and preliminary recommendations;
   6. Closing session.

Opening and closing sessions

5. At the inaugural session General Miguel Angel Viviani (retired), chairman of CTM took the floor on behalf of Argentina. Following the Co-ordinator of the Joint CEPAL/UNEP Development and Environment Unit discussed the interrelationships between development styles and environment, placing particular emphasis on large dams, and the Acting Director of the CEPAL Natural Resources Division referred to the conceptual aspects of large-scale water resource infrastructure projects.

6. The Seminar was closed by Captain Jorge Rafael Jáuregui (retired), on behalf of the Salto Grande Mixed Technical Commission, and by the Acting Director of the CEPAL Natural Resources Division.

3/ See the list of participants in annex 1.

/Officers

Officers

7. In the course of the three days the Seminar was chaired alternately by Messrs.:

- Leonardo Romero Mattos, General Executive Director of the Tinajones Special Irrigation Project;
- Winston Mañosa, Chief, Department for Environmental and Regional Development of CTM;
- Paulo Natal e Silva, Consultant, San Francisco Valley Development Corporation

Brief review of the discussions

8. The Acting Director of the CEPAL Natural Resources Division introduced the topic of the Seminar, drawing attention to the conceptual focus of the Seminar, the proposed methodological approach, and the results obtained as a result of the preliminary analysis of the case studies submitted. The relevant paper (E/CEPAL/Proy.2/R.2) was distributed among participants and provided a basis for the work of the Seminar.4/

9. Subsequently, the three case studies (agenda item 3) previously agreed upon by the respective institutions and CEPAL, which were the substantive components of the Seminar, were considered. The study on the Tinajones Special Irrigation Project (Peru) was presented by Mr. Leonardo Romero Mattos, General Executive Director of the Project, and Mr. Jorge Yáñez, National Development Foundation; Mr. Paulo Natal e Silva, chief consultant of the president of the San Francisco Valley Development Corporation was responsible for presentation of the study on the San Francisco Valley Development Project (Brazil), placing special emphasis on the Sobradinho Dam Project; the study on the Salto Grande Binational Project (Argentina/Uruguay) was presented by Mr. Winston Mañosa, Chief, Department for Environmental and Regional Development, and his team of experts. This latter statement was expanded by a half-day visit to the chief work of the above-mentioned project and to a fish-breeding station located on the Uruguayan bank of the Uruguay River. At the end of each statement and following the visits, the topics in question and the projects visited were considered extensively.

