Community-based Conservation and Vicuña Management in the Bolivian Highlands

by

Nadine Renaudeau d'Arc

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Abstract

Current theory suggests that common property regimes, predicated on the community concept, are effective institutions for wildlife management. This thesis uses community-based conservation of vicuña in the Bolivian highlands as a case study to re-examine this theory. Vicuña is a wild South American camelid living in the high Andes. Its fibre is highly valued in international markets, and trade of vicuña fibre is controlled and regulated by an international policy framework. Different vicuña management systems have been developed to obtain fibre from live-shorn designated vicuña populations.

This thesis analyses whether the Bolivian case study meets three key criteria for effective common property resource management: appropriate partnerships across scale exist; supportive local-level collective action institutions can be identified; and deriving meaningful benefits from conservation is possible. This thesis adopts a qualitative approach for the collection and analysis of empirical data. Data was collected from 2001 to 2003 at different levels of governance in Bolivia, using a combination of ethnographic techniques, and methods of triangulation. Community-level research was undertaken in Mauri-Desaguadero and Lipez-Chichas fieldwork sites. Data was analysed by combining institutional, stakeholder and cross-scale approaches.

Findings suggest that common property regimes are effective institutions for vicuña management if certain conditions are met: government must be committed to paving the way for making policies effective; defined communal area for vicuña management encompasses more than one community; and meaningful benefits are not strictly economic in nature and include the aesthetic, cultural, and social value of vicuña to enhance community identity, social cohesion, and draw community boundaries. These conditions, derived from the Bolivian case study, have important implications for future vicuña management within the Andes, for the development of theory on the effectiveness of common property regimes for wildlife management, and policies for integrating conservation and development aims.

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Glossary

Altiplano: Extensive high-altitude plateaus, above the 3,600 meters, in the east of Central Andes.

Ayllu: An ethnic jurisdiction that groups families usually with kinship relationships.

Aymara: Indigenous language and ethnic group descendants of the Tihuanaku culture.

Ayni: A form of relationship of mutual aid or reciprocity established at household or community level.

Chaku: Periodic round-ups to capture vicuñas, and obtain fibre from live-shorn animals that are release again into the wild.

Mallcu/ MamaThalla: Traditional community authorities (male/female).

Marka Originaria: Indigenous socio-political unit and patrimony of minor units called *Ayllus*, that usually dates back from the sixteenth century.

Puna: Bio-geographical region that extends over the High Central Andes and is characterized by dry climate and scarce vegetation.

Quechua: Indigenous language and ethnic group descendants of the Inca culture.

Sayaña: Family parcel of land.

Vega: An area where water seeps from the ground also called *bofedal* and permits pasture to grow throughout the year

Acronyms and Abbreviations

Codes	Description in English (description of Spanish codes)
AECI	International Spanish Cooperation Agency (Asociación Española de Cooperación Internacional)
AMC	Communal Management Area (Area de Manejo Comunal)
ANCB	Bolivian National Academy of Sciences (Academia Nacional de Ciencias de Bolivia)
ANMINA	Natural Area for Integrated National Management Apolobamba (Area Natural de Manejo Integrado Nacional Apolobamba)
ARMV	Regional Association for Vicuña Management (Asociación Regional de Manejadores de Vicuña)
CBC	Community-based Conservation
CBNRM	Community-based natural resource management
CCMV	Convention for the Vicuña Conservation and Management (Convenio para la Conservación y Manejo de la Vicuña)
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMV	Community Managing Vicuña (Comunidad Manejadora de Vicuña)
CPNRM	Common Pool Natural Resource Management
CWM	Community-based Wildlife Management
DGB	General Biodiversity Bureau (Dirección General de Biodiversidad)
DNCB	National Department of Biodiversity Conservation (Dirección Nacional para la Conservación de la Biodiversidad)
DS	Supreme Decree (Decreto Supremo)
INFOL	National Institute for Wool Production (Instituto Nacional de Fomento Lanero)
IUCN	World Conservation Union
MACA	Ministry of Peasant and Farming Affairs (Ministerio de Asuntos Campesinos y Agropecuarios)

Codes	**Description in English** **(description of Spanish codes)**
MACS	Sustainable Management of Wild Camelids (Manejo de Camélidos Sudamericanos Silvestres)
MAPZA	Protected Areas and Buffer Zones Management Project (Proyecto Manejo de Areas Protegidas y Zonas de Amortiguación)
MDSMA	Ministry of Sustainable Development and Environment (Ministerio de Desarrollo Sostenible y Medio Ambiente)
MDSP	Ministry of Sustainable Development and Planning (Ministerio de Desarrollo Sostenible y Planificación)
NGO	Non-Governmental Organisation
OTB	Territorially-Based Grass-Root Organizations (Organizaciones Territoriales de Base)
RNEA	National Reserve Eduardo Avaroa
SAC	South-American Camelids
SERNAP	National Service for Protected Areas (Servicio Nacional de Areas Protegidas de Bolivia)
SNAP	National System of Protected Areas (Sistema Nacional de Areas Protegidas)
VNP	Vicuña National Programme
VNR	Vicuña National Regulation

Chapter 1. Research Overview

1.1 Community-based conservation

Community-based conservation (CBC) emerged, in the past two decades, as a strategy to link international conservation, and community development (Hulme and Murphree, 2001). CBC became a widely used term, associated with radical changes in conservation and development narratives. Narratives on conservation shifted away from a strict preservationist view, towards an increasing emphasis on linking livelihoods and conservation through sustainable use, as part of the process of designing and complementing international conservation strategies (WWF, 1993, IUCN, 2000). Narratives on development also changed their focus of attention, from an expert-led view, towards an increasing support of people's agency and cooperation and making resource management sustainable (UNDP, 1991, UNEP, 1994).

A large number of CBC projects and programmes have been implemented with different conservation objectives ranging from the conservation of single species, and their habitats, to the conservation of ecosystems, and ecosystem functions (Robinson and Redford, 1991, Western and Wright, 1994a, Hulme and Murphree, 2001). These initiatives are expected to generate sufficient benefits to outweigh the costs of conservation, and contribute to local development goals through appropriate community-based management, and sustainable use. Despite the rapid popularity of CBC projects, the integration of the needs and aspirations of local people with conservation policies developed at global level has, so far, been limited (IIED, 1994, Leach et al., 1997a, Roe et al., 2000). These limitations give rise to a wide debate re-questioning the effectiveness of CBC to link conservation and development aims.

The debate centre on how to link two contradictory objectives such as conservation and development simultaneously, given the complexity of factors that must be balanced (Edwards and Steins, 1999, Kellert et al., 2000). However, within the theory of common pool natural resource management (CPNRM), researchers

suggest that CBC, in particular community-based wildlife management (CWM) under common property regimes, should be reassessed but not abandoned (Campbell et al., 2001, Dolšak et al., 2003). In those cases where CBC under common property regimes has been an effective institutional arrangement for wildlife management, a number of conditions have applied (McKean, 1992, Child, 1995, Agrawal, 2001).

This thesis builds on the various critiques arising from CBC theory, to examine the general hypothesis that common property regimes, predicated on the community concept, are effective institutions for wildlife management.

1.2 Aim and research questions

This thesis uses community-based conservation and vicuña management in the Bolivian Highlands as a case study to re-examine the general hypothesis that common property regimes, defined as the institutional arrangement of an identified social group or community, are effective institutions for wildlife management.

Vicuña *Vicugna vicugna* is a wild South American camelid adapted to live in the high Andean region, above the 3,500 m a.s.l. called *Puna* and *Altiplano* that extends over a trans-boundary region that covers parts of Argentina, Bolivia, Chile, Peru, and Ecuador (Koford, 1957, Franklin, 1982). The species is highly valued for its very fine quality fibre, and the rationale for vicuña conservation through use is that commercialisation of its fibre, obtained from live-shorn target populations, will generate economic benefits to Andean people, and derive in incentives for vicuña conservation. A number of different approaches have been established to harvest vicuña fibre obtained from live-shorn animals; these range from wild to captive management by community groups or individual producers.

In Bolivia, Quechua and Aymara-speaking community groups represent Andean people. Following the successful recovery of vicuña populations, policies have progressively been allowing communities to exploit vicuña fibre. Provided communities can receive technical assistance and training in capture methods, a common property regime for vicuña management in the wild was considered a low-cost and appropriate institutional arrangement to link vicuña conservation and

community aims. Over the past 35 years, the fact that vicuña continues increasing in number attests that community-based conservation has been in part effective for vicuña conservation. Currently, communities are participating in conservation and sustainable use without deriving direct economic benefits because fibre hasn't been commercialised at national level yet[1]. It is usually assumed that CBC projects that do not generate economic benefits are likely to fail in the longer-term (Hulme and Murphree, 2001). Given this context, this thesis asks:

> *Is common property management of* vicuña *in Bolivia an effective strategy to link and maintain conservation and development aims?*

To answer this question, this thesis examines whether the common property regime for vicuña management in Bolivia meets three key criteria identified in the literature of CPNRM for effective common property resource management. First, establishing appropriate partnerships across scale, second, creating local-level collective action institutions, and third, generating meaningful benefits to participating communities. These three criteria are the synthesis from the set of conditions and principles supporting common property regimes as effective institutions for wildlife management. Agrawal (2001) provides a good summary of this set of conditions, and how they relate to each other. As further discussed in Chapter 2 and shown in Table 2.1, the improper implementation of CBC projects usually relates to various shortcomings in meeting these three criteria. The following paragraphs build on these shortcomings to explain how each criterion is critically examined to inform the research questions asked.

The first criterion relates to establishing appropriate partnerships across scale. Appropriate partnerships are usually defined as a dynamic relationship among diverse actors that is mutually reinforcing (Plummer and FitzGibbon, 2004). Conceptually reinforcing relationship refers to the shared undertaking amongst various actors, such as the combination of resources for mutual benefit, or the shared power in decision-making for linking local-level or community-based institutions with regional, national, and international levels (Berkes, 2002). Research has

[1] At the time of this writing (November 2005) fibre hasn't been commercialised yet.

highlighted the importance of adaptive management as one of the conditions required for the establishment of appropriate partnerships below the nation-state (Stern et al., 2002). Adaptive management is usually defined as a dynamic process that implies learning from experiments to shape subsequent policy (Holling, 1973, Berkes, 2002).

In Bolivia, the CBC approach for vicuña management illustrates the attempt to align international conservation agreements, to which Bolivia is signatory, with the social and economic concerns of local communities. This alignment between institutions and actors occur within a political context of decentralisation of government environmental management. The process of decentralisation and implementation of the vicuña management programme in Bolivia involves the creation of partnerships through negotiations of new relationships between government and communities across scale. Research highlights that partnerships across scale can mask highly dependent relationships, influencing the access and distribution of benefits arising from management (Young, 2002). Taking into account these shortcomings, and in the search for appropriate partnerships across scale, this thesis asks:

What are the characteristics of partnerships for vicuña *management?*

The second criterion relates to creating local-level collective action institutions. Collective action institutions usually refer to the formal and/or informal rules and norms of conduct of a group of people to get involved in some kind of common action in pursuit of a shared interest (Cleaver, 2000a, Meinzen-Dick et al., 2004). CBC places the community's involvement at the centre of conservation, and devolves rights and responsibilities to community level institutions in the form of user committees, associations, and groups (Korten, 1986, Murphree, 1993, Murphree, 1994). In Bolivia, the CBC approach for common property vicuña management in the wild relies on the demarcation of communal management areas. Government assumes that these areas will overlap with traditional clearly defined community boundaries for supportive collective action in vicuña management in the wild.

Various critiques exist of the simplification of community boundaries (Agrawal and Gibson, 1999, Guijt and Shah, 1999), particularly in terms of how community boundaries and borders should be conceptualised in common property regimes (Geisler et al., 1997, Sturgeon, 2004). In addition to the issue of boundaries, empirical studies have noted that the size of a group and its heterogeneity are also key variables that may mediate the emergence of collective action (Oström and Ahn, 2003), but these variables appear to have complex effects (Agrawal, 2001). Based on the previous theoretical discussion, this thesis asks:

> *What are the characteristics of local-level collective action institutions for* vicuña *management?*

The third criterion relates to deriving meaningful benefits from vicuña management for participating communities. There are various types of benefits that can derive from wildlife management (Ashley et al., 1999), and there are different types of interests and perceptions arising from participating communities (Gibson and Marks, 1995, Songorwa, 1999). Therefore, a criterion based exclusively on monetary cost-benefit terms denies the possibility of identifying a number of intangible benefits. These benefits valued in non-monetary terms also play an important role in making communities become involved in wildlife management activities (Ashley, 1998).

CBC assumes that communities are cohesive and homogenous entities, interested and willing to become partners in conservation if they participate in the benefits (mainly economic) from wildlife management (Kiss, 1990). In Bolivia, CBC, and participatory vicuña management occurs in the absence of economic benefits. Therefore, the identification of what types of benefits and associated costs are perceived by local people is a key research area that helps to understand if the common property regime for vicuña management is an effective strategy to link conservation and development aims, as addressed in the central question of this thesis. Thus, this thesis pays special attention to understand whether the types of benefits, if any, that local people perceive from participating in vicuña management, and if these benefits are associated to positive attitudes towards vicuña conservation

or instead related to other factors or motives. Taking into account these issues, the thesis asks:

What meaningful benefits derive from participatory vicuña *management?*

The analysis and integration of these three research questions contributes to identifying the conditions that make a common property regime for vicuña management effective. The following section introduces the relevance of this investigation, within the context of wildlife management.

1.3 The relevance of the case study

Community-based conservation of vicuña typifies several aspects of current thinking and debates on wildlife management under a common property regime.

Vicuña typifies the two problems of common-pool resource management, *subtractabiliy* and *exclusion* (McKean, 1992). The story of vicuña conservation demonstrated that in the absence of an institutional framework articulated from the international to local level, that regulates the *subtractabiliy* of fibre and defines the *exclusion* amongst various potential users, vicuña becomes essencially an open-access resource available to anyone, very difficult to protect and very easy to deplete.

Vicuña differs from other wildlife resources with regard to a wide variety of biological and ecological attributes, such as genetic variability, that means culling is not a viable option for the long-term conservation of the species. The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) regulates the *subtractabiliy* in use by ensuring that commercialised fibre is obtained from live-shorn vicuñas. The fibre that one community harvests from vicuña (approximately 250g) subtracts from the possibility of another community shearing the same animal before two years.

Under the Convention for the Conservation and Management of Vicuña, the signatory governments of Argentina, Bolivia, Chile, Ecuador, and Peru, recognise that vicuña use, through appropriate management, has the greatest potential to

contribute to the development of opportunities of Andean people (Vicuña Convention, 1979). At the local level, the problem of *exclusion* arises from the difficulty or costs of excluding potential users to benefit from vicuña use. It is difficult for guards or community members to patrol and monitor wild vicuña populations, and costly to design and maintain a physical demarcation with fences or corrals. Therefore, the two-vicuña management systems that have been developed, the wild and captive models, have important implications in addressing the problems of *subtractabiliy* in use and *exclusion*.

In the Bolivian highlands, CBC of vicuña stands as an outstanding case study within the Andean context, as is explained in the following paragraphs.

First, Bolivia promotes and supports vicuña management in the wild[2] by community groups as the exclusive management option in its specific National Regulation for Vicuña Management, while the neighbouring countries are shifting away from managing vicuña in the wild to enclosing vicuñas in corrals.

Second, CBC of wild vicuña in Bolivia apparently meets one of the key conditions for making a common property regime an effective institution for wildlife management, that the right-holder belong to an identified community group. These community groups are represented by *Quechua* and *Aymara*- speaking communities represented by a group of families sharing rights over specific territories defined by various norms and traditions, with official recognition of these territories by the State, under National Law.

Third, Bolivia has not commercialised fibre yet and community participation in the vicuña conservation programme occurs in the absence of direct economic benefits. Given this problem, debates within the region question whether local conservation of vicuña will be maintained in the future if the market for fibre and economic benefits does not reach local people.

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[2] The term *wild* is used in this thesis, not only to highlight the *vicuña*'s difference from the domesticated *llama* and *alpaca* (the other members of the South American camelid family) as a non-domesticated animal, but also to clarify that the species is not managed under captive or semi-captive conditions.

These specific characteristics also make vicuña management in Bolivia an outstanding case study within the context of community-based wildlife management. Case studies have focused on specific regions (many in sub-Saharan Africa) and habitats (protected areas and forests), and community-based management of vicuña has not been addressed before from an in-depth angle the common-pool natural resource management theory. Given this particular context, the thesis argues that the identification of the conditions supporting the common property regime for vicuña management developed in Bolivia may be functioning under a different set of conditions not found in the literature of CPNRM, and therefore can provide important insights to current debates and discussions relative to vicuña management in the Andes and wildlife management theories.

The following section outlines how this thesis is structured in order to explore the conditions affecting a common property regime for wildlife management.

1.4 Structure of the thesis

This thesis is divided into eight Chapters. This Chapter, Chapter 1, outlines the theoretical background of the research and the aim and research questions the thesis addresses. It summarises the relevance of the case study and describes the structure of thesis.

Chapter 2 provides the conceptual framework of the research. It explores how the idea of integrating conservation and development at community-level emerged. It first describes how conservation perspectives have shifted away from preservation-based to sustainable use at community level. It then introduces common property theory, and how critiques and debates evolved towards supporting common property regimes. The Chapter ends by identifying the key areas of research this thesis addresses to explore under what conditions common property regimes are likely to be effective for wildlife management.

Chapter 3 explores the rationale for choice of method, based on the research questions. It introduces the research approach adopted in this thesis and describes how the case study is used to answer the three key research questions addressed in

this thesis. These relate to the nature of partnerships, local-level collective action institutions, and deriving meaningful benefits to local people. It describes the process of enquiry for answering these questions, and the research methods used including a description of the fieldwork sites. The Chapter ends by explaining how the information was analysed and integrated for answering the three key questions asked in this thesis.

Chapter 4 introduces the historical and regional context of vicuña management in the high Andean region. It outlines the bio-geographical and historical background of vicuña management. It describes the international policy framework and synergy between CITES and the Vicuña Convention, and describes the different management systems that have been developed in Argentina, Bolivia, Chile, and Peru. The Chapter highlights the main strands of argument that evolved discussing the implementation of different vicuña management systems.

Chapter 5 explores the first research question of this thesis that asks whether appropriate partnerships between relevant institutions and key actors for vicuña management across scale exist. The Chapter first describes how the CBC programme for vicuña emerged in Bolivia and evolved towards the establishment of strategic partnerships. It then draws on the five years of experience (1997-2002) in implementing the Vicuña National Programme in three target areas for vicuña management to identify the main factors affecting the establishment of appropriate partnerships.

Chapter 6 addresses the second research question of this thesis. The Chapter explores the different dimensions of the concept of community as perceived by local people. It also examines whether the institutions for vicuña management overlap with local-level collective action institutions. It provides a detailed analysis of the many superimposed boundaries that define institutions for vicuña management in the *Ayllu* San Andres de Machaqa in the west of Bolivia. The Chapter finally identifies the factors affecting and the key conditions enabling community involvement or collective action in vicuña capture and shearing events during the period from 1998 to 2002.

Chapter 7 addresses the third research question and asks whether benefits derived from vicuña management are perceived by participating communities. It first analyses the role of vicuña in local people's livelihoods, and identifies the benefits and costs derived from vicuña conservation and perceived by local people. The Chapter then examines the nature of participation during vicuña capture and shearing events. It pays special attention to the types and distribution of benefits and costs derived from this participation, and whether these are supporting the common property regime for vicuña management in the wild.

Chapter 8 synthesises and concludes the research in this thesis. It integrates the findings from previous Chapters in order to answer the central question in this thesis. It highlights the key conditions derived from the analysis of Chapters 5 to 7, and discusses their relevance to theory. It then highlights key issues to take into account for future for vicuña management in the Bolivia, and also provides with broad set of themes that may inform future policy making for vicuña management in theAndes.

Chapter 2. Challenges for community-based conservation

2.1 Background to community-based conservation

Two quite different perspectives have influenced the merging of conservation and development narratives in support of community-based conservation (CBC): strict preservation and sustainable use.

The strict-preservation perspective focused on the intrinsic value of nature where human intervention was seen as damaging to the equilibrium of ecosystems (Odum, 1975). Protected areas were created where local people were excluded or alienated[3] from their traditional means of livelihood, such as logging, and hunting for subsistence or commercial use (Robinson and Redford, 1991, Ghimire and Pimbert, 1997). This exclusionary model of protected areas was introduced with the creation in 1872 of the Yellowstone National Park in the United States (Blaikie and Jeanrenaud, 1996) and was then implemented in other parts of the world such as Africa, Asia, and Latin America (Anderson and Grove, 1987, Freese and Saavedra, 1991). Ownership, control and management of these areas was centralised in one or more government agencies, such as wildlife or forestry departments, and relied heavily on strict law-enforcement; using park guards, fences and fines (Gibson and Marks, 1995).

After the period of colonisation, particularly in Africa, law-enforcement within protected areas became too costly and often beyond the capacity of many developing country governments due to the increased pressure, and most of these parks became *paper parks*, protected in law but not in practice (Tacconi, 2000).

The creation of international conservation regimes in the 1970s such as the Convention on International Trade in Endangered Species of Wild Fauna and Flora

[3] For example, the Yellowstone National Park (USA) alienated indigenous people, mainly Crow and Shoshone, from their traditional lands; the Kidepo National Park (Uganda) displaced mountain people; the Dumoga-Bone National Park (Indonesia) expulsed Mongondow people (Ghimire and Pimbert, 1997).

(CITES) were seen as one effective measure to halt the decline of a number of target species[4] by imposing international trade regulations (Burton, 1994), but illegal harvests continued within protected areas, usually promoted by the same reserve officers' or other external powerful groups including government leaders themselves (Cloudsley-Thompson, 1992, Glaster, 1993). The assumption that local people were the major cause of overexploitation was then re-questioned (Adams, 2004).

The planned use of resources or sustainable use emerged as an incentive strategy to strive towards striking a balance between rural people's welfare and environmental conservation (Robinson, 1998). Conservation through sustainable use was implemented as a sustainable development policy (Auty and Brown, 1997). It assumed that linkages between conservation and local livelihoods exist or can be re-established (Hanna et al., 1996, Berkes and Folke, 1998, Salafsky and Wollenberg, 2000), and that people who live with wildlife will become partners in conservation if they perceive meaningful benefits, mainly economic, directly derived from wildlife utilisation (Gibson and Marks, 1995).

A number of projects and programmes involving the sustainable use of target species emerged supported by the renewed interest in using markets as the major regulator of exploitation (Freese, 1999), usually at rates within the capacity for resource renewal[5] or *maximum sustained yield* (Gordon, 1954). Knowledge of natural history and demography of the resource to be managed was often considered to be the only requirement to identify policies for sustainable exploitation (Milner-Gulland and Mace, 1998).

Under both the strict-preservation and utilitarian approaches to conservation, the general argument was that users of the *commons*[6] were always trapped in an individually *rational economic maximisation* strategy that brings *ruin to all* described as *the logic of collective action* by Olson (1965); and defined as *the*

[4] For example, the recovery of elephant populations in Southern Africa (Burton, 1994)
[5] Mechanisms include setting closed seasonal areas, quotas, or size limits to determine the optimum collection times between harvests and ensure that harvest levels are within reproductive capacity (Bell, 1986).
[6] The term *commons* is used to refer to a diversity of resources or facilities that involve some aspect of joint ownership or access (Oström et al., 2002).

tragedy of the commons by Hardin (1968). Hardin's model viewed overexploitation as inevitable, unless resources held in common are privatised or government regulations are imposed. The two conservation perspectives, strict preservation and utilitarianism, stressed the importance of unitary ownership as a resource management policy, where effective rules for use are achieved either through privatisation by individual or private corporation, or State control (Naughton and Sanderson, 1995).

Sustainable use strictly enforced by the State, or by private non-state individuals, tends to benefit one selected group that does not necessarily coincide with those local groups most affected by the costs of conservation. State-led or private-led management that focuses on efficiency arguments usually fails to include the cost-benefit trade-offs that community-based systems design to cope with uncertainty. These systems for resource governance have been criticised for their failures to capture the full value of biodiversity conservation (Kremen et al., 1994); and to adequately involve local people to deal with pressures from politically powerful interest groups (Sanderson, 1998, Gibson, 1999).

In the 1990s CBC emerged as an alternative to address the shortcomings in linking conservation and local livelihoods by placing the community involvement at the centre of conservation (Western and Wright, 1994b). Through CBC "local people will benefit from and take ownership of conservation, and thus will be more likely to support it" (Campbell and Vainio-Mattila, 2003). The assumptions that validate this theory relate to state-community partnerships, issues within communities, and the generation and distribution of benefits.

Various experiments were implemented, which can be regarded, conceptually, as different models for CBC promoted under various labels such as community-based natural resource management (CBNRM) for the conservation of natural resources such as water, fish, and forests; community-based wildlife management (CWM) for the conservation of wildlife; or community-based eco-tourism initiatives for biodiversity conservation. The implementation of these experiments has been limited in terms of establishing partnerships across scale,

creating local-level collective action institutions, and deriving benefits from conservation, as shown in Table 2.1.

Conservation through sustainable use and community management is based on common pool natural resource management (CPNRM) theory (Hanna *et al*., 1996; Berkes and Folke, 1998; Gibson *et al*., 2000; Oström *et al.*, 2002). CPNRM theory suggests that the various critiques that arise from the improper implementation of the CBC concept should be interpreted in terms of challenges instead of failures (Campbell et al., 2001, Brown, 2003a, Dolšak and Ostrom, 2003). This theory suggests that common property regimes are effective institutional vehicles to realise devolved management at the local level, particularly if the rights-holders belong to an identified community group, and a number of key conditions are met.

The next section explains the important contributions that research on CPNRM has made to clarify key concepts necessary for understanding the complexity of factors affecting the implementation of CBC.

Table 2.1 Different models implemented for community-based conservation

Model	Experiments	Partnerships across scale	Collective action institutions	Benefits from conservation	References
CWM	CAMPFIRE programme	Unequal representation and power relationships between government, district councils, and local communities.	Lack of fit between village and ward boundaries defined by Communal Management Area.	Lack of revenue sharing from proceeds from wildlife hunting below district council level.	Metcalfe (1994) Murphree (1994) Child (1996)
	COMMERCIAL USE initiatives	Intervention and involvement of private enterprise between government and local communities.	Different management approaches (captive breeding; ranching or communal management areas for wild harvests) derive in non-adaptive management and unclear use rights.	Ambiguity in the generation and distribution of benefits derived from trade of wildlife products.	Swanson and Barbier (1992) IIED (1994) Ashley *et al.* (1999) Mazzucchelli *et al. (2000)*
CBNRM	WATERSHED management	Unequal decision making between government and communities and unequal representation within communities.	Assumes oversimplified ideas about the beneficial nature of local participation, overlooking the potential links between inclusion and possible subordination.	Differential costs and benefits from community-based water management.	Wade (1987) Jinapala *et al*. (1996) Rhoades (1998) Cleaver (2000b)
	FISHERIES	Unequal power relationships between government; local users, and private enterprises.	Maladapted management depending on technique used such as artisan, semi-industrial and industrial fisheries in both freshwater and marine habitats.	Profits from commercial use to private enterprise.	Sen and Nielsen (1996) Pomeroy (1995) Zanetell and Knuth(2004)
	FOREST MANAGEMENT	Partnership between state and Community Forest Protection groups with unequal authority.	Assumptions that the Forest Protection Committees (organised and registered by forestry agencies) represent local people.	Difficulties in untangling boundaries and beneficiaries affect sharing of benefits, responsibilities and power.	Richards (1997) Sithole (2004) Evers (1995)
	EXTRACTIVE RESERVES and related tropical forest management	Partnerships and agreements with local communities, but violation of the legal status of extractive reserves.	Unclear resource tenure and community empowerment problem.	Compensation scheme by granting exclusive access rights to forests and benefit sharing do not consider the risks associated with market failure.	Brown and Rosendo (2000) Schwartzman *et al.* (2000)
ECO-TOURISM	COMMUNITY-BASED tourism initiatives	Relationships between tour operators, local communities, tourism industry, and conservation managers and the media are not articulated with other sectors such as agriculture, or forestry.	Tourism exceeds carrying capacity of environment, and job opportunities to host communities are scarce for local people without relevant skills and the capital to invest.	Most of the profit flow derived from activities such as employment; tourist taxes; handicraft trade, are for national and international tour operators, or to local elites and business people.	Brown (1997) Goodwin *et al.* (1998) Koch (1997)

Source: Based on a review of literature, CWM community-based wildlife management; CBNRM community-based natural resource management.

2.2 Theoretical perspectives on common pool resource management

Common pool resources are defined as those natural resources that are difficult to protect and easy to deplete (McKean, 1992). On the one hand, protection is difficult or costly because common pool natural resources require physical or institutional means to exclude potential users (Randall, 1983, McKean, 2000). The difficulty of implementing institutional means relates to the problem of collective action that arises when the potential users face the temptation to be free riders by benefiting from the resource without contributing to the collective effort of protecting it.

For example, while all countries benefit from global *commons*, such as the seas and the atmosphere, none can be excluded. Countries that do not comply with environmental treaties affect the production and consumption of other countries (Cairncross, 2004). Migratory resources such as fish and wildlife, or others such as ground water, rangelands, and forestlands can also pose a collective action problem depending on how costly or difficult it is to devise physical or institutional means to exclude potential users. The capacity for *exclusion* depends on the technology of physical *exclusion*, as well as the existence of various bundles of rights (Schlager and Ostrom, 1992).

Common-pool natural resources are also defined as those resources easy to deplete because each user is capable of reducing the quality or quantity of the resource products affecting the ability of others to do the same. This phenomenon is referred to by many other names, including *jointness* of consumption and *rivalness of use* between users (Samuelson, 1954, Oström, 2003). In the absence of specific regulations to exploit slow reproducing living resource, the exploiter will choose to make more money depleting the resource quickly and continue to exploit elsewhere (Clark, 1981). The larger the number of fisherman trying to make a living from the same fish stock, the more chance that their consumption of fish will become rival (Swanson and Barbier, 1992). Therefore, it is necessary to acquire sufficient knowledge about the attributes of the resource system that can affect the *subtractability* of yield (Oström, 2003). In this regard, Schlager *et al* (1994)

identifies that *subtractability* of yield also depends on whether the products to subtract are mobile flows like fish or stationary like trees.

In theory, there is a diversity of property rights regimes that can be used to address the problems of *exclusion* and *subtractability* of common pool resources, where a major distinction is usually made between government, private, and community ownership or property right (Schlager *et al.*, 1994). In practice, there is not a clear distinction between them, since for every right an individual or group holds, a combination of rules exists that authorises or requires particular actions in exercising one or more property rights.

Regarding the combination of rules in use, a distinction is usually made between statutory and customary common property, and which is preferable, depending on whether rules in use and their enforcement characteristics are formally recognised or not by the State. Resources involved in *common-property*[7] regimes may be communal property or instead, if not legally owned by the community, managed in accordance with community-based norms and rules (Berkes, 1989a). In this regard, Baland and Platteau (1996) suggest that what a private property regime really needs to be compared to is a situation of regulated common property.

Indeed, if there are no *transaction costs*[8], regulated common property and private property are equivalent from the standpoint of the efficiency of resource use. Agrawal (2001) argues that efficiency is about choosing which costs will be invoked and whose interests are to be defended, developed and sustained. In other words, he suggests that what and whose rights are invoked in a specific resource regime are key questions to ask when making choices of property regimes.

Concerning the types of rights leading to particular actions, and most relevant for the use of common property resources, Schlager and Ostrom (1992) identify five

[7] There are several interpretations of the meaning of *common property* that derive from different legal systems. In French law, the term *bien commun* is used to designate a thing in the public domain such as a river system. In Anglo-Saxon law, *common property* refers to co-ownership rights under the unanimous consent of all common property owners (Hesse and Trench, 2000).

[8] *Transaction costs* are regime specific and refer to the means required to fulfil a certain level or type of use.

property rights. These include the right of access to enter a defined physical property; the right of withdrawal to obtain the products of a resource; the right of management to regulate international use patterns and transform the resource by making improvements; the right of *exclusion* to determine who will have an access right, and how that right may be transferred; and the right of alienation to sell or lease either or both management or *exclusion* rights.

Based on these concepts, researchers explain that important exceptions exist to Olson and Hardin's models characterising human behaviour, as outlined in previous section. These cases reveal that the management of some types of common resources, such as fish and water, are based on self-organisations under communal tenure. These local-level institutions have been created by local user groups in order to address the general difficulty of defining boundaries and the high costs to individuals of policing them, depending upon whether the resource is characterised by mobile flows and/or storage (Schlager and Ostrom, 1992, Allison and Ellis, 2001). Thus, those resources mislabelled as *commons* by Hardin's model were actually *open access* resources in which no property rights or rules limiting access have been defined (McCay and Acheson, 1987, Berkes, 1989a, Bromley et al., 1992). Consequently, the free-rider dilemma which leads to resource degradation was then often thought to be linked to the deterioration of customary often communal-tenure systems (Marks, 1984).

These findings suggest that the analysis of over-exploitation of natural resources should not focus on the individuals' behaviour and resources characteristics alone but also on the institutions within which management decisions take place (Berkes, 1989a, Feeny et al., 1990). In this thesis, institutions refer to the *rules in use* or *rules of the game* that people develop to specify what may and may not be done in a particular situation (North, 1990). The rules are represented by formal constraints, such as laws, or constitutions; informal constraints such as norms of behaviour, culture, or self-imposed codes of conduct, and their enforcement characteristics such as bans, and punishments (North, 1990). Formal constraints are also related in the literature to statutory or state tenure systems, usually based on written laws and regulations, on acts of government agencies, and on judicial decisions. Rights are allocated and confirmed through the issuance of titles or other

forms of registration of ownership. Informal constraints are usually related to customary or communal tenure systems based on traditional local practices and norms, and are flexible, negotiable, and location specific (Cotula et al., 2004). Therefore, rules provide the specific authority structure granting legitimacy and security to specific rights, and derived duties or responsibilities between individuals (Vatn, 2001). In this regard, institutions form the framework upon which organisations, defined as groups of individuals bound together by some common purpose to achieve objectives, are based (DFID, 2003).

Under this terminology, a resource regime is seen as an institutional arrangement that defines who has access to the resources in question, who has to bear the various costs, and under what conditions. These institutions designed to regulate the use of common pool resources must somehow try to cope with two basic incentive problems. The first is the problem of overuse because common pool resources are subractable in use. The second problem is the free-rider problem that stems from the cost or difficulty of excluding potential users. Research has been trying to understand what type of institutional arrangement, in a given context, is most effective. The search for effective institutions is generally assessed in terms of various performing indicators including efficiency, sustainability, and equity (Tacconi, 2000). Efficiency is usually measured in economic terms, and means that resources are not wasted and that a maximum aggregate wellbeing is derived from a given stock of resources. To achieve equity, an efficient allocation of resources, and equitable distribution of gains and costs has to be aimed at. Sustainability refers to the maintenance over time of the resource system that generates the flow of resource units (Dietz et al., 2002).

In practice, it is difficult to visualise a property regime that performs well on all indicators simultaneously. While, economic efficiency has dominated the development discourse, since the 1980s concern on equity and sustainability of the resource occupies an important place in the international policy agenda. Some authors suggest the use of more than one parameter for the analysis of institutions (Pomeroy, 1995, Adger et al., 2003), but these parameters fail to include the evolution and adaptive capacity of institutions to respond to changes (Brown, 2003b).

The type of research that recognises the local capacities to control the incentive problems that stem from the costs or difficulty of *exclusion* and *subractability* in use opens up local-level common property institutions as an alternative policy to decentralise the governance of the environment. This type of analysis can be undertaken by examining the linkages between the attributes of resources, such as their characteristics of mobile flows and/or storage, difficulty of *exclusion* and *subtractability* of yield, and the attributes of the users such as the incentives that participants face (Ostrom, 2003: 243).

In assessing effective institutions, the literature on CPNRM explores selected case studies on *common-property* resource management, each of which generates the conditions that are most likely to promote self-regulating capacities of users and achieve effective common property institutions (Netting, 1981, Oström, 1990a, Berkes, 1992, McKean, 1992, Agrawal, 2001). These principles[9] and conditions constitute the foundations for CBC, and support the general hypothesis that common property regimes are effective institutions in wildlife management. This hypothesis is re-examined in this thesis using *vicuña* management in the Bolivian highlands as a case study.

In this context, CBC of *vicuña* in the Bolivian highlands stands as a particular case where the two characteristics of common pool natural resources can be examined, in terms of the costs or difficulty of protecting the collective community-based *de jure* rights to benefit from *vicuña* use, and of the *subtractability* that involves live shearing of animals every two years. The Bolivian Government supports a common property regime that relies on local-level institutional mechanisms already established in the community to address these two incentive problems for managing wild *vicuña* populations.

While the set of conditions identified in literature has been important to explain the emergence of common property institutions, they have been limited in considering effective management. This thesis, contributes to the search for effective

[9] A set of principles or conditions for successful common property institutions based on lessons learned from a wide range of past experiences are represented by the 'CAMPFIRE principles' (Child, 1996), and the widely accepted 'Design principles' (Ostrom, 1990).

institutions by critically examining the three main criteria considered as challenges for the establishment of effective common property regime. First, to creating appropriate partnerships between institutions across scale; second, establishing local-level collective action institutions supportive of conservation; and third, generating benefits meaningful to participating communities. The following three sections examine how these three areas of research, in need of further investigation, have informed the research questions addressed in this thesis.

2.3 Appropriate partnerships across scale

The concept of CBC places the community at the centre of local conservation (Hulme and Murphree, 2001), but common pool resources distribution and conservation problems usually span national borders, involving a variety of institutions and actors at different levels of governance (Rowbotham, 1994, Tacconi, 2000). The term governance refers to "the articulation of the rules in legal and policy frameworks, and the organisational arrangements necessary to realize them" (Steiner et al., 2003). As part of the institutional design of CBC projects, governance at all levels (local, national, regional and global) is considered mutually reinforcing (Steiner *et al*., 2003).

The first challenge for implementing CBC projects is, therefore, "to design institutional forms capable of accommodating the demands of governance at all the relevant levels while sustaining resources" (Stern et al., 2002). This also implies understanding how institutions and actors at different scales can be linked (Young, 2002), as a means to both resolve the trans-boundary conservation problems of common pool resources (Giordano, 2003), and align multiple interests between users (Steiner *et al*., 2003). The term 'actor' is used in this thesis to refer to the locus of decision and action, including either individuals or social groupings such as community groups, and organisations that exhibit the capacity for decision-making and action as a entity (Hindess, 1988). Under this terminology, multiple actors intervene in CBC projects including governmental agencies, a variety of non-governmental organisations (NGOs), local groups at the intra-community level to one, or more international groups (Berkes, 2004).

The literature on common property management emphasise the importance of exploring what type of partnership in a given context is most appropriate to meet management objectives, set internationally and implemented locally (Young, 2002). Within the context of wildlife management, the challenge is to explore if appropriate vertical linkages below the nation-state exist to meet management objectives set internationally (Young, 2002, Meynen and Doornbos, 2004).

In the case of *vicuña* conservation, Chapter one described that *vicuña* extends over a trans-boundary Andean region covering five countries, and multiple actors from the international to the local levels are interested in its highly valued fine fibre. International conservation agreements have been signed to regulate *vicuña* use at the local level, and address the conservation problem of over-exploitation and trade of its products. Similar examples are found in fisheries global governance and local management (Allison, 2001a), or in CBC via global legislation in sea turtles (Campbell et al., 2002). These examples illustrate how international agreements usually imply the establishment of partnerships across scale to align multiple actors' interests with existing institutions.

The rhetoric of partnerships is at the core of the international conservation policies, and has an important role to play in international and national socio-political environment. Legislation and policies for establishing partnerships among diverse actors are usually embedded in a broader network of laws, and administrative procedures, at both national and local government levels. When it comes to policies regulating wildlife utilisation at international level, and management decisions taken at local level, a specific typology emerges to clarify the different degrees of cooperation (McCay and Acheson, 1987, Berkes, 1994). For example, co-management "refers to various levels of integration of local and state-level management systems" (Berkes et al., 1991).

The idea of partnerships in co-management was often precipitated by government realization of their lack of capacity, and also by the emergence of political-economic processes of decentralisation (Miller and Dingwall, 1997, Carney and Farrington, 1998). The term decentralisation refers to the systematic and rational

dispersal of power, authority and responsibility from the central government to lower or local institutional levels (Pomeroy and Berkes, 1997). Decentralisation of natural resources was implemented through several types of initiatives from numerous governments for the promotion of democratic governance (Manor, 1995). Therefore, the term co-management, also contemplates the involvement of an array of actors' representatives from government agencies, private or commercial claims, and community in terms of interested or ethnic group.

Therefore, there is no one definition of what an appropriate partnership means because most partnership arrangements exhibit a variable degree of cooperation (Plummer and FitzGibbon, 2004). In response to this problem, researchers recognise that appropriate partnerships may allow adaptive management (Stern *et al*., 2002; Brown, 2003b). As seen in Chapter 1, adaptive management is the term used to refer to a dynamic process of "learning by doing" that involves "treating policies as hypotheses and management as experiments from which managers can learn" (Berkes, 2002: 312). Adaptive management is crucial to successful sustainable use of wildlife because of the uncertainties about the ecological consequences of the use, stochastic events and social and economic changes (Allen and Edwards, 1995).

Under the Vicuña Convention and CITES, the different countries are committed to establish partnerships to monitor vicuña populations, and control vicuña management activities. These partnerships from national to local levels embrace the idea of adaptive management because they require knowledge on the status of vicuña populations to be managed, and acquiring experience on vicuña capture and shearing techniques and learning from them, as well as adapting to changing circumstances in the ecological and socio-political environment.

A large number of studies have attempted to explore the effects of decentralisation of natural resource management and differences in organisation of authority across levels of governance (Carney and Farrington, 1998, Wyckoff-Baird et al., 2000), but decentralisation has been difficult to implement. For example, shifting the focus of decisions and the locus of action from government to local level by empowering local communities does not guarantee success (Berkes, 2002). The shift usually introduces problems of scale and power across different levels of

governance, and between the different parties involved (Larson and Ribot, 2004), as also shown in Table 2.1.

While the partnerships established for *vicuña* management may play a key role in making the institutions at the local level effective, this thesis builds on past shortcomings arising from other wildlife management experiments and asks what are the characteristics of partnerships for vicuña management across scale.

The second challenge is how to establish partnerships at the local level. Although CBC emphasises that the external institutional environment must give or allow autonomy to local users, few governments are willing to empower communities without some assurance of their capacity and sense of responsibility to a wider society (Bromley and Cernea, 1989, Barrett, 1990, Keohane and Ostrom, 1995, Young, 1997). The key issues emerging from this debate are explored in the following section.

2.4 The concept of community and theories of collective action

Conservation through community-based management is based on a number of assumptions around the concept of community and theories on collective action. In community-based wildlife policies, a community is seen as a homogenous entity with clearly defined boundaries and interested in conservation if they perceive meaningful benefits from it (Shackleton et al., 2002). Sociologists and anthropologists (Wirth, 1938, Parsons and Shils, 1962, Lerner, 1962, Redfield, 1974) have discussed the ambiguity of the generalisation of the term community long before CBC emerged, and it is still an important and hotly debated issue (Anderson, 1991, Murombedzi, 1991, Agrawal and Gibson, 1999, Guijt and Shah, 1999).

One fundamental critique is that a distinct community with clear and defined boundaries is difficult to identify. Definitions of community boundaries commonly focus on the people of a local administrative unit, of a cultural or ethnic group, or of a local urban or rural area (IIED, 1994, Songorwa, 1999, Mazzucchelli and Ortiz von Halle, 2000). In reality, what appears to be a community in spatial, socio-cultural or economic terms may be deeply divided in relation to individual, institutional and

household interests in, and control over, different kinds of wildlife and therefore the demarcation of community limits and boundaries is unclear (IIED, 1994). In this regard, the geographical literature on concepts and definitions of boundaries reveals that the linkages between the specific levels or dimensions of boundaries remain unanswered (McKean, 1996, Geisler et al., 1997).

Equally fundamental is the critique that communities are defined social units with uniform interests where individuals can speak and decide for themselves (Kiss, 1990). Where CBNRM systems have remained viable and where there are significant elements of their structures still in use, existing resource management regimes may be used as vehicles for conservation (Bennett, 1976, Gadgil, 1987).

In the case of *vicuña* conservation in Bolivia, Chapter one shows that the shift in policy is manifested by government recognition that *vicuña* conservation can never be independent from community management, and that traditional Andean communities have strong local-level institutions with specific norms and enforcement mechanisms that favoured the recuperation of *vicuña* wild populations (DGB, 1999).

Traditional CBNRM systems have been documented through various case studies around the world revealing that traditional culture and local knowledge implies commonality, providing a basis of trust for collective action within that group (Berkes, 1989b, Bromley and Cernea, 1989, Oström, 1990a, Bebbington, 1998).

Various factors may have weakened or broken down the linkages between communities and conservation, such as the breakdown of traditional authority, commercialisation, urban-rural linkages, or the intrusion of inappropriate state policies (Leach et al., 1997b). Guijt and Shah (1999) questions that the problem of simplification of the term community conceals power relations within communities and further masks biases in interests and needs based on, for example, age, class, caste, ethnicity, religion, and gender. In reality, tensions between intra-community groups are inherent and inevitable (Hulme and Murphree, 2001), and even those

indigenous groups with well-functioning local management systems are dependent on the authority structure that supports them (Berkes and Folke, 1998).

An alternative to the analysis of communities suggested in social theory (Douglas, 1987, Granovetter, 1992, Goetze, 1994) and in development studies (Long and Long, 1992, Goetz, 1996) is to explore the relationship between structure and agency. The role of agency in processing experience and shaping action, and the role of structure in both enabling and constraining that agency is crucial to understand collective action and the institutions that shape the management of CPR (Cleaver, 2000b). In this regard, Giddens (1984) says that the actions of human agents should be seen as a process rather than as an aggregate of separate interests, reasons, motives, and acts.

The study on collective action examines the factors that motivate individuals to coordinate their activities to better their collective well-being (Wade, 1987, Lawry, 1990, Oström, 1992a). There are important aspects of collective action that overlap with the concept of social capital (Ostrom and Ahn, 2003). The many definitions of social capital that exist in the literature usually refer to the norms and networks that enable people to act collectively (Woolcock and Narayan, 2000). They identify various perspectives of social capital, including the communitarian, and the synergy view that integrates the network and institutional view of social capital.

The communitarian view equates local organisations with social capital (Woolcock and Narayan, 2000). This perspective is recognised in the development theory and policy, where a focus on getting the people involved in collective action requires the establishment of user committees, associations and community groups (Agrawal, 2001).

According to an enormous literature on collective action, smaller groups are more likely to engage in supportive collective action (Olson, 1965, Oström, 1990a). Other authors remark that the relationship between group size and collective action is not straightforward. For example, Esman and Uphoff (1984) suggest that larger groups may function more effectively, while smaller groups are more successful in initiating collective action. Other authors find that the size of a group is positively

related to its level of collective action (Marwell and Oliver, 1993). Therefore, the relationship between community size and boundaries, and successful collective action is still an area of research in need of investigation (Agrawal, 2002).

The synergy view attempts to integrate the networks and institutional perspectives on social capital (Woolcock and Narayan, 2000). The network view of social capital, stresses the importance of bonding and bridging community ties. In this regard, the concept of embeddedness is used to distinguish local communities in terms of the extent to which particular activities, such as fishing and processing, are embedded in or disembedded from the larger local community due, for example, to the globalisation of the production and marketing (McCay, 2002). The institutional view, on the other hand, argues that the capacity of groups to act collectively resides on the political and legal institutional structure in which they interact (Woolcock and Narayan, 2000).

Given this context, Ostrom and Ahn (2003) see trust, defined as "the expectations individuals have about others' behaviour" (Oström, 1998a), as the core link between social capital and collective action. Sometimes, however, the characteristics of the resource users such as size, boundaries, and heterogeneity are not the only variables affecting collective action. One important dimension in CPNRM is simply its relationship with the size of the resource in question. Common pool resources range in size from the global atmosphere, which is affected by the behaviour of individuals of all countries of the world, to local watersheds, rangeland, or wildlife affected by a smaller group size. The two key conditions recognised in the literature, as facilitators of common property regimes are small size and clearly defined boundaries of the resource (Oström, 1990a, Wade, 1987, Baland and Platteau, 1996).

Other authors argue that focusing on these two conditions alone leaves aside other characteristics of the resource that may be relevant to how and whether users are able to sustain effective institutions (Agrawal, 2002). For example, resources such as wildlife are mobile, and can also be stored, while groundwater basins and lakes have stationary water but their degree of storage is limited. Monitoring many mobile resource systems and gaining accurate information about the resource is

costly and involves considerable uncertainty (Rose, 2002). Research in irrigation networks that spread over entire watersheds, highlights the role of nesting smaller community institutions into larger cooperative entities (Rose, 2002). Insofar, as formal larger governmental institutions act as overall managers, community-based management institutions linked at different levels of governance, also called nested community-based institutions, have an important role to play for making common property regimes effective (Ostrom, 1992a)

There is an emerging critique, however, around the effectiveness of institutions for common pool resource management, both from the theoretical and policy viewpoint which questions that local level collective action institutions might appear to be acting for a collective benefit, but actually serve to shape and reproduce relations of unequal power and authority, marginalizing the concerns, for example, of particular groups of women or poorer people, as shown in Table 2.1. These critiques have given rise to debates around the feasibility of CBC in terms of whether communities can resolve resource conflicts and slow environmental degradation more effectively than a centralised authority (Wells and Brandon, 1992), and in terms of whether incentives are able to bridge the trade-offs between international conservation and livelihood objectives (Brechin et al., 2002, Wilshusen et al., 2002).

