

**UNITED NATIONS  
ECONOMIC COMMISSION  
FOR LATIN AMERICA  
AND THE CARIBBEAN - ECLAC**



**Distr.  
GENERAL**

**LC/G.1460 (Sem.36/3)  
12 June 1987**

**ENGLISH  
ORIGINAL: SPANISH**



**REPORT OF THE INTERNATIONAL SEMINAR ON INTEGRATED SYSTEMS  
FOR THE DEVELOPMENT AND MANAGEMENT OF RIVER BASINS  
IN THE ANDEAN REGION OF LATIN AMERICA**

**(Lima, Peru, 24-28 November 1986)**



## CONTENTS

	<u>Paragraph</u>	<u>Page</u>
I. ORGANIZATION OF WORK .....	1-6	1
Place and date .....	1	1
Participants .....	2-3	1
Agenda .....	4-11	1
Opening session .....	5-6	2
II. ACCOUNT OF PROCEEDINGS .....	7-41	2
III. RECOMMENDATIONS .....	42-50	10
IV. CONCLUSIONS .....	51	12
Annex 1 Definition of terms used .....		15
Annex 2 Criteria for determining the principal features and needs of the highland areas of the Andean region .....		17
Annex 3 List of participants .....		19
Annex 4 List of documents submitted at the seminar ....		25



## I. ORGANIZATION OF WORK

### Place and date

1. As part of the activities under the Project "Planning and management of water resources in upland drainage watersheds in Latin America and the Caribbean", financed by the Government of Italy, the International Seminar on Integrated Systems for the Development and Management of River Basins in the Andean Region of Latin America was held between 24 and 28 November 1986 under the auspices and with the collaboration of the Junta del Acuerdo de Cartagena (JUNAC) in Lima, Peru.

### Participants

2. Experts from countries of the Andean region of Latin America participated in the seminar.
3. Experts from international organizations also participated in the seminar.

### Agenda

4. The meeting adopted the following agenda:

1. Opening of the seminar.
2. Election of Officers.
3. Adoption of the provisional agenda.
4. Presentation on the activities and projects of ECLAC and JUNAC, in the area of integrated systems for the development and management of upland watersheds in the Andean region of Latin America.
5. Presentation of country case studies on the evaluation of the situation, policies and strategies used by countries of the Andean region for the development and integral management of river basins.
6. Presentation by JUNAC on the identification and characterization of the production systems in the Andean region.
7. Presentations of country experts and officials responsible for the formulation and implementation of programmes and projects for the development and management of river basins in the countries of the Andean region.
8. Presentations of officials of international organizations and foundations working in areas related to the development and management of upland watersheds.

9. Analysis of the problem and the need to systematize and exchange information on integrated systems for the development and management of upland watersheds in the Andean region of Latin America.
10. Discussions on and adoption of the recommendations and conclusions of the working groups.
11. Closing ceremony.

#### Opening session

5. The following speakers addressed the opening session: Mr. Carlos Aguirre, Head of the Department of Technological Policy, on behalf of JUNAC; Mr. Michael Nelson, Director of the Natural Resources and Energy Division, on behalf of ECLAC; and Mr. Quintilio Crovetto, Officer in Charge of Technical Co-operation, Embassy of Italy, Lima, Peru, on behalf of the Government of Italy.

6. The seminar was chaired by Mr. Axel Dourojeanni, Head of the Water Resources Unit of the Natural Resources and Energy Division of ECLAC.

### II. ACCOUNT OF PROCEEDINGS

7. The search for strategies to deal with the steady deterioration of the living standards of the inhabitants in the highland regions of the Andes and of the natural resources that sustain them has been a constant concern of the governments of the countries of the Andean region.

8. So far, despite the determined efforts of these governments (backed by political declarations, legislation, formulation of plans, implementation of some successful projects, inter alia), attempts to solve the problems that affect the population and to reverse the process of degradation of natural resources have not been completely successful.

9. This situation is attributable to two main factors:

a) low investment levels in projects for the development of mountainous or hilly regions, in comparison with investments in valleys or plains, which offer greater comparative advantages. Only those basins that have already been developed by means of huge investments (such as in hydroelectric plants or in the establishment of cities) receive greater investments. Government projects or actions that are based on social and political considerations rather than economic and financial ones are usually small in scope or sporadic;

b) lack of adequate management systems for multifocus and single focus government action, in areas to which access is difficult and which generally have relatively little land and water available, with a population that has its own culture, customs and technology. Management techniques must be geared towards increasing popular participation, expanding the scope and ensuring greater continuity of State actions aimed at benefitting the population and developing resources, striving for increased inter-sectoral co-ordination and, generally speaking, providing a more efficient service.

10. The meeting dealt mainly with the issues raised in section b) of the preceding paragraph, that is to say the search for alternatives to improve management mechanisms and the corresponding instruments for the planning and implementation of projects aimed at benefitting the population and developing the resources of highland regions.

11. Before discussing this issue directly, certain criteria were adopted to define some of the main characteristics and needs of the highland areas of the Andean region, which should be considered before proposing a solution (see annex 2). The various strategies and management techniques used by the governments of the region in the highland areas were also analysed and assessed.

12. Participants in the seminar had two basic frames of reference for the discussion. The first consisted of the document "Estrategia para el desarrollo y manejo de la región andina: Una propuesta de acción a nivel de cuenca hidrográfica" (LC/G.1433) and "Propuesta metodológica para sistematizar el desarrollo integral de cuencas hidrográficas de alta montaña en la región andina", both of which were prepared by ECLAC; the second frame of reference consisted of the studies which analysed the strategies, programmes and projects used or proposed for the development and management of basins and highland areas in the Andean region during the period 1980-1985 and projections up to 1990, in the case of Colombia, Ecuador, Peru and Venezuela.