II. CONCLUSIONS

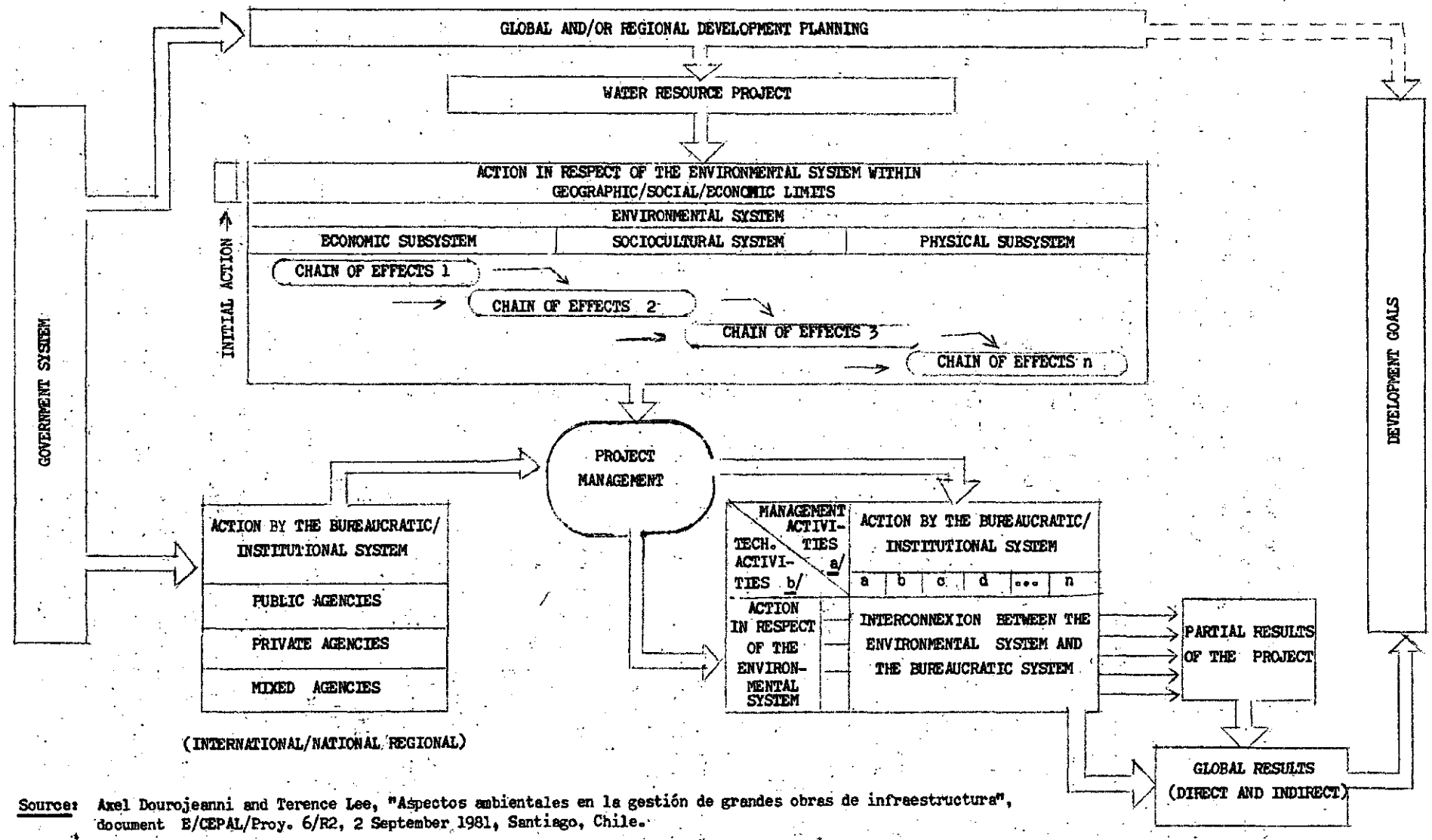
10. It was concluded that, in general, the methodological system proposed by CEPAL for analysis of environmental management, in connexion with large-scale water resource infrastructure projects, was suitable as reference framework for debate. This system,5/ which is presented in summary form in figure 1, shows the various interrelationships that should be taken into consideration in order to organize a water resource project that takes adequate account of environmental management options in decisions. However, it was noted that the figure could be improved so that the operational stage of the projects had a more dynamic appearance and it was stated that the figure did not reflect action taken prior to initiation of the project as such.

4/ See the list of papers submitted at the Seminar in annex 2.
5/ See document E/CEPAL/Proy.6/R.2.

/Figure 1

Diagram 1

RELATIONSHIP BETWEEN ACTION BY THE BUREAUCRATIC/INSTITUTIONAL SYSTEM (MANAGEMENT ACTIVITIES) AND ACTION TAKEN IN RESPECT OF THE ENVIRONMENTAL SYSTEM (TECHNICAL ACTIVITIES) IN A MAJOR WATER EXPLOITATION PROJECT IN THE CONTEXT OF GLOBAL OR REGIONAL DEVELOPMENT PLANNING



Source: Axel Dourojeanni and Terence Lee, "Aspectos ambientales en la gestión de grandes obras de infraestructura", document E/CEPAL/Proy. 6/R2, 2 September 1981, Santiago, Chile.

a/ Such as planning, financing and legislation. b/ Such as studies, construction, operation and conservation.

11. Stress was laid on how desirable it was that the analysis of the relationships between environmental management and large water resource projects should be conducted in such a way that the former was studied in the light of development goals, in other words, that an answer should be provided to the question of how to improve environmental management in order to achieve consistent economic and social development. Account was taken of the fact that the concrete manifestation of environmental management for the purpose of development was, precisely, implementation of a major water resource project. In that connexion, it was stated that, in general, the Seminar and the experience gained from the Salto Grande project, in particular, showed that consideration of the environment in the decision-making system did not result in the establishment of limits or restrictions, or make economic development more costly.

12. Attention was drawn to the fact that the environmental dimension is frequently misunderstood in the formulation of regional plans and water resource projects, since it is common to find certain types of action referred to as "action relating to environmental management" being dealt with separately from action referred to as "action relating to project implementation". This is most obvious in the very construction of a water resource project, since construction must obviously take account of environmental considerations.

