CHAPTER 2
WORKING GROUP FINDINGS AND RECOMMENDATIONS

Working groups were asked to identify and assess the achievements, gaps and lessons learned of watershed management programmes and projects in countries of the three Latin American subregions. They then considered guidelines for the next generation of watershed management programmes and projects. Three main issues were addressed.

Innovative approaches and methodologies for the conservation and sustainable use of water: payment for environmental services; scales (project, micro-watershed, watershed); project design and implementation; and other relevant technical elements for the integrated management of watersheds and mountain ecosystems.

Strategies for research and technological transfer: relations between researchers and end users; databases (local, national and regional); and technology transfers through national, regional and global networks.

Innovative approaches and methodologies for economic and social development: participatory processes; policies and legislation; internal and external benefits; and other relevant elements for the conservation and sustainable management of water.

Based on their country of origin, participants were divided into the following subregions: Central America and the Caribbean (Cuba, El Salvador, Guatemala, Honduras, Nicaragua and the Dominican Republic); Andes and the Amazon (Colombia, Ecuador, Bolivia, Venezuela and Peru); and *S*outhern Cone (Argentina, Brazil, Chile, Paraguay and Uruguay).

Each subregion working group submitted a report, which was discussed at the Workshop Plenary Session. The following is a summary of all the reports made by the working groups for the three subregions.

REVIEW OF WATERSHED MANAGEMENT EXPERIENCES IN LATIN AMERICA: ACHIEVEMENTS, GAPS AND LESSONS LEARNED

Achievements

- All countries of the region use an integrated watershed management approach, which is currently going through a process of regional conceptualization and validation.
- Sectoral, environmental, policy and legal frameworks take account of watershed management issues, and countries have made progress regarding the establishment of watershed entities.
- A significant number of watershed management programmes and projects are being implemented in all countries of the region. Several planning tools and technologies are available.
- The watershed, sub-watershed and micro-watershed framework is being applied to territorial planning in many countries.

- Throughout the region, public awareness of watershed management has increased, and community organizations, governments and local stakeholders are more involved in project planning and implementation.
- Decentralization processes in the region have resulted in local governments assuming responsibility for natural resource management, especially at the sub-watershed level.
- NGOs have made progress as the promoters, facilitators and implementers of community participation; strengthened NGOs have resulted in improved watershed management.
- Strategic alliances for specific projects have been set up among the public and private sectors, local government and communities. Sectoral institutions implement their programmes through these alliances.
- Collaboration and cooperation among different cultures have boosted the management of watershed natural resources, as well as helping to recover and validate traditional practices. Traditional and modern experiences have been incorporated into many activities, and gender equality is gaining increasing importance in programmes and projects.
- Significant progress has been made in the areas of human resource training and the production of information material. It is now recognized that trained and organized communities can have a significant influence at the political level.
- The issue of watersheds that are shared by more than one country has been addressed, and there has been progress in the design and implementation of border watershed management programmes and projects, with special focus on international watersheds.

Watershed management gaps

1) Legal-political framework:

- Political support for watershed management is limited; policies and regulations supporting a watershed management approach are often not applied or coordinated; and policies, plans and projects have been disrupted or discontinued in many countries of the region.
- Sectoral legislation governing the integrated management of natural resources and inter-institutional coordination is not effectively applied and enforced, which contributes to a lack of national programmes for watershed management.
- There are not enough trained personnel to meet the demands of watershed planning and management, owing to the lack of employment stability for programmes' technical staff. Programmes and projects are subject to changes of government, which affects the continuity of activities.
- There is a lack of political will to provide environmental management with sufficient investment, policies, support instruments and means of management and control, mainly owing to other national priorities.
- Watershed management programmes lack continuity because watershed issues are not sufficiently integrated into national development agendas and because governments and administrations are constantly changing.

2) Institutional framework:

- The government institutions responsible for watershed management are weak or limited, as are inter-institutional and multisectoral coordination.

- Relations between communities and political decision-makers are hampered by weak local organizations and a lack of appropriate training for community leaders.
- Public stakeholder participation and commitment are ineffective; inter-institutional coordination of the public and private sectors is limited; and there are few mechanisms for resolving conflicts of interest among watershed stakeholders.