13. The seminar was originally titled "International seminar on integrated systems for the development and management of river basins in the Andean region of Latin America". While it was underway, however, it was considered more appropriate to use the Spanish term gestión de cuencas instead of manejo de cuencas to refer to the management of basins: it was felt that the word gestión more effectively summarizes the objectives of the seminar than the expression manejo. The expression manejo de cuencas (watershed management) was therefore used to refer to the management of natural resources in a technical and hydrological sense, while the expression gestión de cuencas (management of basins) referred to the administrative and operational activity that promotes integral development. In practice (integral) management of basins would cover such possible activities as the physical management (of the natural resources) of the basin.

14. By associating gestión (and not manejo) with the development of basins, it is possible to broaden the view of a basin as an exclusively physical/hydrological unit, and to see it as a management and co-ordination unit which can be used to co-ordinate programmes and projects in an integral manner and with the participation of the populations in question.

15. The main observations and conclusions arising from the discussion and reading of the documents of the meeting are presented in the paragraphs below.

16. It is necessary to review and to analyse more carefully the different management techniques used by the governments of Latin America and the Caribbean to promote the integral development of highland regions. Apparently, most of the existing information is on modalities of sectoral and not integral or multisectoral action. The ECLAC methodology proposes three management systems that focus on integral or multisectoral development. These are: a) the

establishment of multisectoral co-ordinating committees; b) the organization of special projects, such as projects for integrated rural development, microregional development, the integral development of basins, etc., and c) the creation of local, autonomous or semi-autonomous corporations at the regional level of basins. All of these modalities, with the exception of a few corporations in Colombia, have not been continuously followed and have been operational for different periods; the methods of their operation should therefore be carefully reviewed.

17. Other methods used to promote integral development have been: a) the formulation of "integral development plans" for highland areas, elaborated by various national or regional planning offices, in theory with the aim of promoting co-ordination among the different sectors working in the same area in a highland region; and b) the implementation of certain integral pilot programmes or projects for the development of highlands, which, also in theory, serve as models or prototypes for larger-scale activity. The latter two methods have only fulfilled their objectives in so far as they have been linked to an already established management mechanism. Strategies based on the formulation of a plan are incomplete since a plan is not a solution in itself but only an instrument in the service of a management mechanism, which should be established and functional before the plan is elaborated. In the same way, the large-scale implementation of a pilot project requires the establishment of a management system that is capable of disseminating through the region or country in question the experience that has been acquired. Ideally this management system should be in place or should be created before the pilot project is undertaken.

18. Subsequent presentations more clearly identified the elements that should be included in management activity for the development of a basin. It was established that such management should have as its principal objective the improvement of the standard of living of the inhabitants, for which certain criteria should be observed. These include organizing the population to participate in their development; identifying and respecting the peculiar characteristics of the Andean region as they relate to the aspirations of the local communities and populations; creating or consolidating diversified and complementary systems of production; assessing and differentiating the poverty of the rural environment with a view to targeting the most underprivileged and excluded groups; using classification criteria (such as available cultivable land and use of land) based on the reality of the Andean region; and promoting joint action among the users of the basin.

19. On the basis of the above, it was concluded that, first of all, any proposed strategy for the development of highlands should clearly establish: a) the management system to be used in its implementation; b) the operative and physical area of implementation; c) the direct and indirect participants in the development of the area thus defined, and d) the criteria on which decisions regarding the development of each one of the highland regions will be based.

20. The seminar examined the advantages and disadvantages of the various management strategies used by the countries of the Andean region to develop highland areas, and particularly, to improve the standard of living of their inhabitants and to conserve their resources. Two contrasting options were



considered regarding the action of the State. The first is action "from above", using an integral macro-development approach, based on the utilization of the installed capacity of the principal State agencies and their provincial or regional branches throughout the country. Tasks are undertaken by assigning resources from the national level and ensuring that technical and administrative norms are observed so that the regions and provinces implement the plans and tasks assigned to them by the central government. It was agreed that the successful functioning of this mechanism would require a high degree of efficiency and administrative continuity both at the national as well as at the regional and local levels. It was also pointed out that, in order to implement the norms and plans, regional agencies should have at their disposal adequate resources, proper equipment, and sufficient autonomy to adapt the norms and guidelines of the central offices to suit local situations. It was recognized that a major impediment to the viability of this alternative is the frequently sporadic nature of contributions to the development process by central governments to regional governments and by the latter to local governments, owing to budgetary dependence and to the many changes and reorganizations of a political and administrative nature which occur. Constant changes of direction and authority, at the national as well as regional and local levels, weaken and prevent the consolidation of government entities operating at the local level.

21. The second option is to strengthen the management capacity of the local operative management units, such as rural communities in highland areas, municipalities and other organizations existing there, to enable them, independently of changes in government policies, to be capable of governing themselves and of co-ordinating their own integral development without depending exclusively on the central authority. It was observed that this alternative has also been used by several countries, at least as pilot projects in several cases; the problem lies in the fact that the State must organize itself in any case to assist each one of these units to become independent and, as a result, the obstacles again arise of lack of continuity and insufficient coverage by State action, whose promotional activity must be kept up during a long enough period to impart in the local agencies self-sufficiency, authority and qualified personnel. Finally, the meeting discussed the theoretical proposal of a participatory and operational nature presented by ECIAC in the above-mentioned document IC/G.1433. This document proposes a strategy which includes the decentralized organization of the State, through autonomous or semi-autonomous corporations that are capable of generating their own financial resources (like the autonomous corporations of Colombia) and also the need to give special and integral treatment to each subregion, which requires an understanding of the way in which the user organizes and participates in his own development (in communities, municipalities or other participatory models); identifying and adapting technologies that are appropriate to the environment; dealing with diversified but complementary production systems; taking into account the physical environment, its space, its altitude and climate and, in particular being capable of promoting transactions and co-ordinating activities among all the participants in the development process in each one of the basic areas. This proposal is aimed primarily at organizing the actions of the State so that, by means of a regional authority, it can provide the inhabitants of the upland watersheds in the Andean region with the elements required for self-sufficiency in their own development, reducing their current state of isolation, stagnation and

independency. It was also suggested that the procedure that is apparently most appropriate to achieving that objective is the establishment of co-ordination groups or local directorates (based on municipalities or other existing forms of organization) within each management and co-ordination area, that can serve as contacts in relations with entities outside of the basin, thus bringing together "internal" development and "externally oriented" development. This process of bringing together can only succeed through co-ordination and co-operation among both the external and internal participants in the process of development and integral management of the basin. The "co-ordinating group" should, at least in the initial stages, be supported by a technical team provided by the regional authority and should help to reinforce the local systems of community or municipal participation. Since this proposal is theoretical, it could only be concluded that it would be important to compare it with actions that have already been taken by those governments which have applied similar models.

