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Report  
83/5/10.1/03

# INTERNATIONAL CENTRE FOR INTEGRATED MOUNTAIN DEVELOPMENT (ICIMOD)

Establishment of scientific and  
technological information services  
for economic and social development

## An Information Centre and Network

Information  
Sciences  
Archival Copy

by L.E. Samarasinghe  
C.D. Wing

Serial No. FMR/PGI/84/117



United Nations Educational, Scientific  
and Cultural Organization

Paris, 1984

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66897

INTERNATIONAL CENTRE FOR INTEGRATED  
MOUNTAIN DEVELOPMENT ( ICIMOD )

AN INFORMATION CENTRE AND NETWORK

by L.E. Samarasinghe  
C.D. Wing

Report prepared for the International  
Centre for Integrated Mountain Development  
(ICIMOD) by the United Nations Educational,  
Scientific and Cultural Organization  
(Unesco)

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Technical Report  
RP/1981-1983/5/10.1/03  
FMR/PGI/84/117 (Samarasinghe/Wing)  
23 March 1984

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Printed in France

## Table of Contents

### PART 1

#### SUMMARY OF THE FINDINGS OF THE MISSION

### PART 2

	<u>Paragraphs</u>
I Introduction.....	1-5
II ICIMOD: Its background and objectives.....	6-12
III Analysis of existing studies, reports and points of view on the nature of ICIMOD's information system.....	13-20
IV Potential users of an ICIMOD information system and services they would require	
(a) Users.....	21-27
(b) Services.....	28
- Clearing-house services.....	29
- Cataloguing, indexing and abstracting services.....	30
- Current awareness services, retrospective bibliographic search services and s.d.i. services.....	31
- Information consolidation services.....	32
- Referral services.....	33
- Document delivery services.....	34
- Translation services.....	35
- Advisory services.....	36
- Training services.....	37-38
- Publications and preparation of audio-visual materials	39
- Marketing of services.....	40-41
V Basis for proposed structure.....	42
- Existing international systems and services.....	43-49
- National documentation centres.....	50-53
- International information networks outside the region.....	54-58
- Diversity of languages.....	59-60
- Assessment of relevant information sources.....	61
- Capture of relevant documents.....	62
- Document collections at ICIMOD.....	63
- Computerization.....	64-72

	<u>Paragraphs</u>
VI Design of the system.....	73
- Information needs of the users.....	74-76
- Information and documentation resources in the region.....	77-78
- Main elements of the system.....	79
A. Information Centre at ICIMOD.....	80-105
B. National Information Units on Mountain Development (NIUMODs).....	106-112
VII Organizational plan	
1. ICIMOD Information Centre.....	113-123
2. National Information Units.....	124
3. Budget for Year I.....	125
4. Subsequent budgetary requirements.....	126

Annexes

Annex I References

Annex II Number of references in AGRIS and CAB on mountains  
and the Hindu-Kush Himalayas

Annex III AGRIS Centres in ICIMOD region

Annex IV DEVSIS Centres in ICIMOD region

Annex V INFOTERRA sources dealing with Alpine ecosystems

## PART 1

### SUMMARY OF THE FINDINGS OF THE MISSION

The mission fielded by Unesco and IDRC provides in its report the guidelines for the establishment of a user-oriented information system for ICIMOD. It considers that such a system should, in addition to performing the usual functions of a library or documentation centre, namely, the collecting, processing and storage of publications, play a more active role by paying particular attention to the creation of user-oriented information packages resulting from a systematic evaluation, analysis and consolidation of information and data available to the centre. Such evaluated, analysed and consolidated information can be produced by the centre for all levels of users and can be in several forms: digests, reviews, state of the art reports as well as publications tailored for less sophisticated end-users. They would be based on information extracted from publications from many sources, presented in a manner suitable for consumption by particular end-user groups. This proposal is based on our knowledge of the wide spectrum of potential information needs of the end-user groups of the countries of the region.

This activity requires the collaboration of subject specialists and information specialists in the production of the publications, the involvement of communication specialists in the repackaging of the finished products for specific user groups in their particular national, subregional or regional contexts and extension services for the dissemination of the materials. The mission sees the possibility of the participation and collaboration of the specialist staff of the research, training and expertise divisions of the centre in these information activities. The results could strengthen their role and impact in the region and assure the relevance of the research, training and expertise provided by the centre to the region's needs. Further, the workshops and study tours envisaged as an activity of the centre, would be a means for the dissemination of consolidated and repackage information. This programme would therefore require the engagement of all the functions foreseen for the centre. Its outputs would support and strengthen the research and training programmes, be valuable as background and briefings for experts working in the region, and at the same time, through wide dissemination in libraries and documentation centres and to specialists, help create an interest in the problems of integrated mountain development as well as a knowledge of the centre's activities. Such publications would also be useful in establishing exchange arrangements with international, regional and national institutions carrying out activities relevant to ICIMOD's programme.

The Vienna Programme of Action of the United Nations Conference on Science and Technology for Development identified three major broad categories of end-users in the developing countries. End-users in the member countries of ICIMOD could be considered as falling into these identical categories with the last category outnumbering the other two several-fold:

- (a) those at the national, political or institutional level comprising planners, decision-makers, negotiators, researchers;
- (b) implementors, comprising managers, engineers, rural development workers, extension workers, health workers, etc.;
- (c) the rural and urban communities who are the least sophisticated category as far as their information requirements are concerned.

The mission has attempted to formulate a plan for meeting the needs of all three groups of end-users. It is firmly convinced, however, that the defined role of the information unit at ICIMOD will have to be substantially broadened to be able to contribute effectively towards these objectives.

It has been mentioned that in the processes of evaluation, analysis and consolidation of the information received at ICIMOD, a close liaison between information specialists and subject-specialists will be necessary. This would apply also to other essential activities of the centre, e.g. abstracting, indexing and book and document selection. The creation and searching of data bases, preparation of specialized bibliographies, production of technical journals, organization of training courses particularly for users of information relevant to ICIMOD's fields of competence, all require inputs from subject and information specialists. It is recommended that the future structure of ICIMOD be so designed as to permit such collaboration, it being understood, of course, that the information centre does also have its information gathering, storage and provision responsibilities and its servicing functions.

The mission recommends that:

ICIMOD's information and documentation system be established in the form of a regional network for the exchange of information on integrated mountain development and related fields among its member countries on the following basis:

it should utilize all existing sectoral, national, regional and international systems and networks capable of providing relevant information and documentation through a system of intercommunication and linkage. ICIMOD's specialized data base created according to international standards, could be made available for on-line search through appropriate networks. Its technical publications, bibliographies and other outputs would be available on request or through established working lists. It should actively promote the participation of its member countries in such a system. This will imply the establishment of suitable arrangements at the national level for the 'capture' of relevant documents produced within the country, information on on-going activities whether in research or in development programmes relevant to the mountain regions contributing to the organization of workshops and seminars with the objective of disseminating information and its use and application in development. ICIMOD will reciprocate by facilitating access of the country to information produced elsewhere so that it benefits from international research and experience and assist in the training of specialists and users through the provision of training materials and expertise, and collaborating in the organization of study tours and workshops;

it should establish a national information unit for mountain development (NIUMOD) in each member country to function as a source of information on integrated mountain development through its own national collections or through referral to collections located elsewhere in the country. The NIUMOD would also act as a provider of information to the Information Centre at ICIMOD on a regular basis to support training, publication, research, and development programmes planned and implemented by the centre. ICIMOD would provide the technical support necessary for organizing its information handling capability in accordance with international standards. The NIUMOD being the national focal point for information on integrated mountain development would have a direct link with ICIMOD enabling it to draw upon ICIMOD's information and documentation resources as required. The place of the NIUMOD in the national structure will vary from country to country, and several models are possible. These will be described in the detailed report. Nevertheless, it is felt that the functions of the NIUMODs will remain unchanged;

it should also acquire, process and store documentation and information from its member countries as well as others, on integrated mountain development and related fields, necessary to support its training, publication, research and development programmes. ICIMOD's policy for acquiring documents and publications should take into consideration the functions of the national nodes and regional and international potential for provision of necessary information;

it should provide the following services which would be available to member countries as well as to individuals, research and development institutions and national, regional and international organizations interested in problems of mountain development:

clearing-house services; cataloguing, indexing and abstracting services; current awareness services; retrospective bibliographic search services; selective dissemination of information services; information and data analysis services; information consolidation and repackaging services; referral services; document delivery services; translation services; advisory services; training services for information professionals and information users; publications services and preparation of audio-visual materials.



PART 2

I. INTRODUCTION

1. In response to a request received from the International Centre for Integrated Mountain Development (ICIMOD), Kathmandu, Nepal, for advice on the organization and establishment of its information services, the United Nations Educational, Scientific and Cultural Organization (Unesco) and the International Development Research Centre (IDRC) of Canada, provided a joint consultancy mission to ICIMOD in December 1983. The consultants were Mr L.E. Samarasinghe, Chief, Section for Development of Information Infra-structures, Unesco, Paris, and Mr C.D. Wing, IDRC Project Advisor, Peradeniya, Sri Lanka. The joint mission which was co-ordinated by Mr Peter Gueller, Regent of ICIMOD, took place from 14-21 December 1983 and was funded jointly by Unesco under its Regular Programme for 1981-1983 and by the International Development Research Centre.
2. The terms of reference of the mission had been established in the ICIMOD Memorandum dated 18 November 1983, but some modifications were made on the lines of discussions at the International Symposium of ICIMOD held in early December and later, after discussions between the consultants and the Regent following their arrival at Kathmandu.
3. In general terms the consultants were required to advise on the scope and activities of an information system which would support the objectives detailed in the draft work plan for ICIMOD for 1984 and beyond. These dealt with the need for attention to the deteriorating environmental and human setting in the mountain regions, the integrated nature of the issues connected with this situation, the need for an integrated approach to the solution of these problems and the necessity for the participation of scientists, policy-makers, practitioners, local groups and concerned populations in actions towards the solution of mountain development problems. The multidisciplinary nature of these problems, the linguistic, cultural, economic, political and other backgrounds of the populations concerned, the priorities established for the work of the ICIMOD Centre and many other considerations would need to be taken into consideration in the design of an appropriate information system.
4. In specific terms, the consultants were required to advise on:
  - (a) the system design for an information and documentation centre to be established at ICIMOD headquarters in Kathmandu;
  - (b) the system design for a network linking the ICIMOD information centre with an appropriate centre or centres in each of the participating countries of ICIMOD to ensure a two-way flow of information;
  - (c) to advise on possible linkages with institutions, organizations, networks etc. outside the region of the Hindu Kush-Himalayas for exchange of information relating to mountain development problems.

