# THE NATURE AND ROLE OF LOCAL BENEFITS IN GEF PROGRAMME AREAS

## CASE STUDY

## *Bolivia:*
## *Biodiversity Conservation GEFI & II Projects*

GEF

GLOBAL ENVIRONMENT FACILITY
OFFICE OF MONITORING AND EVALUATION
WORKING DOCUMENT
DO NOT QUOTE OR CITE
April 2004

**Author**

**Miguel Castro-Arze** – Lead Consultant

**Case Study Management**

**Dr. Aaron Zazueta** – Senior Monitoring and Evaluation Specialist
azazueta@thegef.org

**ABBREVIATIONS**

| | |
|---|---|
| AWR | Andean Wildlife Reserve |
| BR | Biosphere Reserve |
| CABI | Capitanía del Alto y Bajo Izozog |
| CIDOB | Confederación de Pueblos Indígenas de Bolivia |
| CSCB | Confederación Sindical de Colonizadores de Bolivia |
| CSUTCB | Confederación Sindical Única de Trabajadores Campesinos de Bolivia |
| DGB | Dirección General de Biodiversidad |
| DNCB | Dirección Nacional de Conservación de Biodiversidad |
| EBB | Beni Biological Station |
| FONAMA | National Environmental Fund |
| FUNDESNAP | Foundation for Development of the National System of Protected Areas |
| GEF | Global Environment Facility |
| GEF I | Project for Biodiversity and Ecosystem Conservation in Protected Areas in Bolivia (PCBB) |
| GEF II | Project for Sustainability of Bolivia's National System of Protected Areas |
| INRA | Instituto Nacional de Reforma Agraria |
| MAPZA | Project for Management of Protected Areas and Buffer Zones |
| NAIM | Natural Area under Integrated Management |
| NAWR | National Amazonian Wildlife Reserve |
| NP | National Park |
| NP-NAIM | National Park and Natural Area under Integrated Management |
| NWR | National Wildlife Reserve |
| PA | Protected Area |
| PCBB | See GEF I |
| REA | Eduardo Avaroa Reserve |
| SERNAP | National Protected Areas Service |
| SNAP | National System of Protected Areas |
| TCO | Indigenous Homeland |
| TIPNIS | Isiboro Sécure Indigenous Territory-National Park |
| TORs | Terms of Reference |

**CONTENTS**

**CASE STUDY**

# RELATION BETWEEN LOCAL AND GLOBAL BENEFITS OF GEF-SUPPORTED ACTIVITIES IN THE BIODIVERSITY SUSTAINABILITY PROJECT IN BOLIVIA

## I. INTRODUCTION

Through its support for biodiversity conservation activities in Bolivia since 1993 the Global Environment Facility (GEF) has helped the country build and solidify a National System of Protected Areas (SNAP) with the two-fold aim of achieving global environmental goals and improving the lives of local communities.

The first GEF-funded project was entitled "Biodiversity and Ecosystem Conservation in Protected Areas in Bolivia" (PCBB-GEF I, 1993-1997). It was followed by the SNAP Sustainability Project (GEF II) launched in 2001.

The successive evaluations done of GEF I focused on its implementation, effectiveness, and accomplishments. Mid-term review and monitoring missions fielded for GEF II have examined that project's status and achievement of targets.

These two projects, which have piloted the SNAP's development over the last 10 years, were conceived and designed in accordance with policies and technical guidelines of the Bolivian Government agencies responsible for the SNAP (DNCB-DGB from 1993 through 1998; since 1999, the National Protected Areas Service—SERNAP). Both operations have fit with the associated strategy thrust for protected areas management.

Though their design and implementation were not without problems, the GEF-supported projects have produced some impressive gains. The local benefits they helped generate have directly or indirectly improved both the SNAP as a system and each targeted protected area and its surroundings. Some of these benefits are tangible; others are difficult to quantify and need to be brought out and elucidated.

Just as important to apprehend are the adverse effects of these initiatives, to be able to continue charting or adjust and strengthen the respective processes. In keeping with the GEF's core mission it also is necessary to ascertain how these local benefits are influencing global environmental improvements.

This case study explores **linkages between the local and global benefits produced by GEF-supported activities in biodiversity sustainability projects in Bolivia**. Its objective is to provide pointers for a clearer understanding of this local-global benefit interplay by ascertaining and weighting benefit impacts. A further aim of the study is to orient future GEF policies and strategies in order to bolster biodiversity conservation efforts in Bolivia under the SNAP.

Readers should note that the level of analysis in this case study is circumscribed to the structure of the consultancy. Since the GEF's support for the SNAP is system-wide rather than project-specific, a more in-depth study with a longer timeline might offer a more precise picture in pursuit of the objectives sought. However, it is hoped that the present study will provide useful information in illuminating the linkages between local and global benefits, whereby Bolivia is contributing significantly to global environmental goals as it endeavors to gradually instill a sustainable local development model—this being no easy task when social, economic, and political concerns and interests of different weight are in play.

This paper briefly sketches the impact of 10 years of GEF funding on the SNAP, highlighting results, accomplishments, and constraints. Local benefits are discussed, including their impact on local livelihoods via an analysis of human, social, physical, natural, and financial livelihood factors, and the vulnerability and resilience of such impacts are examined. The nature of these benefits and their global impact are analyzed. Rounding out the study are annexes to the local-benefit matrixes, which recount representative examples.

## II. GEF-SUPPORTED ORGANIZATION AND STRENGTHENING OF THE SNAP OVER THE LAST 10 YEARS

### a) Bolivia and the SNAP

Bolivia's 1,098,581-square-kilometer land mass is home to over 8 million people and 37 ethnic groups. With 190 ecosystems comprising 24 biogeographic domains and various watershed systems Bolivia ranks among the eight most biodiverse nations on the planet. This megadiversity has earned it international recognition as one of the 17 countries that contain 50% to 70% of global biodiversity.[1]

To preserve this rich biota and its ecosystems, ecological processes, landscape resources, and archeological, paleontological, and cultural treasures Bolivia has created some 66 protected areas since 1939, now taking up close to 15% of its territory. Nineteen of these areas are being managed under the SNAP as representative ecosystems of national and regional importance, within a common conceptual, policy, institutional, and regulatory framework.

One of Latin America's youngest systems of its kind, the SNAP was born of the Convention on Biological Diversity to which Bolivia is a party and the Rio Summit's Agenda 21. The ensuing Environment Law[2] enacted in April 1992 governs the workings of the System.

The conceptual, policy, legal, institutional, social, and economic advances the SNAP has achieved in the space of about 10 years in this political and regulatory environment augur well for its viability and sustainability.

### b) GEF support for this process

GEF assistance has been instrumental in the SNAP's organization and consolidation. Though a number of funding providers and conservation agencies had previously supported conservation initiatives and programs in individual protected areas (Beni Biological Station, Amboró National Park, Carrasco National Park, Noell Kempff Mercado National Park, and others), GEF support beginning in 1993 with the GEF I project marked the advent of planned, organized SNAP-related activities.[3] Other finance providers and institutions—primarily the Netherlands, Germany, Switzerland, and Great Britain—then targeted the SNAP for support, pursuing a policy of complementarity in programming and funding.

The GEF II project launched in 2001 to follow through on the SNAP consolidation policy marshaled international cooperation efforts and Bolivian Government resources toward a common program thrust spearheaded by GEF support.

[1] Fundación Amigos de la Naturaleza. Information on SNAP, 2002.
[2] Law 1333 of April 12, 1992.
[3] FUNDESNAP, documents analyzing SNAP funding receipts.

## Table 1
## GEF I IMPLEMENTATION (1993-1998): MAIN ACCOMPLISHMENTS AND CONSTRAINTS

| | |
|---|---|
| **PRIMARY OBJECTIVE** | *Contribute to the conservation of biodiversity resources of national and global importance, proposing a strategy for consolidation of a National System of Protected Areas that will assure, in the long run, the operation of all the protected areas (PAs) comprising that System.* |

| GEF I ACCOMPLISHMENTS | CONSTRAINTS |
|---|---|
| **Consolidation of SNAP institutional base:**<br>• SNAP authority (DNCB, DGB) strengthened.<br>• Digitized planning and monitoring system with regulations (incorporation into SISPLAN, TORs for PA Management Plans and Annual Work Programs developed. Digitized PA maps. Map of Bolivian PAs published).<br>• Biodiversity Conservation Law drafted (1996).<br>• PA regulations developed: Regulations Governing Protected Areas and input into sectoral regulations (INRA, Forestry). | • Political instability: Change in government meant turnover in key personnel in agency responsible for the SNAP.<br>• Diminished focus on the environment holds up SNAP consolidation.<br>• Natural resources (hydrocarbons, minerals) use and development priorities set by central government without reference to an environmental policy.<br>• Owing to lack of political support and weak civil society the environment bill did not become law.<br>• Debilitated environmental civil society. |
| **Information and monitoring system:**<br>• Project to assess SNAP information gaps and current information base.<br>• Information system installed and in service; staff trained, User Manual written.<br>• Network installed; Internet service with protected areas. | • Lack of clear laws on information sharing; susceptibilities regarding information ownership and use, in private entities. Co-managers (Bolivian National Academy of Science and Amigos de la Naturaleza Foundation) developed and are operating their own information systems.<br>• Absence of compatible GIS and, sometimes, of latest-generation hardware impeded information sharing. |
| **Human resources training:**<br>• Human Resources Training Program for SNAP Management designed and implemented.<br>• First graduating class of 36 SNAP park rangers earning professional diplomas from Universidad Autónoma Gabriel René Moreno; 60 rangers completed refresher courses, 21 specialists and 10 professionals trained for PA management. | • High cost of staff training made it impossible to continue the Program.<br>• Lack of evaluation and refresher components and other Training Program adjuncts that the new requirements and profiles demand. |
| **Protected Areas Security and Protection Program:**<br>• National Protected Areas Security and Protection System set in place in 15 SNAP PAs with trained, equipped personnel and basic infrastructure. | • Difficulty in defining a more social vision of PA protection. |
| **Civil society participation capabilities:**<br>• 10 PA Management Committees formed; 7 Protected Area Co-Management Agreements signed with non-governmental agencies, indigenous peoples, and academic institutions. | • Agreements devised without a clear policy on how the co-management arrangement would work.<br>• Uniform procedure followed to set up Management Committees, without reference to situation-specific circumstances.<br>• Differing policies and approaches of co-manager and government agency. |
| **Conservation of representative pristine ecosystems and priority species:**<br>• Management strengthening of 9 priority PAs and 6 additional PAs as circumstances permitted.<br>• Creation of 4 new protected areas, underpinned by technical-legal proposal and Supreme Decrees. | • Boundaries of Manuripi Heath NAR had to be redrawn when problems were encountered with Araona and other groups.<br>• No analysis of gaps in representativity of ecosystems. |
| **Planning and monitoring system developed:**<br>• 6 Management Plans based on established TORs (3 approved by Ministerial Order).<br>• Boundaries and designation of Amboró and Noel Kempff Mercado Parks modified. | • No final approval of Management Plans owing to shortcomings in consensus development exercise.<br>• Problems with in situ monitoring and verification by Protected Areas Unit.<br>• Weaknesses in contractual elements and TORs for ensuring participatory processes and information ownership. |
| **Conservation of priority biodiversity resources:**<br>• Protection of freshwater reserves.<br>• Recovery of threatened species (vicuna, tortoise).<br>• Opportunity for sustainable natural resources management (vicuna, llama, alpaca, fish species).<br>• Recovery of traditional knowledge (production of Aguaratiní antifungal cream—Kaa Iya).<br>• Recognition of traditional medicine (Kallawaya medicine receives UNESCO designation of Masterpiece of the Oral and Intangible Heritage of Humanity).<br>• Proliferation of other potential species (vizcachas, fish species, flamingos, etc.).<br>• Ecotourism opportunities: Development of first-ever tourism strategy; guidelines for communal lodges. | • No regulations on sustainable use of biodiversity resources in and around PAs, defined use priorities, or strategies to manage predators (which harm local interests).<br>• Inadequate signage and demarcation of managed areas.<br>• DGB constraints for access to information generated by NGOs.<br>• No environmental impact assessments of tourism activities.<br>• No processes for local biodiversity valuation.<br>• No specific policies or regulations to promote or expedite tourism, concessions, permits or approvals. |
| • **US$5 million SNAP Trust Account created in FONAMA.** | • Politicization of FONAMA and excessive red tape in that agency.<br>• Trust Account was not capitalized.<br>• No new funding sources identified for the SNAP. |
| • **Diversification of funding sources:** Convention on Climate Change, PL-480 program, Canada, Netherlands SNAP Support Project, GTZ-KfW, Bolivian | • Lack of policies and negotiating and monitoring capacity to channel funding. |

| PRIMARY OBJECTIVE | *Contribute to the conservation of biodiversity resources of national and global importance, proposing a strategy for consolidation of a National System of Protected Areas that will assure, in the long run, the operation of all the protected areas (PAs) comprising that System.* |
|---|---|

| GEF I ACCOMPLISHMENTS | CONSTRAINTS |
|---|---|
| Treasury, oil and gas company contributions (ENRON and Gas Trans Boliviano for Kaa-Iya del Gran Chaco NP-NAIM and San Matías). | |

The GEF has directed its support toward specific, mutually complementary components that are fundamental for the SNAP's organization and consolidation. The thrust of these activities was developed by Bolivia's protected areas authority (DNCB, DGB and subsequently SERNAP) with input from key representative sectors of civil society, under the umbrella of the Ministry of Sustainable Development and pursuing a clearly enunciated "protected areas with people" management policy. This has been the SNAP's guiding principle, consistent with Bolivia's political, economic, social, and environmental realities.

Strategy thrusts for SNAP consolidation are as follows:

- Conserve priority representative ecosystems of great importance for biodiversity conservation in Bolivia.
- Develop conceptual, policy, regulatory, and institutional frameworks for management of the SNAP generally and of individual protected areas.
- Devise arrangements and instruments and develop institutional and social capacity for comprehensive, participatory management of protected areas at the national and local levels.
- Give priority to conservation-effective management programs (planning, protection, and monitoring).
- Lay foundations for sustainable natural resources management as an economic and social development alternative for communities in and around protected areas.
- Generate sustainable financing mechanisms.

### c) GEF I: Results and accomplishments

In pursuit of the above-listed strategy focuses, GEF I and GEF II (the latter still in progress) have achieved some impressive results. Though there have been constraints as well, these have not diminished the viability or sustainability of the process. **Table 1** summarizes the chief GEF I implementation outcomes between 1993 and 1998 and constraints encountered.

