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CONDESAN: Watershed Management and Rural Development in the Andes

CONDESAN (Consortium for the Sustainable Development of the Andean Ecoregion) is a 10-year-old group of more than 70 organizations—national and international, public and private, and including universities, Consultative Group on International Agriculture Research (CGIAR) centers, development NGOs, research institutions, government agencies, municipalities, and producer associations. A key part of CONDESAN's work takes place in areas (including specific watersheds) that are representative Andean ecosystems. CONDESAN benchmark sites are: Mérida in Venezuela, Manizales in Colombia, Carchi in Ecuador, Cajamarca and Puno in Peru, Cochabamba in Bolivia, Jujuy in Argentina.

Interlocking goals of sustainable natural resource management

CONDESAN focuses on 3 interlocking goals: sustainable natural resource management, improving rural incomes, and social equity (Figure 1). The objective of the Consortium is to create regional capacity to conduct research and development projects based on an understanding of natural resource management, the development of environmentally sound production systems, and policies that improve the lives of Andean communities. CONDESAN's overall aim is to reduce poverty and reverse natural resource degradation in the Andes.

CONDESAN's geographic coverage: *páramos*, *jalcas*, *punas*, etc

CONDESAN benchmark sites broadly represent the region's 3 major ecological zones: the "green" or humid Andes of Venezuela, Colombia, Ecuador and northern Peru; the "brown" or semi-arid Andes from northern Peru to Bolivia's eastern cordillera and Argentina; and the "yellow" Andes, or altiplano, of southern Peru and Bolivia. Cross-sectional themes are sometimes applied to a larger number of sites or to the region as a whole. Within the Andean highlands (*páramos*, *jalcas* and *punas*), CONDESAN's target population is poor farmer groups. Farming (mainly tubers and grains) and cattle-raising are the main activities, although income generation comprises additional efforts.

The CONDESAN coordination unit

CONDESAN is a dynamic consortium of diverse research and development partners facilitated by a small coordination unit (CU) in Lima, Peru, at the International Potato Center (CIP). The CU is supported by a technical council comprised of leaders of CONDESAN initiatives (CI) (including benchmark site and project leaders). Partner institutions implement projects, whereas the CU promotes synergies, facilitates linkages between institutions, and supports development and dissemination of tools and methodologies.

The InfoAndina Electronic Network is CONDESAN's main communication tool. It continually disseminates relevant information on key regional events and new opportunities. It also organizes electronic consultations, promoting the application of information and communication technologies (ICTs) to facilitate information and knowledge exchange on mountain development issues through special discussion groups, and provides a regional platform for the operations of the Mountain Forum's Latin American Node. The CU promotes the establishment of synergies between Andean research and development organizations and stakeholders. Linkages among regional projects are also actively promoted to establish synergies and share common resources to optimize operations at the regional level.

Main achievements

- InfoAndina, the electronic information system—a key component of the Consortium's team-building strategy—has been permanently expanding in terms of clients and services offered. It organizes periodic E-conferences to exchange best practices on development issues, and facilitates information exchange on key issues in the region, applying low-cost communication tools.

- The capacity to expand understanding of natural resource management, created at regional level through development of a watershed characterization assessment methodology; creation of platforms for resolution of natural resources-related conflicts; and development of a watershed commonwealth mentality.

- Development of environmentally sound and profitable alternatives to enhance incomes for mountain dwellers: a) promotion of production-to-consumption systems for Andean crops and livestock; crop focus on potatoes, other Andean roots and tubers, fruits and grains; livestock production options in the Andes (beef, dairy products and camelids), expanded through improved forage production and herd management techniques; b) development of community based non-agricultural options.