In each instance, advice was required on the identification of user groups, the services that should be provided by the centre and the network, the infrastructure necessary for the provision of the services, e.g. equipment and manpower and the financial implications of these recommendations.

5. The consultants were also required to look into the possibilities of future computerization of some of the activities of the centre and to make appropriate recommendations.

## II. ICIMOD: ITS BACKGROUND AND OBJECTIVES

6. Concern for the destruction of mountain environments was expressed in several international meetings during the 1970s. Two in particular stressed the importance of an ecologically sound approach to development which would improve the living standards of mountain and lowland populations, while at the same time minimizing environmental degradation. The first of the two meetings was held in Munich in 1974. This international workshop on the development of mountain environment, sponsored by the German Foundation for International Development, recommended the establishment in Nepal of a centre to promote the ecologically sound development of mountain environments(1). In 1975, in Kathmandu, a regional meeting on integrated ecological research and training needs in the Southern Asian mountain systems, particularly the Hindu Kush-Himalayas, was organized by Unesco within the framework of the Man and the Biosphere Programme (MAB). The meeting, attended by delegations from most of the countries of the region, recommended the setting up of a regional institute for integrated mountain development, concentrating on documentation, promotion of research and training and technical advisory services. It also welcomed an offer from the Kingdom of Nepal to host the Institute in Kathmandu. Following this meeting a Unesco feasibility mission in 1976 recommended that a regional centre for integrated mountain development be established in Kathmandu. A resolution endorsing this recommendation was adopted by the nineteenth session of the General Conference of Unesco held in Nairobi in 1976. The resolution was further supported by the twentieth and twenty-first sessions in Paris (1978) and Belgrade (1980).

7. In 1979 His Majesty's Government of Nepal, Unesco and the Governments of the Federal Republic of Germany and Switzerland agreed to act as founding members of the institution. In the same year an ad hoc committee was convened by these bodies to conclude preparatory work already in progress. In 1980 it agreed on the present name of the centre and reviewed the draft statutes.

8. A consultant, Professor Kevin F. O'Connor, was assigned by Unesco-MAB in 1981 to advise on the organizational structure of the centre, the specialists needed, and to propose a preliminary work plan to cover ICIMOD's first two years of operation. A Regent was appointed in 1982 to conduct the business of the centre under an Interim Committee pending the assumption of office by a permanent director. ICIMOD organized its First International Symposium from 1 to 5 December 1983, and was officially inaugurated on 5 December 1983 by the Prime Minister of Nepal.

9. According to its statutes, ICIMOD is an 'autonomous international institution at the service of the States belonging to the Hindu Kush-Himalayans, all of whom may participate in the activities of the centre and use its services'. The objectives of ICIMOD, quoted below, indicate its supplementary or service role in furthering the effectiveness of bodies operating in the region(2).

'Article 1: Objectives

The primary objectives of the centre shall be to help promote the development of an economically and environmentally sound mountain eco-system and to improve the living standards of mountain populations of the Hindu Kush-Himalayan area which, for the purpose of these statutes, includes Afghanistan, Bangladesh, Bhutan, Burma, China, India, Nepal and Pakistan. To this end the centre will serve:

- (a) as a multidisciplinary documentation centre;
- (b) as a focal point for training and applied research activities; and
- (c) as a consultative centre in scientific and technical matters for all the countries of the region upon their request.

Article 2: Functions and activities

- (i) In fulfilment of its foregoing objectives, the centre shall
  - (a) collect, evaluate and make available information and results of:  
research programmes and projects;  
development projects;  
other published and unpublished material related to the economically sound development of hill and mountain areas;
  - (b) assist in the identification, preparation, execution and evaluation of relevant programmes and projects;
  - (c) give advice to governments and non-governmental institutions of the said area on new programmes and on all issues related to the development of mountain areas;
  - (d) serve as a clearing-house for information for all parties engaged in such development and help to make use of existing know-how;
  - (e) produce and distribute relevant information for the different client and target groups;
  - (f) support and undertake postgraduate training in all subjects relevant to mountain development;
  - (g) host national, regional and international seminars and conferences in order to strengthen the idea of economically and ecologically sound development of hill and mountain areas on a world-wide basis;
  - (h) promote, conduct and co-ordinate applied and problem-solving research activities;
  - (i) perform such other related activities as may be appropriate in furtherance of its objectives.

- (ii) The centre will provide assistance, advice and support to countries and non-governmental institutions at their request.
- (iii) The centre shall establish and operate the installations necessary for the achievement of its objectives.'

10. It can be seen from Article 2 that the major functions mandated to ICIMOD are documentation, information, dissemination, training, applied research and technical advisory services. It is understood however that ICIMOD is not an executing agency. It has been conceived as an international agency of service, and will carry out its functions in such a way as to supplement, advise and support development programmes in the mountainous areas of its member countries.

11. The internal structure of ICIMOD will be established by the new director who is expected to assume duties shortly. However, it is clear from available documents and discussions with the Regent and Director-designate that the information centre of which an important function is information dissemination, is to be an integral component of ICIMOD's plans and activities.

12. ICIMOD operates under a Board of Governors who together with the Director will ensure that the stated objectives and functions are properly developed and carried out. The Board consists of eleven members representing the host country, the other States of the Hindu Kush-Himalaya region, Unesco, and the financial sponsors (as of 1983 the Federal Republic of Germany and Switzerland).

### III. ANALYSIS OF EXISTING STUDIES, REPORTS AND POINTS-OF-VIEW ON THE NATURE OF ICIMOD'S INFORMATION SYSTEM

13. The importance of an information system for supporting the concept and activities of integrated mountain development has been consistently emphasized at the meetings and in documents leading to the establishment of ICIMOD. As far back as 1974 the Munich Workshop recommended a public information programme(3). A set of immediate objectives was formulated at the 1975 Kathmandu meeting for the long-term objectives of the centre(4). The immediate objectives of the documentation programme at that time were the creation of a centralized information and data bank and dissemination of information to users at the national, political and institutional levels - 'planners, administrators, land-use specialists, decision-makers as well as research workers ...'. They were given more substance in 1979 with the formulation of draft statutes, objectives and an implementation plan for ICIMOD, by a Unesco mission(5). The draft statutes empowered the centre to establish a multidisciplinary documentation centre and this, as has been seen, is now enshrined in the final statutes. The statutes further provided for the collection, evaluation and dissemination of information on research programmes, development projects and other published and unpublished material related to mountain development.

14. In accordance with this mandate the 1979 mission itemized the components of ICIMOD's information and documentation programmes. They are worth summarizing here as later reports do not differ substantially in their recommendations. The documentary and information material to be collected by ICIMOD was seen to include maps, remote sensing data, research studies, workshop

reports and development project reports, including evaluations produced since 1950. Their subject scope, probably the same as those suggested for books and journals, included agriculture, geography, sociology, climatology, etc., is an indication of the many disciplines embraced by integrated mountain development.

15. The mission for the first time also identified some outputs of the information programme. Besides promotional brochures and newsletters mention is made of 'sponsoring studies of special cases that have had a drastic impact on the ecosystem' and further 'assessment of experience gained from completed and ongoing programmes and projects'. The Information Centre is therefore seen to have a function beyond the mere collection and storage of documents. It would also have a role to play in the analysis and evaluation of the content of some of its collections. The users of such information and of the overall system were given as government institutions, national and international agencies, universities, academic and current and potential co-sponsors of ICIMOD.

16. O'Connor(3) concurs with many of the activities listed in the Unesco Mission report, but in one important aspect goes further. He suggests that the major functions of ICIMOD - training, documentation, research, information dissemination and technical advisory services - have 'natural functional relationships in the form of information flows from outside sources and through the centre to outside target groups'. Documentation staff are therefore seen to interact in different ways with the other functional groups in order to provide information services. Although he presents the documentation and information sections as two distinct groups (at the time of writing they are one unit of ICIMOD) O'Connor views the documentation staff carrying out their work with the inputs of special knowledge of other ICIMOD staff and vice versa. In short, each is dependent on the other. For example, in the provision of abstracts and translation services, inventorising of applied research and development programmes and preparation of review publications, he mentions that specialist staff of ICIMOD must work alongside documentation staff to ensure that the ensuing products are authoritative, and that within ICIMOD itself there is an integration of operations.

17. O'Connor also stresses the desirability of liaison and co-operation with appropriate 'informatics agencies' (information) of the member countries and with those with an international perspective. He believes that this would help ICIMOD identify significant collections of documentation and information relevant to integrated mountain development. It would also give indications on existing information gaps which would require attention by the ICIMOD Information Centre. In this way, from the material and information collected, O'Connor suggests that a special data base compatible with existing computerized information systems would be created. The point emphasized here by O'Connor has been considered in our report as being of vital importance. We consistently underline the need for the sharing of resources already available in the region whether they be in the scientific, technological, environmental, agricultural, geological or other fields. The ICIMOD information network should be so structured as to be able to draw upon these resources and concentrate on those information fields where insufficient attention is being paid at present.