22. In terms of the specific areas in which such actions should be undertaken and in view of the tremendous diversity in the terminology used, it was decided to standardize the following terms in the drafting of these conclusions: a) "operative management unit" is the area defined by the administrative jurisdiction: commune, property, municipality, etc.; b) "physical management unit" is the area defined by natural elements: a basin, an ecosystem, etc. The bringing together or fusion of both units was referred to as "area of management and co-ordination" (see annex 1).

23. The operative areas were examined and note was taken of how the Andean region was divided up among the national State agencies, regional agencies, local authorities and institutes, foundations, projects, corporations, national programmes, etc., which are involved in activities in the highland regions. It was noted that in general agencies at the national level had outdated, insufficient or distorted information of the reality of the Andean region, owing to their tendency to intervene "from outside" through sectoral actions that involve the implementation of specific programmes and projects. Unless such national agencies were careful to ensure the participation of those standing to benefit from their programmes by creating local entities, this has undermined co-ordination among the beneficiaries of such programmes. It was pointed out that intervention without participation was pointless if the aim was to achieve integrated management for the development of the highland areas.

24. It was observed that where States adopted the approach of working by sectoral programmes or projects, each executing agency subdivides the territory into areas that are compatible only with its particular management system, which leads to excessive parcellation, makes it difficult to co-ordinate projects originating from different sectors and confuses the recipients of the assistance. Hence the importance of a common definition of a physical management unit such as the hydrographic basin. This natural area of the basin makes it possible, particularly in highland regions, to establish the interrelationships between the users of the basin and the area being developed, with a view to improving their quality of life and their relations with areas outside of the basin. In the highlands of the Andean region, the river basin therefore constitutes the natural area for the co-ordination of activities involving inhabitants and users. By working with the basin as a

physical management unit, it is possible to determine the manner in which the management operating units (for example landowners, municipalities, rural communities, mining companies and agricultural co-operatives), relate to each other and to the basin.

25. The relationship between the environmentalist, conservationist and protectionist concept of the "management of basins" and the socio-economic concept of the "integral management of basins" clearly demonstrated during the seminar the existence of two schools of thought which are not opposing and which must be brought together through a process of closer contact among experts and through the establishment of a "school of thought" that can systematize the concepts used in both approaches.

26. These currents have had different points of departure and have evolved differently; the first, for example, is based on a conservationist and protectionist approach and its principal objective is to prevent water erosion and to ensure flood and water quality control by managing the natural resources of the basins. It further advocates the multiple use of water from the basins and finally proposes the concept of the development and integral management of basins. The developmentalist and management approach takes as its point of departure macro-national planning, then addresses the question of planning at the regional and area level and concludes with proposals for planning and management for integrated rural development; while this approach may be used in the case of river basins, it is not indispensable since other approaches such as the "micro-region", "community", *inter alia*, may also be used.

27. For these reasons there was no consensus among participants to consider the Andean watershed as the unit of reference. A number of speakers referred to the Andean highland region in general, without specifying smaller and more concrete areas, as a result of which it was not possible to determine the specific unit to which the proposed policies should be applied. Other participants based their analyses on basins, micro-regions, municipalities or rural communities. In view of this, it was considered important to have common criteria for defining concrete physical areas, particularly in view of the need to formulate clearly defined strategies on physical and operative units that would be accepted by all agencies (process of regionalization) to ensure co-ordination of the programmes and projects undertaken in those areas. In order to undertake this regionalization it is necessary, at the least, to accept: a) that the operative or administrative, political or institutional, according to the nomenclature used, limits should be harmonized and made compatible with natural physical boundaries (basins, valleys, hillsides, ecoregions, rivers, etc.) to define a management or co-ordination area, and b) that the highlands are occupied by rural or indigenous communities occupying well-defined areas, but that there are, as well, municipalities and associations that are neither rural nor indigenous, which are located in the basin or which benefit from it with different forms of landholding. These include urban populations, mining companies, universities, hydroelectricity generating companies and other users, who should be taken into account when one speaks of "participation". The opinion of the representatives of townships, companies, local universities and other forms of organization should therefore be taken into account in taking management decisions; this opinion is often overlooked owing to an excessive concern with the rural, the

indigenous and the poor. This approach does not take into account the fact that urban settlements and other social and institutional structures are part of this environment and also play an important role both in the development and in the use and management of natural resources.

28. As regards the approach to management for the integral development of basins, the concepts of society and of participation were carefully analysed. Emphasis was placed on the need to include the analysis of the structure of the Andean society, which may be peculiar to each country and region, before embarking on a development programme and the integral management of basins. Similarly, the participants agreed on the fundamental need for the participation of the inhabitants of the Andean region, from both rural and urban areas, in the management processes. It was clearly established that there could be no management for development purposes without such participation.

29. Both in the general discussions and in the relevant working group, the seminar participants stressed the need to promote the integrated management of river basins for development purposes through the use of instruments to facilitate the action of the State and of the users of the basins in "co-ordination or management areas".