- Negotiation tables, with access to good information, are cornerstones of watershed development projects in the Andes. Projects take advantage of the CONDESAN watershed analysis methodology and irrigation systems analysis to estimate social and biophysical

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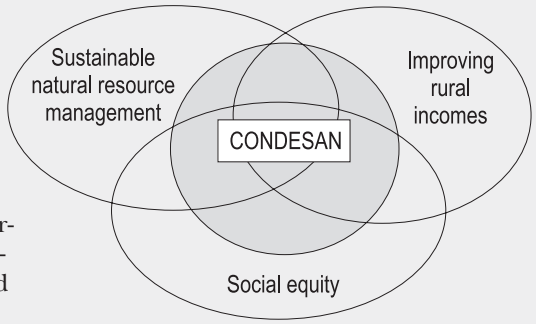


FIGURE 1

externalities associated with alternative land use patterns. Productive projects are developed based on strategic alliances between entrepreneurs and producers and promote the marketing of Andean crops and livestock and value-added enterprises.

CONDESAN regional initiatives

CONDESAN is implementing initiatives of a regional nature, thus not only establishing effective links between research and development organizations but also integrating different Andean countries and sites in the operation of interconnected ecoregional projects. CONDESAN's Coordination Unit is increasingly involved in activities that add value to those being carried out by partners at specific sites and in specific projects. A re-vitalized Technical Committee is already in place with clearer duties to contribute to synthesis and integration of knowledge in the framework of initiatives in the Andes.

CONDESAN is currently engaged in the following projects:

- ***Conservation of biodiversity and sustainable use of the* páramo *in the northern and central Andes (GEF)***. This initiative promotes regional conservation and development projects for the *páramo* ecosystem in 4 countries; environmental services valuation and land use, policy analysis; and strategies for public awareness, training, education and networking. Implementing agencies are UNEP and IADB. CONDESAN is the executing agency.

- ***Sustainable land use in watersheds of the Andes (GTZ-CONDESAN-REDCAPA)***. This regional project, initially in 8 watersheds from Colombia to southern Peru, started in July 2003, with a duration of 8 years. It applies watershed analysis methods based on environmental externalities to prioritize intervention activities and promote co-investment at the local level. It promotes linkages among the externalities, fosters co-investment through strategic alliances, and provides opportunities to propose policy changes for increased impact.

- ***Andean hub of the pro-poor livestock policy initiative (FAO)***. This is a regional project (Ecuador, Peru and Bolivia) focusing on Andean highlands where livestock has a potential to reduce poverty through the application of policy regulations. A proposal is being elaborated with inputs from national and regional workshops to discuss policy analysis and proposals for change at different scales.

- ***Andean Water Vision from an Indigenous and Peasant Perspective (IDRC)***. This ongoing regional project is being implemented in Ecuador, Peru and Bolivia (with inputs from Chile and Argentina as well). It was presented at different international forums, raising water vision awareness among indigenous populations. A new phase is being negotiated for a broader social vision that will include economic aspects, in a proposal with key stakeholders.

- ***CGIAR challenge program on water and food (Future Harvest Centers)***. CONDESAN is the coordinator of the Andean system of basins for this challenge program of the Future Harvest Centers. It participates as a convener of research and development institutions, bringing together, complementing and creating synergies among Andean initiatives. It shapes orientation of the research agenda in the Andes through competitive funds. (www.condesan.org/demo)

- ***Water rights in Bolivia (IDRC)***. Conflicting water rights are modeled within a micro-basin to promote dialogue and participatory discussion and long-term solutions. Designed to provide inputs for new water legislation in Bolivia, this project is a good example of linking research to development with replication potential for other countries in the region.

- ***CONDESAN and the Andean community of nations (CAN)***. The Coordination Unit has also been participating actively in positioning the Consortium at the regional level. CONDESAN has signed a Letter of Understanding with the Andean Community of Nations (CAN) for mutual support in the conservation of Andean biodiversity and management of natural resources. CONDESAN supports a recent initiative to create a Regional Center to Combat Desertification in the Andes and Brazil.