This thesis builds on these critiques and acknowledges that other factors may also be dividing community interests, and crosscut the so called community boundaries by asking what are the characteristics of local-level collective action institutions for vicuña management.

The third area of concern that arises as a major shortcoming from the implementation of CBC projects relates to making participation and benefits meaningful to local people (Cooke and Kothari, 2001). This area of research is examined in the following section.

2.5 Deriving meaningful benefits from conservation

The rationale for CBC through wildlife management or sustainable use is that, as well as achieving international conservation objectives by maintaining biologically viable wildlife populations, it can generate sufficient economic benefits to compensate for the costs of conservation to local communities and nations, and contribute to local development. The underlying assumption is that economic benefits from sustainable use will result in positive incentives for CBC.

In practice, positive incentives rely on the identification of linkages between improved livelihoods and local conservation (Salafsky and Wollenberg, 2000). Livelihoods usually comprise a diversity of capabilities, assets (including both material and social resources), and activities required for a means of living (Carney, 1998). Given this context, local people may be motivated to participate in a conservation programme by several incentives whether initiated by government or NGOs (Maqsood Ali, 1986), such as the desire to apply their traditional knowledge (Kleymeyer, 1994), a vision of wildlife conservation (Nott et al., 2004), the promise of donor funding (Johnson, 2004), or the hope of development which collectively motivated communities (Agrawal and Gibson, 1999). Although these various incentives may make local people participate, research has shown that participatory wildlife management is not necessarily linked to a positive attitude towards conservation. In this regard, Ashley *et al*. (1999) emphasises that, in order to provide effective incentives, the type, distribution and scale of benefits must derive from conservation.

As regard to the type of benefits, one important lesson learned from past experiences, particularly in wildlife management, is that tangible benefits derived from conservation, and perceived by local people are measurable in economic terms (Costanza, 1991). Direct incentives usually focus on changing the cost-benefit ratio of conservation for local communities through direct economic benefits such as compensation schemes for animal damage or infrastructure investment, income-generation from employment, and revenue sharing of any proceeds from wildlife utilisation, or from related activities such as eco-tourism, as shown in Table 2.1.

With regard to the distribution of benefits, empirical evidence has shown that if promises to distribute benefits and reduce costs for people who live on, or adjacent to, wild lands and wildlife (Heinen, 1995) do not meet local short-term expectations, programmes are likely to fail (Songorwa, 1999).

In terms of the scale of benefits, a vast majority of African cases indicate that the economic benefits generated by community approaches are not at a scale that would adequately compensate local residents for the aggregate direct costs and opportunity costs caused by conservation (Hulme and Murphree, 2001). Salafsky and Wollenberg (2000: 1425) suggest that "to be effective, a strategy must be employed on a scale appropriate to the scale of the threat, economically and socially viable, and responsive to changing conditions".

Although CBC projects are likely to be more effective if they also provide immediate economic benefits to local people (Murphree, 1993) at an appropriate scale, this can be affected by the changing values and attitudes of local people. While research suggests that the resource must be valued enough by the users to be able to invest time and energy to contribute to conservation, a perception of wildlife conservation varies greatly between one individual and group to another, and local people may perceive incentives differently. Therefore, there is not one type of valuation and derived benefit within a group of users or community, and special attention on local perceptions helps to identify if incentives are beneficial to local people, and tangibly derived from conservation (Zanetell and Knuth, 2004).

As regard to tangible benefits perceived by local people, research has also shown, that local management with non-economic benefits may also work under certain conditions. For example, when relatively small groups of individuals have exclusive access to a resource, and have a stake in sustainable harvest or protection (Heinen, 1995), or if there is an interest in preserving wildlife for future use which is translated into expected or anticipated benefits (Hjort-af-Ornas, 1996, Balmford and Whitten, 2003). These examples show that biological sustainability may be also enhanced by other mechanisms (Ashley, 1998, Fabricius, 2004). For example, indirect incentives are implemented through social and natural resource management policies to specific conservation problems such as granting more access rights to the

resources in question; the establishment of law enforcement such as penalties or punishment; devolution of authority and responsibility accompanied by public information, participation and capacity building. These other mechanisms are also recognised in the literature as intangible benefits (Ashley *et al*., 1999).

Special attention to intangible benefits in the case of vicuña management in the Bolivian highlands is particularly relevant to explore because community involvement is occurring in the absence of economic benefits derived from this formal participation. Given this context, it is particularly interesting to examine if there is any other type and immediate benefit perceived from *vicuña* conservation and management by participating communities.

Participation in wildlife conservation programmes is usually expected to derive in positive attitudes toward local conservation (Ashley, 1998). However, shortcomings from past experiences have criticised what participation in conservation actually entails (IIED, 1994, Little, 1994, Cooke and Kothari, 2001). In this regard, there is a growing critique of the tyranny of participation (Cooke and Kothari, 2001) that asks if participation is intrinsically a good thing (especially for the participants), and if the focus on getting the techniques right is the principal way of ensuring the success of integrated conservation and development projects.

This thesis builds on these critiques of participation to examine whether meaningful benefits derive from participatory vicuña management are perceived by participating communities.

Finally, the integration of the three research questions formulated in this thesis contributes to answering the central question, in order to test the general hypothesis that common property regimes are effective institutions for wildlife management. The next section summarises the main issues raised in this chapter.

2.6 Summary

Current theory suggests that CBC is an effective strategy to simultaneously achieve and maintain international conservation and community development. CBC combines different strands of thinking that evolved from gradual changes in conservation: the shift from a strict preservation perspective to sustainable use, and a process of devolution of rights and responsibilities from state-enforcement to community management. The primary goals of CBC are to enhance wildlife conservation and provide meaningful benefits to local people.

In practice, a number of shortcomings have arisen from the implementation of CBC projects around the world, particularly in terms of establishing appropriate partnerships across scale, promoting supportive collective action, and deriving meaningful benefits to local people from conservation. These shortcomings have generated a wide debate on the viability of the CBC strategy.

The theories related to the study of CPNRM address this debate, and encourage continuing to explore these shortcomings in terms of challenges that need to be addressed. The CPNRM theory is based on the general hypothesis that common property regimes are effective institutions for wildlife management. CBC of *vicuña* in the Bolivian Highlands provides a pertinent case to test this general hypothesis, because the government promotes the common property regime as the only community-based strategy for *vicuña* conservation in the wild.

The establishment of appropriate partnerships across scale is the first challenge that research needs to address; particularly in terms of how key actors and institutions interact, below the nation-state, to meet the commitments of global conservation regimes. *Vicuña* in Bolivia provides a pertinent case to explore these interactions because CBC is implemented via global and national legislation.

Creating supportive collective action institutions for wildlife conservation is the second challenge that needs to be further explored, in terms of causal relationships between the multiple variables that affect community involvement. This area of research is particularly interesting to explore in Bolivia because the rights-

holders of the community-based strategy are traditional community groups, expected to participate in *vicuña* capture and shearing events and conservation.

Deriving meaningful benefits from CBC to local people is the third challenge that needs to be addressed, particularly in terms of linking conservation and livelihood aims. This area of research is particularly interesting in Bolivia, because local participation in *vicuña* conservation and management activities occurs in the absence of economic benefits.

The general conceptual background introduced in this chapter provides the rationale for choice of methodology that will be examined in the following Chapter.

Chapter 3. Methodological approach

3.1 The case study approach

This thesis uses community-based conservation (CBC) of vicuña in the Bolivian highlands as a case study to explore whether a common property regime is an effective institution for wildlife management. A case study is an examination, through the detailed presentation of ethnographic data, of a specific phenomenon from which the analyst seeks to make some theoretical inference (Yin, 1993, 1994).

The case study's dependence on a specific case may be criticised for its limitations in providing a generalising conclusion. However, generalising concepts can also mask the problems arising from the local context (Brosius *et al.*, 1998). In community-based wildlife management the exploration of particular case studies has provided insights about the conditions under which common property regimes are effective institutions for wildlife management (Oström, 1990a, Child, 1996). "Case studies have contributed greatly to knowledge by documenting the limitations of the Tragedy of the Commons model, identifying key variables, and generating hypothesis" (Stern *et al.*, 2002): 467).

This research builds on the positive outcomes from using a case study and uses findings from the Bolivian case study to "expand and generalise theories" (Yin, 1994) 21). This research aims to test theories of CPNRM and provide empirical evidence to support policy and management of wild vicuña populations in the *Andean* region. Through this analytical generalisation this case study can inform on the effectiveness of a community-based or co-management model for vicuña management, and on the likelihood of findings being transferable to other situations, not only within Bolivia, but also in other Andean countries in terms of theoretical propositions. Within these terms, this research intends to contribute to a wider project called MACS[10] (Sustainable Management of Wild Camelids) which aims to

[10] MACS project was funded by the INCO-DEV Programme of the European Union, Contract ICA4-2000-10229. For more information about MACS project see http://www.macs.puc.cl/

develop practical guidelines and policy recommendations to ensure that vicuña management systems secure the interests of conservation and animal welfare and equitable distribution of benefits.

3.2 Research schedule

The research followed an exploratory approach (Yin, 1993), where data collection was undertaken prior to defining the research questions, and the selection of Bolivia as a study area, as shown in Table 3.1 and explained in the following paragraphs.

Table 3.1 Research schedule

Date	**Location**	**Activities**
Sep 2001	Andean Region (pilot survey)	Rapid appraisal to contact key informants, and get an overall understanding of Vicuña management systems.
Oct 2001	UK (UEA)	Attendance to courses, and seminars; literature review.
Nov 2001	Bolivia (preliminary fieldwork)	Participatory observation in Vicuña capture and shearing events, and confirmation of study area; attendance to first MACS meeting in Chile.
Dec 2001-Jun 2002	UK (UEA)	Attendance to courses; literature review, and development of research questions and hypotheses. Preparation and presentation of Procedural Paper, and preparation for fieldwork.
Jul 2002 - Jun 2003	Bolivia, Peru (main period of data collection)	Main period of data collection at national and local levels; attendance to second MACS meeting in Peru. Contributions to MACS-WP2 tasks.
Jul – Sep 2003	UK (UEA)	Linking data to research questions, and hypotheses; attendance to seminars.
Oct-Nov 2003	Bolivia (follow-up fieldwork)	Attendance to Conference on South American Camelids and Third MACS meeting in Argentina.
Dec 2003 – Dec 2004	UK (UEA)	Presentation of preliminary findings in conferences, Finding criteria for interpreting results, and writing up.
Jan – Aug 2005	Argentina (final editing)	Presentation of preliminary findings in conferences. Contributions to MACS-WP2 tasks. Final editing and submitting of thesis.

Notes: (UEA) University of East Anglia; (MACS) Management of Wild Camelids; (WP) Work Package

In September 2001 a rapid three-week appraisal was carried out to contact key informants, and gain an overall understanding of the different vicuña management systems in the Andean region. This information was triangulated and complemented with data from secondary sources and used to identify key questions in need of investigation, and the appropriate study area for their exploration[11].

Registration at the University of East Anglia (UEA) started in October 2001. The first eight months were spent in UEA attending courses, and reviewing literature on community wildlife management experiences and theories on common property natural resource management. This research helped to identify community management of wild vicuña in Bolivia as a relevant case to explore community-based conservation under common property regimes, as explained in Chapter 1.

During the period October 2001-l June 2002 a theoretical framework was worked out at UEA with a one-month visit, in November 2001, to Lipez-Chichas unit of management in Bolivia to participate in vicuña capture and shearing events, will be explained further in this chapter. This visit was combined with the first MACS Coordination Meeting in Chile. The preliminary fieldwork provided the contextual backing for the research, confirmed the selection of Bolivia as a suitable case study, and provided the empirical background necessary for the formulation of the research questions and writing of the Procedural Paper[12].

The main period of data collection started in July 2002, after spending a few weeks in Argentina to revise tasks and activities of Project MACS Work Package 2. Data collection within Bolivia at both national and local levels, took place from August to December 2002, and from February to March 2003 and in October 2003 to assist the III World Camelids Congress in Potosi, a great opportunity to contact key informants. At national level, key informants were contacted in La Paz city. At local level, the exploration was site-specific and information was collected from the Mauri-Desaguadero target area for vicuña management. During this period it was

[11] The data collected was also used to elaborate a comparative stakeholder and policy analysis between countries as part of a task for MACS Work Package 2.

[12] The Procedural Paper is a requirement of the progression from MPhil to PhD and consists of a conceptual and theoretical overview, literature review, methodology and research plan. The Procedural Paper was compiled and presented on the 30th of March 2002 and amended in June 2002.

also possible to attend the second MACS Coordination Meeting in Peru, and triangulate information with other key informants in Peru.

From July 2003 until December 2004, data analysis consisted in linking data with the research questions, and hypotheses, as well as finding criteria for interpreting the findings, and writing up. These activities were carried out in the UK because they needed access to library and close supervision to complete a first whole draft of thesis. During this period it was also possible to make a short visit to Bolivia combined with the third MACS Meeting in Argentina where data was triangulated. The final period in Argentina, January-August 2005, was used to finish editing in order to finally submit the thesis. During this period written work for MACS-Work Package 2 was also undertaken, as well as presentation of preliminary findings in Conferences.

3.3 Selection of fieldwork sites in Bolivia

Bolivia was selected as an appropriate study area within the Andean context to address the central question of this thesis because: There are approximately 60,000 vicuñas[13] distributed in the Bolivian Highlands The only management system that is implemented is the vicuña management in the wild. The community-based approach operates under a common property regime where the right-holders are *Quechua* and *Aymara*-speaking indigenous communities Fibre has not been commercialised yet and communities are participating in the Vicuña National Programme (VNP) in the absence of economic benefits.

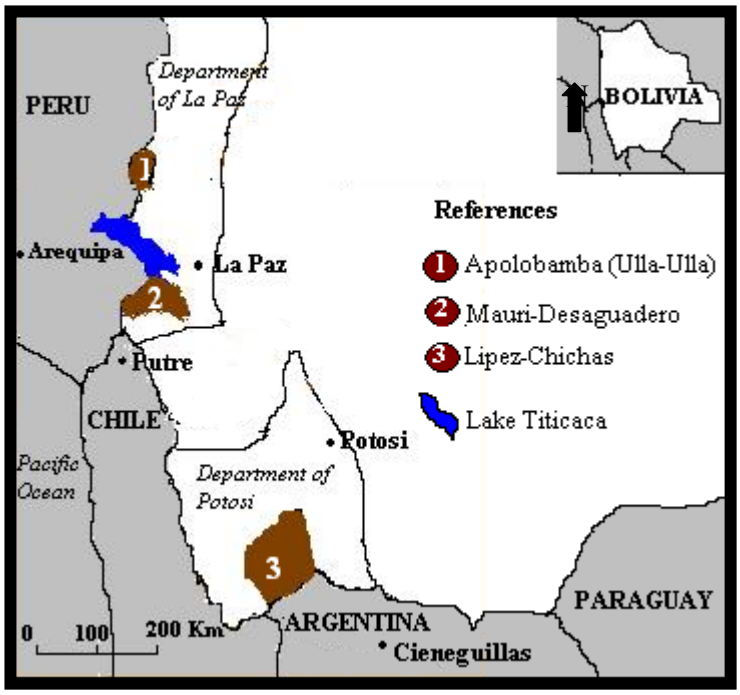
Vicuña distribution covers an altitude range between, approximately, 3,600 and 5,300 m a.s.l. extending over 170,000 Km², between 14° 40'' and 22° 50'' South latitude, along the frontier with Peru, Chile, and Argentina. From 1997-2002, exploitation of vicuña fibre occurred in three target[14] vicuña populations located in Apolobamba (ex-Ulla Ulla) in the north of Lake Titicaca, Mauri-Desaguadero in the

[13] The second largest Vicuña population after Peru

[14] In 1997 CITES down-listed three target Vicuña populations to Appendix II that demonstrated a successful recovery of its populations. In November 2002, all Vicuña populations have been reclassified under Appendix II permitting live shearing and commercialisation of its fibre in all its distribution within Bolivia.

South of Lake Titicaca, and Lipez-Chichas in the extreme South of Bolivia, as shown in Figure 3.1.

Figure 3.1 Study area and fieldwork sites



Source: Based on DNCB (1997a); IGM (1998)

In 2000, five Regional Associations for Vicuña Management (*Asociación Regional de Manejadores de* Vicuña, ARMV) were created, to represent those communities interested to participate in the Vicuña National Programme (VNP). These ARMV were named: Machaqa, Paca Japis and Nor Pacajes located in Mauri-Desaguadero; Apolobamba located in the pilot area Apolobamba, and Sud Lipez located in the pilot area Lipez-Chichas.

Table 3.2 compares the three target areas for vicuña use, in terms of location and distance from La Paz city; area monitored in hectares; number of vicuñas; indigenous groups; government authority in charged of vicuña management activities during 1997-2002; Department; Municipalities; Associations for Vicuña Management (ARMV); number of park and wildlife wardens, Communal Management Areas (AMC).

Table 3.2 Target areas and Regional Associations for Vicuña Management

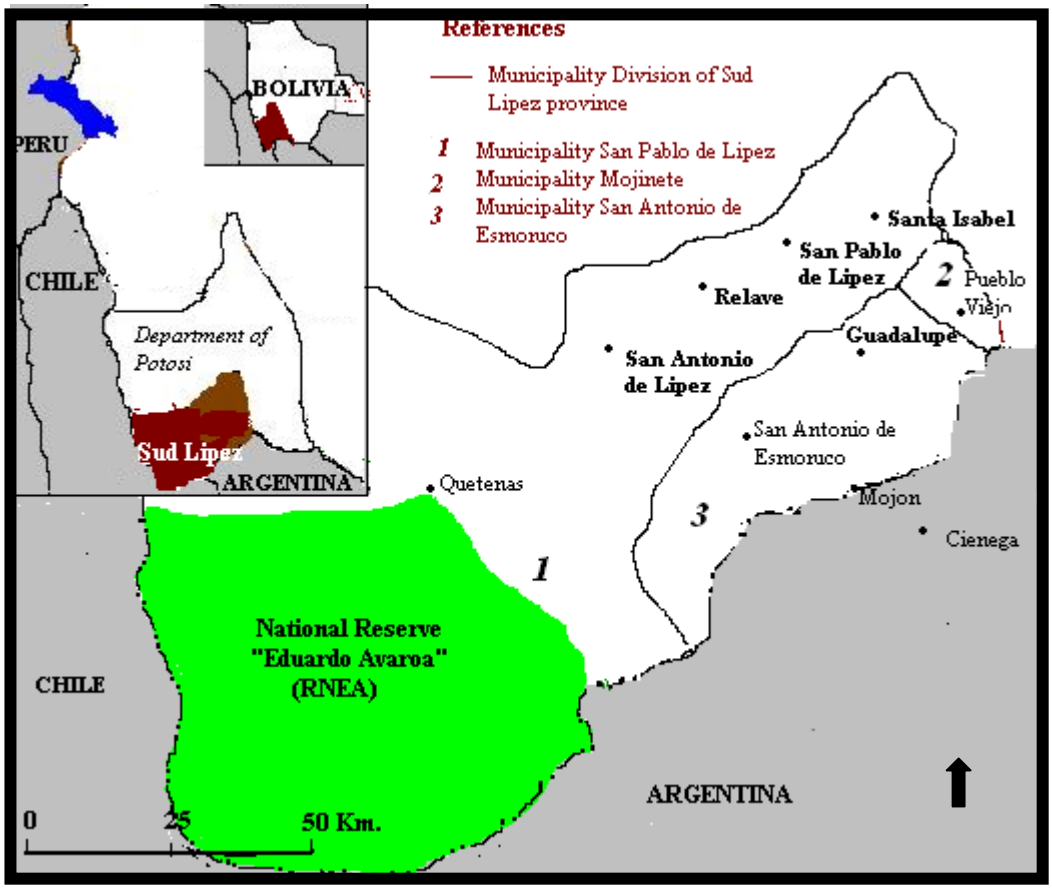
Vicuña Management Unit	Apolobamba (ex-Ulla Ulla)	Mauri-Desaguadero			Lipez-Chichas
Department	La Paz	La Paz			Potosi
Provinces	Franz Tamayo Bautista Saavedra	Ingavi Pacajes Jose Manuel Pando			Sud Lipez
Location (Distance from El Alto)	North (~100Km)	Central (~100Km)			South (~600Km)
Area monitored (hectares)	240,000	388,400			1,282,445
Nº of Vicuñas (Density in Vicuñas/hectare)	8,299 (0.08)	14,117 (0.03)			17,901 (0.01)
Indigenous groups	*Quechua* and *Aymara*	*Aymara*			*Quechua*
Government authority	SERNAP	DGB			DGB
Vicuña Regional Association	Apolobamba	Machaqa	Paca Japis	Nor Pacajes	Sud Lipez
Nº Municipalities	2	1	2	2	3
Hectares	121,138	147,398	73,488	222,498	1,282,445
Estimated numbers of Vicuñas	8,599	7,487	1,455	4,447	18,297
Park/Wildlife wardens	25	9	2	5	8
Communal Management Areas 1998-2002	10	12	0	5	5

Source: Based on DGB (2003); Prefecture La Paz (2002); DGB General Biodiversity Bureau, SERNAP National Servive for Protected Areas

3.3.1 Lipez-Chichas fieldwork site

Lipez-Chichas is situated in the Sud Lipez Province, South-West of the Potosi Department, ranging in altitude from 3,700 to 5,300 m a.s.l. The Province of Sud Lipez is divided into three Municipalities or Sections called San Pablo de Lipez (first section), Mojinete (second section), and San Antonio de Esmoruco (third section). The designated target area for vicuña management is, approximately, defined by the railway lines between Uyuni and the Chilean and Argentine frontiers and by the minor mountain ranges known as the Cordillera de Lipez and Cordillera de Chichas, as shown in Figure 3.2.

Figure 3.2 Lipez-Chichas fieldwork site (Sud Lipez, Potosi)



Source: Based on IGM (1998), SERNAP (2001a), DGB (2003)

Reports from various archeology sites reveal that the region was occupied during the pre-hispanic period, between 4,000 and 3,000 years BC. The first inhabitants were probably hunters and gatherers. Most representative agro-pastoral groups belonged to the *Wancarani* culture (~ 800 B.C. until 400 B.C.), *Tiwanaku* (500 - 1100 B.C.), *Quechuas* and *Aymaras* (1200 - 1350 B.C.) and *Incas* (XIV and XV century). Owing to the harsh conditions, the *Incas* never effectively colonised this desert area, and is still sparsely populated. However, the indigenous language spoken is *Quechua* and schools are bilingual.

The extreme South-West part of Sud Lipez Province corresponds to the Andean National Fauna Reserve Eduardo Avaroa (RNEA) which was created in

1973 to protect vicuña, three species of flamingos (*Phoenicopterus chilensis, P. andinus* and *P. jamesi*), suri (*Pterocnemia pennata*) and the yareta plant (*Azorella compacta*). The reserve expanded to its present size (714,745 ha) in 1981, and is administrated by the National Service for Protected Areas (SERNAP), a decentralised agency of the Ministry of Sustainable Development and Planning (MDSP).

Human settlements are mainly concentrated outside the National Reserve where the highest concentrations of Vicuña populations are also found. The principal rural activity is pastoralism of camelids and mining. Agricultural practice is reduced because of the extreme climate conditions and lack of irrigation systems, and the population has a constant emigration towards valleys and urban centers such as Villazón and Tarija.

Access to the Lipez Chichas area, was not only difficult because of its isolated geographical location and lack of public transport, but also because of heavy snows in winter 2002. However, it was possible to visit the area in spring 2001, and during vicuña capture and shearing events in 2001 (see Table 3.1). During this period, there were approximately 18,297 vicuñas in the whole Lipez Chichas unit of conservation, amongst which only 318 corresponded to RNEA (DGB, 2003). Within the area delimitated by RNEA, vicuña management activities depend on SERNAP norms and regulations. Outside the RNEA, the General Biodiversity Bureau (DGB), a centralized agency of the MDSP, was directly in charge of vicuña management activities that included:

- Employing 8 community members as wildlife wardens,
- Providing infrastructure and equipment for capture and shearing event to 5 communities,
- Providing logistical and technical support during vicuña shearing events
- Certifying, and storing the fibre obtained in 1998 and 2001.

The Regional Association for Vicuña Management (ARMV) named Sud Lipez groups 14 communities. Data was collected from 5 participating communities and 3

non-participating communities in 2001. The location of these communities is illustrated in Figure 3.2, and the main characteristics shown in Table 3.3.

Table 3.3 Characteristics of communities in ARMV Sud Lipez

Municipality	**Nº of people (2001)**	**Communities**	**Nº of vicuñas 2001**	**Kg of fibre shorn**	
				1998	**2001**
First Section (San Pablo de Lipez)	221	San Pablo de Lipez	5.021	3.298	2.235
	252	San Antonio de Lipez	2.881	1.808	2.625
	143	Relave	2.599	(-)	0
	105	Santa Isabel	2.061	(-)	2.660
	460	RNEA-Quetenas	378	(-)	(-)
Second Section (Mojinete)	64	Pueblo Viejo	346	(-)	(-)
Third Section (San Antonio de Esmoruco)	663	San Antonio de Esmoruco	1.067	(-)	(-)
	184	Guadalupe	2.252	0.732	4.260

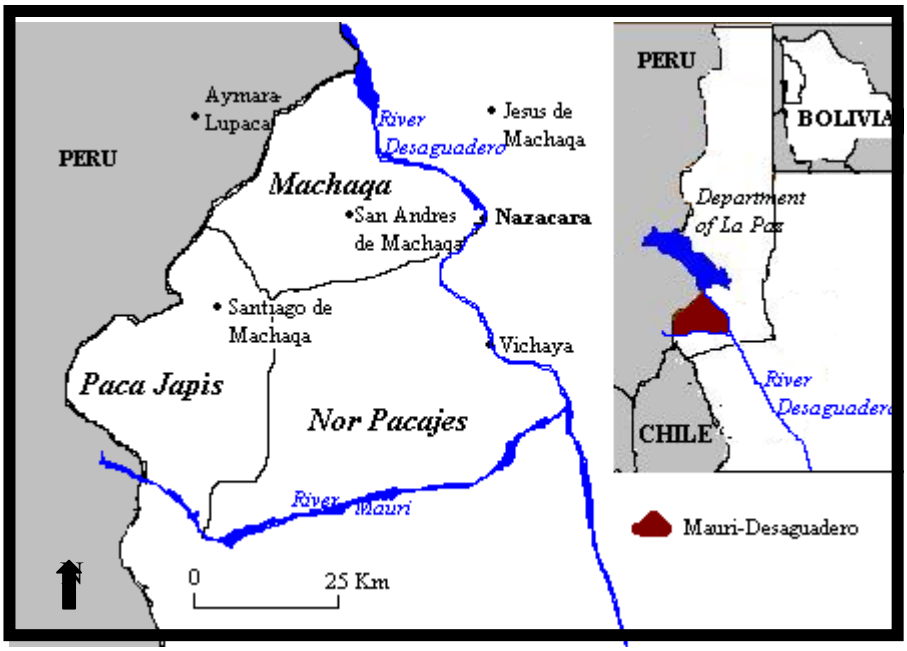
Source: DGB (2003, 2004) , INEB (2001); Note: (-) Did not participate

3.3.2 Mauri-Desaguadero fieldwork site

Mauri-Desaguadero is located south of Lake Titicaca next to the frontier with Peru, in an area delineated by the rivers Mauri, Desaguadero, and the frontier with Peru, as shown in Figure 3.3. The area includes the Province of José Manuel Pando, the Municipality of San Andrés de Machaqa or fifth Section of the Ingavi Province, and parts of the Municipalities of Caquiaviri (second section) and Municipality of Calacoto (third section) of Pacajes Province.

Archeologically, the whole Mauri-Desaguadero area was one of the centres of the Tihuanaco civilization (1200-1450 BC) occupied by *Aymara*-speaking people, who, in spite of a long period of *Quechua*-speaking Inca domination and over 400 years of European contact, have managed to maintain both the *Aymara* language and much of their territorial and social organization based on the *Ayllu* (Bennett, 1946).

Figure 3.3 Mauri-Desaguadero fieldwork site



Source: Based on IGM (1998), DGB (2000a)

Human settlements are generally scattered, or instead grouped in a town or village such as Nazacara, Laquinamaya, Santiago de Machaqa or Vichaya (see Figure 3.3). The principal rural activities are pastoralism of sheep, lama, and cows; agriculture; and gypsum mining in the Pacajes area.

Access to the Mauri-Desaguadero area was relatively easy because of regular buses leaving El Alto city every day. The nearest distance to El Alto, approximately 120Km, was covered in 8 hours. Once in the area, access to other locations was more difficult because of lack of motorised vehicles and regular public transport services.

Within the area, people usually walk, cycle, and in very few cases use motorbikes[15], sometimes taking the whole day to go from one place to the other. Because of these limitations of transport, most of fieldwork was done in the Municipality of San Andrés de Machaqa, an area delineated by the Desaguadero River in the north and east Province of Pacajes and José Manuel Pando in the South, and the frontier with Peru in the West (see Figure 3.3). However, the other areas

[15] Motorbikes are only used for urgent matters because of the cost of fuel and maintenance

within Mauri-Desaguadero were also visited on specific occasions. For example, the area within the Pacajes Province was visited during a three-day bicycle-trip, where various ethnographic techniques were combined to collect information, as will be described later in this Chapter.

During the period of this study, there were approximately 13,677 vicuñas in the whole Mauri Desaguadero target area, of which more than half were distributed within the area that corresponds to the Municipality of San Andrés de Machaqa (DGB, 2003). During the period of fieldwork, the DGB was directly in charge of vicuña management activities that started in the year 2000. This government agency was in charge of:

- Employment of 16 wildlife wardens,
- Providing infrastructure and equipment for Vicuña capture and shearing events to those communities interested to participate,
- Providing logistical and technical support during Vicuña shearing events
- Certifying, and storing the fibre obtained in 2000, 2001 and 2002.

In the year 2000, three Regional Associations for Vicuña Management (ARMV), Machaqa, Nor Pacajes, and Paca Japis, were created within the Mauri-Desaguadero to group the fibre production of participating communities (see Table 3.2). Data was obtained from 16 participating communities and 9 non-participating communities in 2002. The main characteristics of these communities are shown in Table 3.4 for ARMV Machaqa, and Table 3.5 for ARMV Nor Pacajes and ARMV Paca Japis.

Table 3.4 Characteristics of Machaqa Regional Association

Political division	Area in hectares	Nº of vicuñas	AMC	Kg of fibre shorn		
				2000	2001	2002
Ayllu Choque	20,112	1,612	San Antonio	(-)	(-)	3.520
			Kanapata	(-)	11.245	4.785
			Nazacara	3.290	8.435	6.060
			Jesus de Manquiri	1.055	0.615	2.485
			Huallaquiri	(-)	(-)	4.110
			Pachamaya	(-)	2.140	(-)
Ayllu Yaru	13,104	500	Conchacollo	(-)	6.925	0.620
			Rosapata	(-)	(-)	(-)
Ayllu Collana	21,141	955	Collana	(-)	(-)	5.700
Ayllu Levita	41,187	1,996	Laquinamaya	(-)	7.250	12.520
			Queto Querarani	(-)	(-)	(-)
Ayllu Bajo Achacana	23,163	1,050	Chijipucara	(-)	(-)	1.220
			Chuncarcota	0.565	2.380	(-)
Ayllu Alto Achacana	28,990	1,314	Antaquirani	(-)	(-)	8.025
			Villa Pusuma	(-)	(-)	(-)

Source: Prefecture of La Paz (2002) , (2003, DGB, 2004), (INEB, 2001)
Note: (-) Did not participate, (AMC) Communal Management Area.

Table 3.5 Communal Management Areas in Nor Pacajes and Paca Japis

ARMV	AMC	Fibre production in Kg		
		2000	2001	2002
Nor Pacajes	Vichaya	(-)	(-)	(-)
	Chocorosi	(-)	(-)	1.660
	Ninoka	1.290	(-)	(-)
	Laura	(-)	(-)	(-)
	Collana	(-)	(-)	(-)
	Agua Rica	(-)	(-)	(-)
	JankoMarka	(-)	2.555	(-)
	Ticapata	(-)	0.430	4.725
Paca Japis	Santiago de Machaqa	(-)	(-)	(-)
	Berenguela	(-)	(-)	(-)

Source: DGB (2003, 2004), Note: (-) No fibre production,
(AMC) Communal Management Area

3.3.3 Process of enquiry

The key issues arising from the research questions, outlined in Chapter 1, focusing on relationships between institutions and actors at different scales, on factors affecting local-level collective action, and on types of benefits perceived by local people, were particularly suited to qualitative enquiry. However, in some occasions, a combination of qualitative and quantitative data from primary and secondary sources was also used, particularly as a form of triangulation[16], explained later in the Chapter.

The key issues also pointed towards exploring government-community and intra-community relationships suggesting that enquiry will take place at different levels of governance and scale (national-local, and national-international[17] as well), various fieldwork sites, research methods and techniques for qualitative data collection, as shown in Table 3.6.

Table 3.6 Process of enquiry

Issues explored	Level of enquiry	Fieldwork sites	Research methods
Partnerships across scale	International-national-local	La Paz Lipez-Chichas Mauri-Desaguadero Apolobamba	Analysis of documents Interviews and meetings with key informants
Factors affecting collective action	Local	Lipez-Chichas and Mauri Desaguadero	Participative observation in Vicuña capture and shearing events, livelihood activities, and community meetings; Interviews, and discussions with key informants; School workshops Analysis of documents
Types of benefits perceived by local people	Local	Mauri-Desaguadero	Participative observation in livelihood activities; Household interviews Individual and group discussions

[16] For example, during vicuña capture and shearing events, the number of communities involved in shearing activities and the motivations to collaborate were recorded.
[17] International level refers to the level of governance concerning Vicuña management in the Andean region.

Fieldwork focusing on relationships between institutions and actors across scale (see Table 3.6) suggested that the enquiry would be undertaken at different levels of governance, from international to national and local levels. The international level corresponds to various issues arising from vicuña management across the Andes. The national level enquiry focuses on those issues affecting vicuña management within Bolivia. It includes the sub-national level represented by administrative-political divisions: the Department divided into Provinces, subsequently divided into Sections or Municipalities. The local level focuses on the issues arising from the implementation of the vicuña National Programme (VNP) in three target areas for vicuña use (see Table 3.3).

Fieldwork focusing on the exploration of local-level institutions for collective action, and local people's perceptions suggested a local-level enquiry that was conducted at community-level in Lipez-Chichas, and Mauri-Desaguadero (see Table 3.6). At the local level, preliminary fieldwork in Lipez-Chichas confirmed that interested communities included both participating and non-participating communities. Interested communities had to define their community boundaries as Communal Management Areas (AMC) in order to participate in vicuña capture and shearing events. These AMC were used as a unit of analysis during vicuña captures and shearing events in Lipez Chichas (2001) and Mauri-Desaguadero (2002). The creation of these new institutions for vicuña management could overlap or conflict with other local-level institutions and community-based organisations. These AMC guided the investigation of activities and events relevant to vicuña management, but also represented a reference point to explore the patterns of social organisation within communities, such as the nature of community organisations and perceptions and attitudes of community members.

The key issues arising from this community-level research were followed up and triangulated with information obtained in boundary areas such as the:

- Municipality of Jesus de Machaqa in Ingavi province, where vicuña management was not allowed by CITES,
- Aymara Lupaca Reserve in Peru, where communities are managing Vicuñas in captivity,
- Trans-boundary frontier (Argentina-Bolivia) where a bi-national project for capacity building and enhancing commercialisation of lama fibre is been promoted.

3.4 Research methods

Research methods included individual and group interviews, household interviews, workshops, group discussions, and participative observation during vicuña capture and shearing events, community meetings, collective work within communities, and daily activities (see Table 3.6). A combination of ethnographic techniques was also used seeking to draw out the implications of many conversations, encounters and experiences, and to also map local people's residence, and daily livelihood activities. Multiple sources of evidence (Yin, 1994), and crosschecking, also known as triangulation (Pretty, 1994), were used to address issues of reliability and validity.

While information at international level could be obtained from interviewing key informants in the different countries managing vicuña, information at national level, within Bolivia, was obtained mainly from key informants in La Paz. The focus of the interviews was to identify the perceived opportunities and constraints of the Vicuña National Programme. Through this exploration it was possible to understand the relationships between actors and institutions (see Appendix A). Key informants included National Government staff directly involved in vicuña issues, such as SERNAP or DGB government officials and, Spanish Agency of Cooperation or, instead, not currently involved in the Vicuña National Programme but working in related issues such as the Ministry of Agriculture, or development agencies such as

the Norwegian Alliance working with South American camelids production (see Appendix A).

At national level, key informants such as government officers, NGOs and staff from international cooperation agencies were interviewed in La Paz city to find out their involvement in vicuña management, as well as boundaries of decision-making and perceptions. At the local level, the investigation was site-specific and information was collected from Mauri-Desaguadero unit of management, as will be described further in this chapter.

3.4.1 Interviews

Interviews were undertaken in the form of semi-structured and unstructured interviews.

Semi-structured interviews (Bernard, 1994) are one of the important research techniques used in this thesis. They take the form of guided conversations in which a checklist of questions is determined in advance to guide the conversation, such as peoples' general interests and perceptions towards issues arising from the design and implementation of the community-based conservation programme for vicuña management. This approach gives the technique its flexibility, allowing to explore issues of interest in depth, and to identify new areas of interest, which may arise at international, national and local levels.

Key informant semi-structured interviews were aimed at obtaining information on specific issues, such as wildlife wardens (16 in Mauri-Desaguadero and 8 in Sud Lipez), traditional authorities such as the *mallcus*, modern authorities for example local mayor, community wardens, school teachers, priest of the area as well as various other waged employees such as mine workers or local NGO staff (see Appendix A).

Household semi-structured interviews were used to obtain information on local people's perceptions towards vicuña populations living in their land. A total of 23 household interviews were made (19 in Machaqa and 4 Nor Pacajes). A

preliminary mapping of the study area helped to visualise the household distribution, and community boundaries in order to design the transect route along the river Desaguadero that was covered on bicycle or motorbike (see Figure 3.3). The interviews were then compared with these same people's attitudes and perceptions recorded during vicuña capture and shearing events.

During key informant and household semi-structured interviews, informants were asked about their perceptions of vicuña in relation to other resources and activities, and the history of settlement in the area, as well as to triangulate other sources of information and research methods. Before embarking on the subject, general conversation was made to be able to establish a relationship and build up confidence. For analytical purposes, the interview was divided into descriptive questions that allowed informants to provide statements about their activities (*entering questions*), structural questions, which attempted to find out how informants organise their knowledge (*in-depth questions*) and *contrast questions* that allow informants to discuss the meanings of situations and provide an opportunity for comparisons to take place between situations and events in the informants' world. This method was adapted from (Bernard, 1994). Table 3.7 outlines the checklist used to guide conversation towards the principal issue or topic to be discussed.

Unstructured interviews were also carried out as part of the exploratory process, where general questions were asked about people's general interests and perceptions of vicuña and other issues arising from conversation. The sample of interviewees covered a diversity of people in terms of gender, age, livelihood strategies, place of residence, socio-economic position, education, knowledge, experience, direct or indirect involvement or interests in vicuña management issues. These people were identified and interviewed in different places such as their homesteads, towns (Nazacara, San Andres de Machaqa, Vichaya, Santiago de Machaqa), public transport, community meetings, regional fairs, festivals, collective activities, livelihood activities, as well as during vicuña capture and shearing events.

Table 3.7 Guiding questionnaire for individual and household interviews

Entering questions	**In-depth questions**
How did you know that this event was happening? What was your motivation to come? Is it the first time? If the case, Why didn't you come last time?	What would you be doing now instead? What is your role within your household and community? (record gender and age)
Are you interested in vicuña and why?	Who talked to you for the first time about vicuña and when? Where would you put vicuña in a ranking of importance in relation to other resources/activities? (draw a line on the floor to visualise the question better)
What do you think about the capture? What would you do to improve it?	Why do some communities make 'ayni' (help each other) and others do not?
What do you think about the shearing? What would you do to improve it?	How do you think benefits from the fibre are going to be divided?
Contrast questions Why can't Vicuña be killed? Why can't you breed them in captivity? Why is the fibre not sold yet?	

3.4.2 Group discussions and workshops

At local level, information was also obtained from group discussions that arose from various circumstances. During group discussions, special attention was made to identify those issues of concern, different interests, priorities, and power relationships between informants. Three workshops were organised to discuss with students from schools located within Machaqa and Pacajes Vicuña management areas. The objective was to obtain students' views on past Vicuña management experiences. The first activity was undertaken to build on confidence within the group. A picture of the southern subspecies of vicuña was shown and students were asked to identify differences with the vicuñas they see in their fields (the northern subspecies). During the second activity students were asked what they did and did not like during vicuña capture and shearing events.

3.4.3 Participative observation

Participative observation was used to build up gradual understanding of the dynamics of personal relationships, of the slower process of social life (Pratt and Loizos, 1992). The method allowed for a detailed concern with the particularities of local peoples' view-points and perspectives. Perceptions and attitudes may change depending on the characteristics of the individual and the specific context in which he or she interacts (Kopelman *et al.*, 2002) Participative observation was the main technique used, at community level, during everyday life activities, community meetings, and Vicuña capture and shearing events.

3.4.3.1 Everyday life activities

Living in the community, participating in the everyday life activities such as looking for water in the river, cooking, eating, sowing, harvesting, and herding, as well as participating in special events such as festivals, permitted to identify the role of vicuña in local people's livelihoods. During these occasions, considerable attention was given to problems arising at the different levels of territorial and social organization. This helped to identify how changes in vicuña conservation policies are perceived at the local level. In Mauri-Desaguadero, most of the time was spent in Machaqa, living and participating in the everyday life and activities, giving considerable attention to problems of community organisation.

3.4.3.2 Community meetings

Communities in ARMV Machaqa meet every week, fortnightly, or monthly. It was necessary to previously ask the *mallcu* permission to attend the meeting. During community meetings, the main issues arising from discussions and conversations were recorded. The aim was to obtain an overall understanding of the real needs, concerns, and priorities local people have. Special attention was given to how discussion evolved around different issues and whether individuals or a group raised issues. In those community meetings where it was possible, for example at

Jesus de Manquiri and Villa Circaya, the vicuña issue was raised, and individual and group discussions were recorded. These meetings also helped to understand the local perceptions about community size, boundaries, and distance between locations. These perceptions were compared with those obtained from local NGO staff or government staff by attending other meetings organised by them, such as a meeting with local NGO staff and a meeting on the Law of Municipalities (see Appendix A). This information was also triangulated with that obtained from informal discussions amongst community members and wildlife wardens.

3.4.3.3 Vicuña capture and shearing events

Participative observation during vicuña capture and shearing events involved observation of people's attitudes, collated through observations and unstructured interviews, that were recorded before, during and after the two-days event. Informal discussion with members of other communities managing Vicuñas and from other communities where vicuña management is not carried out, represented yet more interesting sources of information. Background information on the institutional framework affecting the research site was provided through semi-structured interviews with government officials from the General Biodiversity Bureau (DGB), and an attempt was made to identify the key actors and institutions directly involved in the vicuña Management Programme.

Participative observation during vicuña capture and shearing events in Sud Lipez was used as a reference point to develop a semi-structured schedule that was improved through the observations in Machaqa. In this way, consistent information was recorded about relationships between actors and institutions and the specific context in which they interact. The two-day event was divided into stages: coordination, decision-making, construction of captures enclosure, round-up, capture, shearing, collection of fibre and fibre weighing. Within each stage, the type of involvement of different groups of actors was recorded.

The involvement defined their role in decision-making and management activities or tasks. The degree of involvement was examined by looking at the levels at which decision-making and/or action took place, that is international-national or national-local. Some issues raised at local level such as lack of economic benefits, depend on decisions made at national level such as policies restricting commercialisation. The rights and responsibilities of the different actors within the group were also recorded. In some cases, groups or actors can belong to more than one group. This is the case of wildlife wardens that are community members and at the same time DGB government employees. This was considered a key point for understanding how interaction within groups of actors occurs. For example, government technicians form part of the government agency DGB and their responsibilities are to control and monitor vicuña management activities at local level as a shared undertaking or co-management arrangement between government and communities.

During vicuña capture and shearing events instances of coordination and meetings were also recorded. The data collected for each event, such as direct observation (DO), or interviews to key informant (KI), when read together, allowed the identification of the technical and organisational aspects that characterise each stage of the event, as shown in Table 3.8.

Table 3.8 Participative observations in vicuña capture and shearing events

ARMV	AMC	Dates of event	Stages of the vicuna capture and shearing event			
			Coordination and planning	Construction of enclosure	Capture and shearing	Weighing of fibre
Sud Lipez	Relave	11-13 Nov 2001	DO	DO	DO	DO
	San Antonio de Lipez	14-16 Nov 2001	DO	DO	DO	DO
	Guadalupe	17-20 Nov 2001	DO	DO	KI	KI
Machaqa	Kanapata	22-23 Oct 2002	KI	KI	DO	DO
	Nazacara	24-25 Oct 2002	DO	DO	DO	DO
	Jesus de Manquiri	28-29 Oct 2002	DO	KI	KI	DO
	Huallaquiri	30-31 Oct 2002	DO	DO	DO	DO
	Conchacollo	14-15 Nov 2002	DO	KI	DO	DO
	Laquinamaya	16-17 18-19 Nov 2002	DO DO	DO DO	DO DO	DO DO
	Chijipucara	20-21 Nov 2002	DO	DO	DO	DO
Total	10 AMC	26 days	10 DO	8 DO	9 DO	10 DO

Notes: ARMV Regional Association for Vicuña Management; AMC Communal Management Area, Data collected through DO Direct observation; or KI Key informant.

3.4.4 Review of secondary sources

Information relevant to vicuña management, community-based natural resource management at international, the Andes, Bolivia, and community-level was obtained from multiple secondary sources. Access to key documents relied heavily on contacts made during my previous visits to the area in September 2001 (see Appendix A). These included official documents such as the proposal of the five countries managing vicuña presented to CITES bi-annual Conference of the Parties and the Vicuña Convention annual Meetings, DGB and SERNAP technical reports related to the Vicuña National Programme, and National Vicuña Census. Other relevant non-official studies and reports were obtained from NGOs, and official aid agencies. Articles from journals and newspapers, as well as archives and files regarding legislation on natural resource management, and land tenure were also consulted. A detailed cartographic map of the area was obtained in the Military Institute for Geographical Information, and compared to information obtained from

Archives in the Ministry of Popular Participation, and the National Statistical Institute.

These various sources of information were consulted before, during and after fieldwork. Key issues arising from them were followed up during interviews with authors and key informants. The triangulation of primary data with information obtained from these secondary sources was also considered essential during the process of enquiry.

3.4.5 Limitations, validation and reliability during fieldwork

Certain factors limited the process of enquiry, due to circumstances such as lack of transport, subjectivity of research findings, and language.

As regard to transport and mobility, during the capture and shearing events, in Lipez-Chichas and Mauri-Desaguadero, DGB technicians and wildlife wardens provided logistic support, but the rest of the time accessibility to the research sites was constrained by lack of own transport. To address the problem of lack of transport, for example, a three-day bicycle trip to visit Nor Pacajes and Paca Japis fieldwork sites.

In other cases, a number of situations arose in which a choice had to be made between two equally interesting opportunities that were, in some way or other, conditioned by different circumstances and a balance needed to be made between the advantages and disadvantages of each option. For example, between attending a community meeting or interviewing more people and a balance was made between accessibility, time constraints, quality and need of information.

Through the wildlife warden from Nazacara community who had a pivotal role within his community and was well known in the surrounding areas, it was possible to establish my first contacts with other community members, actually being formally introduced by him as *La licenciada* meaning the university graduate degree-holder. The first persons with whom I had to make contact were the two traditional authorities of the whole Machaqa area. For this purpose, a letter of introduction was

used to present myself to community authorities, as shown in Appendix B. This letter stated that the author's contribution to communities will be a report[18]. This commitment with communities established a link between my objectives and their acceptance of my presence. News of my arrival soon spread in neighbouring communities and around the surrounding areas. This facilitated my accommodation in other sites, as other wildlife warden's families offered me a place to sleep and stay for a few days, such as the wildlife warden in Ayllu Yaru, or in Santiago de Machaqa.

After my first month's stay in the area, people got to know me and it also made it easier to recognise people and start visualising their individual spatial and temporal pattern of activities. This helped me to understand that people have various households, many activities and that they interact amongst other members of the community and to visualise their social and territorial organisation. It also facilitated my contact with community members from neighbouring communities and areas.

