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Addendum

Managing fragile ecosystems: sustainable
mountain development*

(Chapter 13 of Agenda 21)

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* The report was prepared by FAO as task manager for chapter 13 of Agenda 21, in accordance with arrangements agreed to by the Inter-Agency Committee on Sustainable Development (IACSD). It is the result of consultation and information exchange between United Nations agencies, international and national organizations, interested government agencies, national and international non-governmental organizations and a range of other institutions and individuals.

I. KEY OBJECTIVES

1. The present report reviews progress made in the implementation of the objectives set out in chapter 13 of Agenda 21 (Managing fragile ecosystems: sustainable mountain development),¹ taking into account the decisions taken by the Commission on Sustainable Development on that subject at its third session, in 1995. The present report focuses on a limited number of key objectives of chapter 13 of Agenda 21, including those that are considered the most relevant in the follow-up to the United Nations Conference on Environment and Development (UNCED) context and that have been identified as priority concerns in chapter 13 follow-up. Those objectives are related to programme areas A (Generating and strengthening knowledge about the ecology and sustainable development of mountain ecosystems) and B (Promoting integrated watershed development and alternative livelihood opportunities). The two areas are often dealt with together in the framework of an integrated ecosystems approach to sustainable mountain development. However, the key objectives dealt with in the present report go beyond those identified in programme areas A and B of chapter 13 to include new themes that have come to light more recently.

2. More specifically, chapter 13 focuses mainly on the following objectives:

(a) Raising awareness of the importance of and improving understanding of sustainable mountain development issues at the global, regional and national levels;

(b) Protecting natural resources and developing technical and institutional arrangements for natural disaster reduction;

(c) Strengthening a global information network and database for organizations, Governments and individuals concerned with mountain issues;

(d) Strengthening country capacity to improve planning, implementation and monitoring of sustainable mountain development programmes and activities;

(e) Combating poverty through the promotion of sustainable income-generating activities and the improvement of infrastructure and social services, in particular to protect the livelihood of local communities and indigenous people;

(f) Formulating and negotiating regional or subregional mountain conventions and possibly developing a global mountain charter.

II. SUCCESSES

3. Since thinking about sustainable mountain development has evolved over the five years since UNCED, the issues raised in chapter 13 (which is often referred to as the "mountain agenda") have expanded beyond the original themes of the chapter to include, for example, new emphasis on conservation, culture, sacred values and landscape diversity. The element of spirituality surrounding mountains and the often special relationship between mountain peoples and the

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land they live on and care for has gained greater recognition over recent years, and has become an essential driving force in the movement to conserve mountain environments and cultures. Recently, especially in Africa, the contribution of mountain ranges to water resource flows, more specifically in the chain linking water to food security, has been highlighted. There is also increasing recognition of the importance of mountain areas in terms of biodiversity conservation, economic potential and protection of downstream interests. That has led to a greater willingness to address development and conservation needs through investment programmes in areas that have traditionally been neglected in national-level development planning.

4. Progress has been made in creating greater awareness of the mountain agenda and improving coordination of efforts to protect fragile mountain ecosystems and promote sustainable mountain development, largely as a result of international and regional intergovernmental and non-governmental organizations consultations, which have provided a focus on key mountain issues and led to recommendations relevant at both the global and regional levels. Regional intergovernmental consultations have been held for Asia (1994), Latin America (1995), Europe (two sessions, 1996) and Africa (1996); a regional non-governmental organizations consultation was also held for Europe (1996). Other important meetings include the International Non-Governmental Organizations Consultation on the Mountain Agenda, held at Lima in February 1995, and other regional, subregional and national initiatives, such as the second international symposium on the theme "Sustainable mountain development: managing fragile ecosystems in the Andes" (Bolivia, 1995); an international symposium on the theme "Karakorum-Hindu Kush-Himalaya: dynamics of change" (Pakistan, 1995); an international symposium on agricultural development in mountain and hill areas (China, 1996); the Rwenzori Mountains Conference (Uganda, 1996); and an international conference on the theme "Ecohydrology of high mountain areas" (Nepal, 1996). In addition, awareness of the importance of transboundary cooperation in mountain protected areas has been increased as a result of a transboundary mountain protected area workshop, held in Australia in 1995.