Challenges for the future

CONDESAN will combine actions under a common strategy for the next 3–5 years in order to integrate sites and projects effectively. It will focus on the value added that the Consortium can provide to its members, such as knowledge exchange. CONDESAN's Technical Committee will consolidate in a new format, composed of benchmark site leaders and regional initiatives.

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Rural Tourism in China
A Case Study of *Nongjiale* in the Chengdu Metropolitan Area

Rapid dynamics: rural tourism and urbanization

Rural development in China is having an important impact on the entire country. Economic growth in rural areas has come mainly from non-farm industries, especially rural enterprises. But in recent years, as the growth of rural enterprises has declined, many rural areas have begun to suffer from economic stagnation, and rural development is facing many challenges. Rural tourism has the potential to counterbalance agriculture and increase farmers' incomes.

Modern rural tourism in China began quite late, at the end of the 1980s, but developed very quickly with the growth of urban incomes and the demand for tourism. The city of Chengdu, with its surroundings, is an example of this growth and demand from an increasingly urbanized society.

A hilly cultural landscape for recreation

Chengdu has an area of 12,300 km^2 and is located in the transition belt of the eastern extension of Qinghai–Tibet Plateau and Sichuan Basin, so its landforms vary. Mountains and hills cover 63.6% of its total area. Chengdu has a history of over 2300 years of settlement. The famous ancient Dujiangyan irrigation works have played an important role in making Chengdu "the land of abundance." Chengdu is now a political, economic and cultural center in Sichuan Province. With its tradition of leisure and rich agro-tourist resources, the conditions for development of rural tourism in Chengdu are good. Rural tourism has spread to the suburbs of Chengdu and become a model of rural tourism in China (Figure 1).

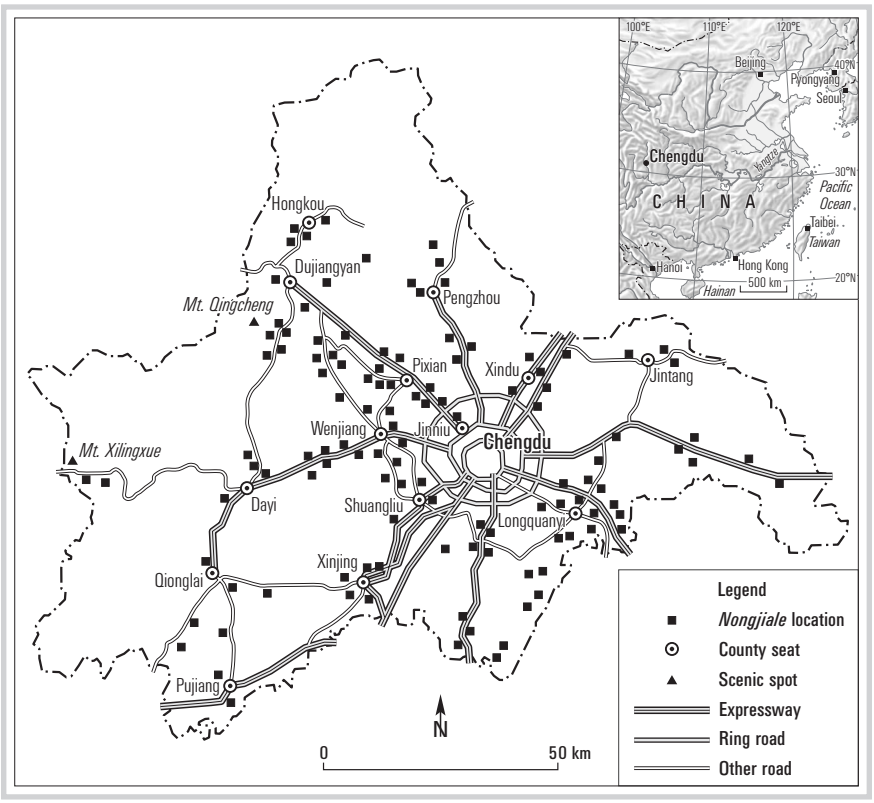


FIGURE 1 Distribution of *nongjiale* locations in Chengdu District. Rural tourism operations are distributed mainly along highways, map of China by Andreas Brodbeck. (Map by Li Huixia)

