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**REPORT ON THE WORKSHOP ON THE ENVIRONMENTAL DIMENSION IN
PLANNING THE DEVELOPMENT OF THE AREA OF INFLUENCE
OF THE COLBUN-MACHICURA COMPLEX (CHILE)**

(Talca, 3 and 4 May 1984)

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1. The first part of the document is a letter from the author to the editor, dated 10/10/1998. The letter discusses the author's interest in the journal and the possibility of publishing a paper. The author mentions that they have been working on a paper for some time and would like to know if the journal is currently accepting submissions. The author also asks for information regarding the journal's policies and procedures.

2. The second part of the document is a letter from the editor to the author, dated 10/15/1998. The editor responds to the author's letter and informs them that the journal is currently accepting submissions. The editor also provides information regarding the journal's policies and procedures, including the submission process and the review process. The editor expresses interest in the author's work and encourages them to submit a paper.

3. The third part of the document is a letter from the author to the editor, dated 10/20/1998. The author thanks the editor for their response and informs them that they will be submitting a paper to the journal. The author also asks for information regarding the journal's policies and procedures, including the submission process and the review process.

4. The fourth part of the document is a letter from the editor to the author, dated 10/25/1998. The editor responds to the author's letter and informs them that their paper has been accepted for publication. The editor also provides information regarding the journal's policies and procedures, including the submission process and the review process.

5. The fifth part of the document is a letter from the author to the editor, dated 10/30/1998. The author thanks the editor for their response and informs them that they will be submitting a paper to the journal. The author also asks for information regarding the journal's policies and procedures, including the submission process and the review process.

Preface

This report contains the conclusions and recommendations of the Workshop entitled "The environmental dimension in planning the development of the area of influence of the Colbún-Machicura Complex (Chile)", held at Talca, Chile, on 3 and 4 May 1984.

This Workshop was carried out under the ECLAC/UNEP Project entitled "Incorporation of the environmental dimension in the processes of development planning: Case studies, methodological aspects and horizontal co-operation". Responsibility for it was assigned to the Joint ECLAC/UNEP Development and Environment Unit, and it was held with co-operation from the Latin American Institute for Economic and Social Planning (ILPES).

The Workshop was organized jointly by the Economic Commission for Latin America and the Caribbean (ECLAC), the United Nations Environment Programme (UNEP) and the University of Talca.

The objective of the Workshop was to analyse development policies and prospects in the area of influence of the Colbún-Machicura Complex with a view first to recommending the most favourable ways of incorporating the environmental dimension into planning and second to discussing regional and national implications of the problem based on the case study.

A basic document was prepared, supported by background documentation.*/

*/ See annex 1.

I. ORGANIZATION OF WORK

Place and date

1. The Workshop entitled "The environmental dimension in planning the development of the area of influence of the Colbún-Machicura Complex (Chile)" was held at the University of Talca on 3 and 4 May 1984.

Participants

2. The meeting was attended by 29 experts.*/

Opening and closing meetings

3. At the opening meeting, the floor was taken by Mr. Oscar Garrido, the Rector of the University of Talca, and by Mr. Osvaldo Sunkel, Co-ordinator of the ECLAC/UNEP Joint Development and Environment Unit.

4. The meeting was closed on 4 May with a statement by Mr. Virgilio Mannarelli, Dean of the Faculty of Agricultural and Forestry Sciences of the University of Talca.

Agenda

5. The Workshop was held on the basis of the following agenda:

- a) General presentation of the topic.
- b) Introduction of the case study on the area of influence of the Colbún-Machicura Complex.
- c) Consideration of the role of large infrastructure works in regional development.
- d) Consideration of the Colbún-Machicura Project seen as a work for the multiple development of the water resources of the Maule river basin.
- e) Consideration of institutional problems in the incorporation of the environmental dimension in regional development planning.

Chairmanship

6. During the two days of discussion, the Workshop was co-ordinated successively by Mr. Juan Antonio Rock, Director of the Department of Economic Sciences of the University of Talca; Mr. Nicolo Gligo, ECLAC/ILPES Expert, and Mr. Sergio Maturana, Director of the Institute for Environmental Research.

Proceedings

7. Mr. Nicolo Gligo introduced the ECLAC/UNEP Project entitled "Incorporation of the environmental dimension in the processes of development planning:

*/ See annex 2.