18. Panday and Axim in ICIMOD Working Paper No. I prepared for the First International Symposium(6) agree with many of the points presented above including the compilation of inventories, material to be collected, analysis of information creation of a computerized data base, and so on. However, the suggested approach to this and indeed the whole programme of ICIMOD is linkage building and the establishment of networks between the centre and the countries of the region as well as interested bodies outside the region. Further, the authors feel the organization of ICIMOD should not exclude national focal points which would keep the Centre in touch with its clientele. These linkages when applied to documentation are based on the understanding that there is a great deal of relevant information on mountain development which is difficult for one institution to collect by itself. The authors recommend that ICIMOD fosters co-operation with existing documentation centres in the region for the supply of specialized information and that a network of documentalists be formed, one per country, for classifying, storing and notifying the Centre of relevant documents produced in member countries. This regime would substantially reduce the storage requirements at ICIMOD headquarters. The information collected could also serve to indicate potential areas of applied research. The authors argue that these links will provide an efficient vehicle for information dissemination at the national level to implementors, policy-makers, scientists as well as to local groups and mountain residents. Finally, great stress is laid on the sharing of information through a variety of media including a scholarly journal, review series, educational materials and radio.

19. Several of the working groups set up during the International Symposium 'Mountain Development 2,000; Challenges and Opportunities' organized by ICIMOD in Kathmandu from 1 to 5 December 1983, also made recommendations concerning the projected documentation and information activities of ICIMOD. The following is a summary of the more important proposals.

- (i) A documentation centre should be established at ICIMOD but its scope should be defined. Duplication of collections already existing in the region should be avoided by the establishment of appropriate linkages.
- (ii) A network organization is suggested but it is recognized that a clearer definition of the linkages and functions of its components is required.
- (iii) The documentation centre should collect, as a priority, maps and remote-sensing data relating to the region, compile and distribute an inventory on current programmes on mountain development, and build up its collections following the priority established by ICIMOD for its research, training and other activities. The documentation centre should also collect documentary and video films and make them available on an exchange basis to member countries.

- (iv) The documentation centre should have the ability to provide the full text of documents referred to in ICIMOD publications if required by users.
- (v) The strategy for communication with and for transfer of information to ICIMOD's potential clients ranging from planners to villagers and workers at the grass-roots level requires examination. The ability to communicate effectively with all groups is essential for the success of ICIMOD.
- (vi) The production of educational material for inclusion in the curricula of schools is an important activity.
- (vii) The documentation centre should be involved in certain public relations functions such as:
  - (i) the production of a News Bulletin or News Digests;
  - (ii) press releases;
  - (iii) production of radio, television, video programmes.

Other units in ICIMOD would also be involved in these activities, some of which could be contracted out to specialized institutions in the region.

- (viii) Special attention should be given to the possibility of using video as an appropriate media for transferring information, ideas, techniques, etc. for the education of rural populations.

20. The Working Group on Documentation and Information Dissemination concluded its report by asserting that 'ICIMOD's role as a disseminator of information to different target groups and in suitable formats, is an essential activity which must receive top priority. It is not enough to collect and store information. It must be available to all in a readily usable forum'.

#### IV. POTENTIAL USERS OF AN ICIMOD INFORMATION SYSTEM AND SERVICES THEY WOULD REQUIRE

##### (a) Users

21. Any discussion on the establishment of an information system must take into account the target groups who are expected to benefit from it. Their needs will influence the overall design of the system including the material to be collected, services provided and co-operation with other institutions. Undoubtedly, one of the most important user groups would be the staff of ICIMOD - the specialists and the long-term and short-term consultants from a wide range of professions, specializations and disciplines. Their particular subject interests and mission-oriented activities would require supporting information and documentation services. These must be broad-based enough to permit staff to take decisions on technical problems, keep them up to date with their special interests, and implement the programmes for which they are responsible. A large part of the information required will have been produced within the region itself. In addition to national journals on mountain development and related subjects, it would consist of national and sectoral plans, research papers, project reports, conference proceedings, training manuals, statistics and so on. Much of this

material falls within the category of non-conventional or 'grey' literature and they would form a very important part of the total information resources of the information system of ICIMOD. Non-conventional literature is characterized by the non-conventional channels and style of distribution. As they are not commercially published or marketed, their 'capture' requires a careful and well-planned strategy. Non-conventional documents include consultant-reports, internal documents, survey data, unpublished results of experiments and projects, survey reports, occasional papers, working papers and other types of documents intended for a limited audience of specialists. One other feature of such materials is that non-conventional literature is usually in the local language, providing yet another handicap towards access to its content. As the upgrading of non-conventional literature can be achieved through bibliographic control, the information system of ICIMOD will have to provide means for the processing of such materials, selected according to their intrinsic value to the programme of ICIMOD. Many factors to be discussed later in the report will determine the location of such materials and the means of access to them.

22. Another important group of potential users of information and documentation whose needs have been frequently mentioned in the reports of ICIMOD meetings comprise high-level officials in the member countries of ICIMOD. Those users belong to a group of planners and decision-makers whose information needs are not exactly similar to that of ICIMOD staff. There is no doubt that they are an important target group but the services they need require a reprocessing of the information, an activity in which the information specialists and subject specialists of ICIMOD will have to co-operate.

23. For instance, the information required for decision-making would include: a summary of a given situation; forecasts based on currents, orientations and tendencies; detailed information on fields related to the specific area of activity; estimation of risks and the economic and commercial implications of the actions envisaged. All this information needs to be reliable and to be provided in clear and concise form. It is evident that ICIMOD must include a capability for the provision of such services to planners and decision-makers in its member countries. Their decisions are important both to the achievement of the objectives of ICIMOD as well as to the development of the mountain regions of the Hindu Kush-Himalayas.

24. There are in addition other potential user groups further down the line with perhaps a more pressing need for service because they comprise by far, the largest numbers as far as population is concerned. These groups which consist essentially of the rural populations (practitioners) are often the most physically isolated from sources of information. Lack of access to library resources, or their inability to benefit from them even if available due to their semi-literacy or illiteracy requires that information be specially produced for their needs. They are traditionally the least sophisticated of users and those most often ill served, ignored even, by existing information facilities. Yet it is a great mistake to assume that these groups are ignorant of environmental change or cause and effect. What they themselves require is access to information which in simple terms relays choices and techniques assessed as being the most suitable for the improvement of their immediate environment and quality of life. This is even more pertinent when one considers that in many member countries, village-level development programmes designed and implemented by village councils and groups are not uncommon. ICIMOD then, cannot afford

to lose sight of its less sophisticated users as they are vital links in the chain of integrated mountain development processes. In the words of Panday and Axinn(6) who are the only authors to have considered them 'The programme of ICIMOD must be responsive to the government of the region and the actors on the scene - programme implementers, local groups in mountain areas and the people who live in the unique ecological niches of the Hindu Kush-Himalaya'.

25. All these potential users fall into three broad categories of end-users identified by the Vienna Programme of Action of the United Nations Conference on Science and Technology for Development. We believe that the target groups in member countries of ICIMOD should be considered as falling into these categories with information services provided accordingly. The last group outnumbers the other two several-fold.

- A. Those at the national, political or institutional level comprising planners, decision-makers, negotiators, researchers, teachers and students (ICIMOD staff falls into this category).
- B. Implementers comprising managers, engineers, rural development workers, extension agents, health workers, etc.
- C. The rural and urban communities who are the least sophisticated category as far as their information requirements are concerned.

26. The activities of the information programme besides responding to the needs of its users must also take into account other factors common to them and the region. They can be summarized as: (i) the geographic spread of users through the eight member countries; (ii) the multiplicity of languages spoken in the region; (iii) the wide ranging disciplines of users: socio-economics, agriculture, engineering, etc.; (iv) the often poorly developed methods of communication such as postal, telephone and telex facilities; (v) the ability of different groups to use and digest information, for example: an abstract written for group A will not be suitable for group C, or a manual of techniques prepared for an irrigation engineer would be unsuitable for group A; and (vi) the scarcity of reliable information and documentation centres and libraries in many member countries.

27. The last point, it should be noted, has inherent dangers for ICIMOD as its documentation centre and information system could easily come to be perceived as a universal repository able to answer any question remotely connected to mountains. On economic grounds it is unreasonable to accept this approach with its implication of having to collect or be aware of every conceivable publication produced in the region which might be of use. A minimum approach to information services is also unacceptable - collection, processing and general distribution of material on integrated mountain development as this ignores the specific characteristics and needs of end users. Instead, an approach midway between the two is proposed, with services based upon ICIMOD's mandate to act as a clearing-house for information on integrated mountain development.

(b) Services

28. An information system serving the needs of users at individual, institutional, national and international levels would be expected to provide accurate, usable and updated information through the following established services:

clearing-house services

cataloguing, indexing and abstracting services

current awareness services

retrospective bibliographic search services

selective dissemination of information services

information and data analysis services

information consolidation and repackaging services

referral services

document delivery services

translation services

advisory services on information, selected subjects to States or institutions

training services for library, documentation and information staff in institutions in the member countries

training services for users at all levels

publication services, e.g. newsletters, journals, occasional papers, etc.

preparation of audio-visual materials, e.g. films, filmstrips, cassettes, video tapes, etc.

This comprehensive list of services would obviously not be within the immediate capability of ICIMOD and certain priorities will need to be established. Also, since the consultants will be proposing a distributed information network within the ICIMOD region, some of these tasks could be assigned definitively or on a contractual basis to co-operating institutions in the region. It may perhaps be useful to define these services as it may help to appreciate their role in the information system as a whole.

Clearing-house services

29. ICIMOD should act as a clearing-house for information on all completed, ongoing and planned activities related to integrated mountain development in the region. To be able to do so, it would need to establish mechanisms for receiving information and documentation on this subject from its member countries.

Cataloguing, indexing and abstracting services

30. These activities will not be entirely concentrated at ICIMOD, as the consultants will suggest the establishment of national information units on mountain development (NIUMODs) which will be expected to develop a capacity to perform the functions at the national level, when necessary. As much of the literature of importance in ICIMOD's work is of the non-conventional type ('grey' literature) and therefore more likely to escape bibliographic control than normal printed materials, cataloguing, indexing and abstracting services need to be associated with ICIMOD information activities. Nevertheless, it cannot be too strongly emphasized that this process should be seen as a means of improving access to information which has not previously been processed, and not as an end in itself.