Nongjiale: a new trend

Typical rural tourism is called *nongjiale* (ie places where you can "enjoy yourself in farmers' families") by local residents. Facilities usually include houses, a courtyard, an orchard, transplant nursery, bamboo grove, or perhaps an additional fishpond and children's playground. Since *nongjiale* are close to the city and transportation is convenient, most tourists do not need to stay overnight (some *nongjiale* do not provide accommodation). Furthermore, the *nongjiale* vary in scale. Some occupy several thousand square meters, enough to accommodate several hundred visitors at the same time, while some are only about 100 m^2 and can receive only few visitors at a time.

All *nongjiale* provide almost the same type of recreation: playing *mahjong* (a popular strategy game in China) and cards, drinking tea, enjoying flowers, and picking fruit. Others offer fishing, Karaoke, table tennis, billiards, children's slides and seesaws, etc. The cost is generally 15–25 yuan RMB (about US$ 2–3) per person per day, including lunch, dinner and tea. But prices are 25–35 yuan RMB (about US$ 3–4) when the fruit is ripe and guests can pick and eat fruit freely at the *nongjiale*. These low prices attract tourists for repeated visits.

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FIGURE 2 Urban visitors pour into Longquanyi County during the peach blossom season. (Photo courtesy of the Longquanyi County Tourism Bureau, Chengdu)

Rural tourism began as family businesses run by local farmers. Most employees are relatives. Local farmers usually manage several businesses concurrently. For example, besides tourism, they may also grow plants in nurseries, fruit trees in orchards, and run other agricultural operations. With the development of rural tourism, some local urban residents began to operate businesses by renting land from local farmers. It is estimated that about 20% of the operators are not local farmers in Chengdu. Generally their operations are larger and their facilities better than those of the local farmers.

Boosting the rural economy

For most operators, *nongjiale* is a main source of income. This study found that tourism accounts for 50%–90% of the total income for enterprises that have tourist operations year round, and 20%–40% for households that have operations in busy months only.

Rural tourism in Chengdu thus obviously contributes to rural development. It has created new models for traditional agriculture and land use. It is a practical way of integrating the primary sector with the tertiary sector and increase rural household income. Longquanyi County is a good example: about one-third of the income growth in rural households each year comes from tourism during the period when peaches are in bloom. Fruit sales to tourists account for about one-third of total sales. If their own fruit cannot meet tourist demand, households buy from others in the village. As a result, rural tourism benefits not only tourism operators, but also others in the county since sales and fruit prices increase.

The problem of rural surplus labor in China is acute (see also the paper by Liu et al in this issue of *MRD*). According to the WTO, every job in the tourism sector can generate another 3–5 jobs in the economy. In Longquanyi County, over 5000 people were engaged in tourism in 2002, and at least 15,000 jobs were linked to tourism. Hence the tourism sector can obviously digest part of the surplus labor force.

Changing mentalities and behavior

It is important that rural tourism accelerate the acceptance of ideas linked with urbanization and boost the quality of rural human resources. To meet visitors' needs, *nongjiale* need to subscribe to newspapers and periodicals, and they must gradually also develop their own interest in reading. Visitors also bring recreational and sports activities to the countryside. The development of tourism and increased income for farmers provide an opportunity to change hygienic habits and improve the rural environment. The village of Nongke illustrates such dynamics. The entire village is beautiful—known as "the peasants' park without walls." The practice of dumping garbage everywhere has almost disappeared, and water closets are now widely used. The roads in the village have been greatly improved. Communication has also improved; every family owns a telephone, including cell phones.

Thus, as local peasants have more opportunities for contact with tourists from cities, their views become broader and some of their traditional ideas change. Tourism puts even greater demands on management. Some operators have taken the initiative to undergo training, and are interested in improving their abilities. This gradually breeds a new class of high-quality entrepreneurs.