Case studies, methodological aspects and horizontal co-operation"; and Mr. Santiago Torres, ECLAC/UNEP Adviser, introduced the study entitled "La dimensión ambiental en la planificación del desarrollo del área de influencia del complejo Colbún-Machicura", the basic document used at the meeting.

II. CONCLUSIONS

8. Although the Colbún-Machicura Complex was conceived as a multi-purpose project, the generation of electric power has been given top priority in its implementation while the programmes relating to irrigation, the development of tourism, fisheries, integrated rural development and industrial and forestry development have been postponed.
9. The integrated institutional approach which was conceived to ensure the co-ordination of the multi-purpose project did not function owing to the fact that a number of institutions parties to the co-ordination agreement simply did not take part. As a result, the construction of the project remained de facto under the direct and sole responsibility of the National Electricity Corporation (ENDESA), which, having recourse to external credits, has carried out the undertaking.
10. In the execution of the project, the national interest in the generation of hydropower has been dominant. The irrigation potential of the project, which should also be considered as being of national importance, has been given neither the priority nor the resources it requires.
11. The way in which the construction of the complex has developed reflects a lack of regional participation in it, which has had an effect on the priorities established in the work. Nevertheless, the measures taken by ENDESA with regard to the construction of irrigation ditches and the rebuilding of canals ensure the viability of future investment in this activity.
12. The plan for the project shows that no prior analysis was made of its repercussions on the environment and the chain effect it would set off.
13. Since the spatial, as well as sectoral and institutional influence of the project cover a significant proportion of the sphere of regional action, there can be no doubt that the Colbún-Machicura Complex is of enormous importance in the task of planning the development of the Maule region. For this reason, regional planning is regarded as being the principal approach which should be pursued (using the work in question as the main point of reference) in order to incorporate the environmental dimension into the development process.
14. The effects of the presence of the Colbún-Machicura Complex make it possible to distinguish at least four processes which can serve as focal points for the incorporation of the environmental dimension into the development planning of the

/river basin.

river basin. These are: the process of energy development; the process of the development of tourism on the basis of the resources generated by the presence of the complex; the process of integrated rural development of some areas of comparatively high poverty (primarily affecting small plots of land); and the process of expanding and improving the irrigation systems for the basin.

15. Of these four processes, the one relating to energy development plays an essentially parametric role in the development of the basin, in the sense that it depends almost entirely on the exploitation of the hydroelectric potential which exists in the country and in the basin.

16. As for the development of tourism, its importance may be seen in analysing the effects associated with it. In this connection it should be added that the possibilities that tourism will grow are in general favourable in view of the project's proximity to the Pan-American highway (approximately 60 kms away) and therefore, to large urban centres (Santiago, Rancagua, Curicó and Talca).

17. The two main reasons for regarding the integral rural development of areas of extreme poverty within the basin as important are first that close to 13% of the farmland in the area affected by the irrigation provided by the complex belongs to the small landholding sector; the second reason relates to the environmental consequences usually associated with subsistence farming and reflected in a gradual deterioration and loss of environmental resources. Also there can be no doubt that the process of integral rural development in areas of extreme poverty should be one of the necessary conditions for attaining adequate use of the water resources potential generated in the process.

18. The third relevant process mentioned, to which attention should be given in the task of incorporating the environmental dimension into regional development planning, relates to the improvement and expansion of the irrigation systems in the basin. This is because water in itself is an environmental resource of first rank and also because the irrigation process to a large extent governs the pace of regional agricultural development. For this reason, the evolution of the irrigation process should be observed carefully both for its positive aspects, and for its negative aspects which may result from improper use of the resource. In addition, it should be noted that this process is also important because of the influence existing and projected irrigation works will have on the characteristics of the hydrographic system of the basin.

19. There are another two processes which, because they are important from the environmental point of view, are indirectly related to the project under review. One of these relates to the possibility that polluted water might damage the hydrographic network associated with that part of the Maule river which lies downstream from the complex. Such pollution could come from the farms, which are connected to the Maule river throughout almost the entire area south of it through the sub-basin of the Loncomilla river and, to the north of the Maule river, through the Claro river sub-basin. The urban-industrial system is so located that its activities are also connected to the Maule river through the

/same channels.

same channels. Given the extensiveness of the farm area and the number of urban centres which are interconnected by means of this hydrographic network, the process of pollution referred to may become serious in the long run if adequate supervision and control are not maintained.