Current awareness services, retrospective bibliographic search services, selective dissemination of information services

31. These services could be provided by ICIMOD when it has built up its basic collection of materials, constructed its catalogue or bibliographic data base and established contact with international data banks abroad for searching of their files. Such services will be essential for the preparation of state of the art reports, for the continuous transfer of information to specialists working on particular topics in the field and to research work that is being conducted at ICIMOD.

Information consolidation services

32. This has become a very important activity in the transfer of scientific and technological information in the developing countries. Originally, information consolidation was considered as a technique for the compression of highly technical information providing a condensed brief on the state of the art of a specialized topic to a scientific research worker. It is now felt that the technique could be applied for transferring science and technology for application in development to the rural populations of the developing countries. The process of consolidation with effective repackaging of the information according to the identified user preferences has been successfully used particularly in the agricultural field. Unesco is at present experimenting on the transfer of biogas and windpump technology to rural populations through the use of consolidation and repackaging techniques. It has also carried out studies on the efficiency of wood burning cooking stoves, a subject which is of primary importance in the environmental context of the Hindu Kush-Himalayas.

Referral services

33. These will direct users to an appropriate source for the information they require. For example, an administrator wanting to know how traditional village healers are being trained to popularize family planning methods can be directed to the projects and agencies involved in such training, or a village group wanting to establish a community energy forest can be put in contact with a proven expert or institution willing to provide guidelines and advice; or, a sociologist wishing to measure the rate of out-migration from mountain towns can be referred to a library holding a comprehensive collection of census returns. This service ensures that the use of existing resources, local, national and international, is fully encouraged by the centre.

#### Document delivery services

34. This is an important aspect of information service, requiring an information centre to have the potential to obtain for a user a copy of a journal, monograph, document or article he needs. Some of these needs can be met through the ICIMOD network, i.e. the information centre at Kathmandu and the eight co-operating national information units on mountain development (NIUMOD). It is envisaged that each NIUMOD will also be a constituent of a national network of science, technology, development, agriculture, engineering, environment and other information centres enabling a sharing of their information resources and possibilities of access to their collections. Where a document is not available in the region other international sources such as the British Lending Library could be called upon to provide it.

#### Translation services

35. The multiplicity of languages in the region will be a great handicap to the free exchange of information. Nevertheless it is expected that a selective database containing the titles or articles in the English language and titles in other languages transliterated into the roman alphabet will provide indicators to useful and relevant materials written in local languages. The functions proposed for the NIUMODs will include a responsibility for preparation of translations of articles from the local language into the language of the user, i.e. for example, from Chinese to Nepali, etc. (see also paragraphs 59 and 60).

#### Advisory services

36. Information specialists at the ICIMOD Centre could be made available on request from member countries to advise on information related subjects. This will help to ensure compatibility of systems and standardization of techniques.

#### Training services

37. It would be expected that the NIUMODs will adopt certain standard techniques for the handling of information. These will have to be developed at the ICIMOD Centre according to established international standards and a training programme for the staff of the NIUMODs will have to be established. The ICIMOD Centre can also serve as a training centre for retraining of the staff of the national centres and for the production of training materials which could be used in the future development of national networks or of individual centres.

38. The ICIMOD Centre would exercise the same responsibility with respect to users. Here the wide variety of users will require careful preparation of appropriate training materials. In these activities it is essential that the information specialist be assisted by both ICIMOD subject specialists and communication specialists.

Publications and preparation of audio-visual materials

39. These responsibilities will be shared with other sections of the ICIMOD Secretariat. However, it can be assumed that the information activities of the centre will provide a growing need for a publication capacity. While publications would serve to get information across to the minority literate groups of the region, audio-visual techniques will have to be harnessed to get the message across to the majority. This aspect of communication must therefore receive special attention and the ICIMOD Centre will need to establish multidisciplinary teams to study the problems and to provide solutions.

Marketing of services

40. The interaction of the information system of ICIMOD with the participating member countries will be crucial to the success of the ICIMOD programme in the region. It is a well known fact that apart from specialists engaged in scientific and technological research activity, in many of the countries concerned there is little interest on the part of decision-makers and planners in utilizing to the maximum extent possible information relevant to the problems for which they seek solutions. As mentioned earlier user education efforts to promote a better knowledge and appreciation of the work on mountain development problems should therefore be a component of the information system's activities. While some methods may be useful for promoting interest among decision-makers and planners, others will have to be designed for various rural communities to encourage them to apply the results of ICIMOD's activities towards the solution of their problems.

41. User education techniques have been developed by other organizations for the promotion of the use of and application of scientific and technological information for development, e.g. among the research and academic communities, among extension workers and among farmers and small industrialists. Such experience could be utilized in the promotion of the use of the services of ICIMOD's information system.

V. BASIS FOR PROPOSED STRUCTURE

42. The implementation of ICIMOD's programme would be dependent upon the success of the information system in rapidly building up a knowledge base, both bibliographic and non-bibliographic, with a strong regional flavour. At the same time, channels of communication with sources outside the region will have to be established through which information, data, techniques, expertise and other essential elements can be exchanged for mutual benefit. The regional knowledge base would be largely built upon existing and available information and documentation in the eight member countries. A large number of international organizations and foundations, e.g. Unesco, FAO, WHO, UNIDO, IDRC have been working in the region for many years and national and regional surveys of information have been carried at the request of many member countries. Such existing studies as well as the results of any additional studies that may be considered necessary by ICIMOD would enable a fairly accurate assessment of the regional knowledge base. This could also be the basis for a referral network for ICIMOD related information operated through the NIUMOD centres. ICIMOD would therefore utilize already established information infrastructures in the region to contribute to the knowledge base required for supporting its activities and for the provision of some of the services that will be required by the Centre as well as information users in ICIMOD's member countries. The network of national nodes also called NIUMOD centres therefore becomes indispensable in the interaction of users, established national information infrastructures and ICIMOD.

Existing international systems and services

43. In addition to important national information centres some of which are listed elsewhere many of ICIMOD's member states are participants in international information systems and networks and as such, collaborate at the regional and international levels in the exchange of particular types of information. As the disciplines covered by these systems fall within those contributing to integrated mountain development linkages with such systems could provide reciprocal advantages to ICIMOD's programme as well as to the co-operative international system itself.

44. The International Referral System for Sources of Environmental Information (INFOTERRA) established by the United Nations Environment Programme already includes India, Bangladesh, Pakistan and China among its co-operating nations. Over 110 countries have established Infoterra focal points. A national focal point of Infoterra is designated by the government of a member state. It is usually set up in a government agency which has responsibility for environmental matters. Its principal responsibility is to compile and maintain a list of sources of environmental information in its national territory for inclusion in the Infoterra Directory and to provide inquiries on request with a list of sources derived from the international directory which are likely to have information relevant to their inquiry.

45. An Infoterra source is defined as a functional unit which has information or knowledge on a particular environmental topics or range of topics and is able and willing to provide appropriate information when requested to do so through the Infoterra system.<sup>1</sup>

46. ICIMOD's activities could benefit considerably from close liaison with Infoterra focal points in the countries in which these have already been set up and with the information sources listed in the International Directory. ICIMOD could also, through the results of its own activities in the member countries of the region, support the creation and development of additional information sources on environment related subjects as a by-product of its activities in the mountain regions. The International Directory would be a valuable tool for ICIMOD for the identification of specialized literature sources and expertise in the 110 or more member countries of Infoterra according to the needs of ICIMOD's programme (see Annex V).

47. A second system, entirely different in character, is AGRIS - the International Information System for the Agricultural Sciences and Technology. Sponsored by FAO since 1975, it is a decentralized bibliographic system wherein each national centre (over 110 at present) provides the AGRIS data base with appropriately formatted information on published and unpublished literature produced within its borders. Its subject scope which is broad, covers many areas of fundamental interest to ICIMOD including rural development, watershed management, soil erosion and control, management of water resources, energy, forestry and so on. Growing at the rate of 11,000 new items a month, it is now the world's largest co-operative data base with over one million references, the original documents of which are available from the reporting centres.

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1. From UNISIST. Report on the evaluation of Infoterra for the United Nations Environment Programme. Prepared by J. Martyn (PGI/WS/3 Paris, April 1981, 120 p.)

48. AGRIS is well supported among ICIMOD member countries with Bangladesh, India, Nepal and Pakistan having active input centres. Through each input centre, the whole data base is accessible and with the exception of India, each centre also produces subsets of the system in the form of national agricultural bibliographies. Because much of AGRIS falls within the scope of ICIMOD it will prove an important source of information both for the centre itself and its users. Amongst other things it can contribute to the preparation of special bibliographies, document selection, identification of information producers about and in the region and indicate current and past research and development programmes related to ICIMOD's mandate. ICIMOD can also contribute to the AGRIS system by ensuring that relevant documents produced by it - both published and unpublished - are deposited at the Nepal AGRIS Centre for inclusion in the international data base.

49. Another international bibliographic system represented in the region is the Development Sciences Information System (DEVISIS) supported by the International Development Research Centre (IDRC). This system is related to development sciences information and covers a wide range of disciplines. It has active centres in Bangladesh, India and Pakistan, all of which have produced annotated bibliographies of their input to the system. ICIMOD can benefit from DEVISIS in the same way as described for AGRIS.

#### National documentation centres

50. The region also has a number of national documentation centres which have a responsibility for collecting processing and disseminating scientific and technical information, especially that produced within their borders. They include the Bangladesh National Scientific Documentation Centre (BANSDOC), the Indian National Scientific Documentation Centre (INSDOC) and the Pakistan Scientific and Technological Information Centre (PASTIC). The functions of these centres are essentially similar providing services to support scientific and technological development through the collecting, processing and dissemination of scientific and technical information. Their perspectives although national, do not preclude them linking up with international organizations and systems or providing their services to other countries.