Challenges

The development of rural tourism faces some challenges. At present, all *nongjiale* have a similar approach to recreation. But stereotyped recreation becomes uninteresting and causes sharper competition, resulting in the decline of economic benefits. Moreover, due to the seasonality of agriculture, rural tourism based on agricultural resources is also highly seasonal. For instance, in Longquanyi County, the peak period is in March, when peach trees blossom. Over 50% of all tourists arrive during this peak month (Figure 2), so the facilities cannot meet demand; moreover, environmental degradation takes place at the same time. By contrast, there are few visitors (only 20% of the annual total) in the off-season. Much tourism infrastructure is unused and many *nongjiale* have to suspend operations.

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Recommendations

The following suggestions address these conditions:

- First, lack of planning is one of the causes of similarity in patterns of rural tourism. Hence it is necessary to plan tourism in accordance with the potential of each county.
- Second, there is a need to enrich the cultural aspects of rural tourism; ignoring them is one of the main problems of *nongjiale*. Cultural enrichment and embeddedness is urgently needed. For instance, rural tourism could include gardening education and integrate local folk culture.
- Third, the tourism sector should be further developed in the off-season. Special offers could be provided, such as "being a farmer for a day," or instruction in weaving and use of farm tools, etc. These activities could be developed in all seasons, independent of sunlight and agricultural resources.
- Finally, training and government support is important. Farmers who have turned away from traditional agriculture to the tourism industry should receive the necessary training.

This study demonstrates that among *nongjiale* operators, urban residents have better management skills than farmers. And among farmers, those who have had the experience of training or of work outside the area have better skills than those who have no such experience. In developing rural tourism, villages and counties will have to unite to promote enterprises in order to avoid damaging competition and improve sustainable development. Local governments should exert their functions in terms of macro-coordination and administration.

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The Mountain Forum Strategic Planning Workshop

Kathmandu, Nepal, 26–28 April 2004: The MRD Perspective

Mountain Research and Development

With a view to its next phase beyond 2004, the Mountain Forum (MF) convened a Strategic Planning Workshop in Kathmandu, Nepal, in late April 2004. The Workshop was preceded by a 2-day meeting of all MF node managers. It was carefully prepared, based on an internal MF Brainstorming Retreat in January that considered the achievements of MF so far; MF's mission for the period 2005–2007; collaboration with the new International Mountain Partnership (IPSDMR); long-term funding strategy; and strategic alliances. A subsequent Strategic Planning Concept Paper summarized MF's strengths: regional and global e-conferences; quality of content and moderation in discussion lists; free accessibility; and the linking of different levels of society and sectors. MF also conducted a survey of its membership in April as a further input. The survey revealed very positive support for MF's information and experience-sharing network services and for its archives and online library.

Building on this background, the Workshop pursued an agenda that included an analysis of MF's current situation, achievements and stakeholders; a review of its vision, purpose and values; and consideration of long-term strategic objectives and priorities for action. The first day featured presentations by an invited group of MF stakeholders, including *Mountain Research and Development*, which was represented by its Managing Editor. *MRD* proposed closer collaboration with MF, specifically in terms of: publication of MF e-conferences of interest to policy- and decision-makers; possible publication by MF of all back issues of *MRD* in the MF online library; and publication of news and initiatives of the International Mountain Partnership, in collaboration with MF. It was agreed that *MRD* could serve as a final record of important MF events. For its part, MF proposed publication of *MRD* abstracts and lead articles on the MF web site.

The Workshop sessions were admirably managed by the MF team at ICIMOD and a facilitator especially hired for the event. The approximately 30 participants and stakeholders present represented a good global cross-section of organizations concerned with mountain issues. All were well prepared to discuss the most important topics on the agenda—MF's mission and its future strategic objectives. There was broad agreement that MF is well positioned to continue and to enhance doing what it does best, and that its strategic future will be closely linked to the International Mountain Partnership, while it simultaneously retains its own distinct identity.