20. Secondly, a process which is closely related to the one described above and which should also be kept under observation is the growth of the urban-industrial system, and in particular waste disposal and the microlocation of activities generating such waste.

III. RECOMMENDATIONS

21. After attention was drawn to the fact that the limits of the hydrographic basin of the Maule river were practically identical with those of the Seventh Region to the south and those of the subregion composed of the provinces of Cauquenes, Linares and Talca to the north, the view was expressed that, for the purposes sought, it was worth paying attention to a second level of planning within the one already discussed; i.e., planning at the level of the hydrographic basin. Moreover, the hydrographic basin of the Maule river covers a substantial portion of the total area of the region and also includes a large share of the region's population. For this reason it might be suggested that, owing to the significance of the Colbún-Machicura Complex within the plans for the Seventh Region, mechanisms used for hydrographic basin planning itself should be put into operation, at least for the Maule river basin.

22. It was considered necessary to study and propose institutional alternatives to further environmental regional development planning. A multi-purpose project needs more than a co-ordinating committee; its insertion in the regional sphere calls for adequate sectoral, national and regional co-ordination. It is recommended that study be given to permanent institutional solutions at a sufficiently high level, such as, for example a regional development corporation.

23. It was recommended that encouragement should be given to the creation of units for studying the environment in sectoral executing bodies, such as the National Electricity Corporation, so that the environmental dimension can be incorporated in institutional programmes and in specific projects.

24. Reference was made to the need to intensify follow-up and monitoring action and to create the tools needed for such action. Support must be given to programmes such as the one responsible for the dynamic study of the area of influence made by the National Forestry Corporation (Basin Management Programme), the University of Chile (NASA Division) and the Catholic University at Talca (School for Forest Technicians).

25. A detailed study must be made of the legal problems related to land holdings around the lake since the appropriation and concentration of much of the land concerned reduces the possibilities for local development.

26. It was recommended that the University of Talca, as a promoter of regional development, should act as a catalyst in the promotion of the exchange of ideas which help to put integral development policies into practice.

27. It was deemed advisable for the University of Talca to organize meetings prior to the filling of the lake on the prospects for irrigation, on the protection of the upper basin and other matters of priority.

28. The value of the advisory and support services provided by ECLAC and UNEP was recognized. It was therefore recommended that such support be sought in the future as needed.

Annex 1

DOCUMENTS SUBMITTED TO THE WORKSHOP

Symbol	Author	Body	Title
E/CEPAL/R.355	Santiago Torres (Consultant)		La dimensión ambiental en la planificación del desarrollo del área de influencia del complejo Colbún-Machicura
<u>Support documents</u>			
E/CEPAL/G.1242	Joint ECLAC/ UNEP Development and Environment Unit	ECLAC/ UNEP	Incorporación de la dimensión ambiental en la planificación
E/CEPAL/L.262	ECLAC	ECLAC/ UNEP	Informe del Seminario regional sobre gestión ambiental y grandes obras hidráulicas
E/CEPAL/ILPES/ R.46	Nicolo Gligo	ECLAC/ ILPES	Medio ambiente en la planificación latinoamericana: vías para una mayor incorporación
CDA-38	Osvaldo Sunkel and José Leal	ECLAC/ ILPES	Economía y medio ambiente en la perspectiva del desarrollo

Annex 2

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1. Introduction

The purpose of this study is to investigate the effects of various factors on the performance of a system. The study is organized as follows: Section 2 describes the methodology used in the study. Section 3 presents the results of the study. Section 4 discusses the implications of the findings. Section 5 concludes the study.

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2. Methodology

The methodology used in this study is a combination of qualitative and quantitative methods. The qualitative methods include interviews and focus groups, while the quantitative methods include surveys and experiments.

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3. Results

The results of the study show that there is a significant positive correlation between the variables studied. The findings suggest that the system's performance is highly dependent on the factors investigated.

The study is organized as follows: Section 2 describes the methodology used in the study. Section 3 presents the results of the study. Section 4 discusses the implications of the findings. Section 5 concludes the study.

4. Discussion

The implications of the findings are significant. The study highlights the need for further research in this area and provides valuable insights into the system's performance.