### d) GEF II: Results, accomplishments, ongoing activities

GEF I demonstrated that establishing an SNAP that could truly achieve global and national goals would be a long-range proposition. With that in mind, SERNAP proposed a US$15 million project entitled "Sustainability of the National System of Protected Areas" to the GEF with a view to creating and sustaining the requisite technical expertise and financial capacity to deal with the complex processes and components that would be called for.[4] Care was taken, in designing this three-phase, 15-year program, to mesh its technical facets and financing arrangements with other grant support already pledged by the international cooperation community (Germany and the Netherlands). The GEF grant ultimately approved was for a five-year project with two likely extensions of five years each.

[4] GEF II Project Appraisal Document, 2001.

That second operation (GEF II), launched in 2001 and still under way, fits with the strategy thrust for SNAP consolidation. Its core objective is to make Bolivia's SNAP sustainable and thereby enhance biodiversity conservation. Thus far GEF II has helped bring about improvements largely on the conceptual, policy, and operational sides in SERNAP and in 10 priority protected areas—these having been achieved despite the institutional instability created by political factors. See **Table 2.**

**Table 2**
**GEF II—SNAP SUSTAINABILITY PROJECT.**
**CHIEF OUTCOMES SOUGHT AND POTENTIAL CONSTRAINTS**
**IN THE PROJECT'S IMPLEMENTATION PHASES**

| PHASE | CENTRAL OBJECTIVE | ANTICIPATED OUTPUTS/OUTCOMES | POTENTIAL CONSTRAINTS |
|---|---|---|---|
| **GEF II (under way since 2001)** | Develop a long-range strategic vision for the SNAP and create a general framework for sustainable management of the System. | i. Laws on biodiversity or PAs two-and-a-half years into GEF II, backed by the responsible authorities.<br>ii. SERNAP strengthened as an independent agency, undergirded by legislation and appropriate administrative actions.<br>iii. SERNAP strengthened, with capacity adjustments; 80% of staff posted to the field or key sites.<br>iv. Management Committees fully operational in at least 14 PAs.<br>v. Pilot natural-resources management initiatives essayed in PAs and their buffer zone.<br>vi. Government financial support secured for SERNAP and the SNAP in accordance with Development Framework goals and GEF funding objectives. | Shift in public policies regarding protected areas and their management thrust, institutional configuration, and priorities.<br><br>Problems with delivery of government counterpart funds owing to fiscal deficits and low priority accorded this matter.<br><br>Change in government triggering an institutional crisis (turnover in key personnel – four Directors in 2003). |

Work began in 2001 to draft a Protected Areas Law, in response to sectoral moves to regulate facets of protected areas and the pressing need to provide legal certainty for the SNAP.[5] However, the August 2003 change in government brought with it a shift in protected-areas policy which affected the broadbased participatory process that had been under way for nearly a year; at this writing that process is definitively suspended. Nevertheless, out of that exercise came the principles and policies that currently govern SNAP management,[6] along with management approaches better structured around the principle of "protected areas with people."

The following are some GEF I and GEF II success highlights.

- Consolidation of the SNAP management agency as part of the Executive Branch structure but with independent technical, administrative, and regulatory authority.[7]

- Development of the conceptual, policy, regulatory, and operational framework for SNAP management and achievement of its objectives of conservation and furtherance of sustainable local and national development.

- Development of human resources capacity in the SNAP authority (technical and administrative personnel) and local stakeholders, by way of Management Committees and the co-management arrangement.

[5] Despite 10 years of drafts and consensus seeking the Biodiversity Conservation bill was not passed into law. Efforts now are under way to restart the process.
[6] SNAP management policies, SERNAP, 2002.
[7] Law 1788 and Supreme Decree 25158.

- New core legislation, in the form of Regulations Governing Protected Areas approved by Supreme Decree and supplemented by an Administrative Order, and input into sectoral regulations (Forestry Law, INRA Law).

- Constitutional jurisprudence favorable to the SNAP and the agency that administers it.

- Creation and strengthening of the Protected Areas Security and Protection System: 19 protected areas now have trained personnel and basic operating equipment and infrastructure.

- A planning system featuring interfaced Management Plans and Annual Work Programs, recognized in the National Planning System (SISPLAN)[8]. The next steps for planning-system purposes are the crafting of an SNAP Master Plan and an analysis of ecosystem representativity gaps in the System. Both those items are currently being tendered, with a late-2004 anticipated completion date.

- Development and strengthening of local participation and capacity building processes, principally in Management Committees, and implementation of policies for local community engagement in protected areas management.

- Development and systematization of reporting and monitoring fundamentals for comprehensive protected areas management. Design of a Monitoring System to meet SNAP management needs is being piloted.

- Creation of the Foundation for Development of the National System of Protected Areas (FUNDESNAP)[9] as one piece of a financial sustainability strategy. (The FONAMA-administered SNAP Trust Account was transferred to FUNDESNAP.) The current US$10 million trust fund endowment is returning approximately US$650,000 annually.

- Design of a natural resources management strategy, essaying pilot ventures that could create livelihood alternatives for residents of protected areas and their surroundings, with careful regard to identified priority conservation needs and sustainability of resource use.

### e) Constraints

Three fundamental elements were missing for GEF I to be termed a complete success:[10] a solid legal foundation for the SNAP (there was support at the outset for the draft biodiversity legislation); a national environmental fund to guarantee the SNAP's long-range sustainability (a capital endowment of up to US$35 million was hoped for), and a biodiversity monitoring system that could be the SNAP's pivotal management focus.

The chief constraints experienced in GEF II implementation thus far are SERNAP's politically-caused institutional instability and the government's failure to disburse counterpart funds.

## III. LOCAL BENEFITS OF GEF-SUPPORTED SNAP MANAGEMENT ACTIVITIES

[8] MAPZA-SERNAP ( 2002). Management Planning Guide for Bolivian Protected Areas.
[9] FUNDESNAP was created in 2000 as a private, not-for-profit institution by agreement among NGOs, government agencies, international cooperation providers, and representatives of grass-roots organizations. Its mandate is to make Bolivia's SNAP financially sustainable.
[10] Aaron Zazueta, PCBB PPER, 2001.

In this case study, "local benefits" are improvements achieved under the umbrella of GEF support delivered over the past 10 years. They refer to elements that have had a positive impact, whether direct or indirect, on local communities and on ecosystems targeted for conservation inside and in the vicinity of protected areas.

These benefits are tangible contributions to the sustenance of the respective populations and to their comprehensive development, as well as to the integrity of the ecosystems in which these community residents live and work.

The first step to identify local benefits, to encompass all facets of the workings of the SNAP, was an analysis of general "thrust areas" in which GEF-supported SNAP management activities have had an influence and there have been tangible impacts on local communities and ecosystems.

The following are the three **thrust areas** selected for this case study that are referenced in the analysis of types of local benefits and their positive or negative impacts, scale, livelihood impact, and tie-in to global environmental benefits:

1) **Creation of an institutional base for Bolivia's National System of Protected Areas**

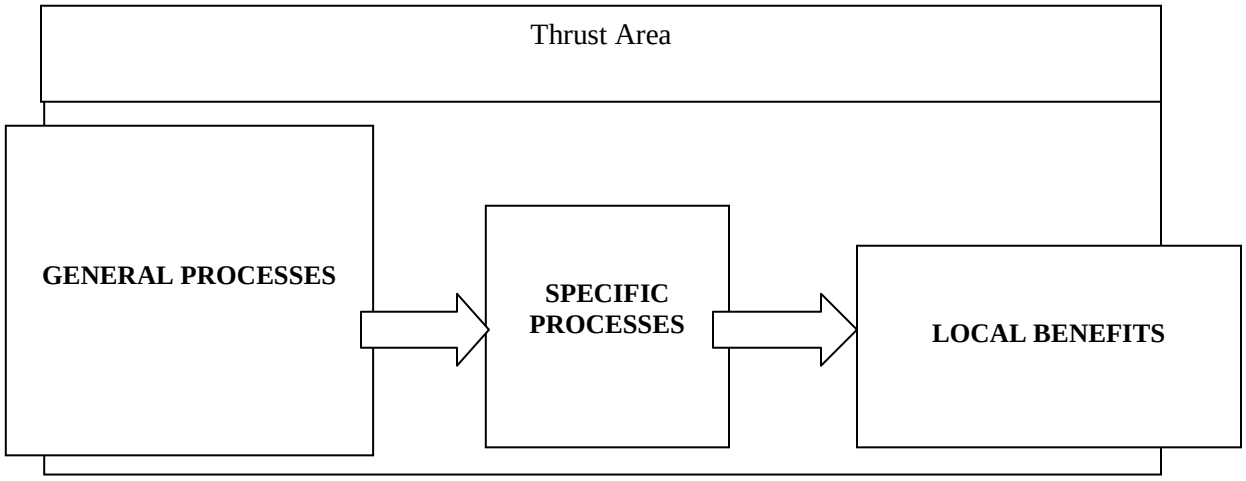
2) **Conservation and sustainable use of biodiversity for sustainable development**

3) **Recognition of local populations' rights, customs, and use practices and local capacity building for ownership of environmental management in protected areas and their surroundings**

Further on in this paper we will look at the local benefits generated in each of these thrust areas to gauge their local livelihood impact and analyze their vulnerability and resilience to change and outside pressures.

Figure 1 below charts the analytical process used to identify local benefits under each of the selected thrust areas.

**Figure 1**
**LOCAL BENEFIT GENERATION BY GENERAL SNAP MANAGEMENT PROCESSES (Example)**




**a) Analysis of local benefits by reference to the thrust areas and GEF-supported SNAP management processes**

The following section discusses local-benefit drivers for each thrust area. The reader is referred to annexes to this paper (Annex 1, 2, or 3, for the respective thrust area) for examples of SNAP activities that attest to the improvements achieved.

**Table 3**
**CREATION OF AN INSTITUTIONAL BASE FOR MANAGEMENT OF BOLIVIA'S NATIONAL SYSTEM OF PROTECTED AREAS**

| GENERAL PROCESSES[11] | SPECIFIC PROCESSES | LOCAL BENEFITS |
|---|---|---|
| Establishment of a government agency with technical expertise and financial capacity for biodiversity conservation, SNAP management, and national and local positioning of this issue. | • Technical, policy and regulatory, and financial strengthening of the protected-areas authority at the national and local level.<br>• Creation of a Security and Protection Corps in SNAP protected areas, with core compliance monitoring, promotion, community outreach, and technical support capabilities for management programs (250 park rangers).<br>• Local technical assistance to institute environmental management and conservation processes.<br>• Management and resolution of environmental and land management disputes in and near each protected area.<br>• Development of jurisprudence relating to protected areas conservation.<br>• Provision of core monitoring and compliance infrastructure and equipment to these protected areas.<br>• New protected-areas equipment and infrastructure put into service.<br>• Expediting arrangements and support for local communities for inter-agency health, education, and basic sanitation interventions.<br>• Local goods and services procurement. | • Support for sustainable local development through a public technical counterpart with comprehensive natural resources and environmental management capabilities and a presence in the most remote and depressed parts of the country.<br>• Opportunities for improved contact and interagency coordination for local communities with other government and non-governmental agencies to help supply basic needs.<br>• Support for communication systems, search and rescue, first aid services, natural disaster prevention and relief.<br>• Indirect services to local communities by way of protected-areas infrastructure, equipment, and personnel.<br>• An increase in economic activity, benefiting the region. |
| Development of the conceptual, policy, regulatory, and operational framework for SNAP management and achieve-ment of SNAP objectives of conservation and furtherance of sustainable local and national development. | • Development of the "protected areas with people" principle and instilling respect for local populations and their customs and use practices.<br>• Development of principles and policies around the concept of protected areas to preserve natural and cultural heritage and further sustainable local and national development.<br>• Development of environmental management planning systems (Management Plans, Annual Work Programs, management programs and projects).<br>• Strengthening of protected areas regulation; administration and enforcement of environmental legislation. | • Contribution to preservation of conservation-compatible traditional customs and use practices and community development with identity.<br>• Income earned from community-based tourism activities, with zoning based on protected-areas planning instruments.<br>• Safeguarding of collectively used lands and natural resources thanks to legally mandated protected-area monitoring and compliance activities. |

[11] See Annex 1 for examples of moves to build an institutional base and local capacity.

**1. Creation of an institutional base for management of Bolivia's National System of Protected Areas**

One of the prime benefits achieved by GEF-supported SNAP management over the last decade has been the structuring of an institutional base for the System, which was the fruit of two intertwined processes:

- Creation of a government agency with technical expertise and financial capacity for biodiversity conservation, SNAP management, and national and local positioning of this issue.

- Development of a conceptual, policy, regulatory, and operational framework for SNAP management and achievement of its objectives of conservation and furtherance of sustainable local and national development.

**Table 3** shows the relationship between these general processes and the specific processes that have yielded local benefits.

**2. Conservation and sustainable use of biodiversity for sustainable development**

Conservation and sustainable biodiversity use also produce local benefits as a result of other general drivers:

- Organization and implementation of the National System of Protected Areas to safeguard representative ecosystems and species that are conservation priorities and to preserve ecological processes and generate environmental services.

- Implementation of management strategies for protected areas and their surroundings, for conservation and sustainable use of biodiversity resources and to further sustainable local and national development.

The local benefits driven by the general and specific processes help bolster conservation work and sustainable-use efforts in each protected area and across the SNAP generally, thereby enhancing prospects of their social and physical viability, as itemized in **Table 4**. For examples, see Annex 2.

An important point to keep in mind is that the generation of direct local benefits in the course of conserving and making sustainable use of biodiversity resources entails the steady creation of alternatives for the utilization of this resource endowment, biodiversity processes, and environmental services to yield social, cultural, economic, and environmental benefits for local communities, the nation, and ultimately the planet. Though establishing protected areas and putting them under management does generate local benefits, the ensuing impacts all are indirect ones.