13. With regard to delimitation of the spheres of influence of the management of a project, emphasis was placed on the fact that such influence should at least cover the total watershed area of a basin or of a system of basins, including those areas through which the water involved in the project flows, whether it is a question of surface or ground water. This is particularly important in the case of the permanent phase of operation and maintenance of water resource infrastructure systems, and of management and conservation of water resources in general. It was emphasized that if such hydrographic areas were subdivided into operational areas (or delimited for political and administrative, and not technical or hydrographic, reasons) it would be necessary to establish machinery for co-operation and co-ordination among the various project management bodies carrying out activities within the individual hydrographic areas. Brief reference was made to the experienc gained from management of the Salto Grande binational project, in which a stretch of river divided lengthwise, for frontier reasons, along its axis must be administrated.

14. In connexion with dynamic questions relating to environmental management, reference was made to the need always to consider its initial, intermediate and operational stages in order to ensure appropriate implementation of the technical activities of a project. There was unanimous agreement that, in general, the greatest difficulty in connexion with appropriate environmental management lay in the low level of importance normally attached to the operational phase of the project (stage of operation and maintenance of works, and of management and conservation of resources or of the natural system).

15. It was made clear that the organization structure of, and the powers connected with, project management basically depend on three questions: (i) the installed capacity and organizational structure of other national, regional and local institutions that are either in a position to, or should, intervene in project implementation; (ii) predetermined technical action to be carried out in the project area, and action resulting from chain effects that are produced during implementation of each individual form of action; and (iii) initial, intermediate and operational stages of project implementation, since these stages make it necessary to modify the management pattern, particularly in the case of the operational phase, in order to adapt to the way in which the project develops.

/III. RECOMMENDATIONS

III. RECOMMENDATIONS

A. General recommendations

16. The Seminar made the following general recommendations:

(a) With regard to the relationships between the global or regional development plans mentioned earlier and large-scale water resource projects, it was suggested that, both during formulation and during implementation of such projects, consideration should be given to ways of establishing a close link between them. It was, however, pointed out that there have been, and there are still frequently, major water resource studies and projects that are not implemented in the context of general or regional development plans.

(b) Attention was drawn to the fundamental importance of identifying and constantly establishing a hierarchy among the forms of action and the chain of effects (in the ecological sense) resulting from implemention of a large-scale project to exploit water resources, both before beginning such a project and during its operation. Such basic work is the sole guarantee of success in environmental management.

(c) It was recommended that projects should be prepared in such a way that from the outset the probable chain of effects of the chief forms of action resulting in environmental change, such as dams, were identified; that task should be carried out by a group of high-level experts. Since this is a dynamic activity, it calls for constant follow-up and a genuine possibility of taking any subsequent action considered necessary for the purpose of permanent management of such chains of effects. The identification of the chains of effects and their division into technically and administratively feasible "tasks" leads to a real possibility of taking action, since, it is thus possible to identify specifically all the consecutive technical activities to be carried out by those responsible for the management of a project, and by other participating bodies, in order to ensure good environmental management in that project's area of influence.

(d) With regard to institutional problems, it was recommended that, in general, in the case of environmental management resulting from a large water resource project participation by various national, regional, local or international bodies with the capacity to take action in connexion with the project should be oriented and facilitated (also with specific financing). It was stated that it was necessary to promote co-operation between those directly responsible for management of the project and the bodies in question.

(e) With regard to environmental management proper, it was recommended that projects with a view to optimizing the relationships between project implementation activities and technical action connected with a given project should be prepared. In that connexion, the project management should assume that responsibility, either by taking the necessary technical action direct, or by requesting and co-ordinating action to be taken by, or with the participation of, other appropriate bodies. At the same time, this leads to the need for constant follow-up so that the relative effectiveness of the action in question may be assessed and the order of priority in which the action should be taken may be set, both during the initial and the intermediate phase and during the operational phase of the project.

/(f) It

(f) It was recommended that in environmental management particular importance should be attached to the operational phase of the project, since it is precisely at that stage that it is possible to assess and control the impact of technical action taken during the period of construction of the dams and thus to identify and manage the chain of effects resulting from that action. For that reason attention was drawn to developments in management structure, which had been especially designed in the Salto Grande Project for carrying out continuing operational activities. The on-going follow-up of the various chains of effects and the way in which the data obtained were used in orienting environmental management in the area of the project were particularly appreciated.