5. New institutional arrangements at the global and regional levels have also contributed to progress in achieving and improving communications networking and in providing an information clearing-house function, in part through the creation in 1995 of the Mountain Forum, a network of organizations and institutions with a shared interest in sustainable mountain development. With major financial support provided by the Government of Switzerland, the Mountain Forum operates primarily as a decentralized structure with regional focal points established to coordinate networking activities. The Consortium for the Sustainable Development of the Andean Ecoregion, convened by the International Potato Center (CIP), a member of the Consultative Group on International Agricultural Research, has been selected as the focal point for Latin America and the Caribbean. The International Centre for Integrated Mountain Development (ICIMOD) is coordinating networking in Asia and the Pacific, both at the regional level through the Asia Pacific Mountain Network and at the subregional level since the establishment of the North and Central Asia Mountain Network. Together with The Mountain Institute, those organizations make up the Mountain Forum's Interim Facilitating Committee, which has been set up at the global level with the specific purpose of assisting in building the network. Regional networks are also being established in Europe and Africa, mainly through the

efforts of non-governmental organizations. The Mountain Forum is one of several innovative partnerships and alliances being studied under the Global Excellence in Management Initiative by Case Western Reserve University in the United States of America. Documenting the way in which the Mountain Forum is expanding capacity beyond its own organizational boundaries is expected to be an important outcome of the study. Another important example of new regional cooperation is the Asociación de Montañas Andinas, whose main objective is to contribute to implementation of chapter 13 in the Andes.

6. Land-use planning and management tools are being developed for mountain watershed areas through the preparation of principles and best practices for sustainable mountain development programmes. They are intended to serve as a tool for national and subnational planning, and are expected to build on existing guidelines on mountain conservation and development. They should also be complementary to the guidelines and planning tools that have been developed in other sectors, such as national forestry action programmes and national conservation strategies, and should be consistent with land-use planning tools being developed under chapter 10 of Agenda 21. That work is expected to be field tested, refined and in limited use by the year 2000.

7. In a growing number of countries, the livelihoods of local communities and indigenous populations are being protected and improved through mountain development programmes and projects that include a variety of income-generating activities and the improvement of infrastructure and social services. A significant change has been observed in many development assistance projects, which currently tend to include greater support to human development and poverty alleviation in addition to more traditional technical concerns of watershed management and protection. The Food and Agriculture Organization of the United Nations (FAO)/Italy Interregional Project for Participatory Upland Conservation and Development, which has been operating in five countries since 1991, provides a promising example of an approach that focuses simultaneously on developing new livelihood opportunities and carrying out watershed management and natural resource conservation, through planning efforts led by local stakeholders. Requests for assistance in mountainous developing countries are being received by donors and development cooperation agencies to improve planning and implementation of programmes that aim to achieve a good balance between local development needs and resource protection and conservation.

8. Progress has been made in the area of biodiversity conservation in mountain areas through action taken by many countries in establishing new protected areas, in undertaking trans-frontier collaboration in protected area management, and in the development of several recent initiatives to link mountain protected areas through corridors in mountain ranges so that large protected bioregions are established. Additionally, more attention has been devoted to the important contributions that have been made by farmers and indigenous peoples to the conservation of biological diversity, as demonstrated, for example, by the use of potatoes as a staple food crop in the Andes. As the issue of mountain biodiversity conservation receives increasing attention, linkages are being reinforced with the Convention on Biological Diversity. For example, the conclusions of the European intergovernmental consultation on mountains related to that issue were presented and discussed at the third meeting of the

Conference of the Parties to the Convention, held in November 1996 at Buenos Aires.

9. Progress has been made in the development of criteria and indicators for sustainable mountain development, based on a collaborative effort involving United Nations bodies and a limited number of other organizations and institutions. That work has focused on the condition of natural resources, human welfare and population dynamics. If the indicators currently being developed are to be of practical use and effective, however, further elaboration will be required, including input from planners and practitioners, especially at the country level. Once refined and field tested, the indicators being developed under chapter 13 are expected to provide planners and executing agencies with a basis for monitoring and assessing the impact and sustainability of mountain development programmes.