**Table 4**
**CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY FOR SUSTAINABLE DEVELOPMENT**

| GENERAL PROCESSES[12] | SPECIFIC PROCESSES | LOCAL BENEFITS |
|---|---|---|
| Organization and implementation of the National System of Protected Areas to protect representative ecosystems and priority species for conservation, sustain ecological processes, and generate environmental services. | • 19 protected areas under management are safeguarding lands representing 80% of the nation's biodiversity, with demarcated boundaries and management categories.<br>• Recovery of threatened species and remediation of degraded ecosystems; restocking or reintroduction of species.<br>• Creation and continuing operation of environmental services. | • Natural disaster prevention in fragile environments.<br>• Stabilization of collective production processes via climate regulation and water resources protection and regulation.<br>• Permanent supply of fresh water of adequate quality and quantity for agricultural production, household use, electric power generation, tourism, etc. |
| Implementation of strategies for management of protected areas and their surroundings for conservation and sustainable use of biodiversity and to further sustainable local and national development. | • Definition of the concept of natural resources management for conservation and sustainable development.<br>• Institution of a participatory planning system in the SNAP and in each protected area.<br>• Land-use planning and management of natural resources use with policies and regulations that benefit local communities.<br>• Implementation of management programs (security and protection, natural resources management, tourism, research, environmental education, etc.).<br>• Implementation of projects to support protected areas management by other government agencies and NGOs.<br>• Instilling an appreciation of the value of species and landscape resources with conservation-compatible use potential. | • Economic benefits to communities by way of alternative natural resources management models.<br>• Access to biodiversity resources for household use, food, medicine, or cultural purposes. |

[12] See Annex 2 for examples of biodiversity conservation and sustainable use.

### 3. Recognition of local populations' rights, customs, and use practices and local capacity building for ownership of environmental management in protected areas and their surroundings

The recognition and affirmation of local populations' rights, customs, and use practices, and local capacity building for ownership of environmental management in protected areas and their surroundings, are the fruit of SNAP principles and policies in action, embodying the "protected areas with people" philosophy. This is concordant with Bolivia's environmental legislation, framed by the principles of the Rio Summit's Agenda 21.[13] (Note that the term "local populations" takes in both indigenous communities and the campesino settlements found in virtually all of Bolivia's protected areas.)

This thrust area is reflected in an SNAP general process: **development and implementation of concepts, policies, strategies, and regulations governing local stakeholder engagement in protected areas management, to instill appreciation and local ownership of conservation and environmental management work.**

The specific processes that drive the different local benefits are helping to strengthen SNAP management and make the System more socially sustainable—this being fundamental for its continuing operation and viability. **Table 5** lists the local benefits created by these processes.

[13] United Nations Organization, "Earth Summit, Agenda 21", Rio de Janeiro, 1992.

**Table 5**
**RECOGNITION OF LOCAL POPULATIONS' RIGHTS, CUSTOMS, AND USE PRACTICES AND LOCAL CAPACITY BUILDING FOR OWNERSHIP OF ENVIRONMENTAL MANAGEMENT IN PROTECTED AREAS AND THEIR SURROUNDINGS**

| GENERAL PROCESSES[14] | SPECIFIC PROCESSES | LOCAL BENEFITS |
|---|---|---|
| Development and implementation of concepts, policies, strategies, and regulations for local stakeholder engagement in protected areas management, to instill appreciation and local ownership of environmental conservation and management work. | • Recognition, respect, promotion, and preservation of traditional knowledge, local populations' rights, customs, and use practices, for conservation and sustainable use of biodiversity resources.<br>• Management of protected areas in a framework of territorial and political-administrative integration and complementarity.<br>• Support for aboriginal community organizations to build local capacity and gradually take ownership of protected areas management.<br>• Co-management of protected areas.<br>• Formation and strengthening of Management Committees.<br>• Creation and strengthening of Inter-Agency Committees.<br>• Hiring of local residents for protected area management.<br>• Strategic partnerships with local organizations to preserve a protected area. | • Local stakeholder spaces for dialogue and consensus on protected areas management.<br>• Building of local stakeholder decision capacity on protected-areas management issues to protect local rights and interests.<br>• Reclaiming of aboriginal communities' cultural identity and sense of territorial ownership.<br>• Strengthening of community-based organizations.<br>• Local capacity building for protected area management and sustainable use of natural resources.<br>• Opportunities for contacts and inter-agency and financial support to implement projects that will benefit local communities. |

[14] See Annex 3 for examples of initiatives to promote and preserve aboriginal traditional knowledge and customs.

## IV. LOCAL BENEFITS IDENTIFIED AND THEIR RELATION TO LOCAL LIVELIHOOD FACTORS

An analysis of local benefits' impact on people and ecosystems must reference elements that determine the benefits' livelihood impact and scale. This means relating each benefit to the human, social, natural, physical, and financial factors considered to be fundamental for local livelihoods.

### a) Characteristics of livelihood factors analyzed

**Table 5** summarizes these factors. The characteristics listed helped differentiate the various factors discussed in this study.

**Table 5**
**LIVELIHOOD FACTORS: MAIN CHARACTERISTICS**

| FACTOR | CHARACTERISTICS |
|---|---|
| **HUMAN** | Individual and group capabilities and skills base. Size and quality of the human resources pool.<br><br>Through these human capital factors different conditions can be developed for achieving outcomes and defined targets. Human capital creates potentialities for the use of other factors. |
| **SOCIAL** | Organizational capabilities and social resources. Opportunities for participation and exchanges.<br><br>A medium of social transformation and coordination. Generates common values. |
| **NATURAL** | Natural resources generally, and environmental services. |
| **PHYSICAL** | Infrastructure, equipment and other assets, production inputs, transportation and communications conditions, goods and services. |
| **FINANCIAL** | Money or convertible assets (property, other assets). |

### b) Livelihood factor impact and scale of local benefits

To weight the impact of local benefits on the above-listed factors a yardstick was devised to express the magnitude of each benefit's impact on the factors, and a weighting scale.

- The local benefit has a **HIGH** impact on the factor when its effect is **DIRECT** and **TARGETED** on the factor (scale 3).

- The local benefit has a **MEDIUM** impact on the factor when its effect is **INDIRECT** but **TARGETED** (scale 2).

- The local benefit has a **LOW** impact on the factor when its effect is **INDIRECT** and **NOT TARGETED** (scale 1)**.**

- The local benefit's impact on the factor is **NIL** when another factor must be generated for the impact to be triggered (scale 0).

**c) Local-benefit trend direction**

To determine a local benefit's sustainability prospects and predict whether its impact on livelihood factors will be short- or long-lived we must ascertain its trend direction.

In this case study, trend directions are defined as follows:

**INCREASING** trend direction**:** The local benefit will be sustainable over time and its impact on a livelihood factor or factors is likely to trend up.

**SUSTAINED** trend direction: The local benefit will be sustainable over time but its impact on a livelihood factor or factors will not necessarily increase.

**DECREASING** trend direction: The local benefit is not sustainable over time and its impact on a livelihood factor or factors is likely to diminish.

**d) Local benefits: Local livelihood impact and trend directions**

An analysis follows of each of the local benefits identified as a product of GEF support for the SNAP, the magnitude of the benefit's impact on local livelihood factors, its scale, and its trend direction. Note that the analysis directly references the examples related in the respective annexes (Annex 1, 2, or 3).

**Local benefit 1**

**A government technical counterpart with comprehensive capabilities in remote and depressed areas to promote sustainable natural resources management and local environmental management**

| | FACTORS | | | | |
|---|---|---|---|---|---|
| **IMPACT** | **H** | **S** | **N** | **P** | **F** |
| **SCALE** | **3** | **3** | **2** | **2** | **2** |
| **TREND** | **INCREASING** | | | | |

This local benefit is directly targeted on human and organizational capacity development to pilot local natural-resources management toward sustainable development models. As discussed in the examples appended to this study, the support delivered for ecotourism project design has done more than further alternative management approaches: it also has improved the capabilities of individuals and organizations at the local level. The Entrance Fee System has created a direct source of funding targeted to specific project implementation and provides indirect support (but targeted on physical factors) on the services and production sides. Though the prime purpose of a protected area is to impact the "natural" factor, the assistance targeted on that factor has had only an indirect impact.

This benefit's trend direction in terms of its impact on local livelihood factors rates as "increasing," since capacities in protected areas are being strengthened and are having multiplier effects on other institutional and societal actors.

**Local benefit 2**

**Opportunities for contacts and inter-agency coordination for local communities with other government and non-governmental agencies to help supply basic needs**

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 3 | 2 | 0 | 0 | 0 |
| TREND | SUSTAINED | | | | |

Moves to channel support from other institutions to enhance health and education services for local populations have had a direct, targeted impact on human livelihood factors. Indirectly, but still targeted, such initiatives have provided community-based organizations and local authorities with tools to be able to rechannel this support. As for opening up more opportunities, regrettably, local communities have yet to see improvements in physical or financial livelihood factors from other institutions' support, targeted on those factors, nor has the natural factor been enhanced.

This benefit's trend direction is "sustained" since protected areas' facilitation efforts are part and parcel of a management policy. For the trend to change to "increasing," more systematic, strategic work will be needed in the SNAP and in individual protected areas and with local stakeholders.

**Local benefit 3**

**Support for communication systems, search and rescue, first aid services, and natural disaster prevention and relief**

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 3 | 3 | 0 | 3 | 0 |
| TREND | SUSTAINED | | | | |

One of the functions of protected areas management is to put an area's physical assets and skilled human resources at the service of the community. The impact of such support is direct and targeted on human, social, and physical livelihood factors. In some instances funding has been directly targeted, especially when the country was hit by a natural disaster; however, this financial aid was circumstance-specific and the experience is not necessarily replicable.

The trend direction of this local benefit's impact is "sustained": though delivering the benefit is part of a protected area's institutional mandate and the area's ranger corps receive ongoing training for these tasks, conditions for certain growth in support capabilities are still not in place. However, these capabilities will be sustained at least at their current level.

**Local benefit 4**

**Indirect services to local communities by way of a protected area's infrastructure, equipment, and personnel**

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 3 | 3 | 0 | 3 | 2 |
| TREND | SUSTAINED | | | | |

A protected area's physical resources are permanently available to assist local communities. The resulting direct impacts are targeted on human and social livelihood factors inasmuch as they influence the activities of individual community members (productive, commercial, household, etc.) as well as the organizational and participatory dimensions (support for town meetings, local authorities' operations). These resources also have an indirect but targeted impact on financial factors, since they frequently count as counterpart contributions to projects that benefit the local community.

This benefit's trend direction and livelihood impact is classed as "sustained" since it can be seen as sustainable over time. It cannot yet be rated "increasing" since this kind of services to the community do not necessarily develop the area's physical capacity.

**Local benefit 5**

**An increase in economic activity, benefiting the region**

Protected area management can significantly boost local economies: the economic momentum sparked by increases in operating outlays, payrolls, and local goods and services purchases have a definite impact on human, social, physical, and financial livelihood factors. The effect on natural factors is targeted but indirect since local economic growth does not necessarily trigger a sustainable natural-resources use dynamic.

This benefit's trend direction is sustained, since activities in protected areas and their financial dynamic typically will become consolidated.

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 2 | 3 | 3 |
| TREND | SUSTAINED | | | | |

**Benefit 6**

**Contribution to the preservation of conservation-compatible traditional customs and use practices and community development with identity**

Since this benefit stems from the pursuit of SNAP management policy its impact is direct and targeted on human and social factors. Its influence on the "natural" livelihood factor is targeted but indirect, there being no assurances of its conservation compatibility. Concrete actions are needed for the benefit to directly impact physical and financial factors.

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 2 | 0 | 0 |
| TREND | SUSTAINED | | | | |

This benefit's impact trend direction is "sustained": though policies are in place in each protected area to continue this contribution, a clearer conceptual, policy, and regulatory base is needed to sharpen the benefit's strategy focus.

**Benefit 7**

**Income from community-based tourism activities with zoning based on protected-area planning instruments**

For the most part the protected areas that have succeeded in promoting tourism are ones that have gone through at least a preliminary zoning process to regulate tourist activity. The initial impacts have had a direct influence targeted on human, social, physical, financial, and natural livelihood factors. Tourism would appear to be the activity in which livelihood impact and scale are identical for all five factors.

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 3 | 3 |
| TREND | INCREASING | | | | |

The trend direction here is "increasing": though not all of Bolivia's protected areas have tourism potential, the work that goes into tourism planning and management has a marked effect on the factors examined here.

**Benefit 8**

**Safeguarding of collectively used lands and natural resources thanks to legally mandated protected-area monitoring and compliance activities**

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 1 | 1 | 3 | 3 | 3 |
| TREND | SUSTAINED | | | | |

This benefit has a direct, targeted impact on physical, financial, and natural local livelihood factors. This assures a factor of production that is also an asset, affording direct access to the natural resource. On human and social factors the impact is indirect and not targeted: it has to do essentially with land and legal protection, though it does have an effect on individuals and their organization.

This impact's trend direction is classed as "sustained": for the most part Bolivia now has solid monitoring and compliance systems in place in its managed protected areas.

**Benefit 9**

**Natural disaster prevention in fragile environments**

Slope conservation, erosion prevention, and preservation of plant cover in fragile zones have a direct impact targeted on all five local livelihood factors, which are protected when disasters are averted.

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 3 | 3 |
| TREND | SUSTAINED | | | | |

The impact's trend direction is "sustained" inasmuch as conservation processes are entrenched in the protected areas. The trend could change to "increasing" only as concrete remediation action is taken in fragile zones.

**Benefit 10**

**Stabilization of collective production processes through climate regulation**

Climate regulation makes for stable production cycles. This benefit has direct impacts targeted on natural livelihood factors, specifically, natural resource availability (land, water, biological controls, etc.). Likewise influenced are human and social factors, as individuals and communities benefit. The influence on the financial livelihood factor is indirect but targeted owing to the prospect of invigorating the local production economy. The influence on the physical dimension is indirect and non-targeted, since it will not necessarily spur capital asset or infrastructure development.

The trend direction here is "sustained," climate regulation being a microregional or regional process. For it to rate as "increasing," environmental monitoring mechanisms would need to be instituted with a medium- and long-range recording sequence.

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 1 | 2 |
| TREND | SUSTAINED | | | | |

**Benefit 11**

**Permanent supply of fresh water of adequate quality and quantity for agricultural production, household use, electric power generation, and services generally**

The local benefit of freshwater supply has a direct impact targeted on production, household, and community services facets. Its strong impact on all five factors, making for integrated livelihood development, is characteristic of the water resource.

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 3 | 3 |
| TREND | SUSTAINED | | | | |

This benefit's impact trend is sustained, inasmuch as Bolivia's managed protected areas have fairly solid watershed and micro-basin protection programs. A micro-watershed restoration or remediation project could heighten this impact, especially in the vicinity of protected areas, but as yet no systematic actions are being piloted for that purpose.

**Benefit 12**

**Economic benefits for communities that adopt alternative natural resources management models**

As was the case for ecotourism development initiatives, any approach to natural resources management in protected areas—sustainable management of wild species or genetic resources, etc.—has a direct, targeted effect on livelihood factors. In contrast to other non-alternative processes, this benefit strongly impacts the natural factor, driving its sustainability.