In the different places that I visited, I talked to any person that crossed my way, and undertook semi-structured and unstructured interviews, or got people involved in group discussions, whenever possible. Nazacara town was a crossroad where buses to and from El Alto (near La Paz) stopped for a one-hour breakfast or lunch break. I used this opportunity to talk to passengers. These people were community members going to El Alto once or twice a week to sell meat or potatoes in the El Alto market.

Generally, respondents drew no boundaries between vicuña issues and other interrelated aspects of rural life. My residence in the area helped me to be aware of issues and concerns that may arise during conversation. People rightly assumed that I was interested in life in general and often called around in the evening to tell me about local events, past or present that they thought would interest me. This also provided me with the opportunity to learn a lot about the dynamics and interrelationship of household life, something that I would miss if I were staying in a residential or guesthouse.

[18] After the fieldwork period finished, this report was written and distributed to wildlife wardens and community authorities, in March 2003.

With regard to subjectivity, it is difficult to judge the degree of subjectivity of my own research. I tried to control the personal biases I was aware of and to be as rigorous and methodical as possible. Therefore, I combined different research methods that would minimise biases. For example, a group might not mention their own involvement in illegal activities in a semi-structured interview, but may be willing to talk about illegal activities in a group discussion. As regard to the issue of subjectivity of respondents, for example, the recognition of differing perceptions, attitudes and divergent interpretations of the world was an essential part during my fieldwork. My first contact with the wildlife warden from Nazacara illustrates this. I could easily undertake household interviews if he took me on his motorbike because he knew the area very well. Households are sometimes 500m apart from each other, and he was a reliable Spanish-*Aymara* language translator. However, I triangulated my method of enquiry, and also borrowed his bike and went on my own with a young boy (11 years old) who acted as a translator between *Aymara* and Spanish.

My language skills in Spanish seemed to me sufficient to conduct fieldwork, but were never really adequate to conduct satisfactory in-depth interviews with community members that only spoke *Aymara* language in Mauri-Desaguadero, and *Quechua* language in Sud Lipez. Although, the main official language in Bolivia is Spanish and my field work was conducted in this language, *Aymara* is the most common language spoken within communities. I could not follow-up the general conversation during community meetings or interviews, and I asked for a translator (during community meetings or interviews) to clarify the main issues raised. I do not know how this affected the clarity of some of the ideas and concepts derived from these discussions. Although I got engaged in vivid discussions to clarify the exact meaning of words and phrases with the translator, I undoubtedly missed some insights from not always understanding what was being said. I felt this most acutely during community meetings, where community authorities gave long speeches and vivid debate arose amongst community members, particularly when addressing the issue of vicuña.

The awareness of these limitations was taken into account during the process of enquiry, by triangulating data across techniques, research sites, and informants with secondary information, as described earlier in this Chapter. Triangulation was

an important method used for the validation of information, and found very useful in this research. The constant validity checks employed in some ways reflect this concern. As described in the previous paragraphs, special emphasis was given to the triangulation of information between periods, methods, informants and sites during the process of enquiry, and thereafter during the process of analysis as explained in the next section.

3.5 The analysis of data

The analysis of data can be divided into three main stages. The first stage took place during fieldwork. The two-way process of enquiry between data collection and subsequent analysis permitted an ongoing triangulation and validation of the information, as well as the identification of key themes, issues, and relationships. The second stage aimed at synthesising and structuring all the information collected during fieldwork. This involved the classification of data collected into categories, the identification of key issues in order to provide answers to each of the research questions, as described in the following sections.

3.5.1 Partnerships between actors and institutions across scale

The first research question pointed towards the identification of relationships between key actors and relevant institutions across scale. In this thesis, key actors refers to those individuals, social groups or organisations that possess the capacity for decision-making and action in vicuña management, and the institutions are defined as the formal rules, and self imposed codes of conduct, and their enforcement characteristics (see Chapter 2).

The identification of key actors, their respective interests, and perceived constraints, suggested the use of stakeholder analysis (Grimble and Chan, 1995) A list of key actors and relevant institutions was obtained from early and recent official and policy documents relevant to vicuña management in Bolivia, conservation and local people's participation. This information was complemented with that obtained from key informants, semi-structured interviews and group interviews. The different groups of actors identified were classified as those that are likely to be involved such

as communities, government, development agencies, and private groups; their roles such as users, managers, technical and financial supporters; and their levels of influence such as local, sub-national, national and international.

The information was grouped under stages, from the planning (1969-1996) to the implementation (1997-2002), and across levels of governance (international, national, and local levels). The data was then read together to describe the evolution of partnerships in Bolivia during the period from 1969 to 2002. The main objective was to look at the effects of higher-level institutional changes, such as changes in international policies, alignment of policies at national level, and government planning, as well as the strategic partnership arrangements that emerged.

The perceptions of various actors towards those strategic partnerships during the implementation phase (1997-2002) were compared within and across three institutional scales: policy, government, and community. This helped to identify the factors affecting the establishment of appropriate partnerships. Appropriate partnerships were defined in Chapter 1 as the mutually reinforcing relationship that allows adaptive management. This definition was also used to identify the conditions under which partnerships in each given context (institutional structure) may become appropriate for meeting management objectives set internationally and implemented locally.

3.5.2 Supportive collective action institutions

The second research question involved analysing data collected at community-level in Mauri-Desaguadero and Lipez-Chichas, and identifying the factors affecting people's coordination within communities, and supportive collective action in Vicuña capture and shearing events.

Community takes different meanings depending on whether the types of boundaries are considered as political, cultural, ecological, or economic, and whether formal institutional boundaries, and boundaries of perceptions of local actors overlap or not. The analysis starts by exploring the different dimensions of the community concept, as perceived by community members in the ARMV Machaqa, an area that coincides with an indigenous *Marka Aymara* San Andrés de Machaqa. The issues related to boundaries, size and internal dynamics of communities, emerging from various sources such as interviews, community meetings, and group discussions, were grouped, compared, and analysed to understand the multiple layers that define community boundaries, as perceived by local people. For example, it was useful to identify key informants and then map their linkages such as kinship, residence, and livelihood relationships in order to map and understand the different levels of institutions to which people belong. This social information was then compared with spatial and administrative information on cartographic maps. Through this process, the community concept as perceived by community members, was compared with the one assumed by government and conservation actors. This information was compared with the information on size and boundaries of communal management areas obtained from community documents, and triangulated with information obtained from key informants. This helped to identify which boundaries overlap or mismatch. The specific local-level institutional arrangements that are already in place were also examined and analysed as to where they conflict or align within those areas of overlap.

The second part of the analysis focused on the identification of factors affecting community involvement in vicuña capture and shearing events. Data collected in 12 non-participating communal management areas, and 22 participating communal management areas located in Mauri-Desaguadero and Lipez-Chichas

fieldwork sites was analysed, triangulated and compared. The objective was to identify if the factors affecting community involvement are linked to conservation interests or other motives. Participative observation during vicuña capture and shearing events provided valuable information on local attitudes towards vicuña. Before the events, motivations and interests to cooperate emerged from different key informant interviews, group discussions, and community meetings. Participative observation at community-level and triangulation of data across different sites allowed the identification and grouping of factors affecting community participation into three categories: those factors affecting ongoing participation, failure to participate, and initial participation.

3.5.3 Deriving meaningful benefits from vicuña management

The answer to the third research question draws on data collected at the local level in Mauri-Desaguadero and Lipez-Chichas fieldwork sites, and the analysis points towards examining local people's perceptions, attitudes, and motivations towards participatory vicuña management. Participatory vicuña management includes vicuña conservation, and vicuña capture and shearing events.

First, group discussions, interviews, and community meetings were analysed and compared. The livelihood approach (Carney, 1998) was used as an analytical tool for understanding the different dimensions that affect livelihoods. The identification of pros- and cons- as well as advantages and disadvantages of vicuña conservation were analysed and interpreted as costs and benefits derived from vicuña conservation and perceived by local people. In this analysis, the prioritisation of issues arising from informants was also identified, paying special attention to the characteristics of the informants in terms of gender, age, position and residence within the community, as well as the situation under which the interview was held. For example, the same respondent was interviewed in three different situations: during, before and/or after v*icuña* capture and shearing events. This provided the opportunity to identify changes between perceptions, incentives to participate, and attitudes towards vicuña conservation. In all cases, special attention was given to find out how people regard the others on the list of interviewees. This analysis permitted to identify linkages between changing livelihoods, participation and conservation.

The information collected within communities helped to understand the organisational processes during the two-day vicuña capture and shearing events, in 12 communal management areas, 3 located in Sud Lipez, and 9 in Machaqa. In order to compare cases, participative observation helped to identify an organisational pattern that made it easier to compare the type and degree of involvement of different groups of actors in the different activities and management tasks. Special attention was also given to motivations or incentives to participate in vicuña capture and shearing events, and if these incentives are perceived as benefits by participants. Data on perceptions, attitudes and motivations was integrated with data on institutional structure, and used to understand the dynamics of conflicts, consensus building and decision-making amongst three main groups of actors (DGB technicians, communities, and wildlife wardens) influencing the underlying motivations to participate in the programme.

The third part of the analysis pointed towards the classification of respondents in context of their own group and situation. The group characteristics were divided into age, gender, duties and responsibilities towards the community, livelihood strategies, past experience and knowledge, and role towards the vicuña management programme. The different perceptions and attitudes were compared between research sites and cases. Special attention was given to compare data from participating and non-participating communities. This analysis enabled to compare when those people, related to decision-making tasks about vicuña, coincide with those governing the internal dynamics of communities.

The final stage in the process of analysis involved the interpretation of data as will be further explained in the analysis of the thesis (see Chapters 5, 6, and 7). Before presenting this analysis, the next section introduces the bio-geographical and socio-political context of vicuña management in the Andes.

Chapter 4. Vicuña management in the Andes

4.1 Introduction

This chapter introduces the regional context of the thesis by exploring the historical and empirical research-based knowledge related to vicuña management in the Andes. Section 4.2 examines the bio-geographical and historical context of vicuña conservation and its implications for vicuña management. Section 4.3 describes how an international policy framework emerged to address the problem of vicuña overexploitation. Section 4.4 shows how different vicuña management systems have been developed. Section 4.5 highlights the main strands of argument that evolved in support of vicuña management in the wild.

4.2 Bio-geographical and historical context of vicuña conservation

The vicuña *Vicugna vicugna* is a wild South American camelid[19] (Class Mammalia, Order Artiodactyla, infra-order Tylopoda) exclusively found in the high-central Andean region that lies at elevations between 3,500 and 5,000 m a.s.l. extending over parts of Peru, Bolivia, Argentina and Chile (Koford, 1957), as shown in Figure 4.1.

[19] The Camelidae family originated 40-45million years ago on the plains of North America. The family was divided, three million years ago. One group became confined to arid zones of Asia and North Africa originating the genus *Camelus* (the one-humped camel and two-humped dromedary). The other group migrated to the high Andean Region of South America and originated the wild vicuña and guanaco (Wheeler, 1988).

Figure 4.1 Distribution of vicuña in the high-central Andes

Source: Based on CITES (2000).

The central Andes are surrounded by mountain ranges and high valleys or plateaux variously called *Puna* and *Altiplano* (Stone, 1992). The climate is arid marked with a short wet summer period and long dry periods during winter season, and cyclic years of drought that get more severe from northern to southern latitudes (Troll, 1968). Two geographic vicuña subspecies have been described. The *Vicugna vicugna vicugna* [Molina, 1782] is the subspecies found in latitudes South of 18º. It is larger and lighter in colour than the northerly subspecies *Vicugna vicugna mensalis* [Thomas, 1917] that besides being darker in colour, and smaller in size, is easily identified by the long tufts of white hair in the chest.

The region is characterised by latitude-related climatic variations, that together with the topography and effects of altitude such as the lowering of atmospheric pressure, increasing solar radiation, and wind speed produce complex local and regional weather conditions (Stone, 1992). This local weather variability is usually reflected in the overlapping patchworks of different vegetation quality (Zimmerer, 1999, Florez *et al.*, 1985). The vicuña, as well as the other three members of the South American camelid family[20], represented by the wild guanaco *Lama guanicoe* and the domesticated alpaca *Vicuna pacos* and llama *Lama glama*, developed specific morphological, physiological and ecological adaptations to the arid and altitude conditions of the *Puna* and *Altiplano* region where they live. The following overview shows how South American camelids and especially vicuña are better adapted to these high altitude and arid conditions of the Andes than exotic livestock, such as sheep, and the important implications it has for vicuña management in the Andes.

4.2.1 Vicuña adaptations to the Andes

In the Andes the vegetation is scarce, dominated by grasslands characterised by grasses and cushion plants[21] sparsely distributed, shrub-lands formed by xeric shrubs sparsely distributed in fragile soils, and remnants of *Queñoa Polylepis tormentera* that form dwarf forests in the valleys and hilly slopes (Baied and Wheeler, 1993). Vicuña and the other members of the family are classified as low impact grazers (Baied and Wheeler, 1993).

First, the presence of soft, nail-covered digital pads (padded feet) instead of hooves, a structure that minimises impact on vegetation and loose soil in contrast to the hooves that cut into the ground, and help to keep the foot flat on shifting sand (Wilson, 1984). They also differ from other ruminants in stomach morphology, digestion, diet selectivity, and intake (Pfister *et al.*, 1989, San Martin and Bryant,

[20] The close phylogenetic relation among these four species is shown by the fact that hybrids are fertile. For example, the cross between alpaca-vicuña is the pacovicuña. However, the crosses between domesticated camelids are more common, for example the offspring of a *llama* crossed with an *alpaca* gives a *huarizo* or *wari.*

[21] Cushion plants such as *Distichia muscoides* dominate, mixed with other species like *Senecio* sp., *Callamagrostis* sp., *Werneria* sp., as well as hygrophilous herbs, grasses and other juncaceas.

1989). Vicuñas have a specialised rumen that permits a more efficient digestion of the low protein and high fibre content characteristics of dryland pastures (Florez *et al.*, 1985). They also have open rooted, continuously growing incisors (Miller, 1924) adapted to graze small and perennial grasses close to the ground (Franklin, 1982), and a prehensile split upper lip that they use to select certain parts of plants, and together with their sharp incisors helps them to cut the vegetation, leaving roots and enabling the scarce vegetation to regenerate.

The key element for support of life in the high Andes is water availability (Messerli *et al.*, 1997). Between the mountain chains, small valleys or large basins are found which are dissected by rivers and creeks, occupied by lakes, or by *vegas* or *bofedales*[22] (Orlove, 1982) that are moist areas situated right under the snow-line (5,300 m a.s.l.), or instead along meandering rivers. Where water is not a limited resource, vicuñas (and their domesticated form, the alpacas) became obligate drinkers[23] (Franklin, 1983), and the distance from water resources determines their daily pattern of activities (Vilá and Cassini, 1994, Renaudeau d'Arc *et al.*, 2000).

In the *vegas* or *bofedales* luxurious vegetation grows and extensive peat-bogs are formed, which are covered by hard and dense cushion plants that comprises the preferred diet of the vicuña (Koford, 1957). While guanacos and llamas can be grazers as well as browsers vicuñas and alpacas are mainly grazers, adapted to higher pastures where they live (Reynafarje *et al.*, 1975).

Vicuñas are also adapted to altitude conditions by possessing specific blood cells morphology (red globes) that allows them to be more efficient in capturing oxygen at the low atmospheric pressure where they live (Reynafarje *et al.*, 1975). In order to survive the dramatic changes in temperature during the day, the vicuña (as well as the other members of the family) developed a fine fleece[24]. This fibre has two layers: a soft inner one for warmth and insulation usually called wool, and a stiff outer one for protection of the skin usually called kemp fibres. Vicuña fibre is

[22] Alkaline cushion-bog peats of the semi-arid Altiplano (Wright, 1963).
[23] *Vicuña*s also have specific mechanisms to avoid dehydration, but guanacos (and its domesticated form, the lllamas) can remain without drinking up to six months (Franklin, 1983).
[24] Fur or hair that is technically defined as fibre..

extraordinarily fine (approximately, 12 microns) and soft. It is classified as the world's finest quality fibre and can fetch one of the highest prices in the international market[25].

Habitat use varies according to time of day. In extensive zones of the Andes, vicuñas spend the night, early morning and late afternoon on the slopes ((Renaudeau d'Arc *et al.*, 2000). Later in the morning, they descend to the *vegas* where, like many ungulates, they spend most of their time foraging (Ménard, 1982, Vilá and Cassini, 1994, Renaudeau d'Arc, 1997).

Vicuña social organisation includes family groups, bachelor groups (especially males) and solitary animals (Koford, 1957, Franklin, 1974). Family groups have territories with all-year round families integrated by a mean of one male, three to four females and two offspring (Vilá, 1995). The group stays close together, with the inter-individual distance between females in a family groups being approximately 2.6 meters and the males tending to be a little apart from their females in their positions of followers. All members of the family urinate and defecate in dung piles[26] (Koford, 1957, Vilá, 1994).

Reproductive physiology and timing also reflects an adaptation to the high Andes. Vicuñas are, like all South American camelids, induced ovulators and have a gestation period of 11 months (Novoa, 1970). Each female has one offspring per year that is born during the wet summer season (December-March). This permits the females to recover their condition after 6-7 months dry season and ensures that birth occurs when the best pasturage is available (Wheeler, 1995). Therefore, one of their advantages over sheep and cattle is that they can reproduce and prosper at much higher altitudes (Fernández-Baca, 1966). These reproductive characteristics, as well as the climatic conditions, have both important implications for management, especially in defining the shearing season that is concentrated in spring before the wet season and when female pregnancy is not too advanced; or in autumn, after the wet season, when offspring has already been born (Bonacic and Macdonald, 2003).

[25] Prices can range from 300US$ to 600US$ per kilo of *Vicuña* fibre depending on the market.
[26] Dung-piling behaviour is characteristic among the South American camelids.

Bachelor groups are very heterogeneous in size (some can reach up to 100 males) and can travel long distances. Recent studies have shown that the free movements of these males are important for the reproduction of the species and to maintain the genetic flow between vicuña populations, characterised by lower levels of genetic diversity within than between populations. This genetic feature is characteristic of those threatened species that had formerly large ranges but which have been isolated from each other and have suffered drastic demographic contraction in recent generations (Wheeler *et al.*, 2001). However, it is difficult to assess how much of the genetic pattern observed is the result of a natural consequence of evolutionary history, because vicuña has long been used by Andean societies, as will be examined in the next section.

4.2.2 Andean society and vicuña management

Archaeological research indicates that complex civilisations already existed in the Andes long before European colonization (Stewart, 1946). Human occupation in the *Puna* and *Altiplano* may have begun 15,000 years ago, thereafter, with the development of the first civilisations in the region, a centre of domestication of high altitude crops and South American camelids was developed (Wheeler, 1984, 1991).

The dominant *Inca* civilisation was itself built on preceding civilisations (Chepstow-Lusty *et al.*, 1998). They developed, over time, an integrated agro-pastoral system in response to the high variability of the environment. Osteological, zooarcheological, and genetic data indicates that the shift from hunting to domestication and herding of wild camelids, guanaco and vicuña, did not occur abruptly, but was gradual, and is probably a reflection of the ongoing process of human adaptation to the high Andean region (Wheeler, 1984, Wheeler *et al.*, 1992). Domestication of wild camelids consisted of consecutive breeding selection of the wild species, vicuña and guanaco, that took 7,000 to 10,000 years to obtain the recent morphotypes of alpaca and llama respectively (Kadwell *et al.*, 2001)

The two domesticated species are therefore the result of thousands of years of selective breeding during which the llama became a specialised pack animal and the alpaca a fibre producer (Wheeler, 1995). The Andean society developed during millennia the multiple uses of these animals (wool, meat, leather and as pack animals) through specialised breeding practices. Alpaca and llama textile production and redistribution were rigidly controlled by the state. The finer alpaca wool was reserved for the higher-quality textiles, such as garments; llama wool, with greater tendency to felt, was used for ropes and sacks (Murra, 1975). Offerings or sacrifices of cloth accompanied all social, religious, military and political events (Novoa and Wheeler, 1984). The llama was also an important beast of burden and, before the European introduction of the horse, donkey and mule, was the only non-human form of land transport. The dung was used as a major source of fuel in the treeless *Puna* and *Altiplano*, and of fertiliser in areas closer to agricultural zones (Orlove, 1982).

Vicuña were sacred and only sheared through a traditional technique developed by the Incas called *chaku*. The *chaku* technique was a ritual held every 3 to 5 years under strict rules (Cardozo, 1954, Koford, 1957, Cobo, 1979). All Vicuñas in an area were rounded up, sheared to obtain the fine fibre for which the species is world famous since the Conquest. The majority was released again into the wild, while only males, and old infirm animals were killed. Under Inca rule the fibre was used to produce the finest fabrics that were dedicated to the service of the temples of the sun, either as decorations or worn by the priests and the nobility (Novoa and Wheeler, 1984). The use or hunting of vicuña outside this ritual was controlled and banned[27]. While domestic camelid herding was economically and culturally dominant, the traditional use of vicuña demonstrated the intricate interaction between the ecological and cultural system that existed in the Andean society (Sumar, 1988). Some researchers emphasise that underlying the *chaku* practice was an ideology that favoured the sustainable utilization of Vicuña products and the conservation of the species (Hofmann *et al.*, 1983, Vilá, 1999).

[27] Some historical records reveal that hunting *Vicuña*s was punished with death.

The European conquest dismissed the value of llama and alpaca which were progressively displaced to higher areas by introduced farm animals such as sheep, goats and cattle, less adapted to the harsh conditions of the Andes (Flores Ochoa, 1977). Llama and alpaca populations were decimated throughout the Andes, a process which has never been reversed (Novoa and Wheeler, 1984). Vicuña fibre was highly prized and the species was persecuted and hunted to near-extinction, as will be described in the next section.

4.2.3 Overexploitation of vicuña to near extinction

The analysis of the severe depletion of vicuña populations throughout history falls in the area of common property theory. As explained in Chapters 1 and 2, common pool resources such as wildlife and in this case the vicuña are non-exclusive by nature and create a divergence between individual and collective interests which, unless regulated and controlled, leads to over-exploitation.

At the time of the Conquest, it was estimated that a number of nearly 2 million vicuñas existed within the whole range of distribution. Within little more than a century, with the advent of Spanish rule, the Inca laws and regulations were broken. Vicuña started to be persecuted and hunted to obtain the entire pelt. This uncontrolled hunting caused an alarming decline in the population to nearly 10,000-15,000 by the mid-twentieth century (Chébez, 1994).

The compilation of archaeological research, most intensively studied in Peru and Bolivia, with historical records during the Colonial and Republican Periods furnishes considerable information to explain the commercial demand for vicuña products (Yaccobaccio *et al.*, 2003). The high harvesting rate can in part be explained by the rise and prominence of the international wool trade (Carus-Wilson, 1952). One source of evidence of this, as figures in Box 4.1 illustrate, is that vicuña fibre could be easily blended with other fibres, such as alpaca. Unlike sheep wool, vicuña (and alpaca) fibre is so fine, that it can only be spun into a thin yarn. This requires specific processing and manufacturing procedures for spinning and weaving, and fibre was marketed by private deals between specialised brokers rather than by

general auctions[28] (Orlove, 1977). The system of auctions is a usual "public sale of goods such as sheep wool or property, where people make higher and higher bids (offers of money) for each item, until it is sold to the person who will pay the highest price" (Procter, 1995).

Box 4.1 The different origins of fibre stocks for export

In 1965, Bolivia exported 5 Ton (5,000 Kg) of fibre under the seal of *vicuña* quality. If one considers that one *vicuña* produces annually 120-180 grams, one can deduce that this represents material from 27,000 – 40,000 animals. These numbers are too high, and beyond the capacity of the *vicuña*, if one assumes that by 1965, 10,000 *vicuña*s remained in the whole range of distribution. Moreover it must be taken into consideration, that not all products from hunted *vicuña*s were exported, for a considerable amount remains always in the country (national industry, tourism, local consumption). Therefore this may support the estimation that most of the exported wool was made up by alpaca products under the seal of *vicuña* quality.

Source: Jungius (1971)

In the late nineteenth and early twentieth centuries, domestic firms for manufacturing fibre also emerged in Southern Peru, usually tied to one British merchant house that marketed the wool directly or through brokerage firms. Until the 1930s, "Britain's general domination of the world wool market and its early lead in the development of a textile industry were reinforced by its position as a leader in the foreign trade of the west coast of South America" (Orlove, 1977). The arrangement was that British ships and English brokers received wool and fibre on consignment and sold it at auctions in Europe. England's role as a distribution centre for Andean wool started to decline in the 1930s and 1940s as European, for example Germany purchased wool in quantity for army uniforms, and North American buyers made

[28] Wool auctions began in 1835 replacing the older system of private arrangement between selling brokers.

direct bids to the domestic firms. The system shifted[29] towards the more cautious technique of sale under contract (*venta a firma*).

Concern about this alarming over-exploitation of vicuña populations is not new and dates back to the end of the nineteenth century when Simón Bolivar prohibited the hunting of vicuña in 1825. This decree, and subsequent laws and regulations, existed on paper but were not effective in stopping the decline of the vicuña to its near-extinction because they did not contain the necessary clauses for enforcing their application. Furthermore, national legislation was not coordinated with that of the neighbouring countries of Argentina, Peru and Chile where vicuñas were also found (Jungius, 1971).

In response to this alarming situation, laws and decrees were formulated within the different countries, but these measures did not halt vicuña hunting and international trade of its products at an alarming rate, until substantive political motives for a regional alliance to protect vicuña populations were raised at the international level, at the same time as other wildlife agreements, notably the Ramsar Convention on Wetlands were created.

4.3 Development of a policy framework for vicuña conservation

The support for a regional alliance to protect vicuña began in the 1950s (Koford, 1957). This support was built on archaeological, and ethnographic empirical evidence demonstrating the potential role and contribution that South American camelids (SAC), and vicuña management in particular can make to improve Andean people's livelihoods, and at the same time contribute to conservation (Cardozo, 1954), as shown in Table 4.1.

[29] This shift of international wool and fibre marketing was also related to the increasing use of synthetic fibres in the two decades after the Korean War, by raising the risks of speculation that the previous 'consignment' system implied.

Table 4.1 Linkages between conservation and local livelihoods through SAC

Conservation	**Local livelihoods**
Biology Native species adapted to the vulnerable climatic conditions of the region	Cultural In some localities, there is a cultural relationship between South American camelids and Andean people that relies on cultural, religion, and traditional uses as sources of meat, fibre, dung and transport
Ecosystem Much more appropriate and efficient grazing animals for the high Andean grasslands than the introduced sheep and cattle.	Economic The fibre of these animals belongs to the category of *fine or choice wools* (together with mohair, cashmere, angora, camel, yak and cashgora) accounting for 2.6% of the world wool production.

Source: Adapted from Renaudeau d'Arc (1999)

In 1969 the Vicuña was included in the Red Data Book of the World Conservation Union (IUCN) with a world population of about 10,000 vicuñas of which 1,000 to 1,500 survived in small populations or scattered groups in the driest parts of the *Puna* and *Altiplano* (Jungius, 1971). Subsequently, in recognition of the (Adams, 2004) world responsibility for 'the conservation of wildlife on our planet', the British Board of Trade and Industry strictly prohibited the importation of vicuña fibre, and the USA introduced legislation forbidding the importation of wild animals that are in danger of extinction (Fish and Wildlife Service, 1969).

That same year, 1969, the governments of Bolivia and Peru signed a bilateral agreement called the *Tratado de La Paz*[30] with the objective to join efforts in the salvation of the species from extinction. Subsequently, the governments of Argentina, Bolivia, Chile, Ecuador and Peru began to recognize that vicuña hunting could not be controlled effectively without the creation of an alliance at regional level. The neighbouring countries, Argentina in 1971 and Chile in 1972, adhered to the *Tratado de La Paz* with its name changed to Convention for the Conservation of Vicuña (*Convenio para la Conservación de la Vicuñ*a, CCV) and marked a first step towards establishing a policy framework.

[30] The literal translation of this agreement would be 'The Peace Treaty' with a double meaning because it was signed in La Paz city (capital of Bolivia).

4.3.1 The successful recovery of vicuña populations

At international level, the CCV was a document where regulations stated, in ten articles, a measure of international protection of vicuña. In 1973, the Convention for International Trade of Endangered Species (CITES) was created. The different governments became gradually CITES party members[31], and the vicuña populations of each country were classified under Appendix I. Box 4.2 outlines the main regulations that provide controls on international trade of vicuña products.

Box 4.2 The CITES trade regulation on *vicuña*

The Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, March 3, 1973), known as CITES, regulates international trade in specimens of species of wild fauna and flora on the basis of a system of permits and certificates, which are issued when certain conditions are met and which have to be presented when consignments of specimens leave or enter a country (WCMC, 1996). Currently, the *vicuña* are subject to two different degrees of regulation:

- Appendix I includes those populations that are threatened with extinction and for which trade must be subject to particularly strict regulation and only authorised in exceptional circumstances.
- Appendix II includes those populations that are not necessarily currently threatened with extinction but may become so unless trade in them is strictly regulated.

Source: based on http://www.cites.org/eng/disc/how.shtml

[31] Ecuador, Chile and, Peru became parties to CITES in 1975; Bolivia in 1979 and; Argentina in 1981 (see http://www.cites.org/eng/disc/how.shtml)

At national level, Action Programmes outlined how the government planned to achieve the commitments signed under the CCV (Torres, 1992). The commitments involved setting up protected areas and a ban on all hunting and commercialisation of vicuña products.

After ten years of successful recovery of vicuña populations, in October 1979, another agreement was signed to include the possibility of initiating the commercialisation of vicuña valuable fibre under certain conditions. This new Vicuña Treaty was called the Convention for the Conservation and Management of Vicuña (*Convenio para la Conservación y Manejo de la* Vicuña, CCMV). This new international alliance replaced the previous one, the CCV, and linked the concept of conservation and management based on the idea that the move towards sustainable use of vicuña fibre was possible in the near future. The 1979 Convention contained many important commitments, divided into thirteen articles outlined in Box 4.3.

Box 4.3 The Convention for the Conservation and Management of *Vicuña*

- Article 1 agrees that conservation of *vicuña* provides an economic production alternative for the benefit of the Andean population, under strict state control, conforming to the National Wildlife Regulation of each country.
- Articles 2 prohibit *Vicuña* hunting and trade of *vicuña* and its products.
- Articles 3 and 4 emphasise the trade of *vicuña* fibre and semen, or derived products (cloth made from fibre) has to be strictly regulated. Any management decision has to be made under the strict control of the State in coordination with the other members of the CCMV and CITES. The export of *vicuña* semen or any other reproductive material is prohibited except for research purposes.
- Articles 5 and 6 commit the different countries to creating reserves for protection, monitoring and research of *vicuña* populations.
- Articles 7 and 8 highlights the need to undertake research and to share information, as well as organise annual meetings to discuss technical and administrative issues, and the establishment of an information centre based in Bolivia.
- Article 9 defines the following terms: conservation, exploitation, culling, illegal hunting, illegal trade, skin and hide.

Source: based on http://ciunsa.unsa.edu.ar/sma/digesto/inter/node56.htm

This new Treaty represented a landmark in the entire history of the legislation of vicuña, recognizing the positive economic importance of the vicuña for the inhabitants of the Andes and promoting the concept of its utilization, under strict state control, and according to the principles of wildlife management within each country (see Article 1, Box 4.3). The signatory governments[32] acknowledged, in the first article of this Treaty, that what was needed was a more dynamic relationship between the state and the local communities' interests, as these were the people who had borne the costs of conservation of vicuña. This idea was not only promoted within the region (Wheeler, 1984, Sumar, 1988, Torres, 1992), but also supported at international level. In the 1980s, the vicuña was selected by the Food and Agriculture Organisation (FAO) as one of the key species that, through proper management had the greatest potential for contributing to the development of rural communities in the region (FAO, 1987).

Before the 1990s, generating economic benefits from commercial use of vicuña was restricted. CCMV established a synergy with CITES, in order to reinforce the ban on vicuña products (CCMV: Articles 3 and 4), and regulate trade in vicuña products (Roe *et al.*, 2000).

4.3.2 Synergy between CITES and the Vicuña Convention

The Regional Alliance or Vicuña Convention is the legal binding between the five signatory governments, Argentina, Bolivia, Chile, Ecuador, and Peru, and CITES offers trade bans and restrictions of endangered species. This horizontal synergy between the CCV and CITES was successful in allowing the recovery of some of the vicuña populations (Torres, 1992). The alliance of the countries was not limited to the stipulations prescribed under the Vicuña Convention to avoid hunting, commercialisation and traffic of vicuña products. Under CITES regulation all existing vicuña fibre products, including those in the domestic market, are to be listed in an inventory and registered. Consequently, all new products or fibre not registered is also being considered illegal. The only fibre that is allowed for

[32] Ecuador became a member of this new *Vicuña* Treaty.

commercial purposes is that obtained from live-shorn vicuñas that have been captured according to regulations.

To monitor the implementation of this new international policy environment, a Technical-Administrative Commission of the Vicuña Convention (*Comisión Técnico Administrativa del Convenio de la* Vicuña, CTACV) was established through a Temporary Advisory Board or Secretariat, renewed every year.

The role of the Secretariat is to inform about the activities undertaken during the previous year, each country member presenting its report. For example, for the period March 2002 to June 2003, the Secretariat or Chairmanship during the 22nd Meeting of the Commission in Arica, Chile was undertaken by Bolivia, through the Ministry of Sustainable Development. Therefore,

> *The Alliance of the countries was not limited to the clear-cut specifications to ban hunting, commercialisation, and transit. The annual meetings of the Administrative Technical Commission created a community environment of ideas, projects, co-participation in research and actions in which the Latin-American colours were erased by an integrated spirit and territory. The Conventions for the Conservation of Vicuna are a practical manner of integration* (Cardozo, 1985).

The Alliance or joint venture between local communities, conservationists, and governments has succeeded in safeguarding the vicuña in the Andes (Bonacic, 1997, Bonacic and Gimpel, 2003); and it is evident from the increase of vicuña populations, as shown in Table 4.3, that the Convention has been successful in achieving one of its goals, the recuperation of vicuña.

Table 4.3 Vicuña population growths during the period 1969-2001

Country	**1969**	**1981**	**1997**	**2001**
Ecuador	0	0	1,600	2,000
Chile	500	8,000	19,800	16,900
Argentina	1,000	8,200	22,100	33,500
Bolivia	3,000	7,150	33,800	56,400
Peru	10,000	61,900	102,800	118,700
Total	14,500	82,600	180,100	227,500

Source: Based on the official country reports to CITES meetings.

The populations subsequently recovered, and CITES started a gradual change of policies, from strict protection (Appendix I) to allowing commercial use of fibre (Appendix II) under certain conditions, such as the establishment of trade quotas for the commercialisation of fibre obtained from live-sheared vicuñas.

Vicuñas were re-classified as "lower risk: conservation dependent" in the 1996 Red List of Threatened Animals of The World Conservation Union (IUCN, 1996). This indicates that vicuñas are currently at "lower risk" only because of conservation efforts, the cessation of which, within a period of five years, would result in the species qualifying as a threatened category. The World Conservation Union (IUCN) was an important influence in pushing sustainable-use up the conservation agenda. The IUCN formalised this commitment with the establishment of a technical programme in the Secretariat and the formation of a Specialist Group under the auspices of the Species Survival Commission (SSC). The guidelines for *sustainable use* were incorporated within the principle of sustainability, traditional knowledge and the principle of equitable allocation of resources and distribution of benefits (Allen and Edwards, 1995). The Vicuña Convention and the IUCN guidelines for sustainable use of wild species supported community management in their policies, where tenure conditions favour this type of management (Mazzucchelli and Ortiz von Halle, 2000).

4.3.3 Vicuña management systems

Under this international policy framework, the shift towards commercial use of fibre has occurred gradually (Wheeler and Hoces, 1997). The Vicuña Convention Commission plays the role of an advocacy group that approves or rejects the Vicuña country's proposals presented to CITES every two years. CITES requires its parties to establish National Management Authorities and Scientific Authorities, and these are represented by the National Forest Corporation (CONAF) within the Ministry of Agriculture in Chile, the General Biodiversity Bureau (DGB) within the Ministry of Sustainable Development and Planning in Bolivia, the National Council for South American Camelids (CONACS) within the Ministry of Agriculture in Peru, the National Secretariat of Environment and Sustainable Development (SADS) functioning within the Ministry of Health and Environment represented by the National and Provincial Wildlife Bureaus, and the Ministry of Environment in Ecuador, as shown in Table 4.2.

Table 4.2 Vicuña conservation and management systems in 2001

Countries	Argentina	Bolivia	Chile	Peru	Ecuador
Total number of vicuñas	35,000 – 45,000	56,383	16,899	118,678	2,000
CITES classification	Appendix I and II	Appendix I and II	Appendix I and II	Appendix II	Appendix I
National authority	National Bureau of Wild Fauna and Flora	General Biodiversity Bureau	National Forest Corporation	National Council for South American camelids	Ministry of Environment
Management systems	Captive	Wild	Wild and captive	Wild and semi-captive	N/A
Fibre trade	Yes	No	Yes	Yes	N/A

Source: Based on official reports at the Vicuña Convention meetings, and stakeholder mapping for MACS project (Work Package 2), Notes: (N/A) Non-applicant.

Government agencies in charged have been responsible for developing different vicuña management systems, that range from extensive (wild management) to more intensive forms of management (semi-captive and captive management systems) to obtain fibre from live-shorn vicuñas, following a similar categorisation as the one laid down by CITES (Luxmoore and Swanson, 1992), as shown in Table 4.4.

Table 4.4 Main characteristics of the vicuña management systems until 2002

Management systems	Wild management	Semi-captive management	Captive management
CITES terminology	Wild harvest	Ranching or rearing	Captive breeding
Technique	Temporary surrounding technique where Vicuñas are round-up into a corral, sheared and released again.	Fencing of extensive plots to enclose Vicuñas with the possibility of interchanging with wild populations	Small captive farming units where Vicuñas are kept enclosed
Infrastructure	Mobile capture enclosure constructed with posts and fish net	Large corral (12Km perimeter) in an area of 1,000 Ha from which domestic livestock is withdrawn	Small corrals in an area of 10 Ha with or without natural pasture and water
Country	Peru Chile Bolivia	Peru Chile	Argentina

Source: Based on Lichtenstein and Vilá (2003), Luxmoore and Swanson (1992)

Each country relies on its own experience, adopting and implementing the different vicuña management systems.

Peru was the pioneer in shifting away from strict preservation to vicuña exploitation, and in 1987 started developing the wild management system in two target vicuña populations reclassified by CITES under Appendix II (see Table 4.4). The management system was based on a non-lethal harvesting technique for shearing vicuña fibre from populations that live in wild conditions. It consisted of surrounding wild Vicuña into a funnel-shaped mesh where they were handled one by one, shorn and then released again into the wild. The principles were based on the ancient method used by the Incas called *chaku*. In 1994 the wild management system was extended to all vicuña populations in Peru, following the re-classification by CITES under Appendix II to allow trade in fibre obtained from live- sheared animals. In

1995, a new law was passed favouring the formation of Rural Community Enterprises, and the National Council for South American Camelids began developing a new exploitation system based on the semi-captive management of Vicuña (Lichtenstein *et al.*, 2002). This new management technique consisted of the installation of large corrals to enclose vicuñas in communal land, from which domestic livestock have to be withdrawn (see Table 4.4).

In Chile, the principles of the wild management system were adopted in 1997 and the specific technique developed in Peru was improved, in terms of animal welfare, production and organisation of human labour, design and materials for building the capture enclosure. For example, techniques to minimise stress during capture and shearing, included blindfolding vicuña eyes with a hood (Bonacic *et al.*, 2000). However, in 1999 Chile also adopted the captive model for vicuña management (Bonacic and Gimpel, 2003).

In Argentina, the National Institute for Agriculture and Livestock Technology (INTA) initiated in 1965 vicuña management in captivity on an experimental basis at their high altitude experimental station, located in the Northwest of the country. In 1994, the INTA promoted the vicuña captive management system as a productive alternative for producers within the region (see Table 4.4).

Research is revealing the serious shortcomings emerging from the intensive systems for vicuña management. These shortcomings are generally discussed in terms of the deleterious alterations that interfering with natural populations by using fences and enclosures are likely to produce on the gene pool of the species (Kadwell *et al.*, 2001); and in terms of who benefits and pays the cost of vicuña management (Lichtenstein and Renaudeau d'Arc, 2004).

With regard to the genetic alteration, the lack of interaction between those vicuñas under enclosure and wild populations can produce direct harm to populations, through mortality or reduced reproductive success, as well as genetic homogenisation such as separating sub-species or races (Wheeler *et al.*, 2002).

As regards to providing meaningful economic benefits to local people, recent studies question the profitability of intensive forms of management (McNeill and Lichtenstein, 2003). Vicuña captive management systems are usually a high-cost alternative for poor local people that do not generate incentives for conserving those vicuñas living in wild populations (Lichtenstein and Renaudeau d'Arc, 2005a). For example, the semi-captive management system developed in Peru was not profitable enough to cover initial investment and communities got into debt, and did not perceive meaningful benefits (Lichtenstein, 2002, Lichtenstein *et al.*, 2002). In Argentina, studies have shown that those producers engaged in the Vicuña Captive Management Programme promoted by the INTA had very little possibility of getting returns from the enterprise because of the low rentability of corrals, high costs of maintenance of the corrals, low price fixed by a contracting mill, and unrealised terms and conditions set out by the INTA to make the enterprise profitable (Lichtenstein and Renaudeau d'Arc, 2005a, Lichtenstein, *in press*).

The experiences in Peru, Chile, and Argentina reveal a strong interest towards developing intensive forms for vicuña management to increase the efficiency and production of fibre (see Table 4.4). In Bolivia, these intensive models for the exploitation of vicuña fibre were considered too high-cost as an alternative for communities that live below the poverty line, and cannot afford to take on the costs of demarcation involved in enclosing vicuña. In 1997, the Bolivian government embraced the principles of the wild vicuña management system and common property regime in policies through the formulation of the National Regulation for Vicuña Conservation and Management.

4.4. Institutions for vicuña management

Little attention is being given to the evolution of institutions for vicuña management. As seen in Chapter 1, there is a diversity of institutions that can be used to address the two problems of *exclusion* and *subtractability* of vicuña, but the study of institutions focuses on exploring the linkages between the group of users and the resource to be managed.

During the Inca Empire vicuña was sacred, protected, and used under a common property regime specified by specific rules and regulations to ensure the long-term viability of the species (Bonacic, 2000, Bonacic and Macdonald, 2003). After the Conquest, the rules of the common property regime were broken, and the species became an open access resource. Under the Republican period, as a wild species, vicuña became a State property, but the over-exploitation of the species couldn't be controlled without the reinforcement of measures in the foreign countries, where the high demand of vicuña products continued. Therefore, it is only after action for the conservation of the species became articulated from the international to the local level that the story of vicuña exploitation was reverted into one of the few success stories of wildlife conservation. Commercial use was banned, a network of protected areas was created, and killing was labelled as poaching.

In less than 40 years vicuñas recovered from almost 10,000 to nearly 250,000 animals. This successful story of vicuña conservation provides a convincing illustration of the proposition that the resolution of the conservation problem is to be sought for in the realm of institutional arrangements. Otherwise, vicuña becomes essentially an open-access resource available to anyone, very difficult to protect and very easy to deplete.

Under the Vicuña Convention, the commitment of all signatory countries is that vicuña has to be managed under strict control of the State for the benefit of those Andean people that have been paying the costs of conservation. By linking economic benefits to vicuña conservation through sustainable use, the state seeks to gain local people's support and make them partners of conservation. As a wild species vicuña is property of the State in Chile, Bolivia, and Peru, and *res nullius* (without owner) in Argentina (Lichtenstein and Vilá, 2003). Under the Vicuña Convention the CITES national authorities and the different laws and regulations of each country, governments are responsible for the long-term conservation of the species and for implementing the vicuña management programmes. Bolivia is the only country within the region to have formulated a specific National Regulation for Vicuña Management (Lichtenstein and Renaudeau d'Arc, 2004).

In order to involve local people, each country has been experimenting various vicuña management systems, giving rise to different forms of institutions for vicuña management, depending on whether the allocation of rights and responsibilities are to individuals, families, or communities. The captive management system developed in Argentina and Chile can be seen as a private property[33] regime because it involves individual producers or families. The extensive forms of management developed in Peru and Bolivia share the characteristics of a common property regime, defined as an institutional arrangement or combination of rules in use, where the exclusive rights to benefit from vicuña use (usufruct) and responsibilities of custodianship are allocated to communities.

Under the Vicuña Convention, the rights to benefit from vicuña use should be allocated to Andean people while the government retains the management authority and control over key decisions regarding commercialisation of fibre. Bolivia is the only country within the region to have specified in the Vicuña National Regulation the rules and regulations of the common property regime.

In this thesis, the common property regime for vicuña management developed in Bolivia is also seen as a community-based co-management institutional arrangement because conservation, management, and benefits are community-based, but government allocates and controls the roles and responsibilities to be shared with communities. The following Chapters explores the rules characteristics the common property regime for vicuña management in Bolivia.

[33] The term *property* embraces the variety of rights that individual or group holds, for each of which a combination of rules exists that authorizes or requires particular actions in exercising one or more property rights (Schlager *et al.*, 1994).

Chapter 5. Partnerships for vicuña management in Bolivia

5.1 Introduction

Partnerships, as seen in Chapter 2, are widely regarded as a means to link local management objectives with global governance (Young, 2002), in order to increase the institutional capacity for local conservation (Pretty and Ward, 2001). Appropriate partnerships are usually defined as mutually reinforcing relationships (Plummer and FitzGibbon, 2004), that allow adaptive management (Stern *et al.*, 2002). Below the national level, partnerships can occur across a broad spectrum of possibilities of power sharing, depending on country and site-specific conditions (Grimble and Laidlaw, 2002)

In the case of vicuña management in the Andes, the synergy between the Vicuña Convention and CITES, explained in Chapter 4, represents a strategic partnership established by the governments of Argentina, Bolivia, Chile, Ecuador, and Peru, to bring together efforts to protect vicuña populations and control poaching and illegal trade of vicuña products. While this agreement is signed globally, the implementation of their provisions has to be made below the national level. This thesis explores what are the characteristics of partnerships established across scale for vicuña management within the Bolivian context. Scale refers to the different levels of decision-making and allocation of vicuña management tasks, amongst the various actors and the institutional structure in which they interact.

The Chapter identifies the conditions under which partnerships for Vicuña management evolved in Bolivia during the period from 1969 to 2002. It is based on data collected from 40 semi-structured interviews, 7 group interviews with key informants directly involved or interested in the Vicuña Management Programme. These key informants included 17 government officials; 16 staff members from official aid, NGOs, and projects; 6 staff members from Academic institutions; and 25 wildlife wardens. This information was complemented with that obtained through attendance to 2 seminars and participative observation during an official ceremony in

Apolobamba. Finally this primary data was triangulated with data obtained from secondary sources including official, technical, and policy documents relevant to vicuña conservation and management, and corresponding to the period from 1969 to 2002 (see Appendix A).

This Chapter is divided into five sections. The next section, Section 5.2, examines the processes that influenced the development of the Vicuña National Programme during the period from 1969 to 2002. Section 5.3 analyses the evolution of partnerships for implementing the National Programme for Vicuña Management during the period from 1997 to 2002. Section 5.4 discusses the factors affecting the establishment of appropriate partnerships. The final section, Section 5.5, summarises and discusses the main findings of the chapter.

5.2 Development of the Vicuña National Programme in Bolivia

The Bolivian government has nearly 35 years experience in the design and implementation of a Community-based Conservation and Management Programme for Vicuña. Two parallel processes have been underway, influencing the establishment of partnerships.

Table 5.1 Processes influencing the emergence of partnerships

Period	Policy alignment	Government planning	Partnerships
1969-1991	Strict-protection policies	Protection and monitoring of Vicuña populations	Regional Alliance Government-wildlife wardens
1992-1996	Sustainable use and community participation	Development of guidelines and criteria for Vicuña management	Government-wildlife wardens Government-external support for national census
1997-2002	Formulation of the Vicuña National Regulation and changes of CITES policy	Implementation of the Vicuña National Programme	Wildlife wardens-National police-customs Community-based institutions Government-Funding agencies

Source: Analysis of secondary sources complemented with interviews to key informants

One process involves the alignment of policies from international to national levels, reflecting the shift in conservation perspectives from strict protection (period 1969-1991), towards the inclusion of the principles of sustainable use, and community participation (period 1992-1996), later embraced under the Vicuña National Regulation (period 1997-2002). The second process corresponds to the structural adjustments of government administration that occurred within a political context of decentralisation. During that period, the government planned and implemented the protection and monitoring of vicuña populations (1960-1991), development of guidelines and criteria for vicuña management (1992-1996), and the implementation of a Vicuña National Programme (1997-2002). These two parallel processes influenced the emergence of strategic partnerships, as will be examined, in more detail, in the following sections.

5.2.1 Period from 1969 to 1991

The first period, 1969-1991, as shown in Table 5.2, corresponds to the alignment of strict-protection policies signed at the international level, and the emergence of partnerships between government and communities by employing a few community members as wildlife wardens to secure the protection and monitoring of vicuña populations.