51. The collections of these centres and those of other institutions in their national networks are made known through their publications. BANSDOC, for instance, publishes the Bangladesh Science and Technology index, National Union Catalogue of Scientific and Technical Periodicals in Bangladesh and Scientific and Technical Periodicals of Bangladesh. INSDOC and PASTIC have also produced similar listings. Inventories, directories and bibliographies are also produced by these centres: PASTIC has prepared over 750 scientific and technical bibliographies(7) while BANSDOC has compiled a directory of national scientists and a list of Current Scientific and Technological Projects in the Universities and Research Institutions of Bangladesh(8).

52. The Institute of Scientific and Technical Information of China (ISTIC) has a national mandate for the provision of scientific and technological information and documentation services. Functionally, it is at the top of a national information system comprising six regional and twenty-nine provincial information and documentation centres. Other important libraries for scientific and technological information in the country are the Chinese Academy of Sciences Library and the Beijing (National) Library.<sup>1</sup>

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1. Brawne, M. and Schwarz, S.: Development of the Institute of Scientific and Technical Information of China (ISTIC) (FMR/PGI/81/104 (Rev.) Paris, Unesco, 1981, 84 p.

53. Other member countries of ICIMOD also have well established scientific and technological information centres, university libraries, specialized libraries and other types of information units which could, through their information resources support ICIMOD's programmes. The harnessing of the resources of all such centres existing in the region at the national level through the proposed NIUMOD centres will permit their utilization for mutual advantage of both the centre themselves and of ICIMOD.

International information networks outside the region

54. In addition to the international information systems already mentioned there are a number of other data bases in relevant subject fields which are accessible through information systems and networks located mostly in Europe and the United States. Among them, just to cite a few examples, are:

Agriculture related data bases:

CAB (Commonwealth Agricultural Bureaux System)  
which consists of some 20 linked subdata bases, e.g. annual breeding abstracts; agricultural abstracts; dairy science abstracts; forestry abstracts; herbage abstracts; index veterinarius; plant breeding abstracts, etc.

Chemistry related data bases:

CA Condensates (Chemical Abstracts Services)

Physics related data bases:

INSPEC (International Information Services in Physics, Electrotechnology, Computers and Control)

55. In addition to these there are many other bibliographic data bases relating to general scientific subjects as well as multidisciplinary ones, mission oriented systems in science and technology, e.g. energy, environment and ecology, earth sciences; industry-specific systems, e.g. agro-industries, ceramics, building and construction, water, wood; and patents and negotiable technology systems.

56. A number of networks using computer-telecommunications technology are available for accessing these data bases. Among them are: TYMNET - a network based in the United States of America but also accessible from Canada and Europe via nodes established by European PTTs.

TELENET - established as a value-added network in the United States of America and designed as a commercial packet-switching network. It uses both ground based and satellite circuits and can be linked through nodes established in the United States and Europe.

EURONET - a joint project of the European communities and the European PTTs is a packet - switched network linking over 80 data bases and data banks. It is the equivalent of a European international PTT-operated data network.

57. Finally there are the suppliers of information such as Lockheed (Dialog) and SDC in the United States of America, SDS in Europe and major suppliers of document delivery services such as NTIS in the United States of America, VINITI in the USSR, BLLD in the United Kingdom, CNRS in France, the Technische Informationsbibliothek in Hannover FRG, CNR in Italy, etc.

58. The above information condensed from the volume prepared by Page on Information Systems for Technology Transfer<sup>1</sup> is intended to give an indication of the importance for ICIMOD of maintaining a continuous link with the information resource centres of the outside world. Certain infrastructure problems will hamper direct and instantaneous access to these resources, but the consultants feel that an effort should be made to identify the cheapest, most efficient and most convenient location within the ICIMOD region for such access if and when required. Public data networks are expanding rapidly and spreading outside the American and European continents. Access to them from many of the member countries of ICIMOD is already possible but would be even easier within a short period of time. Such access will permit an institution in the region to carry out literature and data searches on behalf of ICIMOD. If this should prove to be difficult to arrange for technical or other reasons, an information broker in Europe or the United States could be contracted to carry out these operations.

#### Diversity of languages

59. In the eight member countries of ICIMOD there are a considerable number of working languages. In North India alone one can count Bengali, Hindi, Assamese and a host of other regional languages such as Kumaoni, Awadhi and Maithili. While a large number of documents are produced in English there is still a significant amount published throughout the region in the vernacular. In Nepal, for example, some 30 per cent of the references supplied to AGRIS are in Nepali (4). As a primary function of ICIMOD is to facilitate exchange of information amongst member countries the language question cannot be overlooked.

60. A wide ranging translation capability is required, not only from the national languages of the region to English and vice versa, but also from one or other of the languages of the region into the language of the user requesting the information, e.g. Burmese into Nepali or Nepali into Chinese. The use of the services of international translation agencies would be prohibitively expensive and also perhaps unpractical in view of the limited use internationally of most of these languages, Chinese and English excluded. The alternative would be to devise a system whereby the translation could be done in the country of origin of the requested document. This would require that the NIUMOD in each country establish a roster of translators whose services could be commissioned as required on a contract basis. As payments for these services will be at locally prevailing rates, the system would be relatively inexpensive to operate.

#### Assessment of relevant information sources

61. The multidisciplinary character of activities relating to integrated mountain development will require that those involved in them, both at ICIMOD as well as in the member countries will have access to the required information and documentation. As mentioned before the material will consist of both regional and international information and documentation. This implies access to a vast quantity of material which a single information centre would find impossible to handle. For agriculture alone, a check of the AGRIS and CAB data bases in November 1983, revealed that since 1975 AGRIS has added 5,180 references on the mountain agriculture of the area and CAB since 1973 has added 7,466 references. A complete listing by country is given in Annex II. In the case of AGRIS, it should be noted that Afghanistan, Bhutan, Burma and China do not yet provide input to the system, so the potential output of current literature produced in the region as a whole is considerably higher. These figures relate to agriculture related disciplines alone and do not include other disciplines related to ICIMOD's work e.g., socio-economics, geology, health. They do not also include material published before 1970. While these facts

(1) Page, J., Information Systems and Networks for Technology Transfer, (PGI/WS/2) Unesco, 1978. 322 p.

should convincingly demonstrate the impossibility of complete coverage of relevant literature through acquisition and storage of materials at ICIMOD, it also places on ICIMOD, as a primary responsibility, the organization of an effective decentralized regional network with adequate international linkages to ensure the two-way flow of information that is vital to its work both at the centre and in the region.

#### Capture of relevant documents

62. The national information units on mountain development (NIUMODS) would have a major responsibility in capturing the information and documentation most relevant to ICIMOD's programme. These will function as local nodes and have as their responsibility the identification, screening and procurement of relevant literature. Even more important would be their referral function, which would operate through their ability to locate collections within their countries which could support and supplement ICIMOD's activities. The need for forging strong links with research institutions and national information and documentation systems and services has previously been mentioned in the report. Following the acquisition of materials it will be processed according to an established standard for the region and stored at the national information unit. ICIMOD will receive from each national information unit the processed information as input to the data base being created at the centre. A selection of documents of direct importance to ICIMOD's programme will be transmitted to ICIMOD's information and documentation centre. Others will be retained at the node.

#### Document collections at ICIMOD

63. If one takes into consideration opinions expressed on the information services expected of the centre, the role of the national information units in capturing and processing documents, the possibilities of access to national and international information systems in the region and outside and the extent and availability of information and library resources in the region, the scope of the ICIMOD collections could be confined to the following:

1. documents selected by ICIMOD from the collections established at the national centres on the basis of their relevance to ICIMOD's current programmes or their regional or international character;
2. current journals produced in the member countries on subjects related to ICIMOD's work;
3. a carefully selected number of reference works - dictionaries, encyclopedias, maps and atlases, handbooks, etc.;
4. locational aids such as union lists of journals, bibliographies, directories of libraries, research personnel and projects, library catalogues, etc.;
5. journals, books and documents from outside the region of direct interest to ICIMOD staff and selected by them;
6. descriptive literature and brochures on the institutions of the region;
7. relevant audio-visual material such as video films and tape-slide guides.

These and the use of foreign data networks will provide the information base through which ICIMOD can provide services to its staff and to a section of its users. Other users will need processed information based on these collections, which will consist of analysed, evaluated and consolidated information and data to serve specific user needs. The production of these materials will require the close collaboration of the staff of information and documentation centres with subject specialists dealing with training, research and other activities of ICIMOD. The participation of communication experts particularly in the repackaging of this analysed information will also be required.

### Computerization

64. The activities that are envisaged for ICIMOD, particularly those in the information field, require that some thought be given to the possibility of utilizing new information technologies for speedy and more efficient access to and manipulation of information. In moderately sized information units, the microcomputer has become more or less standard equipment and has altered the fundamental nature of information handling.
65. The microcomputer is a development following the invention of the 'microprocessor' by INTEL in 1971. The microprocessor which is a dense package of an electrical circuit etched on a silicon chip smaller than a postage stamp is the equivalent of the central processor unit of mini- and mainframe computers. With the addition of other components, e.g. silicon chips to create an internal memory capability, a full-fledged general purpose computer, the microcomputer, can be created. The microcomputer system requires the addition of other hardware to the microcomputer. This consists of storage devices, e.g. floppy discs, hard discs, tapes, printers and terminals or CRT and keyboard.
66. Until about 1980 most microcomputers used processors with 8-bit word sizes, i.e. the basic unit of information manipulated by the computer consist of 8 bits or one-byte. Since late 1980, there has been a trend towards 16-bit and 32-bit architectures. Several reasons can be given for this evolution. The 8-bit microcomputers were limited to a maximum internal memory size of 64 kilobytes which severely limited their use in industrial and commercial environments. Also since 16-bit words are commonly used in minicomputers and 32-bit words in most mainframes, the trend in the microcomputer field foreshadows increasing software compatibility among micros, minis and mainframes.
67. Microcomputer applications in an information centre can be put into four broad categories:
1. technical processing
  2. public services
  3. management
  4. other applications.
68. Technical processing
- (a) acquisitions.  
The various processes of printing order forms, retaining records, updating on receipt of materials are managed by software programmes written for various types of microcomputers.
  - (b) cataloguing
  - (c) card production
  - (d) data entry
  - (e) serials control.

