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COMPILATION OF CASE-STUDIES ON BEST PRACTICES AND LESSONS LEARNED FROM THE USE OF BIOLOGICAL DIVERSITY UNDER THE THEMATIC AREAS OF THE CONVENTION

Note by the Executive Secretary

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I. INTRODUCTION

1. In paragraph 3 of decision V/24, adopted at its fifth meeting, the Conference of the Parties to the Convention on Biological Diversity requested the Executive Secretary "to invite organizations involved in sustainable-use initiatives, and other relevant organizations, to gather, compile and disseminate through the clearing–house mechanisms and other means, case-studies on best practices and lessons learned from the use of biological diversity under the thematic areas of the Convention, drawing on the experience of Parties, Governments, relevant organizations, the private sector and indigenous and local communities". In paragraph 4 of the same decision, the Conference of the Parties requested the Executive Secretary to draw from an assessment of the case-studies practical principles and operational guidelines for the sustainable use of biological diversity, and guidance specific to sectors and biomes, within the framework of the ecosystem approach. In decision VI/13, the Conference of the Parties reiterated its invitation to submit case-studies on the sustainable use of biodiversity.

2. Following these two invitations, the Secretariat received a number of submissions, which are currently available on the Convention website at: http://www.biodiv.org/programmes/socio-eco/use/case-studies.asp. The present note reports only on case-studies that described best practices and lessons learned from the sustainable use of biological diversity under the thematic areas of the Convention. Information contained in section II is based on submissions by organizations involved in sustainable-use initiatives (and other relevant organizations), as well as on searches carried out by the Secretariat. Sources of information are mentioned at the end of each case-study.

3. Participants in the Fourth Workshop may wish to use the information contained in the case-studies to further develop the principles and operational guidelines contained in section II of the note by the Executive Secretary on the subject (UNEP/CBD/WS-Sustainable Use/4/2).

4. For each thematic area under the Convention, the document presents a brief description of the causes of biodiversity loss followed by the description of each case study. The case-studies have been structured following a common format which includes information on:

1. Location of the case-study/project
2. Summary/ brief description of the case-study/project
3. Expected outcome and /or results achieved
4. Best practices and lessons learned
5. Contact person responsible for the case-study
6. Source
7. Suggestions from the case-study for the further development of the principles and guidelines

II. CASE-STUDIES: SUMMARIES AND LESSONS LEARNED

A. Marine and coastal biodiversity

5. Numerous subsistence communities around the world are heavily dependent on animal proteins provided by marine fisheries, such as fin-fishes, crustaceans and molluscs. As reported in the Global Biodiversity Outlook (2001), 1/ marine capture fisheries have increased in number nearly five-fold in the past 50 years, rising to nearly 90 million tonnes in the late 1990s, thereby making up more than 70% of the total world production of aquatic resources. Over-exploitation, by-catch, habitat degradation and destruction as well as coral bleaching and unsustainable mariculture have resulted in a severe loss of marine and coastal biodiversity. Moreover, the lack of integrated cross-sectoral approaches to address the

1/ Secretariat of the Convention on Biological Diversity (2001), *Global Biodiversity Outlook*, UNEP, Montreal

wide array of interrelated issues pertaining to marine and coastal management has contributed to the further depletion and unsustainable use of resources.

6. The following case studies identify how integrated management can contribute to the sustainable use of resources, through the harmonization of policies and strategies as well as the sharing of relevant information.

A.1. Entrepreneurial marine protected areas: small-scale, commercially supported coral reef protected areas

Location: worldwide

Responsible organization: Coral Reef Alliance and other resorts and/or businesses.

Objectives and goals: To create an expanded network of small, locally run Marine Protected Areas that use tourism or other commercial support to achieve long-term economic and environmental sustainability of the protected area.

Brief description: Marine Protected Areas (MPAs) are widely acknowledged as having great potential for protecting coral reef habitats and related marine life. Despite this potential, many MPAs in coral reef areas lack sufficient funding and management and therefore do not provide any real protection. In some circumstances, dive resorts, which have a vested economic interest in promoting abundant marine life, can become the primary stewards of small-scale, commercially supported MPAs in coral reef areas.

Expected outcome: Entrepreneurial MPAs cannot provide the comprehensive protection ultimately required on a global level, but they may perform several valuable functions including:

- Protecting areas that serve as refuges for threatened marine life;
- Building local capacity in MPA management;
- Acting as test cases for MPA management techniques;
- Building public awareness of and support for MPAs;
- Providing core areas for larger, slower-developing MPAs.

Best practices and lessons learned: A simultaneous and complementary approach to the Global System of Marine Protected Areas is to create a network of widely dispersed small reserves in addition to the large reserves. Small-scale MPAs may be especially appropriate in coral reef areas, where nearby reefs can be managed by local communities and nongovernmental organizations. In addition to community-based MPAs, in certain circumstances dive resorts or similar commercial entities can act as the primary stewards of coral reef resources as managers of small scale MPAs. The key to success of this approach is to acknowledge dive resorts or other commercial entities as full partners in the planning and management of the MPAs, not just as potential sources of revenue to support the MPA. The lessons of community-based management strategies for coral reef areas, which also apply to commercially supported MPA efforts:

(a) Without substantial input of all key stakeholders in defining issues, selecting management strategies, and implementing management measures, the best-laid plans for MPA management can fail;

(b) Entrepreneurial MPAs have the advantage of using existing commercial infrastructure and management structures, making it possible to create small-scale MPAs more quickly and to institute management regimes more easily than with large-scale MPAs.

(c) There are reasons for hesitating to surrender control of an MPA to a commercial entity: there is great potential for abuse of power by a resort or other commercial entity that has profit as its

primary motive and does not answer to a public constituency. Nonetheless, the demonstrated potential of resorts to serve the public good through MPAs while pursuing private goals seems to justify exploration of whether more functional MPAs can be created and managed by private enterprises.

(d) While it is essential to guard against surrendering too much authority to commercial entities, this must be balanced by efforts to create a framework where the management potential of commercial partners is utilized.

It should be stressed that the entrepreneurial MPA approach is not intended to compete with either large-scale or community-based efforts to build MPAs. In fact, integration with other programmes and networks will be critical to the success of the programme. Further, this strategy will work only in limited circumstances. Most notably, it will work only in coral reef areas that have sufficient marine resources and are accessible enough to attract a steady, paying clientele of scuba divers and tourists to help offset the costs of the MPAs.

From a management perspective, the most successful MPAs in developing countries have been small-scale projects that include local stakeholder input and accountability.

For entrepreneurial MPAs to be truly successful they must be a part of a more integrated management approach that takes into account causes and effects outside the MPAs boundaries; entrepreneurial MPAs must be tied into a network that includes traditional, national, and international coastal and marine managers. The initial step, however, is to help create enough entrepreneurial MPAs so that the basic models can be tested and improved.

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Source: M.E. Hatziolos, A. J.Hooten, M. Fodor (Eds)(1998) *Coral reefs. Challenges and opportunities for Sustainable Management*, World Bank, Washington

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 2 and 7. In addition to the guidance contained in these two principles, governments and resource managers may consider to:

- ***Include the private sector as full partners in the management of biological diversity.***
- ***Provide co-management interventions with legal support and effective enforcement measures.***

A.2. The Marine Aquarium Council and environmental certification for the marine aquarium trade

Location: worldwide

Responsible organization: the Marine Aquarium Council (MAC)

Objective and goals: By creating credible, international, multi-stakeholder standards of practice where none exist, certification will ensure the marine aquarium trade is responsible and sustainable, at no cost to governments. This will create market incentives for industry to comply with standards of practice. The standards will be based on what industry, conservation industry, consumers and government work together to agree is needed for the trade to be responsible and sustainable. MAC is now an independent third party institution whose goal is to transform the marine aquarium industry into one that is based on quality and sustainability.

Brief description: MAC is working to:

- Develop standards for quality products and sustainable practices;
- Establish a system to certify compliance with these standards and label the results;
- Create consumer demand and confidence for certification and labeling.

In addition MAC is:

- Raising public awareness of the role of the marine aquarium industry and hobby in conserving coral reefs and other marine ecosystems;
- Assembling and disseminating accurate data relevant to the collection and care of ornamental marine life;
- Encouraging responsible husbandry by the industry through education and training.

The MAC Standards are to be tested and then put into work in pilot areas. Pilot certification will seek to include operations in at least the Philippines, Fiji, Australia, Indonesia, and Hawaii that will be linked to numerous importers and retailers in the US and Europe who are waiting to participate in the pilot phase of certification. Following the pilot phase, the certification system will formally be launched and become operational, and certified marine ornamentals will be available soon after that.

Over the two years following the implementation of the core standards, a more comprehensive set of "full standards" will be developed to address the broader more complex range of issues and approached to ensuring sustainability for the marine aquarium trade. the full standards will expand on the core standards and also include a set of standards for mariculture and aquaculture practices.

Results achieved: MAC is undertaking a major outreach effort to widely inform the marine aquarium industry, the hobbyists, government agencies and NGOs of the standards and certification systems and provide materials on how to participate. There will be training to ensure that the industry in developing countries has the skills and capacity to supply certifiable marine ornamentals.

Best practices and lessons learned: To achieve market-driven quality and sustainability in the marine aquarium industry, a comprehensive approach by an independent, multi-stakeholder institution is required to develop an international system of standard setting, certification and labeling, as well as raise awareness, demand, and confidence among the industry and consumers.