Table 5.2 Processes influencing the period 1969-1991

Level of governance	**Policies**	**Government administrative capacity and planning**
International	1969, 1979: Vicuña Convention 1979: CITES Appendix I	Since 1989: Ministry of Peasant and Farming Affairs (MACA), Subsecretariat of Environment and Renewable Natural Resources
National	1975: Wildlife, National Parks, Hunting and Fishing Law 1990: General and Indefinite Ban of wildlife products	1969-1978: Centre for Forest Development (CDF) promoted the creation of a Network of Protected Areas 1979-1992: Institute for Wool Promotion (INFOL) developed a Monitoring System for Vicuña and National Programme for Vicuña
Local	Strict-protection policies for Vicuña	Protection and monitoring of Vicuña populations by wildlife wardens

Sources: Analysis of policy and official documents.

At international policy level (see Table 5.2), the Bolivian government is one of the first governments, as seen in Chapter 4, to have signed, in 1969, the Convention for the Conservation of Vicuña and to agree, ten years later, to the inclusion of the concept of sustainable use and the economic importance of the commercial use of fibre for the local inhabitants of the Andes, in the first article of a new Convention for the Conservation and Management of Vicuña, signed in Lima (Convention of the Vicuña, 1979: Article 1). In the same year, 1979, Bolivia became a party to CITES, and the whole vicuña population was then classified under Appendix I restricting the exploitation and commercialisation of vicuña products.

At national policy level (see Table 5.2), the Wildlife, National Parks, Hunting and Fishing Law (Law N° 12301/1975) describes wildlife resources as property of the State and defines the government obligation to regulate and administer the use of wildlife resources. In 1990, a General and Indefinite Ban of Wildlife Products was passed (SD 22641; 08/11/1990). Under this national policy framework, vicuña is property of the State and since 1990, any attempt to use vicuña is strictly banned by national law.

During the period from 1969-1978 (see Table 5.2), the specific government agency responsible for the administration of the country's protected areas and the conservation of natural resources was the Centre for Forest Development (*Centro de Desarrollo Forestal*, CDF). The CDF functioned within the Ministry of Peasant and Farming Affairs (*Ministerio de Asuntos Campesinos y Agropecuarios*, MACA). Under CDF[34] administration, a network of protected areas were designated, amongst which the national reserve Ulla Ulla[35], located in the north of the Department of La Paz, stands out for being the first national reserve to be specifically created, in 1972, for the protection of vicuña (Marconi and Baixeras, 1995)

[34] Under CDF administration, various areas were designated for the preservation of representative species of the country's ecological diversity. The first protected area created in Bolivia was the Sajama National Park (1939) to conserve *Keñoa Polylepis tomentella* forests, also included Vicuña populations (Marconi and Baixeras, 1995).

[35] In 1977, the national reserve Ulla Ulla changed its category to UNESCO biosphere reserve, and in 2000, changed its category of protection and name to Natural Area for Integrated National Management Apolobamba (*Area Natural de Manejo Integrado Nacional Apolobamba*, ANMNIA).

In 1979 (see Table 5.2), the National Institute for Wool Promotion (*Instituto Nacional de Fomento Lanero*, INFOL) was designated as the first government agency responsible for developing the National Programme for the Protection of the Vicuña. During the period 1979-1989[36], INFOL functioned within MACA, to develop the production and commercialisation of fine fibres from camelids. Most of its activities were developed within the Ulla Ulla National Reserve (Cardozo, 1981)

The attempts, at national level, to address community claims were made through rural development initiatives outside protected areas, and local people's participation in protected area management was not yet embraced by policies (Baudoin, 1995)However, INFOL set up a monitoring system using community members employed as wildlife wardens (*Guardafaunas*) to control poaching and illegal trade activities, as well as to provide monthly evaluations of the Vicuña population (INFOL, 1985, MACA *et al.*, 1990). In 1980, to improve the monitoring system, INFOL developed a classification system in which the *Altiplano* region was divided into three macro-regions (North, Centre and South), subsequently sub-divided into eight Vicuña Conservation Units, including 38 Protected Areas covering a monitoring area of nearly 3,500,000 hectares (DNCB, 1996).

The involvement of community members in vicuña conservation efforts was envisaged at a time in which partnerships for conservation were not contemplated by government policies (DGB, 1997). It is only after Bolivia's structural reforms, in the mid-1990s, that establishing partnerships for conservation with local communities was promoted as part of the decentralisation strategy of government (Wyckoff-Baird *et al.*, 2000), as will be seen in the following section.

[36] In 1989 INFOL was dissolved.

5.2.2 Period from 1992 to 1996

During the period from 1992 to 1996, as seen in Table 5.3, government decisions regarding vicuña management were influenced by the apparent synergy between the Vicuña Convention and CITES, and the attempt to align the national conservation strategy with the various commitments signed in international agreements, including the Biodiversity Convention (CBD) at the Earth Summit in Rio de Janeiro in 1992 (ratified by Law Nº 1580/1994), and the signature of the Convention Against Desertification and Drought (UNCDD, Law N° 1688/1996).

Table 5.3 Processes influencing the period 1992-1996

Level of governance	**Policies**	**Government administrative capacity and planning**
International	Synergy: Vicuña Convention-CITES 1992: Biodiversity Convention 1996: Convention Against Desertification and Drought Vicuña Convention-CITES	Since 1993: Ministry of Sustainable Development and Environment (MDSMA)
National	1992: Environmental Law replaces Wildlife Law 1994: Amendment of the Political Constitution of the State: Law of Decentralization and Popular Participation 1996: Law INRA for distribution of land titling	National Department of Biodiversity Conservation (DNCB) 1996: National Census of Vicuña Populations 1996: Creation of a National Institute for Agrarian Reform
Local	Alignment of policies to include the concepts of sustainable use and community participation	Government planning for the development of guidelines and criteria for vicuña management

Sources: Analysis of policy and official documents

Within the new international policy context (see Table 5.3), the main objective became to integrate the two principles of conservation and sustainable use of natural resources. In response to these international trends, in 1992, the Bolivian government passed its first General Environmental Law (Law 1333, 27/04/1992) replacing the Wildlife, National Parks, and Fishing Law that was previously in use (see Table 5.2). After the promulgation of the General Environmental Law, the concept of a National System of Protected Areas (*Sistema Nacional de Areas Protegidas*, SNAP) was introduced and developed as a national conservation strategy. SNAP classifies specific areas under different categories for the conservation and management of natural resources[37] (SERNAP, 2001a)

In 1993 (see Table 5.3), a new space in the government administration created called the Ministry of Sustainable Development and Environment (*Ministerio de Desarrollo Sostenible y Medio Ambiente*, MDSMA) as the main national authority responsible for the conservation and management of renewable natural resources. Under the General Environmental Law, the MDSMA transferred responsibility to the National Department of Biodiversity Conservation (*Dirección Nacional para la Conservación de la Biodiversidad*, DNCB), and its two administrative units: the Wildlife and Protected Areas Units. The Wildlife Unit is responsible for the protection and management of those species with an economic value, and the Protected Areas Unit.

This change of government administration occurred in response to a changing policy environment that culminated the amendment of the Political Constitution of the State in 1994 (see Table 5.3), in an attempt to address the problem of extreme rural poverty in Bolivia (van Dijck, 1998). The Bolivian Constitution was modified recognizing the social, economic, and cultural rights of indigenous, farming communities, and local associations and unions, especially in their communal lands of origin (Bolivian Constitution, 1994: Article 171). Two political initiatives, amongst others, stand as landmarks in this government re-structure. One is the

[37] The SNAP classification includes 4 categories of strict protection and preservation (National Parks, National Sanctuary, National Monuments, and National Reserve), and 2 categories that allow sustainable use of natural resource management (Wildlife Reserve and Natural Area for Integrated National Management).

inclusion of local participation, through the establishment of the Law of Popular Participation (*Ley de Participación Popular*, LPP) and the Law of Administrative Decentralisation (*Ley de Decentralización Administrativa*, LDA). The other initiative is the reinforcement of land rights through the establishment of a land tenure law called Law INRA together with the creation of the National Institute for Agrarian Reform (*Instituto Nacional de Reforma Agraria*, INRA).

The LPP (Law Nº 1551; 20/04/1994) emphasises the need to give more rights and responsibilities to local communities (see Table 5.3). The Law introduced community control over municipal governments by recognizing Territorially-Based Grass-Root Organizations (*Organizaciones Territoriales de Base*, OTB). Under the LPP, local farmer organisations, urban neighbourhood committees, and indigenous groups could become OTBs by registering as such. This was supposed to permit them to influence municipal investment decisions and elect committees to monitor the distribution of the municipal finances. The LDA complemented the LPP by modifying the structure and functions of the departmental prefects. The law transferred responsibilities to the prefects, who are expected to become involved in more technical issues, in addition to their traditional role of maintaining public order (Kaimowitz *et al.*, 2000). The INRA Law (Law 1715, 18/10/1996) implemented different forms of clearing land titling (*Saneamiento de Tierras*). In the vast majority of the Bolivian highlands, the INRA Law gave official recognition to existing customary and indigenous rights over specific territories called *Marka* and *Ayllus*, named Original Community Territories (*Tierras Comunitarias de Origen*).

Under this political context, in 1996, the first national census of vicuña was carried out showing that vicuña distribution expanded, occupying nine units of conservation and management, and 94 protected areas with 7 areas included under SNAP categories[38], controlled and monitored by 41 park wardens, and 53 wildlife wardens. Based on the successful recovery of the vicuña population evidenced by the results of the national census (DNCB, 1997a), the CITES Secretariat accepted the Bolivian proposal to transfer three target populations located in Mauri-Desaguadero,

[38] These 7 protected areas are: National Reserve Ulla Ulla, National Park Sajama, Andean Fauna Reserve Eduardo Avaroa, Wildlife Refugee Huancaroma, National Fauna Reserve Yura, Reserve Incakasani Altamachi, and National Park Llica (DNCB, 1996).

Ulla Ulla and Lipez-Chichas from CITES Appendix I to Appendix II, restricting the export of vicuña products (annotation º606).

Following the restructuring of government (Constitutional Reform in 1994), and the re-classification of vicuña into Appendix II[39] (CITES meeting in 1997) the Bolivian Government enacted a National Regulation[40] to provide the national legal framework for Vicuña Conservation and Management (Vicuña National Regulation, 1997). The VNR specifies the rules of the game of the common property regime developed for vicuña management. During the period from 1997 to 2002 the national strategy for vicuña conservation and management was implemented, as described in the following section.

5.2.3 Period from 1997 to 2002

In 1997, new government elections brought about structural adjustments in the executive power with the creation of the Ministry of Sustainable Development and Planning (*Ministerio de Desarrollo Sostenible y Planificación*, MDSP) as the head ministry in the planning sector of National Government (DGB, 1997)), as shown in Table 5.4.

[39] The signing of CITES permit in 1997 was based on the successful results of the national census that counted 69 percent (23,293 of 33,844) of Vicuña (DNCB, 1997a).
[40] The Vicuña National Regulation is divided in: 7 Titles, 14 Chapters and 64 Articles. This main document is authorised by Supreme Decree (DS 24.529, May 1997).

Table 5.4 Processes influencing the period 1997-2002

Level of governance	**Policy alignment**	**Government administrative capacity and planning**
International	1997: CITES Appendix II (three target vicuña populations) 2002: Convention for the Conservation of Migratory Species (Law No. 2357/2002)	Since 1997: Ministry of Sustainable Development and Planning (MSDP) through Wildlife General Bureau (DGB)
National	1997: National Regulation for the Conservation and Management of Vicuña 1999: Supreme Decree lifts the general ban of wildlife products 2001: Administrative Resolution approves the technical guidelines for the design of the Vicuña Management Plan	1997-2002: Supervision and control of the National Programme through: - the National Service for Protected Areas (SERNAP) within areas included in SNAP protected categories - the Wildlife General Bureau (DGB) in the rest of vicuña distribution
Local	Policies allow shearing in three target populations located in Sud Lipez, Apolobamba and Mauri-Desaguadero.	Wildlife/park/community wardens Local community user groups (CMA); Regional associations for Vicuña management (ARMV)

Sources: Analysis of official and policy documents

DNCB changed its name to the Wildlife Biodiversity Bureau (DGB) and became the CITES Management Authority in Bolivia, and as such responsible for planning the Vicuña National Programme. The Protected Areas Unit was re-structured as an autonomous agency called National Service for Protected Areas (*Sercicio Nacional de Areas Protegidas*, SERNAP), exclusively responsible for the creation and administration of protected areas, and vicuña management.

Under the Political Constitution of the State (amended in 1994, Law 1615/95) and the INRA Law (Law N° 1715/1996), the State regulates the regime for exploitation of natural resources securing their conservation and growth (see Table 5.4). A common property regime for vicuña management in the wild was considered the best strategy to link the national policy environment, with the community-based protection and monitoring of vicuña populations, and the principles for the sustainable use of vicuña. The Vicuña National Regulation (SD N° 24529/1997) was

formulated prescribing the rules of the common property regime for vicuña management to be implemented.

In Bolivia, the Vicuña National Regulation (VNR) assumes that the design of communal management areas by communities themselves will fit the biological and ecological characteristics of vicuña populations, with the territorial and social configuration of traditional communities (DNCB, 1997b).Therefore, these traditional communities are legally by the State on the basis of two criteria.

First, that of location, determined by residence within the vicuña ranges of distribution, and proximity to vicuña populations to be managed, that is the rural areas of the *Altiplano* region. There are nearly 2 million and a half people living in the rural area of the *Altiplano* (INEB, 2001). These people belong to two important indigenous groups, the *Quechua* and *Aymara* speaking indigenous people. They are spatially distributed in *Communities* or *Ayllus*, two terms used within the Andean context, to refer to a group of families sharing control of a territory under specific norms and regulations established by community members with, in most of the cases, official recognition by the State. The distribution of *Aymara* communities in the North West and Central West overlaps with Peruvian and Chilean territory, and the *Quechua* communities in the South overlaps with Argentinean territory. However, one feature that distinguishes communities in Bolivia from other countries in the Andes such as Peru is the lack of fences or infrastructure dividing community land. What is particularly interesting about the Andean peoples in Bolivia is the importance of their cultural identity, and strong survival strategies developed to cope with the harsh climatic conditions of the *Altiplano* (Platt, 1982, Harris, 2000, Zoomers, 1998). The government assumes that social norms and informal laws supporting vicuña conservation are already embedded in the society.

The second criterion relates to the emphasis of the VNR fitting institutions to the socio-ecological system in which communities and vicuña co-exist. In Bolivia, the Political Constitution of the State (amended in 1994) designates wildlife resources as public property under the original dominion of the State. Within this policy context, the vicuña as a wild species belongs to the State Patrimony, and thus to all citizens of the nation-state. The State, represented by the national government,

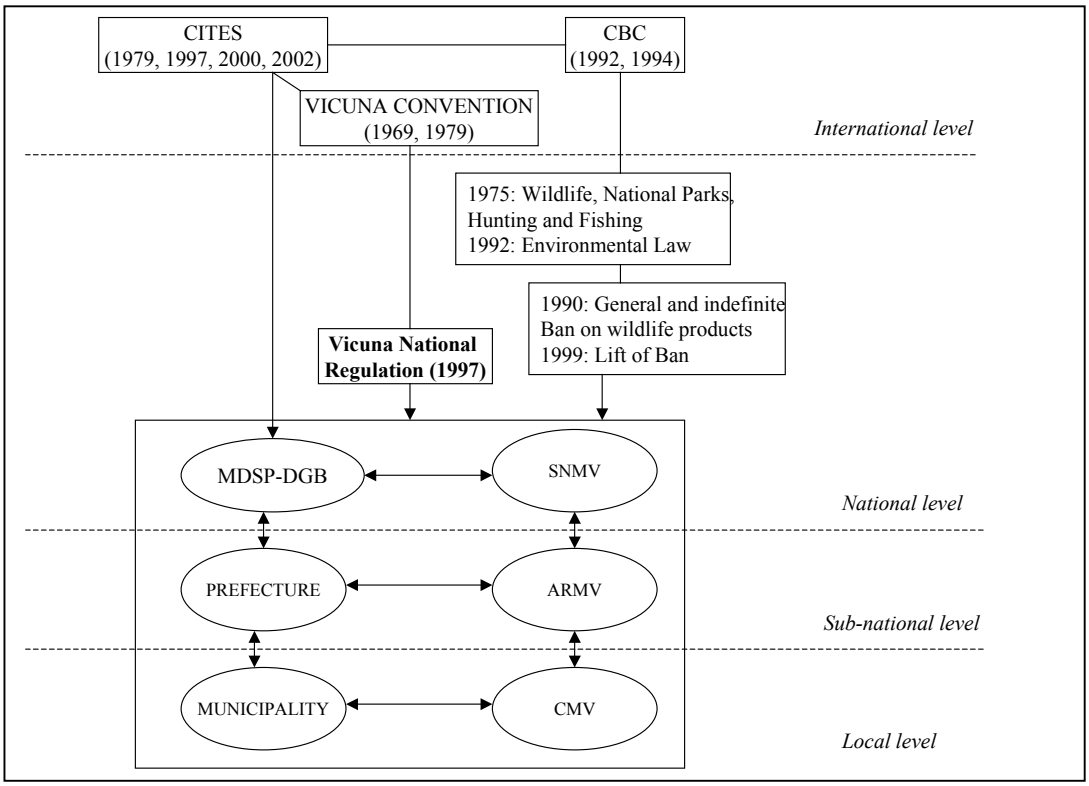
vests authority to manage vicuña to peasant communities (legally recognized under Law N° 1551/1994) by issuing a Certificate of Custodianship to them for those wild vicuña populations found on land under communal jurisdiction. The Certificate of Custodianship is an instrument to promote tenure security to local people who bear the costs of vicuña conservation. It recognises community groups on the basis of legal and administrative boundaries, and grants exclusive rights to use and benefit from vicuña fibre obtained from live sheared animals. The government expects that this right recognition represent a legal incentive framework for the protection and recuperation of those wild vicuña populations living in the respective communal management areas. The ultimate goal is that communities interested in vicuña management should design their own vicuña management plans (Administrative Resolution 027/2001).

From 1997 to 2002 both government agencies, the DGB and SERNAP, were responsible for monitoring and executing the Vicuña National Programme within and outside the National Protected Areas System (DGB, 2000a, 2000b, SERNAP, 2001a). In 1999 the general ban on wildlife products was lifted (SD 25458/1999). This allowed the implementation of activities laid out by the programme such as the vicuña capture and shearing events, issuing certificate of custodianship to interested communities, and dissemination of information to communities through capacity building workshops (DGB, 2000c, DGB, 2001)

While the General Environmental Law of 1992 recognizes the rights of NGOs, and local populations to participate in local conservation and management, it does not clearly mandate how to accomplish this (Baudoin, 1995). Under the Vicuña National Regulation, instead, specific roles and responsibilities are assigned to centralised and decentralised government and community-based institutions at different levels of governance during the vicuña management process. For example, the central government and the Society for Vicuña Management (SNMV) at the national level, the prefecture and Regional Association for Vicuña Management (ARMV) at the sub-national level, and the municipality and Community Managing Vicuña (CMV) at the local level. These relationships occur within an overall institutional and government-accepted framework, as shown in Figure 5.1.

There are many forms of policies implemented and developed incrementally over time in the decentralisation process of a government, and usually this involves a process of adaptation (Blaikie and Sadeque, 2000)In Bolivia, the new policy framework was introduced with the amendment of the Political Constitution of the State in 1994. The following section explores how partnerships evolved during the five years of experience implementing the Vicuña National Programme in three target areas (DGB, 2000b)

Figure 5.1 The Vicuña National Regulation institutional arrangements



Top diagram: The Vicuña National Regulation is embedded in a wider network of international agreements and national laws and regulations. Bottom diagram: The levels of decentralization of government represented by the municipalities at local level, the prefecture at sub-national level and central government represented by the Wildlife General Bureau (DGB) within the Ministry of Sustainable Development and Planning (MSDP), can interact (represented by double arrows) with the different levels of community organisations represented by Communities Managing Vicuña at the local level (CMV), Regional Associations for Vicuña Management (ARMV) at sub-national level, and the National Society (SNMV) at national level.

5.3 Evolution of partnerships embraced in the Vicuña National Regulation

The Vicuña National Regulation (VNR) embraces the concept of partnerships between key actors and the institutional structure in which they interact. The VNR contemplates the establishment of three cross-scale partnership arrangements as strategic to align the various commitments signed by government at an international level, with government adjustments made at national level, and the implementation of the programme at a local level, as listed below and explored in more detail in the following paragraphs.

- Partnerships for patrolling and monitoring vicuña populations;
- Partnerships to access exclusive use rights over vicuña;
- Partnerships for implementing the Vicuña National Programme

5.3.1 Partnerships for patrolling and monitoring vicuña populations

The general statement that "by virtue of the Alliance [The Vicuña Convention] the population of vicuña in Bolivia is being re-established" (Cardozo 1981: 77) is illustrated by the steady growth of vicuña populations, from under 1,000 in 1965 to over 56,000 in 2002 as shown in Table 5.5.

Table 5.5 Vicuña populations in Bolivia during the period 1965-2002

Date	Area (Ha)	Vicuñas	CITES classification	Source
1965	100,000	1,097	Appendix I	Based on census in Ulla-Ulla (Cardozo, 1981)
1981	150,000	7,150	Appendix I	Based on monthly reports (1985)
1986	9,970,372	12,047	Appendix I	Based on monthly reports MACA *et al.* (1990)
1996	3,428,356	33,844	Change to Appendix II*	Based on national census DNCB (1996)
2002	3,428,356	56,383	Change to Appendix II**	Based on monthly reports (DGB, 2002a, 2002b)

*Three Vicuña populations located in Ulla Ulla, Mauri-Desaguadero and Lipez-Chichas areas.
**All Vicuña populations.

Over the past 35 years, vicuña populations have been increasing in numbers (see Table 5.5). While target vicuña populations (mainly in Ulla Ulla) were already monitored since the mid 1960s, but a system for patrolling and monitoring vicuña populations at national level was first introduced in the early 1980s. The system relied on partnerships established between government and local communities through the appointment of community members as wildlife wardens paid by government to control and monitor vicuña populations and provide the information through a monthly report.

After 1993, the DNCB (later changed its name to DGB) employed wildlife wardens, while the SERNAP employed park wardens for the vicuña control and patrolling within the National Protected Areas System. This co-management arrangement between government and communities through employment relates to the problems of law enforcement and is also found in other parts of the world, such as the Philippines coastal fisheries (Pomeroy, 1995). However, as is reported by the Director[41] of the Institute of Ecology, it is not possible to attribute all gains in vicuña conservation to this co-management arrangement because:

> *The wildlife wardens do not have transport or weapons that poachers usually have. Besides, because wildlife wardens are members of the communities; they can easily be forced by the same community to poach* Vicuña*. The successful story of* Vicuña *conservation must be related to a traditional value of the species that still remains, otherwise they would already have been transformed into beefsteaks!!!* (Interview in La Paz, 26/02/2003, 17/4).

In this regard, the general argument is that "The principal reason for the growth in the general vicuña population is the protection provided by the peasant (*campesino*) communities" (Vicuña National Regulation, 1997: 1), also confirmed by foreign policy (FWS, 2002). In the case of community wardens, for example, they have the same roles and responsibilities as wildlife wardens, but work *ad honorem*, and as highlighted in the government report: "These people [community wardens] reflect the interests and backing of the communities" (DNCB, 1996: 7).

[41] The informant was ex-director of DGB.

This increased attention given to local communities as supporters of conservation relies on the general assumption that local communities are not the major threat to vicuña conservation. In fact, in most countries around the world, the major threats to protected areas come from outside influences such as government supported timber concessions, road-building activities, agricultural subsidies, mining concessions, or dam construction amongst others (Mc Neilly, 1998).

In summary, partnerships were first established between the government and communities by employing community members as wildlife wardens, to carry out the specific tasks of monitoring and census. In 1997, this partnership arrangement was extended across levels of governance, and the Vicuña National Regulation established a Patrolling and Monitoring System[42] (SVV), which contemplates the establishment of partnerships between community wardens, and external actors such as national police, customs, to control illegal trade and enforce laws and regulations. These partnerships, across levels of governance are expected to be mutually reinforcing by distributing the costs of enforcement, and allowed adaptive management by generating information through continuous monitoring and control of vicuña populations. This information was then used to identify those target vicuña populations that showed a successful recovery in number in order to be used.

5.3.2 Partnerships to access the exclusive use-rights over vicuña

The VNR stresses the need for the organization of community-based management institutions in order to access the legal recognition and exclusive rights to benefit from vicuña management. In order to request the creation of a basic communal management area, partnerships amongst communities must be established for the presentation of the following documents:

[42] The DGB has also begun coordinating with the National Police and military to help curb illegal activities dealing with Vicuña and their products.

- Letter of request
- Legal capacity (*personeria juridica*) issued by the Basic Territorial Organisations (*Organización Territorial de Base*, OTB)
- Mapping of the communities included in the management area and vicuña population numbers including list of community wardens

Following the presentation of these documents, the National Authority declares the territory having vicuña natural population under the custodianship of one or more communities managing vicuña (*Comunidad Manejadora de* Vicuña, CMV) whose territorial boundaries are defined as Communal Management Area (*Area de Manejo Comunal*, AMC). These AMC, including one or more CMV can be grouped into Regional Associations for Vicuña Management (*Asociación Regional de Manejadores de* Vicuña, ARMV), which subsequently forms the National Society for Vicuña Management (*Sociedad Nacional de Manejadores de* Vicuña, SNMV).

During the period from 1997 to 2002, 5 ARMVs grouped the 347.403 Kg of vicuña fibre sheared in 32 AMCs (DGB, 2003). The idea to spatially group vicuña users from the local to the regional level is an institutional design that borrows significantly from the Vicuña Breeders Association developed in Peru, and from the Regional Association of Camelids Breeders (*Asociación Regional de Criadores de Camélidos Sudamericanos*, ARCCA), developed for llama producers of the Southern Altiplano in Bolivia (Lamas and Renaudeau d'Arc, 2003). Having the production divided among a large number of units, and then linking in order to channel the product from the producer to the final buyer has been the common pattern for the organisation of (sheep) wool production and distribution throughout the Andean region (Orlove, 1977). The rationale behind the commercialisation of fibre or wool through one channel is to increase the volume of production, in order to obtain higher prices for fibre (Analysis of interviews to fibre cooperatives, 16/9/2001 and 17/11/2001, 14/1 and 5-6/2).

In the case of Bolivia, the government retained the rights to store (VNR, 1997: Article 32), and auction vicuña fibre produced at national level (VNR, 1997: Article 34); while the SNMV (community-based institution that was not created yet) had the rights to oversee the commercialisation process and sign contracts with textile

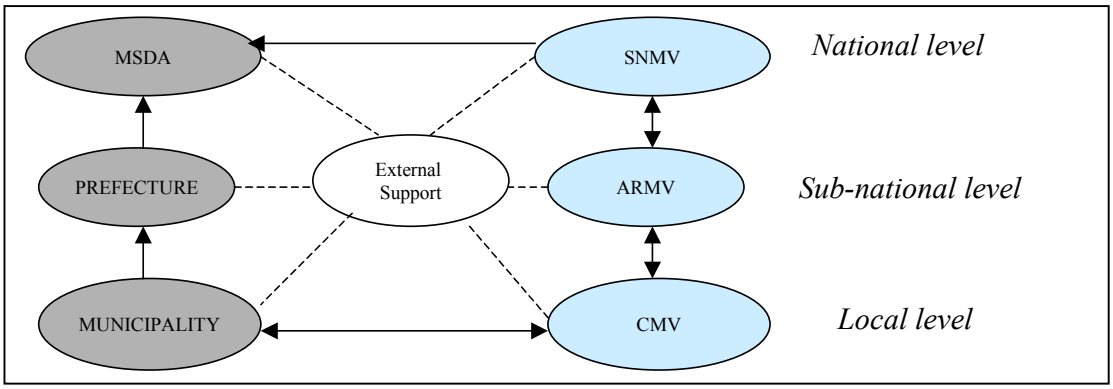
enterprises (VNR, 1997: Article 35). However, during 1997-2002, fibre was taken and stored by government but not commercialised, and the effectiveness of these community-based institutions at sub-national level (ARMV) and national level (SNMV) was difficult to assess since they were specifically designed for the administration and distribution of future economic benefits.

From 1997 to 2002, the main objective of government was to implement the shearing programme activities in those interested communities (DGB, 2000b, SERNAP, 2001a)

5.3.3 Partnerships for implementing the Vicuña National Programme

Within the institutional context in which the Vicuña National Programme was planned, one expected partnership arrangement is that NGOs or other support agencies may act as intermediaries between government, either central or decentralised, and community organisations represented at local, sub-national and national level, as illustrated in Figure 5.2.

Figure 5.2 Relationships contemplated in the Vicuña National Regulation



Note: Diagram represents the co-management model and partnership arrangements between government and community organisations (continuous lines) at the different levels of governance (see text), and the new partnership arrangements and spaces of engagement (intermittent lines) with external support.

The partnerships that communities can establish with external actors such as NGOs or other types of support agencies are one of support only, and do not share profits. This is specified in the National Regulation for Vicuña Management.

> *The trade union organisations, associations of producers, NGOs or other public or private institutions*[43]*, without exception, cannot act in representation of either the Community or the Regional Association for* Vicuña *Management, in the exploitation and* Vicuña *management activities.* (Vicuña National Regulation, 1997: Article 13)

The article of the Vicuña National Regulation, outlined above, is an important legal instrument to secure the allocation of exclusive rights to benefit from vicuña use to local communities. The statement is outstanding within the Andean context because national legal instruments in other countries do not contemplate securing benefits to local people (Renaudeau d'Arc and Lichtenstein, 2005). In Peru, for example, legislation allows private investors, both national and international to form partnerships with communities, and also take profit (Sahley *et al.*, 2004)). In Argentina, the lack of appropriate legislation enables affluent producers such as a textile enterprise and National Institute of Agriculture Technology to also take part and benefit from vicuña use (Lichtenstein, *in press*).

Within the context of decentralisation of government, providing technical and financial support to communities would be part of the future[44] roles of decentralised government such as prefectures and municipalities, as shown in Figure 5.2. Partnerships may evolve towards the creation of new spaces of engagement with non-governmental organisations (NGOs) or other external support agencies as well as advice in the elaboration of the Vicuña Management Plan. For example, municipal governments and the departmental prefects are in charge of drawing up the Vicuña National Plans (Prefecture of La Paz, 2002). This also improves its opportunity to negotiate interests with external institutions such as NGOs or other external agencies interested in supporting the programme.

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[43] The term 'institutions', as defined in the Vicuña National Regulation, also includes the concept of actors.

[44] Since 2002, the Prefectures and Municipalities are playing a more important role by providing technical and logistical support to participating communities. However, the coordination of central government, prefecture, municipalities, and target communities are part of an evolving process (Velasco and Orozco, 2003)

However, during the period 1997-2002, the government played a key role in controlling, and executing the Vicuña National Programme with practically no intervention from decentralised government (DGB, 2002a).

From 1997 to 2002, external agencies and central government established relationships (partnerships) that were expected to "maintain the equilibrium between the state norms and the implementation at local level" (SERNAP *et al.*, 2001a)). The following paragraphs examine how partnerships evolved during the five years' experimental shearing programme.

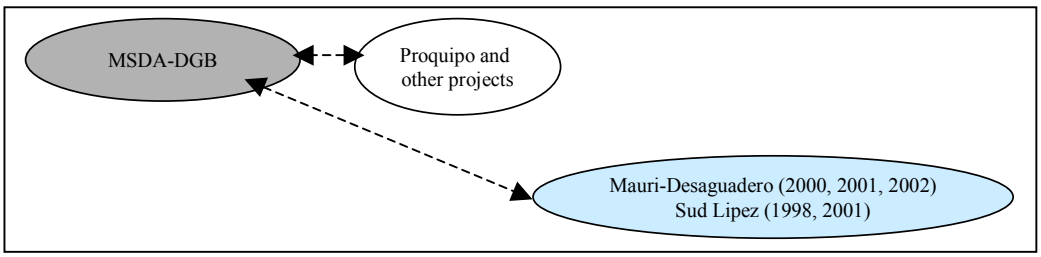
By 2002 the DGB and SERNAP had five years experience developing different strategies to implement the programme in each of the three very different geographical settings. : Apolobamba, Mauri-Desaguadero, and Lipez Chichas (see Figure 3.1 in Chapter 3). Apolobamba is a protected area, administrated by SERNAP, located north of Lake Titicaca in the Department of La Paz, where wild and land resources are managed under specific rules and regulations through a Protected Areas Management Plan. Mauri-Desaguadero, located south of Lake Titicaca in the Department of La Paz, and Lipez-Chichas, in the extreme southwest of the country in the Department of Potosi, are not included under SERNAP administration.

DGB and SERNAP have each developed a different strategy to finance and technically support the implementation of the programme. Most of the time this has been done through signing of bilateral agreements with international official aid agencies, for example, the Netherlands Government Cooperation (SNV) with the Programme Quinoa Potosi (PROQUIPO) in Sud Lipez, and the International Spanish Cooperation Agency (*Agencia Española de Cooperación International*, AECI) with the Programme Araucaria implemented in ANMINA. Figure 5.2 shows that the main difference between both strategies is the way partnerships have been pursued, strengthened and redefined inside and outside protected areas.

5.3.3.1 Strategy developed by DGB

In 1998, an agreement was made between the PROQUIPO and the Wildlife Administrative Unit of the DNCB (National Department of Biodiversity Conservation) that later changed its name to DGB (Wildlife Biodiversity Bureau) to operate the Pilot Center of Sud Lipez (see Figure 5.3). The purpose was to develop and put into practice management and shearing programmes. Five communities were selected as communities for this pilot experience. Through PROQUIPO, the communities received the infrastructure and training necessary to participate in the vicuña capture and shearing events. The SNV provided financial support to underwrite initial efforts to implement the National Programme, as shown in Figure 5.3. In 1999, the capture and shearing activities in Sud Lipez were suspended because of lack of government resources. In 2002, capture and shearing activities in Machaqa and Nor Pacajes were delayed for more than two weeks because of administrative procedures related to the budget allocation from the project's finance.

Figure 5.3 Strategy developed by DGB to implement the Vicuña Programme

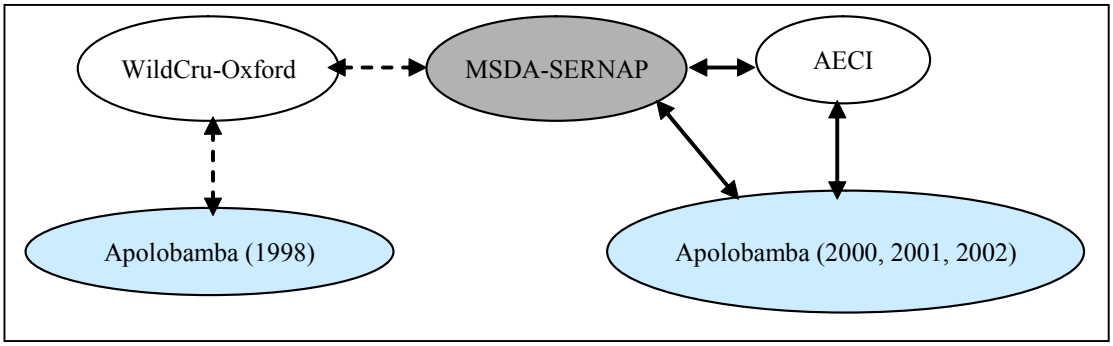


Note: The diagram represents the discontinuous partnership arrangements (dotted lines) established by DGB (General Biodiversity Bureau) with external agents such as Proquipo and other projects to implement the Vicuña National Programme in Mauri-Desaguadero and Sud Lipez.

5.3.3.2 Strategy developed by SERNAP

In the case of the protected area Apolobamba, SERNAP park staff, the park wardens and the Reserve Director have controlled and monitored programme activities including monthly census. In 1998, an experience of collaboration took place between a researcher from the University of Oxford and SERNAP to demonstrate a vicuña capture and shearing technique that takes into account animal welfare issues (Bonacic, 1999), as shown in Figure 5.4.

Figure 5.4 Strategies developed by SERNAP



Notes: Diagram represents the discontinuous partnership arrangements (dotted arrows) established by SERNAP (National Service for Protected Areas) in 1998 with the WildCru-Oxford project to implement shearing activities in Apolobamba, and the establishment of a continuous partnership arrangement (continuous line) with AECI (International Spanish Cooperation Agency) during the period from 2000-2002. This three-way co-management model is contemplated in the Vicuña National Regulation (see Figure 5.2).

In 1999, the reserve began to benefit from additional support, for five years, from the Spanish International Cooperation (AECI) through the ARAUCARIA Programme to train local communities in the management of the vicuña and in the organization of the Regional Association (SERNAP *et al*., 2001a), and design of a Management Plan (SERNAP *et al.*, 2001b, SERNAP, 2001b). One of the conditions attached by AECI to support the Vicuña National Programme was to change the protected areas category of Ulla Ulla National Fauna Reserve to Natural Area for National Integrated Management Apolobamba (ANMINA) and, in this way, extend it to lower ecosystems. The acceptance of this condition enabled a long-term agreement to be signed between SERNAP and AECI that secures the continuity of

the external support through local representative members such as the Reserve Director, park wardens and AECI technicians (SERNAP, 2004)).

In addition, an agreement was signed in 2000 between the Bolivian Academy of Sciences (*Academia Nacional de Ciencias de Bolivia*, ANCB), and the Institute for Conservation and Research of Biodiversity (*Instituto para la Conservación e Investigación de la Biodiversidad*, ICIB), SERNAP-ANMINA and the Regional Association for Vicuña Management Apolobamba (ARMVA), to facilitate access to funds from the Netherlands International Cooperation Agency for the completion of the Vicuña Management Plan, the first plan for vicuña conservation and management produced in Bolivia (ICIB *et al.*, 2002), based on DGB approval of a specific technical guideline regulation for the elaboration of the management plan (SERNAP *et al.*, 2001b).

The two strategies developed by DGB and SERNAP for establishing partnerships, either through the institutional support of an NGO or a national or international agency, have also been identified in other co-management experiences such as in inland fisheries (Sen and Nielsen, 1996, Berkes, 2002, Allison and Badjeck, 2004).

Therefore, during the period 1997 to 2002, the government played a key role by establishing partnerships across scale for implementing the Vicuña National Programme. It is the CITES management authority and its role cannot be delegated to another party. Government responsibility includes signing agreements at international level, and providing enabling legislation at the national level, to address problems and issues related to vicuña management. During 1997-2002, government responsibility also included negotiating with external actors for implementing the Vicuña National Programme. However, these partnerships established by government to implement the Vicuña Management Programme were not always appropriate, as will be examined in the following section.

5.4 Factors affecting the development of appropriate partnerships

The strategic partnerships identified in the previous section are analysed as spaces of engagement defined as horizontal networks or partnerships at the same level of governance, and as spaces of dependence defined as vertical networks where partnerships are established across levels of governance (Cox, 1998)), as shown in Table 5.6.

Table 5.6 Spaces of dependence and engagement affecting vicuña management

Scale	Spaces of dependence	Spaces of engagement	Constraints
International	The government advises CITES on decisions they wish to take forward in their proposals and CITES evaluates if access to shearing activities and/or commercialisation is detrimental or not to the survival of the species.	Access to support from advocacy groups such as GECS or IUCN; International aid or lending organisations; engagement with foreign policies such as FWS or WTO; relationship with market enterprises.	Lack of vicuña fibre commercialisation
National	Administrative regulatory procedures related to process of decentralisation and budget allocation.	Partnerships with NGOs and donor agencies, engagement with research institutes or other interested groups; exchange of information and capacity building.	Lack of continuous financial support
Local	Community organisations: Communal Management Areas, Regional Associations for Vicuña Management, National Society for Vicuña Management. Government role is advisory: community organisations report to government their fibre harvesting and government certifies and sells the fibre.	Partnerships with decentralised government (prefectures, municipalities and OTBs); contact with local, national and international media; linkages with NGOs; coordination with other grassroot organisations	Unclear boundaries, use-rights, and lack of economic benefits

Source: Conceptual idea of table adapted from (Tompkins *et al.*); Contents based on analysis of Vicuña National Regulation (1997)

The analysis of interviews to key informants and triangulation with secondary sources identified three main constraints affecting these partnerships. These constraints were the lack of fibre commercialisation, the lack of continuous financial support, and the unclear boundaries, use rights and lack of economic benefits perceived at the local level (see Table 5.6).

5.4.1 Lack of vicuña fibre commercialisation

The Vicuña National Programme has been implemented without commercialisation of vicuña fibre. Under the Vicuña National Regulation, the only way allowed is to commercialise fibre stored at national level and transformed in cloth. Table 5.7 presents the results of the analysis of documents and interviews to key informants, and identifies the main conditions restricting fibre commercialisation during the period from 1979-2002.

Table 5.7 Conditions restricting the fibre commercialisation

Period	1979-1996	1997-1999	2000-2001	Since Nov 2002
International level	CITES (Appendix I)	CITES (0 Quota for export)	CITES (1,975 Kg Quota for export)	CITES (No restrictions)
National level	National ban	VNR: Experimental basis for 2 years National ban	VNR: DGB stores and auctions fibre The regulation allows commercialisation of cloth only SNMV signs contracts	
Local level	Strict-protection	Capture and shearing activities in: Ulla Ulla/Apolobamba Mauri-Desaguadero Lipez-Chichas		Capture and shearing activities of all Vicuña populations
Stock of fibre	0	70.838Kg	195.473Kg	347.403Kg
Main conditions restricting fibre commercialisation	Not permitted by CITES and national ban		"Limited stock of fibre to be transformed into cloth"	"Lack of technological capacity to process fibre into cloth"
Scale of restriction	International National		National	

Source: Analysis of proposals to CITES and to the Vicuña Convention (1997, 2000 and 2002) and semi-structured interviews to key informants. VNR Vicuña National Regulation, SNMV National Society for Vicuña Management

During the period from 1979-1999, the main restrictions to access fibre commercialization were stipulated at international and national levels (see Table 5.7). During 1979-1996, CITES classified under Appendix I all vicuña populations in Bolivia, restricting use. During 1997-1999, CITES transferred to Appendix II three target vicuña populations located in Apolobamba, Mauri-Desaguadero and Lipez Chichas, allowing shearing activities to take place, but the shift in policy was envisaged to take place on an experimental basis for the minimum of two years, and with zero quota of export (international trade was banned). CITES regulations were reinforced at national level, by the formulation of a national ban for wildlife products established in 1990 that was only lifted in 1999. In 1997, the Vicuña National Regulation (VNR) was also enacted imposing new conditions for the commercialization of fibre, permitting only the comercialisation of cloth, through the DGB under the supervision of the National Society for Vicuña Management (SNMV) to oversee this process.

During the period from 2000-2002, the main restrictions for fibre commercialization were manifested at national level (see Table 5.7). In 2000, CITES established a quota of 1,975 Kg for export per year, but under the Vicuña National Regulation (1997: Article 15), fibre could only be commercialised as cloth. In 2000, there was a stock of nearly 80Kg and as regards to the lack of commercialisation, the director of the Protected Area Apolobamba specified during a meeting[45] held in the SERNAP offices: "*Our main concern now is to increase the national stock of fibre to 200Kg in order to transform it into cloth by a mill"* (Interview in La Paz, 31/08/2001, 4/1).

As the government official said, the stock of fibre at national level was considered insufficient to be able to transform it into cloth, and this was the main argument used by the Bolivian government to explain the lack of commercialisation at the Vicuña Convention Annual Meeting (DGB, 2000a), as also shown in Table 5.7. In 2001, the expected stock of fibre of 200Kg was nearly reached with

[45] The purpose of the meeting was to find out government perceptions of potentials and constraints of the Vicuña National Programme in Bolivia.

195.473Kg (DGB, 2002a, DGB, 2002b), and surpassed in 2002 with 347.403Kg (DGB, 2003), but commercialization was still postponed.

Although communities were given the exclusive rights to benefit from vicuña use, under the Vicuña National Regulation, the government retained the rights to store and auction vicuña fibre that can only be exported as cloth (Vicuña National Regulation, 1997: Article 15). There is a lack of technological capacity within the country[46] to process this fibre into cloth, and government is debating whether to change the conditions for commercialisation stated under the VNR (DGB and WCS, 2004). The main question is whether vicuña fibre should be sold as a rough product with an estimated value of 200 US$/Kg, or as a finished good (cloth) with an estimated value of 500 US$/meter of cloth. This information is based on market research officially presented when drawing up the Vicuña Management Plan of the ARMV Apolobamba, undertaken by the Academy of Sciences in La Paz (Apolobamba open ceremony, 28/09/2002, 125-128/2).

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In order to obtain communities' opinion, a meeting was planned with key community members, including community authorities, wildlife wardens and people in charge of the vicuña management organisation, from the three pilot areas that have been shearing vicuña since 1998. The assumption was that if there is a strong pressure from communities for economic profits, the commercialisation of raw fibre is the solution because it can be sold directly without having to wait for the process of fibre transformation (analysis of interviews to DGB officials, 2002).

The absence of commercialization seemed to be associated with the lack of alignment between the change of CITES policy and lack of technological capacity to implement the conditions stated under the Vicuña National Regulation and access fibre commercialization (DGB, 2004). A number of key informants suggested some solutions to solve the problem. Table 5.8 analyses the implications of these solutions on the development of a new legislative framework, in terms of spaces of engagement and dependence.

[46] Within the Andean region there is only one mill that can transform raw fibre into cloth. This private mill is located in Arequipa, Peru.

The market research undertaken by an economic consultant, as part of the formulation of the Vicuña Management Plan in Apolobamba, suggested that fibre should be commercialized through separate channels, and transformed into crafts and finished goods to allow an added value to it. In this regard, the Director of the Academy of Sciences (ANCB) said during the opening ceremony in Apolobamba:

> *I think that the economist consultant made a ridiculous proposal, I would like to ask him how can you be reassured that fibre sold as crafts only will be legal? I can just see how easy it is to insert a legal label to an illegal knitted sweater or knitted gloves. The advantage of selling cloth rather than fiber is that you can be reassured that it comes from legal shearing. This is the reason why the* Vicuña *legislation states that fibre can only be sold as cloth and perhaps one of the factors that has delayed commercialisation of fibre in Bolivia is because there is not enough fibre to sell for mill processing [above 200 Kg]*. (Pers.Comm. in Apolobamba, 28/09/2002, 126/2).

The arguments stated by the director of ANCB unmask the underlying reasons of contemplating commercialisation, as cloth only; that is to avoid the smuggling of legal fibre through the illegal trade of fibre and crafts that already exists in Bolivia.

Table 5.8 Perceived problems and reforms to the Vicuña National Regulation

Perceived problems of Vicuña National Regulation	**Proposed reforms to VNR**	**Actor voicing reforms**	**Scale of impact**
Transformation of fibre into cloth is the only option of commercialisation (Article 15)	New law that allows selling fibre as craft and finished good to permit an added value. This is seen as the exploitation of a product with an increase in benefits (added value) and beneficiaries (more people involved in the productive chain).	Economic consultant	Expands spaces of engagement
One channel of commercialization through DGB-SNMV (Articles 34-38)	New law that allows regional associations managing Vicuña to directly associate with textile entreprises for the sale of fibre.	Economic consultant	Expands spaces of engagement
Lack of community participation and consensus in policy formulation	Meeting with key stakeholders at community and government level	Director DGB	Reinforce spaces of dependence
Lack of information on basic fibre processing and market options	Analyse the different trade route options for the fibre "Bolivia has never been recognised because of quality so it is suggested to focus on new markets such as those based on origin of fibre (for example: how many families are going to be beneficiaries)"	Director DGB	Expands spaces of engagement Expands spaces of dependence

Source: Participative observation during Apolobamba open ceremony (date 28/9/2002, field code 125-128/2 in Appendix A).

The Director of the DGB[47] also explained that decisions regarding the future commercialization of fibre have to take into account the lack of technological capacity in Bolivia, and point towards research on alternative markets available for commercialisation of fibre such as fair trade options (see Table 5.8). She also suggests that these alternative options for the commercialisation of fibre then need to be further discussed with communities to reach a common consent (Analysis of semi-structured interview to Director of DGB, 28/09/2002, 125/2).

[47] Since its creation in 1993, the director of the DGB changed 5 times: 1993; 1997; 2001; 2002 and 2003.

Government administrative and institutional structures and vicuña laws and policies will, in most cases, require restructuring to support these initiatives (analysis of semi-structured interview to Director of DGB, 28/09/2002, 125/2). This restructuring depends, as well, on the new administrative procedures set up by the new government agenda following elections in 2001 and 2002.

In this regard, the Director of DGB also considers that the legal changes necessary to expand or reinforce the networks and spaces of dependence and engagement for successful commercialisation of fibre, as shown in Table 4.8, may require more than just the consensus of communities. In some cases, it may be more feasible and desirable to draw up a completely new legislation, rather than to modify existing government regulations.

In summary, it took five years, 1997-2002, for the Bolivian government to lift all conditions set out by CITES in order to expand the live-shearing programme to all vicuña populations[48]. During the period 1997-1999, the lack of fibre commercialisation, was explained by CITES restrictions reinforced by a national ban. Since 2000, CITES enabling policy unmasked the lack of initiative or capacity of government to address the lack of alignment between the Vicuña National Regulation and the local context, in order to make rules and regulations effective.