69. Public services

- (a) circulation
- (b) current awareness
- (c) inter-library loan
- (d) data base searching
- (e) storage and retrieval.

This is an important factor as far as ICIMOD is concerned since the system would be required to store and manage the information as well as retrieve it. Three systems are cited as examples.

1. The STAR system developed by CUADRA Associates which runs on an Alpha-Micro, 16-bit microprocessor with 128K memory. The system permits the building of a data base and its search and retrieval by Boolean. A photo composition interface produces finished copy. Total cost about \$40,000.

2. A smaller turnkey retrieval system - CLASS (California Library Authority for Systems and Services) uses a TRS-80 II and costs about \$5,000. A recent version called Golden Delicious runs on Apple computers.

3. The PRIMATE system developed by the Institute for Scientific Information comprising a data base management system, a system for filing memos, correspondence, documents, etc. and can serve as a front end processor for on-line systems such as Euronet, BRS and SDC.

Management

70. (a) Word processing  
(b) Mailing lists  
(c) Statistics  
(d) Personnel.

Other applications

71. (a) Research  
(b) Electronic mail  
(c) Training using computers as media.

72. Many of these applications can be supported by software already tested and available in the market. A selection of the microcomputer equipment and of the most appropriate software can be made when a decision is taken on the priorities for application of computerized techniques.

VI. DESIGN OF THE SYSTEM

73. The design of the information system for ICIMOD should be based upon:

1. Knowledge of the information needs of the users of the system, comprising both the specialists working at the ICIMOD Centre as well as wide spectrum of users in the member countries of the region.

2. Knowledge of the available information and documentation resources in the region which are relevant to the programme and objectives of ICIMOD.

3. A model of the main elements of the system, namely the documentation and information centre at ICIMOD and the proposed national information units with details on their function, organization and structure.

4. Personnel needs for the centre at ICIMOD and for the national information units, with training and other requirements.

5. An estimation of the desirable speed and methods for the gradual introduction of the new information technologies and considerations of methodological and technological compatibility within the region and internationally.

6. Nature of linkages to be established at the international level for mutual exchange of information and experience.

7. Necessary financial resources for the realizations of the system's objectives.

#### Information needs of the users

74. In evaluating the information needs of users of ICIMOD's information services it might be relevant to recall the following statement which seems to describe very appropriately the importance of this point in the final design of the system.

'Users are individuals, each with unique, informational, educational, psychological and social needs. A person may need "practical knowledge" to solve immediate problems in his daily life and work. He may need "professional knowledge" to further his continuing education. Or, he may need "intellectual knowledge", the kind that furthers his understanding of the arts, humanities and sciences, and which enriches his personal life...

75. Organizations, like individuals, need information and knowledge. Business organizations need facts and data to forecast a market, develop a new product or adapt a new technology. School needs information to improve and extend the learning process. Research organizations need information to synthesize new data with known facts as part of the creative persons. Government needs the information at every level to formulate plans, refine decision-making and help government workers to anticipate and resolve problems.' (9)

76. User studies are of course a continuing process in many information systems and form the basis for policy decisions affecting their structure and services. While ICIMOD will, at the beginning, provide the conventional information services to its more easily identifiable users, studies of needs of other potential user groups may reveal the need for different types of services, for the establishment of which a planning process could be set in motion (see paragraphs 21-27).

Reference may be made to the following document when such studies are being planned: Unesco. UNISIST Guidelines on Studies of Information Users (PGI/81/WS/2) Paris, Unesco 1981, 38 p.

Information and documentation resources in the region

77. Earlier in this report reference has been made to already existing collections of information in the region on subjects, relevant to ICIMOD's activities (see paragraphs 43-53). It has been emphasized that linkages should be established with these centres to ensure mutual exchange of information and documentation. The relevant centres could be identified from reports of national surveys carried out by consultants on behalf of international organizations, non-governmental organizations and foundations.

78. There may also be important directories and similar materials produced by national professional associations which contain information on this point. ICIMOD could gradually build up, using already available documentation and information, a list of existing information and documentation centres and libraries in the region with which it could have mutually beneficial relationships. These institutions could be a useful source for documents, articles from journals and even inter-library loan. Such an arrangement would help to cut down considerably the need for purchasing the volume of the information materials needed for the support of ICIMOD's programme.

Main elements of the system

79. This will consist of two parts:

- (a) the Information Centre at ICIMOD;
- (b) the national information units or nodes to which we have given the acronym NIUMOD.

A. Information Centre at ICIMOD

80. The Information Centre at ICIMOD would have two main functions:

- (a) to guide, co-ordinate and supervise the information activities established to support ICIMOD's programme both at its secretariat and in the member countries;
- (b) to provide information to meet the information requirements of users from its own information resources or by using national units, other national information centres or institutions or regional or international sources.

81. In order to perform these functions, a plan will have to be established possibly, partly based on the following methodological and technological chain, developed by H. Schutz. (10)

Methodological and technological chain

1. Identification of information sources
2. Selection according to needs
3. Procurement
4. Filing, recording, making accessible for bibliographical and practical purposes, analytical and synthetic processing
5. Microfilming, storage
6. Retrieval

7. Processing into information media
8. Reproduction
9. Dissemination
10. Use and application of information; feedback
11. Improvement and upgrading of information techniques and equipment
12. Training
13. Evaluation.

#### Sources of information

82. This aspect has been dealt with in detail earlier in this report. The objective should be the gradual establishment of a functioning information network linking these sources with the ICIMOD Centre and the improvement of the communication facilities which will be used for information transfer.

#### Selection according to needs

83. The ICIMOD Centre will establish guidelines for the selection of materials for its collections (see paragraph 63). This will require the involvement of the subject specialists whose particular research and subject elements will play a major role in the policy for selection. In general, it could be expected that the ICIMOD Centre will have a basic collection of commonly used reference materials - dictionaries, encyclopedias, bibliographies, directories, etc. relating as closely as possible to the fields covered by the Centre's priority activities. It would then have to establish a selection policy for publications produced in the region, e.g. monographs, journals, documents, conference proceedings, government publications, etc. These would be necessary for planning and implementation of ICIMOD's programme and would form a very important component of the information collection. Next, the identification of appropriate regional and international institutions and organizations both in the ICIMOD region and outside it and access to their catalogues would enable a selection to be made of relevant materials produced from these sources. Finally, the building up of a carefully selected core library of books, journals and other materials purchased from overseas publishers and booksellers to complete the collection.

84. Language would be an important consideration in decisions regarding selection of information materials. English being a commonly used language in the region, it could be assumed that much of the material would be in that language. However, many government publications of importance and perhaps also some monographs and journals would appear in the local national or regional language. Whether such materials should be selected will depend upon whether that language capability exists in the ICIMOD Centre, but some allowance has been made for this in the structure proposed for the national information units (NIUMODs).

#### Procurement

85. Once selection has been made, the next step would be procurement or acquisition. This will be achieved through one of several means: purchase: using the funds provided by the Centre for this purpose; exchange: by obtaining the required material on a continuing basis in exchange for ICIMOD publications following previously established arrangements between ICIMOD and the relevant institution or organization; gift:

where the institution provides its publications free to ICIMOD, e.g. government publications, publications and documents of United Nations and other international organizations.

86. As mentioned earlier, certain serious problems will arise as a result of the diversity in the language of publication in the region. To offset this, the NIUMOD will take some responsibility for procurement and also provide translation copying and similar services on request. The extent of their involvement will vary in each case and will have to be negotiated in each instance with the national authorities.

#### Filing, recording and making accessible the required information

87. This concerns the cataloguing, indexing, abstracting and other processing activities, the creation of manual catalogues, printed catalogues, bibliographies and data bases and the analysis and consolidation of the content of the information and documentation. It is hoped that careful selection of materials advocated earlier and the derogation of some activities to national units will greatly reduce the burden of the cataloguing, indexing and abstracting responsibilities of the Centre.

88. Nevertheless, some of it will have to be done, as this is indispensable for ensuring that the acquired materials are accessible and retrievable when required. The danger, previously pointed out, of trying to set up a traditional library or documentation centre, using its resources, manpower and time to catalogue and index mountains of documents can be avoided. To do so will require that the head of the ICIMOD Information Centre be constantly examining the user-orientation of his unit's activities. Its objective should be to play an active role in ICIMOD's work by participating with ICIMOD's specialists in the transformation of the information received at the Centre into forms that can be utilized by the various user groups in the region. One technique is the creation of user-oriented information packages resulting from a systematic evaluation, analysis and consolidation of data and information available to the Centre. These could consist of digests, reviews, state-of-the-art reports as well as publications tailored for less sophisticated end-users (see paragraph 32).

89. This activity requires the collaboration of subject specialists and information specialists in the production of the publications and the involvement of communications specialists in the repackaging of the finished products or specific user groups in their particular national, subregional or regional contexts and extension services for the dissemination of the materials.

#### Microfilming and storage

90. No recommendation is being made for the present regarding microfilming, though at a later stage with the increase in the quantity of acquired materials, microfilming and perhaps microfiche techniques may have to be introduced. Microfiche as a means of transmitting documents to users would have to be introduced after some field studies to determine user response, availability of microfiche readers and other factors.

### Retrieval

91. A basic requirement for retrieval is the availability of an organized store of information and a clearly defined inquiry or requirement. Retrieval can be for the purpose of satisfying a desire to have the answer to a query relating to an item of factual information or it could be for the purpose of finding all information available on a particular problem, such as a search resulting in a bibliography, inventory or in the preparation of synthetic or analytical documents or information.
92. The possibility of establishing a computerized retrieval system has been discussed (see paragraphs 64-71). Many types of retrieval systems, of increasing complexity, are operational, but a simple 'user-friendly' system would be a pragmatic starting-point on which further development could be effected as required.
93. Information retrieval systems can be categorized as follows:
1. Document retrieval systems which could be of three types:
    - (a) bibliographical (providing bibliographic references, titles, etc.);
    - (b) factographic (providing specific facts, and titles in connection with facts);
    - (c) systems which supply the primary documents in the forms of originals, photocopies or microforms.
  2. Numerical data systems providing numerical data.
  3. Information-processing systems (logical-adaptive systems) which produce new knowledge from existing knowledge.