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Summary Report on Mountain Biodiversity in the Convention on Biological Diversity (CBD)

The Conference of the Parties (COP) to the Convention on Biological Diversity (CBD) adopted **Mountain Biodiversity** as decision VII/27 at its 7th meeting, held in February 2004 at Kuala Lumpur. At its 4th meeting in 1998, the COP to the CBD had selected mountain biodiversity as 1 of the 3 themes for in-depth consideration at its 7th meeting. At its 6th meeting in 2002, the COP adopted the guidelines and format for a thematic report on mountain ecosystems. The Subsidiary Body on Scientific, Technical and Technological Advice (SBSTTA)—an open-ended intergovernmental scientific advisory body to the COP to the CBD—considered mountain biodiversity as the main theme and adopted the structure, elements, goals and possible actions of the proposed program of work on mountain biodiversity at its 8th meeting. It further decided to complement this structure with actions to be identified with the help of an ad hoc technical expert group and consultations with parties, other governments, and relevant organizations. A meeting of the Ad Hoc Technical Expert Group on Mountain Biodiversity held in July 2003 in Rome subsequently submitted its report to the 9th meeting of SBSTTA. The latter adopted the recommendations that included a program of work on mountain biodiversity. Thus, COP-7 took up mountain biodiversity as a priority issue for review and guidance and adopted the decision by 188 countries as parties.

The decision noted that Parties should implement the program of work on mountain biodiversity in the context of national priorities and incorporate these into national biodiversity strategies and action plans, as well as national programs and activities. The Parties should implement them considering the ecosystem approach to reduce the rate of mountain biodiversity loss by 2010, contribute to poverty reduction, and benefit indigenous and local communities dependent on mountains. It invited the Parties to adopt outcome-oriented targets for mountain biodiversity, taking into account the Strategic Plan of the CBD, the Global Strategy for Plant Conservation, the Plan of Implementation of the World Summit on Sustainable Development, and the Millennium Development Goals.

The decision also agreed that the knowledge, innovations and practices of indigenous and local communities should be taken into account and their participation in conservation and sustainable use of mountain biological diversity ensured, in accordance with Article 8(j) on in-situ conservation and related provisions of the CBD. It recognized the need for human and technological resources and for financial capacity to implement effectively the activities in the program of work. It thus encouraged governments and other interested entities to form partnerships to address these needs.

It also urged bi- and multilateral organizations and processes to provide funds, training and support, where applicable, to developing country Parties and Parties with economies in transition to assist in the effective implementation of the program of work. It invited to report on implementation of this decision and those parts of the program of work that are identified as priorities under national and local conditions. The following summary gives an insight into the program of work on mountain biodiversity (see also www.biodiv.org/default.aspx).

Program and purpose of work on mountain biodiversity

The program on mountain biodiversity features goals and activities that are specific to mountain biological diversity, although the existing programs of work on forests, inland waters, agricultural, and dry and sub-humid land biodiversity also apply to mountain ecosystems. As a result, the goals and activities contained in the existing programs of work in each of these thematic areas should also be applied and implemented, whenever appropriate, to their respective areas in mountain ecosystems. Information and input from international forums may also be taken into account, particularly, Chapter 13 of Agenda 21, which relates to sustainable mountain development, the World Summit on Sustainable Development, and valuable inputs that emerged from the International Year of Mountains 2002. In addition, a number of international agreements, institutions, and program initiatives may be considered.