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 3 | 3 |
| TREND | SUSTAINED | | | | |

The trend direction for this benefit's impact is "sustained" since many elements still need structuring (regulations, technical dimensions, policy) before there can be an "increasing" trend toward sustainable alternative natural-resources management models.

**Benefit 13**

**Access to biodiversity resources for household use, food, medicine, or cultural purposes**

One local benefit stemming from the "protected areas with people" principle that also honors local customs and use practices is local community access to biodiversity resources. This benefit directly targets and impacts all five livelihood factors because it has an effect both on the interests of individual community members and in the organizational and cultural spheres. It ensures the availability of natural resources and the possibility of benefiting from environmental services as well as directly generating financial and physical resources.

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 3 | 3 |
| TREND | SUSTAINED | | | | |

This benefit's trend direction is "sustained" because its factor impact will be permanent. The direction could change to "increasing and sustainable" in a scenario of tighter regulation of access to biodiversity resources for household use, more clarity on resource use management issues, commercialization of surpluses, and affirmation of conservation-compatible cultural use practices.

**Benefit 14**

**Local stakeholder spaces for dialogue and consensus regarding protected area management**

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 0 | 0 | 0 |
| TREND | SUSTAINED | | | | |

Ongoing moves to create spaces for dialogue as part of a policy to engage local stakeholders in protected area management in Bolivia, in parallel with the growing national policy trend toward local ownership of decisions, have achieved a direct impact targeted mainly on human and social livelihood factors. Arguably the greatest impact on local livelihoods has been in the spheres of personal development and creation of self-evaluation capabilities, cultural identity, and decision capacity, along with the strengthening of organizational and social dimensions. Though this access to spaces for dialogue has no effect on natural, physical, or financial factors it can drive other processes that do influence those factors (land-use planning, projects, etc.).

The trend direction for these impacts is "increasing" since delivering this benefit is part of a management policy and, especially, in light of the current national climate regarding spaces for dialogue, which go beyond the issue of protected area management.

**Benefit 15**

**Building of local stakeholder decision capacity regarding protected-area management issues to protect local rights and interests**

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 2 | 2 |
| TREND | INCREASING | | | | |

Building local capacity for protected area management is a core SNAP policy goal, the ultimate object being to make the conservation process socially sustainable.

This benefit associated with SNAP management directly impacts human and social livelihood factors by endowing individuals with skills, knowledge, and capabilities while promoting and improving organizational aspects. Because of the direct tie-in between community rights and interests and natural resources and land, this benefit has a direct, targeted impact on the natural factor as well. It indirectly affects physical and financial factors, since communities associate land and its resources both with production factors and assets and with income generating avenues.

The trend direction for this benefit's impact is "increasing." The community participation process no longer bears on SNAP management policy alone: it is being recast as a demand for local ownership of protected areas management.

**Benefit 16**

**Recovery of local aboriginal communities' cultural identity and sense of territorial ownership**

| | FACTORS | | | | |
|---|---|---|---|---|---|
| IMPACT | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 0 | 0 |
| TREND | INCREASING | | | | |

A sense of territorial ownership is one facet of the move toward local ownership of management of protected areas and recognition of its importance. Reinstilling this sense of ownership has a high impact on the human factor—preserving and promoting personal identity as part of the celebration of a

society and culture—as well as on social livelihood factors, for a community's organization around territorial interests. On the natural factor the benefit's impact is direct and targeted, inasmuch as "territory" takes in natural resources, their use potential, and environmental services.

The trend direction of this benefit's impact is "increasing." A common thread in demands being voiced by social groups (primarily indigenous communities) across the country is the reclaiming of cultural identity and a sense of territorial ownership.[15]

**Benefit 17**

**Strengthening of community–based organizations**

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 3 | 3 | 2 | 0 | 0 |
| TREND | INCREASING | | | | |

The pursuit of a local participation and capacity building policy has bolstered community-based organizations. This benefit has had a direct impact targeted on human and social factors: community organization leaders and members and the organization overall have been strengthened, essentially around the matter of protected area management (e.g. formation of Management Committees, co-managers, negotiation processes). There has been no comparable impact on the natural factor, where the benefit's effects have been indirect but targeted because these organizations' demands center on land and natural-resources management issues. The impact on physical and financial factors is nil because other things have to happen before those factors can feel the effect of this particular improvement.

The trend direction for this benefit's impact is "increasing": apart from the deepening of the community engagement policy, the climate in Bolivia is propitious for moves to quickly strengthen social organization mechanisms.

**Benefit 18**

**Building of local capacity for protected area management and sustainable use of natural resources**

| IMPACT | FACTORS | | | | |
|---|---|---|---|---|---|
| | H | S | N | P | F |
| SCALE | 3 | 3 | 3 | 0 | 0 |
| TREND | INCREASING | | | | |

Local communities' acquisition of skills and capabilities has had a direct impact targeted on human, social, and natural livelihood factors. Some highlights of this personal and organizational capacity development for protected areas management and focus on sustainable natural-resources use are the hiring of local residents to work in protected areas; local community involvement in protected area planning and zoning; local residents' input in participation forums, and territorial and political-administrative integration of the protected area.

[15] Regulations under the INRA Law; CSUTCB, CIDOB, CSCB Lists of Demands 2000 – 2003.

The "increasing" trend direction of this benefit's impact echoes the tendency of the other local benefits that influence the local organizational dynamic. This is largely attributable to the increasingly propitious climate in the country for local capacity building for development management.

**Benefit 19**

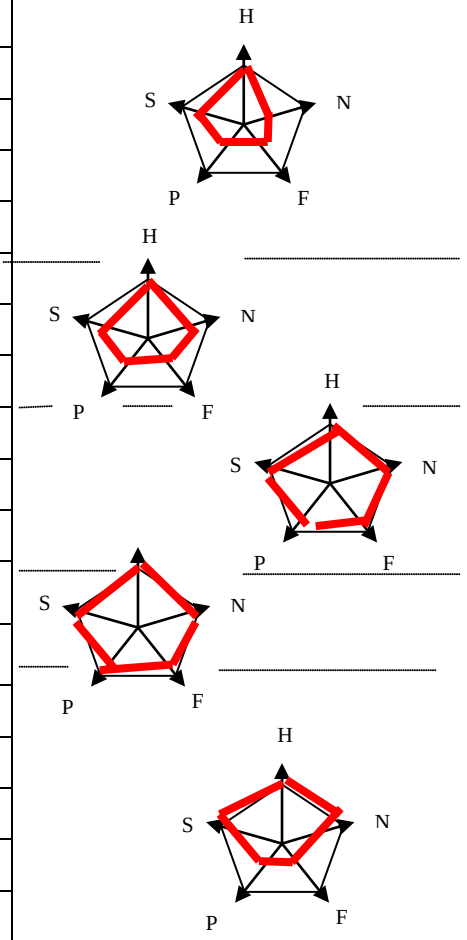
**Opportunities for contacts and inter-agency and financial support to implement projects that will benefit local communities**

By virtue of the concrete opportunities that this local benefit opens up, its impact is direct and targeted on the entire spectrum of local livelihood factors. The SNAP's management objectives, policies, and vision have conveyed the need for concrete support to supply local needs; the result has been institutional and funding support for this purpose.

| | FACTORS | | | | |
|---|---|---|---|---|---|
| **IMPACT** | **H** | **S** | **N** | **P** | **F** |
| **SCALE** | **3** | **3** | **3** | **3** | **3** |
| **TREND** | **INCREASING** | | | | |

This benefit's impact trend direction is "increasing" as more and more institutions step up to deliver this kind of support.

**Table 6**
**LOCAL LIVELIHOOD IMPACT OF LOCAL BENEFITS AND THEIR TIE-IN TO SNAP GENERAL PROCESSES**

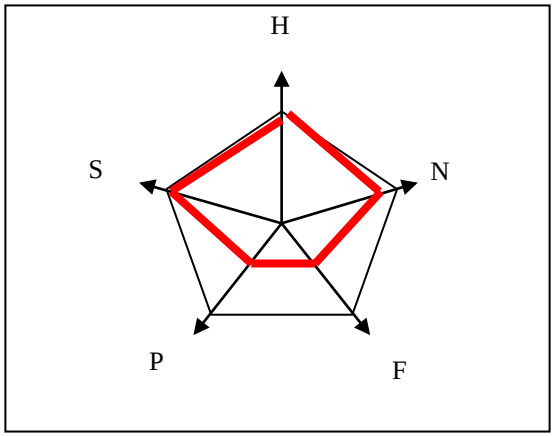
| GENERAL PROCESSES | LOCAL BENEFIT | FACTOR IMPACT | | | | | |
|---|---|---|---|---|---|---|---|
| | | H | S | N | P | F | |
| Creation of a government agency with technical expertise and financial capacity for biodiversity management, SNAP management, and national and local positioning of this issue. | **1** | 3 | 3 | 2 | 2 | 2 |  |
| | **2** | 3 | 2 | 0 | 0 | 0 | |
| | **3** | 3 | 3 | 0 | 3 | 0 | |
| | **4** | 3 | 3 | 0 | 3 | 2 | |
| | **5** | 3 | 3 | 2 | 3 | 3 | |
| Development of the conceptual, policy, regulatory, and operational framework for SNAP management and achievement of SNAP goals of conservation and furtherance of sustainable local and national development. | **6** | 3 | 3 | 2 | 0 | 0 | |
| | **7** | 3 | 3 | 3 | 3 | 3 | |
| | **8** | 1 | 1 | 3 | 3 | 3 | |
| Organization and implementation of the National System of Protected Areas to protect representative ecosystems and priority species for conservation and sustain ecological processes and environmental services. | **9** | 3 | 3 | 3 | 3 | 3 | |
| | **10** | 3 | 3 | 3 | 1 | 2 | |
| | **11** | 3 | 3 | 3 | 3 | 3 | |
| Implementation of management strategies for protected areas and their surroundings, for conservation and sustainable use of biodiversity resources and to further sustainable local and national development. | **12** | 3 | 3 | 3 | 3 | 3 | |
| | **13** | 3 | 3 | 3 | 3 | 3 | |
| Development and implementation of concepts, policies, strategies, and regulations for local stakeholder engagement in protected areas management, to instill appreciation and local ownership of conservation and environmental management work. | **14** | 3 | 3 | 0 | 0 | 0 | |
| | **15** | 3 | 3 | 3 | 2 | 2 | |
| | **16** | 3 | 3 | 3 | 0 | 0 | |
| | **17** | 3 | 3 | 2 | 0 | 0 | |
| | **18** | 3 | 3 | 3 | 0 | 0 | |
| | **19** | 3 | 3 | 3 | 3 | 3 | |
| **RELATIVE WEIGHT** | | **2.9** | **2.7** | **2.1** | **1.8** | **1.5** | |

**e) Livelihood impact: General discussion**

**Table 6** presents the consolidated impact of the local benefits examined here on livelihood factors and their tie-in to the general processes that drive the benefits.

It is quickly apparent that the main impacts fall on human, social, and natural livelihood factors, where the impact is direct and targeted (close to scale 3).

In the case of physical and financial factors (1.7 relative weight) the local benefits' impact has been indirect and moderately targeted.




According to this weighting, SNAP management has triggered improvements primarily in the first-mentioned three factors. This is entirely consistent with the SNAP's first principle (protected areas with people) and its management policies.

The physical and financial factors drive conditions for infrastructure, production inputs, transportation and communications, and goods and services generally. They also determine economic prospects for activating these inputs and resources.

How vulnerable and resilient is this system if it has failed to achieve a measure of balance in factor impacts?

**f) Vulnerability and resilience of local benefits' local livelihood impact**

A local population's access to the different livelihood factors can vary according to the setting and to external influences that can impede or enhance livelihood generation.

The VULNERABILITY of the local-benefit-generating processes refers to the extent to which the influences would exert an effect over time.

Positive outside influences were identified earlier when grading the benefits' impacts on human, social, environmental, physical, and financial factors. Negative influences bearing directly on vulnerability also need to be identified and factored into the analysis of the general processes that drive the local benefits.

This case study looked at general SNAP management processes to analyze negative elements in local benefit generation, which are outlined in **Table 7**.

One approach taken in the study to assess vulnerability was to gauge the processes' **RESILIENCE,** i.e., the ability to resist these negative influences. The following resilience scale was adopted:

**LOW** resilience: The external negative elements have a short-term effect on impact trend directions and stability of local benefit generation.

**MEDIUM** resilience: The negative elements do not affect a process's trend direction but do mute a local benefit's livelihood impact.

**HIGH** resilience: The negative external impacts affect neither process trend direction nor livelihood impact.

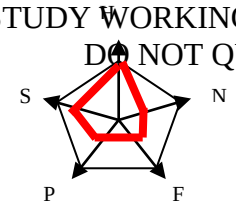
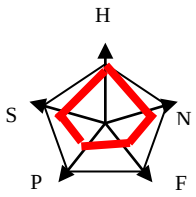
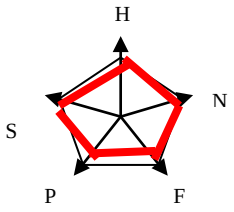
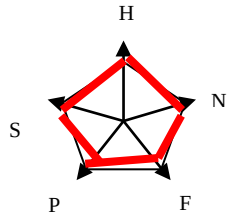
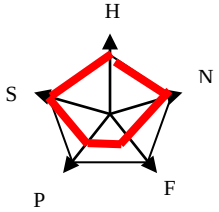
| GENERAL PROCESS | NEGATIVE IMPACTS | FACTOR ACCESS | RESILIENCE |
|---|---|---|---|
| Establishment of a government agency with technical expertise and financial capacity for biodiversity conservation, SNAP management, and national and local positioning of this issue. | 1) Creation of too many unfulfilled expectations in local communities as to the benefits of protected areas and the SNAP.<br><br>2) Technical capabilities not accompanied by concrete financial support offerings, hence, effective use alternatives cannot be developed. |  | **LOW:**<br><br>Significant negative impacts that depend on development of physical and financial factors and jeopardize the process. |
| Development of conceptual, policy, regulatory, and operational framework for SNAP management and achievement of its objectives of conservation and furtherance of sustainable local and national development. | 3) Conceptual elements relating to use of existing natural resources in place but insufficient regulatory and operational support to make them work on the ground; excessive expectations thus are raised. |  | **MEDIUM:**<br><br>Negative impact, depending partly on physical and financial factor development. Does not affect the process. |
| Organization and implementation of the National System of Protected Areas to protect representative ecosystems and priority species for conservation and sustain ecological processes and environmental services. | 4) Fewer prospects of benefits for individuals because of the generation of collective, local, and global benefits.<br><br>5) Harm to local economies from inadequate wildlife management (invasive species).<br><br>6) Creation of unrealistic expectations about environmental services as a local livelihood alternative and to further regional development.<br><br>7) Constraints on natural resources use with no alternative ideas that would be viable in the short term. |  | **MEDIUM:**<br><br>Significant negative impacts. Though these do not depend on physical or financial factor development, they jeopardize sustainability of factor access. |
| Implementation of management strategies for protected areas and their surroundings, for conservation and sustainable use of biodiversity and to further sustainable local and national development. | 8) Dearth of natural-resources use alternatives in the short run to benefit local populations.<br><br>9) Creation of too many expectations in local communities regarding benefits of protected areas and the SNAP, with no funding support.<br><br>10) Constraints on natural resources use with no clear conservation-compatible alternatives. |  | **MEDIUM:**<br><br>Significant negative impacts. Though these do not depend on physical or financial factor development they jeopardize sustainability of factor access. |
| Development and implementation of concepts, policies, strategies, and regulations for local stakeholder engagement in protected area management, to instill appreciation and local ownership of conservation and environmental management work. | 11) Creation of expectations in community-based organizations and local governments about use alternatives, with no real, concrete physical or financial prospects.<br><br>12) Generation of support from community-based organizations with a risk of it diminishing owing to lack of support in demonstrating conservation-compatible alternative uses. |  | **LOW:**<br><br>Significant negative impact; depends on physical and financial factors. Jeopardizes the process. |

**Table 7**
**NEGATIVE IMPACTS OF GENERAL SNAP MANAGEMENT PROCESSES AND THEIR INFLUENCE ON LOCAL BENEFIT GENERATING PROCESSES**

**g) Negative impacts of general SNAP management processes and their influence on local benefit generating processes**

The following are some of the negative impacts of the general processes discussed here.