III. PROMISING CHANGES

10. New forms of partnership are coming about as a result of increased collaboration and interaction between the public and private sectors, in which Governments, non-governmental and intergovernmental organizations have found common ground and engaged in constructive dialogue. There has been a concerted and participatory effort, particularly over the past three years, to amplify the original aims and objectives of chapter 13 by forging consensus on priorities and identifying the differing strengths and capacities of public, private and non-governmental organizations sectors to contribute to implementation. In addition, there has been greater emphasis on including local populations and community groups in identifying and planning mountain development activities. New partnerships are also being realized between mountain research and development interests. International research institutes, such as CIP, ICIMOD, the International Centre for Research in Agroforestry (in particular through the African Highlands Initiative) and the joint United Nations University (UNU)/International Mountain Society (IMS) project, which have either a specific mountain focus or include strong mountain research programmes, have been active members of the inter-agency network on mountains. That has served to strengthen the linkages and interaction between mountain research and development interests. Such organizations as the International Union for Conservation of Nature-World Conservation Union (IUCN), the International Center for Alpine Environments and the International Livestock Research Institute have increased their involvement in mountain conservation and development, and have developed new partnerships through their roles in planning and implementing the regional intergovernmental consultations in Europe and Africa.

11. Although there are still relatively few activities that have been initiated directly as a result of chapter 13, the willingness of most regions of the world to engage in intergovernmental and non-governmental consultations on the topic of sustainable mountain development has been an important step in implementation since UNCED. That process has allowed for clearer definition of the challenges facing each region and possible responses to them, and a stronger sense of involvement and commitment on the part of Governments and other concerned stakeholders as the discussion has focused on issues of greater direct relevance at the regional and national level. That consultation process has been carried

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out over a relatively short period, having begun only in late 1994, with the majority of meetings having taken place during 1996. Although there has been insufficient interest to date by Governments of North America to hold an intergovernmental consultation there, a meeting organized by non-governmental organizations, to which Governments would also be invited is currently under discussion. As a result of those regional meetings, greater activity is expected at the national and regional levels in terms of specific mountain development and conservation programmes and reinforced institutional arrangements. Regional networks, in addition to those in Asia and Latin America, are also being established in Europe and Africa, following consultations held in 1996. In accordance with the recommendations of the Commission on Sustainable Development at its third session, upon completion of the regional consultations a wider international meeting on sustainable mountain development is expected to be held. Several Governments have already expressed their support for holding such a meeting, the objectives of which, however, would need to be clearly defined and perceived as timely and relevant to ongoing implementation for the countries and organizations involved.

12. The maintenance and generation of database and information systems to facilitate the integrated management and environmental assessment of mountain ecosystems has seen little progress to date; however, that is expected to change in the near future given new and evolving institutional arrangements and new technologies becoming available for that type of work. In the area of conventional dissemination of scientific and developmental information on mountains, the quarterly journal Mountain Research and Development, co-published by UNU and IMS, continues as the only scholarly publication of its kind worldwide.

13. Improvements to the ecological knowledge base for technologies and agricultural and conservation practices in the mountain regions of the world have been slow but have recently been increasing. Most conservation and development programmes in mountain areas now contain specific components for improving databases on biological resources. On the other hand, economic, sociological and cultural information are still largely unavailable. Greater emphasis is being placed on the importance of understanding and promoting appropriate indigenous and locally adapted technologies.

14. Transnational cooperation has also been improving. There is an increased willingness to work across national borders marked by mountain chains, in particular for scientific reasons, such as to study the behaviour of migratory species, for environmental conservation purposes, and for ecological/economic reasons among countries sharing major watercourses. Transborder collaboration among biosphere reserves is a new emerging topic in the Man and the Biosphere programme of the United Nations Educational, Scientific and Cultural Organization, in particular in Eastern and Central Europe. There is also a need for greater cooperation among countries sharing water resources, especially in many regions of the world where there is growing demand for water.

15. Work has progressed on the better understanding and dissemination of information regarding environmental risks and natural disasters in mountain ecosystems. At the twentieth session of the FAO/European Forestry Commission Working Party on the Management of Mountain Watersheds, held at Lillehammer,

Norway, in July 1996, the topic of mitigation of natural disasters in mountain areas received significant attention, both in the European and global context. That topic was also dealt with in depth at the June 1996 meeting of INTERPRAEVENT, a group of European experts meeting at Garmisch, Germany, to discuss cooperation in research, technology transfer, planning and development relating to natural resources management in mountain areas, at which the protection of alpine areas against natural disasters, such as floods, avalanches and mudflows, was discussed at length. ICIMOD has also been very active in that field, and has recently launched a training programme for mountain risk engineering in the Himalayas. Also, the Working Group on Natural Disasters of the International Union of Forestry Research Organizations (IUFRO) plans to hold a meeting in the framework of the Eleventh World Forestry Congress (Antalya, Turkey, 13-22 October 1997). The meeting will consider, *inter alia*, hazard prevention measures in mountain regions. That cross-cutting issue is expected to receive increasing attention in the near future as a result of greater awareness created through international initiatives, such as the 1994 World Conference on Natural Disaster Reduction, and new and ongoing efforts by international bodies, such as those mentioned above.