Market assessment shows that there is a strong demand for certified marine aquarium organisms and that this demand will increase rapidly when there is a comprehensive, international, independent certification system.

Certification will allow the industry and market to reject unsustainable, sub-standard practices and products. Sub-standard operators will be forced by the market to either adjust their practices "upward" or lose market support and leave the trade.

Developing countries with most reefs, and even developed countries, do not have enough funds to create, implement and enforce enough laws and management plans to protect all reefs all the time. Coastal communities with incentives to manage and conserve reefs can contribute to the effective and financially sustainable reef conservation and management. With market incentives and independent certification, coastal communities involved in the aquarium trade will have motives for becoming the guardians, stewards and enforcers of management and conservation, often in remote areas rarely visited by governments.

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Source: The Marine Aquarium Council

Suggestions from the case-study for the further development of the principles and guidelines

This case-study is linked to principle 2. In addition to guidance contained in this principle, governments and resource managers may consider to:

- ***Create international multi-stakeholder standards of practice to ensure a responsible and sustainable trade of biodiversity.***

A.3. Management of avian ecosystems in Seychelles

Location: Seychelles inner granitic islands

Responsible organization: BirdLife Seychelles, in collaboration with the Ministry of Environment and Transport, the Ministry of Foreign Affairs, and the Ministry of Finance.

Objectives and goals: The Management of Avian Ecosystems in Seychelles is a three-year cooperative project, which aims at improving the understanding of endangered ecosystems and species of the granitic Seychelles Endemic Bird Area (EBA, and contributing to their management and sustainable use.

Brief description: The project consists of several components including island assessments, ecological studies of three of the four critically endangered endemic birds, in addition to ecosystem restoration activities. The management and restoration of the upland forest, coastal wetland, coastal plateau and their threatened endemic bird taxa are improving. Secondly, the project allows for the assessment of threatened endemic biodiversity globally. A short list is under compilation stating potentially restorable islands, initial actions taken to restore at least one of these and preparations made for the successful translocation of at least one of the three endemic bird taxa. Thirdly, the project is resulting in replicable management models for tropical island habitat and bird conservation. Fourthly, training and partnerships are increasing the capacity for field-based management of threatened ecosystems throughout the Western Indian Ocean. The project intends to create socio-economic models and measures for island restoration and management.

Results achieved: The project has led to excellent institutional development. Skills in conservation science, notably research and monitoring, biodiversity assessment and database management have also been improved.

To date, all the physical objectives have been met. Creation and dissemination of awareness and educational materials have matched project expectations.

Key information on globally threatened bird species and their ecosystems has been gathered and analysed. These activities will lead to better management and information about necessary habitat improvements.

Lessons learned: The importance of recruiting and retaining an experienced project coordinator demonstrated to be a keystone for successful project implementation.

The input of existing BirdLife Seychelles resources and staff has proven to be indispensable. A significant lesson for any such future operations is that implementing organizations can build expertise through a

project. These organizations should have existing capacity and intrinsic institutional strengths with perhaps international links to support the project at various stages.

The implementation modality of the projects seems to represent a "paradigm shift" for Seychelles in that a local NGO is leading the implementation of a major conservation project supported by significant multilateral funding. The role of governments as "facilitator" in multilaterally funded project execution is perhaps novel for this country and could be a successful model for the future.

The above notwithstanding, the experience with implementing the project has demonstrated that there is an insufficiently-developed legal framework with regard to the nature, role and operations of NGOs which has perhaps constrained progress of the project. This is maybe because active NGOs are so few in number in Seychells and none have implemented such a multilaterally funded project previously.

The project, to date, indicates that well directed and designed activities remove barriers to successful and sustainable ecosystems management. To ensure sustainability and momentum of the project, it is advisable that a future project carries forward the capacity developed for island assessment, conservation science and restoration. In addition, there is a need to establish participatory processes to create a common vision for sustainable island management amongst the wide diversity of stakeholders in Seychells.

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Source: Division for Sustainable Development (UN/DESA)(2001) *Sustainable Development Success Stories, Special issue on Small Island Developing States*, New York

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principle 7. In addition to guidance contained in this principle, governments and resource managers may consider to:

- ***Assess and enhance the role of local NGOs in project management.***

B. Inland waters biodiversity

7. Over-consumption of water resources together with pollution by chemicals and waste water are menacing biological diversity in inland water ecosystems. Aquatic environments are often degraded by industrialization, urbanization, deforestation, mining and agricultural land and water uses. These threats are, in some cases, exacerbated by economic turmoil, poor land tenure and lack of enforcement of environmental laws. An unsustainable 80 percent of water used in the developing world is for agriculture, and in 2015 many developing countries will not be able to maintain their levels of irrigated agriculture thus affecting their food security and public health. Water tables under most of the main grain-producing areas are falling.

8. The continued availability of inland water ecosystem resources is an indispensable requirement for the health and prosperity of human communities and is vital for the maintenance of biodiversity. Biodiversity is a key determinant of the structure and functioning of the ecosystem complexes which help maintain the hydrological cycle and water quality. Understanding of the interactions between the biotic and abiotic components of the ecosystem is essential for developing sustainable use models of inland water resources.

9. The case studies presented below indicated that there are several activities that can be undertaken to promote the sustainable use of biological diversity in inland water ecosystems.

B.1. Guidelines for wise use of Hadajia-Nguru Wetlands

Location: North-eastern Sudan-Sahelian zone of Nigeria

Responsible organization: IUCN / Hadejia-Nguru Wetlands Conservation Project (HNWCP)

Objectives and goals: Focus of the project has been the maintenance of the economic and ecological functions of the Wetlands in particular, and the promotion of sustainable development in the Yobe basin in general.

The specific objectives of the project aim at:

- Developing and advocating a master plan for the sustainable management of water resources in the Yoba basin, in conjunction with proposals on the institutional framework and expertise required for implementing the plan;
- Developing and extending technologies, in collaboration with local people, for the sustainable utilization of the resources of the wetlands;
- Improving the management of protected areas and providing guidelines for the wise use of natural wetlands resources.

Summary: In Nigeria, in spite of the dramatic increase in the appreciation of their values, wetlands remain one of the most threatened and critical ecosystems. It is in this context that the IUCN/Hadejia-Nguru Wetlands Conservation project, as a major aspect of its efforts towards conservation and wise use of the Hadejia-Nguru Wetlands, decided to develop standards and guidelines for the sustainable use of the natural resources of the Wetlands. In order to develop the plans and guidelines, the project conducted studies on the hydrology and socio-economy of the basin, with a focus on the wetlands, so as to gain a clear scientific insight of the issues at stake. In order to develop the technologies for the sustainable utilization of wetlands resources, the project undertook a number of pilot projects that demonstrate how the productivity of some land-use practices could be increased without damaging the stability of the ecosystem.

Furthermore, in order to sell the plans and guidelines to the responsible institutions, as well as to organizations and communities that will be affected in the process, the project undertook some advocacy and awareness campaigns.

Results achieved: The primary outcome is the development of preliminary standards and guidelines that could ensure that the resources provided by the wetlands are utilized sustainably. Information is provided on the status of the natural resources of the wetlands and how they are used in order to: isolate specific threats to the continued availability of resources, identify uses to which the wetlands resources could be put in order to improve livelihoods and present the standards and guidelines that need to be adhered to for the sustainable use of the resources.

Best practices and lessons learned: Sustainable management of an area as diverse as the HNW, with its complex socio-economic setting, required steps that go beyond mere removal of the threats to the ecology of the wetlands. Technical steps had to be combined with appropriate institutional arrangements that were perceived by the local communities as bringing about significant improvements in their welfare, in order to arrive at a management regime that is sustainable.

It was important to base the management of the protected areas on the biosphere reserve concept, by which the most valuable or sensitive parts of the protected areas are to be designated core areas, to be managed strictly according to plans that will ensure maximum preservation of the objects of protection,

which may include ecotourism; while the areas around the core are managed variously as the buffer or support zone, portions of which can be available to local communities for traditional uses, while others are set aside as recuperation/regeneration zones, planted refuges or managed resources reserves such as game reserves, partitioned grazing land or areas set aside for the enhancement of production of natural resources.

Effective management of the protected and open areas of the wetlands depends on the use of experts to provide the detailed techniques for management. Wildlife experts for the protected areas, crop production experts for cultivation techniques, livestock production experts to work out carrying capacities for different land use scenarios and natural resource use experts should work hand in hand to assist the local communities to achieve optimal integrated use of the wetland resources.

It was concluded that it was necessary for the various management committees for the different reserve zones to arrive – through participatory processes – at a suitable mixes of legal, financial, socio-cultural and economic tools for attaining their defined objectives. Moreover, the example analyzed confirmed the importance of the ecosystem approach and the biosphere reserve concept in achieving integrated management and sustainable use of biological diversity. These two paradigms have proven to be fundamental pillars in the understanding of ecosystems functions and their interactions with human activities as well as effective management tools.

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Source: D. Okali and H.H. Bdliya (Eds)(1998) *Guidelines for Wise Use of Hadejia-Nguru Wetlands*, IUCN - The world Conservation Union, Geneva

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 4 and 7. In addition to guidance contained in these two principles, governments and resource managers may consider to:

- ***Apply the biosphere reserve concept for the effective integrated management of protected areas;***
- ***Involve a wide range of experts together with the local community while planning for the management of a protected areas;***
- ***Establish, through participatory processes a mix of legal, financial, socio-cultural and economic tools to facilitate the management process.***

B.2. Artisanal fishing sustainable development and co-management of resources

Location: West Africa – Guinae Bissau – Rio Grande de Buba region

Responsible organization: IUCN The World Conservation Union

Objectives and goals: The project was initially based on the concept of "developing to conserve". It was conceived in 1991 and was planned to apply the principles of sustainable development, to implement a precautionary approach to resources and to include participatory management. The more precise objectives of the project is to define and establish mechanisms that would allow as long term as possible use of existing fisheries resources to the benefit of local populations.