**1) Too many unfulfilled expectations raised in local communities as to the benefits of protected areas and the SNAP**

Local residents of each protected area and its surroundings welcomed well-intentioned claims that the presence of the PA would mean new local development and livelihood options. These prospects have yet to materialize.

**2) Technical capabilities not accompanied by concrete financial support options, so effective use alternatives cannot be developed**

Since no funding has been forthcoming for the technical ideas developed by the SNAP management authority, these are still white elephants.

**3) Conceptual elements relating to the use of existing natural resources in place but insufficient regulatory and operational support to make them work on the ground, raising excessive expectations**

Because Bolivia still has no comprehensive body of regulations governing natural resources use, proposals in that regard cannot go forward.

**4) Fewer prospects of benefits for individuals because of the generation of collective, local, and global benefits**

Because protected area management focuses on local community, departmental, or national interests rather than individual property interests, it directly affects personal interests and obligates individuals to work in concert in communities or regionally.

**5) Harm to local economies from inadequate wildlife management (invasive species)**

The introduction of out-of-area species, e.g. different domestic plants and animals, without proper animal or plant health controls and with no chance to assess the introduced species' ecosystem impact creates animal and plant health problems that can imperil wildlife in the protected area in question.

**6) Creation of unrealistic expectations about environmental services as a local livelihood alternative and to further regional development**

The idea that environmental services can offer communities a livelihood alternative once there has been an economic valuation of such services and fees are charged for them is still at an embryonic stage. There being no guarantee that offering such services will yield immediate economic benefits for a local community, any such claim raises false expectations.

**7) Constraints on natural resources use with no ideas on viable alternatives for the near term**

One problem here is that biodiversity protection efforts have enabled various species to recover and proliferate. Vicuna programs are the only successful initiative that has spawned concrete resource use options. There still are no avenues for sustainable use of other resources like vizcachas, fish species, a variety of timber trees, or forest products since the requisite regulatory base is not in place.

**8) Dearth of natural-resources use alternatives in the short run to benefit local populations**

This is an adjunct to the previous item: it is taking too long to put together new resource use ideas or proposals and, hence, to finalize, secure funding for, and launch a venture.

**9) Creation of too many expectations in local communities regarding the benefits of protected areas and the SNAP, with no financing support**

Idem point 1)

**10) Constraints on natural resources use with no clear conservation-compatible alternatives**

Idem point 7)

**11) Creation of alternative-use expectations in community-based organizations and local governments with no real, concrete physical possibilities or funding prospects**

Idem point 1)

**12) Generation of support from community-based organizations with a chance of it diminishing owing to a lack of support in demonstrating conservation-compatible alternative uses**

Idem point 1)

It is evident from the above that the general SNAP processes discussed are not strongly resilient to the negative impacts of local-benefit generation, mostly because of the existence of negative impacts that drive process trend directions and influence the stability of local-benefit generation.

Resilience is low where financial and physical factors combine with use constraints and there are unfulfilled expectations or expectations that realistically cannot be fulfilled in the near term. Such is the case of the first and last general processes listed in Table 8.

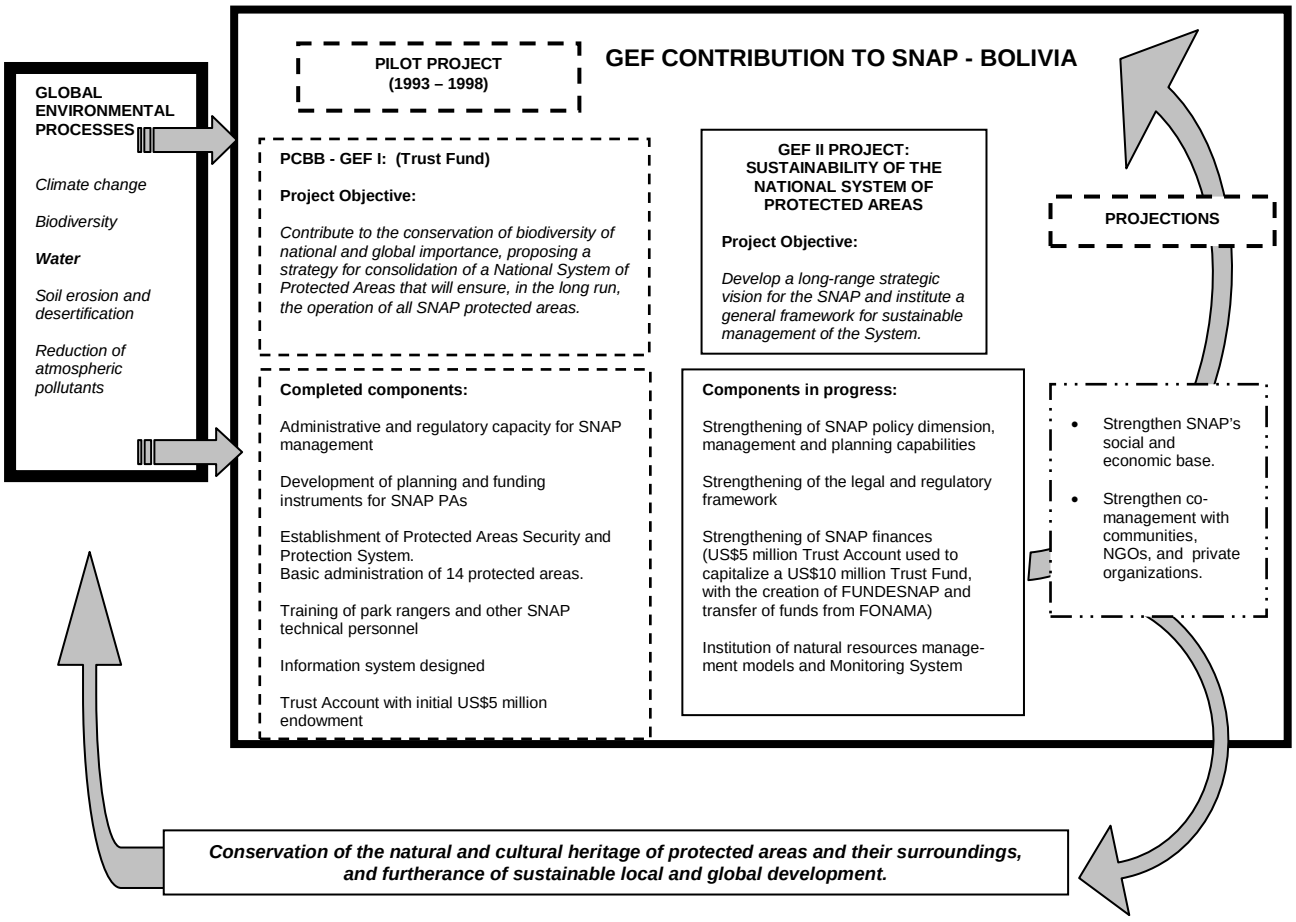
Resilience is medium where opportunities for physical and financial factor access have been enhanced—even when the kind of negative impacts mentioned above for the “low resilience” scenario are at work—and the trend direction of the general process will not be affected.

To conclude: The negative impacts discussed will significantly affect SNAP general processes when these do not manage to enhance prospects for physical and financial factor access. Their effect will not be significant when these levels are in balance with the other factors.

## V. GLOBAL BENEFITS AND THEIR LINKAGE WITH THE LOCAL BENEFITS IDENTIFIED IN THE CASE STUDY

Previous chapters of this study identified local benefits and assessed their livelihood impact, vulnerability, and resilience. This section looks at how these local benefits contribute—if at all—to global environmental processes.

**Figure 2**
**GEF ASSISTANCE TO THE SNAP: INTERPLAY WITH GLOBAL BENEFITS**




Among the global environmental impacts documented by world organizations are the loss of genetic resources and biodiversity, global warming and diminishing freshwater supplies, an increase in desertification and in levels of atmospheric CO2, and ozone layer depletion. All these developments are playing a part in the rises in poverty observed in many parts of the world and could ultimately imperil survival of the human race. A central aim of GEF-supported projects in Bolivia to construct an effective National System of Protected Areas has been to contribute to the generation of global environmental benefits (see Figure 2).

The global benefits addressed in the analysis are improvements that will help restore global environmental processes. Climate change is one of the highest-impact elements on the global plane because it is so closely associated with global warming which is melting polar ice and raising the snowline. These are two of the chief explanations for the shrinkage of water resources that are essential for human survival.

Measures to curb deforestation, preserving and regenerating plant cover and re-greening denuded areas, diminish the effects of desertification and erosion and capture more carbon dioxide from the atmosphere.

The prime reasons for conserving biological and cultural diversity are to protect genetic resources and their wild relatives and sustain ecological processes that help preserve pristine ecosystems and local, national, or regional endemic plant and animal species and contribute to the recovery of endangered species of flora and fauna, giving local populations prospects of sustainable development.

**Table 8** lists the local benefits in decreasing order from I3 to I0 according to the strength of their impact on the "natural" livelihood factor (for an explanation of the number scale see the chapter on Local Benefits).

**a) Analysis of findings**

We first identified how many and which local benefits have contributed to global benefit generation, and how. Local benefits exerting an impact of I>1 (i.e., I=2 and I=3) have an effect on the majority of the global benefits considered. Local benefits with I=0 have zero impact on the natural factor, so their contribution to the global benefits is nil. None of the local benefits was rated I=1 because there is no component of the SNAP consolidation process that is not targeted on the natural factor.

For three local benefits rated I>1 (benefit 18 with I=3; benefits 1 and 5 with I=2) no effects on any global benefit were observed, since those gains have to do directly with capacity generation and promotion of environmental knowledge, but these processes do not refer to concrete actions.

According to the analysis, conservation and cultural elements account for over half the contribution to global benefits. One thing to consider on the cultural side is the benefit-driving processes' impact or targeting on human and social factors in keeping with the "protected areas with people" philosophy.

The local benefits examined contributed little (at any level of I) toward global progress in slowing global warming or reducing atmospheric CO2. This is mainly because only a handful of initiatives have addressed those processes and, above all, because this impact is not readily measurable, entailing as it does complex processes that come out of the sum of the other global improvements.

**Table 8**
**LINKAGES BETWEEN LOCAL AND GLOBAL BENEFITS**

| I | LOCAL BENEFIT | GLOBAL BENEFITS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Slowing of global warming | Conservation of water supplies | Reduction in atmospheric CO2 | Slowing of deforestation rate | Reduction of desertification | Reduction of erosion | Biodiversity conservation | Preservation of cultural diversity | Conservation of genetic resources |
| 3 | 7 | | X | | X | X | X | X | X | X |
| | 8 | | X | | X | | | X | | X |
| | 9 | X | X | X | X | X | X | X | | X |
| | 10 | X | X | | X | X | X | X | X | X |
| | 11 | X | X | | | X | X | X | X | X |
| | 12 | X | X | | X | X | X | X | X | X |
| | 13 | | X | | X | X | X | X | X | X |
| | 15 | | X | | X | X | X | X | X | X |
| | 16 | | X | | X | X | X | X | X | X |
| | 18 | | | | | | | | | |
| | 19 | X | X | X | X | X | X | X | X | X |
| 2 | 1 | | | | | | | | | |
| | 5 | | | | | | | | | |
| | 6 | | X | | X | X | X | X | X | X |
| | 17 | | | | | | | | | |
| 0 | 2 | | | | | | | | | |
| | 3 | | | | | | | | | |
| | 4 | | | | | | | | | |
| | 14 | | | | | | | | | |

**b) Conclusions**

1. The local benefits identified in this case study have contributed consistently to the generation of global benefits that go well beyond the pursuit of biodiversity conservation.

2. No negative impacts of the local benefits on global benefits (or vice versa) were observed. This is because both sets of benefits fit with Bolivia's protected-areas management logic, sustainable development being one of its strategy thrusts.

## VI. GENERAL CASE STUDY CONCLUSIONS

1) Though the design focus of GEF-supported projects has been the generation of global benefits—specifically, biodiversity conservation—they have contributed to larger global environmental processes.

2) One feature of GEF project strategies has been to afford opportunities for local benefit generation primarily for indigenous people, campesinos, and settlers. These have had an impact on the livelihoods of these populations and, more specifically, on human, social, and natural livelihood factors.

3) The identified local benefits' influence on physical and financial livelihood factors was more muted.

4) No specific gender focus was observed.

5) The anticipated outcomes of the GEF-supported projects were consonant with the thrust of SNAP management strategy. Actual results surpassed expectations, solidifying the original strategy thrusts and bolstering the SNAP.

6) There is a direct relation between the generation of local benefits and their contribution to global benefits.

7) There are some significant areas of vulnerability in the local benefits and the processes that drive them; this could affect their sustainability prospects. Resilience is associated with enhancements of physical and financial livelihood factors.