30. The main challenge in promoting the development and integral management of highlands and not reducing them to the status of pilot projects, is to determine the steps and resources that are required in order to undertake relevant actions in each area of the territory of a country. This requires processes of regionalization and microregionalization, the training of leaders and specialized personnel, the identification and evaluation of each area, development of a close relationship with the local population, the organization of co-ordination groups, and other activities that would permit the establishment of an entire institutional and participatory system at the national level. The work done so far has either been on an insufficient scale or undertaken only at the sectoral level, and has therefore had insufficient impact.

31. In this regard, the participants stressed the importance of the proposal of ECLAC to devise a management support system for the development of river basins in the Andean region. This proposal involves the preparation of an operational manual for the formulation, selection and implementation of strategies, programmes and projects in highlands, on the basis of the compilation and processing of actual experiences and their incorporation into a computerized system that permits quick and easy access to a variety of choices of action.

32. On the question of methodology, the seminar received the report and the pre-conference document, "Manual on Agriculture and Forestry", which draws together more than 20 years of experience in work co-ordinated by the agriculture and forestry service of the Technical University of Cajamarca (Peru). The information was compiled with the assistance of the Junta del Acuerdo de Cartagena and the European Economic Community. It is felt that this manual will be of great use to all those institutions interested in the development of the highlands of the Andes, and that it will help to extend pilot experiences to the national level.

33. The seminar also received manuals of the National Programme for the Conservation of the Soils and Waters of River Basins, prepared by the Ministry of Agriculture of Peru through its General Department of Water, Soils and Irrigation under an agreement with the Agency for International Development. These manuals and the corresponding report are also extremely useful for the management of natural resources in highlands. The meeting also took note of the existence of several other projects and actions that are being undertaken in the area of the management of basins in Latin America and the Caribbean, which served as a reference for the drafting of the background documents for the meeting.

34. During the seminar the need to organize the State to render the proposed strategy operative highlighted the importance of training government technicians, in the first place, and, secondly, through them, the inhabitants and users of upland watersheds.

35. The participants stressed the need for experts working in highlands to possess interdisciplinary professional training, since they are required to function in management areas, that are defined by the limits of river basins or by the limits of other operative management units, and must be able to operate within the framework of integral programmes, serving as a link between specialists, users and political authorities. Such training should cover technical, administrative, social and economic aspects, and it will be necessary for the universities of the region to establish special programmes at the post-graduate level in the integral management of natural resources and in the integral development of basins.

36. As noted earlier on in this document, one of the basic reference frameworks for the discussions that took place during the seminar were the case studies of experiences in upland Andean watersheds in Colombia, Ecuador, Peru and Venezuela. The principal observations and conclusions of participants and of the relevant working group are contained in the following paragraphs.

37. The highlands of the Andean region contain populations and elements of production that are of decisive importance for the future development of each one of the countries studied; an integral strategy for such areas is therefore essential.

38. State action, however, has focussed primarily on the extraction of resources, mainly hydroenergy and mineral resources, for the benefit of the lower parts of the basins and of the urban centres. Proportionately speaking, very little has been done to benefit the inhabitants of the highland areas of the basins. The seminar stressed how important it was for governments to strive to achieve a better distribution of financial resources in the basins, balancing the major investments made for the exploitation of resources such as mineral and hydroenergy resources, with the small investments made to assist the inhabitants of the area in terms of their basic needs. There are also two types of small-scale investments: those which can and should be made by the population itself and those that require staff and resources brought in from other areas. It was considered useful to determine what should be the balance of State investments in such cases. It was observed that, despite the long list of programmes and projects undertaken to benefit highlands almost none of

them is broad enough in scope to tackle existing problems, and resemble pilot projects more than national programmes. In short, it was felt that there was a great lack of information and knowledge about the form and scope of State investments and activities designed to benefit highlands. Specific case studies do not shed any more light on the distribution of these investments at the level of each basin studied, which is why it would be useful to secure more information in this regard. It was also noted that the information required to take decisions should not only include how much has been done but also, and above all, how much remains to be done.

39. Programmes which have been designed exclusively to manage and conserve renewable natural resources unfortunately do not place enough emphasis on productive aspects, which often makes them impractical or objectionable, since the populations do not identify with measures that are exclusively protectionist. Productive projects, on the other hand, even though at times they do not expressly state what conservationist measures are incorporated, are more likely to be accepted both by investors and by the local population.

40. The four specific case studies show that the productive potential of the highlands of the Andes is very high, even though there is not enough precise information to quantify them. The State must be capable of generating more investment projects on the basis of information on alternatives and options, which is why it is essential to be aware of this potential in order to justify the appropriation of State resources for integral development management.

41. The seminar highlighted the need to continue comparing the various recommended strategies implemented by the governments of the Andean countries over the last ten years, with regard to the development and management of the resources of highlands for the benefit of the population, particularly with a view to sharing and exchanging experiences.

### III. RECOMMENDATIONS

42. The Andean countries of Latin America which have populated areas over 2 000 metres above sea level, are currently facing a set of common problems manifested in the physical and socioeconomic deterioration of their resources and populations. This situation is partly due to a lack of clarity and continuity in their management mechanisms and partly to inadequate fiscal investment in infrastructure, research, credit, and in the promotion of private investment, despite the importance attached to the contribution of such areas to the economy of the Andean countries, in terms of food, energy, minerals, water resources, tourism and labour.

43. Although the governments of the Andean countries have sought to adapt and elaborate management strategies for the integral management of highlands with a view to incorporating them dynamically into the rest of the national territory, their efforts have been characterized by a lack of continuity and by resources that are insufficient relative to the magnitude of the task. It is therefore important for countries to share their experiences through mechanisms for horizontal co-operation. The work of international agencies in this sense is effective when it facilitates the exchange of information among

institutions, the interdisciplinary training of professionals, comparative analysis of strategies and other alternative forms of co-operation.