(g) With regard to economic and financial issues, it was suggested that account should be taken of the costs and benefits resulting from the taking of action with an impact on the entire environmental system, and not only of the water resources aspect (this calls for identification of the various forms of action and their respective chains of effects in order to determine their costs and benefits). It was stated that this could be achieved as the chains of effects became better understood, thus permitting identification and advance assessment of the cost and benefits of their management. In particular, it was recommended that: (i) account should be taken of the long-term impact of water resource projects; (ii) indirect costs and benefits should be included in the economic studies; and (iii) environmental management alternatives should be integrated into the design and economic evaluation of water resource exploitation projects, with the alternatives in question being assessed both individually and in the light of their large-scale impact.

B. Specific recommendations

17. The deliberations at the Seminar show that there is an extensive and varied experience and knowledge in the field of construction and operation of large dams in the Latin American region. It also demonstrated the need for, and the potential benefits of, on-going and systematic co-operation among the countries of the region and, more specifically, among experts and planners directly involved in the development of large water resource exploitation projects.

18. The Seminar therefore made specific recommendations:

(a) It recommended that CEPAL and UNEP, as well as the entire United Nations system, should seek ways and means of institutionalizing in a permanent manner horizontal co-operation machinery with a view to promoting environmental management in connexion with the implementation of large water resource projects. It suggested that it was possible to use financial resources available within UNDP to promote technical and economic co-operation among those responsible for the projects in question.

(b) It also recommended that CEPAL should explore the possibility of establishing a regional centre for training in environmental management of large water resource projects, and seek possible financing means, particularly through UNEP and UNDP. The Salto Grande Mixed Technical Commission offered itself as the headquarters of such a centre.

(c) It was recommended that ecological, social and economic indicators should be developed and identified for the purpose of effective monitoring of the environmental conditions of large water resource projects. This, it was stated, is particularly necessary in order to identify and control appropriately the chains

/of effects

of effects that develop in the area of the project, as well as in order to assess their costs and benefits. The indicators in question would thus form the fundamental elements of good environmental management, above all at the operational stage of the project; moreover, they would provide the basis for planning action, not only in the area of the project, but also in similar areas where the initiation of similar activities is planned.

(d) Furthermore, extremely specific proposals concerning ecological issues relating to fauna and flora were formulated, including: (i) the possibility of establishing a capybara and alligator farm at Salto Grande; (ii) the establishment of a reserve of ecosystems in that same region, similar to the Michilia and Mapimí reserves in Mexico; and (iii) assessment of the possibility of reintroducing vertebrates of major tourist interest whose current populations are not self-sustaining.

(e) The Salto Grande Mixed Technical Commission requested CEPAL, with support from UNEP, to prepare and put into operation a socio-economic and environmental information system in the Salto Grande region.

/Annex 1

Annex 1

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/Annex 2

Annex 2

DOCUMENTS SUBMITTED AT THE SEMINAR

Symbol a/	Author	Agency	Title b/
E/CEPAL/PROY.2/R.1 6	Jorge Yáñez B.	Fundación para el Desarrollo Nacional Peru	Gestión ambiental en grandes obras hídricas: Estudio del proyecto Tinajones (Perú)
E/CEPAL/PROY.2/R.2 6	Axel Dourojeanni and Terence Lee	CEPAL	Aspectos ambientales de la gestión de grandes obras de infraestructura
E/CEPAL/PROY.2/R.3 6	Alfredo Rabinovich, Winston Mañosa, Lilian Boiry, Ernesto González	Comisión Técnica Mixta de Salto Grande (CTM) Argentina/Uruguay	Gestión ambiental en grandes obras hídricas: Estudio del aprovechamiento múltiple de Salto Grande (Argentina-Uruguay)
E/CEPAL/PROY.2/R.4	Companhia de Desenvolvimento do Vale do São Francisco (CODEVASF)	CODEVASF Brazil	Gestão ambiental em grandes obras hidricas: Projeto Sobradino integrante do plano global de desenvolvimento do Vale do rio São Francisco (Brasil)

a/ Documents prepared under the Project on Horizontal Co-operation in Latin America relating to Styles of Development and Environment.

b/ Documents have been reproduced in Spanish, unless otherwise, indicated.