## VII. RECOMMENDATIONS

1. For SNAP management processes that are local-benefit drivers to be sustainable, local benefit recipients need greater access to physical and financial livelihood factors. This will help achieve balanced local livelihoods and make local benefit driving processes more resilient. Above all, this is a way to deliver on the expectations created in local communities regarding development of resource use options that can help raise their standard of living within the sustainable development framework the protected area is promoting.

2. SERNAP would need to identify SNAP-related local benefits and then elucidate them in participatory exercises with local communities. This will help assure viability of protected areas management and sustainability of processes that are producing local and global benefits.

3. One design feature of new GEF-supported projects should be components to systematically identify local benefits and their interplay with global benefits.
4. International comparative assessments need to be done to quantify local benefits' contribution to global benefits, so GEF funding can be directed to initiatives that yield the greatest global improvements in the course of sustainable processes.

## ANNEX 1

### *CREATING AN INSTITUTIONAL BASE FOR BOLIVIA'S NATIONAL SYSTEM OF PROTECTED AREAS*

Bolivia's first serious, systemic move to address the question of protected areas dates back to 1992 with the enactment of the Environment Law that governs environmental protection and management matters, one component being the National System for Protected Areas (SNAP). The government agency responsible for the System underwent a succession of organizational, name, and reporting-line changes from 1992 until 1999, when all SNAP affairs were put under the National Protected Areas Service (SERNAP). The System has held firm to its policy thrust and objectives, which have matured in the intervening years. Like its predecessors, SERNAP has not been immune to political, administrative, and legislation changes but with its policies, regulations, and strategies it was equipped to tackle new imperatives, notably challenges ensuing from the Administrative Decentralization Law and Public Participation Law.

The creation of SERNAP as an agency with technical, administrative, and regulatory autonomy signaled the recognition of the SNAP's importance. This set the stage for policy, strategic, regulatory, and technical development of the SNAP and hence the strengthening of its capabilities.

The high profile of the issue of protected area management and of the SNAP authority shows up in a number of significant legal battles. One prominent example was a lengthy court battle against an offending NGO, which featured a constitutional challenge of the Regulations Governing Protected Areas (the only piece of legislation that regulates the SNAP as a whole) that claimed that the SNAP's authority and prescribed procedures for designating a zone as a protected area were unconstitutional. This was a very serious matter: had the Constitutional Court ruled the Regulations unconstitutional the SNAP would have been left completely unprotected. In the end the Court found that the Regulations are constitutional; thus, respect for protected areas and their governing legislation are constitutionally protected obligations.

In those same legal proceedings an appeal for annulment was filed against SERNAP claiming that authority for SERNAP rested with the Minister of Sustainable Development and not the Director of SERNAP. The Constitutional Court found the appeal to be without merit, thereby recognizing the full authority of SERNAP's Director and hence of SERNAP itself. These Constitutional Court rulings set very valuable precedents, political-administrative as well as legal.

The topic of protected areas gradually found its way into public policies. In the most recent presidential elections, for instance, the environment and protected areas were much in evidence in political party platforms: ADN (Acción Democrática Nacionalista) proposed to "strengthen SERNAP's institutional base to make it work efficiently and ensure that it is adequately funded." MBL (Movimiento Bolivia Libre) proclaimed the need to "address fundamental issues such as valuation and use of our nation's natural-resources endowment, … but also protection policies," and stated "There can be no economic, human, or environmental progress without sturdier institutions and stronger stakeholders."[16]

Creating an institutional base for SNAP management has yielded a series of benefits:

[16] Environmental Defense League (LIDEMA) (2002). *El desarrollo sostenible en la oferta electoral de los partidos políticos* [Sustainable Development in Political Parties' Election Platforms], pages 92, 100.

**1) A government technical counterpart with comprehensive capabilities in remote and depressed parts of the country for promotion of sustainable natural resources management and local environmental management**

Under the terms of a 2001 agreement between the Quetena Grande and Quetena Chico communities in Eduardo Avaroa Reserve, SERNAP, and the Municipality of San Pablo de Lípez, 25% of the entrance fee intake (the "SISCO" scheme) is earmarked for community projects. One now-completed operation built a health post and purchased motorcycles for health workers; SISCO revenues were used as San Pedro de Lípez Municipality counterpart funds. This project benefited the Reserve's entire local population.

———

The presence of Regional Directorates has been instrumental in the development of ecotourism projects that improve the lives of entire communities. Cases in point are Pilón Lajas Reserve, with its Mapajo Lodge, Sajama National Park with Tomarapi Lodge, and Madidi Park and San Miguel Lodge.

Another venture, the Asunta project in Isiboro Sécure Indigenous Territory-National Park (TIPNIS), exemplifies the benefit discussed here. In 2001 the TIPNIS indigenous organization (*subcentral*), as co-manager of the protected area and owner of this indigenous homeland, decided to launch an ecotourism project in the Asunta region inside TIPNIS. The venture called for financial and technical support from a private tour operator, so a technical counterpart was needed to examine and discuss the company's proposal.

Since it did not have the requisite technical expertise the *subcentral* approached the Regional Directorate. With advisory assistance from that office, delivered by specialists from SERNAP headquarters, the project was developed and implemented and now is yielding economic benefits for the Asunta community.

———

The Araucaria Program launched in 1999 and still in progress is being funded by the Spanish cooperation agency, with the NGO BOLHISPANIA as implementing agency. Its core mission is to fund projects to benefit Apolobamba NAIM communities. The Regional Directorate's technical and operational support was instrumental in this program's design and implementation, including municipal liaison and counterpart facets.

**2) Local communities have opportunities to contact and coordinate efforts with public and private agencies**

The direct support that NGOs are delivering to local communities in protected areas is made possible by the existence of a national protected-areas authority and Regional Directorates that draw NGOs' attention to the local population and its needs. Community projects that come in for NGO support contribute as well to conservation of the protected area. From 1999 to 2003 the NGO TROPICO funded ecotourism development work in Eduardo Avaroa Reserve (lodge design, printed literature, training, construction of a tourist lookout in Laguna Verde, etc.), working in concert with the Quetena Chico and Quetena Grande communities. Another agency, CARE, carried through various projects from 1997 to 2002, among them a water supply project for Apolo communities near Madidi Park. These ventures, too, were coordinated directly with the targeted communities.

———

Thanks to efforts since 1998 by Pilón Lajas Reserve and Isiboro Sécure Park, teachers and health professionals have gone into area communities to work; in some cases this marked the first time such

services had been available. Through another collaborative arrangement worked out with the First Lady's Office, clothing, medicine, and health care equipment were delivered to these communities. Government agencies' relatively quick response was made possible by the institutional support of the protected areas.

**3) The institutional presence generates indirect services to local communities**

When a natural disaster strikes, a protected area's staff, vehicles, and camps are put to work to help in the search and rescue effort and administer first aid. When Pilón Lajas Reserve was flooded in 2000 the Reserve's entire staff and all its equipment and infrastructure was put at the service of the affected communities to help with rescue and relief work. Since there was virtually no police presence in Rurrenabaque (only three officers) this support was greatly welcomed and earned the Reserve public recognition from community and government authorities in the region.

———

When a massive snowstorm buried southern Potosí Department in 2002 and the government declared a national state of emergency, personnel of Eduardo Avaroa Reserve, SERNAP headquarters staff, and SNAP funding providers rushed to the aid of Quetena Grande and Quetena Chico communities. The inpouring of aid worth an estimated US$300,000 saved human lives and camelid livestock. As a protected area, this region and its communities came in for immediate support surpassing by far the aid delivered to other parts of the disaster zone.

During the snowstorm that battered the Andean highlands in July 2002 Sajama National Park was able to secure funding for fodder and medicine for livestock (principally camelids) and to pay a professional veterinarian to treat animals injured during the storm and its aftermath.

———

Sajama National Park is a major tourist draw, attracting visitors who wish to experience the snows of Mount Sajama. Occasionally hikers and climbers put themselves at risk, getting lost for instance in a surprise snowstorm. The area's ranger corps, who are trained in mountaineering and search and rescue, work at great personal risk and without the most rudimentary mountaineering equipment to locate and rescue such visitors and administer first aid.

Like all of Bolivia's protected areas, Carrasco National Park boasts tourist attractions that appeal to adventure travelers. Problems can arise when visitors fail to register and thus run the risk of getting lost or injured from bites, falls, or other accidents. In one such incident in mid-2003, which fortunately ended well, park rangers joined forces with SAR teams to locate and rescue two lost members of a group of Cochabamba university students.

**4) Indirect services to local communities**

One feature of most Bolivian protected areas today is a community support service using radio communication equipment installed in camping grounds. TIPNIS has a first-aid post; in Pilón Lajas there is transportation service for community members, especially the elderly, women, and children. A radio station set up in Sajama National Park (the only local station) with support from the MAPZA Project is providing service to the community and broadcasting environmental education programs.

**5) An increase in economic activity, benefiting the region**

When a protected area is placed under management the regional economy receives a boost. According to SERNAP budget data, local outlays for wages, goods and services and annual investment expenditure (in the last three years) tally US$4.2 million. This also encourages new local business start-ups. Over the past five years Pilón Lajas Reserve and Madidi Park have propelled economic growth in Rurrenabaque as hunting, fishing, and chainsaw logging that were the mainstays of that hitherto marginal economy have given way to ecotourism. Today Rurrenabaque is one of Bolivia's leading tourist destinations and is generating more balanced local economic growth. Similar local economic booms are evident in Uyuni thanks to Eduardo Avaroa Reserve and in Buena Vista with Amboró Park.

**6) Contribution to the preservation of conservation-compatible traditional customs and use practices and community development with identity**

Most SNAP protected areas are home to population groups with distinct ancestral cultures, and conservation management work in these areas takes these traditional practices into account. The Kallawaya culture in Apolobamba NAIM has been famed for its knowledge of traditional plant medicines since colonial times when the wife of a Peruvian viceroy was cured of malaria with an infusion of quinine (*Cinchona calisaya*). In 2003 UNESCO recognized this traditional knowledge in particular and the Kallawaya culture generally by proclaiming it a Masterpiece of the Oral and Intangible Heritage of Humanity.

_____

To deal with the problem of puma attacks on domestic fauna, Sajama National Park has instituted a puma control program using the traditional *chacuna* method in which firecrackers are set off to drive the animals out of the area.

**7) Income from community-based tourism activities with zoning based on protected-area planning instruments**

The Mapajo ecotourism project in Pilón Lajas Reserve, supported by the NGO PRAIA, has been providing economic benefits to Asunción del Quiquibey communities since 1999. This conservation-compatible venture is concordant with the Reserve's preliminary zoning plan.

Likewise, tourism activities revolving around the communal lodges built in Sajama Park (Tomarapi), Amboró Park (Mataracú) and Madidi Park (San Miguel and Chalalán) are directly benefiting the respective local communities.

**8) Safeguarding of collectively used lands and natural resources**

Community members' land and natural resources both benefit generally from park ranger security and protection services. Sometimes the rangers' involvement goes a step further: in Pilón Lajas Reserve an NGO widely known to be engaging in illegal activities tried to take possession of a collectively used piece of land in the community of San Miguel. When NGO officials, accompanied by an agricultural judge, appeared on the land bearing a court order, community residents turned to the park rangers for protection and assistance. After seeking legal advice from SERNAP the rangers refused to allow the NGO to take the land because the NGO's actions had no basis in law. With the

Regional Directorate's help the San Miguel community defended its position before the agricultural court. In the end the NGO was forced to desist, while the land tenure regularization process continued.

## ANNEX 2

### *LOCAL BENEFITS ENSUING FROM CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY FOR SUSTAINABLE DEVELOPMENT*

Roughly 1.5 million Bolivians depend directly or indirectly on protected areas for subsistence—600,000 residing in the areas proper, the others living in the vicinity.[17] Indigenous people make up 70% of this population base. Many of the 60 municipalities that overlap or adjoin these protected terrains rely on natural resources inside the areas either directly (logging, stock-raising, water resources, microclimate drivers, etc.) or as local development alternatives (ecotourism, crafts, etc.).

Madidi NP-NAIM is a prime example. This region, the most biodiverse-rich in the nation, boasts some 1,100 bird species that represent 90% of Bolivia's avifauna, and harbors approximately 6,000 higher plant species. This makes it one of the most outstanding natural reservoirs of genetic resources on the planet, on a par with its counterparts across the border in Peru (Tambopata-Candamo and Bahuaje Sonene).

Protection and security activities in SNAP protected areas have been instrumental in consolidating the managed PAs and, perhaps even more significantly, in recovering endangered species and ecosystems and geological and geomorphologic features, notably freshwater supplies (snow-capped mountain peaks) and the scenic beauty of natural monuments. These activities also have opened up opportunities for scientific research and access to the use of biodiversity resources.

By virtue of their ecological continuity and connectivity a number of SNAP PAs form ecocorridors for biodiversity preservation, for example the Manuripi NAWR—Madidi NP corridor. Since the Manuripi River zone also is near the site of the proposed Tahuamanu Bioreserve and Yaminahua TCO (both in Peru) this would create an ecocorridor for Amazon fauna and flora. Sajama National Park adjoins Chile's Lauca National Park and forms a corridor for survival of Andean fauna, especially the vicuna and Andean armadillo. San Matías NAIM borders on Brazil, creating an ecological corridor with that country's Gran Pantanal National Park and Acurizal and Dorochê private reserves.

Haffer (1980) proposed some zones of PAs on the eastern Andean slopes as possible Pleistocene Refuges, i.e., sites of extraordinary importance for their biodiversity accumulation over the last 20,000 years.

El Palmar NAIM was created in Chuquisaca to protect relict palm trees of the endemic species *Parajubea torallyi* (Bolivian mountain coconut palm). Other endemic species also are being protected to enable their populations to rebound: endemic orchids (Amboró NP-NAIM, Noel Kempff Mercado NP, Cotapata NP-NAIM), endemic hummingbirds, and endemisms of rare species and species with a disjointed distribution caused by particular kinds of terrain like limestone outcroppings (San Matías NAIM). Also targeted for protection are threatened species like the guanaco (*Lama guanicoe*) (Kaa Iya del Gran Chaco NP-NAIM) and oilbird (*Steatornis caripensis*) (Carrasco NP, Cotapata NP-NAIM).

The move to manage PAs under the SNAP has raised high expectations among local residents of Bolivia's most depressed municipalities but unless higher income-generating options can be devised it will be difficult to deliver on those expectations. Opportunities would need to be provided by creating a sustainable market for biodiversity products.