Also the practical objective was to test whether it was possible to set up environmental conservation and fisheries resources management mechanisms in a developing country characterized by poor knowledge of the resource characteristics and scarce financial and human resources.

Summary: Based on an integrated approach within the field of fisheries, the principal mechanisms of the project consist of:

- Involvement of all parties;
- Carrying out modular micro-projects;
- Establishing an initial financing system (micro-credit type);
- Bio-ecological monitoring of the resources;
- Institutional and judicial support for the State.

This project has chosen to give priority to one main axis, the fisheries sector. It has been approached in a very broad way: capture knowledge and management of the resource; transformation and valorization of fish; commercialization; legislative aspect.

Results achieved: Achievements regarding knowledge about the environment and the resource and its exploitation are considerable, given the resources used. The first study carried out provides the physico-chemical characteristics of the Rio Grande de Buba over an annual cycle. The specific catches from each different mesh size of drift nets were described, providing a basis for the first minimum mesh size regulations.

A study on the characteristics of the fisheries of the Rio Grande de Buba has lead to a document that envisages which forms of exploitation should be developed, and details planning and regulation measures to be established. Since the project started, it has stimulated regular meetings between the different parties involved. These parties, meeting as a committee, enabled the exchange of information and, for example, the results of bio-ecological and fisheries studies were regularly presented to those concerned. The annual evaluations of micro-projects were also formally given.

The credit system set up greatly mobilized the population. It worked convincingly and it could be generalized to a large number of economic activities. Rather than supporting only the fisherman the training approach of the credit system meant it could be a collectively appropriated, leading in turn to a great dynamism and letting a progressively greater number of people for the community benefit.

Best practices and lessons learned: Normally the material and human means used should be proportional to the area. When this is not the case, there is the risk of dispersion, the data are more varied but their robustness is lost. To avoid a heavy protocol each month, the existing data could allow a few biologically significant periods to be defined during which sampling could be intense. With the aim of optimizing both available time and material, an important question to consider is what are the motivations of the routine collection of environmental parameters and what use will be made of these data.

Experience shows that a small fisherman often possesses complex knowledge and can easily become an intensive fisherman and predator under certain conditions, which are more often social than technological or environmental. A more thorough comprehension of the socio-cultural context would better enable the factors of success to be determined. The approach could then be adapted more efficiently to other human contexts when it is reproduced, and would give a presentiment to the conditions of “divergence” during the development of a fishery.

The project was lunched on the assumption that the money or material lent to the fishermen would quickly be refunded, and thus that the profitability of the exploitation would be significant. In addition it was clear that the fishery resources were abundant, which made this assumption reasonable. However, when this type of project is reproduced in a different country or context, it would be wise to first plan a study of the potential profits, in order to be sure about making such an assumption.

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Source: E. Baran and P. Tous (2000) *Artisanal fishing, sustainable development and co-management of resources. Analysis of a successful project in West Africa,* IUCN - the World Conservation union, Geneva

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 4 and 12. In addition to guidance contained in these two principles, governments and resource managers may consider to:

- ***Assess different form of exploitation and use the assessment as the basis for planning and regulation measures to be established.***

C. Agricultural biodiversity

10. Agricultural biodiversity is largely created, maintained and managed by humans and, in addition to food production, provides some environmental services generated by natural ecosystems. Indeed, all forms of agriculture, whether intensive or extensive, are entirely dependent on biodiversity for the supply of plant and animal genetic resources for production and for the provision of essential ecological services, such as the maintenance of soil fertility, nutrient cycling, pollination, erosion control, and pest and disease control. In addition, agricultural biodiversity often presents cultural and spiritual values associated with traditional rural landscapes.

11. Case-studies examined indicated the need to investigate further traditionalmanagement systems and improve upon them with a view to ensuring sustainability of uses. The regeneration of traditional systems together with the participation of local farmers in research and assessment of appropriate technologies could facilitate the establishment of locally run small-scale enterprises and enhance the quality of products. In addition, the role of economic instruments as an effective alternative to regulations for the promotion of sustainable uses should be explored. The issue of land productivity should also be addressed and risks associated with agricultural intensification should be considered while planning for new crops and land-uses.

C.1. Agricultural intensificaton, indigenous knowledge and the critical role of business community

Location: Worldwide. Specific case-study: Manaus, Brazil

Responsible organization: Study of the World Bank
Objectives and goals:

- Identify some of the critical dimensions of the issue, highlight their many facets, and suggest policies that mitigate adverse effects of agriculture on the environment.
- Transform unsound agricultural practices so that productivity increases while the adverse effects on biodiversity decrease.

Brief description: Eutrophication of lakes and estuaries, loss of soil microorganisms, accelerated soil erosion, contamination of groundwater, and draining of wetlands attest to the dangers inherent in intensifying agriculture without regard to the long-term consequences for the natural resource base. But agricultural intensification is not synonymous with such externalities; these are environmental signals that intensification is being approached the wrong way.

Many of the innovative approaches to marketing the untapped wealth of biodiversity in Latin America are likely to come from relatively small-scale enterprises. One example is Kapot International based in Chagrin Falls, Ohio. Kapot has a Brazilian subsidiary in Manaus and markets Amazonian fish. Kapok will begin marketing some unusual Amazonian fruits for the juice and candy industries in North America. With assistance for the International Finance Corporation (IFC), an innovative trust fund has been established to spur greater private-sector investments and better use and management of the wealth of biological resources in Latin America.

Expected outcome and/or results achieved: Sustainable agricultural intensification would include such approaches as:

- More rational use of nutrients, space, and energy in all land-use systems;
- Greater recycling of nutrients;
- Better use of biological resources to raise and maintain yields of crops and livestock;
- Greater appreciation for and use of indigenous knowledge, especially of neglected crops that could help improve livelihoods and the environment;
- More effective measures for soil and water conservation;
- The deployment of "environmental corridors" in landscapes that have been transformed by agriculture and livestock-raising.

Best practices and lessons learned:

- A blend of modern science and indigenous knowledge will be required to face the challenges of increasing agricultural production in the decades ahead.
- The process of crop livestock intensification needs to be explored across a range of land-use systems to highlight specific strategies for raising yields while alleviating biodiversity loss.
- Instead of excessive reliance on an arsenal of potent chemicals to improve soil fertility and thwart the attacks of insects and decease-causing organisms, agricultural research is geared increasingly to manipulating genes and releasing predators of crop pests, among other biological assets. When crops and livestock are bred so that they can thrive under the incessant onslaught of challenges to productivity, agricultural production systems become more resilient.
- Economic growth and poverty alleviation hinge in large measure on managing biodiversity in habitats transformed by humans, such as farmland, rangeland, and forests exploited for lumber and non-timber forest products. How farmers and livestock owners manipulate natural resources is therefore critical to the question of conserving biodiversity.
- Some land-use practices, such as the indiscriminate use of pesticides, destroy some crop pollinators and therefore have a tangible negative effect on agro-biodiversity. Overuse of pesticides can also create a boomerang effect by eliminating predators of crop pests, which then develop resistance to pesticides.
- Work is already under way to address a range of issues related to off-site effects, including reduction or elimination of agricultural pollutants in groundwater and in run-off and greater emphasis on integrated pest management strategies.
- Incorporating indigenous knowledge is thus an integral part of the new paradigm for agricultural research and development that is emerging at various speeds in different parts of the world.
- Market forces can be harnessed to ferret out crops or old varieties that are in danger of slipping into extinction and promoting them.

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Source: J.P. Srivastava, N.J.H. Smith, D.A. Forno (1996), "Agriculture as Friend and Foe of Biodiveristy", in *Biodiversity and Agriculture Intensification*, World Bank, Washington

Suggestions from the case-study for the further development of the principles and guidelines

This case-study is linked to principles 5. In addition to guidance contained in this principle, Governments and resource managers may consider to:

- ***Identify and eliminate land-use practices that have a negative effect on biodiversity, investigate alternative methods and practices and implement them.***

C.2. Appropriate technologies for improving productivity of marginal farms

Location:

- Alutila, Khagrachari, Chittagong Hill Tracts, *Bangladesh*
- Tanguanyao, Pisha, Ningnan, Sichuan, *China*
- Masangping, Lutie, Ningnan, Sichuan, *China*
- Suongjang, Mokokchung, Nagaland, *India*
- Chimmi, Papumpare, Arunachal Pradesh, *India*
- Godawari, Lalitpur, *Nepal*
- Paireni, Mugling, Chitwan, *Nepal*
- Begowal, Islamabad, *Pakistan*
- Pari, Islamabad, *Pakistan*

Responsible organization: International Center for Integrated Mountain Development (ICIMOD)

Objectives and goals: The overall programme goal is to find sustainable ways for more productive use of marginal farmlands in the mountains in order to combine reasonable improvements in the standards of living of local farming communities with sustainable use and management of natural resources. The main objectives of the Phase-II programme are:

(a) To develop, refine, and demonstrate prototype, cost-effective SALT (sloping agricultural land technology) techniques and other appropriate technologies that will enhance the productivity of agricultural land while conserving soil and its fertility; and

(b) To strengthen further the capacity of national agencies to spread awareness about SALT and other appropriate technologies through training, workshops, exchange of experiences, and networking.