The overall purpose of the program of work is *significant reduction of mountain biodiversity loss by 2010 at the global, regional and national levels*, through implementation of the 3 main objectives of the CBD. The aim of implementation of the program of work is to make a *significant contribution to poverty alleviation in mountain ecosystems and lowlands dependent on the goods and services of mountain ecosystems*. It focuses on addressing characteristics and problems that are specific to mountain biodiversity. The program of work is intended to assist Parties in establishing national programs of work with targeted goals, objectives, and actions, with specific actors, timeframes and inputs, and expected measurable outputs. In determining national

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programs of work, Parties are encouraged to pay due regard to the socioeconomic, cultural and environmental costs and benefits of various options. In addition, Parties are encouraged to consider the use of appropriate technologies, sources of finance, and technical cooperation, and to ensure, through appropriate actions, the means to meet the particular challenges and demands of their mountain ecosystems.

Direct actions

Deal with the negative impacts of key threats to biodiversity: Actions incorporate appropriate measures and strategies to identify, prevent and mitigate the impacts of key threats to mountain ecosystems that affect mountain biodiversity. These threats include: adverse land-use practices, human-induced slope instability, natural geological hazards, the negative impacts of economic development, introduction of invasive alien species, the impacts of global climate change, local and long-range pollution, glacial retreat, and other human-induced pressures on mountain ecosystems.

Protect, recover, and restore biodiversity: Actions encompass strategies to identify and initiate specific activities to address different aspects of mountain biodiversity, including socioeconomic considerations, especially in relation to indigenous and local communities. The areas to be considered include: endemism of species; fragile mountain ecosystems and biodiversity hotspots with a focus on threatened species; land use and water resource planning at landscape level; protected area systems; and adequate and effective networks of mountain-protected areas. Consideration must also be given to sustainable agriculture and pastoralism using sustainable traditional practices, ecosystem sustainability with emphasis on degraded slopes, conflict issues involving humans and other species, freshwater networks for migratory species; and restoration areas where mountain biological diversity has been degraded significantly.

Promote sustainable use of biological resources: Actions include promotion of sustainable practices in areas that have a direct impact on the conservation of mountain biodiversity, especially focusing on indigenous and local communities and community-based management systems. Also mentioned are promotion and strengthening of sustainable land use and water resource management practices in relation to livelihood needs; partnerships between all stakeholders; local capacity for sustainable tourism management, while preserving natural and cultural heritage values; sustainable use of economically valuable wild plants and animals as an income-generating activity for local inhabitants; and integrated watershed management practices.

Promote access to, and share benefits of, genetic resources: Suggested actions are to strengthen the capacity of indigenous and local communities to engage in equitable benefit-sharing arrangements, develop methods to assess and conserve genetic resources of high economic value, and promote actions through conservation-linked income opportunities for marginal communities, all in accordance with national legislation where it exists.

Maintain genetic diversity through traditional knowledge and practices: Actions include strategies for minimizing the threat of genetic erosion of domesticated biodiversity and wild relatives, paying particular attention to the centers of origin of genetic resources, and developing sustainable use practices for biodiversity at all levels. Further, the strategies include respecting, preserving and maintaining indigenous knowledge, practices, processes and technologies, and implementing provisions contained in Article 8(j) on in-situ conservation and related provisions of the CBD.

Means of implementation

Enhance the legal, policy, institutional, and economic framework: Suggested actions for the enhancement of legal and policy frameworks are to identify and address perverse incentives and policies that may impede the implementation of the CBD in mountain ecosystems; improve science–policy linkages; and develop and implement legal and policy strategies at the landscape or river basin level, emphasizing upstream–downstream relations and prevention of biodiversity loss. Actions for institutional framework enhancement are to develop performance indicators and report on the integration of conservation and sustainable use of mountain biodiversity into institutional programs, including sectoral policies, legal and economic frameworks, and strengthening of legal and institutional capacity to implement the work program, especially through national focal points, institutes and other relevant stakeholder groups and mechanisms. Strategies to enhance the economic framework include developing and introducing appropriate incentives, market and compensation mechanisms; promoting the diversification of income-generating activities to support conservation and sustainable use of mountain biodiversity; and preventing the negative impacts of economic development. Additionally, the implementation of environmental and social impact assessments at sectoral, program and project levels is to be encouraged. Consideration is also to be given to the specificities of indigenous and local communities depending upon mountain ecosystems, and integration of aspects of mountain biodiversity into plans, policies and programs related to mountain areas.