[17] SERNAP, *Memoria Insticucional 1998-2002.*

External funding has helped create opportunities for women especially in the craft trade, for instance, hand-weaving of llama fiber in Quetena Grande (REA), an initiative that is giving employment to over 20 women,[1] jatata palm weaving in Galilea near the Beni Biological Station, and assembly work in Sajama.

This case study has identified local benefits ensuing from conservation and sustainable use of biodiversity for sustainable development, which gives communities access to biodiversity resources and local environmental benefits. Drivers of such benefits are the protection of freshwater reservoirs to assure a sustainable supply of good-quality water; protection of disaster-prone fragile environments; slowing of soil erosion; streamflow regulation and silting control in watersheds to prevent droughts and flooding; climate stabilization; and conservation of flora and fauna species for household use, food, medicine, or cultural practices.

### 9) Natural disaster prevention in fragile environments

The frequency of natural landslides and rockslides in protected areas situated on the craggy eastern slopes of the Andes attests to the extreme soil and earthquake vulnerability of this land.[†] Some particularly fragile zones are Amboró NP-NAIM, Carrasco NP, Madidi NP-NAIM, and Pilón Lajas BR-TCO where protection programs are endeavoring to prevent or minimize deforestation and help restock vegetation in fragile areas. The aim is to stabilize slopes and largely prevent natural disasters like landslides, rain and hail storms, overflowing rivers, and flooding. Indeed, such events typically are occurring outside the protected areas, where there are no environmental management or disaster prevention systems in place.

The SEARPI project to regulate the Piraí River basin in Santa Cruz helped pilot the creation of Amboró NP-NAIM. Prior to the launch of the protection program operated by the park ranger corps, rain and hail storms were a frequent occurrence and the Piraí River often overflowed its banks. This took a particularly heavy toll on the city of Santa Cruz de la Sierra, mainly because the destruction of trees had left the upper reaches of the watershed denuded. There have been no reports of such events in the past few years.

A more recent example was the March 2003 disaster (repeated the following November) on hillsides along the Tipuani River downstream from Madidi NP-NAIM. Mining activity, which severely disturbs the region's fragile topography, triggered landslides that buried the mining town of Chima in mud and gravel and claimed many victims, numerous children among them. No such events have been reported elsewhere in an SNAP protected area.

### 10) Stabilization of collective production processes by means of climate regulation

When forest cover is regenerated within a protected area and kept safe from logging, microparticles of water in the atmosphere are captured by the small treetop leaves. The water collected seeps down through stems and trunks to nourish the soil. The plant cover also shields the soil from direct sunlight, so less water evaporates. This, in combination with firmly rooted trees and shrubs, reduces soil erosion. As relative air humidity increases the climate changes and the ambient temperature rises.

These favorable conditions set the stage for production process improvements, though at the moment there are no ready examples at hand.

---

[1] Tríptico TROPICO.

[†] SERNAP Environmental Monitoring Directorate (DMA). *Zonas de manejo en áreas protegidas como instrumentos de protección efectiva del patrimonio natural y cultural del país* [Management Zones in Protected Areas as an Effective Means of Protection of Bolivia's Natural and Cultural Heritage].

Madidi NP-NAIM offers another example of the effects of climate regulation. The regenerated, protected forest barrier in that area is helping to halt the spread of natural forest fires on the pampas, which could impoverish the soil and make it useless as a production resource.

**11) A permanent supply of fresh water of the requisite quality and quantity for agricultural production, household use, electric power generation, tourism, etc.**

The freshwater reserves that form watersheds, microbasins, and aquifers by infiltration feed the closed upland watershed and the Amazon and Plata basins. Mountain formations in Sajama NP, Eduardo Avaroa NAWR, and Apolobamba NAIM help configure and sustain the closed watershed. Mountains in Madidi NP-NAIM, Apolobamba NAIM, Cotapata NP-NAIM, Pilón Lajas BR-TCO, TIPNIS, Tunari NP, Amboró NP-NAIM, and Kaa Iya del Gran Chaco NP-NAIM nourish the Amazon watershed; San Matías NAIM, Sama BR, Tariquía NWR, Aguaragüe NP-NAIM, and Otiquis NP-NAIM feed the Plata basin.

Mount Sajama in the national park of the same name—at 6,542 meters, Bolivia's highest snow-capped peak—and the Payachata Range (Mount Pomerape at 6,222 m.a.s.l. and Mount Parinacota at 6,132 meters) nourish the Andean upland closed watershed by way of the Sajama, Tomarapi, and Esquillani rivers. Water flowing into rivers and fresh groundwater reservoirs sustains marshlands that are grazing grounds for local livestock (mainly camelids) and provide households with water via groundwater aquifers. These same water resources sustain lakes in the high Andes that are nesting grounds for flamingos and ducks and breeding grounds for food fish. Another of this area's attractions is its hot springs with their curative powers.

The Apolobamba mountain range that straddles Apolobamba NAIM and Madidi NP-NAIM is a crucial freshwater reserve that feeds the upland closed watershed and the Amazon basin via the snow-covered peaks of Mount Cololo (5,916 m.a.s.ml), Mount Soral (5,700 m.a.s.l.), Mount Akamani or Katantika, and their glacier lakes. In the closed upland basin, snowmelt from those peaks bathes vast tracts of wetlands that are vital permanent grazing lands for browsing camelids, especially vicunas, and supply residents of the Ulla Ulla plateau with water. Another source is the Suches River, a major tributary of Lake Titicaca that is the habitat of fish species such as the endangered suche. Hot springs in this area attract locals and tourists alike. Water from this snowmelt also sustains lakes in the high Andes that are staging grounds for migrating flamingos and ducks and have been stocked with fish such as trout, which is part of the diet of inhabitants of the Ulla Ulla tablelands. Toward the Amazon basin the Apolobamba Mountains contribute to the formation of the upper reaches of the watershed that are the headwaters of numerous rivers and Beni River tributaries (Madidi, Pelechuco, Hilo Hilo, Sorapata, Sunchuli, Charazani, Amarete, Yuyo, Mapiri, Tuichi, Eslabón, Hondo or Erasama) in the Yungas de La Paz formation that is home to a large population of settlers, campesinos, and indigenous people. The volume of snowmelt flow in the region has yet to be quantified but there are water boxes in the region supplying households in the largest communities. The tributaries formed make the Beni River more navigable and harbor Amazon fish species that are the subsistence diet of the local population.

Mount Silala in the closed Andean watershed, at the northern boundary of Eduardo Avaroa NAWR in the Río Grande de Lípez basin, is the source of the Silala River on the border with Chile. Snowmelt from this peak is an important source of fresh water for this desert region, which is currently the subject of a dispute. Volcanic and receiving lakes—Colorada (a RAMSAR site), Verde, Hedionda, Pastos Grandes, Salada, and others—are a permanent haven for three flamingo species whose nesting grounds are protected.

Protection of watersheds around the Yungas valleys in Cotapata NP-NAIM, the Huarinilla River, a tributary of the Coroico and Beni rivers, and the Cielo Jahuira River, tributary of the Zongo (site of hydroelectric plants) helps in power generation for the departments of La Paz and Oruro.

In the Beni River plain, watersheds of various Mamoré River tributaries are home to commercially valuable fish species like pacu and tiger shovelnose catfish. Between the tributaries lie the Sécure, Ichoa, and Isiboro river basins (TIPNIS); the Iviruzu, Chimoré, and Sajta-San Mateo basins (Carrasco NP), and the Ichilo,

Yapacaní, Surutú and San Mateo watersheds (Amboró NP-NAIM). These river waters also are tapped by large settlements inside the PAs or on their perimeter. The Quiquibey River basin (Pilón Lajas RB-TCO, Beni Biological Station) that bathes and regulates the Beni floodplain helps sustain grazing land for extensive cattle ranching in this region.

Snowmelt from the Tunari Mountains in Tunari NP (Mount Tunari, 5,035 m.a.s.l.) contributes to the formation of a network of micro-basins that feed watersheds in the city of Cochabamba as well as valley groundwater reservoirs in aquifer infiltration areas. This is a groundwater and surface water source for Cochabamba valleys, for farming and household use and for power generation for Cochabamba.

An important protected area in the Plata basin is Kaa Iya del Gran Chaco NP-NAIM, which serves a key hydrological function with the Bañados del Izozog wetlands, capturing and regulating rainfall and thereby assuring water supplies for Chaco region households and farm operations. The Gran Pantanal ecoregion shared by Brazil, Bolivia, and Paraguay is the world's largest and most pristine wetland. The San Matías NAIM marshes (recently declared a RAMSAR site) are the best conserved. These huge tracts of wetland lend themselves to extensive cattle ranching and associated wildlife management. Otuquis NP-NAIM with the Bañado de Otuquis helps regulate the Paraguay River flow in an area drained by a complex water system made up of lake ecosystems (*bañados*), large and small lagoons, ponds, streams, rivers, and creeks, which in turn feed the two main Paraguay River tributaries in Bolivian territory—the Candelaria and Otuquis. By preserving the trophic chain in the region (via the supply of silt and nutrients) and conserving wild bird species that are threatened elsewhere in this wetland, those two rivers are major suppliers of protein for the diet of indigenous groups, in particular, and help keep the Paraguay River navigable. The Tacsara Mountains (Cordillera de Sama BR) protect the Tajzara, Camacho, and San Juan del Oro river basins (the latter river being harnessed downstream to generate electric energy for the South Tarija and Potosí region) and the Guadalquivir. These waters ultimately form the Bermejo River.

**12) Economic benefits for communities that adopt alternative natural resources management models**

The SNAP PAs harbor natural reservoirs of significant genetic diversity, both wild and modified by man (wild and domesticated camelids, medicinal plants, etc.), with Kallawaya, Chimane, Quechua, Aymara, Chiriguana, and other indigenous cultures, strengthened or preserved by way of the national and transboundary ecocorridors formed by these PAs by virtue of their physical continuity, or as strategic staging areas particularly for bird species.

Protection programs have been instituted in the PAs to preserve agricultural genetic resources (tubers, corn) or traditional medicines (Apolobamba NAIM, Sajama NP), wild maize in Madidi NP-NAIM, and promising flora and fauna (wild fruit, wild meat, etc.). This opens up opportunities for sustainable use of biodiversity resources to generate income and enhance local livelihood sustainability directly (use of vicuna fiber, camelids generally, wild meat, traditional medicine) or indirectly (tourist guide services, craft sales, food and lodging sales).

Few gains have been posted as yet from biodiversity management initiatives, with the notable exception of vicuna management, but the regulations curbing illegal logging in PAs are an important step forward.

Thanks to protection measures in Apolobamba NAIM (formerly Ulla Ulla NWR), the vicuna population increased and was moved to CITES Appendix II, setting the stage for sustainable use of vicuna fiber. Training programs have featured hands-on capture and shearing sessions with campesino communities; park rangers, wildlife wardens, and community monitors have undergone training as well. This ongoing process has already been replicated in Sajama NP. The Biodiversity Directorate (DGB) is collecting vicuna fiber and plans to sell it on the international market and distribute revenues among the community.

Products obtained from llama husbandry in Quetena Grande (REA) using native germplasm of domesticated camelids are llama jerky in various formats (sliced, breakfast pack, school snacks) and llama fiber, and hand-woven items being crafted from llama fiber by more than 20 women.[1] This project in Eduardo Avaroa NAWR and Sajama NP is being operated by a consortium associated with TROPICO, with external funding support.

Training programs run in Galilea near the Beni Biological Station have taught locals to weave cloth from the leaves of the understorey palm *Genoma deversa.* This has given birth to innovative textiles and designs and fiber treatment and dyeing. The most skilled artisans were earning good money from sales of their textiles but they now have moved to the nearby town of San Borja.

In Tariquía NWR, the co-manager PROMETA piloted and operated a honey production project that has been very successful, delivering a whole range of products manufactured from bee honey.

Sajama NP received support for the launch and operation of a community lodge in Tomarapi, administered by an area residents' association. This world-class facility features cabins fitted out for the region's climate, hot water, bathrooms, and cuisine prepared by trained chefs. The lodge has been receiving foreign and Bolivian visitors since 2003.

**13) Access to biodiversity resources for household use, food, medicine, or cultural practices**

The work done to protect SNAP PAs also has boosted the populations of other species such as vizcachas in Apolobamba NAIM and Sajama NP, flamingos in Eduardo Avaroa NAWR and fish species in high Andean and TIPNIS lakes, for instance, and various riverways in most of the Amazon and Chaco PAs. This can spur the development of pilot wildlife management programs focusing on the collection of flamingo eggs for local families' tables (provided a substantial increase in nesting flamingo populations is documented and a rigorous monitoring and compliance system is put into place), the demarcation of sport and commercial fishing zones, etc. Regulations also are needed to govern extraction of nonwood forest resources (resins, lianas, fruits, dyes, for example) and of wood products, alder sticks to make picks, and so on.

Thanks to conservation efforts, relict forests have been saved as a germplasm resource for chestnut trees (*Bertholetia exelsa*), rubber trees (*Hevea brasiliensis*) (Manuripi NAWR), forest species such as bigleaf mahogany (*Swietenia macrophylla),* and cedar *(Cedrella*) (EBB, Manuripi NAWR, Madidi NP-NAIM, Noel Kempff Mercado NP). Other conservation targets are quewiña forests (*Polylepis tarapacana*, the highest forest formation in the world, which grows at more than 5,200 m.a.s.l. in Sajama NP); the mossy quewiña tree (*Polylepis pepei)* in Apolobamba NAIM and Cotapata NP-NAIM, white quebracho (*Aspidosperma quebracho-blanco*) relicts, hill quebracho (*Schinopsis haenkeana*), mountain pine (*Podocarpus parlatorei*) and amburana (*Amburana cearensis)* (Torotoro NP). Conservation work also is protecting bird nesting sites (three flamingo species in Laguna Colorada, Eduardo Avaroa BR) and fish and turtle hatching grounds (EBB, Madidi NP-NAIM, Manuripi NAWR, TIPNIS), and Otuquis NP-NAIM and San Matías NAIM with their fish and aquatic invertebrate breeding centers (various commercially valuable fish species: dorado (*Salminus maxillosus*), pacu (*Piaractus mesopotamicus*), pintado (*Pseudoplatystoma corruscans*), and tiger shovelnose catfish (*P. fasciatum*)). This is creating an opportunity to repopulate forest resources and animal species in zones around protected areas that at present are devoid of this wildlife, and then develop wildlife use plans, sport and commercial fishing activities, and so on.

All the SNAP PAs are home to cultures that are knowledgeable about the curative powers of their region's plants, for instance, the Chimane community in the Beni Biological Station. An externally funded

[1] Tríptico TROPICO.

pilot project implemented by CABI to produce the antifungal cream Aguaratiní from the guiraquillo plant (*Solanum lorentzii*) in Kaa Iya del Gran Chaco NP-NAIM has cleared the second phase.