Brief description: The marginal quality of farmland has made it difficult to achieve the strategic objectives of poverty alleviation and natural resource management. The evidence shows that people living in marginal and fragile resource zones care more about more productive (economic benefits) unit than unproductive unit of the same type of land resource. The major gap presently is identified in the lack of

technological options that can meet the two objectives simultaneously. Therefore, the focus of this programme is on finding technological options that ensure that marginal farms become economically more productive, while contributing to the conservation of the natural resource base. With this in mind, technological options for soil, water, and nutrient management on marginal farms and their dissemination through training, human resource development, and institutional capacity building will receive special attention.

Results achieved:

- Among the technologies evaluated, Sloping Agricultural Land Technology (SALT) has been identified as the most promising and relevant technology for mountain farming, because it is effective in reducing soil erosion and in maintaining and improving soil fertility.
- Phase-I of ICIMOD's Project on Appropriate Technologies for Soil Conserving Farming Systems (ATSCFS), funded by the Asian Development Bank (ADB), was successfully implemented during the period from March 1994 to December 1997 in six of the ICIMOD member countries, namely, Bangladesh, China, India, Myanmar, Nepal, and Pakistan.
- The major focus of Phase II remains to be the testing, demonstration and training on Sloping Agricultural Land Technology (SALT) and other technologies.

Best practices and lessons learned: Networking and partnerships are the key implementation strategy of the project and hence are critical. The project has played a key role in bringing together different agencies to focus on the common problems of soil erosion, fertility decline, and inappropriate water management on sloping lands. These agencies range from national policy-making ones to field-based organizations in different countries. Exchange of planting materials and literature and sharing and exchange of research data, experiences, and lessons are being undertaken. In addition, assessment of technologies and policies are slowly generating greater interest at national and local levels regarding soil erosion. These interactions have been instrumental in generating an increased appreciation of the integrated nature of the problem of soil erosion — covering soil conservation, nutrient depletion, soil fertility, water management, and crops and their economic benefits.

Although numerous factors contribute to decline in land productivity, soil erosion together with nutrient loss, excessive use of chemical fertilizers, and low soil organic matter are the main ones.

The findings from socio-economic surveys carried out at project sites indicate that although soil loss and fertility decline on agricultural lands are two critical factors contributing to declining land productivity and land degradation, farmers as well as government agencies have paid limited attention to the soil erosion problem. Excessive use and inappropriate application of chemical fertilizers have led to negative effects on soil, and the efficiency of chemical fertilizers is very low.

Strengthening the capacity of national agencies to transfer skills and knowledge and to spread awareness about SALT and other appropriate technologies through training, workshops, exchange of experiences and networking is a priority for the success of the project.

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Source: *www.icimod.org*

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 5, 9 and 13. In addition to guidance contained in these three principles, Governments and resource managers may consider to:

- ***Implement training activities prior to the start of a project in order to enable stakeholders to achieve a full technical knowledge of the requirements and instruments available.***
- ***Ensure information on the project is exchanged among all relevant stakeholders.***

C.3. Agro-pastoralism and biodiversity conservation in East Africa

Location: Maazinland, Tanzania. The area encompasses some 35,000 square kilometres. It is surrounded by the Serengeti and Ambroseli national parks, Mount Meru and Kilimanjaro and some ecosystems to the south, the boundaries of which are unclear.

Responsible organization: Study of the IUCN Forest Conservation Programme

Objectives and goals: Traditional pastoral communities should be allocated specific areas for rotational grazing to allow livestock raising. This will entail a change in the existing land tenure policy to allow for communal property ownership and institution of grazing control measures. Efforts should also be made to study traditional management systems and improve upon them to ensure their sustainability.

Summary: Biodiversity conservation in the Masaai ecosystem has mainly been confined to the protected areas. It is now realized that there is significant biodiversity in the non-protected development areas. These lands are subject to increasing degradation and resultant biodiversity loss because of human population pressures.

Apart from biological and ecological importance, the biodiversity of Maasiland has consumptive values that include commercial harvesting and sale of resources such as meat, leather, honey, timber, and aviary birds. These products make a substantial contribution to both the local and export economy of Tanzania. Other consumptive values of biodiversity include the use of wood and dung and different uses of wildlife products, from medicine to house construction.

The tightly-knit and sedentary settlement pattern, together with increased commercial farming, has restricted the nomadic life style of the Maasai and game animal migration. The result has been a reduction of dry seasons pastures, a decline in pasture quality due to overgrazing, an intensified competition between wildlife and livestock for pasture and water, and a restriction of individual livestock holdings and herds.

Expects outcome:

- Restoration of traditional Maasai management strategies, which ensure that families had the right type of livestock at any given point in time. Restoration of a wide spectrum of adaptive livestock grazing strategies designed to minimize the effects of drought.
- *Group ranches*: revision of the concept of "group ranches" so that pastoralists receive exclusive leasehold right of occupancy in consideration of their traditional or communal land rights.
- *Rotational grazing*: it is recommended that truly pastoral villagers who live nomadic or semi-nomadic lives should be allocated specific areas that are suitable for livestock-raising. They should then be allowed to practice rotational grazing in those areas instead of using unsystematic ways of moving their animals in search of pasture and water.

Best practices and lessons learned:

- The immediate measure needed to achieve the objective is to correct the inadequacies of existing land-tenure policy to allow for communal property ownership in Tanzania. Existing laws regulating land tenure are both confusing and outdated.

- Traditional pastoral practices are capable of effective regulation of land use when blended with modern techniques, and may lead to the development of sustainable pastoral systems and conservation of biodiversity.
- Although traditional land husbandry systems are now believed to be sustainable, they are not being assisted or given the opportunity to evolve to higher technological levels. They are instead an over-taxed, impoverished and neglected sector. Efforts should be made to study traditional management systems and improve upon them to ensure their effectiveness.
- There is need for a concerted search for policies and strategies, which take into account innovative approaches to natural resource conservation and development. Biodiversity can be sustained and enhanced by encouraging the regeneration of traditional indigenous systems.
- Research and development programmes should include those plants and animals now neglected by traditionally valued by local communities. Participatory approaches could be of great use to this end and would help ensure effective management of rangelands and conservation of biodiversity.

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Source: R.B.B. Mwalyosi (1995), in P. Ahalladay and D.A.Gilmour (Eds)*Conserving Biodiversity Outside Protected Areas. The role of traditional agro-ecosystems*, IUCN, Geneva

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 4 and 7. In addition to guidance contained in these two principles, governments and resource managers may consider to:

- ***Include farmers and indigenous and local communities as research partners, in the assessment of the technologies they will have to use;***
- ***Explore and study traditional management systems and improve upon them to ensure their effectiveness***

D. Forest biological diversity

12. Forest ecosystems play multiple roles at the global and the local levels, as providers of environmental services and as a source of economically valued products. Moreover, forests are estimated to contain half of the world's total biological diversity and primary forests have the highest species diversity and endemism of any ecosystem type (Global Environmental Outlook 3, 2002). Despite the many programmes and initiatives under implementation at the global and national levels, biodiversity loss persists due to rapid deforestation, fragmentation and degradation. In the 1990s, the total loss of natural forests has reached 1.61 million hectares a year, of which 1.52 million is lost in the tropics. The main causes of biodiversity loss are human-induced and include: conversion to other uses (mainly agricultural land), overgrazing, unmitigated shifting cultivation, unsustainable forest management, introduction of invasive alien plant and animal species, infrastructure development, mining and oil exploitation, forest fires caused by humans, pollution and climate change.

13. The case-studies reported below depict some of the main recommendations for the sustainable management and use of forest biological diversity. Precondition to any action is the development of integrated management strategies, which should include social, cultural, economic and environmental considerations of the communities using the resources. Examples highlight the significance of economic aspects and tools for community involvement in the conservation and utilization of forest resources, explore the role of incentive measures in inviting and assisting local involvement, and report on business opportunities which arise from the marketing of biodiversity products. As far as technologies are concerned, all examples indicate the need to blend traditional knowledge of the resource with modern techniques and instruments for the optimization of uses and the identification of the most suitable conservation strategies.

D.1. Sustainable management of mangrove forests in Asia

Location: Asia. About the 40 per cent of the world's mangrove forest occur in Asia in countries between Arabian peninsula in the west and Japan in the east. There are substantial areas of mangrove forests in countries like Pakistan, India, Bangladesh, Myanmar, Thailand, Cambodia, Viet Nam, Malaysia, Indonesia and the Philippines.

Responsible organization: various Governments

Objectives and goals: The sustainable management of mangrove formations in many South and Southeast Asian countries

Brief description: Mangroves play a very important role in the lives and economies of coastal communities as these communities often depend on mangrove forests for meeting their need of products, as well as the generation of income.

The Sundarbans, which is the single largest chunk of contiguous mangrove forest in the world, has been under sustainable management for more than a hundred and twenty years. Scientific management of mangrove forest was first initiated in the Sundarbans in the 1870s when a Forest Management Division was established exclusively for the management of mangrove forests of the Sundarbans in the Gangetic Delta. The Matang Forest in Malaysia has been under appropriate management from the 1920's. Mangrove forest formations in a number of countries in the region have been under appropriate management regimes for decades.