5.4.2 Lack of financial support

With regard to the financial support, key informants concur that the legal status of protected areas administrated by SERNAP has advantages over the non-protected areas because, as stated by the DGB technician,

> *The already established institutional arrangement to administer the protected area increases the opportunities of bilateral agreements with other support institutions* [for example, International Official Cooperation Agencies and Academic Institutions] (Interview in La Paz, 21/08/2001, 35/2).

[48] In November 2002, all Vicuña populations were re-classified by CITES to Appendix II allowing commercialisation of vicuña fibre obtained from live shorn vicuña*s*.

In fact, support from donor agencies is critical in financing the implementation of the Vicuña National Programme. Donors often attach conditions to their funding, forcing state agencies to review their policies and practices in order to align their agendas with the donor agenda. One clear example of this is the conditions attached to the bilateral agreement signed between SERNAP and AECI to implement the vicuña programme in Apolobamba. Programa Araucaria-AECI was already carrying out other activities in the Apolobamba area and as the coordinator of the programme stated:

> *Programa Araucaria would also support the* Vicuña *National Programme if SERNAP increases the protected area Ulla Ulla National Reserve to the category of Natural Area for National Integrated Management* [ANMINA] (Interview in La Paz, 02/09/2002, 49/2).

The strategy developed inside protected areas has also been promoted in Sajama National Park, supported by the German International Cooperation Agency (GTZ) to implement the Protected Areas and Buffer Zones Management Project (*Proyecto Manejo de Areas Protegidas y Zonas de Amortiguación*, MAPZA).

The apparent ease of access to resources has given support to the idea that Mauri-Desaguadero should also enter into the category of SERNAP protected area. The idea was initiated and promoted by the bi-national authority Bolivia-Peru for the Hydric System of the Lake Titicaca (*Autoridad Binacional Autonoma del Sistema Hidrico del Lago Titicaca*, ALT) financed by the United Nations Development Programme (*Programa Nacional de Naciones Unidas*, PNUD) as a strategy to align Peruvian and Bolivian environmental policies in a trans-boundary area.

While the strategy inside protected areas developed under SERNAP administration will probably not change, the strategy outside protected areas administrated by DGB has potential to change (see Figure 5.2). At the time of this study there was a widespread awareness that the decentralisation of vicuña management will provide new opportunities or spaces of engagement to implement the Vicuña National Programme. This idea was already developed in Sud Lipez. The huge distance from La Paz (nearly 600km; Table 5.2) and lack of continuity of

government in supporting the shearing programme, has given local space for the development of new strategies where decentralised government plays a key role.

Discussions with key informants reveal that the region is moving towards decentralised management with new local institutions arising. One example in Sud Lipez area is the grouping of municipalities called *mancomunidad*. The advantage of this new institution for Vicuña management in Sud Lipez is expressed by the Director of the National Reserve Eduardo Avaroa (RNEA), located in Lipez-Chichas region as:

> *We are now in the process of joining the municipalities of San Pablo de Lipez, San Antonio de Esmoruco and Mojinete to a municipal government group called 'mancomunidad'. This increases the human population or target population in proportion, and gives access to more funding that could be used for local* Vicuña *management* (Interview in RNEA, 13/09/2001, 8/1).

While the management authority has been passed to hands of decentralized government, such as the prefecture and municipality, new spaces of engagement will open where partnerships with new partners, such as external support agencies including NGOs, can be established at different levels of governance, as shown in Figure 5.3.

These spaces of engagement of government for external support are particularly relevant in Bolivia. Local NGOs can play an important facilitator and capacity building role with high legitimacy and urgency but low power on the vicuña decision-making frame, such as the Regional Association for Camelids Breeding (ARCCA) in Sud Lipez; and the NGO SATAWI in Mauri-Desaguadero. These local organisations can also bridge divergent views between local people and government agencies and manage conflict within or among communities. In Bolivia, other examples exist in which government departments use NGOs as project implementers (see Bebbington 1998). However, this apparent dependence on external funding and support by government may raise the question whether the role of government and external funding acts as "mediators of sustainability" (Bebbington, 1998) or "agents of social development" (Korten, 1986).

While the lack of financial support is one of the major concerns perceived by government officials at the government-community interface, at community level the viability of the programme is being affected by a problem of 'unclear boundaries and use rights' that is perceived at the local level, as will be examined in the following section.

5.4.3 Unclear boundaries and use rights

The main conflicts arising from vicuña conservation at local level were reported as being a problem of "boundaries and use rights" by the Park director and wildlife wardens in Sud-Lipez (Interviews in Sud Lipez, 13/09/2001, 10/1) and park warden in Apolobamba (Interview in La Paz, 29/08/2002, 45/2).

The four protected areas for vicuña under SERNAP administration happen to be next to the international border of Peru such as the case of ANMINA, next to Chile such as the National Park Sajama, and next to Argentina such as in the RNEA, and interviews with Directors of these three protected areas identified conflicts around who has the right to use vicuña. In fact: *"*Vicuña*s cross over from Bolivia to Chile [National Park Sajama] and to Peru [ANMIA] where they are sheared or sometimes killed"* (Interviews in La Paz, 30-31/08/2001, 3-4/1).

The emergence of different systems for vicuña management, based on the presence or absence of enclosures, is creating a serious trans-boundary conflict regarding use rights over vicuña that crosses between Bolivia and Peru. For example, as users in Peru are enclosing vicuñas, there are fewer animals on the Bolivian side where vicuña is managed in the wild.

Although the details vary, the key issues behind these conflicts are the mobility of vicuña across international boundaries and the unpredictability in the flow of benefits that this produces. The problem is exacerbated in Bolivia because of the lack of commercialisation. The mobility aspect is illustrated in many other important commercially exploitable species that cross international boundaries, such as fish and whales. International management of these resources, including regulation In the case of vicuña, the Vicuña Convention, is an Alliance between four

countries to address conservation problems, but does not specify how to manage vicuña at national level and the possible conflicts derived from it.

The director of the RNEA located in Sud-Lipez believes that one way to mediate this problem is the formulation and implementation of bi-national policies (Pers. comm. Director of RNEA, 30/08/2001, 2/1). In this regard, the Regional Coordinator of fibre cooperative emphasises that bi-national policies already exist,

> *This idea has already been developed for the case of llama management in a trans-boundary area of Sud Lipez-Vilama (North of Argentina) through the bi-national Cooperative to facilitate the commercialisation of lama fibre* (Interview in Argentina, 17/11/2001, 5/2).

The unpredictability of the resource flow is related to its mobility, but also to the lack of clearly defined trans-boundary policies between countries which delegates control of the local resources to community-level while at the same time claims ownership of wild resources with conservation interest (McKean, 2000). The importance of establishing bi-national agreements is highlighted in long-term studies in Bolivia, where a special note is made regarding management of river basins that span international borders (Preston, 1999).

The analysis in this section reveals that the establishment of appropriate partnerships not only depends on the capacity of government to adjust and implement policy changes or in the institutional mechanisms to negotiate the establishment of new partnerships, as discussed in the cases of lack of commercialisation and financial support, but also on how to make them effective at the local level. The following section derives the main conclusions from these findings.

5.5 Synthesis and conclusions

Vicuña management in Bolivia is divided in various stages that require the establishment of mutually reinforcing partnerships that allow adaptive management across scale. As seen in Chapter 1 and 2, adaptive management implies the ability of a management system to respond or adapt to changes. In this thesis the definition of

adaptive management extends more narrow interpretation, and view adaptive management as management in response not only to changing ecological context or nature of the resource, but also adapting to external or broader policy context.

During the planning stage (1969-1996), partnerships established at international level between CITES and the government of Bolivia were mutually reinforcing to control the ban of fibre trade, and made considerable progress in developing a national system for monitoring vicuña populations that was then used to inform CITES policy about the successful recovery of three target vicuña populations. However when implementing the Vicuña National Programme (1997-2002), vicuña management did not adapt to the new CITES legislation. In 1997, CITES allowed the exploitation of vicuña fibre, and in 2000 fibre trade; but there was a clear structural deficiency of the state in aligning its national policies to the changes in CITES policy and later in implementing them. This is clearly illustrated by the continuous lack of commercialisation of fibre.

To implement the Vicuña National Programme, government represented by the different agencies at national (SERNAP, DGB) and sub-national (Municipality and Man-community) levels, established partnerships with external agencies including international, bi-national or national agencies and NGOs for financial support. The adaptive and learning aspects of these partnerships depended on the institutional arrangements established in the target area. The protected area of Apolobamba, administrated by SERNAP, provided the organisational and institutional for adaptive management. Partnerships established between SERNAP and AECI were mutually reinforcing and allowed adaptive management. This is clearly demonstrated by the considerable progress for elaborating a management plan for vicuña in Apolobamba. On the other hand, partnerships established between DGB and external agencies did not provide a continuous support to Mauri-Desaguadero o Lipez-Chichas and the mechanisms which allows and promotes adaptive management were limited.

Community-level partnerships are illustrated by local-level institutional arrangements established between government and communities, such as the devolution of management responsibilities to communities through the Certificate of

Custodianship; the recognition of exclusive use rights and benefits through the creation of Regional Associations; and the establishment of a monitoring system of vicuña populations through the employment of community members as wildlife wardens. These different local-level institutional arrangements were established at different stages in the management process, from planning to implementation of shearing activities. The main characteristic of these arrangements is that they are associated to the political process of decentralisation that Bolivia is currently experiencing and should allow and promote adaptive management. However, in the absence of economic benefits, the mutually reinforcing and adaptive aspects of the partnerships established at community-level are sometimes unclear. Partnerships at the local level become unclear in terms of distribution of roles, responsibilities, demarcation of boundaries and use rights; particularly, in those trans-boundary areas where vicuña*s* cross between countries.

The following two Chapters explore in depth these issues arising at local-level. Next Chapter examines the mixture of boundaries that affect the internal dynamics of communities, and supportive collective action in vicuña management.

Chapter 6. Collective action and vicuña management

6.1 Introduction

The common property regime for vicuña management in Bolivia assumes that communities characterised by the lack of fences, are based on rules and regulations that enable people to act collectively. The government in Bolivia assumes that these community-based collective action institutions have favoured the recuperation of vicuña populations in the wild, and will continue supporting vicuña management in the wild (DGB, 1999). This Chapter critically examines if these assumptions can be identified in the form conceptualised by conservation actors and government in Bolivia by asking: What are the characteristics of local-level collective action institutions for vicuña management?

The question is rooted in various bodies of theory, in particular, theories on collective action (Olson, 1965, Oström, 1998a), studies on how institutions shape the management of common pool resources (Cleaver, 2000), and how boundaries and borders should be conceptualized in common property regimes (Giordano, 2003, Geisler *et al.*, 1997, Sturgeon, 2004). There are important aspects of these theories that overlap with the concept of social capital (Oström and Ahn, 2003, Woolcock and Narayan, 2000). This Chapter hopes to contribute to these theories, by looking at two particular research areas that remain under explored. One is the linkages between the specific levels or dimensions of boundaries (McKean, 1996, Geisler *et al.*, 1997), and the second one is how variables relate to each other in order to achieve collective action (Agrawal, 2002).

This analysis is based on primary data collected through a close examination of the configuration of communities conforming the Regional Association for Vicuña Management (ARMV) Machaqa; participative observation during vicuña capture and shearing events in 2001 (Lipez-Chichas fieldwork site), and 2002 (Mauri-Desaguadero fieldwork site); and interviews to key informants in 22 participating and 12 non-participating communities distributed in Sud Lipez, Machaqa, Nor Pacajes, and Paca Japis Regional Associations for Vicuña Management. Primary data

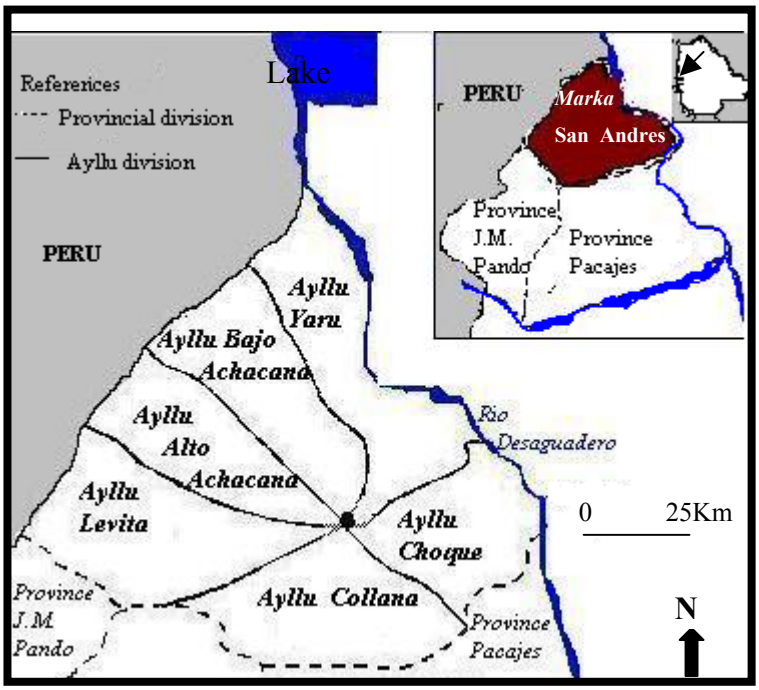
was triangulated with secondary sources including cartographic maps, and official as well as NGO reports (see Chapter 3).

This Chapter is divided in five sections. Section 6.2 explores the concept of traditional community in the Regional Association for Vicuña Management (ARMV) Machaqa. Section 6.3 uses a detailed analysis of the many superimposed boundaries that define institutions for vicuña management in ARMV Machaqa. Section 6.4 discusses the factors affecting community involvement or collective action in vicuña capture and shearing events during the period from 1998 to 2002. Section 6.5 summarizes conclusions on the main findings in this the Chapter.

6.2 The concept of community in San Andrés de Machaqa

The Regional Association for vicuña management (ARMV) called Machaqa was created in the year 2000 to group all communities interested to participate in the Vicuña National Programme (see Chapter 5). The area that forms the ARMV Machaqa covers approximately 155,155 hectares, and is delineated by the river Desaguadero in the North-East, the province of Pacajes in the South, the province of José Manuel Pando in the South West, and the frontier with Peru in the West, as illustrated in Figure 6.1.

Figure 6.1 The *Marka* San Andrés de Machaqa



Source: Based on community members mapping and IGM (1998)

The ARMV Machaqa corresponds politically with the Municipality[49] of San Andrés de Machaqa of the Ingavi Province, and culturally and ethnic with the traditional *Marka*[50] San Andrés de Machaqa, represented by *Aymara* speaking groups of families possessing specific rights over minor units represented by kinship jurisdictions called *Ayllus*. The *Marka* San Andrés de Machaqa[51] exemplifies those cases, within the Bolivian Altiplano, that have conserved and maintained the internal social and territorial organization of its six traditional *Ayllus*. These *Ayllus* exist since before the Conquest, and converge in the town, called San Andrés de Machaqa (Plata Quispe *et al.*, 2002, Astvaldsson, 1997, Ticona and Albó, 1997), as shown in Figure 6.1, and examined further in the following section.

[49] Until 2002, the areas of San Andres, and Jesus de Machaqa belonged to the municipality of Viacha; since 2002, both areas have been divided and created two new municipalities.
[50] In general, *Marka* is defined as the patrimony of minor units called *Ayllus*, surrounding an administrative or ceremonial center (Ticona and Albó 1997).
[51] The *Marka* San Andrés de Machaqa borrows significantly from its neighbouring *Marka* Jesús de Machaqa and its twelve *Ayllu,* located on the other side of the river Desaguadero (Ticona and Albó, 1997)

6.2.1 Nested community-based institutions

The term ‘community’ in San Andrés de Machaqa is a broad concept that embraces the principles of *nested community-based institutions* (Astvaldsson, 1997). Each resident belongs to more than one social and territorial dimension of community represented by the *Marka* San Andrés de Machaqa, its six original *Ayllus* Collana; Levita; Choque; Alto Achacana; Bajo Achacana and Yaru, and the 52 original communities (see Figure 6.1). Under this concept, there is no one community to which local people belong to, and the term ‘community’ is used to refer to each of the “community levels” (Albó, 2002).

As regard to the territorial configuration, the two major groupings, *Marka* and *Ayllu*, are both referred to as community in everyday language-speaking. For example, ‘community San Andrés’ refers to the *Marka* division; and ‘community Choque’ refers to the *Ayllu* division. As regard to the social configuration, in each of the different levels a system of rotative authorities is established, as part of the service that each family has to bring to the other members of the community. This community service is also part of the duties to secure, in reciprocity, the access to family plots of land to cultivate and common rangeland without having physical demarcation with fences or specific landmarks, as explained in Box 6.1.

Box 6.1 Access to land-based resources

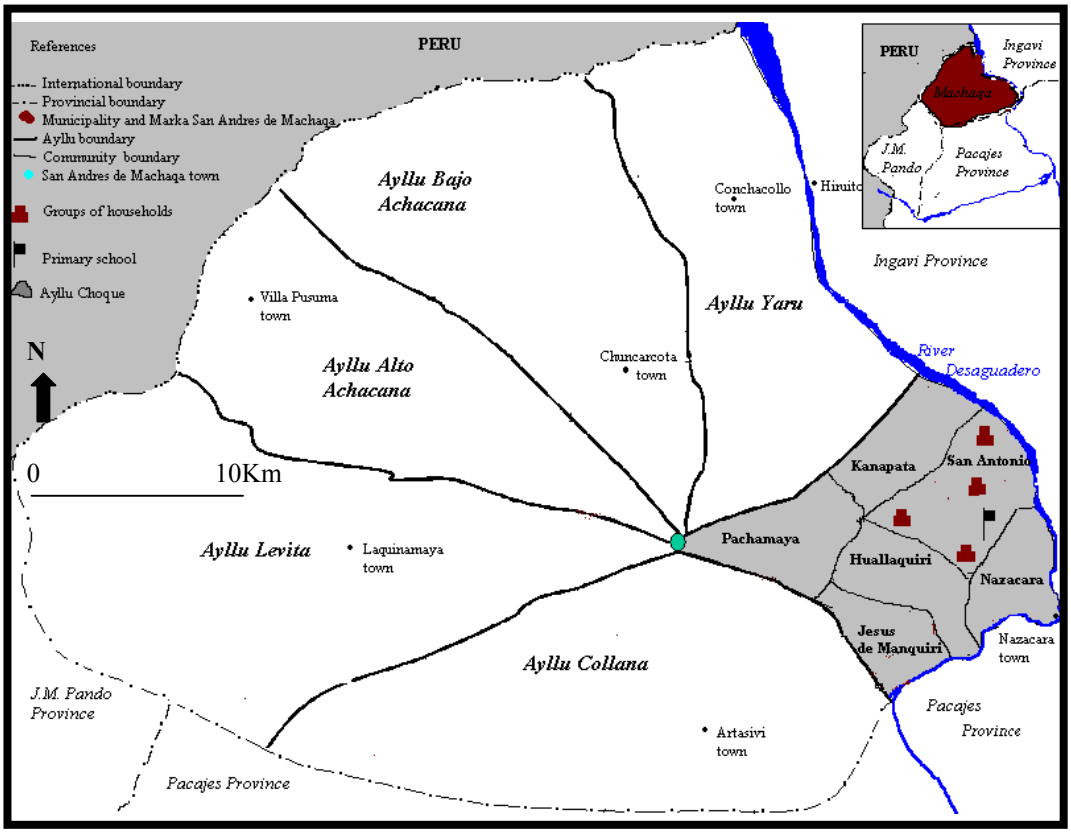
Family groups control parcels of land called *sayañas*, while the community as a whole has access to pastures. This means that each family has the right to access and use some communal land for grazing called *aynuqas.* New families from the paternal side inherit family parcels of land (*sayañas*). In this way, they avoid division of land on inheritance. Each community member starts its 'journey' (*camino*, *thakhi)* in its paternal community land or residence, and this fact is important because that is the community to which, once married, the individual will have to fulfill a number of duties and responsibilities in order to 'become a person' (*jaqi)* recognized and acknowledged by the community. The *thakki* and *jaqi* are the two principles that control and maintain the access rights to land. The journey starts with every 'married couple' (*chacawarmi*) and their 'parcel of land' (*sayaña*).

The community duties are *ad honorem* services such as labour work provided to the community, and the responsibility to fulfill the position of community authority. Both members of the married couple become community authorities on a rotational basis. These are named *Mallcu* and *mama thalla* referring to the man and woman respectively. They represent communities *vis a vis* government, in rituals and ceremonies.

Source: based on Albó (2002)

The *Marka* San Andrés de Machaqa is subdivided in two social and territorial organizations with official recognition by the State. The division corresponds to the three *Ayllus* in the south (*Marka de Ayllus y Comunidades Originarios San Andres* Sur, MACOSAN-Sur) represented by the *Ayllus* Collana, Levita y Choque, and the three *Ayllus* north (*Marka de Ayllus y Comunidades Originarios San Andres Norte*, MACOSAN-Norte) represented by the *Ayllus* Alto Achacana, Bajo Achacana and Yaru (see Figure 6.1). Each *Ayllu* usually groups between 4-13 small communities, each of which is represented by approximately 30-60 families (INEB, 2001). Households within communities are spatially scattered and grouped under *zones* also called *estancias*. This internal territorial configuration of *Ayllus* is illustrated by the example of *Ayllu* Choque in Figure 6.2.

Figure 6.2 Internal organisation of *Ayllu* Choque



Source: Based on mapping by community members and IGM (1998)

In the north and south of the *Marka* there is a community authority represented by the *Jacha Mallcu*, while each *Ayllu* and community has its own community authority also called *Mallcu*, as shown in Table 6.1.

Table 6.1 Configuration of communities in San Andrés de Machaqa

Size of community	**Territorial organisation**	**Social organisation**
540-1800 families	North/South *Marka*	*Jacha Mallcu*
180-360 families	*Ayllu*	*Mallcu cantonal or subcentral*
30-60 families	Community	*Mallcu*

Source: Based on secondary data from INEB (2001) and fieldwork.

Therefore, the expression *"All Mallcus walk together"* (Ticona and Albó, 1997: 81) is commonly used to emphasise the unit of the *Marka* based on nested community-based institutions represented by their respective community authorities, and whose boundaries for collective action will be further examined in the following section.

6.2.2 Boundaries for collective action

Collective action in the *Altiplano* context is identified by different terms and definitions. Many scholars have focused their studies on the diverse institutions for mutual aid, reciprocity and collective work in the Andean cultural world (Delgado *et al.*, 1998, Mayer, 2002). One of these mechanisms is reciprocity or *Ayni* where people participate by providing resources, for example labour, in return for food, cash or other material incentives. Another of these mechanisms is the periodic meetings or assemblies that are used as forums to discuss issues of concern. If these issues or problems affect a group of communities, bigger assemblies are organised and *Mallcus* representing higher hierarchies of communities such as one *Ayllu* or a group of *Ayllu* also participate in the event. These meetings were observed during fieldwork in three occasions to discuss different issues such as the creation of a Municipality within the *Marka* (meeting in Chuncarcota, 08/10/2002, 135/2), to share their fears and concerns towards the dredging of the River Desaguadero (meeting in Nazacara, 19/09/2002, 123/2), and the construction of a bridge to join the neighbouring *Markas* San Andrés and Jesus de Machaqa (Aguallamaya, 12/10/2002, 159/2).

Discussions in meetings and semi-structured interviews with key informants reveal that legitimacy of community members is crucial in securing collective action and cohesion within communities.

Within communities, certain mechanisms exist to guarantee participation of all members and maintenance of equity. Equality of opportunities for all community members is considered more important criteria for community leardership than aptitude for the position. This 'democratic ethnicity' (Albó, 2002) makes

communities less active when the rotating shift falls on a community authority less capable in communicating with other community members. However:

> *It is not acceptable that somebody lives as a lazybones at the expense of others, or that he exists by begging. Community mechanisms will incorporate him into his rights and duties, or will end by excluding her/him from the community* (Albó, 2002: 18).

A young informant (20 years old) studying in La Paz to become a teacher in his community specifies his duties and responsibilities *vis-à-vis* the community for securing collective action:

> *I live in Nazacara because my mother has land here, but my father has land in Manquiri so I also belong to Jesus de Manquiri community and it is there where I want to teach at school* (Interview, 29/10/2002, 41/3).

Both, Nazacara and Jesus de Manquiri, are communities within *Ayllu* Choque. The informant referred to his paternal community land or residence, and this fact is important because that is the community to which, once married, he will start his 'journey' along which he will have to fulfill a number of duties and responsibilities in order to 'become a person' (see Box 6.1).

Although these traditional community institutional mechanisms were observed during fieldwork, the process of creation of new political-administrative divisions within the area, were also seriously affecting the internal dynamics of communities, as seen in the following section.

6.2.3 Processes affecting traditional configuration of communities

The traditional configuration of six *Ayllus* in San Andrés de Machaqa has been divided into discrete territorial and social units through successive land Reforms and counter-reforms. The result is the overlap of multiple socio-political divisions representing in the same space different historical periods. These different processes are represented in Table 6.2 below.

Table 6.2 Social and territorial organisation in San Andrés de Machaqa

Spatial scale in hectares	Territorial organisation		Social organisation			
	Traditional boundary	**Political division**	**Traditional authority**	**Political authority**	**Families**	**Nº of people**
200,000	*Marka* Division of *Marka*	Municipality	Jacha *Mallcu* (North *Marka*) Jacha *Mallcu* (South *Marka*)	Mayor	1,800	8,200
30,000	*Ayllu* Division of *Ayllu*	Sub-central Canton	*Mallcu* (sub-central or cantonal)	Sub-mayor	180-360	820
5,000	Community Estancia/ Zone	Syndicate Canton	*Mallcu* (*originario*)	Corregidor	30-60	100-200
30 – 40	Family land		Heads of household (Couple)		1	4

Source: Based on data collected during fieldwork in San Andres de Machaqa and analysis of documents; Numbers shown are approximate; *Corregidor*: canton magistrate

The year 1952 represents an historical landmark for the relationship between communities and the State changed (Plata *et al.* 2002). The land reform promoted by Government resulted in the creation of syndicates and sub-centrals, bringing communities into the political party system, while providing a new internal social structure that in some cases functions in parallel with traditional territorial organisations. The six traditional *Ayllus* of Machaqa were then transformed into 10 sub-centrals with a total of 53 agrarian syndicates or minor communities (see Table 6.2). These changes resulted in two main processes currently affecting communities today: the cantonization and municipalization.

The process of cantonization started towards the end of the 1950 decade. It is characterised by the subdivision of *Ayllus* to access the new socio-political status of canton. Through this new process, the sub-centrals changed their names to cantons (see Table 6.2). In some ways, the conversion of traditional community boundaries into new cantons represents a higher status. In San Andrés de Machaqa, *"to be converted into canton means an increase in status because it opened up access to education, health and political services"* (Plata Quispe *et al.*, 2002: 29). In *Ayllu*

Choque, for example, the wildlife warden defines his decision-making boundary as the canton and not the *Ayllu*: *"Each community has its own authority (Mallcu or Mama Thalla) but belongs to the same canton Nazacara"* (Interview, 11/09/2002, 61/2).

The process of political division based on the canton has also brought about the possibility to create a town, as the administrative nuclei of the canton, from where the new political representatives can exercise their local authority such as public registry office, residence association, council of neighbours (*Junta de Vecinos*), educational council (*Junta Escolar*); or to implement the secondary school, a health centre or a weekly fair.

The process of municipalisation started as a result of the Law of Popular Participation (LPP, Law 1551/ 1994). This law was passed initiating the process of decentralization from central state to municipalities. Because of this process, it is also referred locally as the Law of Municipalities. This law was implemented to allocate financial resources to the provincial level, and in particular to the municipal level of governance. These resources were allocated for the execution of programmes, projects, and various other initiatives that community-based organizations at the rural level (called OTBs as an effect of this law) considered of priority.

In this regard, during an informative meeting held by municipal authorities in Chuncarcota community, the government official told the community members that the Law of Municipalities had been created to favour resource distribution and generate more money for local productive initiatives (Meeting, 08/10/2002, 135/2). In practice, community claims centered around the reduced amount of resources reaching the region through the Law of Popular Participation. The solution seen by community members was to be independent from the municipal government of Viacha who was seen as corrupt (La Prensa, 23/11/2002).

For example, in the case of San Andres and Jesus de Machaqa, decentralisation brought about an increased eagerness to establish their own autonomy through the creation of their own municipality in order to have direct

access to resources. In May 2002, San Andrés de Machaqa, and Jesús de Machaqa (located on the other side of river Desaguadero, Figure 6.1) were declared new municipalities. Government duties were handed over by the municipal government of Viacha to the two new municipal governments of San Andrés and Jesús de Machaqa in 2002 (Meeting in Chuncarcota, 08/10/2002, 135/2).

Another unforeseen effect of the law of Decentralisation was the internal division of community boundaries. This was the result of the increased eagerness to establish new political divisions, such as cantons, in order to have access to government representation. Since 1996, the Agrarian Reform Law (Law INRA) has been re-establishing traditional community boundaries through land titling known as Indigenous Community Territories (*Tierras Comunitarias de Origen*, TCO). This process called *Saneamiento de Tierras* is a slow process of land titling and recognition through the State. The Land Reform Law INRA is speeding up this process as is also observed in Machaqa. Traditional community boundaries are also being divided to access land titling and, consequently, recognition from the State.

This Section introduced the different dimensions that the term *community* entails for the *Aymara*, and highlights that it is "difficult to provide one definition of *community*, because of the many community concentric circles to which Aymara people belong to" (Albó, 2002: 31). These concentric circles correspond to nested institutions for collective action defined by ethnic and cultural boundaries. However, important socio-political processes are cross-cutting these traditional community boundaries, as will be reflected by the analysis of local-level institutions for vicuña management.

6.3 Local-level institutions for vicuña management

In Bolivia, the traditional configuration of Andean communities is characterized by the lack of physical demarcation such as fences or boundary markers, and is presumed to be compatible with the ecological distribution of vicuña. This section explores the different sets of boundaries that define institutions for vicuña management including conservation and access to vicuña use. As seen in

Chapter 5, the Bolivian Government developed a national system devising institutions at various levels of spatial aggregation for community-based monitoring and custodianship of vicuña populations.

At national level, the government in Bolivia sets up the terms and conditions, under the Vicuña National Regulation and CITES, for the formation of community-based institutional arrangements. At a regional level, CITES policy is defines those areas for strict protection and these areas for conservation through sustainable use based on the species-area relationship. At a sub-regional level, the Regional Associations for Vicuña Management group those communities interested in vicuña use. At a local level, these interested communities have to organise their territories, as communal management areas, and their exclusive rights to use vicuña become officially recognised by the State.

6.3.1 International policy boundaries

CITES divides the target populations under Appendix I (conservation under strict-protection) or Appendix II (conservation through sustainable use), based on the spatial scaling of species-area relationships. In this regard, the director of the Ecological Institute says:

> *There is no logic behind the argument of Appendix I and Appendix II of CITES. Within an area classified under Appendix II, a community may have fewer animals than their neighbour, a situation very similar to an area classified under Appendix I. If there are a small number of animals, it is not worth capturing and shearing* vicuña*s and behaving as if it was under Appendix I* (Interview in La Paz, 26/02/2003, 16/4).

While the rationale of CITES is to improve the incentives for conservation by shifting policies to sustainable use, the preceding argument refers to the incentive problem that may arise from the considerable uncertainty of vicuña distribution. The change in CITES policy does not consider the difficulty and limitations of spatial scaling that usually arises in natural resource management (Sclater and Sclater, 1988).

Many studies have shown that when a resource-based productivity is low or varies spatially and over time, local people may decide to implement either common or private property solutions (Feder, 1987, Lawry, 1990). This trend from communal to private use of resources is illustrated for vicuña management in Peru. Results of a questionnaire distributed to community members from the Vicuña Committee in Arequipa reveal that, in spite of having very few vicuñas in their fields, local people pursue semi-captive systems for vicuña management (Workshop, 12-13/12/2002, 238/3). The semi-captive system that encloses vicuñas inside a corral is a form of demarcation or privatization of vicuñas.

Therefore, while international policy regimes, such as CITES, try to link the horizontal scale of embedded agro-ecological systems with the policy framework, vertically articulated from the international to the local levels, the potential to integrate conservation with development goals remains largely unexplored with regards to habitat availability (Dickson, 2002), or the perceptions of local people themselves.

In Bolivia, where the common property regime for vicuña capture and shearing in the wild is the only solution adopted for vicuña use, interested communities have to make decisions and establish intra-and inter-community shared agreements to manage vicuña within their communal land. On the other hand, the ethnic boundaries (*Aymara*-speaking communities) may overlap, complement or conflict with political boundaries that have been imposed in Andean communities through various reforms and counter-reforms, as explained earlier in this Chapter. These sets of boundaries are examined in the following two sections.

6.3.2 Regional Association for Vicuña Management Machaqa

Vicuña distribution in the area that conform the ARMV Machaqa is not homogenous. As seen in Chapter 4, given the arid, high-altitude, rugged relief conditions of the Altiplano region, overlapping patchworks of different qualities of land are characteristic. The area that forms the *Marka* San Andrés de Machaqa presents different patterns of land use. The total cultivated extension in the *Marka*

occupies 5% (300 hectares) and the pastoral land takes up 94% (141,599 hectares) of the total area. The South of the *Marka* is characterized by conditions that are less favourable for agriculture and more suitable for livestock grazing.

Vicuña distribution is not only affected by a changing and unpredictable environment, but also by anthropological factors. For example, to avoid vicuñas eating crops and bathing in livestock baths, people chase them with dogs (Pers. obs. in *Ayllu* Choque and *Ayllu* Yaru, fieldwork 2002). These examples illustrate those cases where collective vicuña custodianship is difficult to implement. Both groups of factors, environmental and anthropological, fluctuate across space and from one season to the next and may explain the patterns of distribution of vicuña within the area of study. For example, *Ayllu* Choque, located in the South of the *Marka*, shows the highest concentration of vicuñas with a density of 0.083 vicuñas per hectare in comparison with the lowest concentration of vicuñas in *Ayllu* Yaru with a density of 0.038 vicuñas per hectare, as shown in Table 6.3.

Determinants of vicuña distribution are not homogenous within the area of Machaqa, and availability at time of need may differ depending on the specific site conditions. For example, deciding where vicuña capture is going to take place depends on three main conditions: density of vicuñas, water availability, and accessibility to the site (personal observation, vicuña capture and shearing events 2002). Each *Ayllu* within ARMV Machaqa coincides with a Protected Area designated by government in 1980 (see Chapter 5) for the continuous monitoring and census of vicuña populations. This information is provided by 9 wildlife wardens distributed within the area (see Table 6.3). The following section examines how communities in each of the *Ayllus* within Machaqa organized their territories to access vicuña capture and shearing events.

Table 6.3 Overlapping boundaries for vicuña management in Machaqa

Social and territorial organisation	**Area in hectares**	**Nº of vicuñas (density in vicunas/ha)**	**Nº of wildlife wardens**	**Nº of families**	**Nº of communities**	**Participating communities**	**AMC (1997-2002)**	**Boundaries (year 2002)**
Ayllu Choque	21.,171	1,672 (0.083)	3	232	6	1	San Antonio	Community
						1	Kanapata	Community (in division)
						1	Nazacara	Community
						1	J.deManquiri	Community
						1	Huallaquiri	Community
						1	Pachamaya	Community
Ayllu Yaru	13,794	500 (0.038)	1	230	4	3	Conchacollo	Canton (Division of *Ayllu* Yaru)
Ayllu Collana	22,254	955 (0.045)	1	203	6	6	Collana	*Ayllu* = Canton
Ayllu Levita	43,354	1,996 (0.045)	2	406	11	8	Laquinamaya	*Ayllu* = Canton (in division)
Ayllu Bajo Achacana	24,382	1,050 (0.045)	0	316	12	1	Chijipucara	Community
						6	Chuncarcota	Canton (Divided community)
Ayllu Alto Achacana	30,200	1,314 (0.046)	2	347	11	1	Antaquirani	Community
Marka San Andrés de Machaqa	155,155	7,487	9	1734	50	25	12 (2000-2002)	*Marka* = Municipality = ARMV

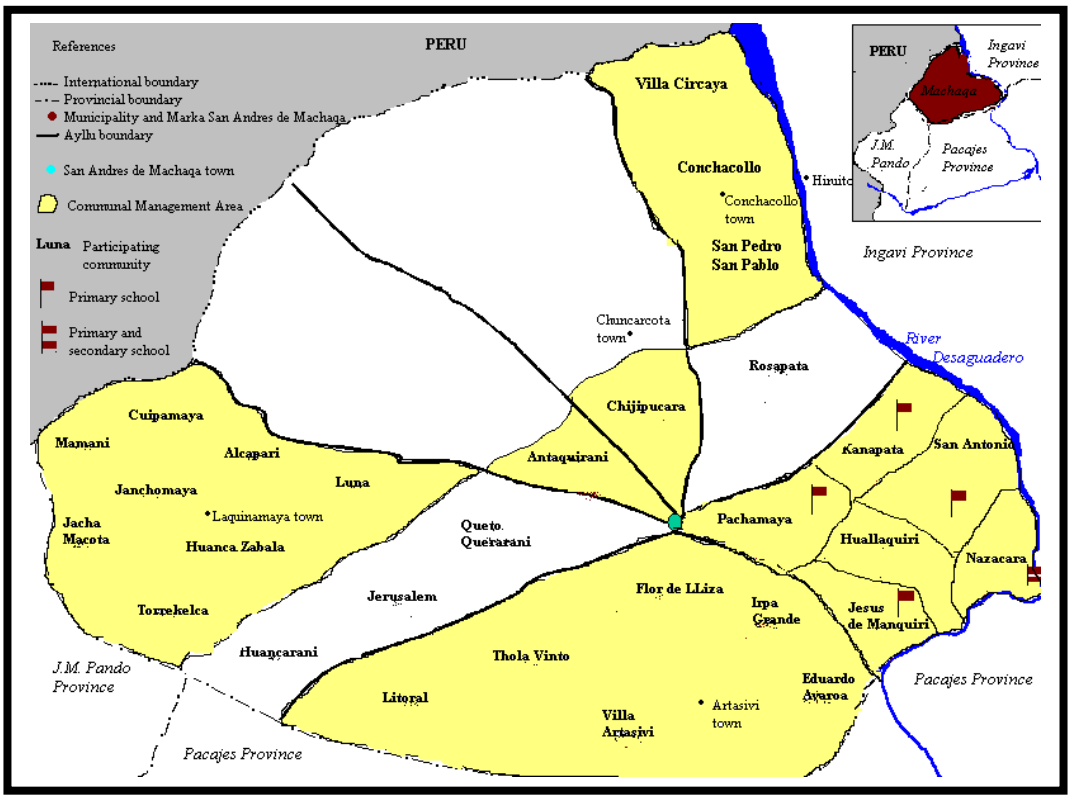
Source: Analysis of interviews and meetings with key informants, participative observation during vicuna capture and shearing events in 2002, triangulated with secondary sources such as cartographic map of San Andrés de Machaqa, (DGB, 2002a) 2003), Prefecture of La Paz (2002), Plata Quispe *et al.* (2002). Notes: AMC Communal Management Area

6.3.3 Communal Management Areas

The analysis in this section suggests that nested community-based institutions for collective action, defined by ethnical traditional community boundaries, are not always reflected in the size and boundaries of AMC; and other factors may also be dividing or cross-cutting community boundaries.

Communal management areas (*Areas de Manejo Comunal*, AMC) are territories shared by one or a group of communities as shown in Figure 6.3. Since 1997, land titling for vicuña custodianship is given to one or more communities interested in vicuña management that have agreed to share their territories to protect and manage vicuña. Through the legal recognition by the State, they become exclusive users and beneficiaries of shearing activities and future commercialisation of fibre (see Chapter 5). Delays during this legal procedure are caused not only by the extremely bureaucratic procedures, but also because communities encounter difficulties in mapping the boundaries of their communal management areas (Rendón Burgos, 1998). When analyzing the overlapping boundaries of communal management areas, three different patterns emerged (see Table 6.3).

Figure 6.3 Communal Management Area in ARMV Machaqa



Source: Mapping by community members triangulated with cartographic map, croquis wildlife wardens, Satawi report, and DGB (2002a, 2003).

At one extreme, communal management areas coincide with the *Ayllu*. This is the case of AMC Collana. At the other extreme, AMC coincide with communities as defined on the basis of traditional authority structure. This is the case of AMC in the *Ayllus* Choque, Bajo and Alto Achacana. A third case was identified in which communities in a part of the *Ayllu* have associated to share their communal area to manage. This is exemplified by the AMCs in Levita and Yaru. This division does not coincide with any political division in the past. Areas for vicuña management formed by more than one community have also been observed in the Regional Association Apolobamba. This Association groups ten communal management areas that represent 25 communities, because three of these are formed by more than one community (SERNAP, 2004).

These different layers of traditional, political and administrative divisions are illustrated by the size and boundaries of communal management areas observed. There are cases, such as in the *Ayllu* Levita where three communities do not want to associate with the 8 communities that conform the AMC Laquinamaya, three communities do not want to associate with the rest of the communities of the *Ayllu* Levita to manage vicuña. The underlying reason for this is that they wish to separate from the rest of the *Ayllu/Canton* Levita boundary by claiming their own land titling as canton and nominating their own traditional authorities (Meeting in Laquinamaya, 17/11/20002, 161/3).

Therefore, AMC boundaries for vicuña management reflect instead the various political and administrative divisions imposed by the various reforms and counter-reforms in Bolivia. These socio-political processes, as will be discussed in the following section, may also be affecting the functionality of AMC.

6.4 Factors affecting collective action in vicuña capture and shearing events

Vicuña capture and shearing events occur once a year in each of the communal management areas where community has shown interest to participate. Although the number of community groups that have participated in this two-day event has increased, since the shearing programme started in 1998 for Sud Lipez and 2000 for Machaqa, 2001 for Nor Pacajes Regional Associations, community involvement in vicuña capture and shearing events has been discontinuous, as shown in Table 6.4. Therefore, this section explores the factors affecting the emergence of collective action in vicuña capture and shearing events.

Table 6.4 Communal Management Areas in Mauri-Desaguadero

ARMV	Participating Communal Management Areas					
	1998	1999	2000	2001	2002	Total
Sud Lipez	3	-	-	5	-	5
Machaqa	-	-	3	7	10	12
Nor Pacajes	-	-	1	3	2	5
Paca Japis	-	-	-	-	-	0

Source: Based on DGB (2003); Prefecture La Paz (2002), Notes: Communal Management Areas are integrated by one or more participating communities, ARMV Regional Association for Vicuña Management

The in-depth analysis of ethnographic data collected at community-level in Sud Lipez, Machaqa, Nor Pacajes, and Paca Japis ARMVs was analysed to identify those conditions that facilitate or impede community involvement in vicuña capture and shearing events, and supportive collective action. These conditions were grouped under four main variables, as shown in Table 6.5.

6.4.1 The ability to communicate

The common property regime for vicuña management in the wild is based on the general assumption that traditional communities imply commonality, providing basis of trust for collective action within that group. Trust is usually defined as 'the expectations individuals have about each other's behaviour (Oström, 1998a), and the evidence taken in this thesis for identifying trust is on how actors perceive or expect other actor's behaviour, in terms of legitimacy and reputation for keeping promises.

The key actors examined were those directly involved in the coordination and planning of the two-day vicuña capture and shearing event (VCSE). These were the DGB technicians, the wildlife wardens, community authorities, and community members. Their specific roles and responsibilities, as shown in Table 6.6, also rely on the ability to communicate, as will be examined further in this section.

Table 6.5 Variables affecting collective action in vicuña shearing events

Variables	**Participating communities**			**Non-participating communities**
	Ongoing participation	**Failed to participate**	**Initial participation**	
The ability to communicate	Between wildlife warden and *Mallcu* Accountability (or lack of) between wildlife warden and community Opponent lobby by strong community leader	Lack of *Mallcu* appropriate leadership	Ability to communicate between wildlife warden and *Mallcu* Appropriate *Mallcu* leadership Communication flow between wildlife warden and *Mallcu*	Lack of access to information Lack of communication between wildlife warden and *Mallcu*
Past experiences	Successful experience in nested community-based watershed management Successful experience in vicuna capture and shearing events Continuous external support Lack of legitimacy and trust towards the State	Conflict regarding use rights over vicunas captured last year	Observation of successful experiences in other communities	Willingness and capability to address transaction costs Lack of infrastructure and material and logistic support Lack of people
Mechanisms for conflict resolution	Reciprocity or Ayni established Low transaction costs to obtain human labour and resources in those larger AMC	Lack of consensus within community	Reciprocity or *Ayni* established Low transaction costs to access human labour in those big CMA Lack of social contract to obtain human labour	Other livelihood priorities and not interested
Size and boundaries of communal management are (AMC)	Appropriate capture site Many capture sites provided by larger AMC Low density of vicuna does not affect community involvement	Unclear boundaries and use rights in small AMC	Many capture sites provided by large AMC Low density of vicunas does not affect community involvement	Low density of vicunas and lack of appropriate capture site No legal entitlement Areas under Appendix I of CITES

Source: Analysis of ethnographic data collected in 12 AMCs where communities did not participate and 22 AMCs amongst which 9 AMCs showed an ongoing participation, 5 AMC failed to participate in 2002, 8 AMC initially got involved in 2001 (Sud Lipez area) and 2002 (Machaqa and Nor Pacajes areas), and 12 AMC that did not participate (see Chapter 3 and Appendix A). Notes: AMC Communal Management Area

Table 6.6 Distribution of roles and responsibilities during vicuña events

Key actors	Roles and responsibilities
DGB technicians	The DGB is the government authority that coordinates and plans the event in Lipez Chichas and Mauri Desaguadero areas. The DGB represents the government and CITES authorities in Bolivia. The objective of the DGB technicians is to give support to communities until wildlife wardens and community members acquire the appropriate technical skills to handle shearing in the future. The responsibility for certifying fibre still remains in the hands of government, and the fibre shorn each year is taken to La Paz city to be stored in the Ministry offices until commercialisation takes place at national level. From 1998-2002, they provided logistic support; technical guidance; and financed tools and materials through various projects and programmes to both study areas.
Wildlife wardens	A total of 24 wildlife wardens distributed in Mauri-Desaguadero (16) and Lipez Chichas (8) areas. They are members of the communities, employed by the DGB to support vicuña management activities. During the period from 1998-2002, they acquired technical expertise on vicuña capture and shearing and supported interested communities in the various management tasks. Wildlife wardens also coordinate with communities in the organisation of territorial boundaries to be recognised by the State as communal management areas. This coordination is usually established through the community authority. Wildlife wardens have to provide the DGB agency with a list of community management areas and preferred date for initiating the event.
Community members	Interested communities have to also obtain the legal entitlement, willingness, and institutional capacity to participate in the capture and shearing of vicuñas. They are expected to collaborate in each stage of the event. The coordination and planning for vicuña capture and shearing events is done through the community authority, depending on the internal power relationships between the traditional and political authorities within communities. In Sud Lipez, the coordination is made through the political authority called *corregidor* because it is more influential within communities than the traditional authority called *jilacata*[52]. Instead, in Mauri-Desaguadero the coordination of the event is made through the traditional authority called *Mallcu*. Community authorities of each communal management area have to coordinate and plan with the rest of the community members the date and location of the vicuña capture and shearing events. *Mallcus* communicate their decisions to the wildlife wardens in charge of their area.

Note: Table constructed by author based on the triangulation of the information from DGB reports and field observations. The information presented in this table integrates both, the formal and informal roles and responsibilities observed during fieldwork.

[52] An anthropologist working in the region confirmed this observation of power relationships between political and traditional authorities in Sud Lipez (Pers.comm. M.Bolton).

6.4.1.1 Government technicians and interested communities

The communication between DGB technicians and interested communities relies on both formal and informal procedures. The formal procedure consists of a letter of request and norms endorsed by DGB (see Chapter 5), while the informal procedure corresponds to the adaptation of DGB technicians to the specific conditions, once they arrive to the communities. The overlap between the formal and informal procedures can either facilitate or create contradictions and impede the ability to communicate, as will be illustrated by the examples described below.

One of the cases where the interplay between formal and informal procedures facilitates the coordination and planning of the event is the importance of flexibility and adaptation of DGB to site-specific circumstances. For example, the DGB technicians take into account the different power relationships that exist between traditional and political authorities in Sud Lipez and Mauri-Desaguadero for re-confirming, once arrived to the communities, the date and location of the event (see Table 6.6). Another example of the overlap that exists between formal and informal procedures is illustrated by the coordination and planning of vicuña capture and shearing events in *Ayllu* Choque, explained below.

Ayllu Choque, located in Machaqa Regional Association, shares 180 posts for construction of the vicuña capture enclosure between its six original communities that have organized their territories in six communal management areas for vicuña management. The *Ayllu* has approximately 1,672 vicuñas distributed in 21,171 hectares. The area is patrolled and monitored through periodic census by three wildlife wardens, members of the Nazacara, Huallaquiri and Pachamaya communities (see Figure 6.4).