Respect, preserve and maintain the knowledge, practices and innovations of

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indigenous and local communities: Actions include promoting the implementation of activities aimed at maintaining existing levels of agro-biodiversity, paying particular attention to centers of origin and the goods and services they provide, both to meet local demands and ensure sources of food security. The action calls for states to respect, understand and support the traditions and sustainable practices of indigenous and local communities in mountain regions. In addition, decision-making processes are to be promoted, paying particular attention to empowerment of women, enhanced access to information, and development of capacity building measures and information sharing for the full participation and involvement of indigenous and local communities in decisions that affect them in relation to mountain ecosystems. Further, implementation of activities aimed at the improvement of mountain livelihoods, poverty reduction and the maintenance of cultural identity is to be promoted, in order to achieve the sustainable use of mountain biodiversity.

Establish regional and transboundary collaboration: Actions include strategies to promote integrated transboundary cooperation for sustainable activities in mountain ranges, through mutually agreed-upon arrangements by countries concerned. Regional and transboundary cooperation for research, adaptive management, and exchange of expertise is also to be promoted, to strengthen and improve conservation and management of mountain biodiversity, also through peace parks. In addition, collaboration and synergies between the work programs of the CBD and other global conventions and agreements is to be strengthened. New methodologies and new mechanisms are to be developed, such as upland–lowland contracts that sustain mountain biodiversity and provision of goods and services.

Supporting actions

Identify, monitor and assess biodiversity: Actions include promoting the monitoring of susceptible areas subject to climate change, conducting mountain surveys in priority areas, and supporting the work of the Global Mountain Biodiversity Assessment (GMBA). In addition, whenever appropriate, the programs of work of the global initiatives are to be applied, and national biodiversity strategies, action plans and other national reports to the CBD are to be used for monitoring and assessment of mountain biodiversity.

Improve knowledge and methods for assessment and monitoring: Strategies include developing indicators of status and change in mountain ecosystems; also selecting international, regional and national criteria, and appropriate quantifiable indicators. The actions also call for assessing and addressing the key threats to mountain biodiversity, and developing methodologies for assigning value to ecological services and compensating poor and vulnerable mountain communities.

Improve infrastructure for data, and information management for assessment and monitoring: Actions include enhancing and improving technical capacity at a national level to monitor mountain biodiversity; promoting open access to existing information on biodiversity and related databases; and sharing through the clearing-house mechanism of the CBD. Moreover, actions include encouraging mapping and inventory of biodiversity and land use changes, and using analog and digital databases, both for scientific purposes and to support decision-making.

Improve research, technical and scientific cooperation, and other forms of capacity-building: Actions encompass steps to conduct long-term research on species adaptability to changing environmental conditions, and on the role and importance of mountain biodiversity and ecosystem functioning. Additionally, there is a call for collaborative research of mutual interest and exchange of experience and knowledge about sustainable development and ecosystem vulnerability among countries with mountains. Capacity is to be developed and opportunities enhanced in relation to community-based research and monitoring, as well as scientific and technical coordination mechanisms at national level, in order to identify research priorities and optimize efficient utilization of research results.

Increase public education, participation and awareness: Actions include strategies that promote educational and capacity-building systems tailored to the specific conditions of mountain ecosystems and broadly based awareness of the values of mountain biodiversity. The related contexts for awareness are: implementation of sustainable tourism activities, and knowledge of upland–lowland interactions among policy-makers and planners. Furthermore, actions include promoting the education of women and increasing awareness of the contribution of knowledge, practices and innovations of indigenous and local communities—including women—to conservation and sustainable use of mountain biodiversity.

Promote appropriate technologies, including indigenous technologies: The strategy includes implementing the program of work on technology transfer, with particular attention to matters relating to the conservation and sustainable use of mountain biodiversity.

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