44. In this respect, the seminar congratulated the Economic Commission for Latin America and the Caribbean (ECLAC) and the Junta del Acuerdo de Cartagena (JUNAC), which, with the financial support of the Government of Italy and of the European Economic Community respectively, embarked in 1984 on a project to promote horizontal co-operation in the planning and management of water resources in upland watersheds in Latin America. It also recommended that these tasks be clearly identified, particularly as regards the revision or formulation of strategies for the integral development of upland watersheds and the elaboration of instruments of methodology that would facilitate their implementation.

45. The seminar requested ECLAC and JUNAC to undertake a comparative analysis of the specific case studies with a view to assessing the approaches used in dealing with the problem of upland watersheds in the Andean region.

46. It also stressed the need for ECLAC and the other participating agencies to expand and widen the study of strategic aspects at the institutional, economic, political and technical levels in order to propose alternative ideas for action to governments since the strategies were only dealt with in a preliminary manner in the specific case studies submitted.

47. The seminar requested ECLAC and JUNAC to take the necessary steps to pursue the preparation of the manual on the development and management of river basins in the Andean region since it considered such a manual the most appropriate methodological instrument to guide governments, institutions, experts and other users in the integral management of river basins and of highlands in the Andean region.

48. Since there is currently no centre specialized in the development and integral management of watersheds, the seminar decided to request ECLAC, with the co-operation of international agencies such as FAO through the Latin American Technical Co-operation Network on Watershed Management, the OAS, UNEP, UNESCO and others, to continue their promotion activities and the co-operation among specialists on the subject and among institutions or corporations located in the Andean area at the region or microregional level.

49. The seminar strongly recommended that a thorough analysis be conducted of the curricular education and training systems in place in the training centres on the management or administration of river basins and of renewable natural resources, as well as the establishment of a network for exchanging and updating knowledge among teachers working on the subject of river basins. These activities could be facilitated through courses conducted with the support of ECLAC and of ILPES with a view to establishing a school or methodological approach to the development and integral management of Andean highland regions and basins.

50. Finally, the seminar considered it essential to recommend to the relevant agencies that a similar meeting should be held no more than three years hence, in order to evaluate the progress made in the implementation of these

recommendations and their effect on the Andean areas of the countries of Latin America.

#### IV. CONCLUSIONS

51. As a result of the discussions, the participants in the seminar recommended the following conclusions:

a) The discussion and the specific case studies on the activities of the countries of the Andean region in the development and management of upland watersheds reveal the great importance of these regions to each of the countries, in so far as they sustain a large portion of the population, particularly the indigenous or rural population, and constitute an important source of natural resources.

b) A large portion of the population and resources of these areas are in a situation of progressive deterioration, reflected in a low standard of living and in the degradation of renewable natural resources, particularly the soil, vegetation and fauna.

c) In order to arrest this trend the governments of the Andean region have made many efforts, which, although useful, still do not have the necessary scope or comprehensiveness.

d) Such efforts have nevertheless given rise to frequent declarations of policy, passages of legislation, formulation of plans, creation of specialized agencies, implementation of various programmes, development of pilot projects and evaluation of resources, which constitute a valuable source of basic information that can and should be used in the formulation or evaluation of strategies.

e) Two types of reasons, economic and financial on the one hand and administrative and management on the other, largely explain why the efforts of governments have still not succeeded in raising the low standard of living of the inhabitants of the highlands and putting a stop to the degradation of their natural resources.

f) Economic and financial aspects have played and continue to play a decisive role in the allocation and procuring of resources, and have prevailed over environmental, social and legal considerations which should also underlie investments in such areas.

g) The specific case studies revealed a close link between the effectiveness of administrative and management mechanisms of the entities responsible for assisting in the development of the highland areas and their sources of finance, and that the management systems differ according to the source of its funding (public funds, investment loans or proceeds from special taxes).

h) The sources of financing play a decisive role not only in the choice of management system, but also in the determination of the time frame within



which activities can be carried out and in the degree of its social and environmental impact, in addition to its economic and financial impact.

i) The necessary integral or multisectoral character of activities to improve the quality of life of populations in highland regions places two major restrictions on government activity: the need to deal with various alternatives simultaneously, which makes it difficult to justify it in economic terms, and the lack of compatibility between the integral or multisectoral projects and what is usually the organization of the State.

j) In order to overcome such restrictions emphasis should be placed on the urgent need to divide the highland areas into zones with stable boundaries, such as river basins, which would enable and oblige State agencies to work in a co-ordinated manner, and would facilitate the organization of the population of such zones to enable them to participate in their own development.

k) Such a clear policy of micro-regionalization would enable the State to perform its tasks by co-ordinating the activities of the various entities in a single basin or zone, or by means of integral projects in one or more basins. In both cases the population and users in the area can be clearly identified, which facilitates their participation in a co-coordination group or any other such mechanism.

l) In order for the State to assist the local population to achieve its own goals, it must organize itself in order to progressively assist each one of the micro-regions, which requires that regionalized and decentralized management systems should be designed with personnel capable of performing in multidisciplinary fields.

m) The economic and financial inputs to sustain such management systems should come from special resources allocated for this purpose as in Colombia, where 2% of the sales of energy from hydroelectric plants is used for the benefit of the inhabitants of the basins from where this resource is obtained, from loans for investment projects, funding from the public treasury and other resources contributed by the inhabitants and user of the basins, such as local labour.

n) As regards technology, efforts should be continued to utilize the experiences and results obtained from various integral pilot projects, implemented in the countries of the region, such as the agriculture and forestry project undertaken in Cajamarca, Peru, with a view to making direct use of local technology.

o) The results of such project could be used in the elaboration of large-scale plans. It is felt that so far this source of information has not been adequately exploited.

p) In view of the different approaches and disciplines involved in the elaboration of development and management strategies for highlands, it is necessary to classify, compare and systematize the different approaches, criteria, definitions and methodologies used by specialists on the subject, in

order to facilitate the interdisciplinary task. This requires the establishment of a school of thought and action in this area.

g) International organizations such as FAO, ECLAC, UNESCO, IDB, IBERD, inter alia, should continue to support and promote co-operation among specialists, technical personnel and in general among those responsible for implementing the development strategies of the highland areas of Latin America and the Caribbean, as well as among specialists in this field in research and training centres.