Through the formal procedure, wildlife wardens reported that five communal management areas presented in June 2002 a letter of request to be approved by DGB to participate in the vicuña capture and shearing events to be held in October 2002. The five communal management areas were: San Antonio, Nazacara, Kanapata, Jesus de Manquiri, and Pachamaya. In their list mentioned by wildlife wardens,

Huallaquiri was not mentioned. In this regard, the DGB technician explained why the formal procedure is used to arrange a tentative schedule of the events:

> *The six communities from Ayllu Choque requested the capture. The application is done every year because Mallcus are rotated every year. With that information, it is possible to draw up a temptative schedule.* W*e do not know beforehand when and where the captures are taking place until we get the confirmation from respective Mallcus* (Interview, 31/10/2002, 58/3).

While six communities were scheduled to participate in vicuña capture and shearing events in 2002, only five eventually did, because Pachamaya withdrew from the list. Therefore, the formal procedure does not guarantee the commitment or shared interest from communities towards the vicuña capture and shearing event. In this regard, the DGB technician manifested their will, in case of re-structuring schedule, to support another capture in those communities that wish to do so:

> *We have budget for 200 litres of fuel, this covers six captures and shearings, the six communities in Choque.* Now*, we need to work out Saturday and Sunday* [These days were scheduled to undertake vicuña capture and shearing events in Pachamaya]. *One option is to ask Nazacara and Kanapata if they want to do another capture. Kanapata has already expressed its will* […] (Interview, 25/10/2002, 32/3).

The example in *Ayllu* Choque reveals that there is still an opportunity for communities to get involved or withdraw from the event. This demands some coordination and timing between the DGB and community agendas in both study areas. The delays between DGB promises and deliverables, during the period from 1998-2002, in part explain the lack of continuous community involvement in vicuña capture and shearing events (see Table 6.4).

However, communities in Mauri-Desaguadero and Lipez-Chichas fieldwork sites have different historical geo-political relationships with central government, and therefore perceive DGB's delays between promises and deliverables differently. In both study areas, nevertheless, it appears to be moving into a phase of reduced optimism and some communities have become discouraged.

In Sud Lipez, there was a lack of continuity of vicuña capture and shearing events, for example captures were suspended in 1999 and 2002 for various motives (see Chapter 5). In Mauri-Desaguadero, although the formal pre-arranged date for vicuña capture and shearing events was mid-September, the exact date of the event was not settled until DGB technicians arrived in the field in mid-October. During the whole month, there was great expectation and discussion on the possible date of vicuña capture and shearing events. Communication between wildlife wardens and DGB offices in La Paz was done through telephone. DGB technicians told wildlife wardens to have people ready for their arrival at any time. This unpredictable schedule of vicuña capture and shearing events produced major discontent at community level. For example, in AMC Conchacollo, coordination and organisation of peoples' participation had to be suspended on two occasions due to false communications of DGB arrival. DGB technicians also confirm the negative impact of the delay between promises and deliverables:

> *The failure in the coordination and planning has been the bureaucratic delays in obtaining fuel to travel (...), but communities should be alert (...) communities generally wait for us to do everything (...). We are here just to support them (...). One day we will not be here any more, and it is then that they have to continue with the initiative* (Interview in Machaqa, 17/11/2002, 159/3-160/3).

Wildlife wardens are responsible to communicate these government delays to the community. This leads to a lack of trust of communities towards government, also making the relationship between wildlife wardens and community members difficult, as will be explained in the following section.

6.4.1.2 Wildlife wardens and community members

Wildlife wardens are community members that have been elected by communities themselves at the start of the Vicuña National Programme (in the 80'). For example, the wildlife warden from Nazacara was the first warden to be designated in the area (20 years ago). There are 16 wildlife wardens employed by the DGB to monitor vicuña populations in the Mauri-Desaguadero area. The unit of monitoring and census of vicuñas in Machaqa is the *Ayllu*. Nine wildlife wardens are

employed by the DGB to protect and control vicuña populations in each *Ayllu*. The area monitored by each wildlife warden is very variable. It can range from approximately 7,000 hectares in *Ayllu* Choque to 22,000 hectares in *Ayllu* Collana (see Table 6.5). However, the monitoring area that one wildlife warden is responsible for, is still over the limit of 1,000 hectares per guard, stipulated by the IUCN for patrolling and monitoring a protected area (Sayer *et al.*, 1992).

These wardens have to control poaching and monitor and census vicuña populations, providing this information to the DGB in exchange for a salary of 600Bs/month equivalent[53] to approximately £ 43. Along with the wildlife wardens, community wardens have also been elected on an *ad-honorem* basis but wildlife wardens complain that they do not cooperate with them. Wildlife wardens know that this is related to the fact that they will not work in the same tasks for the government without compensation.

As shown in Table 6.7, community members and DGB perceive the role of wildlife wardens as pivotal during the coordination and planning stage, while wildlife wardens perceive their responsibility to align community interests with government agendas limited and constrained by DGB and *Mallcus*.

[53] Equivalent to rate 22/09/2004

Table 6.7 Perceptions of constraints during the coordination and planning stage

Respondent	**Problem**	**Why?**
Wildlife wardens	Communication with *Mallcus* and DGB	"*Mallcus* are rebel, do not listen" "DGB delays their arrival to the field"
Community members	Wildlife wardens retain the information	They share and retain information either with DGB or *Mallcus*, but do not communicate to the rest of the community. Their position should rotate, we are all capable of doing their job!"
DGB technicians	*Mallcus* Wildlife wardens	*Mallcus* rotate every year Wildlife wardens do not communicate with communities

Source: Analysis of interviews to community members, wildlife wardens, and DGB technicians.

The commitment perceived by wildlife wardens to align interests between DGB and communities, is illustrated by a discussion held between DGB technicians and wildlife wardens in Conchacollo. An important meeting was held in Conchacollo, the same day of DGB technicians' arrival. The meeting was organized to discuss why some communities fail to participate in the vicuña capture and shearing event, and the delays and absences amongst wildlife wardens. The DGB technician opened the discussion by blaming the wildlife wardens for being inefficient in their ability to communicate with community authorities and other community members:

> *You see, these are the results when you [wildlife wardens] do not relate appropriately with Mallcu [community authority] and move*[54] *adequately within your community* (Meeting, 15/11/2002, 140/3).

To this statement, the wildlife warden of *Ayllu* Alto Achacana responded:

> *My experience is that I can't talk about vicuna in community meetings because community members are not kind and Mallcus do not listen to us because they say we earn a salary* (Meeting, 15/11/2002, 140/3).

[54] The term in Spanish that is used is *moverse* and it is a metaphor that illustrates that the ability to communicate (because of the lack of transport) is related to the ability to walk and visit the scattered households within the area.

In some cases, wildlife wardens have maintained a high level of legitimacy within their community and have won respect as communicators of vicuña issues to the rest of the community. For example, the wildlife warden of Nazacara who was appreciated as a good community member, was asked to report on the status of the vicuña within the area during a community meeting in Jesus de Manquiri (Fieldwork observation, 16/09/2002, 103/2). In other cases, wildlife wardens are reported as having a lack of legitimacy *vis-a-vis* their duties and responsibilities within communities, and are neither listened to nor invited to provide their opinion on the matters or issues relating to vicuña.

As regards delays and absences, the wildlife warden from Santiago de Machaqa located in Paca Japis Regional Association, stressed the need to improve the system of planning and coordination between DGB technicians and wildlife wardens from the area. He said:

> *Sometimes, one loses more than one should travelling forward and backwards to the arranged meeting point because of misunderstandings* (Meeting, 15/11/2002, 140/3).

Wildlife wardens have to cover their own travel expenses, including bus or fuel for motorbike or bike repairs. During the past month, wildlife wardens had met 3 to 4 times in Nazacara town where they expected the DGB technicians to arrive. In the case of wildlife wardens in Pacajes, there is no direct public transport to Machaqa area, access is through La Paz City or, if not, a 2-day bicycle ride of approximately 100Km. During the discussion, the argument built up with examples from each wildlife warden. The DGB technician, finally reinforced his authority by recommending:

> *You should listen to Radio San Gabriel, a little half an hour in the morning between 7 and 8 am and half an hour in the evening between 5 and 6 pm, we have always announced our arrival to the field by radio* (15/11/2002, participative observation, 140/3).

In fact, wildlife wardens' perceptions, outlined above, indicate that they have a critical position regarding the ability to communicate with DGB technicians and communities that influences the coordination and planning process during vicuña capture and shearing events.

The analysis of interviews at the local level reveals that local people usually question the wildlife warden's role within communities. *"What do they do to receive a salary that others in the community cannot do?"* was a general question arising from discussions. In fact, there is a general lobby against wildlife wardens, with emphasis on the unfairness of their position that has grown rapidly following public awareness questioning their efficacy. However, there are some cases in which wildlife wardens already have a high legitimacy, both towards the Vicuña National Programme and towards the duties and responsibilities to their own community. This legitimacy is seen as that reputation for keeping promises, and therefore for being trustworthy. The following sections illustrate how this legitimacy develops into trust and leads to various forms of collective action that can either support or inhibit participation in vicuña capture and shearing events.

6.4.1.3 Community authorities and members

In the case of Huallaquiri, the community authority, the *mama thalla*, played a key role in lobbying members of the DGB and of the communities to gain access to vicuña capture and shearing events. She personifies one of the effects that out-migration is producing on the internal dynamics of communities. Her rights to the inherited family parcel of land (*sayaña*) were maintained by fulfilling for the family the service of community authority that year. She is a young single woman, 25 years old, and the only member of her family left with time to fulfil this position since other members of her family migrated and the remaining members, her widowed mother and a sister who is a single mother of two young boys, live in Nazacara town. Thus, she has been designated within her family as responsible of maintaining the rights of the family to their parcel of land and, in this case, to fulfil the position of community authority (*mama thalla*).

Regarding vicuña management this situation has its advantages since, as described in the example above she was particularly interested in the shearing programme and also was particularly dynamic in her position of community authority. The author had the opportunity to see her actively participating in two other meetings within the *Marka.* These were the meeting at Aguallamaya bridge to discuss about issues concerning both *Marka*; San Andres and Jesus de Machaqa (12/10/2002, participative observation, 159/2). A meeting in Chuncarcota was also held to discuss about the advantages and disadvantages of transforming the *Marka* into a municipality (08/10/2002, participative observation, 135/2).

In Conchacollo, the community discontent towards DGB intervention was lobbied by one local leader that also announced that Conchacollo community will take over vicuña management.

The communities of Huallaquiri and Conchacollo showed that the ability to make credible commitments within communities is channelled by community members with leadership characteristics such as the community authority in Huallaquiri and community member in Conchacollo. This ability can either enhance, in the case of Huallaquiri, or impede, in the case of Conchacollo, the implementation of the Vicuña Management Programme.

The examples of interactions between DGB technicians, wildlife wardens and community leaders explored in this section show how the organization and emergence of collective action relies on the ability to communicate; how this communication is established; and the characteristics of the individuals involved. In the absence of any form of fencing, the agreement amongst communities and individuals occur over access to land and access to vicuña populations. These internal dynamics will probably lead to cases of cooperation and non-cooperation. These cases are explored in this section.

The close examination of cases discussed in this section reveals that the ability to communicate between the DGB technicians, wildlife wardens, community authorities, and community members, is rooted on relationships of trust. An appropriate leadership to establish the link between the government and community

members can enhance this trust. The features of an appropriate leadership were identified as:

- Good communication with other community members;
- Legitimacy towards their role;
- Accountable for their actions

In reality, to develop an appropriate leadership built on trust, in an environment in which others are untrustworthy, has proved to be difficult to maintain. Another pre-condition that may also play a key role for achieving cooperation is the existence of mechanisms for resolution of conflicts, as will be explored in the next section.

6.4.2 Social capital and mechanisms for resolution of conflicts

The comparison of the factors affecting community involvement in vicuña capture and shearing events (see Table 6.6), and legitimacy towards local-level collective action institutions, reveals the key role that mechanisms of conflict resolution have in either reinforcing or weakening this relationship of trust *vis-à-vis* external agencies and community members.

One of the mechanisms is the *Ayni* or mutual reciprocity agreement between communities. Laquinamaya, Collana and Conchacollo are community organisations formed by a group of families, spatially and socially joined together, to participate in vicuña capture and shearing activities, defined by themselves as "a joint capture" (*captura en conjunto*, pers.obs. *Mallcu* subcentral, 15/11/2002, 139/3), while Nazacara, Huallaquiri, Jesus de Manquiri, San Antonio, Kanapata within *Ayllu* Choque, Chijipucara within *Ayllu* Alto Achacana, and communities within Sud Lipez decided not to group with other communities.

In the first case, communities in Levita, Collana and Yaru created specific collective action organizations for the event. It could be assumed that these cases show more evidence of collective organisations than the second cases. In the second case communities in Choque, Alto Achacana and Sud Lipez adapted organizational structures already in place called *Ayni* for the specific event.

The community authority in Huallaquiri established an *Ayni* with Jesus de Manquiri and Nazacara to acquire human labour support during the vicuña round-up and capture event. The DGB technician said:

> *People in Nazacara are not going to come because they don't need help, they've got lots of vicuna, they have already captured many and they have enough people within their community so that they do not need to do Ayni* (Meeting, 29/10/2002, 40/3).

In fact, as a community member from Nazacara says: *"* (…) *Nazacara is winning, isn't it ?(...)"* (interview, 25/10/2002, 29/3). Although her comment reveals that people in Nazacara were more interested in communitarian-inter-group rivalries, than communitarian-inter-group reciprocity or *Ayni* with Jesus de Manquiri, this can also be seen as an evidence of social capital.

The general attitude observed was a low expectation from individual members towards overall community participation and involvement. When the community authority in Huallaquiri arranged with community authority in Jesus de Manquiri an *Ayni* to help in their future captures, the School teacher from Jesus de Manquiri, whispered: *"I doubt it a lot that Jesus de Manquiri will give much support"* (Pers. comm., 29/10/2002, 39/3)

This general lack of trust at community level is also related to the ambiguity that exists around use-rights and future beneficiaries of the vicuña capture and shearing events. Sometimes, it generates a lobby, at community level, against vicuña capture and shearing terms and conditions that are imposed by government. In this respect, a community member in Chijipucara located in Machaqa insisted: *"We will participate in the capture if you let us butcher vicunas"* (participative observation during group discussion, 20/11/2002, 186/3-187/3). Another community member in Chocorosi located in Nor Pacajes said: *"We will only participate in the capture if the fibre stays with us"* (semi-structured interview, 16/10/2002, 183/2).

In the first case, it was only one person with little power in his community; in the second case, lobbying was being used against state agency DGB. The fact is that

DGB takes the fibre shorn to La Paz offices and the lack of economic benefits from it is making local people mistrust the fairness of this programme.

Thus, the general assumption regarding the cohesion of communities is no longer tenable, and it is evident that communities are in a process of continual division of territories together with that of interests. In those cases where the mutual agreement between communities was established, the incentives to associate were not necessarily linked to the Vicuña Management Programme. They were instead linked to using the exclusive rights granted by government as a vehicle to either reinforce rights to political divisions, such as formation of new cantons, or enhance community pride and dignity *vis-a-vis* Government, by perceiving vicuña as part of their patrimony.

The local-level institutional design for vicuña management, explored in the previous section, represented by the Regional Association and the Communal Management Areas, in some ways overlaps, conflicts or reproduces configurations of inequity and exclusion from regional to local level.

In fact, the creation of Regional Associations for Vicuña Management is seen by community members as an organisation imposed and managed by the State because members of the Assembly are not considered members of the community. One way they locally define this is by saying: *"They are political positions and do not represent us"* and are said *"not to be active"* (Analysis of interviews to key informants)

Most of the people say that the main reason for this is because their role in the process of fibre commercialisation, that is the collection of fibre and distribution of benefits, is not functional yet. In fact, it was very difficult to contact these Assembly members in the field since most of them were residents in La Paz. Very few key informants knew about their existence and wildlife wardens do not communicate with them. Their physical absence and the apparent ignorance of their existence within communities reflects, in this case, their lack of information regarding vicuña management. This lack of information and the effects of past experiences are explored in the following section.

6.4.3 The role of past experiences

The role of past experiences, and how they can affect perceptions of success are demonstrated in Pachamaya and Huallaquiri areas for vicuña management. Before DGB arrived in the field, Pachamaya was scheduled to participate while Huallaquiri was not. Once DGB arrived in San Antonio and Kanapata, for vicuña capture and shearing activities; the wildlife warden from Pachamaya community said, during a group discussion amongst wildlife wardens: *"Pachamaya doesn't want to participate, half of them are in discord between yes and no [participating or not in the event]"* (30/10/2002, group discussion, 48/3).

The underlying reason for this disagreement was related to past experiences over the rights to vicuña use that members from Pachamaya community had faced during their participation in the shearing event in the previous year 2001. In this regard, the wildlife warden from Pachamaya community added:

> *Last year, when they captured vicunas, people started to yell: Those are the vicunas from Jesus de Manquiri! Release them again, Let them loose!"* (30/10/2002, group discussion, 48/3).

The site where they had chosen to capture vicuña was situated in a trans-boundary area, between Pachamaya and Jesus de Manquiri communities, and the conflict around who has the right to use vicuña is a problem related to unclear boundaries and property rights, as well as a lack of security.

This trans-boundary problem is a typical dilemma of a common-property resource, where controlling access is costly, and trans-boundary and fugitive characteristics make it difficult to set up use-boundaries for wildlife moving across community territories. As a result of this process, some community groups often capture the flow of benefits, creating a breakdown in linkages between communities upon which the common property regime depend.

The case of Huallaquiri was different. Before vicuña capture and shearing started, the community authority from Huallaquiri expressed her reservations about participating in the shearing event that year:

> *It is not possible, the site is not good for the capture because it is on a slope, and there is low density of vicuna and we are very few people* (interview, 15/09/2002, 95/2).

Her argument was based on the perception that the community did not fulfil the three criteria for the selection of capture site: the high density of vicuñas, water availability and accessibility to the area. This perception was based on her first-hand observations during vicuña capture and shearing events in 2001 in Nazacara, a communal management area offering good conditions for vicuña capture and with successful fibre production. Interestingly, her argument changed after her personal observations in the Jesus de Manquiri shearing events when she saw that, in spite of the reduced number of vicuñas and few people participating, they were able to capture some vicuñas.

In Jesus de Manquiri, the criteria for selection of capture sites and design of enclosure did not follow technical advice. The site chosen was at the edge of the Desaguadero river, two hours bicycle-ride from Nazacara town, along the river's edge, and the difficult topography affected the design of the capture enclosure and limited the probability of capturing vicuña. In spite of these limitations, this experience showed that it was possible to capture and shear vicuña: 18 vicuñas were captured, 15 were sheared with a total harvest of nearly 2.5 Kg of fibre.

In the end, the community members and authority in Huallaquiri reconsidered participating in the event. The main problem was finding a way to transport the posts from Jesus de Manquiri to Huallaquiri. Under *Ayni*, the community authority of *Ayllu* Choque, in representation of Huallaquiri community, asked the DGB technician: *"Engineer, Huallaquiri wants to capture vicuna, would it be possible for you to help us with the transport of posts?"*, and the DGB technician replied *"It is not the moment to ask for help*" (29/10/2002, participative observation, 38/3).

The DGB technician meant that if the community was interested it should have organized itself beforehand. However, the motivation to participate in the vicuña capture and shearing event by the *Mallcu* of Huallaquiri, was strong enough, and the rest of the community members agreed to carry the 100 posts from Jesus de

Manquiri up to Huallaquiri school by foot the same day, so as to be ready for the construction of capture enclosure, the following day.

Both examples show that past experiences can change local perceptions and understandings of vicuña management. In the case of Pachamaya, past experience is related to unclear property rights and conflict of boundaries, providing a negative perception on probability of future success. In the case of Huallaquiri, past experiences are related to personal observations and gathering of information in other areas, this provided the basic knowledge for assessing their future risks in getting involved in the programme. However the experience in Huallaquiri also revealed the ability of the community authority to pursue its own community interests.

The positive effects of successful past experiences in building trust for future collective action is also observed by staff from development agencies working in the area since the 1980's severe drought (semi-structured interview, 21/10/2002, 6/3).

Some projects worked well, such as the watershed management. These projects have been successful in some cases such as in *Ayllu* Levita where the project coordinated by the Norwegian Mission, encouraged original communities to form collective action institutions in order to control and monitor water pumps. In order to maintain them functioning a monitoring system was developed within the communities on a rotational basis. In the case of AMC Laquinamaya, the eight communities decision to manage vicuña in joint collaboration may be based on their past successful experience in managing water resources. This development intervention has been supported and promoted by the Mision Alianza Noruega and is still functioning. However, three communities from the *Ayllu* Levita are not included in this joint collaboration. One reason for this is because these three communities want to divide their boundaries from the rest of the *Ayllu* and create their own canton. This process of division of communities through land titling (Land Reform INRA 1996) has also been observed in other parts of Machaqa area (Plata Quispe *et al.* 2002).

Some other interventions, such as construction of greenhouses, were abandoned once the project withdrew (semi-structured interview to Satawi engineer,

17/09/2002, 108/2). The Plan Altiplano, for example, was a project that focused on the construction of greenhouses, planting trees and latrines (semi-structured interview to project coordinator, 06/03/2003, 19/4). In Nazacara, the greenhouse roof was stolen; in Chuncarcota the latrines were used for storing livestock fodder and there was nobody to repair the water pumps when they broke. The main causes of the demise of these projects, according to key informants, were lack of interest and capacity building of local people. The lack of interest in having greenhouses or latrines is supposed to be related to a problem of uses and customs.

The salient point here is that different values and perceptions are negatively affecting the traditional institutional mechanisms for cooperation, bringing about, in turn, conceptual and practical difficulties in sharing vicuña and land resources as a tenure strategy.

6.4.4 Size and boundaries of Communal Management Areas

This section examines if the design of communal management areas by communities themselves to access vicuña use will fit the biological and ecological characteristics of vicuña populations, and the territorial and social configuration of local communities, as is expected by government (DNCB, 1997b). It argues that the size and boundaries of communal management areas may affect vicuña fibre harvesting and collective action. Communities have chosen between two strategies to manage vicuña. One is grouping communities' territories and the other strategy is to manage vicuña within the boundaries of one community only. This section explores the functionality of these two types of AMCs during vicuña capture and shearing events. The analysis and comparison of boundaries from 12 communal areas for vicuña management in Mauri-Desaguadero and Lipez-Chichas study areas reveals that those areas integrated by more than one community, can provide more than one appropriate site to capture vicuña and facilitate collective action during vicuña capture and shearing events, as explained in the following section.

6.4.4.1 Access to appropriate vicuña capture sites

The analysis in this section suggests that communal management areas integrated by more than one community can provide one to three, in the best of the cases, appropriate sites where to capture vicuña. For example, in AMC Laquinamaya, vicuña capture and shearing events could be repeated in two different sites favoured by the size of communal management areas integrated by eight communities, thus offering various appropriate sites where to capture vicuña.

Where the density of vicuña is low, varying spatially and over time, probably related to the poor habitat quality, the availability of vicuña at time of need, that is the day of capture, is unpredictable. Therefore, having more than one appropriate site to undertake the capture is one of the advantages of having a large unit for vicuña management.

The disadvantage of those AMC integrated by only one community may lead to conflicts between neighbouring communities that claim exclusive use rights over the same transboundary vicuña population. To avoid these conflicts, is one of the reasons why the community Pachamaya decided not to participate in the vicuña capture and shearing events in 2002 (see Table 6.6). Similar disputes over access to land, water resources, and usufruct rights over vicuñas have been found in Peruvian communities (El Comercio Peru, 26/5/2003).

The problems arising from the management of common pool resources in transboundary areas are found across a wide range of natural resources such as water, forests and wildlife (Leach *et al.*, 1997a). In the case of water resources, problems of allocation occur between urban and agriculture demands for water, such as the Colorado River in California, USA, as an example, or problems of international demarcation of transboundary rivers such as the example of the River Silala in the frontier between Bolivia and Chile (Bazoberry Quiroga, 2003).

Regarding usufruct rights over wildlife in general, and vicuña, in particular, this analysis shows that the problems arising in trans-boundary areas are very similar to the one described above for water resources. For example, Argentineans say that

Bolivian park rangers get into the Argentinean Puna to take vicuñas to their side and Bolivians say that Peruvian people shear Bolivian vicuñas when they cross to their side. Agreements have been signed at an international level to address these problems by creating trans-boundary protected areas (see Chapter 5).

As a result of these territorial and administrative reforms, new internal divisions are emerging affecting traditional community boundaries at different levels. Internal divisions within communities are affecting land distribution and allocation. In *Ayllu* Choque, for example people have recently been saying: *"Kanapata is divided, it has four Mallcus!"* (Analysis of interviews). This means that an internal dispute has divided the original community into four groups of families designating their own authorities. Sometimes, the same community has been split up dividing both territories and people, such as the division of Villa Pusuma in *Ayllu* Alto Achacana; often along kinship and interests fault lines, such as the division of Kanapata community in *Ayllu* Choque. In the absence of any form of fencing, agreement between groups of individual at different scale to access land-based is fundamental in the Bolivian Highlands (Herve *et al.*, 1995). However, the overlapping boundaries and processes currently affecting vicuña management, such as land titling has been a subject of confrontation between families. For example, the murder of an older couple by family members in Kanapata and community disputes in Yaru about rights to access common land.

Finally, the analysis in this section shows that, in the absence of any form of fencing, the shared agreement established between neighbouring communities to design the Communal Areas for vicuña management in Bolivia occurs at different scales, and confronts the dynamics of different sets of boundaries and processes affecting the access to common resources such as land, water and vicuña. The following section explores the implications of the size and boundaries of AMC on access to collective action.

6.4.4.2 Access to human labour

Vicuña capture and shearing events rely heavily on collective action institutions already in place in the Andean communities. This also reduces other costs associated with the two-day event, such as the access to tools, infrastructure or transport of posts; for example, posts are shared by each of the three *Ayllus* in Machaqa. In fact, these types of institutions for mutual aid, reciprocity and collective work, such as *Ayni*, as well as the community land not being divided by fences, and the relative poverty of the Bolivian Highlands are the three main factors supporting community-based management in the wild.

In those AMCs where social contracts have not been established such as in AMC Chijipucara, the lack of human labour affected the vicuña capture event, which resulted in a small number of vicuña captured. The social bond to collaborate in vicuña activities is already established in those communal management areas formed by more than one community. In this regard, those communal management areas formed by one community only depend on the establishment of these social contracts to compensate the lack of human labour. This is illustrated by the following case in Huallaquiri, as shown in Box 6.2.

Box 6.2 Access to human labour in Huallaquiri community

In CMV Huallaquiri, community authority's willingness to participate in the event, supported by Huallaquiri community members, was strong enough so that the problem of lack of human labour was resolved through the establishment of an *Ayni* agreement with Jesus de Manquiri and Nazacara.

In spite of people's low expectations, such as those of the school teacher from Jesus de Manquiri who told me she really doubted Jesus de Manquiri would give much support, on the day of the event there were approximately 23 community members, amongst which approximately 10 came from Jesus de Manquiri and 5 from Nazacara. The community involvement in these cases was related to the legitimacy towards the *Ayni* contract. This social contract is a key element in the organizational process during the round-up and capture of vicuña for those AMC integrated by one community only.

Source: Participative observation in vicuña capture and shearing events in Huallaquiri

Finally, establishing or not a social contract to access human labour, also heavily depends on the characteristics of community members, and it is difficult to predict whether the internal dynamics of community members is changing towards reinforcing or weakening these links. The next chapter adds another layer to this exploration by looking at the individual incentives to cooperate.

6.5 Synthesis and conclusions

In addressing the question of what are the characteristics of collective action institutions for vicuña management, this Chapter examines whether the common property regime for vicuña management in the wild fits the traditional community, based on norms and networks that enable people to act collectively.

Empirical observations derived from the close examination of an *Aymara* indigenous community in San Andrés de Machaqa reveals that what appears to be a

clearly-defined community at the local level is linked, through specific duties and responsibilities that each individual has to provide to the higher community levels called *Ayllu* and *Marka*. The geographical area of San Andrés de Machaqa exemplifies those cases, within the Bolivian Highlands, where *Aymara* (Astvaldsson, 1997; Ticona and Albó, 1997; Plata Quispe, 2002) and *Quechua* (Harris, 2000) speaking communities have conserved and maintained their traditional configuration existing before the Conquest. These studies generally confirm that the configuration of traditional communities is characterised by multiple community levels, linked through specific rules and social networks. This idea is embraced under the concept of nested community-based institutions (Astvaldsson, 1997). The many definitions of social capital that exist in the literature also refer to the norms and networks that enable people to act collectively (Pretty and Ward, 2001, Woolcock and Narayan, 2000).

This discussion of the concept of traditional communities in the Bolivian Highlands is important within the Andean context because the term community is currently being used by the vicuña management projects to refer to the target beneficiaries without a clear definition of what it really means. In practice, the target beneficiaries of these projects vary from individuals in Argentina, to families in Chile, and peasant communities in Peru (Lichtenstein and Renaudeau d'Arc, 2005). Therefore, who the beneficiaries are may have important implications on the scale of benefits.

In Bolivia, government allocates exclusive use-rights to those communities that have agreed on the size and boundaries of communal management areas and assumes that they will fit local-level collective action institutions. In this regard, the literature on common property resource management reveals that where traditional communities have remained viable, and where there are significant elements of their ethnic customs and traditional culture still in use, existing resource management regimes may be used as vehicles for conservation (Bennett, 1976, Gadgil, 1987). In the common property literature, the institutional fit or overlap is one of the pre-conditions necessary for effective common property resource management (McKean, 1992). The empirical evidence in this Chapter shows that communal areas designed for vicuña management do not always overlap with traditional community

boundaries, as conceptualised by government. Communal management areas confront conceptual and practical difficulties with pre-existing and new institutional arrangements, each of which introduces new rules of the game and relationships of power affecting the internal dynamics of the presumed traditional communities. These intra-community tensions usually lead to unclear boundaries and rights to access and use common pool resources. The concept of permeable boundaries captures the idea that community-based institutions are not static and clearly defined, and are instead the result from the individual's position in a network (Bordieu, 1977). This may have important implications on how collective action emerges. In this regard, findings in this thesis show that in those cases where collective action has been supportive of vicuña management, a number of conditions are met.

One condition relates to establishing an appropriate leadership. Legitimate institutions have a huge role to play in common management (Richerson *et al.*, 2002). Therefore, successful commons management on any scale requires a system of legitimate institutions. In this regard, some studies point out that leaders need some form of legitimacy in order to persuade members to cooperate (Van Vugt and De Cremer, 1999). This Chapter provides empirical evidence for this by identifying that an appropriate leadership based on the ability to communicate, accountability and legitimacy towards community duties and responsibilities, can enhance trust and facilitate cooperation. The evidence for this is that the information flow between community members is effective when the communication relies on the accountability of *Mallcus* and wildlife wardens to the community group, relationships of trust regarding their roles and responsibilities within the community group, as well as legitimacy of community members.

The other key condition relates to the establishment of conflict resolution mechanisms. Many anthropologists have focused their studies on the diverse institutions for mutual aid, reciprocity, and collective work in the Bolivian highlands (Albó, 2002; Bebbington, 1998; Harris, 2000), and other parts of the Andes such as in Perú (Delgado *et al*., 1998; Mayer, 2002). These mechanisms are usually related to the existence of institutional mechanisms to negotiate and renegotiate in order to resolve conflicts. Some studies have shown that to obtain low-cost compliance with management decisions, ruling elites have to convince citizens that decisions are in

the interest of a larger community (Koch, 2004). This Chapter identifies mechanisms of reciprocity or *Ayni* that facilitated collective action in those cases where the small unit of management did not favour cooperation within the group of users. Other studies support this finding and identify that the use of land under common property regimes, is not tied exclusively to the pattern of whole-village involvement, but can be arranged through contractual arrangements with smaller groups (Bromley and Cernea, 1989). However, this thesis argues that sometimes these mechanisms entail high transaction costs. Instead, a large network of small communities can reduce these costs.

The third condition is associated to an experience of past successful collective action in sharing land and resources supported by government and NGOs. An appropriate leadership, conflict resolution mechanisms, and past experiences are different forms under which trust develops. Ostrom and Ahn (2003) define trust as "the expectations individuals have about others' behaviour" (Ostrom, 1998a: 14), and as the core link between social capital and collective action. Empirical evidence in this thesis shows that a large network of small communities for vicuña management is usually based on trust. In this regard, studies in the Andean region (Bebbington, 1998; Albó, 2002) and in other parts of the world (Berkes, 1989; Bromley and Cernea, 1989; Ostrom, 1990) have also shown that ethnicity and traditional culture implies commonality, providing a basis of trust for collective action within that group. "Without trust in institutions, conflict replaces cooperation along fault lines where trust breaks down" (Richerson *et al.*, 2002).

While some authors usually associate the size of a group with the levels of collective action (Marwell and Oliver, 1993), this thesis also pays special attention on how the size of unit of management can also affect capturing the flow of benefits. In this regard, special attention is given to the distribution of the vicuña populations to be managed. The overriding condition that derives from the analysis in this thesis is that a large size of the unit of management, an area that encompasses a network of small communities, is more effective to capture the flow of benefits because it increases the number of sites available to capture and shear vicuña and the ties and networks between community groups to enhance cooperation. This observation contradicts one of the suggestions made by common property theory, where the two

important conditions recognised in the literature, as facilitators of collective action, are small size and clearly defined boundaries (Oström, 1990a, Wade, 1987, Baland and Platteau, 1996). On the other hand, the finding in this thesis supports other authors' argument that focusing on size and boundaries alone leaves aside other characteristics of the resource that may be relevant to how and whether users are able to sustain effective institutions (Agrawal, 2002).

Esman and Uphoff (1984) argue that larger groups may function more effectively, while smaller groups are more successful in initiating collective action. In this regard, the common property literature highlights that there is probably a threshold at which economies of scale take over negotiating, and collective decision-making, collective agreement on fairly restrictive use rules, and collective enforcement of those rules becomes easier (less time, lower transaction costs) than endless bilateral deals.

Therefore, this Chapter concludes that a communal area for vicuña management that encompasses a network of small communities is still more effective than a small unit for securing, on a long-term basis, the two conditions necessary for effective common property management of vicuña. It provides the social basis for developing trust and minimise the transaction costs to achieve cooperation, as well as it offers various sites to capture and shear vicuña, and with it secure the flow of benefits every year.

The next chapter explores the perceptions and attitudes of local people, within participating communities, in order to identify what type of benefits, if any, are meaningful to them.

Chapter 7. Benefits and costs from vicuña management

7.1 Introduction

Community-based Conservation is based on oversimplified ideas about the relationships between community participation, generation of benefits, and wildlife conservation. A community is seen as a social unit with uniform interests (Agrawal and Gibson, 1999) that require meaningful benefits (mainly economic) in order to adopt conservation attitudes and participate in conservation programmes (Gibson and Marks, 1995, Hackel, 1999). As seen in Chapter 1, community-based conservation of vicuña in Bolivia is also based on these assumptions and this Chapter asks: what meaningful benefits derive from participatory vicuña management?

Understanding benefits derived from participation and meaningful to local people requires identifying the positive, as well as the negative, perceptions and attitudes local people have from participating in vicuña management. Participation in vicuña management refers to local people's involvement in the everyday custodianship of vicuña populations in communal land, and in the two-day vicuña capture and shearing event held every year. The considerable experience in community-based wildlife management highlights the importance to recognise the various types of benefits that can derive from participating in wildlife management (Ashley *et al.*, 1999), and to understand the divergent interests and perceptions within communities (Gibson and Marks, 1995, Songorwa, 1999). While findings in Chapter 6 identified the key conditions facilitating collective action in vicuña management, this Chapter builds on these findings and adds another layer to this investigation, by exploring the individual motivations to participate in vicuña management.

This Chapter draws on data collected in Mauri-Desaguadero and Lipez-Chichas fieldwork sites during 2001, 2002, and 2003. It integrates the information collected through ethnographic techniques, including semi-structured interviews and participative observation during community meetings, and vicuña capture and shearing events.

The Chapter is divided into five sections. The next section, Section 7.2, explores the interactions between vicuña and local people's livelihoods, paying special attention to the costs and benefits that local people perceive from the CBC programme under common property regime. Section 7.3 examines the nature of participation during vicuña capture and shearing events, looking at the relationship between government technicians, wildlife wardens, and community members. Section 7.4 discusses the linkages between participation, and attitudes towards vicuña conservation. Section 7.5 synthesizes and concludes the main issues arising from the Chapter.

7.2 Local perceptions and attitudes towards vicuña conservation

This section draws on data collected in Mauri-Desaguadero where sufficient time was spent to observe the interactions between the 'everyday' livelihood activities and vicuña populations in community land. This helped to understand local people's livelihood strategies, perceptions, and attitudes towards the community-based conservation programme that is implemented.

There is a prioritisation of issues arising from the analysis of group discussions, community meetings and interviews in Mauri-Desaguadero fieldwork site (see Appendix A). This sequence of issues is illustrated, as an example, by the 40 year-old Head of the Education Council in Jesus de Manquiri:

> *When I was small there were no vicunas, now there are thousands of them, that is 'bonito' (...) but those thousands have started to represent a disadvantage because they invade our crops, they bathe and dirty our livestock baths and our water sources…each time more and more, and they harm us* (community meeting, 16/09/2002, 103/2).

The first issue raised relates to the aesthetic appreciation of vicuña by using the term 'bonito'[55], but the second issue that emerges relates to the increasing problems arising from the successful recovery of vicuña populations, emphasising that vicuña is becoming a problem rather than an opportunity. A member from Villa

[55] The term 'bonito' in Spanish language means pretty, nice-looking.

Pusuma, also working in the local NGO, illustrates this change in local people's attitude towards vicuña populations with a significant joke: *"Before, we had to protect the vicuna and now we have to protect ourselves from them"* (meeting, 18/09/2002, 118/2).

This changing attitude towards the increasing number of vicuñas reflects the general perception among those local people who now report vicuña is a problem in terms of costs incurred, rather than an opportunity in terms of benefits they represent. These perceived benefits and costs will be analysed in the following sections.

7.2.1 The value of vicuña and non-economic benefits

Effective CBC under a common property regime is usually enhanced if the resource to conserve is valued by the community. In Bolivia, the successful story of community-based conservation of vicuña is attributed to the cultural value vicuña has to local people and as one DGB official below expresses the main argument supporting vicuña management:

> *Although it shares its top-down approach as most wildlife management projects, it differs because vicuna management is rooted in the ancestral culture of local Andean people today with the wild management technique considered the best option to fit the social and territorial configuration of local communities* (semi-structured interview, 6/3/2003, 20/4).

In fact, there is apparently a cultural, historical, and aesthetic value of vicuña that is used to enhance the identity, pride and dignity of communities *vis-a- vis* the State and external world, this is illustrated by the community authority's (*mallcu*) speech during a community meeting in Villa Circaya:

> *I just came back from a workshop on Indigenous Villages of the Highlands (Pueblos Indigenas del Altiplano) and there were argentine compatriots, and the issue of indigenous patrimony was highlighted and that we belong to this heritage, as well as the vicuna, and we have always been the owners of vicuna. It is the State that comes and wants now to expropriate vicuna from us. Why did they take away the fibre?* (community meeting, 9/10/2002, 141/2).

What the *mallcu* vividly emphasised above is the expropriation of vicuña by the State. In this regard, in Bolivia there is historically a strong engagement of rural communities with the defense of their patrimony and natural resources (Malloy and Thorn, 1971, Dunkerley, 1984, Galeano, 1998). This is reflected in the long history of regional social movements and struggles, in most cases driven by communities living in rural areas (*comunidades campesinas*) to obtain greater participation in policy formulation and allocation of resources, such as logging in Santa Cruz, coca in Cochabamba, land, and gas in the Altiplano.

In addition to the cultural value that vicuña may have, stands the importance of vicuña as a vehicle to mobilize social capital. Recent discussions of social capital suggest the use of the political-capital concept to explain the struggles of local communities to gain access to natural resources (Birner and Wittmer, 2003). The emphasis is not only on the institutions and their associated rules, but on the networks of communication, norms of social practice and relationships of trust that facilitate cooperation within some communities and lobbying of political decision makers. This is clearly demonstrated by the community protests in *Ayllu* Yaru, as shown in Box 7.1.

Box 7.1 Community protests in *Ayllu* Yaru

The community Villa Circaya, located within the *Ayllu* Yaru, is managing vicuña as a joint association together with the communities Conchacollo and San Pedro San Pablo. This means that they form a network of three communities for the custodianship and cooperation in vicuña capture and shearing events. The protests against the tight calendars of the DGB to come and undertake the vicuña capture in 2002, explored in Chapter 6, reflect the continuous community claims over vicuña ownership and authority in decision-making. Another landmark illustrating these claims for rights and ownership over vicuña as seen in 1999, when the Bolivian government donated 77 vicuñas to Ecuador, as part of an international agreement signed under the Vicuña Convention. The *Ayllu* Yaru within San Andrés de Machaqa was selected as the target area to capture vicuñas for Ecuador. In practice, community members and authorities from *Ayllu* Yaru protested against government intervention and banned the capture in that area. The vicuñas were finally captured in *Ayllu* Choque where communities did not object to the initiative.

Source: Triangulation of interviews to key informants

The two community protests in *Ayllu* Yaru related to government intervention reveal a confrontation between state interests and local communities' wish to remain in control of vicuña (see Box 7.1). Empirical evidence in other parts of the world has shown that community protests against state intervention are usually related to the lack of government legitimacy *vis-a-vis* local communities (Knudsen, 1987), and unresolved tenure issues (Martin, 2003). In the case of vicuña, community underlying interests in reasserting exclusive use-rights over vicuña *vis-à-vis* the State and neighbouring communities are a way for demonstrating community boundaries.

The key question is whether or not vicuña conservation contributes to building social capital by fostering collaborative action, or undermines it by increasing conflict within communities or between communities and external actors. Conflicts at community level seemed to impede the effectiveness of the programme with DGB intervention. These conflicts are usually related to unrealised expectations derived from the contradiction arising from the devolution of rights and responsibilities to local communities, while key decisions regarding storage and commercialisation and access to economic benefits, remain in the hands of the State (see Chapter 5).

However, the analysis in this section reveals that currently the benefits that are meaningful to local people are not strictly economic in nature, and value of vicuña is also:

- Aesthetic or cultural
- A vehicle for demonstrating community boundaries
- A way of reinforcing social capital

Once the DGB withdraws, or the commercialisation of fibre is finally realised, these values may persist or change either in support or against the continuation of the Vicuña Management Programme. Therefore, because circumstances can change, the understanding and analysis of whether these values derive in meaningful benefits should be part of a continuous research process.

7.2.2 Perceived costs derived from vicuña conservation

Livelihood strategies in the two fieldwork sites, Mauri-Desaguadero and Lipez Chichas, have developed in various ways, by combining two main components. Firstly, livestock and crops as the everyday natural resources they use for subsistence; and secondly, the market, urban and migrant income. Therefore, the costs of vicuña conservation are perceived differently depending on the degree of diversification or dependence on the land that people have for making a living.

However, in semi-structured interviews, both participating and non-participating community members complained that vicuñas:

- Eat crops mainly potatoes and barley;
- Transmit scab to livestock;
- Bathe in livestock baths, dirtying and contaminating them with their infectious diseases;
- Compete with their livestock for pasture land

These problems coincide with those raised by local people sharing the land with vicuña in the Jujuy province in Argentina (Lichtenstein and Renaudeau d'Arc, 2004). In Bolivia, vicuña populations are considered damaging to their rural livelihoods based on agriculture and livestock activities, and people generally blame wildlife wardens about the damages caused by the vicuña, as illustrated by one man during the community meeting in Jesus de Manquiri: *"Wildlife wardens are vicuna custodians and should take charge of the problems vicunas cause to us, but they do nothing"* (community meeting, 16/09/2002, 103/2).

In regard to the damage caused to agricultural activities, within the study area, people complain that during potato-sowing season, from September to November, vicuñas represent a problem difficult to deal with because they remove the earth to eat potato roots; and near the barley-harvesting season, March, vicuñas are usually eating in the fields (pers. observation in different locations within Mauri-Desaguadero). Farmers usually protect their crops by putting scarecrows

(*espantapájaros*) or wire fencing their fields (pers. observation in different locations within Mauri-Desaguadero).

In regard to the damage caused to livestock activities, the competition of vicuña with livestock (mainly llamas, sheep, and cows) for forage and water resources is a major issue of concern, especially during the dry season in the winter months from June to November. Marshy areas are very scarce and people construct special watering places for their livestock. Vicuñas usually use these places to drink and also bathe. South American Camelids, in general, have the behaviour of rolling where there is loose earth or sand. These special places are called *revolcaderos* and are used by all members of the vicuña family (see Chapter 4). There is a general belief that vicuña have lice and scabies, one locus of transmission to lamas may be from using the same r*evolcaderos*. Technicians and researchers that have worked in other areas of the Altiplano region, with similar complaints from farmers, say that the transmission is from llamas to vicuñas and not the other way round, as farmers say. It is also important to highlight that the infection rate of vicuña is much lower than that of domestic livestock. This phenomenon is usually related to the biological fact that wild genomes are more variable and resilient to diseases than domestic genomes (Com.pers. Lamas).

However, people also raised their concern towards the detrimental effects of competition by livestock on vicuña conservation, as expressed by a woman in San Andres de Machaqa town, aged 30, working as a shopkeeper: *"Vicunas die a lot, vicunas get weakened by lack of pasture and water, then they are chased by dogs and foxes who hunt them (...)"* (semi-structured interview, 17/9/2002, 109/2). The issue of "*vicunas killed by dogs and foxes"* also appears in wildlife wardens monthly reports (DGB, 2002b, 2003), and represents a threat to vicuña conservation.

It is generally assumed that to provide effective incentives for conservation, these should be at a scale that outweighs the costs of CBC. As seen earlier in this section, the costs perceived by local people are usually associated with opportunity costs. As seen in Chapter 1, CBC in Bolivia has been partly effective for the recovery of vicuña populations. One possible explanation of this is that the expected economic

and non-economic benefits derived from vicuña conservation are adequately outweighing the opportunity costs of conservation perceived by local people.

The underlying assumption is that communities are clearly defined social units with uniform interests. This assumption overlooks the different types, uneven distribution, and scale of costs and benefits. For example, economic benefits may can derive from poaching but be unevenly distributed amongst those community members that are 'free riders', as will be examined in the following section.

7.2.3 The issue of poaching and illegal trade of fibre

One measure of community-based institutional failure might be a high rate of poaching or 'free rider' behaviour. The issue of poaching and illegal trade by community members might be one of the key tests of institutional viability and is recurrently stated in the DGB official report as one of the major potential threats for the future of vicuña management in Bolivia (DGB, 2003, 2004). It is therefore important to ascertain whether community members or outsiders do poaching. These issues emerged after living for a significant period within the study area and allowed a follow-up of these issues in conversations and triangulation with key informants.

In Machaqa, for example, people are generally aware that killing vicuña is banned by law. However, it was noticed during conversations and interviews that poaching and illegal trade of vicuña fibre occurs, as illustrated in the three cases below in Table 7.1.

Table 7.1 Enquiry on the possession of vicuña fibre

Interviewee	**Livestock keeper by river Desaguadero**	**Shopkeeper in Nazacara town**	**Trader in a regional market at the frontier with Peru**
Question	"Do you have vicuña fibre?"		
Response	"Please, I want vicuña wool, let me get it" (16/9/2002, semi-structured interview, 102/2)	"I like to spin vicuña fibre. I have the know-how. I learnt when vicuña hides were available. Now, it is banned, it belongs to the State" (semi-structured interview to shopkeeper#1, 18/9/2002, 112/2) "It is banned, but I can get some if I want" (semi-structured interview to shopkeeper #2, 18/9/2002, 117/2)	(Observation: after a minute of silence and crossing eyes with another woman) "Well yes, I can get some now… I'll bring it to you" (Question: Isn't it forbidden?) "Well yes it is forbidden…but it is possible if you want" (semi-structured interview, 13/9/2002, 85/2)

Source: Semi-structured interviews during field work in Machaqa (see Appendix A)

In Pacajes, the issue of poaching forms part of their conversations as an open subject. For example, during a workshop organised by the author at the school in Vichaya, the director of the school said: *"We have to kill the vicuna to obtain the fibre"* (school workshop, 12/9/2002, 73/2).

During that workshop, the same activities such as in the workshop in Nazacara were undertaken (see Chapter 3). The overall observations made were a lack of information about vicuña issues that made students sometimes not fully aware of policies or, if informed, this information did not seem important to them.

What is also important to highlight is that the area of Vichaya in Pacajes coincides with an important area of gypsum mine development. These are private enterprises where entire families get involved for the pay. As a woman interviewed in the bus going back to La Paz said:

> *My husband and children are now working in the gypsum mine. They pay 15Bs/day*[56]*. I am going back to the farm to take care of the livestock the next two weeks while my sister replaces me in the gypsum mine* (semi-structured interview, 8/12/2002, 233/3).

[56] 1US$ = 7Bs (8/12/2002).

This enterprise also involves a very active urban-rural communication with sometimes workers coming from other regions, such as the case of two gypsum mine workers in Nazacara coming from Viacha city. The presence of foreigners in the area may have important implications on vicuña poaching activities, as the same woman in Vichaya interviewed in the bus confirmed:

> *People here kill vicuna. That fat man there* [she pointed out a man sitting in front of us] *killed and even ate one. I know how to spin vicuna fibre that I buy in Achiri for 1000Bs/Kg*[2] (semi-structured interview, 8/12/2002, 233/3).