### Processing into information media

94. While the outputs of information centres are generally publications, documents and other printed materials, it can be expected that ICIMOD's programme will require that other media such as audio-visual be increasingly used to provide services to certain groups of users in the region. The use of audio- and video-cassettes, filmstrips, radio, television and other means for information transfer may need to be studied and, if feasible, applied under certain conditions.
95. The technical operations of the documentation centre lend themselves to a variety of publications which ICIMOD may consider to be worth publishing. As documents received in ICIMOD are to be abstracted, a regular bulletin of these abstracts can be produced with little effort. Similarly, an accessions list could be prepared and distributed or a current awareness section reserved for such a listing in the ICIMOD Newsletter. If the results of retrospective searches and ad hoc bibliographies produced for individual clients are considered as being potentially useful to others they too can be considered for general publication. It can also be envisaged that the materials resulting from the information analysis and consolidation services will be published when produced.

96. Outputs of the implementation of ICIMOD's internal programmes and activities and those it sponsors should be reported in its own publications such as monographs, staff papers, conference proceedings and annual reports. The organization, mandate, activities and services of ICIMOD could be conveyed to wider audiences through popularly written brochures and handbooks which would also lend themselves to translation into the major languages of the region.

97. These few examples of ICIMOD's projected requirements seem to point to the necessity for ICIMOD to have its own in-house printing facilities. This if integrated with the word-processing functions of the computer would ensure complete control over the production of publications. The purchase of a small offset press can be justified by the fact that commercial printing costs in Kathmandu are high, delivery dates are rarely met, paper quality is variable, proof-reading services are poor and good quality binding is hard to find. In-house printing facilities will therefore overcome these constraints.

#### Dissemination

98. As regards document provision, which is one aspect of this subject, publications produced by ICIMOD or cited in its publication must be made available to users by a document location and delivery service. There is little point in providing an array of information services to users if the documents they wish to consult are unavailable. This is particularly the case for users in member countries whose library facilities are weak. The efficiency of this service rests on the ability of the documentation centre to locate where the requested documents - reports, journal articles, books, etc. - can be found, especially in the region. This can be achieved by collecting the published catalogues and union lists of documentation centres and libraries through the links made with them. Outside the region, the services of large document delivery services and networks such as the British Lending Library and the Agricultural Libraries Information Network can be called upon to supplement local and regional resources.

99. Considering the uniqueness of the collections to be established at the documentation centre and the national units, and the general difficulty of access to unpublished documents, the Centre does have an obligation to provide copies of material in its possession upon request. For a number of reasons, it can be assumed that for the present at least the preferred medium for all copies of documents delivered is inevitably photocopy. Should the Centre decide to microfiche its documentation collection, duplicate microfiche (a much cheaper method of document delivery) can be supplied to users with viewing facilities.

100. Translation facilities are required to promote information exchange and sharing among users of the region. The national units are expected to compile and maintain a register to direct clients to the appropriate translators in their country. Copies of the registers should be sent to Kathmandu and merged to form a small computerized data bank thus enabling the centre to identify translators needed for its own work and that of other agencies (see paragraphs 106-112).

### Use and application of information

101. This is an important aspect of information work which often does not receive sufficient attention. It is just as important for an information service to know how and to what effect information is being applied in the field as it is to collect, process and disseminate it. A monitoring system for this activity will have to be set up. Several studies are available on the techniques to be applied but these are generally applicable to the sophisticated information user.

### Improvement and upgrading of information techniques and equipment

102. Information technology is subject to rapid changes and it can be expected that frequent modifications in techniques, equipment and approaches would be necessary in any active information centre to accommodate these developments. The ICIMOD Information Centre should be so structured as to be able to move with the changes and to be able to use them to promote better services to its clients. It would therefore be advisable in the initial design of the Centre to adopt international standards for the organization of the information and to ensure that all other techniques adopted conform to these international standards.

### Training

103. Training of personnel of the Information Centre and of the NIUMODs and techniques to be adopted by the documentation centre is needed to ensure the smooth transfer of information throughout the network. Such training should concentrate on the procedures to be employed for the bibliographic processing of documents acquired by the system. This is particularly important for the creation of the regional data base. These standards would include the physical description of the document, provision of a transliteration standard for application in writings in the vernacular and the assigning of keywords to indicate the major themes discussed in the document. Training in the chosen methodologies is also necessary if the national units are to be engaged in other activities like the compilation of inventories to current mountain research and development programmes.

104. To ensure that the information system reaches as wide a clientele as possible, the documentation centre and national units have a role to play in the training of users and the popularization of services. The main user group to be trained is the staff of ICIMOD itself who should be able to carry out their own searches of the data base and locate required material in the documentation centre. Occasional briefing programmes for librarians, documentalists and others upon whom the system relies for the capture of documents could also be advantageous to the system.

### Evaluation

105. An evaluation is an examination of an activity in terms of its costs, its effectiveness and its impact. Its intent is to determine how well the activity is meeting the objectives set for it. This would be an evaluation for effectiveness.

In general, an evaluation for effectiveness may be subdivided into:

- (a) an evaluation of how well an activity is carried out;
- (b) an evaluation to determine how it is carried out and whether or not it can be improved.

It is hoped that the activities of the centre will be subjected to an effectiveness evaluation at regular intervals(11).

B. National Information Units on Mountain Development (NIUMODs)

106. The wide geographic area covered by ICIMOD, the lack of information resources in some countries of the region, the often poor means of communication within and between countries, diversity of language and the volume of material to be screened for its applicability to support the activities of the Centre, all point to the need for decentralizing some of the documentation functions. The consultants consider that national units be established in each of the participating countries for the purpose of locating, screening, procuring and processing relevant documents. The national units could assist ICIMOD by:

- (i) disseminating ICIMOD publications;
- (ii) popularizing the programmes and services of ICIMOD through the close links forged between individuals, institutions and networks;
- (iii) keeping ICIMOD informed of new policies, programmes, institutions, training courses and activities in other areas of ICIMOD's interest being developed in their countries;
- (iv) providing local users with access to the documents stored at each unit or assisting them by directing them to relevant resources in their country;
- (v) processing requests for information to be forwarded to Kathmandu;
- (vi) suggesting topics for special publications tailored to the needs of specific target groups;
- (vii) maintaining a register of translators.

The national units will therefore permit the efficient provision of information both to local users and the staff of ICIMOD.

107. Establishing the national units is entirely consistent with ICIMOD's statutes. Article 2: (3) states:

'The Centre shall establish and operate the installations necessary for the achievement of its objectives.'

In relation to co-operation and co-ordination with other institutions Article 10 states:

'1. The Centre may establish appropriate relations with governmental, non-governmental and other organizations whose activities are related to its objectives'.

In relation to co-operation and co-ordination with other institutions Article 10 states:

'1. The Centre may establish appropriate relations with governmental, non-governmental and other organizations whose activities are related to its objectives.

2. Within the framework of these relations, the Centre may enter into agreements or establish working relationships with such institutions'.

108. The nature of the national information units on mountain development will depend upon a number of factors which would vary from country to country. As no distinctive structure can be worked out, we suggest a number of models one of which could be selected and adapted according to the particular conditions and wishes of the country.

109. In the first model, the unit is created by and financially dependent upon ICIMOD. All recurring costs including staff, communications, local travel, office rental, and utilities are paid for by ICIMOD as are equipment, furnishings and supplies. The unit will establish links with the socio-economic, scientific technological and other national and institutional information centres and networks as well as the INFOTERRA, AGRIS and DEVSIS focal points (where they exist). It would also establish a direct link with ICIMOD carrying out on behalf of the ICIMOD Information Centre certain decentralized activities according to its possibilities.

110. The second model establishes the unit in an existing information centre such as the national focal point for scientific and technical information or one dealing with a discipline related to ICIMOD's fields of interest. If necessary, ICIMOD would make a financial contribution towards the running costs of the unit. This might cover local travel, allowances and utilities. The institution would be expected to provide space and basic office equipment and, if possible, professional and secretarial support. A contract between ICIMOD and the relevant institution could be negotiated to work out the terms of the establishment of the unit.

111. For the third model, all aspects relating to it including the selection of a suitable environment and provision of staff, will be a matter for negotiation between the government of the Member State and ICIMOD. Again, a contract will be necessary to establish the node.

112. Considering the variety of social, economic and political structures and systems prevailing in member countries, it is possible that all three models, with minor adaptations to suit local conditions, would be associated in the network. Staff of the national units will, in all cases, be considered as local employees. To attract experienced, well qualified people ICIMOD should be prepared to provide remuneration over and above the going rates for that country. When the national institution, as may be the case in the second and third models provides the staff requirements, their remuneration might be

supplemented by some modest financial incentives. The minimum of staffing for each unit would be one experienced information specialist, documentalist or librarian and one typist-clerk, both fluent in English and the language of their country. Courses will be organized at ICIMOD for the professionals in charge of national units to ensure compatibility of methods and techniques. The required manuals providing guidance to national units will be established at an early stage in the establishment of the network.

## VII. ORGANIZATIONAL PLAN

### 1. ICIMOD INFORMATION CENTRE

113. The ICIMOD Information Centre will be managed by a Head of Unit/Chief of Division who will be responsible to the Director of ICIMOD. The Chief of the Information Centre will have responsibility for the planning and implementation of the work plan of the Information Centre, the proper utilization of the budgetary provisions for information activities and the safeguarding of the institution's information and documentation collections and resources.