## Annex 1

## DEFINITION OF TERMS USED

During the process of drafting the conclusions and observations, it was observed that a number of different terms were used to refer to the physical or operational areas in which development activities are carried out. It was therefore considered necessary to adopt a unified terminology and, with this in mind, ECLAC prepared the following definitions:

Operational management unit: This is a unit of space defined by the area of action of an enterprise, company, community or individual, that uses in some form or another the renewable or non-renewable natural resources of the basin. These operational units are defined and represented by the inhabitants or users of an area: a landowner or land user who occupies a plot of land; a group of landowners or occupants of land in association; the representatives of a rural community; the directorate of an agricultural co-operative; the directorate of a mining enterprise; the directorate of a hydroelectricity generating enterprise, or the directorate of an irrigation area.

Physical management unit: This is a unit of space defined by natural features, such as the drainage area of a river, a hillside, an ecosystem, *inter alia*. In such units, the use of resources should be integral and co-ordinated. Activities that are undertaken and which should be co-ordinated are those that affect the state of the natural resources: constructing a dam or a road, managing a forested area or fauna, or cultivating a field. The physical management unit adopted by the seminar as a unit of reference is the watershed.

Management and co-ordination area: This is an operational unit of space formed by the joining together of a physical management unit and of one or more operational management units. By taking a river basin as a "physical management unit", the co-ordination and management area will be composed and managed by the representatives of each one of the "operational management units" that carry out activities in such a basin.

Co-ordination group: This is an entity comprising the members of each co-ordination area. The members of the co-ordination group are the representatives of the operational management unit that carry out activities in a common physical management unit. The co-ordination groups may be established under the auspices of a municipality or other type of representation of the users and inhabitants of a basin.

Criteria for co-ordination: These are the criteria that underlie the agreements to be concluded among the representatives of the operational management units. Such criteria may be the desire to enhance the quality of life of the inhabitants, to preserve natural resources, or to conserve the local cultural patrimony, inter alia, related to the common interest within the physical management unit.

## Annex 2

**CRITERIA FOR DETERMINING THE PRINCIPAL FEATURES AND NEEDS  
OF THE HIGHLAND AREAS OF THE ANDEAN REGION**

a) The highlands cannot be treated as homogeneous or continuous units. Although manifest in any situation of poverty and environmental degradation, poverty in most of the highlands is unevenly distributed, as illustrated by the various indicators of quality of life, potential and economic activity. This inequality must be evaluated in order to give priority to specific activities aimed at reducing the differences between these areas or basic development units, each of which requires special treatment.

b) The analysis of conditions in the highlands must be undertaken at the level of basic co-ordination units, using evaluation techniques that are suited to the circumstances of each area. Excessive reliance on estimates and the use of imported models are of little value in seeking specific solutions which, in the final analysis, are the ones that yield results. As tactfully expressed by Rengifo and others, "...in the Andes cultivated agricultural land does not always correspond to the theoretical classification of the classifying instrument".<sup>1/</sup> The solution must therefore be sought in the opposite direction.

c) The development and management of basic units in the highlands is not a process that is linked exclusively to the agricultural sector or to the preservation of the environment. The highland area of the Andean region, as J. Sánchez explains, "is like a complex in which agriculture and industry, city and country, energy, technology ... must be located in the sierra itself ...".<sup>2/</sup> Indeed it is not possible to develop and manage an upland watershed without the diversification of activities. This diversification begins at the level of the family --which simultaneously performs tasks in agriculture, livestock farming, artisanry, commerce, harvesting, services and the sale of their labour-- and continues at other larger-scale economic levels such as the community, the district, the province, inter alia.

d) In practice there are two approaches to the development of basic units: "from inside to outside" and "from outside to inside". The first may be associated with the classical development based on the family and community and with the support which the units may receive to improve living conditions within them. The second case involves the intervention of actors external to the unit (basin, district, etc.) to extract or exploit given resources, for example, hydroelectric energy, mineral, forestry or fisheries products, inter

alia. The study of the development process in upland watersheds should reflect both approaches. In the case of development from "inside to outside", the interest of the highland populations is paramount since it seeks their security, self-sufficiency or survival through diversification of their activities, the promotion of co-operation among individuals, the simultaneous management of areas at different altitudes, and the use of local technology. In the second case of intervention, from "outside to inside", private, regional or national interests take precedence. This usually leads to sharp conflicts between the authorities of the basins and the regional or national centralist interests.

e) Development of the highlands at the level of each basic unit can only be undertaken by co-ordination and co-operation among the participants in the process. These participants, whether passive or active, act "from inside to outside" or "from outside to inside", and must be clearly identified and brought together in a "co-ordination group". These may be representatives of the population in general, such as rural communities or municipalities; representatives of the private sector, such as landowners or merchants; representatives of the State technical sector; representatives of political organizations, local authorities, armed forces, teachers, religious orders, benevolent missions, foreign missions, etc.

f) The possibility of co-ordination <sup>3/</sup> among the participants in the development of each basic unit will exist provided that it is known what, why, with what, how and when to co-ordinate it. In order to pool together ideas on this subject, participants in the process should be assisted in: i) knowledge of the interests, rights and positions of each participant in relation to the subject, and ii) the study of the largest possible number of options for action and interaction, and of the procedures and resources necessary to implement agreed measures. Such assistance requires the organization and training of technical personnel functioning at the level of each basic development unit, or groups of units.

g) The process of development of each basic unit, whether the latter is a basin or other area, requires a plan of action at the level of each country and region, which makes possible, strengthens and co-ordinates the action of each basic unit. This action plan must be clear and practical and should not consist merely of a list of intentions or of general policy outlines. In other words, it must be carefully prepared and should specify and attach priorities to its objectives. It should indicate how, when and where to achieve them, and should refer both to existing obstacles and to appropriate measures for surmounting them.