While, the data obtained from individual interviews in Machaqa and Pacajes reveals that poaching forms part of local peoples' livelihoods; this presumption was also confirmed through other primary sources, as illustrated by the case presented in Box 7.2.

The current use of shawls called *chalinas* made from vicuña fibre was also observed during the annual festival in Santiago de Machaqa, located in the province of J.M. Pando within the Paca Japis Regional Association for Vicuña Management. During this annual festival, ex-community members, now living in Bolivian cities such as La Paz, El Alto, Cochabamba, or other countries such as Argentina, Peru and Brazil came to the annual feast, dancing with their vicuña *chalina* on their shoulders (observation in Santiago de Machaqa Annual Festival, 13/09/2002). This traditional use of cloth made from vicuña fibre is also recorded in the official reports of the DGB (2003, 2004).

Box 7.2 Illegal trade of vicuña fibre

A woman traveling from Santiago de Machaqa town to La Paz was sitting in her seat and unfolded from under her blanket vicuña wool. She was threading and told me she bought the raw fibre for 1000 Bolivianos/Kg in the 16 de Julio Market. That fibre, she said, is dirty and sometimes humid so it weighs more. They say, that it is brought from Ulla Ulla located close to Moho in Peru. She needs 2 kilos and a half for making a vicuña shawl called *chalina* because a woman from Calacoto, a rich neighbourhood in La Paz, asked her to make 20. She then asked if I thought that it was possible to export. She also told me that many years ago she went to Argentina and sold already made *chalinas* to the Bolivians living in Buenos Aires for 4000 Bolivians. They need this garment for the annual feast. She said that Argentine fibre is also sold in La Paz but it costs less because it is whiter. This is due to the fact that the other vicuña subspecies, *Vicugna vicugna vicugna*, is whiter than the Andean northern sub-species, *Vicugna vicugna mensalis* (see Chapter 4).

Source: Analysis from interview to key informant in Machaqa (semi-structured interview, 22/11/2002, 206/3)

Although the establishment of international policy framework articulated with national conservation efforts, has been successful to substantially reduce the extent and impact of poaching on vicuña populations (see Chapter 4), poaching remains, however, a warrant concern in the different countries with vicuña (FWS, 2002).

In response to this international concern, a workshop was organised by the Vicuña International Convention. Key informants from Argentina, Bolivia, and Chile attended to discuss and identify a list of actions to be taken to address the problems of poaching and illegal trade of vicuña products (VIII Technical Meeting of the Vicuña Convention, 20-22/11/2004). Amongst the main actions to be taken, stands the importance to investigate, control and supervise the different levels of the illegal trade chain, in particular those fibre selling brokers, and organizations responsible of the crime.

The workshop acknowledges that pressure for local poaching continues to come from external groups operating at higher levels of the illegal trade chain. This is a general problem encountered in wildlife management that has not been explored, consistently and in depth yet.

The community-based approach for wildlife conservation places the community empowerment at the center of the conservation strategy. The devolution of rights over resources and access to economic benefits, is expected to encourage communities to become custodians of their resources, against external intervention. In Bolivia, this differentiation of external and local is also contemplated in the community-based rationale for vicuña management (Vicuña National Regulation, 1997). However, local poaching and the illegal trade that is associated are both still regarded as an important concern in official reports (2002a, DGB, 2000a). In most of the cases, this derives from complex networks and relationships amongst actors operating at different levels of governance.

While wildlife wardens report isolated cases of poaching of between 3 to 20 animals (DGB, 2000b); one person was arrested in La Paz with 324 vicuña skins in his possession (cited in FWS, 2002), and 90 vicuñas were killed near Andamarca in the Oruro Department in Bolivia (Pers. comm. Marconi). These figures confirm the testimonies from Machaqa and Pacajes, outlined earlier in this section, and suggest that poaching occurs at a bigger scale when the initiative or interest comes from external actors.

This widespread regionality of the issue of poaching is also related to the important issue of illegal trade, particularly in the many forms under which international illegal trade can take place. For example members of the border police in Argentina believe that vicuña fibre is smuggled into Bolivia and exchanged for coca leaves and rifles (Pers.comm. Lichtenstein). The threat of vicuña poaching by organized external poachers, as occurs in Argentina (Barbarán, 2002), is an everyday issue within communities in Peru (Pers. comm. community warden during workshop, 12/12/2002, 183/3).

In Peru, for example, during a conversation regarding the issue of empowerment of communities against external threats over vicuña, a wildlife warden from the Regional Association Arequipa in Peru said that community members do not possess guns or rifles but police do. He said that some Chilean people, working in a mine came together with the police to kill vicuña. He couldn't do anything about it (workshop in Arequipa, 12/13/2002, 238/3).

As seen in this section, poaching activities are an ongoing and real fact within the Andean region and Bolivia stands as the principal illegal market to trade illegal fibre from other countries such as Peru or Argentina (DGB, 2002a, 2003, 2004). This was stated in the DGB report as an important threat of poaching in Bolivia (DGB, 2004).

Local authorities use vicuña ponchos, scarves, and blankets, especially at traditional celebrations, and are an important element used in traditional dances during festivals (CITES, 1997). In this regard, the Director of the Institute of Ecology points out:

> *The threat of poaching and risk of illegal trade is not just a problem related to the lack of commercialisation; it is a social problem affecting the Andean context* (Interview in La Paz, 26/02/2003, 17/4).

National policy grants exclusive rights over vicuña use to local people, encourages vicuña capture and shearing events, but retains the rights to store the fibre and restricts the possibility of spinning, weaving, making garments or handcrafts at the local level. The problem is perceived at the local level as another form of expropriation by the State of their natural resources; in this case their rights to access vicuña fibre. However, the fibre used for making traditional handcrafts still comes from vicuñas killed illegally.

Although the possibility of deriving immediate economic benefits is still linked to poaching and illegal trade of fibre, the extent of this activity is limited to a few community members. The main beneficiaries from this activity usually have access to illegal markets and depend on rural-urban livelihoods (see Table 7.1). Therefore, those community members whose livelihoods are highly dependent on

rural activities, and the most affected by the damage caused by vicuña conservation, do not perceive any types of economic benefits to compensate this damage.

The key issues arising in this section were usually followed up in discussions and interviews giving rise to underlying expectations and aspirations regarding the future vicuña management.

7.2.4 Expectations and aspirations of future vicuña management

Effective community-based wildlife management is usually associated with the generation and distribution of meaningful benefits at a scale that outweigh the costs caused by conservation (Murphree, 1993, Ashley and Roe, 1998) Understanding meaningful benefits requires identifying the divergent interests and perceptions within communities (Gibson and Marks, 1995, Songorwa, 1999).

Table 7.2 shows the different interests expressed by local people that arised from community meetings, interviews, and during vicuña capture and shearing events. These interests are usually influenced by the degree of information people had about vicuña activities, and the length of their experience participating in the programme.

For example, those people that had no previous experience or information about the existing techniques to manage vicuña, expressed their desire to enclose vicuñas and breed them like their livestock, as shown in Table 7.2. Those wildlife wardens, for example, that received training in other areas for vicuña management within Bolivia and Peru, and have been participating in vicuña capture and shearing events in the different communities, acquired the skills and knowledge to acknowledge the negative implications derived from vicuña management in captivity (see Chapter 4). In general, local people's concerns centred on deriving benefits from use, or any types of compensation for the associated costs caused by vicuña conservation (see Table 7.2).

Table 7.2 Interests and issues raised during meetings and interviews

Interests	**Issues raised during community meetings and interviews**
Domestication	-Animals should be treated (*dosificar*) -Attention should be given to the vicuña by farming them like we do with our animals -Project suggested by one community member: vicuña should be fenced and to breed it, provide pasture and water. -Special areas for feeding them should be set aside so they will remain in the same place -Vicuña has to be bred (criarla)
Repopulation	-There are lots of vicuña that could be used to repopulate other areas - Other areas should be repopulated with vicuña -*"(...) what should be done with them is to populate our areas where there is no vicuna"* (16/09/2002, Community meeting, 103/2)
Benefits from use	-We want to shear this year! (*Que se esquile este año*!) -I want to see seed in exchange of fibre -I see that lots of things could be done with the fibre afterwards
Compensation	-Can you give us seeds? (*No puede dar semillas?)* -Some sort of compensation should be given through providing seeds or the construction of water sources (*Tendria que aparecer alguna ayuda para semillas o apoyo con la construccion de Fuentes de agua*)

Note: The listing of issues represents the order of importance in which they emerged from data collected in Mauri-Desaguadero area. The table corresponds to the triangulation of responses from a sample of 23 respondents along the river Desaguadero, from Aguallamaya to Vichaya (see map in Chapter 3) with discussions during community meetings in Villa Circaya and Jesus de Machaqa (10 men; 8 women; 2 mallcus; 1 teacher; 1 school council; 2 wildlife wardens); and interviews to key informants within the study area such as wildlife wardens, school teachers, and NGO staff.

Before the vicuña capture and shearing programme started, communities were told that the harvesting of vicuña fibre would only be allowed in those Communal Management Areas with their respective Certificate of Custodianship, and with government authorities during vicuña capture and shearing events. In Mauri-Desaguadero, this information was disseminated to communities through leaflets and workshops, also emphasising that killing vicuña is an illegal activity banned by law. However, the extent of this awareness campaign was limited, not all community members attended the workshops, or understood how the vicuña management programme is implemented, either because workshops were limited in some of the areas within Mauri-Desaguadero because of lack of continuous funding; or other reasons such as not informed or no time to do attend.

However, during vicuña capture and shearing activities, the DGB technicians held a meeting with communities to answer questions and as a forum of discussion around the issue of expected benefits (Meeting in Laquinamaya, 17/11/2002, 161/2;

Meeting in Chijipucara, 21/11/2002, 201/3). In these meetings, people were actually told that the distribution of revenue would be significantly different, whether commercialisation is of raw fibre or cloth. Benefits from the commercialisation raw fibre (200 US$/Kg) would be less than for cloth (500 US$/Meter) but immediate. These prices represent underestimated values from the average obtained in the market (250 US$/Kg for raw fibre, Workshop in Arequipa), as shown in Table 7.3.

Table 7.3 Potential benefits from legal and illegal markets in 2002

Markets	**Type of benefits**		**Sources**
	Raw fibre	**Cloth**	
Estimated legal market value	200 US$/Kg	500 US$/Meter (industrial)	Meeting in Laquinamaya (17/11/2002, 161/2) Meeting in Chijipucara (21/11/2002, 201/3)
Perceived illegal market value	140 US$/Kg	280 US$/Kg	Semi-structured interview in Machaqa (22/11/2002; 206/3)

Looking again at the Table presented on potential economic benefits (see Table 7.3), it is possible to compare the distribution and scale of economic benefits that can derive from vicuña capture and shearing events. The following discussion uses data from vicuña capture and shearing events during 2002 in a large unit for vicuña management such as AMC Laquinamaya, and a small unit illustrated by AMC Chijipucara, as shown in Table 7.4.

Table 7.4 Expected benefits derived from vicuña capture and shearing events

Communal Management Area	**Vicuñas**	**Nº of communities**	**Participants (Nº of women)**	**Vicuñas captured**	**Kg of fibre**	**Benefits from raw fibre (200US$/Kg)**
Laquinamaya	1,400	8	72 (18)	103	12.520	2.504 US$
Chijipucara	250	1	22 (4)	8	1.220	244 US$

Sources: Based on Prefecture of La Paz (2002), DGB (2003, 2004), INEB (2001), Fieldwork in 2002.

Studies have shown that vicuña management in the wild has its comparative advantages to other livelihood activities, and can outweigh associated costs if a minimum of 10kg of fibre can be sheared per year. Numbers in Laquinamaya (12.520Kg of fibre or 2.504 US$ if sold as raw fibre, see Table 7.4) are significantly higher than in Chijipucara (1.220Kg of fibre or 244 US$/Kg if sold as raw fibre, see Table 7.4). This difference in terms of potential economic benefits, and the difference in numbers of participants between Laquinamaya and Chijipucara suggests that a network of eight communities is more effective than one community to achieve cooperation and capture the flow of benefits, as further discussed in Chapter 6. While the type or amount of benefits perceived is different, so is the scale and distribution. At this point it is important to clarify that the unit of management is the unit of beneficiaries. Benefits distributed at community level in Laquinamaya (313 US$ if sold as raw fibre) still have a comparative advantage to those distributed in Chijipucara (244 US$/Kg if sold as raw fibre). In Peru, benefits derived from vicuña management in the wild are mainly used for community development projects (Lichtenstein, 2002). In CAMPFIRE programme, schools, clinics, and maize grinding mills have been the most common type of community projects (Child, 1995).

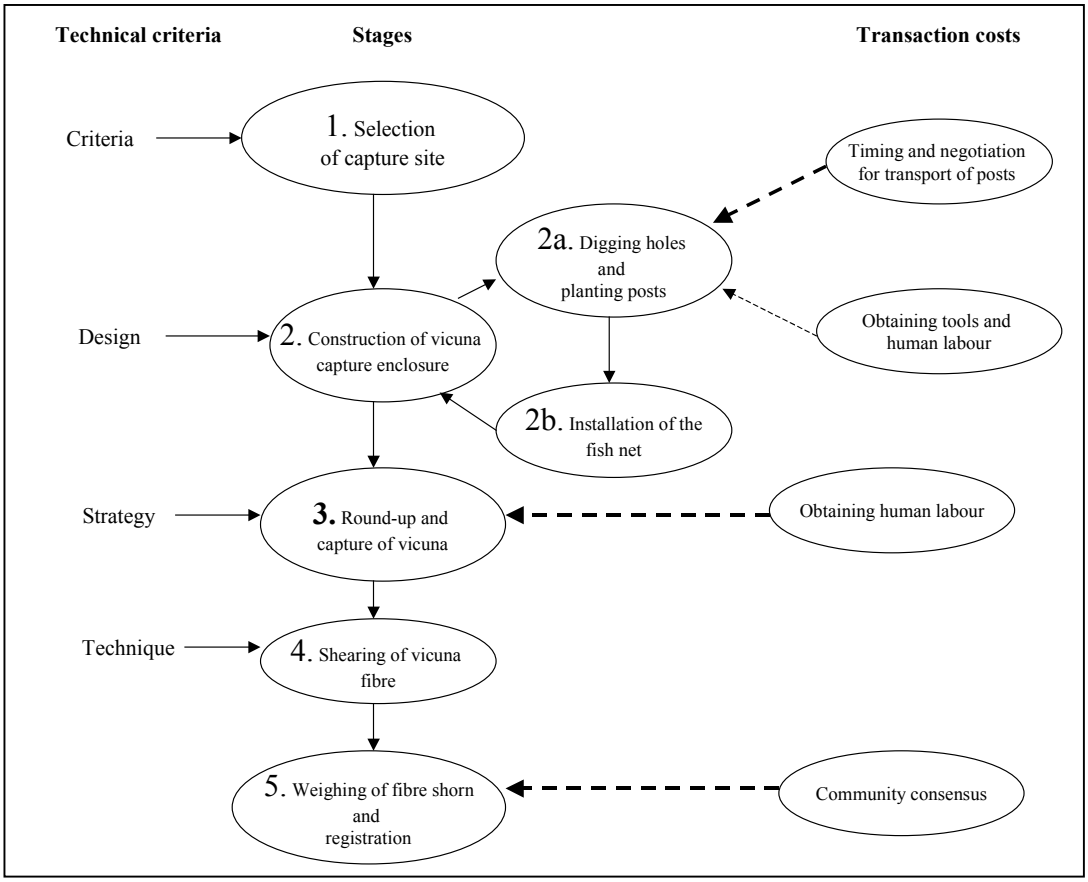
One would suggest that communities are partly motivated by the hope of these future economic benefits. However the extent of this type of motivation was limited. As was explained earlier in this section, information with regard to what types of benefits would derive from vicuña management was not widely disseminated. In other cases people were suspicious towards those potential benefits government told them they will receive, and they were motivated to participate in vicuña capture and shearing events because of other types of incentives, as will be further explored in the following section.

7.3 Participation during vicuña capture and shearing events

In the literature on common pool natural resource management, the beneficial nature of participation is generally discussed from two different perspectives. First, participation can be seen as a tool or means to achieve specific management goals based on efficiency arguments. can be seen, alternatively, as a process that enhances the capacity of individuals to improve or change their livelihoods (Uphoff *et al.*, 1998). Participation as a process becomes an end in itself rather than just a means to achieve specific objectives and is based on equity and empowerment arguments. The identification of both cases relies on the close examination of power relationships amongst various actors along a gradient of community involvement and empowerment (Berkes, 1994, Pretty *et al.*, 1994, Sen and Nielsen, 1996).

This section explores the nature of participation in vicuña capture and shearing events and the benefits, if any, derived from this participation by specifically looking at the power relationships amongst various actors involved in the vicuña management process. Vicuña capture and shearing is a two-days event that occurs in those interested communities with the legal entitlement to shear vicuña (see Chapter 5). Participatory observation in 12 vicuña capture and shearing events distributed in Sud Lipez (3 events in 2001), and Machaqa (9 events in 2002) enabled the author to build up consistent empirical evidence to break down each event into five stages (see Appendix A for quality of data collected). The stages are: selection of capture site; construction of the enclosure; round-up and capture of vicuña; shearing of vicuña; and weighing and certification of fibre shorn, as shown in Figure 7.1 and described more fully in Appendix C.

Figure 7.1 The five stages of vicuña capture and shearing events



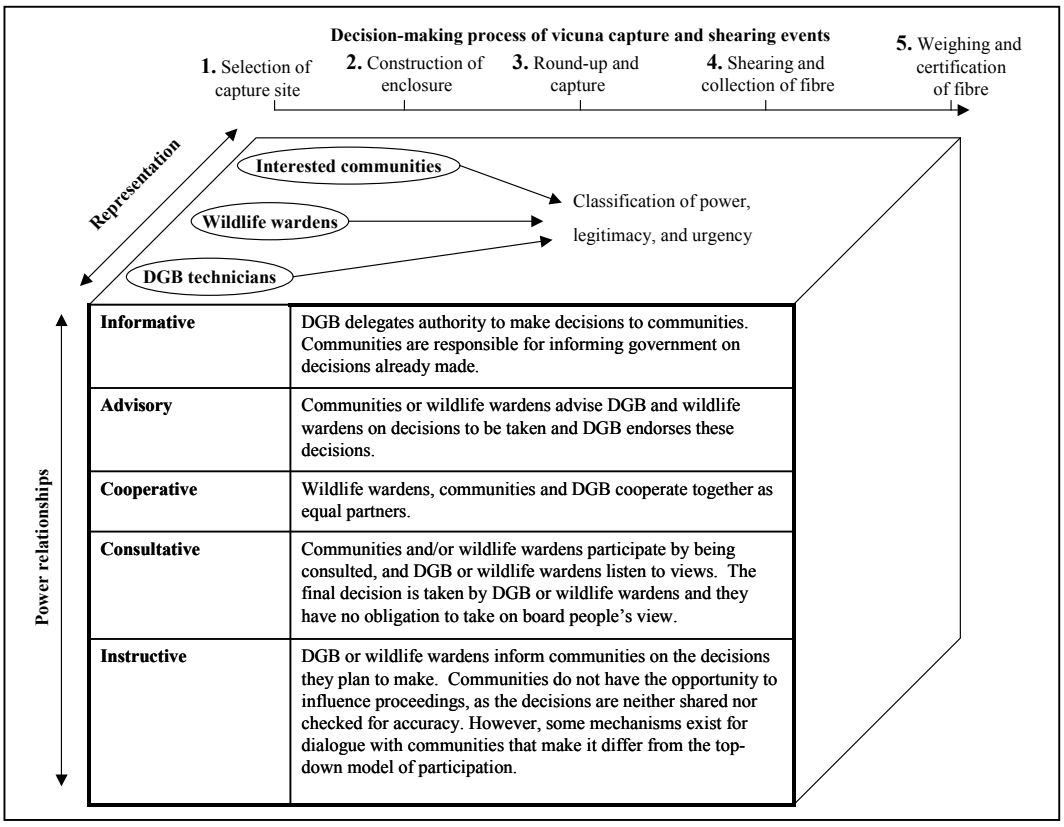
Notes: Figure constructed on the basis of consistent empirical evidence from 10 vicuña capture and shearing events in Machaqa and Sud Lipez. The figure shows the breakdown of the event in five stages. The components on the right of the figure represent the variables affecting the realization of management tasks within each stage. The intermittent arrows represent this variability. Bold intermittent arrows represent the critical variables. These critical variables can impede the continuation of the sequence of the event. The components on the left of the figure represent the technical aspects necessary for the completion of each stage.

7.3.1 The nature of participation

This section started examining the nature of participation during vicuña capture and shearing events (VCSE). The VCSE are divided into five stages: selection of capture site, transport of posts, construction of the enclosure, round-up and capture of vicuña, and shearing and weighing vicuña fibre. VCSE in 12 Communal Management Areas, distributed in Sud Lipez and Machaqa, were used to analyse and compare the nature of participation.

The nature of participation in each stage of the capture and shearing programme is examined using the three-dimensional model adapted from Plummer and Gibbon (2004), as shown in Figure 7.2.

Figure 7.2 Model to examine vicuña capture and shearing events



Source: Table adapted from the three-dimensional model suggested by Plummer and FitzGibbon (2004) to examine the vicuña capture and shearing events in 10 communities distributed in Sud Lipez and Machaqa study areas in Bolivia.

The first dimension focuses on the decision-making process (see Figure 7.2). Each stage of the VCSE includes important decisions to be made and management tasks to be undertaken by three groups of actors. These are influenced by the technical aspects of management decisions laid out and specified by the DGB (government agency), and the transaction costs involved in rotating material and negotiating human labour, as illustrated in Figure 7.1 and explained in the previous section.

The second dimension introduces the scope of the three main groups of actors. These actors are the DGB technicians representing the government, the interested communities, and the wildlife wardens representing the link between government and interested communities. During each of the five stages of the 10 VCSE observed the actions and interactions of these three main groups of actors were recorded and classified in terms of relative power, legitimacy, and urgency.

Power is defined as "the ability of those who possess power to bring about the outcomes they desire" (Salancik and Pfeffer, 1974). In this analysis, the "outcomes they desire" are identified as interests; the group of actors with the means to gain access to carry out their own interest is considered the most powerful. The analysis will then highlight which are the means, such as status or recognised leadership, and mechanisms such as issuing directives, negotiation, discussion, or coercion by which they attain their intended goals.

Legitimacy is based upon the stakeholders' own perception of who and what really counts in a socially accepted or expected social structure. In this study, the social structure or contextual setting is defined by the decisions and management tasks involved during the VCSE.

Urgency is the stakeholders' attribute that captures the dynamics or interactions between power and legitimacy and is defined by "the degree to which the stakeholder claims call for immediate action" (Mikalsen and Jentoft, 2001). In other words, "Legitimacy gains rights for stakeholders through power and in combination, they create authority; [they also] gain voice through urgency" (Mikalsen and Jentoft, 2001). In this analysis, urgency is defined when the stakeholder group perceives its interest as highly important or critical, such as high expectation or high priority. This analysis provided the basis to examine the power relationships that define the third dimension of the nature of participation, as shown in Figure 7.2. The power relationships identified within each stage of the 10 events, when read together, can be grouped into five broad types: instructive, consultative, cooperative, advisory, and informative (Sen and Nielsen, 1996). Similar types of analysis have been addressed before but they focused on a broad scale, such as the one providing general overviews of international experience in fisheries management

(Sen and Nielsen, 1996; Allison and Badjeck, 2004) with little information on the details of the arrangements. This analysis, instead, describes the details of the decision-making arrangements perceived at the local level. Based on these terms and definitions, the following paragraphs examine in detail the nature of participation through a case study examination of power relationships presented in Table 7.5.

Under the terms and conditions of the Vicuña National Regulation, the expected relationship between government and communities is advisory for the certification of fibre, and informative for the rest of the stages (see Chapter 5). However, the variety of decision-making arrangements for each stage of the event, observed in Table 7.5, suggests that the nature of participation is dynamic and defies easy classification.

The first day of selection of capture site and construction of the enclosure, turned out to be informative in Sud Lipez, while it was consultative and cooperative in Machaqa. On the second day of vicuña capture and shearing activities, the relationship between government and communities changed to being advisory in Sud Lipez, and instructive and cooperative in Machaqa. Finally, the weighing of fibre shorn in both study areas seems to share some characteristics of both arrangements to consultative.

The examination of the nature of participation in Sud Lipez and Machaqa are examined in the two following sections.

Table 7.5 Decision-making arrangements during the two-days event

Stages	Instructive	Consultative	Cooperative	Advisory	Informative
Day 1: Selection of capture site	N/A	DGB technicians go to the field sites and consult with the wildlife wardens to decide whether to proceed and how (Machaqa=5 AMC)	Criteria was discussed amongst community members and wildlife wardens (Machaqa=2 AMC)	N/A	Site was already selected before DGB arrived in (Sud Lipez=3 AMC)
Day 1: Construction of enclosure	N/A	Task is mainly undertaken by wildlife wardens, who already have the expertise, DGB is consulted (Machaqa=3 AMC)	In a few cases, wildlife wardens were supported by community members (Machaqa=2 AMC)	N/A	Wildlife wardens and communities worked together and DGB was informed about tasks in (Sud Lipez=3 AMC)
Day 2: Round-up and capture of vicuna	The strategy is decided by DGB that instructs and organise people (Machaqa = 5 AMC)	N/A	This stage requires the collaboration of everyone (Machaqa = 2 AMC)	Community members implemented their own strategy for round-up and DGB logistically support them (Sud Lipez = 2 AMC)	N/A
Day 2: Shearing of vicuna fibre	The technique is supervised and controlled by DGB (Machaqa + Sud Lipez=10 AMC)	N/A	N/A	N/A	N/A
Day 2: Weighing of fibre shorn and registration	N/A	DGB weighs the fibre, wildlife wardens and communities supervise DGB (Machaqa + Sud Lipez=10 AMC)	N/A	N/A	N/A
Mechanisms by which decisions are taken	Directives from DGB	Discussions DGB-wildlife wardens Community lunch	Community meeting and consensus Community lunch	Group discussions once during the process of round-up	Community meeting and group consensus

Source: Idea of table based on Sen and Nielsen (1996) and Allison and Badjeck (2004). The definitions were adapted to the vicuña case study (see Figure 7.2). The information in this table is based on the integration of data obtained from a sample of 10 communal management areas (AMC) distributed in Machaqa and Sud Lipez (see Table 3.8 in Chapter 3). Shaded boxes correspond to the expected partnership arrangements (see Chapter 5). Notes: N/A Non-applicant, DGB Wildlife Biodiversity Bureau

7.3.1.1 Participation in Sud Lipez

In Sud Lipez, all cases examined could be classified as informative in their decisions of where to capture vicuña. The site chosen by the three communities visited, Relave, San Antonio de Lipez, and Guadalupe, was in a different place than the one suggested by the DGB technicians in a previous visit to the area in August 2001.

In Relave, the site was located 10Km from the town (see Figure 3.2 in Chapter 3). Community members placed the enclosure near a marshy area where they said vicuñas came down to eat. In San Antonio de Lipez, two capture enclosures were installed in two different areas but only one used for the occasion with 200 posts spread out at 10mts distance from each other. In Guadalupe, two capture sites were chosen: one high in the mountains in a very rocky place that ended in a small lake; the other site was located in a more accessible area, nearer the road, and in a marshy land. Posts were cut in half to be able to construct the two enclosures.

The capture sites chosen by the three communities in Sud Lipez did not meet the criteria set out by DGB, particularly the criteria regarding accessibility to the area. The sites' topography, in most cases, included very steep slopes, and was difficult for transport by truck to the area (see Plate 7.2 in Appendix C). These examples show that, in Sud Lipez, where communities have difficulty complying with government directives, the decision-making arrangement was defined as informative. When DGB technicians and wildlife wardens arrived to the community they were informed about decisions already made within their communities. During the planning and coordination phase in Machaqa, this informative arrangement was also observed. For example, during a community meeting in Jesus de Manquiri, the *mallcu* pointed out the date and location where his community desired to capture and shear vicuña. Unfortunately, that date and location did not coincide with DGB officials'suggestion. Another case was observed in Ayllu Yaru, when members from the three communities, Conchacollo, San Pedro San Pablo, and Villa Circaya, got together at specific meeting points twice in a month, as a result of misunderstanding on DGB technicians' arrival to the field. Unfortunately, their claims were never

directly communicated to DGB officials, and if they did, other constraints were affecting their arrival to the field, such as bureaucratic procedures of setting designs, work plans and timetables (see Chapter 5).

7.3.1.2 Participation in Machaqa

In Machaqa, three interesting situations were observed (see Table 7.1). The first situation can be described as consultative where the wildlife wardens consulted the DGB on their selected capture site, and the communities were informed about the decisions already made. In some cases, the selected site coincided with the site selected the previous year with the exception of those communities that experienced capture and shearing for the first time, such as Huallaquiri and Chijipucara. In these two communities, different mechanisms were used during the decision-making process:

In the case of Huallaquiri community, a discussion amongst wildlife wardens from the Mauri-Desaguadero area was held to decide where and how to design and construct the capture enclosure. The DGB technician chaired the discussion and called upon the different participants to give their opinion, starting with the wildlife warden from Huallaquiri, himself. His opinion was vague but the other wildlife wardens from Nazacara, Pachamaya, and in the end Vichaya and Santiago de Machaqa, identified the core of the problem. The problem was a house located inside the future capture enclosure site that was surrounded by a potato plantation protected by barbed-wire fence that could injure vicuñas if they tried to escape by jumping when surprised during the round-up.

In the case of Chijipucara, it was also the first time that the community was experiencing the event. The community warden suggested a site based on local knowledge and his own monthly census, although there were big doubts over the presence of vicuñas.

The second interesting situation to examine is illustrated by Jesus de Manquiri. In this case, community members were consulted about where to install

the capture enclosure. The discussion of capture site took place amongst the wildlife wardens. The previous year, 2001, the community itself selected the capture site, which was apparently very different to the one suggested by wildlife wardens in 2002. Wildlife wardens called this behaviour 'a whim' when communities manage to impose their decisions in an informative way. This case is particularly interesting to examine because it reveals a behaviour similar to the one found in communities in Sud Lipez.

The third situation to examine was how decisions can shift from being consultative to cooperative. This is illustrated by the case of Laquinamaya. Communal management areas have to offer two to three locations or sites with appropriate conditions to capture vicuña. In Laquinamaya, during a community meeting and once the first vicuña capture and shearing event was accomplished, the community discussed their desire to organise a second capture in a different site. This second site for capture was discussed and agreed by consensus during that meeting. This process of decision-making is identified as cooperative because DGB technicians and wildlife wardens were also present during that meeting and were asked to give their opinions. During that meeting there was an attempt to integrate the formal data from wildlife wardens' census and the informal information obtained from local people's perceptions.

In summary, two extreme cases were observed: those communities that did not fully comply with government directives; and those communities that followed DGB instructions in a more or less consultative way. The first case is illustrated in Sud Lipez, and with less intensity in Machaqa. The close examination of these cases showed that the scope of participation as a dynamic process of learning, capacity building at community level is being constrained rather than facilitated. On the one hand, there is a lack of legitimacy of government *vis-a-vis* communities and an increasing ambiguity of their role regarding rights over fibre. On the other hand, wildlife wardens are fragmenting communities rather than facilitating communication in support of the vicuña management problem. The scope of the different groups of actors involved in VCSE, are examined in the following sections.

7.3.2 Support provided by Government

With regard to government, represented by the DGB, their role has been to provide financial, technical, and logistical support to communities. Providing direct support to communities required flexibility of DGB technicians in order to adapt to timing and negotiations within communities. For example, the DGB technicians logistically supported communities during transport of posts. The transport of posts was highlighted by the DGB technicians as one of the perceived barriers of the event, while at the same time, an evidence of community willingness to participate in the programme. The timing and negotiation for transporting posts from one site to another is entirely delegated to communities and represents an important transaction cost that communities need to overcome for the event to continue. Each post weighs 3-4 Kg, is 4mts long and one person can carry two posts for short distances. The posts are transported from one communal management area to the next. Short distances can be covered by DGB truck, otherwise people within communities have to carry the posts themselves or some other kind of transport (see Plate 7.3). In all cases communities need time to negotiate and find out mechanisms to overcome this cost, as illustrated in Box 7.3 and Box 7.4.

The examples in Boxes 7.3 and 7.4 show that in some circumstances, the need for flexibility conflicted with budget constraint. In some other instances, discussing error and failure were important opportunities for learning. These forums of discussion were mainly established amongst wildlife wardens and with communities. The main constraints found were time and budget limitations, probably related to a lack of personnel to cover and assist the needs of both target areas: Lipez Chichas and Mauri-Desaguadero.

Box 7.3 Strategies developed for transporting posts in *Ayllu* Choque

In *Ayllu* Choque, 180 posts were shared amongst the 6 participating communities of the *Ayllu*. These were kept in Estancia Kaynapata that is located in community Kanapata. After vicuña capture and shearing event that took place in Kanapata, these posts were transported by the DGB truck to the site Laka Laka in Nazacara. This involved three trips plus the costs of gasoline. From Nazacara they had to be taken to Jesus de Manquiri, also with the support of DGB truck. The next capture was in Huallaquiri, and the community authority tried to negotiate with the DGB technician the transport of posts but the latter refused to help because it was an improvised demand. The posts had to be transported to Huallaquiri school by the community members themselves. They were supported by some members from Jesus de Manquiri and Nazacara. They could only transport 100 posts. These decision-making arrangements where there is voluntary labour or instead persuasion for support are defined as collaborative. DGB technicians and wildlife wardens make a key contribution in collaborating with communities at this stage.

Source: Participative observation during vicuña capture and shearing events (see Appendix A)

Box 7.4 Transport of posts in *Ayllus* Yaru, Bajo Achacana and Collana

Ayllus Yaru, Bajo Achacana and Collana had to share 120 posts approximately. These were kept in Chuncarcota. They were taken to Conchacollo for the day of the capture. From there they had to be taken to Chijipucara. This transport was negotiated between Chijipucara and NGO Satawi. In this case, the relationship was instructive. The community payed the NGO to do the job. The price was first negotiated from 200 Bs to 100Bs and finally agreed on a price of 50Bs. In the case of Laquinamaya the 150 posts were already there. They had to be translocated from one site to the other with the help of the DGB truck. In Sud Lipez, posts were transported by people and also by the DGB truck.

Source: Participative observation during vicuña capture and shearing events (see Appendix A)

During the period of this study DGB technicians retained key aspects of management authority, in terms of defining technical criteria and placing time constraints on local decision-making, in order to continue their work in other communities. For example, the decision-making arrangement during the round-up and capture of vicuña, and subsequently shearing activities, was mainly instructive. However, the comparison of cases shows that although their legitimacy and urgency towards the programme was maintained, their power varied depending on the stage of the process, and the willingness and the internal capacity of communities to participate. For example, during the selection of capture site and construction of the enclosure, the power of DGB technicians was low *vis*-a-*vis* the willingness of communities in Sud Lipez to handle the control of vicuña management, while in Machaqa the relative power of DGB technicians was medium, because communities were not willing to participate during the first day of the event.

However, community control is not possible in all stages of the vicuña capture and shearing event, principally because of the international-national policy context where the principal goal is the protection of the species. The key stages, where DGB handles the control of the process, are the shearing and weighing of fibre. Their role is mainly to supervise and endorse shearing activities, and weight of fibre shorn in an advisory relationship. During the period of this study, DGB officials relied heavily on the coordination of wildlife wardens with communities for planning VCSE, and in their transfer of capacity building and expertise on technical decisions regarding the event.

Government explicitly grants rights to one or more communities sharing a communal management area for vicuña management. These *de jure* rights are formally and legally recognized through the delivery of the certificate of custodianship at community level that may include one or more communities. The only specification made by government is the term "exclusivity of use to communities" (see Chapter 5). During VCSE, the government commands and controls the process by taking away the fibre shorn by communities. Communities perceive this as if the government was the principal beneficiary from this programme, once again using them as vehicles to fulfill their interests. Under the existent national and international policy context communities are not the decision-

makers in the process since the allocation of usufruct rights does not originate directly from communities.

7.3.3 The role of wildlife wardens

Wildlife wardens play a major role planning and coordinating the event, by communicating with community authorities, community members and other institutions such as schools. Wildlife wardens also represent a sub-group within participating communities, and their position of government employee creates a conflict, rather than facilitates the communication within communities. In Sud Lipez and Mauri-Desaguadero, DGB classified wildlife wardens under two positive traits: good communication with the community and self-motivation. Wildlife wardens identified two other important personal traits characterising them; comradeship and past experiences in other vicuña management areas and countries[57].

In regard to capacity building through participating in the event, wildlife wardens from Machaqa have been acquiring expertise, throughout the years, on how to install the capture enclosure. The decision-making arrangement is mainly consultative. One demonstration of power relationships at this stage is shown by the example in Jesus de Manquiri.

In Jesus de Manquiri wildlife wardens designed the enclosure, at the edge of the river. The unsuccessful capture was blamed by the community members on the fact that decisions were made unilaterally without participation of community members who had valuable local knowledge. This issue was brought into the discussion when taking decisions about the design of the enclosure in Huallaquiri. Group discussions were started while in the field, at the side of a rill where a stream of water was passing and nobody could hear what the other group was saying. They were blaming each other because of bad experiences in Jesus de Manquiri. The technician said to the wildlife warden of Huallaquiri:

[57] These past experiences refer to capacity building exchanges experienced by a number of wildlife wardens during vicuña capture and shearing events in Pampa Galeras in Peru, and Apolobamba, Sud Lipez, and Oruro within Bolivia. These exchanges for capacity building were promoted and financed by the DGB agency.

> *Look where have you brought us, you haven't taken into account accessibility to the area. How many years have you been wildlife warden? And you haven't learnt that it is necessary to choose three best sites [according to the criteria] to install the enclosure. Between those three sites, you choose the best one based on three main criteria. It depends on the number of vicunas, availability of water points, topography* (participative observation, 30/10/2002, 45/3).

However, wildlife wardens conflictive position within communities, as perceived by various community members, and outlined in Table 7.6, make their key role of passing over to community members the skills and knowledge on VCSE difficult. In this regard, during a special meeting of wildlife wardens and DGB technician, the wildlife warden from Pairumani expressed: "*We cannot oblige them to learn"* (Meeting, 15/12/2002, 140/3).

Table 7.6 Local perceptions regarding the role of wildlife wardens

Respondent	**Perception of wildlife warden role**
Community members	Their position should be rotated. At present it is a political position of pure self-interest. They receive a salary but do not deal with the damage vicuña to us. What they do, any of us can do it as well.
Mallcus	They do not communicate with the rest of the community; neither do they attend community meetings
Wildlife wardens	*Mallcus* do not like us because we earn a salary. People do not listen to us.

Note: Integration of interviews to community members, *mallcus*, and wildlife wardens (see Appendix A)

This internal conflict of wildlife wardens within communities is reflected in the small number of community members that collaborate during the construction of the enclosure, as shown in Box 7.5. However, in a discussion amongst wildlife wardens held in Pachamaya, they expressed:

> *We do not have to be the only ones working. The community has to also participate on the first day of construction of enclosure. We already have long years of experience and the ones that should learn how to construct the enclosure are the communities themselves. However, we generally end up working alone and doing everything by ourselves with community members telling us 'You are the ones that have to work because you receive the little salary*' (participative observation, 29/10/2002, 40/3).

Box 7.5 Participation during the construction of capture enclosure

During the construction of the vicuña capture enclosure, the work is carried out mainly by wildlife warden staff and DGB technicians. Wildlife wardens provide the labour and DGB technician the logistic and technical support. They alone are able to carry out all management tasks necessary for the construction of enclosure. The wildlife warden from Calacoto, located in Nor Pacajes Regional Association, referring to the organization of vicuña capture and shearing in Huallaquiri said, *"We are here to support communities but not to do all the work. Are you sure there are going to be enough people?"* (participative observation, 20/10/2002, 37

Source: Participative observation during vicuña capture and shearing events (see Appendix A)

The participatory process during VCSE, as explored in this section, is therefore affected by the ambiguity of the role played by wildlife wardens. Their role is usually mixed or overlapped with government's role. The apparent ambiguity regarding the distribution of roles and responsibilities is also observed in regard to who has the rights to retain the fibre.

In fact, the cases explored in this section reveal that the DGB technicians relied heavily on the willingness of communities to participate as a cohesive unit, overlooking the internal conflicts that may already exist or arise by the employment of community members as wildlife wardens and decisions regarding the storage and auction of the fibre shorn. These conflicts are usually related to unrealised expectations, derived from the contradiction that entails the devolution of rights and responsibilities to local communities, while proprietorship or ownership over wildlife resources remains in the hands of the state (see Chapter 5).

However, some degree of participation of community members in all stages of the capture and shearing process was observed. Their motivations for doing so are explored in the following section.

7.3.4 Community members' participation

Participative observation during livelihood activities and community meetings identified the issue of accountability and legitimacy towards community duties and responsibilities, as the two main variables defining who is included or instead excluded as community member.

For example, a woman from the community Chijipucara, currently living and working as a shopkeeper in the town of San Andrés de Machaqa has not been invited to VCSE in Chijipucara (Interview, 17/09/2002, 109/2). She says that the community has excluded her because she has stopped participating in community duties and responsibilities. This woman migrated to a town located within the Marka San Andrés de Machaqa, but has lost her rights over her plot of land.

Other community members have migrated temporarily or permanently to other cities within Bolivia, or other countries. This process dates from mid-past century and affects the population structure of communities in most of Bolivian highlands (Cortes, 2002, Preston, 2002). The result of out-migration is that people aged 30-40s no longer live in the rural areas, while old people remain. This phenomenon of out-migration is also reflected in the current division of household labour. As an old man from Kanapata community said:

> *She* [referring to his wife] *has no time. The women have much more work than men. All our children have migrated to the city, we are alone with the little animals, and our children are no longer here with us to help* (Interview, 11/09/2002, 65/2).

During VCSE, the small proportion of women in relation to men participating in the event reflected the lack of time of women. In Laquinamaya this proportion was approximately 25%. Although the *lack of time* of women is probably related to the cultural issue that women are expected to do most of the household work, this has been exacerbated because of the lack of help from children.

The absence of children and young people also has important implications during VCSE. For example, Jesus de Manquiri, with approximately 30 families, and

Huallaquiri, with approximately 15 families, are two communities with high rates of out-migration of young people that are not able to participate during the round-up. The fact that the school in Huallaquiri had to close in 2001, because there were no children attending school, indicates that the few members of these families that are actually living on their land are elderly people.

Out-migration is also affecting the shift of community authorities or *mallcus*. The common patterns observed are that the same person occupies the position twice, or a young member of the family fulfils the role because the designated person is absent. *Mallcus* stand as a key sub-group because they have to serve the interests of community members to participate in vicuña capture and shearing events, and communicate these interests to wildlife wardens and government technicians for the planning and coordination of the events (see Chapter 6). Therefore, if the shift in authority falls on a person that is unaccountable to actions *vis-à-vis* community members, it may affect participation during vicuña capture and shearing events.

Analysis of interviews and discussions with community members reveals that, in spite of being few in numbers, people were motivated by several incentives to participate in VCSE, as shown in Table 7.7. These incentives, although effective in making people participate in VCSE, were not always linked to a positive attitude towards vicuña conservation, and in some sites hidden or openly sympathetic attitudes were observed towards poaching or stealing fibre.

Individual incentives were related to the social contract or commitment established by the *mallcu* with other community authorities, or instead linked to a kinship relationship with other community members. For example a girl from San Antonio was participating in Nazacara's round-up of vicuña and said: *"My uncle told me to come"* (Nazacara round-up, 25/10/2002, 23/3).

Amongst people that were curious or inquisitive, women stand as an important sub-group. They sometimes also used the opportunity of the event as a forum for expressing their concerns related to vicuña issues, or capturing fibre illegally (see Table 7.7).

Table 7.7 Individual incentives to participate in shearing activities in Nazacara

Motivations	**Responses and observations**
Opportunity to steal fibre	A woman cut the fibre from an offspring and hid it under her pinafore (*delantal*). One wildlife warden punished her and told her that her act was wrong it was not legitimate *vis-a-vis* the DGB technicians. It was an offspring and offsprings are not sheared.
	Another woman also, towards the end of the shearing stage started to cut part of the frontal long tufts of white fibre, and put it away inside her pocket. One DGB technician that was watching her said in a loud voice 'leave that animal alone, you can let it loose again now'.
	A woman sheared the tail and all the neck of the vicuña, and nobody said anything.
Pride and competition	During the weighing of fibre the total weight summed up was 6kg. Because the weight was above the one harvested in Kanapata (nearly 5kg) community members congratulated each other, as if it was an Olympic competition. The community members from Kanapata that collaborated in the capture and were present acted silent. A 19 year-old girl asked: 'Nazacara is winning, isn't it?'
Forum for raising their problems and discussing their issues of concern related to vicuña	Observing the captured vicuñas lying on the floor, two women stared at them and protested in a loud voice "I feel sorry for them...." (...) "they have lice (*piojos*)"(..) "they have to be bathed" (...) "they also have scabies (*sarna*)" (...) "they transmit diseases to our livestock"
	An old woman while shearing said in a loud voice " vicuña eats potatoes, barley (..)"
Curiosity, inquisitive	Another woman asks me: "What can we do with the fibre? It is very fine, do you see? It cannot be weaved, do you see (*no ve*)? She was also an older woman that came out of curiosity because she lived near the capture site but did not want to try shearing because "I am scared" (..) "I just came a little moment to see how it is"

Notes: Results from participative observation during vicuña shearing activities in Nazacara, 25/10/2002

One of the key challenges of institutional design is to cope effectively with changing values and attitudes, which are generally also associated with cultural traditions and strength within communities (Stern *et al*., 2002). For example, in-migration has also brought about new actors into the scene, changing local people's values and perceptions towards common property management, and with important implications on the common property regime for vicuña management.

For example, some returning migrants have experienced migrating for a long period (more than five years) to La Paz and El Alto; lower lands such as Cochabamba or Santa Cruz or abroad in Sao Pablo or Buenos Aires. This is the case, for example, of a 32 year-old woman member of San Antonio community in Ayllu Choque. She said that every year, May-June they recruit young people to go and work as seamstresses in Sao Pablo in Brazil. She did not have a passport and she crossed the frontier illegally. She felt exploited as a slave because it was hard work, illegal, working and living in the same factory. She finally decided to come back to Bolivia, spent some time in Santa Cruz, Cochabamba and La Paz doing some odd jobs. In this regard, she said *"Now, I am back here, my mother lives here too, we have our land, our livestock"* (group discussion, 23/10/2002, 9/3).

One of the arguments for returning was that in cities, you need money for everything and you become old too soon while in the community you can survive without cash. She emphasized that at home she had more social security in terms of quality of life and community or family backing that was more important for her than obtaining cash in a city at high health-care expense. Poverty is understood as *pisin jakaña* a local term in *Aymara* that means to live in poverty in relation to the unsatisfactory basic needs such as water availability, gas, electricity. Happiness[58], on the contrary, is related to the *suma qamaña* an *aymara* term that refers to good living in terms of food availability such as through a good harvest or feast.

Empirical evidence in other parts of the world has shown that the power, status, and legitimacy amongst participants may affect communication and create

[58] All *Mallcus* encourage this happiness by distributing alcohol and coca leaves in community meetings, collective work, festivals, fair.

inequalities within the user group, leading to the division between the excluded and included (Chatty, 1998, Beuret *et al.*, 2004). The empirical data presented in this section suggests that changes in values and attitudes do not always have negative implications, and may open new opportunities for supporting VCSE in the future.

Finally, the community cohesion that is significantly important for defining who is included and excluded from the benefits derived from vicuña management, is being challenged within communities and should be taken into account for future plans in the distribution of benefits.

7.4 Synthesis and conclusions

In addressing the question of what meaningful benefits local people derive from participating in vicuña management, this Chapter reveals that communities are participating in the vicuña management programme without deriving direct economic benefits from sustainable use.

Direct economic benefits are still linked to poaching and illegal trade of fibre. Although illegal activities are recognised at national and international levels as a threat in Bolivia (DGB, 2000; FWS, 2002), their extent or scale is not negatively affecting vicuña populations. From 1997-2002, vicuña populations have been increasing in number and CITES re-classified in 2002 all vicuña*s* under Appendix II allowing commercial use of fibre. However, the thesis acknowledges that current poaching is probably linked to the local and regional markets that characterises the Bolivian Highlands for trading products originated from a wide range of local resources (DGB, 1999). Empirical observations in Bolivia confirm that there is still a comparative advantage between legal and illegal prices within the region (Wheeler and Hoces, 1997). In fact, the expected price in Bolivia from the sell of raw fibre in legal markets (200 US$/Kg), far outweigh those values obtained in the illegal market (140 US$/Kg), but the distribution of these benefits differ. While benefits from sustainable use are planned at community level, benefits from poaching are usually perceived by a few people that can include free riders within communities. Empirical observations in this thesis, suggests that these illegal activities are controlled in some areas more effectively than others because of a collective interest within those

communities that are participating in vicuña capture and shearing events. Although important, these interests are not strictly associated with expected economic benefits, and relate instead to non-economic benefits that may derive from vicuña conservation and sustainable use.