114. The Chief of the Unit must be a person with academic background in science, preferably in the ecological or environmental sciences and a professional qualification in information science. A knowledge of computerized techniques in information handling and international experience would be desirable. Preference should be given to someone from one of the participating countries of ICIMOD, but if no suitable persons with the above professional profile can be found, it may be necessary to open recruitment to persons outside the region. In such a case, a fixed-term contract of not more than two years could be offered, pending the completion of training and the gaining of the necessary experience by a regional recruit.

115. The Chief of the unit will also be required to carry out certain technical tasks selected from among the many activities listed earlier in the report. One of the more important ones will be staff training. This will involve the development of training modules for the training of staff at the unit and for the staff from the national information units (NIUMODs). Selection of appropriate standards for application in the information processing activities and the elaboration of manuals of procedures for indexing, abstracting, cataloguing, etc. would also require his attention. In some of these, he may require short-term consultant advice, particularly in regard to computerization techniques and procedures.

116. It is considered that, for a start, the recruitment of two qualified documentalists or librarians would be sufficient to carry out the technical services envisaged. They should have good academic backgrounds, professional qualifications in librarianship or information science and some years experience in work in a documentation or information centre.

117. To assist the professional staff perform their duties, two typist-clerks, one or both of whom is able to operate a photocopier and input data into the computer, are required. A printer/mechanic should also be engaged to run the offset press. It is expected that all staff bring with them some linguistic skills in the regional languages. All staff mentioned above need to be hired within the first three months of the full operation of ICIMOD as it is essential that the Centre's information base be established quickly.

118. To come back to the question of consultant assistance, we would recommend that provision be made for about six man-months of consultant assistance in the first year of operation. In addition to advising on computerizing techniques and indexing and abstracting strategies consultants may be required for identifying suitable information sources in each country, advising on the standards and methods for processing documents and training documentation staff of national information units in the application of the processing methods. Consultants must obviously have a sound knowledge of the region and should whenever possible be recruited for short-term missions from nationals of participating countries.

Summary of staff requirements for Year I  
Professional staff

119. Chief of Unit (12 man/months) international/regional  
Documentalist/librarian (2 x 12 m/m) regional  
Consultants (6 m/m international/regional)

Technical staff

Typists-clerks (2 x 12 man/months) regional  
Secretary to Chief of Unit (1 x 12 m/m) regional  
Printer/mechanic (1 x 12 m/m) regional

Equipment

120. Library furniture: catalogue cabinets, reading tables, shelving, etc.  
processing, storage and retrieval equipment  
printing, microfilming equipment  
photocopying equipment  
audio-visual equipment  
microcomputer hardware and software

(a total investment of about \$100,000 should be provided for in Year I)

Acquisitions

121. Purchase of books, journals and other materials including cost of searching foreign data bases. (\$50,000 per year)

Supplies

122. Consumables such as paper for photocopying and computer output, plans, etc. (\$20,000 per year)

Training

123. One training course of one month for staff of national information units to be held in Kathmandu in Year I. 8 persons - airfare plus per diem at \$50/day  
Estimated total cost \$15,000

2. NATIONAL INFORMATION UNITS (NIUMODs)

124. It is expected that the establishment of these units will be facilitated in some countries by the provision of subsidies to cover part of the staff and establishment costs. On the assumption that four such units will need to be subsidized, we have estimated an average for each of \$10,000 per year, representing a total cost of \$40,000. We have provided \$3,000 per year in each case for salaries (\$2,000 for the documentation officer and \$1,000 for the typist-clerk) which could be considered as incentive payments and the balance \$7,000 for the purchase of essential items of equipment and as assistance towards rental, electricity, maintenance of premises and local travel costs of the staff of the unit.

3. BUDGET FOR YEAR I

125. The total annual budget for Year I of the Information Centre of ICIMOD, not including staff costs would therefore be:

Equipment (capital investment)	\$100,000
Acquisitions of books, journals, cost of searching foreign data bases	\$ 50,000
Supplies	\$ 20,000
Training	\$ 15,000
Subsidies to national units	\$ 40,000
Consultant services 6 m/m	\$ 42,000
	<hr/>
	\$267,000
	<hr/> <hr/>

4. SUBSEQUENT BUDGETARY REQUIREMENTS

126. After Year I, the annual budget will not be appreciably reduced as new activities will be undertaken requiring additional investments in equipment and training. It is not possible to estimate the requirements at this stage as it will depend upon the momentum with which the preliminary activities of ICIMOD are implemented.



ANNEX I

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10. Schutz, H. Function and organization of a national documentation centre in a developing country. Paris, Unesco, 1975. 218 pp.
11. Lancaster, F.W. Guidelines for the evaluation of training courses, workshops and seminars. Paris, Unesco, 1983 (BEP/83/11) 129 pp.

ANNEX II

Number of references in AGRIS and CAB on mountains and the Hindu-Kush Himalayas

<u>No. of refs. in AGRIS</u>	<u>Keyword</u>	<u>No. of refs. in CAB</u>
6756	Mountain (in general)	15669
1	Hindu Kush	18
209	Himalayas	768
125	Afghanistan	678
45	North West Frontier Province	615
370	India + mountains	989
215	Kashmir	930
311	Himachal Pradesh	1362
95	Kumaou/ Gunohal	354
38	Sikkim	140
10	Arunachal Pradesh	68
3359	Nepal	1129
28	Bhutan	68
16	Tibet	297
227	Bangladesh + mountains	29
131	Burma + mountains	21

Total number of references relating to the region is:

AGRIS - 5180; CAB - 7466

Number of references in AGRIS and CAB on development of mountain areas:

AGRIS

1242 references to mountain development irrespective of place  
40 references to integrated mountain development with 38 of  
them referring to Nepal

CAB

544 references to mountain development irrespective of place  
1 reference to integrated mountain development

ANNEX III

AGRIS Centres in ICIMOD Region

1. Bangladesh Agricultural Research Council  
130/C Dhanmandhi Residential Area  
Road No. 1  
Dhaka 5  
Bangladesh
2. Agricultural Research Information Centre  
Indian Council of Agricultural Research  
Library Avenue, IARS Buildings  
New Delhi 110012  
India
3. Agricultural Documentation Centre  
Agricultural Projects Services Centre  
P.O. Box 1440  
Kathmandu  
Nepal
4. Directorate of Scientific Information  
Pakistan Agricultural Research Council  
P.O. Box 1031  
Islamabad  
Pakistan

ANNEX IV

DEVSIIS Centres in ICIMOD Region

1. Bangladesh Institute of Development Studies  
Mohjheel Commercial Area  
Dhaka 2, Bangladesh
  
2. Centre for Development of Instructional Technology (CENDIT)  
C11 Community Centre  
Safdarjung Development Area  
New Delhi 110016  
India
  
3. Pakistan Institute of Development Economics  
Quaid-i-Azam University  
P.O. Box 1091  
Islamabad  
Pakistan

ANNEX V

INFOTERRA SOURCES DEALING WITH ALPINE ECOSYSTEMS

INFOTERRA Source No. 036-2019-01

Chief of Scientific Services  
National Parks and Wildlife Services  
Grosvenor Street  
P.O. Box N189  
Sydney  
Australia  
Telex: NAPAW-AA26034

INFOTERRA Source No. 036-3022-01

The Professor  
Department of Zoology  
Latrobe University  
Bundoora  
3083-Victoria  
Australia  
Telex: Latrob - AA33143

INFOTERRA Source No. 036-3026-11

The Head  
Centre of Environmental Studies  
University of Tasmania  
G.P.O. Box 252C  
Hobard - 7001  
Tasmania  
Australia  
Telex AA58150 - TASUNI

INFOTERRA Source No. 036-5004-01

Environment Studies Association of Victoria  
324 William Street  
Melbourne 3000  
Australia

INFOTERRA Source No. 124-1630-02

Head  
Department of Biology, University of New Brunswick  
Box 4400  
Fredericson N.B. E3B 5A3  
Canada

INFOTERRA Source No. 250-2020-02

Mr P. Ozenda  
Laboratoire de Botanique et Biologie Vegetale  
Université Scientifique et Médicale de Grenoble  
B.P. 53  
38041 p Grenoble  
France

INFOTERRA Source No. 356-0007-01

Head, Department of Palynology  
Birbal Sahni Institute of Paleobotany  
53 University Road  
226007 Lucknow  
Uttar Pradesh  
India

INFOTERRA Source No. 756-1001-02

Dr. A. Antonietti,  
Head of Division  
Division for Nature Conservation and Protection  
of Cultural Values  
Federal Forestry Office  
Laupenstrasse 20  
CH-3003 Berne  
Switzerland

INFOTERRA Source No. 902-0100-04

Terrestrial Ecosystems Working Group -  
Ecosystems Section  
UNEP  
P.O. Box 30552  
Nairobi, Kenya

INFOTERRA Source No. 360-1000-04

Head, Sub-Directorate of Natural Resources  
Directorate of Nature Conservation and Wildlife Management  
Jl. Ir. H. Juanda 9  
Bogor, Indonesia

INFOTERRA Source No. 578-1063-06

International Division  
Ministry of the Environment  
Myngt 2 - Dep.  
Oslo 1  
Norway

Telex 18990 ENV N

INFOTERRA Source No. 840-5000-24; 840-5000-46;  
840-5000-74; 840-5002-02  
U.S. NFP Infoterra (Room 2903 PM 211A)  
U.S. Environmental Protection Agency  
401M Street SW  
Washington DC 20460  
United States                      Telex: 892758 - EPAWSH

INFOTERRA Source No. 902-0131-41

Man and Biosphere Programme (MAB)  
Division of Ecological Sciences - UNESCO  
7 Place de Fontenoy  
75700 - Paris, France              Telex: 204461 - PARIS

INFOTERRA Source No. 902-0131-53

Co-ordinator  
Unesco MAB Project 8  
7 Place de Fontenoy  
75700 Paris, France              Telex: 204461 - PARIS

INFOTERRA Source No. 356-0219-01

Head, School of Entomology  
St. John's College  
282002 Agra  
Uttar Pradesh, India