3) Participation:

- The concept of participation needs to be more clearly defined. Many stakeholders are not participating in the planning and implementation phases, so projects never manage to establish self-management of watersheds.
- Community participation mechanisms and watershed user training programmes are often weak.
- There is little integration between upstream and downstream actors, and this often leads to conflicts of interest.

4) Information:

- Although progress has been made in the area of information administration and management, the quantity and quality of basic and applied information are not sufficient to allow proper planning, monitoring and assessment. Detailed information about the watershed is particularly inadequate.
- The information available for watershed management and planning is seldom reliable, and the public has no access to it; the exchange of information and experiences is poor.
- Information about water pollution caused by solid and liquid waste and hazardous substances is not available to many watershed management programmes and projects.

Others:

- Watershed management programmes and projects usually have poor social, economic and environmental results.
- It is difficult to obtain public sector funding to implement plans, programmes and projects, and there are no appropriate financial mechanisms to promote private sector participation.
- Small rural producers receive inadequate technical assistance and applied research results.

Lessons learned

- The use of watersheds as territorial units for planning and management can optimize human and economic resources, and achieve the sustainable development, conservation and preservation of natural resources.
- The integrated watershed management concept that has evolved is centred on participation; but watershed stakeholders' participation is still limited, as are their links with decision-makers.
- Multidisciplinary participation and consensus can strengthen watershed management and training; when decision-making takes account of all the different cultures involved, community participation is reinforced and watershed management processes facilitated.
- Strong, decentralized organizations and institutions are essential to watershed management, but lack of coordination at the local, regional and international levels has hindered watershed management. Weak management in local institutions has been a significant obstacle.

- Many watershed management projects have lost credibility because they have not addressed water quantity, quality and availability properly.
- Watershed management policies, programmes and projects are not yet capable of meeting the region's social needs in terms of poverty alleviation and the provision of basic services.
- Watershed management programmes and projects have often failed to improve people's quality of life. This situation must be improved if watershed management activities are to attract more community acceptance than they do at present.
- Although technical and financial cooperation agencies consider watershed management a top priority issue, and have increased investments accordingly, there is still a need to balance the levels of investment in physical infrastructure with those in the conservation and protection of natural resources.
- Technical cooperation has been an important factor in the implementation of integrated watershed management policies.
- Watershed management interventions have paid inadequate attention to traditional practices and knowledge, especially those of local populations.
- Internal and external migration represents a constraint for watershed management interventions owing to the loss of continuity and consistency of activities.

CONSIDERATIONS FOR FUTURE WATERSHED MANAGEMENT PROJECTS

Major approaches and methodologies for watershed management

This topic addressed innovative approaches, methodologies, major issues and solutions for effective watershed management and integrated mountain ecosystem management. It focused particularly on the conservation and sustainable use of water.

1) Financial mechanisms:

- Clean production, carbon sequestration, and efficient land and energy utilization should be promoted through the use of non-traditional financial mechanisms (payments for environmental services, certification of origin, clean production or organic agriculture, incentives, tariffs, etc.) that are tested by pilot projects.
- When applying payment schemes for environmental services, the types of service to be provided, the demand and the capacity for paying all need to be identified.
- Payments for environmental services should be used to fund watershed management activities. Payments should be set on the basis of demonstration watershed projects and the monitoring and assessment of compliance with agreements.
- When valuating environmental services, the local situation and the conditions of the country concerned should be taken into account, and practical criteria should be applied in the initial stages.
- Other countries' and regions' experiences of valuating and defining tariffs are useful. The exchange of experiences provides a basis from which to develop a harmonized payment methodology that clearly identifies services and beneficiaries, assesses different types of environmental services, and can be applied in a range of contexts.
- Strategies for compensating environmental service provision, and the creation of a national fund for managing watershed natural resources should be considered.

- Environmental service compensation schemes should be considered for communities and other areas that generate water for different users. Collection mechanisms should be based on technical, economic and social criteria.
- Incentives to establish watershed protection areas should be developed.

2) Scale issues (project, micro-watershed, sub-watershed, watershed):

- The scale of a programme or project can be based on such criteria as its purpose, the watershed's strategic value, demand, risks of natural disaster, ecosystem fragility, response capacity, and the availability of financial and technological resources.
- National, regional and local development plans must be taken into account when establishing the linkages required by national watershed development policies and when developing national watershed plans and priorities regarding resources, usage and conflicts.
- A methodology of multi-level planning for watersheds, sub-watersheds and micro-watersheds should be applied, in which projects and programmes are planned at the watershed level and executed at the micro-watershed level.