Regulated harvest of mangroves began in several countries in the region in the last century. In the early stages, only harvest from assigned areas within the forest was being practiced in these countries where the mangrove forest where mostly under the control of governments. In most cases revenue was collected against the harvest of a specified quantity of wood.

Results achieved: Based on the silvicultural requirement, local conditions and the objective of fulfilling the demand for specific products, site and situation specific management regimes have been developed in these countries to guarantee the supply of deliverable products, while ensuring the sustainability of the forests. These management practices have withstood the test of time and have proved that the management interventions have been appropriate because these forests still exist in good condition even tough they have been providing a steady yield of products for several decades.

Best practices and lessons learned: Even though very few efforts have been directed toward the sustainable management of mangroves in general in Asia, the conservation of their habitat and the general protection of forests and their resources have played a major role in the conservation of wildlife in mangrove forests. Even though this arrangement is not enough, the general protection of mangrove forests and the limited conservation and management efforts have played a major role in wildlife conservation in mangrove forests like the Sundarbans.

The management of mangroves in Asia, particularly in Bangladesh, India and Malaysia, has been in place for several decades and has withstood the test of time. The Sundarbans in Bangladesh have been under a

simple, easy-to-implement management regime, which was installed more than a hundred years ago. This has ensured sustainability and if the management practices are followed properly, this will ensure maintenance of the stands in stable condition for an indefinite period of time.

The clear-felling system employed in South-East Asian countries has also given equally good results. There has not been much change in the crop quality at Matang over the last 70 years. The fact that the current crops of trees are smaller in size has resulted from a short rotation designed to produce smaller sized trees for charcoal manufacture.

One major weakness of the management regimes implemented in Asia mangrove forests is that they almost exclusively aim to specifically manage economically important species of plants. A mangrove forest is not just a collection of trees. It is an ecosystem which has a rich diversity of both floral and fauna resources. A management strategy for the integrated management of all resources of a mangrove forest has not been formulated yet.

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Source: Z. Hussain (1998), Sustainable Management of Mangrove Forests in Asia, in H.A. Van der Linde and M.H. Danskin, *Enhancing Sustainability. Resources for our future*, IUCN , Geneva

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 4 and 6. In addition to guidance contained in these two principles, Governments and resource managers may consider to:

- ***Consider and manage also biodiversity resources which are not recognized as economically important species***

D.2. Community forest management: the case-study of Chilota and Seke communal areas

Location: Zimbabwe

Responsible organization: IUCN – the World Conservation Union

Objectives and goals: The major objective of the case-study is to analyse local community rules and practices of sustainable woodland resource management in Chihota and Seke Communal Areas and to identify policy and legislative implications that may enhance forest management in a variety of conditions.

Brief description: In Zimbabwe, the tenure regime in communal areas is described as a common-property regime, although in practice communal resources are managed under State property rules. Where there has been meaningful devolution to suitable local-level institutions, and effective administrative systems are in place, then common-property regimes can enforce exclusion. Under such circumstances, common property is no different from "private property". Given this situation, if investment is made in an asset, such as improved woodland with high shrinkage potential, the lack of effective administrative systems and policies as characterizing open-access systems ensures that use rates will eventually deplete the resource.

Results achieved: The methodology was designed to capture the following information:

- The presence of community managed woodlands;

- The rules governing woodland resource use and management;
- Household compliance with rules governing woodland resource and management;
- The presence of monitoring and sanctioning for rule violators;
- Benefits derived from the woodlands;
- Roles of outside institutions in the management of the woodlands, and
- Problems encountered in the management of the woodlands.

Best practices and lessons learned: The separation of forest management from other farming activities led to the creation of separate tenure regimes for forests and land, thereby fueling competition between different land uses. The end result has been that the country's forests have suffered more from the commercial and strategic value placed on them than by the broader social, cultural, economic, or environmental considerations of local communities.

The case-study offers a powerful argument for the need to address the problems of lack of legal tenure over local resources. Successful sustainable forestry-resource utilization is based on the creation of boundary and authority rules determining who can use resources, when, and how much. Boundary and authority rules exist in the communities under discussion but are not always respected due to the inherent limitations in authority that characterize the rules themselves. Hence, it is important that the locally derived rules be formalized into law. The communities need full legal and administrative authority over the forest resources.

The study also revealed the absence of any local territorial authority that can sanction decisions affecting communities such as state regulations, plans, and land allocation. Effectively, the community does not have rights to question the legitimacy of State interventionism. As a result, the communities cannot challenge certain contradiction between local practice and rules, on the one hand, and State policies and laws on the other. The situation is further exacerbated by confusion of roles between central government, local government agencies, and traditional community structures.

The result of the case-study suggest that monitoring of local forest resources was not effective despite the interest of the community and in some instances the employment of forest rangers. The communities expressed strong views regarding monitoring and sanctioning. Their view that the role of monitoring is best done by government is an indication that the government is seen as the police.

The inability to enforce the rights of communal residents over their resources is contributing to a new form of communal tenure without State involvement. In the study area, farmers have resorted to "privatizing" forest resources by fencing-in forests closest to the homesteads. This practice enables farmers to monitor the resource more closely and it guarantees supply availability. So, in the absence of delegated authority and rights, communities are devising local strategies that give them territorial authority and the ability to exclude "outsiders".

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Source: Y.Katerere and E.Guveya (1999), Community forest management practice: a case study of Chihota and Seke Communal Areas, in J.Oglethorpe (Ed.) *Tenure and Sustainable Use*, IUCN, Geneva.

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 1 and 2. In addition to guidance contained in these two principles, Governments and resource managers may consider to:

- ***In addition to the commercial value of biodiversity, consider the social, economic and environmental value it can have for indigenous and local communities;***
- ***Address the problem of the legal tenure over local resources.***

D.3. The Beverly and Qamanirjuaq Caribou Management Board (BQCMB)

Location: Canada

Responsible organization: The Beverly and Qamanirjuaq Caribou Management Board (BQCMB)

Objectives and goals: To safeguard the caribou of the Beverly and Qamanirjuaq herds for traditional users who wish to maintain a lifestyle that includes the use of caribou, as well as for all Canadians and people of other nations.

Among the goals:

- To ensure that caribou are accessible and available to traditional users;
- To increase knowledge of caribou ecology;
- To encourage the wise use of caribou;
- To cooperate with other northern wildlife management boards and to involve local individuals and organizations in management programs;
- To strengthen public support for the conservation of caribou;
- To recommend management action to maintain population levels for each herd between a minimum of 150,000 (crisis herd size) and levels that can be sustained by the range while maintaining good caribou condition.

Brief description: The BQCMB is a group of hunters, biologists and wildlife managers working together to conserve Canada's vast Beverly and Qamanirjuaq caribou herds for the welfare of traditional caribou-using communities and others. The BQCMB was created to help manage two caribou herds whose migratory routes straddle two territories, two provinces and four different native cultures. The board consists of 12 members, including a chairman and vice chairman. Appropriately, since the main purpose of the board is to safeguard the caribou herds in the interest of aboriginal people who have traditionally relied upon caribou, the majority of board members represent aboriginal communities.

Results achieved: Among the most recent projects:

- While mining developments promising to alter the landscape of Canada's North, the Beverly and Qamanirjuaq Caribou Management Board took steps to research and map out the most important habitats of the Beverly and Qamanirjuaq range.
- A "hunting wisely" poster was distributed to caribou-range communities . The Board worked with area hunters to hammer out a hunter's code of ethics – a kind of moral manual for the hunting profession that crosses provincial and territorial borders.
- The BQCMB's newsletter has began publication in 1997, and it has been well received by the public.
- In May 2000, the BQCMB agreed to create a long-term ongoing monitoring system that uses local/traditional knowledge as well as science.

Best practices and lessons learned:

- The success of a monitoring project depends on the project organizers working with the region's communities before the project as started, to establish a relationship of trust.
- The monitoring process requires following some simple but important principles: "going slowly, keeping it simple, staying relevant to the needs and concerns of communities, economizing where possible, and thinking long term".
- It is essential to gain knowledge from local experts.
- Indicators are essential tools to track what is or is not changing on the land. The best indicators are easy to use, can be measured year after year, have past records, and give people meaningful information.
- Effective caribou management must be based on cooperation and communication among traditional users and governments.
- Improvements in caribou hunting methods and the use of caribou will be necessary and could involve principles of allowable harvest, voluntary harvest restraints, and more effective harvesting techniques.
- Aboriginal people demonstrated remarkable courage in abandoning past positions. One was that permission to satellite-collar caribou would never be given, because such tampering of the animal was seen as disrespect, interfering with the natural cycle of the caribou's life.
- Government board members have learned to be patient. They have learned to understand that aboriginal people avoid snap decisions and generally prefer decision by consensus. Aboriginal people prefer prolonged discussion that includes elders in each community.

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Source: Canadian submission: A compendium of selected projects, initiatives and activities related to the sustainable use of biological diversity (August 2001) and BQCMB web site.