16. Perhaps most importantly and underlying most other factors that have contributed to the relatively successful implementation of chapter 13 is the notion of commitment. Many of those who advocate the sustainable development and conservation of mountain regions and peoples speak with conviction and deep emotional commitment to many of the causes espoused by chapter 13. The various stakeholders working on mountain-related issues, whether from local communities, non-governmental organizations, Governments or international organizations, often share a common view of the importance and uniqueness of mountain areas and cultures, and carry out their work with a strong sense of dedication. Their conviction and the partnerships that were forged prior to UNCED, were instrumental in gaining chapter status for mountains under Agenda 21, and in maintaining close collaboration throughout the post-UNCED period.

IV. UNFULFILLED EXPECTATIONS

17. Several objectives of chapter 13 remain unfulfilled or have seen little or no progress towards implementation, as described below.

Survey work

18. Adequate progress has still to be made in undertaking integrated survey work of the different natural resources and their use in mountain ecosystems, and carrying out related activities needed to strengthen knowledge about the ecology of mountain ecosystems. Although greater progress is being made at the regional level, a longer time-frame than the five years since UNCED will be required to achieve a more thorough understanding of the knowledge base globally.

National-level institutional arrangements

19. Although the issue has been raised in various forums since UNCED, there continues to be a lack of new institutional arrangements at the national level

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to enable a more comprehensive and integrated approach to mountain conservation and development. In spite of increased international attention since UNCED on the need for reform (through chapter 13 follow-up), examples of departments, programmes or legislation that deal with mountain issues in a more integrated way are still rare, which has been an inhibiting factor in carrying out comprehensive national mountain development planning.

Special attention to mountainous island countries and landlocked countries

20. Little attention has been paid so far to the need for specific consideration for mountainous island countries and landlocked mountainous countries. Island countries face a unique situation, especially with regard to water resources. Greater efforts are needed to better understand the technical issues facing that category of countries.

V. EMERGING PRIORITIES

21. Upon completion of the current consultation process for chapter 13 follow-up in late 1996, many of the issues concerning sustainable mountain development, which have so far been discussed in rather general terms at the global level, will also have benefited from discussion in a regional context, allowing for further elaboration, refinement and regionally specific proposals for action. That process has allowed an increased focus on specific objectives of chapter 13 and better understanding of how they can best be achieved. Some key objectives that have emerged during UNCED and the five-year review period, for which it now seems likely that obstacles to achievement can be overcome, are described below.

Special status of mountain areas

22. One of the important achievements of the chapter 13 review process has been greater recognition of mountain areas as special and distinct from lowland areas, and therefore worthy of special attention. That recognition is seen as a key factor in the recent change of attitude of Governments, intergovernmental organizations and non-governmental organizations to pay greater attention to mountain conservation and development, as well as in the mobilization of the resources that will be needed for increased investment in mountain areas. Greater action at the national level is required, including, for example, the formulation of national mountain development plans as part of national development plans.

Legal and institutional mechanisms

23. There is also greater recognition of the need for new or reinforced legal mechanisms (charters, conventions, national legislation etc.) to protect fragile mountain ecosystems and promote sustainable and equitable development in mountain regions. Additionally, Governments, intergovernmental organizations and non-governmental organizations agree that more suitable institutional mechanisms are required to assure an integrated approach in view of the complexity of mountain ecosystems and the socio-economic issues at stake.

Investment in mountain development and conservation

24. More mountain-specific investment programmes and greater mobilization of financial resources for mountain development and conservation programmes will be required in order for real progress to take place on the mountain agenda. In some cases, that may mean formulating and financing programmes that are focused exclusively on mountain areas; other situations may lend themselves to expanding conservation and development programmes that have been designed for lowland areas to include mountain areas as well. There are promising signs of greater willingness on the part of Governments to increase investment levels in mountain areas, which have historically been neglected. In addition, bilateral and multilateral donors have expressed greater willingness to assist mountainous developing countries in elaborating and implementing mountain development plans and programmes, in accordance with the increased attention being given to mountain regions and a redefinition of priorities. Greater investment potential in upland areas is motivated not only by the need to protect downstream infrastructure and populations but also by the realization of the importance of economic development of mountain populations for their own benefit and the potential contribution to national economies, as well as by an increasing awareness of the importance of biodiversity conservation.