3) Project design and implementation:

- Before watershed management activities are implemented, the interests of the different stakeholders should be assessed and the management options identified from these.
- Sources of non-agricultural rural employment in non-agricultural areas, such as ecotourism, environmental service provision, agribusiness and agroforestry, should be encouraged.
- Harmonized project design can be achieved through consideration of the information available, assessment of the need for more detailed or additional research and studies, and formulation of flexible projects with appropriate deadlines.
- Watershed activities should be based on up-to-date information that is accessible to the different users and that includes studies aimed at improving the planning for different scales of intervention.
- Projects should be designed and executed with the full participation, consultation and consensus of the community involved so that it can play a leading role in self-managing the watershed.
- Community frustration is reduced when projects have sufficient resources and time.
- Projects should be implemented gradually, starting with high-priority watersheds and taking account of users' interests, fragile ecosystems and the importance of water catchments and regulation.
- The design and implementation of projects in watersheds that cross political and administrative boundaries must be flexible, and should be discussed and approved by all the parties involved in order to ensure their participation in the efficient execution of projects, based on agreement.
- Project designs should include strategies for ensuring sustainability, objectives that improve living conditions, and consideration of such aspects as risks and threats, poverty reduction, biodiversity and food security.
- Technical and institutional capabilities should be strengthened, and new private sector funding sources that can contribute to the successful implementation of projects should be identified.
- Aspects such as land tenure, clear titles and rights to different natural resources need to be considered.
- Watershed management should be addressed through multiple-use, integrated management systems that consider the availability of groundwater, apply GIS and other modern technologies, and ensure that efforts in local watersheds are assessed and followed up.

4) Other technical elements:

- An ecosystem approach, which considers mountain habitats, biodiversity and landscape conservation, should be applied to watershed management. Protected area management should be integrated with watershed management.
- There is a need to promote productive activities, such as non-traditional crops and organic farming, which can increase competition and environmental sustainability.
- Water resources management should focus on soil and water conservation, and consider water as a finite resource of economic value, which has to be used and managed rationally.

Appropriate strategies for research and technology transfer

1) Relation between researchers and end users:

- Research and the dissemination of results from watershed management activities must be based on demand and aim to solve the problems faced by different watershed stakeholders, including inhabitants of the watershed, NGOs and local governments.
- There is a need to strengthen applied research focused on users' needs, and to consider production systems that use local resources.
- Users should participate in the identification of research topics, the definition of research guidelines and the validation of management practices.
- Research results should provide watershed users with technological elements, methods and tools, and should use manuals and booklets to facilitate their adoption.
- There is a need to establish demonstration watersheds for the transfer, teaching, monitoring and assessment of actions taken. Discussion of scientific and traditional knowledge should also be fostered.
- Research results should be disseminated in non-technical language, and distance-learning training programmes for the various levels of watershed stakeholder should be implemented.
- New sources of private sector funding for research and the dissemination of results should be identified.

2) Databases:

- Data and information should be standardized and pooled in order to create an institutional database that provides easy access to watershed management information.
- Data, information, experiences and knowledge should be shared at the local, national and regional levels through national networks and the Latin American Technical Cooperation Network on Watershed Management (REDLACH).
- Poor rural communities must have free access to databases that support productive management.
- Criteria and indicators should be established for monitoring and assessing the operation and progress of watershed management programmes and projects, as well as the environmental and socio-economic context.

3) Technology transfer:

- Within the REDLACH framework, new national networks should be created, and existing ones strengthened, as a means of disseminating and sharing experiences. The exchange of specialists from institutions involved in watershed management-related research should be promoted.
- Links should be established between REDLACH and the water resource network of the Organization of American States in order to benefit from the experiences of both networks and to assist in the design of coherent policies for water resources and watershed management.
- Within the REDLACH framework, there is a need to create a network of universities and institutions involved in watershed management research, encourage access to and dissemination of results, and optimize economic resources.
- Research should be planned as a long-term process that includes the duplication of successful results on demonstration watersheds, which serve as areas for training and visits from interested parties.
- After they have been successfully field-tested, the results of technology, information and research should be disseminated in ways that are easily understood by decision-makers and other users.
- The farmer-to-farmer and producer-to-producer rural extension systems should be promoted.