Suggestions from the case-study for the further development of the principles and guidelines

This case-study is linked to principles 4 and 12. In addition to guidance contained in these two principles, Governments and resource managers may consider to:

- ***Facilitate cooperation and communication between traditional users and governments***
- ***Compile information on traditional sustainable uses in collaboration with traditional experts and combine the information obtained with modern technologies.***

E. Dry and sub-humid land biological diversity

14. By definition, dry and sub-humid lands include dryland, Mediterranean, arid, semi-arid, savannah and grassland ecosystems (decision V/23 of the Conference of the Parties to the Convention on Biological Diversity), and are thought to cover about 55 per cent of the worlds terrestrial ecosystems (GBO, 2002). Dry and sub-humid lands have great biological value and are home to many of the world's food crops and livestock. More than 35 per cent of the global human population are living in these ecosystems and many

people depend directly on the natural resource base including biodiversity for their daily livelihoods. In many countries a link between poverty and dry-land ecosystems is apparent, and it is understood that the sustainable use of biological diversity resources can potentially contribute to sustainable livelihoods in such areas. Among the key characteristics of dry and sub-humid lands are the extremely variable climatic conditions, often exacerbated by prolonged periods of drought. The long-term climatic cycles trigger populations dynamics in plant and animals.

15. The following case-studies demonstrate that this trend can be reversed if more sustainable land management practices are adopted, thus requiring fundamental changes in agricultural, institutional, and policy dimensions of society.

16. A number of good practices confirm the above. In particular, specific lessons for the sustainable management of dryland resources have been compiled by the World Bank , through a series of projects and studies. 2/ From the assessment of the World Bank lessons and the case-studies compiled in the present document, it is possible to conclude that the sustainable use of dryland biological resources requires:

The implementation of new management policies and institutional arrangements, aimed at strengthening local capacities and authorities, maintaining political support from all stakeholders and promoting decentralized and participatory decision-making;

The utilization of improved technologies, targeted at the upgrading of dryland farming practices, the integration of traditional knowledge and technology in project design and the conservation of soil and water quality;

Investments in supporting activities, such as education, communication and capacity building, marketing of local products and the exploration of alternative markets, infrastructure development and social services.

E.I.: Ecological basis for a sustainable management of indigenous vegetation in central Asia

Location: The investigation is carried out at a research station of the Chinese Academy of Sciences in an oasis at the southern edge of the Taklamakan desert in Xinjiang, China.
Responsible organizations:

- Albrecht von Haller Institut für Pflanzenwissenschaften, University of Göttingen, Germany (project coordination)
- Institut für Pflanzenphysiologie , University of Vienna, Austria
- Institute of Ecology and Geology, Chinese Academy of Science, Urumqi, China
- State Key Laboratory of Arid Agroecology, Lanzhou, China Economic Institute, Xinjiang Academy of Social Sciences, Urumqi, China

Objectives and goals: The objective of this project is to contribute to an ecosystem management regime that guarantees a sustainable use of the vegetation and, thus, retains its protective against sand drift.

Brief description: In the perimeters of the Central Asian deserts, destruction of the indigenous vegetation has led to rapidly progressing desertification. The cause of destruction of the indispensable sand-fixing vegetation belt is overuse, arising from the pressure of population's growing demand for livestock feed and fuel.

The quantity of water available to the oasis as a whole is required for household needs of the population, for the irrigation of cropland, and for the preservation of the shelter vegetation against sand drifting. This

2/ See http://lnweb18.worldbank.org/ESSD/essdext.nsf/17ByDocName/CaseStudies and (Oygard, R. Vedeld, T. & Aune, J. 1999, Good practices in drylands management, World Bank).

project should contribute to the ability to calculate the fraction required for maintenance of the shelter vegetation more exactly. Simultaneously, it should however also enable the assessment of the additional economic gain from sustained exploitation of this vegetation, the examination of the relationship between this profit and the amount of water used for irrigation and to compare it with the corresponding relation for the irrigation of cropland.

Expected outcome: This project would identify measures with which an expansion of desertification can be prevented, in a river oasis on the southern margin of the Taklamakan.

Best practices and lessons learned: The destruction of the indigenous vegetation and the transition from the oasis to the sandy desert resulting from its overexploitation as fodder and fuel is the most important factor causing an increase in land degradation.

The maintenance of this vegetation as protection against sand drift is essential, while simultaneously taking the population's exploitation interests into consideration in order to increase their acceptance of the protective measures.

The indigenous vegetation is particularly well adapted to the local ecological conditions and thus can be regenerated and maintained with the least relative effort.

The re-establishment of shelter vegetation in the foreland of the settlements and their cropland to protect them against the sandy desert is imperative in any case. The most limiting source is water. Therefore, a vegetation that offers the best relation between shelter effect and water reqirement but, in addition, also provides the best possible relation between economic benefits and water requirement is to be achieved to the best possible degree.

Conclusions were drawn from the results on a management regime that leads to controlled vegetation development (in accordance with the user's demands) and that guarantees sustainable use. At the same time, the results provided a basis for estimating the necessary water investment per unit area and for calculating the ratio between water investment and economic benefits for different management alternatives.

Contact and source: Albrecht von Haller Institut für Pflanzenwissenschaften, University of Göttingen, Germany (project coordination) http://www.gwdg.de/_templates/missing.html

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 9 and 10. In addition to guidance contained in these two principles, Governments and resource managers may consider to:

- ***Study and promote alternative measures for biodiversity conservation which can prevent biodiversity loss processes while taking pop ulation's exploitation's interests into account***

E.2. Direct seeding: the natural solution for regenerating biological diversity

Location: Niger, one of the Sahelian countries suffering the most from the effects of desertification.

Responsible organization: EDEN foundation

Objectives and goals: The regeneration of biological diversity in arid agricultural lands.

Brief description: Farmers in the Sahel need a reliable food supply from their fields. This goal is being compromised by the environmental degradation that is taking place in the Sahel. Perennial plants were seen as the appropriate tool to fulfil this goal, and direct seeding as the most suitable method to re-introduce them into arid areas. Direct seeding was selected because irrigation and/or plant nurseries waste water and other valuable resources. EDEN's specialty is to research and develop direct seeding of drought and heat tolerant perennials that provide human food, passing on the results to interested farmers. A dry farming agriculturalist demonstrates how to best direct seed these species. EDEN has been

carrying out a research and extension programme, to make it possible for farmers to establish edible perennials by direct seeding to stabilize degraded land. Farmers around the field station have been direct seeding since 1991. The numbers of farmers direct seeding has doubled yearly since 1991. They have direct seeded to stabilize their environment and/or for food. Farmers are also increasing biodiversity in their fields as a direct influence of EDEN's work by natural regeneration from rootstocks and natural regeneration from seeds that are already in the ground.

Expected outcome: The project is trying to introduce many species, and variations within the same species, to promote genetic diversity. By making seeds available to farmers, the farmers promote biodiversity in their fields. This gives farmers better returns from their land due to higher tolerance to drought, insect pests and disease.

Best practices and lessons learned:

Perennials provide a permanent vegetative cover in arid lands and annuals can be intercropped. The roots anchor the soil and parts above ground reduce soil and sand movement.

Intercropping perennials with annuals leads to better use of light, water and nutrients due to the different spacing, height and root depth of the plants.

Perennials provide organic matter through leaf fall and dead roots which improves soil porosity, stability and water infiltration. Perennials also reduce sheet erosion and increase water penetration on hard soils by slowing water flow on slopes. Water is therefore retained in the soil for longer after the end of the rainy season (or during drought periods in the middle of the rainy season) resulting in reduced plant water stress.

Perennials protect annuals from desiccating winds.

Edible perennials have the distinct advantage of providing food in drought years when the annual crops fail. Intercropping edible perennials with annuals also ensures a variety and better nutritional balance in food supply. Edible perennials are also preferable because they are less likely to be cut down than non-food producers.

When local farmers play a large role in the establishment of perennials, they are more likely to maintain the plants afterwards especially if they can benefit from them. Farmers keep aggressive annuals in check when intercropping perennials, these annuals would otherwise smother young perennials making the area species poor. The most ideal situation occurs when the local farmers see it as in their own interest to establish and maintain the perennials, then no inducements are needed which makes it very economical to regenerate.

It is preferable for farmers to use tools that are available and familiar to them which will be affordable and easier to maintain. In this way farmers' knowledge is respected which makes it more likely that they will want to direct seed.

When a farmer makes the decision to direct seed by his own initiative, he is more likely to continue with direct seeding. The farmer will then require an extension worker (or some other training programme) to demonstrate how to direct seed each species. The extension worker needs to continue to support a farmer so that he can learn to do the whole process of direct seeding by himself. Then, direct seeding becomes self-sustainable after an initial phase. Other farmers who like the results of direct seeding will ask the farmer who has already direct seeded questions about the uses of the plants and how they are sown.

This is a modular solution which is economically realistic for the region. This means that it can start on a small scale in different areas, and the modules can join together when developed to form an active front against desertification. The experience gained can be applied to the whole of north-west Africa and other hot and arid places of the world.

Contact and source: *eden@eden-foundation.org*

Suggestions from the case-study for the further development of the principles and guidelines

This case-study is linked to principles 9. In addition to guidance contained in this principle, Governments and resource managers may consider to:

- ***Make seeding material directly available to farmers, in order to promote biodiversity in their field***
- ***Promote tools that are familiar and available to farmers and that are affordable and easy to maintain.***

E.3. The desert margins programme

Location: Desert margins of Sub-Saharan Africa

Responsible organization: The Consultative Group on International Agricultural Research

Objectives and goals:

- Collect and assess current dryland management practices, including traditional smallholder knowledge;
- Understand the causes, extent, severity, and physical processes of soil and ecosystem degradation;
- Develop improved soil, water, and biodiversity management strategies that are ecologically sound, economically viable, and acceptable to the people of the desert margins;
- Design policies, programs, and institutional options that would serve as incentives to people living in the desert margins to adopt these improved practices;
- Enhance the institutional capacities of Program member countries to conduct research on sustaining the desert margins;
- Disseminate the knowledge gained to farmers, policy-makers, and other stakeholders, and catalyse action plans based on it.