#### Notes

1/ Grimaldo Rengifo et al., "La agricultura andina-Perú", provisional version, Lima, 1984.

2/ National Agrarian University "La Molina", Centre of Andean Rural Studies, "Bartolomé de Las Casas", Estrategias para el desarrollo de la sierra, Cuzco, April 1986, p. 11.

3/ ECLAC, Transacciones ambientales en el campo de los recursos hídricos, LC/L.364, 13 December 1985.

Annex 3

LIST OF PARTICIPANTS

Julio Bonilla Garcés  
Ingeniero Civil - Consultor en Riego, PESCS  
Camino Real 355  
Lima, Perú

Juan Bosco Hondermann Nuñez  
Profesor Universitario  
Jr. Andrés Guaman 720 S/j  
Miraflores,  
Lima, Perú

Sergio Bustamante Pérez  
Jefe Oficina de Planeación - Economista  
Corporación Autónoma Regional Rionegro-Nare (CORNARE)  
Apartado Aéreo 185  
Rionegro, Antioquia,  
Colombia

Eliseo Colque Gutiérrez  
Consultor - Ingeniero Agrónomo  
Centro de Estudios de la Realidad Económica y Social (CERES)  
Av. Alemania 820  
Santa Cruz, Bolivia

Quintilio Croveti  
Encargado de Cooperación Técnica  
Embajada de Italia  
Lima, Perú

Carlos Federico Espinal  
Jefe Técnico Nacional PADT-Rural Colombia - Ingeniero Agrícola  
TR 44 100-22  
Bogotá, Colombia

Francisco Espinoza Gamarra  
 Coordinador Proyecto Conservación de Suelos  
 Agencia para el Desarrollo Internacional  
 Avenida España 386  
 Lima, Perú

Guillermo Gallardo Estrella  
 Director de Planificación del INERHI - Ingeniero Civil  
 Calle Juan Larrea 534  
 Quito, Ecuador

Alcides Gómez Jiménez  
 Consultor/Investigador  
 Fundación "FIHES"  
 Carrera 15 A No. 55-53  
 Bogotá, Colombia

Marino César González Rivadeneyra  
 Profesor Principal - M.Sc. Ing. Forestal  
 Universidad Nacional Agraria  
 Apartado 456  
 La Molina,  
 Lima, Peru

Julio Guerra Tovar  
 Consultor  
 Los Forestales 631  
 La Molina,  
 Lima, Perú

Roberto López Cabrejos  
 Consultor Forestal - Dr. en Ciencias Agronómicas  
 Fundación para el Desarrollo Nacional  
 Juan José Calle No. 446  
 Urbanización Aurora, Miraflores,  
 Lima, Perú

Oscar Martínez Horna  
 Médico, Director de Investigación  
 Escuela de Salud Pública  
 Ministerio de Salud  
 Av. Brasil 3558, Magdalena,  
 Lima, Perú

Benjamín Morales Arnao  
 Director de Ciencias de la Tierra y el Mar  
 CONCYTEC-Perú  
 Camilo Carrillo 114  
 Jesús María,  
 Lima, Perú



Patricio Oliva  
 Jefe Unidad de Manejo de Cuencas - Ingeniero Civil  
 INECEL  
 Casilla 565-A  
 Quito, Ecuador

Lelia Oquendo  
 Coordinadora Programa de Recursos Naturales y Medio Ambiente  
 Secretaría General de Planificación - CONADE  
 Arenas y Manuel Larrea,  
 Quito, Ecuador

Simón Pachano  
 Investigador - Sociólogo  
 Instituto de Estudios Ecuatorianos  
 Casilla 147, Sucursal 12 de Octubre,  
 Quito, Ecuador

Jean-Francois Perrin  
 Coordinador Técnico del Programa de Energía y  
 Saneamiento Básico - Ingeniero  
 Proyecto Especial Atención Primaria y Servicios Básicos de Salud  
 Manuel del Pino 279 - LINCE,  
 Lima, Perú

Gonzalo Alfonso Peña  
 Consultor - Ingeniero Forestal - Especialista en Manejo de Cuencas  
 Av. Bolivia, Edificio Ricalex, Oficina 11-6  
 Los Caobos,  
 Caracas, Venezuela

Pablo Emilio Polit G.  
 Economista - Consultor CEPAL  
 Pedro Torres 892, Nuñoa,  
 Santiago de Chile

Luis Razuri Ramírez  
 Profesor Titular - Ingeniero Agrícola  
 Centro Interamericano de Desarrollo Integral de  
 Aguas y Tierras (CIDIAT)  
 Parque La Isla,  
 Mérida, Venezuela

Jorge Rojas Díaz  
 Director de Programación  
 Dirección General de Aguas, Suelos e Irrigaciones  
 Jirón Washington 1894, oficina 802  
 Lima 1, Perú

Jaime Saldarriaga  
 Ingeniero/Investigador  
 Calle 78 No. 9-57, oficina 701  
 Bogotá, Colombia

Wladimiro Salinas Romero  
Ingeniero  
CPM-Consultores  
Casilla 6550  
La Paz, Bolivia

Ramón Antonio Sánchez Ramírez  
Jefe de División de Conservación de Cuencas  
Ingeniero Agrónomo  
Ministerio del Ambiente y de los Recursos Naturales Renovables (MARN)  
Dirección de Manejo de Cuencas, Torre Sur, piso 12  
El Silencio,  
Caracas, Venezuela

Pablo E. Sánchez Zevallos  
Decano de la Facultad de Ciencias Agrícolas y Forestales  
Ingeniero Agrónomo  
Universidad de Cajamarca  
Ciudad Universitaria  
Tarapacá 570  
Cajamarca, Perú