**ANNEX 3**

***DEVELOPMENT AND IMPLEMENTATION OF CONCEPTS, POLICIES, STRATEGIES, AND REGULATIONS FOR LOCAL STAKEHOLDER ENGAGEMENT IN PROTECTED AREAS MANAGEMENT, TO INSTILL APPRECIATION AND LOCAL OWNERSHIP OF CONSERVATION AND ENVIRONMENTAL MANAGEMENT WORK***

The first principle of SNAP management is "protected areas with people," as evidenced in the System's governing legislation (Environment Law, Regulations Governing Protected Areas) and in its own principles and policies (July 2002 policy paper).

Creating recognition and an understanding of what is entailed in administering protected areas with people is an ongoing process. Legal recognition[18] of the status of aboriginal peoples and communities within PAs is only the starting point. In Bolivia, the necessary next step was the formation, in 1994, of Management Committees by order of the Ministry of Sustainable Development. A set of Regulations Governing Protected Areas adopted in July 1997 prescribed additional spaces for public participation, which was seen as an essential element of PA management. These Regulations broadened the Management Committees' mandate, introduced the arrangement of co-management with community-based organizations, and laid out the following core objectives of comprehensive PA management: *"Ensure genuine, responsible participation of the regional and local population in protected area consolidation and management. Ensure that protected area management and conservation contribute to quality-of-life improvements for the local population and further regional development, and* ***build capacity in local and regional populations to equip these communities to support and implement protected area planning, management, and conservation activities***."[19] This made for a two-pronged policy of community engagement and local ownership of PA management.

The central thrust of the July 2002 SNAP policy paper is a "protected areas with people" management approach and interface with the work of municipal and departmental governments. Among the core principles enunciated are *respect for and affirmation of cultural and natural diversity, recognition of local community rights, customs, and use practices, subsidiarity, equitable social participation,* and *fair distribution of benefits*.

That regulations relating to SNAP policies were in place before the policies were even formalized attests to the dynamic of the SNAP management process. In fact the principles of local participation and local ownership have been and are being analyzed, internalized, and applied simultaneously in a bid to respond to mounting social demands.

Given the heartening results of these regulations and policies it seems safe to assume that their application will achieve social sustainability of protected areas and thereby afford greater assurances of their viability.

This process, too, is driving a number of local benefits:

**14) Local stakeholder spaces for dialogue and consensus regarding protected areas management**

At this writing there are 15 Management Committees operating within the SNAP; their configuration, terms of reference, and rules of procedure are as prescribed in the Regulations Governing Protected Areas. In these forums for analysis, discussion, consensus development, and decision making, committee

[18] Environment Law, Section 64.
[19] Regulations Governing Protected Areas, Section 3.

members—particularly local community representatives—have developed analytical and negotiating skills. One mark of this capacity enhancement is the number of representatives of communities based in protected areas (notably Pilón Lajas BR, Madidi NP, Apolobamba NAIM, and Amboró NP) who took active part in National Dialogue discussions from 1999 to 2002 and government/grassroots organization negotiating groups in 2002-2003 in the wake of demands presented by farm workers, settlers, and indigenous groups (CSUTCB, CSCB and CIDOB).

**15) Building of local stakeholder decision capacity on matters pertaining to protected areas, to protect local rights and interests**

In September 2001, Tacana indigenous people blocked the Beni River in a widely reported dispute with an NGO (dating back to 1996) to make the organization halt irregular activities that were hurting the Tacana community and Madidi Park ecosystem. Departmental government and INRA authorities stepped in; SERNAP's profile was heightened as it pursued administrative and constitutional action against the NGO. By dint of the strong alliance forged between SERNAP and local indigenous communities over the course of these events those parties prevailed over the NGO, in the process earning credibility and building a community of interests for management of this area that would benefit Tacana communities.

**16) Aboriginal communities' recovery of cultural identity and sense of territorial ownership**

At a town meeting held in 2000 in the course of SERNAP's protracted administrative suit against a logging company, Rurrenabaque community members (indigenous people, campesinos, settlers, local authorities, tour agencies, and the general public) roundly opposed the company's proposal to go into the Pilón Lajas Reserve, which also is an aboriginal homeland (TCO). The company was seeking to harvest wood on roughly half the Reserve land. This meeting would end up being a turning point.

The Chimán indigenous people who live in the Reserve and own the TCO harbored bitter memories of the logging company because the community had been continually deceived in the past and had witnessed the indiscriminate harvesting of mahogany wood before the land became a managed protected area. Today this threat has been banished and local communities in the Reserve can exercise ownership rights to their territory.

**17) Strengthening of community-based organizations**

The indigenous community organization (*subcentral*) of the TIPNIS park and territory, co-manager of that protected area since 1997, has undergone a considerable organizational strengthening process. When the co-management agreement came to its end in 2002 SERNAP reviewed the arrangement and elected to continue it: one of the main reasons behind the decision was the indigenous organization's solidity and maturity. The *subcentral's* former president created and currently chairs Central Movima Indígena del Beni (CEMIB), an association of several indigenous *subcentrales*, which has gained a high profile in the region.

Another indigenous organization whose capacity was bolstered is CABI (Kaa Iya Park), which today ranks among the most technically, organizationally, and financially solid members of the Confederation of Indigenous Peoples of Bolivia.

The capabilities of the Chimán and Mosetén Regional Council in Pilón Lajas Reserve are being enhanced with technical and financial support from Germany's technical cooperation service (DED),

Conservation International, and SERNAP. The Council now has an office and has acquired some equipment; it is gaining financial expertise and tackling the issue of land ownership in the TCO.[20]

**18) Local capacity building for protected area management and sustainable natural resources use**

The Kaa Iya Park co-management arrangement in which the Izozeño people are represented by the indigenous organization CABI as co-manager is perhaps the most interesting experience to date. This now-consolidated organization is internally cohesive and credible to outsiders, with a high profile in the municipality. Highlights of CABI's work that have considerably improved management of this protected area are:

- Creation of a technical-financial arm (the Ivi-Iyanbae Foundation).
- Strong local involvement in conservation decisions and initiatives for the area.
- Development of participatory methodologies for zoning, management planning, and Izozog TCO land tenure regularization (broad consensus, good social and inter-agency coordination, agreements with third parties).
- Sustainable management projects in the buffer zone.
- An education program for Izozog schools, with environmental education contents for primary-school students and teacher training programs.

**19) Opportunities for contacts and inter-agency and financial support for implementation of projects that benefit local communities**

In 2001 the La Paz municipalities of J. J. Pérez (Charazani), Curva, and Pelechuco formed the Apolobamba Ecotourism Partnership. All three municipalities are active members of the Apolobamba NAIM Management Committee, out of which this alliance evolved. Its core mission is to foster comprehensive, consensus-based management of Apolobamba, conserving the environment and biodiversity.

[20] The Pilón Lajas Biosphere Reserve is both a protected area and an indigenous homeland.

## METHODOLOGY ANNEX

The subject of this case study is Bolivia's National System of Protected Areas (SNAP). The study looks at a variety of SNAP features and issues: biodiversity resources in the protected areas (PAs) and their vicinity, organizational processes, legislation, funding structure, and other matters.

### a) Thrust areas, general and specific processes, and local benefits

A conceptual methodology had to be developed to identify local benefits generated during the GEF-funded operation of the SNAP over the last 10 years. Three **THRUST AREAS** were first selected:

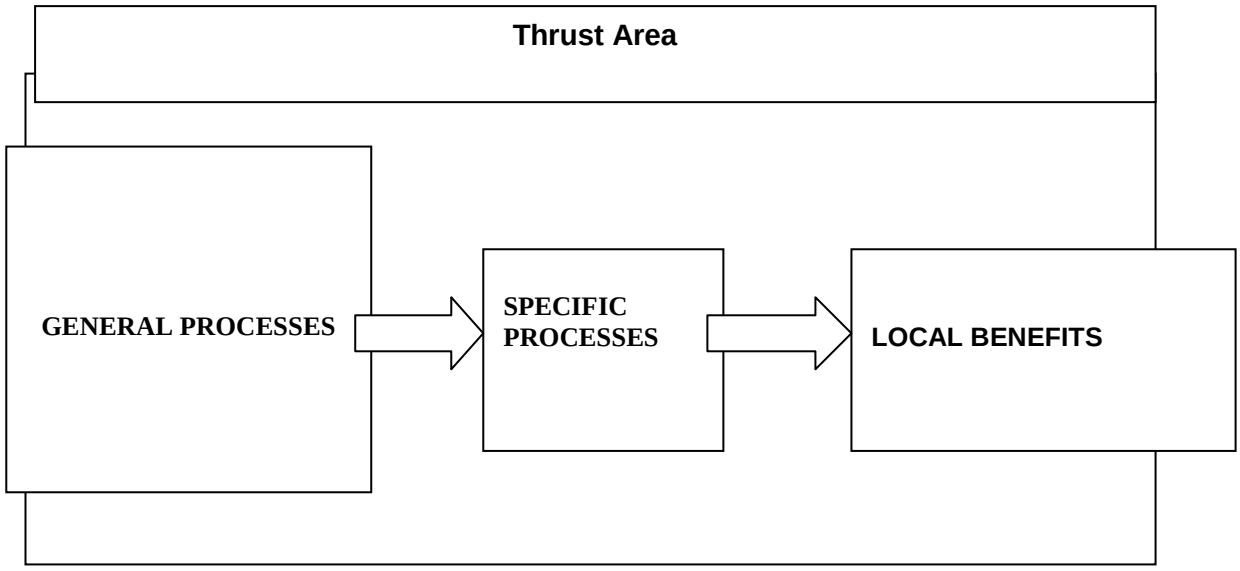
1) **Creation of an institutional base for management of Bolivia's National System of Protected Areas**

2) **Conservation and sustainable use of biodiversity for sustainable development**

3) **Recognition of local populations' rights, customs, and use practices and local capacity building for ownership of environmental management in protected areas and their surroundings**

**General** and **specific processes** and **local benefits** then were defined within each thrust area**,** as depicted in the following schematic.

**Figure 1**
**LOCAL BENEFIT GENERATION BY GENERAL SNAP MANAGEMENT PROCESSES**
**(Example)**




The criteria for an improvement to be termed a "local benefit" for these purposes were strict: the benefit had to be driven by the general and specific processes specified for each thrust area; there had to be

documented examples of the benefit; it could not be exceptional, and it had to have been repeated at least once. Examples of the respective benefits (referencing the thrust areas) are described in Annexes 1, 2 and 3.

An in-house workshop was held, with Review Committee members participating, to validate the procedure for identifying the thrust areas and general and specific benefit-driving processes.

The task of establishing local benefits was given to a small working group because the workshop participants had differing views on what should and should not be treated as a local benefit; that made for a more selective definition.

### b) Analysis of local benefits and their relation to local livelihood factors

The local benefits' effects on populations and ecosystems needs to be analyzed by reference to their livelihood factor impact and scale. This means ascertaining each benefit's relationship to key human, social, natural, physical, and financial local-livelihood factors.

**Table 5**
**LIVELIHOOD FACTORS: MAIN CHARACTERISTICS**

| FACTOR | CHARACTERISTICS |
|---|---|
| **HUMAN** | Individual and group capabilities and skills base. Size and quality of the human resources pool.<br><br>By way of human capital factors, different conditions can be developed for achieving outcomes and defined targets. The human factor creates potentialities for the use of other factors. |
| **SOCIAL** | Organizational capabilities and social resources. Opportunities for participation and exchanges.<br><br>A medium of social transformation and coordination. Generates common values. |
| **NATURAL** | Natural resources generally, and environmental services. |
| **PHYSICAL** | Infrastructure, equipment and other assets, production inputs, transportation and communication conditions, goods and services. |
| **FINANCIAL** | Money or convertible assets (property, other assets). |

The local benefits' impact on each kind of asset or natural factor has been graphed as a pentagon. Each side of the figure was assigned a magnitude in accordance with the impact yardstick and scale described below.

### b.1) Factor impact and scale of local benefits

A scale was devised to quantify and weight each benefit's impact on livelihood factors:

- The local benefit has a **HIGH** impact on the factor when its effect is **DIRECT** and **TARGETED** on the factor (scale 3).

- The local benefit has a **MEDIUM** impact on the factor when its effect is **INDIRECT** but **TARGETED** (scale 2).

- The local benefit has a **LOW** impact on the factor when its effect is **INDIRECT** and **NOT TARGETED** (scale 1)**.**

- The local benefit's impact on the factor is **NIL** when another factor must be present for the impact to be triggered (scale 0).

**c) Local-benefit trend directions**

It is essential to chart the trend direction of a local benefit's impact to be able to analyze its sustainability and the likely duration of the livelihood factor impact. This study used the following scale to depict trend directions:

- The trend direction is **INCREASING** when the local benefit will be sustainable over time and its factor impact will trend up.

- The trend direction is **SUSTAINED** when the local benefit will be sustainable over time but its factor impact will not necessarily increase.

- The trend direction is **DECREASING** when the local benefit is not sustainable over time and its impact on livelihood factors is likely to diminish.

**d) Analysis of vulnerability and resilience of local benefits' local livelihood impacts**

The VULNERABILITY of the local-benefit-driving processes refers to the extent to which their influence will be felt on livelihood factors over time.

Positive outside influences were identified earlier when grading the benefits' impact on human, social, environmental, physical, and financial factors. Negative influences that impinge directly on vulnerability need to be identified as well and factored into the analysis of the general processes that are driving the identified local benefits.

This case study has looked at general SNAP management processes to examine negative elements in local-benefit generation.

One approach taken in the study to assess vulnerability was to gauge the processes' **RESILIENCE,** i.e., the ability to resist these negative influences. The resilience scale was as follows:

**LOW** resilience: The external negative elements have a short-term effect on process trend direction and stability of local benefit generation.

**MEDIUM** resilience: The negative elements do not affect process trend direction but do mute the local benefits' livelihood impact.

**HIGH** resilience: The negative external influences affect neither process trend direction nor livelihood factor impact.

**e) Identification of global benefits**

The global benefits considered for the analysis are gains that will contribute to global environmental restoration efforts.

To relate the local benefits to global benefits, the former were placed in decreasing order from I3 to I0 to denote their impact on the natural factor. The next step was to identify which and how many of the local benefits had helped achieve global benefits, and how.

There was not enough quantitative data to quantify the local benefits' impacts on global benefits, but a qualitative analysis was done.