Research priorities:

There is a need for more research in: the impact of human activities on the watershed; land cover and erosion control; sediment transport; hydrological studies, including of groundwater and glaciers; payment methodologies for environmental services; watershed ecology, hydrology and dynamics; hydrological models to assess environmental impacts at the watershed level; hydrometeorological models to assess the impact of climate change; the restoration of rivers and riverbanks; and the validation of technologies for management, soil and water conservation and technology transfer that are appropriate for local conditions.

Innovative approaches and methodologies for the efficient management of watershed ecosystems, with special focus on socio-economic considerations

1) Participatory processes:

- Watershed management plans, programmes and projects should consider participatory processes that involve watershed stakeholders and apply modern self-management and local sustainable development methods.
- When formulating watershed management projects, it is important to include awareness raising and training for the different actors involved, and to generate timely, secure and accessible information that facilitates participation in decision-making.
- Watershed management requires mutual agreement among communities, the government and the private sector. Such consensus is obtained through consensus mechanisms, watershed agencies and inter-institutional networks.
- Incentives for encouraging the participation of all watershed stakeholders should be considered.

2) Political and institutional aspects:

- Development policies should consider watersheds as planning and management units in which actions can be coordinated, human and economic resources optimized, and natural resources protected and conserved.
- Policies and legislation should consider the decentralization of institutions and establish channels for institutional linkages at the local, regional and national levels. They should take account of local and regional development aspects, and ensure medium- and long-term self-management of the watershed.
- National policies should ensure the funding required to implement watershed programmes and projects, and should be enforced by decentralized watershed entities that manage their resources autonomously.
- Project goals should be set according to national development guidelines and strategies.
- There is a need for policies and legislation that facilitate the creation of watershed authorities under different management schemes (e.g. corporations, agencies, boards, committees) and foster the implementation of programmes and projects aimed at solving socio-economic problems and ensuring conservation of the natural resource base.
- Policies and regulations should take account of the current social, cultural, economic and environmental conditions and technical capacities, and should have the consensus of the various sectors and stakeholders.
- In order to avoid conflicts arising from different guidelines and to ensure consistency with the current political, legal and institutional framework, central governments should foster, regulate, manage, support and harmonize sectoral regulations, laws and policies that specify the roles, competencies and scopes of the different institutions involved.
- International agencies' projects should collaborate with national counterparts and watershed stakeholders in order to ensure a comprehensive and integrated approach.
- Through their ministries of foreign affairs, governments should participate more actively in the implementation of environmental protocols and agreements related to watershed management.

3) Internal and external benefits:

- Value-added production, marketing and trade activities should be designed to turn environmental advantages into competitive ones.
- Watershed programmes should aim to improve production, employment, food safety and intangible, social, environmental and cultural benefits, as well as the quality of life in upper, middle and lower watersheds.
- Programmes should include infrastructure development aimed at improving production, the environment and living conditions.
- Watershed inhabitants' incomes can be increased by activities related to tourism, scenic values and value-added production. Biodiversity conservation should be rewarded and schemes for fair and equitable benefit sharing fostered.
- Territorial linkages between watershed inhabitants and other stakeholders should be fostered and strengthened.
- Environmental value should be incorporated into watershed management.
- The formation of "social capital" and "heritage accounts" should be encouraged.
- The efficiency of watershed projects for local communities should be assessed through valuation methodologies and cost–benefit ratio studies.
- Criteria and indicators should be applied for monitoring and follow-up and to validate project results.

4) Other relevant elements:

- Demonstration watersheds and integrated agroforestry plots should be established in zones close to waterways.
- Watershed management programmes should be developed in priority watersheds in each country in order to build up a demonstration, experimental watershed network.
- Bioengineering and forest protection aimed at regulating water resources, restoring forest hydrology, reducing vulnerability in areas subject to flooding, and improving wildlife habitats should be included.
- The watershed concept should be used to promote synergy among organizations, agencies and international agreements.
- The development of shared watersheds should be promoted as a mechanism for integrating countries.
- Watershed management programmes should be related to implementation of Agenda 21, the Millennium Development Goals, and the Johannesburg Plan.