Brief description: The balance of life at the desert's edge is more precarious than ever before. Growing populations are asking more of the land than it can deliver. When the diverse natural vegetation is cleared and soils tilled over large areas without nutrient replenishment or fallows, topsoil blows away and the desert takes over. Rural families are left with no choice but to abandon their impoverished farms, and join the ranks of the urban unemployed. This downward spiral can be stopped if more sustainable land management practices are adopted. But this would require fundamental changes in agricultural, institutional, and policy dimensions of society.

Expected outcome: Limit the loss of topsoil, promote sustainable land practices to blend natural sciences and socioeconomic research, while tapping the deep pool of knowledge held by farmers and nomads who have fine-tuned their survival to the vagaries of these land over millennia.

Best practices and lessons learned:

- Millet is well adapted to harsh conditions, and is the staple cereal food for peoples living on the edge. Breeders are working closely with farmers to improve the crop further.
- Animals generate food and income, and manure is the chief source of soil nutrients in the desert margins. By corralling livestock, their manure can be concentrated on fields intended for crop production.

- To fight soil loss from floods, degraded hillslides in Niger are contoured with stone barriers. Manure is placed into shallow "Zai" holes to improve soil fertility.
- A simple, appropriate technology, millet stalks trap soil from dust stroms, converting what would otherwise have been a loss, into a gain.
- Windbreaks like trees mitigate the ravages of the desert winds at the farmer's field level.
- Diversifying and enriching, highly remunerate tree crops such as date palm create a year-round vegetative cover as well.

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Source: *www.icrisat.org*

Suggestions from the case-study for the further development of the principles and guidelines

This case-study is linked to principles 9. In addition to guidance contained in this principle, governments and resource managers may consider to:

- ***Diversify and enrich production for a year-round vegetative cover and adopt simpler and appropriate technologies***

F. Mountain biodiversity

17. Mountains are hotspots of biological diversity, as biodiversity is essential to the functioning and integrity of their ecosystems. Conservation of mountain biodiversity responds to the need to safeguard environmental and economic services including food security, ecosystem integrity and adaptability, maintenance of cultural heritage and preservation of aesthetical values among others. Indeed, it should be noted that six of the 20 plants supplying 80 per cent of humanity's food originated in mountains, and diversification, which is the creation of new varieties, usually occurs in mountains. In many mountain areas, cross-fertilization between domestic and wild varieties of food crops continues to occur and new varieties are produced. Moreover, marginal environments, like semi-arid areas and mountains, are conducive to grater biodiversity (International Development Research Center, 2002).

18. The causes of mountain biodiversity loss are similar to those identified for other biomes, and include poverty, commercial mining, logging, deforestation, urbanization, unsustainable agriculture, and climate change. Of particular relevance is the rapid growth of tourism activities which has severely impacted on mountain ecosystems in the last two decades, accelerating the rate of biodiversity loss through the massive development of tourism-related infrastructures and the introduction of invasive alien species. There is a need to coordinate policies and actions, also across borders, to coherently and comprehensively address issues related to the sustainable use of mountain biodiversity, tourism and trade. In particular, case-studies have identified the need to tackle problems arising from the development of tourism activities and to explore the possibilities offered by ecotourism. Participation of local and indigenous communities in the decision-making and planning processes is considered a priority also in the management of mountain-biodiversity related activities, should they be farming or ecotourism. Finally, given that a growing number of mountain farmers is abandoning traditional practices for more modern high-yield farming techniques, the need to identify and support sustainable practices combining old and modern knowledge should be addressed.

F.1. Transboundary biodiversity conservation in the Eastern Himalaya

Location: The extended Mount Everest ecosystem, including the Qomolangma Nature Preserve in the Tibet Autonomous Region of China, and the Makalu-Barun National Park and Conservation Area, Langtang National Park, and Sagarmatha National Park in Nepal, forms the core program area. Together, these contiguous areas are designed to protect a transect extending from 450 to 8,000 meters above sea level covering over 42,000 square kilometres.

Responsible organization: The Mountain Institute

Objectives and goals: The programme seeks to ensure long-term protection of the biological and cultural resources in the Eastern Himalaya through transboundary collaborative exchanges and agreements. The primary purpose of Transboundary Biodiversity Conservation Program is to implement and extend cooperative biodiversity conservation between contiguous protected areas in the Eastern Himalaya by building on the cooperative framework and exchanges developed over the last three years. By strengthening conservation cooperation across the Nepal-China border, the programme is reducing the threats to biodiversity and is providing economic incentives for maintaining a close cooperative relationship. The program uses a combination of:

- High-level exchanges between government officials and protected area managers;
- Joint training workshops and exchanges for protected area managers and local communities;
- Collaborative research projects between scientists and research institutions active in the region.

Brief description: The programme has helped facilitate cooperative management of over 42,000 square kilometers in contiguous protected areas of the Mount Everest extended ecosystem. Through an active programme of government, scientific and NGO exchanges, cooperative methodologies are being put in places that are serving as models for the region. The combination of coordinated policies and actions, relatively standardized methodologies, and concurring priorities, is essential to adequately address issues such as transboundary wildlife trade and poaching, grazing management, non-timber forest products development and management, wildlife migration corridors, the harvesting of medicinal and rare plants, tourism and trade.

Results achieved:

- A pioneering model of transboundary conservation in the Himalaya has been created.
- Conservation cooperation across an international border which previously had not been crossed by park or forestry officials. This cooperation has provided a means for local scientists and people to explore the mutual benefits of conservation and enterprise development.
- Officials and scientists of Nepal and the Tibet Autonomous Region have set up a framework of committees at the local and central levels to move discussion more firmly into action.
- While no formal protocols or treaties have been signed the program has increased policy coordination in the region through a resolution of joint recommendations signed at the "Hands around Mount Everest" exchange visit.
- Increased ties between the private sectors, especially in the tourism industry, have been formed and are providing economic incentives to maintain conservation cooperation.
- Discussions have begun to develop new trans-border tourism routes and identify mechanisms to capture some of the revenue generated and use it for trans-border cooperative conservation initiatives.

Lessons learned: To achieve sustainable development of mountain areas it is essential to:

(a) Involve mountain communities, especially women, in decisions affecting their lives and the resource base on which their livelihoods depend;

(b) Develop mountain-specific policies and laws, with full local participation, representing the interests and needs of local communities;

(c) Re-invest part of the revenues derived from mountain resources in local conservation and community welfare;

(d) Promote partnership and collaboration between government and local people, public and private sector, upstream and downstream communities, and across boundaries;

(e) Support traditional mountain economies, sustainable livelihoods, and small-scale production systems through niche marketing and improved access to markets; capture tourism benefits locally and minimize negative cultural environmental impacts of tourism;

(f) Recognize and promote indigenous knowledge systems and cultural heritage as essential resources in achieving sustainable mountain development;

(g) Consider the sacred and spiritual values of mountain landscapes as an important basis for conservation of mountain environments;

(h) Support integrated and applied research on critical mountain issues.

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Source: The Mountain Institute at: www.mountain.org

Suggestions from the case-study for the further development of the principles and guidelines

This case-study is linked to principles 4 and 7. In addition to guidance contained in these two principles, Governments and resource managers may consider to:

- ***Involve women in decisions affecting their lives and the biodiversity base on which their livelihoods depend;***
- ***Re-invest part of the revenues derived from biodiversity in local conservation and community welfare;***
- ***Support traditional economies, sustainable livelihoods, and small-scale production systems through niche marketing and improved access to markets; capture tourism benefits locally and minimize negative cultural environmental impacts of tourism;***

F.2. Crater Mountain Wildlife Management Area (CMWMA): a model for testing the linkage of community-based enterprises with conservation of biodiversity

Location: Crater Mountain Wildlife Management Area, Papua New Guinea. The site spans a wide range of elevations (150-2100 metres) that contains a full range of the biotic diversity of Papua New Guinea.

Responsible organizations: Research and Conservation Foundation of Papua New Guinea (RCF) and Wildlife Conservation Society (WCS)

Objectives and goals: The sustainable use of biological diversity through the introduction of small locally-owned enterprises for eco-tourism.

Brief description: Although the CMWMA currently has a low population density, a number of threats are looming in the near future including industrial logging, mining, and oil drilling. To counter these threats, the project is establishing locally owned and operated research and ecotourism enterprises in the CMWMA. These innovative community owned and operated enterprises are establishing support structures for natural and social scientists interested in studying the natural ecosystems and cultural diversity in the CMWMA. These enterprises provide lodging and guide services to domestic and international visitors interested in experiencing the natural wonders of the CMWMA. The project team members are working with community members to develop biological and socio-economic monitoring systems. The team is also working with landowners to develop a land-use management plan which provides for biodiversity conservation and enterprise sustainability. Finally, they hope to demonstrate to government officials and other land-owners in Papua New Guinea that community-managed lands can generate profits in a sustainable fashion.