Resource flows

25. In connection with paragraph 24 above, there remains a need for clearer understanding of resource flows to and from mountain areas, that will lead to increased income for mountain communities and a fairer distribution of earnings from natural resources exploitation and services provided in mountain areas. Increased attention is already being paid to that important issue, as evidenced by the electronic conference hosted by the Mountain Forum in 1996, on the theme "Paying for mountains: innovative mechanisms and promising examples for financing conservation and sustainable development". The increased attention being paid to that issue, especially as certain mountain resources, such as water, become more scarce and acquire greater economic value, is expected to result in more studies undertaken to improve understanding of the overall flow of resources and services.

Status of women and children

26. The need for greater empowerment, equity and equality of mountain women has been expressed as an important concern throughout the period of UNCED and chapter 13 follow-up. Those issues are expected to receive greater attention in terms of policy, legislation and institutional reform, with growing awareness and recognition of the role and needs of women related to mountain development. A recent publication by UNICEF, Children, Women and Poverty in Mountain Ecosystems,² produced in collaboration with UNU and IMS, is already drawing attention to the basic causes of poverty in mountain areas and the need for policy revisions.

Cultural integrity and biological diversity

27. There is growing recognition of mountain areas as valuable sites for preserving cultural integrity and conserving biological diversity, which has

come about through increased awareness of specific mountain cultures and their important role in maintaining mountain ecosystems, as well as greater recognition of the endemism of plant and animal species in mountain areas. More concerted action is needed to address those increasingly important areas of concern.

Monitoring progress

28. As the mountain agenda moves forward and mountain development and conservation efforts grow, it will be necessary to be able to gauge progress and the extent to which it is sustainable. An enhanced ability to carry out assessment and monitoring of mountain development and conservation activities will be required. The development of a set of criteria and indicators for sustainable mountain development has been under way since late 1995. That work is currently being refined with the aim of providing a practical tool for use at the national or subnational level.

Exchange of experience and information collection and dissemination

29. More direct exchange of experience and information, both among mountain people themselves and among other resource management practitioners working in mountain areas, is needed. Exchange visits between groups of farmers from neighbouring upland communities have proved to be among the most effective means of stimulating new ideas and transferring knowledge in many mountain conservation and development projects throughout the world in recent years. The networks that have been created over the past few years, especially through the activities of the Mountain Forum and regional intergovernmental and non-governmental organizations consultations, should be fully exploited to stimulate and enhance that type of direct exchange at all levels. There is also a need for greater accessibility of existing information to end-users, both at policy and operational levels. In fact, knowledge and information dissemination was identified at a 1996 European intergovernmental consultation on chapter 13 as a priority area to be addressed. Some key issues raised include the needs to standardize data and data collection; ensure greater accessibility of scientific data to decision makers; improve inter-ministerial communication on mountain issues; and ensure more interdisciplinary and applied research on mountains.

Food security

30. As highlighted at the World Food Summit held by FAO in Rome in November 1996, the issue of food security has become a top priority for the global community. Accordingly, efforts to eradicate hunger and malnutrition are expected to receive greater attention under chapter 13, along with the overall objective of poverty alleviation in mountain regions. New initiatives in that area should focus specifically on strategies to enhance food security in a sustainable manner, *inter alia*, through the sustainable flow of water resources and their efficient use for agricultural and other production systems.

Mountain forests

31. Since new interest and attention is being devoted to the forest policy debate, especially since the establishment by the Commission of the

Intergovernmental Panel on Forests, new opportunities are available to further discuss the important role played by forests in mountain areas with respect to such issues as hazard prevention, biodiversity conservation and livelihood opportunities. New institutions and forums, including the European Observatory on Mountain Forests and the IUFRO Task Force on Forests and Mountain Development, have recently been established to focus specifically on such issues. FAO is also giving greater recognition to the importance of forests in mountain regions, and is currently in the process of preparing a publication on the management of mountain forests.

Notes

¹ Report of the United Nations Conference on Environment and Development, vol. I, Resolutions Adopted by the Conference (United Nations publication, Sales No. E.93.I.8 and corrigendum), resolution 1, annex II.

² New York, 1996.