Eduardo Seminario  
Especialista en Manejo de Cuencas  
Centro Agronómico Tropical de Investigación y Enseñanza (CATIE)  
Turrialba, Costa Rica

Luis Suárez Echeverría  
Especialista Sectorial-Ingeniero Civil  
Banco Interamericano de Desarrollo (BID)  
Paseo de la República 3245, piso 14  
Lima, Perú

Miguel Vallier Urbina  
Director de RURALTER  
Parque Municipal 105  
Barranco,  
Lima, Perú

Absalón Vásquez Villanueva  
Profesor Asociado, Facultad de Ingeniería Agrícola,  
Universidad Nacional Agraria "La Molina"  
Apartado 456  
La Molina,  
Lima, Perú

Wilson Fernando Vivero Silva  
Ingeniero Agrónomo/Director Nacional del Proyecto de Manejo y  
Conservación de la Cuenca Alta del Pastaza  
Ministerio de Agricultura y Ganadería  
Avenidas Eloy Alfaro y Amazonas  
Quito, Ecuador

Jorge Yáñez Becerra  
Ingeniero Agrónomo-Coordinador Proyectos  
CARE  
Los Laureles 485  
San Isidro,  
Lima, Perú

Pierre de Zutter  
Escritor  
Parque Municipal 105  
Barranco,  
Lima, Perú

#### SECRETARIAT

#### Economic Commission for Latin America and the Caribbean (ECLAC)

Axel Dourojeanni  
Head, Water Resources Unit  
Natural Resources and Energy Division  
Casilla 179-D  
Santiago de Chile

Mario Lenzi  
Water Resources Expert  
Water Resources Unit  
Natural Resources and Energy Division  
Casilla 179-D  
Santiago de Chile

Michael Nelson  
Director, Natural Resources and Energy Division  
Casilla 179-D  
Santiago de Chile

#### Junta del Acuerdo de Cartagena (JUNAC)

Carlos Aguirre Bastos  
Jefe, Departamento de Política Tecnológica  
Av. Paseo de la República 3895  
San Isidro,  
Lima, Perú

Jorge Salinas Seminario  
Economista/Encargado Jefatura PADT-Rural  
Av. Paseo de la República 3832  
San Isidro,  
Lima, Perú

Annex 4

LIST OF DOCUMENTS SUBMITTED AT THE SEMINAR

Basic documents

1. Programme.
2. Temario provisional (IC/L.398(Sem.36/1)).
3. Temario provisional anotado (IC/L/399(Sem.36/2)).
4. Estrategia para el desarrollo y manejo de la región andina: una propuesta de acción a nivel de cuenca hidrográfica (IC/G.1433).
5. Propuesta metodológica para sistematizar el desarrollo integrado de cuencas hidrográficas de alta montaña en la región andina (working document prepared by A. Dourojeanni and T. Santamaría, November 1986).

Reference documents

1. Eliseo Colque Gutiérrez, "Algunas experiencias del oriente boliviano en el desarrollo y manejo de cuencas hidrográficas", Centro de Estudios de la Realidad Económica-Social (CERES), Bolivia.
2. Corporación Autónoma Regional del Valle del Cauca (CVC), "La CVC: algunos aspectos históricos", Cali, Colombia.
3. Corporación Autónoma Regional Rionegro-Nare (CORNARE), "Consideraciones finales", Seminar "Hacia una política de desarrollo regional", Rionegro, Antioquia, 6 to 10 October 1986.
4. Lorenzo Chang Navarro, Conservación de suelos y manejo de las cuencas hidrográficas, Ministry of Agriculture of Peru, National Programme for the Conservation of Soils and Water in River Basins, Lima, July 1985.
5. Pierre de Zutter, "Perspectivas del ecodesarrollo andino", Lima, November 1986.
6. Fundación para el Desarrollo Nacional, "Resumen de la evaluación y diagnóstico de las estrategias, programas y proyectos utilizados o formulados para el desarrollo y manejo de cuencas y/o zonas alto andinas

del Perú durante 1980-1985 y su proyección hacia 1990", Lima, November 1986.

7. Alcides Gómez, Darío Fajardo M. and Soledad Ruiz N., "La situación agroalimentaria y las políticas para el campesinado en Colombia, 1960-1986", Bogotá, November 1986.
8. Instituto Ecuatoriano de Recursos Hidráulicos, "La planificación de los recursos hidráulicos en el Ecuador", Quito, November 1986.
9. Junta del Acuerdo de Cartagena (JUNAC)/European Economic Community (EEC), Manual silvoagropecuario, Cajamarca, 1985.
10. Junta del Acuerdo de Cartagena (JUNAC)/Instituto Indigenista Interamericano, "Relato general del Encuentro Campesino de Desarrollo Rural para Dirigentes del Area Andina", Cochabamba, Bolivia, 6 to 12 October 1986.
11. Ministry of Agriculture of Peru, Estrategias de promoción en las comunidades y caseríos andinos para la conservación de suelos en el Perú, National Programme for the Conservation of Soils and Waters in River Basins, Lima, December 1985.
12. Ministry of Agriculture of Peru, Impacto de la conservación de suelos y aguas en la sierra peruana, National Programme for the Conservation of Soils and Waters in River Basins, Lima, April 1986.
13. Ministry of Agriculture of Peru, Manual técnico de conservación de suelos, National Programme for the Conservation of Soils and Waters in River Basins, Lima, September 1985.
14. Simón Pachano, "Estudio sobre manejo y desarrollo de cuencas alto andinas en Ecuador", preliminary document, Quito.
15. Jaime Saldarriaga, "Conclusiones y recomendaciones del Estudio de Caso de Colombia", Bogotá.
16. Eduardo Seminario, "El proyecto regional de manejo de cuencas, una alternativa en educación para el manejo de los recursos naturales de Centroamérica y Panamá", Centro Agronómico Tropical de Investigación y Enseñanza (CATIE), Turrialba, Costa Rica.