Results achieved: The community and business development staff in the field continue to work with members of 21 landowning clans on eco-enterprise development. Community leaders have participated in tourism planning workshops, national study tours and ongoing village extension courses to build local capacity in small business development. Because literacy levels are extremely low, support classes are offered in English, literacy and basic math. With field staff assistance, communities have discussed and tested business management structures, worked with an architect to design traditional facilities and trail systems to better accommodate the scientific traveller, determined rates and produced marketing brochures for their products. A market study was conducted to assist them in product planning. A successful model for international and domestic sale of traditional handicrafts developed in one village in the wildlife management area has been transferred to the others to eventually be marketed under the "Crater Mountain" label.

Best practices and lessons learned:

- In a traditional culture where tribal rivalries and fighting have been in place for centuries, the Crater Mountain WMA has had unprecedented success in bringing together representatives from 21 clans representing two language groups to discuss and draft legislation to manage the second largest WMA in PNG.
- Although yet in a very early state of development, this fledgling structure has provided valuable lessons for viable management structures in privately-owned protected areas in PNG.
- An associated landmark in national leadership has been the increased involvement and capacity of the national project staff who work as trainers with the Crater Mountain communities, and who have taken a lead in this extremely challenging conservation initiative.
- The greatest challenge in the development of the Crater Mountain Wildlife Management Area continues to be the community's low level of literacy and experience with the modern cash economy as well as the historical presence of inter-clan conflict and suspicion of one another. The average level of formal education is grade one, most residents have never traveled beyond the boundaries of the WMA and have only recently begun to personally manage small sums of cash. Fear of traditional sorcery and loyalty to clan affiliations underlies social behavior. Resident field extension staff with excellent communication skills have been essential to meet this challenge. They provide slow-paced, ongoing training conducive to traditional village lifestyles. Their constant presence provides the communities with an invaluable source of information to answer queries to dispel misconceptions about the outside world and the cash economy beyond the WMA boundaries, and they may serve as an unrelated third party to very carefully mediate clan conflict or misunderstanding.

Contact and source: *www.bcnet.org* or *www.bsponline.org*

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 6. In addition to guidance contained in this principle, governments and resource managers may consider to:

- ***Explore development opportunities offered by ecotourism.***

F.3. The Maloti-Drakensberg transforntier project

Location: The Project addresses the conservation problems of the Maloti-Drakensberg Mountains, a 300 kilometre-long alpine and montane zone along the southern, eastern and northern borders of the landlocked mountain Kingdom of Lesotho and the Republic of South Africa.

Responsible organization: KwaZulu-Natal Nature Conservation Service/Global Environment Facility (GEF)

Objectives and goals: The challenge is to conserve the biodiversity of this mountain region while contributing to its community development, primarily through nature-based tourism.

Summary: Two of the largest civil engineering projects in southern Africa, the Tugela-Vaal Scheme and the Lesotho Highlands Water Project, carry water from the mountains to the economic powerhouse of Africa, the megalopolis of Johannesburg and surrounding cities.

However, these unique resources are increasingly degraded by a grazing regime based on communal access and decreased regulatory capability, more especially in Lesotho. The cultural resources of the area are also faced with extreme pressure from resource prospectors and vandals. Exacerbating these problems even further is the lack of ownership of the land that restricts investment in conservation of the natural resource base. Due to a communal land-tenure system that permits access right to resources, Lesotho has the lowest protected area coverage of any nation in Africa (<0.4%) and, as a consequence, biodiversity and natural resources are at risk.

The main components of the project are: project management and transfrontier cooperation; conservation planning; protected area planning; conservation management in existing protected areas ;conservation management outside existing protected areas; community conservation programmes; nature-based tourism development; institutional development.

Expected outcome:

- The project will work with Governments and local communities to make proposals for a possible network of protected areas, targeting specific biodiversity "hotspots" as well as protecting biodiversity within community-managed rangelands. This intervention requires policy review as well as the development of incentives and regulatory systems at national, regional, and local community levels.
- Another product will be the legislative and administrative framework for the establishment of a transfrontier conservation area (TFCA) for the conservation and sustainable use of the region.

Best practices and lessons learned:

- The strategic option of the project is to work with the communities outside the project zone on nature-based tourism initiatives, thereby providing a viable alternative land use for the stakeholders.
- Land use planning should precede the construction of any residential accommodations.
- A central tenet of this project design is to place community involvement in nature conservation as the determining factor for long-term sustainability. Some of the preparatory studies, especially the social assessment for Lesotho, consulted elaborately with community-based stakeholders. Fieldwork carried out under this contract lays the foundation for community involvement during project implementation.

- Each of the Project's financial management systems must be capable of producing timely, understandable, relevant, and reliable financial information that will enable management to plan, implement, monitor and appraise each Project's overall progress towards the achievement of its stated and agreed objectives. Specifically, each financial management system must support management in their deployment of limited resources with the purpose of ensuring economy, efficiency and effectiveness in the delivery of outputs required to achieve desired outcomes that will serve the needs of the people of Lesotho and South Africa.
- Appropriate legislation is needed to manage project of this kind. The mission confirmed with the relevant authorities that the legal status of the Sehlabathebe protected area requires appropriate legal clarification.

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Source: www.maloti.org.za

Suggestions from the case study for the further development of the principles and guidelines

This case-study is linked to principles 4 and 12. In addition to guidance contained in these two principles, governments and resource managers may consider to:

- ***Promote standardize methodologies to adequately address issues pertaining to the sustainable use of biodiversity resources, tourism and trade policies***
- ***Establish a legislative and administrative framework for the creation of transfrontalier areas for the conservation and sustainable use of biodiversity.***

III. CONCLUSIONS

19. Despite geographic, historic, and cultural differences among countries, similarities and recurrent issues are shared by the examples reported above, across all thematic areas. The concept of sustainable development implies the complexity of designing operational policies and programmes. This complexity is reflected in all the case studies analysed by the expressed need to encourage a comprehensive and integrative approach to resource management. Integrated management is considered to be a proactive approach and an ongoing collaborative planning process that brings together interested parties, stakeholders and managers to reach general agreement on the best mix of conservation, sustainable use and economic development of different ecosystems.

20. At the same time, integrated management does not only mean resource coordination, control and use; it also invites the inclusion of parallel ecosystems and the involvement of a broader range of expertise in the planning process and calls for the participation of all stakeholders in the phases devoted to the gathering of baseline information and decision-making. Experts, managers, planners, and local communities should jointly determine different land use scenarios and should work in a coordinated manner while choosing the appropriate uses of their resources.

21. Indeed, all the case-studies examined call for the involvement and empowerment of local communities and civil society in both decision-making and implementation processes and invoke the

creation of credible and equitable arrangements for benefit-sharing. Local empowerment is achieved if collective action promotes trust, transparency and equity. Case-studies recall also the need to refocus development policies in order to benefit indigenous and local communities. The lesson of community-based management strategies for coral reefs apply equally well to forest. That is, without substantial input of all stakeholders in defining issues, selecting management strategies, and implementing management measures, the best-laid plans for management are bound to fail.

22. In this context, there is a need for a concerted search for policies and strategies, which take into account innovative approaches to natural resource conservation and development. Biodiversity can be sustained and enhanced by encouraging the regeneration of traditional indigenous systems. Key factors that enhance sustainable use include dialogue and linkage between traditional and scientific knowledge systems and openness in collaboration between traditional and government institutions. Monitoring, assessment and economic valuation of biodiversity have also emerged as being essential instruments supporting decision-making in different areas. Processes leading to the compilation of relevant information for decision-making need to be updated and adapted to more inclusive and comprehensive audiences.

23. Institutional structures, legislation, and regulations have also to be reformed to better support sustainable development and the sustainable use of biological resources. Technical steps should be combined with appropriate institutional arrangements that are perceived by the local communities as bringing about significant improvements in their welfare, in order to arrive at a management regime that is sustainable. Appropriate legislation is also needed to manage biodiversity projects. Adequate consideration should be given to land and sea tenure and common property rights. Governments must formally recognize new forms of association and collective action with direct effect on national policy, and immediate measures are needed to correct the inadequacies of existing land tenure policies. In some cases local concepts and forms of access and ownership have become more secure impacting the rural communities, bringing a direct influence on reforms on national land law. In other cases, existing laws regulating land tenure are both confusing and outdated.

24. New markets and a new sensitivity on the part of local people of the economic viability of their products is also supporting and stimulating local productions, illustrating how the sustainable use of biodiversity be both a conservation strategy and a way to promote local, small scale economies, and so contributing to the elimination of poverty at the local level. Indeed, the causes of biodiversity loss and poverty are strictly intertwined and need to be addressed in a systematic and integrated manner. In may case studies it was evident how population pressures impose an unsustainable burden on local resources, worsening the ability of the ecosystem to support normal production patterns and drastically reducing food security.

25. The case-studies analysed focused primarily on political and organizational changes which can promote the sustainable use of biological diversity at the local level. More limited in number were proposals of innovative methods or techniques for sustainable productions, indicating that the need to reform current policy and management structures should be a priority and that a reliance solely on science will not bring effective solutions to the problem. Sustainable use is primarily a matter of political willingness towards the restructuring of the administrative system. In other words, the necessary conditions should be created at the local level to empower local communities in the management of their resources, promote the integration of traditional knowledge with advanced scientific information and instruments, and make local managers accountable for the conservation and sustainable use of their productions. Such a reform could be promoted only through a careful revision of existing legislation, policy regimes and existing instruments at the national level.

26. The principles and guidelines under development (UNEP/CBD/WS-Sustainable Use/4/2) represent a useful instrument in support of this reform, as they could and should be used by Governments

as the primary framework for the development of national legislation promoting the sustainable use of biological diversity.