One non-economic benefit relates to the cultural value vicuña has for enhancing community identity and social cohesion. The empirical evidence is drawn from communities in San Andrés de Machaqa where local people expressed, during community meetings and interviews, their strong engagement with the defence of their property rights over vicuña as part of the indigenous patrimony. One would presuppose that this linkage, between vicuña and culture, is unique from this particular location in the Bolivian Highlands. Moreover, these linkages are also recognised in other locations within the Bolivian Highlands (Cardozo, 1981; Torres, 1992). The Bolivian Government assumes that the cultural value of vicuña is supposed to maintain the social base (the community) for law enforcement if it operates at a regional scale that includes all *Quechua* and *Aymara* communities in the Bolivian Highlands (DGB, 1997). This discussion refers back to the literature on common property management where an emphasis is made on the importance of culture and tradition as a pre-condition to achieve success (McKean, 1992).

Other authors suggest that these cultural linkages may be affected by changing values and perceptions within communities (Songorwa, 1999; Holmes, 2003). In fact, empirical evidence presented in this thesis shows that in some locations, local people report that vicuña is a problem, where before vicuña was seen as an opportunity. It is usually assumed in studies on attitudes that a change of attitude reflects the user interest and resultant behaviour of communities (Infield, 1988, Gillingham and Lee, 1999). In this thesis, community involvement has been increasing in spite of the negative attitude towards vicuña conservation. These findings support the idea that conservation attitudes, and participation in conservation programmes are not always linked to interests in using specific resources (Holmes, 2003). In this thesis participation in vicuña management is linked to other interests and motives, not necessarily supportive of the Vicuña Management Programme that is implemented.

In this regard, another type of non-economic benefit and perhaps the most important one that derives from participating in vicuña management is using vicuña as a vehicle for demonstrating community boundaries. Community members perceive benefits from boundary claims by participating in vicuña events. A key evidence of this is illustrated by the dispute between Pachamaya and Jesus de Manquiri communities in San Andrés de Machaqa. By reasserting their exclusive rights to access and use vicuña populations, they can also claim and reassert rights over land and through this redefine community boundaries vis-à-vis neighbouring communities. In Southern Africa, communities view community-based conservation as an opportunity to strengthen their hold over their land in the absence of strong group land rights (Child, 2004). Since the Bolivian Altiplano does not have physical demarcation of boundaries, these boundary claims between communities play an important role in reaffirming land demarcation.

The other important group of non-economic benefits from participating in vicuña capture and shearing events relate to acquiring technical skills and self-capacity building to capture and shear vicuña. A key evidence of this is demonstrated during vicuña shearing activities, when wildlife wardens and DGB technicians passed their skills and knowledge to shear vicuñas to those interested community members. This can be seen as a form of empowerment or delegation of management skills from Government to communities for future vicuña management. Empirical evidence shows that this empowerment is limited because it is mainly concentrated on wildlife wardens.

The discussion above seems to contradict the general assumption that community-based wildlife conservation initiatives can only be sustainable if they derive benefits strictly valued in economic terms, perceived as immediate, and distributed at an appropriate scale that adequately compensate local residents for the costs caused by conservation (Murphree, 1993, Hulme and Murphree, 2001).

The Chapter showed that participating in vicuña management is delivering several non-economic benefits that need to be viewed in terms of long-term incentives, of which expected benefits also forms part. This proposition comes back to the previous statement and supports the idea that common property regimes for

wildlife management are usually enhanced if the resource is of sufficient extent or value to those entitled to manage it in common (Hobley and Shah, 1996). The evidence for this key observation is that the social base (the community) for law enforcement has apparently been maintained by the cultural and social value vicuña has to local people, and enforced by Government.

Given this context, the next chapter integrates these key findings with findings from previous Chapters 5 and 6 in order to answer whether common property regimes are an effective institution for wildlife management.

Chapter 8. Synthesis and conclusions

8.1 Introduction

This chapter builds on the conditions identified in the analysis and discussion from previous Chapters and concludes that the common property management of vicuña in the wild has the potential to link conservation and development aims if the conditions outlined in Table 8.1 are met and maintained in the longer term. The identification of these key conditions was undertaken in terms of three main criteria for effective common property resource management identified in the literature of CPNRM (see Chapter 1), as shown in Table 8.1.

Table 8.1 Effective common propety vicuña management in Bolivia

Main criteria	**Key conditions**
Appropriate partnerships across scale	Government must be committed to paving the way for making policies effective.
Supportive local-level collective action institutions	Defined communal area for vicuña management encompasses more than one community.
	Relationship of trust and confidence amongst community members based on an experience of past successful collective action
	Appropriate leadership: terms and conditions of position are perceived as fair, legitimacy towards their role, accountable of their actions.
	Conflict resolution mechanisms based on reciprocity or *Ayni*.
Deriving meaningful benefits to participating communities	Although important, benefits that are meaningful to local people are not strictly valued in economic terms, and the aesthetic, cultural, and social value of vicuña play an important role: • To enhance individual capacity by acquiring technical skills • To enhance community identity and social cohesion • As a vehicle for demonstrating community boundaries

The following section, 8.2, provides an overview of the main findings in this thesis and explains the key conditions shown in Table 8.1. Section 8.3 highlights the main findings relevant to theory. Section 8.4 outlines the implications for future vicuña management in Bolivia. Section 8.5 highlights the key issues derived from this research relevant to vicuña management policy in the Andes. Section 8.6 provides an outline of concluding remarks and recommendations for future research.

8.2 Overview of research findings

Like many CBC programmes, the Vicuña Management Programme in Bolivia has different phases of implementation, and the conditions outlined in Table 8.1 derive from the analysis and examination of partnerships across scale, local-level collective action institutions, and the generation of meaningful benefits during the first phase of implementation (1997-2002) in three target areas where vicuña was classified under appendix II of CITES.

8.2.1 Appropriate partnerships across scale

The vicuña management programme in Bolivia has promoted the devolution of rights and responsibilities over vicuña to local communities through the establishment of strategic partnerships between government and communities, but these are not always appropriate in terms of mutually reinforcing and allowing adaptive management.

The relationship between communities and government is not mutually reinforcing because communities do not have the necessary authority over vicuña in order to generate the benefits they have been granted. In fact, under the Vicuña National Regulation, government retains the right to store and auction the shorn fibre that can only be exported as cloth, there is a lack of technological capacity in Bolivia to process fibre into cloth. At the time of writing fibre commercialisation keeps being postponed by government, and communities do not perceive economic benefits from their involvement in the vicuña management programme. The lack of commercialisation derives in a lack of trust of communities towards government.

They have not received economic benefits from vicuña use, and complain that government must be committed to paving the way for making their rights effective.

During the first stage of implementation of the Vicuña National Programme (1997-2002), the national policy framework did not adapt to CITES enabling policy[59] to initiate fibre export. The thesis acknowledges that there may be various underlying motives explaining the lack of adaptation of government policy to new international legislation, one being an environment of uncertainty regarding political positions and access to funds in the Ministry of Sustainable Development because of the subsequent changes of presidents, leading to structural reforms in the Ministry. All in all, these facts are linked to an undercurrent of ethnic and political unrest occurring in Bolivia that is a drawback for implementing a long-term project relying on Government backing such as the Vicuña Management Programme.

Since 2003, the Vicuña Management Programme has been extended to the whole vicuña range of distribution, therefore implemented at a larger scale (all communities in the Bolivian Highlands with vicuña*s* in their land can use vicuñas). Communities in Bolivia are usually known because of their active participation and protest regarding government policy changes and legislation over other natural resources. In this regard, the thesis presumes that community claims and protests will probably be raised at higher levels of governance, if lack of commercialization keeps been postponed.

8.2.2 Local-level collective action institutions

The government in Bolivia implemented the sustainable use programme encouraging communities to participate in vicuña capture and shearing events in three target areas. This thesis analysed the first stage of implementation where central government provided the financial and technical support to communities. At local level, communities have to agree on the size and boundaries of communal management areas to access the exclusive rights to use vicuña.

[59] International and national policies get aligned in 2000, when CITES lifts the 0 quota for export under certain terms and conditions (see Chapter 5).

Empirical evidence in this thesis shows that the size and boundaries of communal management areas do not always coincide with traditional configuration of communities based on norms and regulations to act collectively, as presumed by government. They also reflect the division of traditional community land. At community level, findings in this thesis show that important socio-political processes (such as decentralisation, and distribution of land titling, migration) are affecting the internal dynamics, and power relationships within communities, leading to the division of community land and the introduction of new power relationships and conflicts within communities.

The design of communal management areas and participation in vicuña capture and shearing events are reinforcing these processes. In the future, these may foster or undermine collaboration in the common property regime for vicuña management in the wild. In those cases where they foster collaboration one of more of the following conditions seems to have applied. First, there is an experience of past successful collective action. Second, there is an appropriate leadership based on the ability to communicate, accountability, and legitimacy towards community duties and responsibilities. Third, conflict resolution mechanisms based on reciprocity or *Ayni* exist. While these conditions have played a key role in facilitating collective action in one small community, the thesis finds that a large network of small communities is the overriding condition to effective common property management of vicuña in the wild because it is based on relationships of trust necessary to achieve cooperation, as well as increases the flow of benefits.

8.2.3 Deriving meaningful benefits

While the direct benefits in monetary terms from sustainable use are absent, the immediate benefits from poaching are negligible compared to the scale of non-economic benefits derived from participating in vicuña management. So far, community-based conservation in Bolivia has been effective in creating non-economic benefits at a collective 'community' level rather than at individual level. In fact, non-economic benefits that are meaningful to local people have played a key role in maintaining local people's participation and supporting the common property regime, in the absence of fibre commercialisation. These include the aesthetic,

cultural, and social values of vicuña to enhance individual capacity by acquiring technical skills, to enhance community identity and social cohesion, and as a vehicle for demonstrating community boundaries.

The relative contribution to local people's livelihood strategies of these non-economic benefits depends on the scale at which benefits are perceived. As long as vicuña population increases, so do the opportunity costs of land, damage to crops and competition with livestock. In the future, one would assume that the long-term sustainability of vicuña management in Bolivia will depend on whether non-economic benefits exceed, by a wide margin, the increasing costs to communities if they are to make the required contribution.

These main findings have important implications for the development of theory on the effectiveness of common property regimes for wildlife management, as will be examined in the following section.

8.3 Conclusions relevant to theory

Three important insights relating to the conditions outlined in Table 8.1 add to current debates on integration of conservation and development, and on community-based wildlife conservation. This section discusses the similarities and differences of these main findings with the literature supporting common property regimes.

8.3.1 Large network of small communities for wildlife management

In the literature on common property management, small size and clearly defined boundaries for resources and resource users stands out as overriding factors in determining the effectiveness of common property regimes (Wade, 1988, Oström, 1990a, McKean, 1996, Agrawal, 2001). Common-pool resources of small size, stable, and with well-delineated boundaries are considered by many researchers to be easier to manage (Dolšak and Ostrom, 2003), and there is a logic in limiting the size of a group where defining boundaries is based on consensus and agreements (McKean, 1992).

The empirical evidence in this thesis contradicts these suppositions, and argues that when it comes to common pool resources that are extensive and mobile such as the vicuña, a large unit of management is more effective to capture the flow of benefits and achieve cooperation than a smaller unit. The different arguments supporting this statement are expanded below.

8.3.1.1 A large unit to capture the flow of benefits

One overriding argument supporting this statement relates to the genetic and ecological characteristics of the species to the managed. Vicuña shares the genetic features of those species that have been threatened to near depletion. Vicuña is a wild species that extends over a trans-boundary region in the high Andes of five countries, where populations are recovering isolated from each other, and with lower levels of genetic diversity within than between populations (Wheeler *et al.*, 2002). Therefore, one key condition to maintain the genetic variability that will determine the viability of populations is the non-divisibility (non-fencing) of populations, to allow the interaction of different gene pools (Wheeler *et al.*, 2002). As seen in Chapter 4, vicuña social organisation is characterised by territorial family groups and bachelor groups (Vilá and Cassini, 1994, Vilá, 1994). The free movements of bachelor groups are important for the reproduction of the species and to maintain the genetic flow between vicuña populations (Vilá, 2002).

These genetic and ecological characteristics of vicuña have important implications on the effectiveness of the institution designed for vicuña management. For example, vicuña management in captivity may derive in the genetic homogenisation of the population under small enclosure producing direct harm through mortality or reduced reproductive success (Wheeler *et al.*, 2002). On the other hand, vicuña management in the wild seems more effective to achieve long-term conservation of the species because it doesn't interfere in the interrupt the flow of gene pool between vicuña populations (Wheeler *et al.*, 2002). Forests are another resource system that presents similar characteristics as vicuñas, because of its extension. They often cease to produce some of its products if divided into smaller parcels, and have to be managed in large units (McKean, 1992).

While the flow of benefits depends on the characteristics of the resource and the institutions for management (Agrawal, 2002), studies have highlighted the importance of figuring out the scale at which the common property regime ought to be for capturing those benefits (McKean, 1996). In this regard, this thesis argues that even in the common property regime for vicuña management in the wild, a larger scale is fundamental for increasing the flow of benefits because it increases the number of sites available for capturing and shearing vicuña. In arid environments such as the *Puna* and *Altiplano* where vicuña live, some locations are more productive than others; and this is an important environmental factor affecting vicuña distribution and mobility.

Vicuña management differs from other wildlife management programme because culling is not permitted. Vicuñas can be shorn every two years, and the average or total fibre that can be harvested in large network of small communities in the Puna may be fairly steady over the years because it can be obtained from various capture sites. On the other hand, there is a great uncertainty on the fibre harvesting in those communal areas integrated by one community only, providing one or two capture sites. A larger area of management can provide more than one location to capture and shear vicuñas. In these terms, creating a larger unit of management is a way of acknowledging that the risk is substantial and sharing it rather than imposing all the risk randomly, on some particular users each year (McKean, 1992).

8.3.1.2 A large unit of management to achieve cooperation

A large unit of management integrated by a large network of small communities is more effective in achieving collaboration by lowering the transaction costs of working together. Creating a network of small communities is a way of avoiding negotiations and use those collective management rules already functioning within the group. In these terms, common property regimes can be particularly attractive in providing administrative efficiency when resource management rules can simply be crafted onto the functions of a pre-existing community organization.

Vicuña may be analysed as those regional resources that requires devising institutions at various levels of spatial aggregation and linking them (McGinnis and Ostrom, 1996). One illustrative example of these resource systems is water. Research in irrigation networks that spread over entire watersheds, highlights the role of nesting smaller community institutions into larger cooperative entities (Rose, 2002). Insofar, as formal larger governmental institutions act as overall managers, nested community-based management institutions have an important role to play for making common property regimes effective (Oström, 1992b).

There is an emerging critique, however, around the effectiveness of linking local-level institutions for common pool resource management, both from the theoretical and policy viewpoint. Local level collective action institutions might appear to be acting for a collective benefit, but actually serve to shape and reproduce relations of unequal power and authority, marginalizing the concerns, for example, of particular groups of women or poorer people (Roe *et al.*, 2000). In this regard, findings in this thesis show that the institutional arrangement for vicuña management creates a new space at the community-level and vehicle to channel current conflicts of interests within communities and struggles for division of land.

One may argue that a small group is more effective for achieving consensus agreements and negotiations (Oström, 1990b). In the case of vicuña management, communal management areas, integrated by one community only, may cross-cut vicuña populations to be managed, and generate conflicts with regard to use-rights and boundaries with the neighbouring community, if these are not well delineated and understood. In the literature of common property management, this type of conflict is known as an externality (Oström *et al.*, 1994). As explained earlier in this section, vicuña exhibits heterogeneity in spatial resource distribution (more-productive versus less-productive locations, for example), communities must devise rules that assign access to particular locations. A large network of small communities can easily internalise those rules.

Another important argument supporting a network of small communities for vicuña management relates to the fact that it lowers the transaction costs of monitoring. Monitoring many mobile resource systems and gaining accurate

information about the resource is costly and involves considerable uncertainty (Rose, 2002), particularly in the face of relative poverty and environmental uncertainty that characterises the Bolivian Highlands.

Finally, a large network of small communities for vicuña management in Bolivia has its comparative advantages to a small unit. It fits the ecological requirements of vicuña populations, warrants collective action, and illustrates those cases where a large unit of management provides for the rights of many to be equally included as a hedge against uncertainty (Oström, 1990b, Agrawal, 2001).

8.3.2 Intangible benefits for long-term wildlife conservation

In the literature of community-based conservation and wildlife management, economic and immediate benefits are the key conditions in determining the successful wildlife management. If local people do not receive tangible benefits from conservation it will be unlikely that they will become supporters of conservation (Barrow and Murphree, 2001). However, not all empirical evidence support these suppositions, and some authors consider that intangible benefits also have an important role to play in community-based wildlife management (Ashley, 1998).

In this regard, findings in this thesis suggest that people can sometimes see longer-term, strategic benefits from being involved in conservation projects, even when those projects may carry short-term costs and risks, and when direct economic benefits are limited or non-existent. The different arguments supporting this statement are expanded below.

8.3.2.1 Long-term strategic benefits

Many arguments can explain why intangible benefits can play a long-term strategic role in wildlife conservation. Within the Andean context, studies on pastoral household economy reveal that in their decision-making Andean people usually develop different livelihood strategies to derive benefits in the long- and short-term in order to cope with the risks and uncertainties of living in the Andean highlands

(Browman, 1982, Zoomers, 1998). In this context, some studies have explored vicuña contribution to Andean livelihoods (Cardozo, 1981; Torres, 1992). This contribution do not relate only to the potential economic value, but also to non-use values that play an important role for strengthening social capital. In this thesis, the role vicuña has to enhance community identity, social cohesion, and reaffirm community boundaries operates at a community scale, and therefore outweighs the small scale of benefits derived from poaching activities, and the costs and risks derived from vicuña conservation in family plots of land.

The considerable experience gained in wildlife management around the world reveals that benefits are strategic in the long-run when the type, distribution and scale outweighs the benefits of alternative uses, and are targeted at the key resource users (Ashley and Roe, 1998, Steiner and Rihoy, 1995).

The empirical evidence for this revelation is drawn from the vicuña management case study in Bolivia where communities participate in the vicuña management programme in the absence of direct economic benefits from conservation and sustainable use. Therefore, the strategic benefits from being involved in the vicuña management programme are not strictly valued in economic terms, and relate instead to the intangible value vicuña has to mobilise social capital. The thesis suggests that, in the future, persisting unrealised expectations for economic gain may change, and be transformed into disincentives to participate, while intangible benefits derived from vicuña conservation are likely to continue to play an important role. Particularly, in motivating communities to support the community-based conservation programme, in spite of the uncertainty regarding future commercialisation and expected economic gains, and when obtaining immediate economic benefits from poaching is limited to a few community members, too risky, and controlled.

8.3.2.2 Short term costs and risks

It might be argued that the economic benefits of vicuña management are not outweighing the costs to households in terms of damage to crops and livestock

competition, nor they are significant when compared with the contribution of other livelihood activities. Currently, the economic benefits derived from illegal activities are not benefiting those community members most affected by the costs caused by vicuña conservation.

These costs were distributed differently amongst community members depending on the degree of diversification or dependence on the land that people have for making a living, livelihood strategies, and who participated in the vicuña capture and shearing event (communities and individuals). On the other hand, the direct benefits from participating in vicuña capture and shearing events such as capacity building is mainly concentrated on wildlife wardens, and they do not seem to outweigh the costs of participating in the two-day vicuña capture and shearing events such as the opportunity cost of labour in terms of time; transaction costs in terms of land disputes, time in negotiation and community planning.

A key finding deriving from the analysis of vicuña management in Bolivia is that sometimes communities can see the combined benefits of being involved in vicuña management greater than the associated costs. These benefits are valued in cultural and social terms, and provide the means for those investing their time and resources in vicuña use to ensure that it is they (individuals or communities) that can capture the rights over vicuña and land.

One may argue that in the longer-term, the lack of legal commercialisation may derive in a serious change of attitudes towards conservation, if government does not take into account issues related to the costs that entails the conservation of an increasing number of vicuña in community land where local people's livelihoods depends on other forms of land use. However, the thesis emphasises that, although important, benefits should not be strictly valued in economic terms. This supports the idea that different types of benefits form part of an incentive framework that may last over time and between generations (Jones and Murphree, 2004).

8.3.3 The paradox of participatory vicuña management

Community-based conservation of vicuña in Bolivia presents a paradox. People continue to participate despite the lack of tangible benefits. Expectations of benefits remain unrealised. Furthermore, although rights and responsibilities have been devolved to local communities, proprietorship or ownership over wildlife resources remains in the hands of the State.

Under the Vicuña Convention, the State is the management authority responsible for the long-term conservation and monitoring of vicuña populations, while Andean people are named as the main beneficiaries (Lichtenstein and Renaudeau d'Arc, 2005). In most countries as a wild species, vicuña is property of the State. Examples around the world show that the actual ownership of the protected areas and wildlife remains in the hands of the state, and many of the important decisions regarding use rights still remain with central authorities or their local representatives (Murphree, 1994, Strum, 1994).

In the case of Peru, communities were given progressively more control over Vicuña in the 1990s, starting with user rights and custodianship in 1991 and expanding to property rights in 1995 (Lichtenstein *et al*., 2002). Studies in Peru reveal that property rights, allocated by government to community groups, is limited because government usually retains the key decisions regarding the type of management system to be implemented with the associated costs incurred, as well as the terms and conditions to access the flow of benefits derived from fibre commercialisation (Sahley *et al*., 2004). Peru has appeared to delegate rights to communities while retaining or enabling other legal mechanisms that make those rights ineffective (Sahley *et al*., 2004). The case study in Bolivia, provides another example of how national policies aim to devolve the responsibility without giving decision-making authority to local people. In Bolivia, government grants exclusive rights to benefit from vicuña to communities, but retains key decisions regarding the storage and auction of the fibre shorn.

Participatory vicuña management is a broad term, and the requirements of a technique for vicuña capture, and shearing renders the objectives of participation ambiguous. This characteristic of participatory vicuña management in Bolivia mirrors the experience of other community-based wildlife management initiatives where a phase of co-management is necessary before community-based management can be established (Hasler, 2003). This co-management arrangement between the State and communities can be seen as a means to achieve specific management goals based on efficiency arguments (Uphoff *et al*., 1998), or alternatively, as part of a process that enhances the capacity of individuals to acquire the skills and knowledge to undertake the captures. Participation as a process becomes an end in itself rather than just a means to achieve specific objectives and is based on equity and empowerment arguments (Berkes, 1994; Pretty *et al*., 1994; Sen and Nielsen, 1996).

In this thesis, people see co-management as a way for government to take control of the process and not to delegate authority to the local level, certainly not to the community. Communities do not have the right to retain the shorn fibre, so the potential benefits are captured elsewhere; either retained by government for future commercialisation, by a neighbouring country when vicuñas cross borders, or by external poachers. Community-based conservation in Bolivia is grounded on the historical value vicuña has to the Andean indigenous patrimony, and local people perceive government intervention as an expropriation and violation of their customary and cultural rights over vicuña.

The key problem of the current community-based co-management arrangement is that it enables government to encourage vicuña capture and shearing events, but not allow fibre commercialisation and to control the management process in the name of 'capacity building' or 'expected economic benefits'. One may optimistically suggest that this paradox of participatory vicuña management is part of a blurred picture, and in the future, once the phase of commercialisation starts, economic benefits and capacity building will go hand in hand. However, there are still a number of issues that need to be addressed to open the path for contemplating this argument.

8.4 Issues relevant for future vicuña management in Bolivia

The key conditions, derived from the first stage of implementation of the programme, may have important implications for this second phase of implementation of the Vicuña Management Programme in Bolivia. The second phase of implementation started in November 2002 when CITES transferred all vicuña populations to Appendix II allowing exploitation of vicuña fibre in the whole range of distribution. Since 2003, the financial and technical support of the Programme has been passed to the hands of decentralised government (Prefecture and Municipality) and is now dependent on the creation of new partnerships between communities, NGOs, and Municipalities. All communities with their correspondent Certificate of Custodianship have access to the Vicuña Management Programme. While key decisions regarding access to market and commercialisation are still in the hands of government, interested communities are expected to design their own vicuña management plans, and agree on the size and boundaries of their communal management areas.

Therefore, this section highlights those key issues arising from the first stage of implementation of the vicuña management programme that may derive in potential threats to long-term sustainability if they are not adequately addressed.

8.4.1 Poaching and illegal trade of fibre

Poaching and illegal trade of vicuña products is usually seen by the Vicuña Convention and CITES as the key tests of institutional viability once legal commercialisation of fibre starts. This test is difficult to assess in Bolivia, where banning legal trade was followed by encouraging sustainable use without commercializing the stock of fibre accumulated at national level. However, poaching activities are in control since vicuña*s* have continued to increase in number.

Under the international regulatory policy framework, the linkages between non-economic valuation of vicuña and reduced poaching are important findings in this thesis that explain how poaching has been maintained in control. These findings are particularly relevant within the context of wildlife management around the world,

where the lack of such linkages explain the heavy poaching of ivory and rhino horn in Africa putting at risk these species at expense of a high price (Sugg and Kreuter, 1994, Child and Bergstrom, 2001).

However, poaching activities usually do not act in isolation and are related to illegal markets. Therefore, identifying the linkages between who participates in the activity, who pays the costs of conservation, and who derives benefits in the different levels of the illegal chain are key issues for determining whether illegal activities will remain, reduce or increase once the legal market opens.

8.4.2 Power relationships within communities

Government relies on the ability of communities to organise and participate as a cohesive unit overlooking the internal conflicts that may already exist or arise as the result of the implementation of the Vicuña National Programme. Local conflicts are usually an overriding issue in debates about whether or not there has been success or failure in CBC. In this thesis, the sources of local conflict are usually related to unrealised expectations, and the violation of community rules by the introduction of new relationships of power. These are reflected in the perceptions towards the representatives of Regional Associations, wildlife wardens, and in discussions around future distribution of benefits.

8.4.2.1 Legitimacy of Regional Associations representatives

Government assumes that giving local people the rights to create their own Regional Associations for Vicuña Management, will result in democratically accountable and representative associations. The findings in this thesis show that the individuals representing these associations are not recognised by community members because the mechanisms for election of representatives are not perceived to be fair (see Chapter 6). Making institutions genuinely representative has proven one of the main difficulties in community-based wildlife management programmes (Roe *et al*., 2000). The underlying problem is that the selection of the members of the Regional Associations did not follow the norms and regulations of communities.

8.4.2.2 Conflict between *ad-honorem* responsibilities and paid work

There are many mechanisms by which members of communities are designated to fulfil a wide range of roles and responsibilities within communities. These generally form part of the rotational services *ad-honorem* that each community member provides to the rest of the community. In the case of wildlife wardens, the paid work and their long-term position seriously contradicts these norms and rules within communities. Wildlife wardens are reproducing and enforcing power relationships and inequality within participating communities. This position, recognised by government, but considered as not legitimate to community rules impedes rather than facilitates the communication between government and community members. Government should take into account these issues arising from communities.

8.4.2.3 Collective action

Collective action in the Vicuña Management Programme does not always derive from expected benefits or positive attitudes towards conservation, but also from other groups of interests or motives. Collective action can either foster collaboration for common property management, such as using vicuña as a vehicle to enhance social cohesion, or undermine it by increasing conflict within communities, such as the internal divisions of land or between communities and external actors. Individual participation can either contribute to the social base (community) through legitimacy and action, or instead show hidden or openly sympathetic attitudes towards free-rider behaviour such as poaching or stealing fibre. Therefore, what appears to be a community in terms of social units with uniform interests may be deeply divided in relation to institutions for collective action, and individual interests. These findings illustrate the importance of identifying and monitoring the factors affecting the emergence of collective action in vicuña capture and shearing events. This has important implications to assess if communities will continue to participate in the future, particularly once commercialisation of fibre starts.

8.4.3. Land tenure and distribution of benefits

Findings in this thesis suggest that, as long as the boundaries of communal management areas and the individuals who can benefit from vicuña use remain uncertain, no one knows what they are managing or for whom (see Chapters 6 and 7). The underlying conflict of boundaries relates to a problem of unclear land tenure that is also putting into question community membership, and may lead to unclear distribution of benefits. The empirical evidence in this thesis reveals that participating in vicuña management is a way to reproduce and reinforce community land tenure *vis-à-vis* neighbouring communities, as well as reaffirms community membership and with it rights to access land amongst participants. These findings have important implications for the future distribution of benefits. An evidence of this is demonstrated by the exclusion of some ex-community members living in towns from participating in VCSE. These people do not fulfil the duties and responsibilities towards communities and have lost their rights to access land. Therefore, defining what are the boundaries of the vicuña, as well as those authorized to use and benefit from it, seems to be important issues in planning for future distribution of benefits within communities.

8.4.4 Addressing externalities of vicuña management in the wild

In the analysis of externalities related to the use of vicuña, one can argue that one communal management area creates externalities for other communal management areas if those shorn vicuñas cross boundaries. Withdrawing one unit of a resource (shearing a vicuña) reduces the number of resource units available to other resource users (vicuña available to be shorn), thereby increasing the costs of withdrawal. This type of externality is also observed in many other resource systems such as fisheries, where use in one zone immediately reduces harvests in another zone. These studies suggest that rules must be devised that addresses these different types of externalities (Ostrom *et al*., 1994).

Taking into account the trans-boundary mobility of vicuña populations between Bolivia and its neighbouring countries, local communities face the risk of having vicuñas crossing borders and losing the potential benefits they represent.

Empirical observations show that Peruvian communities do not perceive these risks because vicuñas that are wild managed in Bolivia, cross borders and become enclosed in Peru. Therefore, the costs of exclusion are not fairly distributed between countries. In this thesis, an institutional design for vicuña management, integrated by a large network of small communities is suggested to increase the species-area relationship and include the entire vicuña population to be managed, as a way to internalize the externality of sharing the same vicuña population. Again, rules must be devised that address these different types of externalities (Oström *et al.*, 1994). If the technology for vicuña use exhibits heterogeneity (for example, captive versus wild management) then the use of one technology imposes negative externalities on users of another technology. In this regard, a general consensus in Bolivia is that bi-national policies need to be planned and implemented in order to align vicuña management property regimes in those international trans-boundary areas to address these externalities.

8.4.5 Adaptive management in Bolivia

Adaptive management is usually defined as the integration of design, management, and monitoring to systematically test assumptions in order to adapt and learn (Salafsky *et al.*, 2001). The concept of adaptive management are already in use by some national regulatory agencies, such as the US Fish and Wildlife Services, and are embraced in the Vicuña Convention and CITES because they support research into conservation action.

In Bolivia, the idea of adaptive management at community level is difficult to clearly visualise because government controls key decisions regarding vicuña management, and there is very little room for community learning by doing. One may argue that the vicuña management is a process divided into stages and these empirical observations correspond to the first stage of implementation (1997-2002), when communities depended on the support of government to undertake vicuña capture and shearing events. While learning and adaptation is expected to be at community level, adaptive management also implies the ability of a management system to respond or adapt to changes. The lack of adaptation of the management system is illustrated by the fact that, in spite the change of CITES policy to allow

fibre trade, the government in Bolivia stocked the fibre shorn by communities and kept commercialisation postponed.

The definition of adaptive management in this thesis therefore, not only encompasses management in response to changing ecological context or nature of the resource, but also adapting to external or broader policy context.

.8.5 Issues relevant for vicuña management policies in the Andes

This section highlights the main issues emerging from the discussion on the Bolivian case study that can be synthesised into a set of broad policy guidelines for vicuña conservation and management in other countries within the Andes.

8.5.1 Defining the target beneficiaries

Under the Vicuña Convention, signed in 1979, the Andean population was named as the target beneficiaries of future vicuña management projects. It has been recognised that there are considerable regional differences of what an Andean population is. Currently, the main beneficiaries of vicuña management projects are defined as communities in Peru and Bolivia, families in Chile, and individual producers in Argentina that do not always coincide with the most poor people in the Andes (Lichtenstein and Renaudeau d'Arc, 2005). The important factor is not how the community is defined, but the fact that those beneficiaries are also those that pay the costs of conservation.

For example, in Bolivia, the term community is officially recognised by government as a social and territorial organisation, characterised by tightly knit kinship groups. In the Andean region, *Quechua* and *Aymara*-speaking indigenous communities represent these groups. The ethnic and cultural boundaries based on collective action institutions are expected to overlap with communal management areas for vicuña management. The thesis shows that this assumption is not always reflected in the reality. Important socio-political processes are dividing these ethnic boundaries, introducing new groups of interest within the same geographically defined community.

These findings suggest that sometimes it appears to be more useful to use the idea of community-based collective action institutions, because it takes into account the position of the individual in a network. The thesis suggests that this concept helps to understand if the group of beneficiaries, coincide with those people that also pay the costs of conservation.

8.5.2 Distribution of benefits and costs

The question of whether benefits exceed costs proves to be rather elusive in most of the vicuña management projects, usually excluding opportunity cost of land and labour (Lichtenstein *et al*., 2002). As seen in previous section, it is also necessary to consider who benefits and who bears the cost as these may not be the same.

The studies undertaken up to now, which make a reasonable assessments of costs and benefits of intensive forms of management, all reach the conclusion that benefits to communities are considerably less than costs (Lichtenstein *et al*., 2002; (McNeill and Lichtenstein, 2003). Live shearing of vicuñas in Peru can generate a surplus, provided an extensive form of management is adopted and communities have a reasonable number of vicuñas in their land. In such cases, the opportunity cost of land is less of an issue. Where more intensive forms of management are adopted the potential for generating a surplus is much more limited given the high costs of equipment involved (Lichtenstein *et al*., 2002).

Therefore, the flow of economic benefits is not enough to enhance the high value of vicuña, it is also important to consider the associated costs and intangible benefits such as land and resource tenure rights that secure the scale of distribution of future economic benefits. This has also shown to be a key factor in other places around the world (Roe *et al*., 2000; (Child and Bergstrom, 2001).

8.5.3 Land tenure and vicuña management system

Conceptual and practical difficulties exist in sharing simultaneously vicuña and land resources as a tenure strategy. Conceptually, policies that secure benefits to local people are often broadly defined in the Vicuña Convention in terms of rights over land and vicuña. In most vicuña management initiatives, the implementation guidelines, stipulating how to put such policies into practice, are unclear (Renaudeau d'Arc and Lichtenstein, 2005).

In Latin American countries that have adopted the neo-liberal model, including Argentina, Chile, Peru and Ecuador, there is a preference for the privatisation and individualisation of land rights (Zoomers and vand der Haar, 2000). Most of these countries are implementing vicuña management in captivity (Lichtenstein, *in press*). In Bolivia, attempts are being made to combine this neo-liberal approach with the official recognition of the tenure status of common lands of specific sectors of the society, amongst which stand communities within the Andes. Therefore, the land tenure situation is closely linked to the socio-political context and in determining the way in which vicuña is used, with important implications on the conservation of vicuña and distribution of benefits.

8.6 Final remarks

It is often assumed by conservationists that giving communities opportunities to participate and benefit from vicuña use, will automatically transform them into custodians and poaching will be reduced. The case study of Bolivia shows that these assumptions are misplaced and the reality of community conservation is far from straightforward. While, vicuña management is clearly used to achieve the objectives of conservation, conservation is not necessarily the outcome of all vicuña management strategies (Lichtenstein and Vilá, 2003, Lichtenstein and Renaudeau d'Arc, 2005b). Indeed, conservation is currently in conflict with intensive forms of vicuña management (Lichtenstein *et al*., 2002). Murphree (1993) further points out that the scale of benefit should be linked with quality of management otherwise there is no incentive for better management.

In Bolivia, captive breeding is seen to be incompatible with the long-term conservation of wild vicuña populations and is banned in national law. Community-based conservation under strict preservation has been successful for the recovery of vicuña populations, and currently, communities are participating in the sustainable use programme in the absence of direct economic benefits. Will common property management of vicuña be sustained in the longer term as a conservation and development strategy?

The future is difficult to predict, because of the lack of commitment of government to make community property rights effective. However, the thesis indicated conditions that can strengthen the common property regime for vicuña management in the wild, and suggests that these key conditions would further be enhanced if government were committed to making rights meaningful. Furthermore, this thesis acknowledges the importance of understanding the wider contexts in which community-based conservation of vicuña in Bolivia takes place, such as the political processes, national and international policies, as well as market trends.

The vicuña case study has not been addressed before from an in-depth angle of the common-pool natural resource management theory focusing on the analysis of institutions. Hopefully, the various conditions, the key issues, and main findings arising from the institutional analysis in this thesis, will guide future research in the Andes, particularly in Bolivia once the commercialisation phase starts, as well as challenge policies trying to link conservation and development aims.

Appendix A.

List of data collected

1. Preliminary field work (Year 2001)

Date	Field note record	Location	Institution/community	Research method	Informant/s
30/08/2001	1/1	La Paz	Spanish NGO	Semi-structured interview	Regional Coordinator of VSF
30/08/2001	2/1	La Paz	SERNAP	Semi-structured interview	Director of National Reserve Eduardo Avaroa (RNEA)
31/08/2001	3/1-4/1	La Paz	SERNAP	Group interview	Director of Environmental Monitoring/ Director Apolobamba Reserve
31/08/2001	5/1	La Paz	Academy of Sciences	Semi-structured interview	Director
31/08/2001	6/1	La Paz	Research project MACS	Semi-structured interview	Consultant in Bolivia
04/092001	7/1	Reserve Pampa Galeras (Peru)	Community Lucanas	Group interview	CONACS technicians/ Lucanas members
13/09/2001	8/1	Sud Lipez	SERNAP	Semi-structured interview	Director of RNEA
13/09/2001	9/1	Sud Lipez	Community San Pablo de Lipez	Group interview	Wildlife wardens
13/09/2001	10/1	Sud Lipez	Community San Pablo de Lipez	Community meeting	Community authorities
14/09/2001	11/1	Sud Lipez	Community Quetenas	Group interview	School staff
14/09/2001	12/1	Sud Lipez	Community Quetenas	Community meeting	Community authorities/community members
14/09/2001	13/1	Sud Lipez	Community Quetenas	Semi-structured interview	Nurse
16/09/2001	14/1	Jujuy (Argentina)	Fibre Cooperative	Semi-structured interview	Regional coordinator
07/11/2001	0/2	Putre (Chile)	Research Project MACS	Project meeting	Project team members
07/11/2001	1/2	Ankara (Chile)	Vicuña breeding station	Group interview	SAG/CONAF Technicians
07/11/2001	2/2-3/2	Santiago de Chile	Guanaco breeding station	Group interview	CONAF Technician/UC Academic
17/11/2001	4/2	Jujuy (Argentina)	Weaving cooperative	Semi-structured interview	Regional coordinator
17/11/2001	5/2	Jujuy (Argentina)	Fibre cooperative	Semi-structured interview	Regional coordinator
17/11/2001	6/2	Jujuy (Argentina)	Fibre cooperative	Semi-structured interview	Regional coordinator

Date	Field note record	Location	Institution/community	Research method	Informant/s
19/11/2001	7/2	Sud Lipez	Community San Antonio de Esmoruco	Community meeting	Community authorities
19/11/2001	8/2	Sud Lipez	Community San Pablo de Lipez	Group Interview	DGB Technicians/BBC Wildlife photograph
20/11/2001	9/2	Sud Lipez	Community San Antonio de Lipez	Group discussion	Community members/DGB technicians
21/11/2001	10/2	Sud Lipez	Community San Antonio de Lipez	Group discussion	Community members/DGB technicians
22/11/2001	11/2	Sud Lipez	Community Relave	Semi-structured interview	School teacher Relave
22/11/2001	12/2	Sud Lipez	Community Relave	Group Interview	DGB Technicians
23/11/2001	13/2	Sud Lipez	Community Relave	Meeting	Members Relave
23/11/2001	14/2	Sud Lipez	Community Relave	Semi-structured interview	Mayor *(Corregidor)* Relave
24/11/2001	15/2	Sud Lipez	Community Relave	Meeting	Members Relave
24/11/2001	16/2	Sud Lipez	Community Relave	PO in vicuña capture	Community members/DGB technicians
24/11/2001	17/2	Sud Lipez	Community Relave	Semi-structured interview	School teacher Relave
25/11/2001	18/2	Sud Lipez	Community Guadalupe	PO in construction enclosure	Wildlife wardens/DGB technicians
26/11/2001	19/2	Sud Lipez	Community Guadalupe	Semi-structured interview	Truck driver in Guadalupe
26/11/2001	20/2	Sud Lipez	Community Guadalupe	Semi-structured interview	Mayor *(Corregidor)* in Guadalupe
26/11/2001	21/2	Jujuy (Argentina)	Community Cienega	Semi-structured interview	School teacher in Cienega
27/11/2001	22/2	Jujuy (Argentina)	Community Cienega	Group Interview	Womens weaving group in Cienega
27/11/2001	23/2	Jujuy (Argentina)	Community Cienega	Group Interview	School students from Cienega
27/11/2001	24/2	Jujuy (Argentina)	Community Cienega	Semi-structured interview	Mayor (*Comisionado municipal*) from Cusi Cusi
28/11/2001	25/2	Jujuy (Argentina)	Abra Pampa	Semi-structured interview	Hotelier in Abra Pampa
01/12/2001	26/2	Jujuy (Argentina)		Electronic communication	BBC Wildlife photograph

2. Main Period of Data Collection (Year 2002)

Date	Field note record	Location	Institution/community	Research method	Informant/s
16/08/2002	32/2	La Paz	University	Semi-structured interview	MACS contact in Bolivia
17/08/2002	33/2	La Paz	EU funded Project	Process documentation	List of SUPREME project team members
17/08/2002	34/2	La Paz	University	Semi-structured interview	Anthropologist University of Manchester
21/08/2002	35/2	La Paz	Ministry of Sustainable Development	Semi-structured interview	DGB Technician
21/08/2002	36/2	La Paz	University	Process documentation	Research on camelids
22/08/2002	37/2	La Paz	National Institution for Protected Areas	Semi-structured interview	Director of Environmental Monitoring-SERNAP
22/08/2002	38/2	La Paz	National Institution for Protected Areas	Semi-structured interview	Biodiversity project coordinator-SERNAP
22/08/2002	39/2	La Paz	Ethnographic Museum	Seminar	Anthropologist
23/08/2002	40/2	La Paz	Spanish cooperation agency	Group Interview	Coordinators AECI-Araucaria Programme/ MACS contact in Bolivia
27/08/2002	41/2	La Paz	University	Semi-structured interview	MACS contact in Bolivia
27/08/2002	42/2	La Paz	Spanish cooperation agency	Group Interview	Coordinators AECI-Araucaria Programme
27/08/2002	43/2	La Paz	National Institution for Protected Areas	Semi-structured interview	Director Reserve Apolobamba-SERNAP
29/08/2002	44/2	La Paz	Ministry of Sustainable Development	Semi-structured interview	DGB Technician
29/08/2002	45/2	La Paz	National Institution for Protected Areas	Semi-structured interview	Park warden Reserve Apolobamba-SERNAP
29/08/2002	46/2	La Paz	National Institution for Protected Areas	Process documentation	SERNAP-MAPZA-GTZ Project in Sajama
30/08/2002	47/2	La Paz	Ministry of Sustainable Development	Semi-structured interview	DGB Technician
02/09/2002	48/2	La Paz	Academy of Sciences	Semi-structured interview	Director ICIB
02/09/2002	49/2	La Paz	Spanish cooperation agency	Group Interview	Coordinators AECI-Araucaria Programme/ MACS contact in Bolivia
02/09/2002	50/2	La Paz	CIOEC	Group Interview	CIOEC coordinator/MACS contact

Date	Field note record	Location	Institution/community	Research method	Informant/s
					in Bolivia
02/09/2002	51/2	La Paz	Canadian cooperation agency	Semi-structured interview	CECI Technician
02/09/2002	52/2	La Paz	Spanish cooperation agency	Semi-structured interview	Field technician from AECI Cooperation
02/09/2002	53/2	La Paz	PNUD bi-national Programme	Semi-structured interview	Director ALT
08/09/2002	55/2	Machaqa border	Aguallamaya Sunday Fair	Group Interview	Project coordinator from North Machaqa, members from Yaru
08/09/2002	56/2	Machaqa border	Nazacara Pacajes Town	Meeting	Community authorities
08/09/2002	57/2-58/2	Machaqa	Nazacara Town	2 Group discussions	Wildlife warden, shopkeeper, community members, staff from road prefecture
11/09/2002	59/2-60/2	Machaqa	Nazacara Town	2 Workshops	Nazacara Schools
11/09/2002	61/2	Machaqa	Nazacara Town	Semi-structured interview	Wildlife warden
11/09/2002	62/2-67/2	Machaqa	San Antonio/Kanapata	5 Household Interviews	Community members living alongside river Desaguadero
11/09/2002	68/2	Machaqa	San Antonio	Semi-structured interview	School teacher San Antonio
11/09/2002	69/2	Machaqa	Nazacara Town	Semi-structured interview	School director
11/09/2002	70/2	Machaqa	Nazacara Town	Group discussion	Wildlife wardens, local authorities
12/09/2002	71/2	Nor Pacajes	Vichaya Town	Semi-structured interview	Ex-community authority
12/09/2002	72/2	Nor Pacajes	Vichaya Town	Group discussion	Shopkeepers
12/09/2002	73/2	Nor Pacajes	Vichaya Town	Workshop	School students
12/09/2002	74/2	Nor Pacajes	Vichaya Town	Semi-structured interview	Community member
12/09/2002	75/2	Nor Pacajes	Vichaya Town	Semi-structured interview	School director
12/09/2002	76/2	Nor Pacajes	Vichaya Town	Semi-structured interview	Community member
12/09/2002	77/2	Nor Pacajes	Vichaya Town	Semi-structured interview	School kiosque keeper
12/09/2002	78/2	Nor Pacajes	Vichaya Town	Semi-structured interview	School teacher
12/09/2002	79/2	Nor Pacajes	Vichaya Town	Semi-structured interview	ALT topograph
12/09/2002	80/2	Machaqa	Nazacara Town	Group discussion	Truck drivers
13/09/2002	81/2	Machaqa	Nazacara Town	Semi-structured interview	Wildlife warden Nazacara
13/09/2002	82/2	Machaqa	Nazacara Town	Semi-structured interview	Wildlife warden Pachamaya
13/09/2002	83/2	Machaqa	Nazacara Town	Semi-structured interview	*Mallcu* from Kanapata
13/09/2002	84/2	Machaqa	Nazacara Town	Semi-structured interview	Gypsum (*estuco*) mine worker
13/09/2002	85/2-86/2	Paca Japis	Santiago de Machaca Market	Semi-structured interview	Peruvian trader

Date	Field note record	Location	Institution/community	Research method	Informant/s
13/09/2002	87/2	Paca Japis	Santiago de Machaca Annual Festival	Semi-structured interview	Resident in La Paz (*Pasante)*
13/09/2002	88/2	Paca Japis	Santiago de Machaca Town	Semi-structured interview	Wildlife warden Santiago de Machaca
14/09/2002	89/2-90/2	Machaqa	Nazacara Town	Group discussion	Wildlife warden, shopkeeper
15/09/2002	91/2	Machaqa	Nazacara Town	Semi-structured interview	Shopkeeper
15/09/2002	92/2	Machaqa	Nazacara	Semi-structured interview	Gypsum (*estuco*) mine worker
15/09/2002	93/2	Machaqa	Nazacara	Semi-structured interview	Gypsum (*estuco*) mine worker
15/09/2002	94/2	Machaqa	Nazacara Town	Semi-structured interview	Neighbour board (*Presidente Junta de vecinos*)
15/09/2002	95/2	Machaqa	Nazacara Town	Semi-structured interview	Communitiy member
15/09/2002	96/2	Machaqa	Nazacara Town	Group Interview	Neighbour board, wildlife warden Nazacara
15/09/2002	97/2	Machaqa	Nazacara Town	Semi-structured interview	Communitiy member
15/09/2002	98/2	Machaqa	Nazacara Market	Semi-structured interview	Fisherman from Hiruito
16/09/2002	99/2	Machaqa	Nazacara Town	Semi-structured interview	Member from Santiago de Machaqa
16/09/2002	100/2	Machaqa	Nazacara Town	Group discussion	community warden, corregidor
16/09/2002	101/2	Machaqa	Nazacara Town	Semi-structured interview	Neighbour board (*Presidente Junta de vecinos*)
16/09/2002	102/2	Machaqa	San Antonio	Semi-structured interview	Community member
16/09/2002	103/2	Machaqa	Jesus de Manquiri	Meeting	School teacher, Community (authorities and members), Wildlife wardens
16/09/2002	104/2	Machaqa	Nazacara Town	Group discussion	Community authorities
16/09/2002	105/2-106/2	Machaqa	Nazacara Town	Semi-structured interview	Priest
17/09/2002	107/2	Machaqa	NGO Satawi	Group interview	Field technician/ex-community warden
17/09/2002	108/2	Machaqa	NGO Satawi	Semi-structured interview	Engineer
17/09/2002	109/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	Shopkeeper
17/09/2002	110/2	Machaqa	NGO Satawi	Semi-structured interview	Project coordinator/*Mallcu* Villa Pusuma
18/09/2002	111/2	Machaqa	NGO Cintdes	Semi-structured interview	Field technician

Date	Field note record	Location	Institution/community	Research method	Informant/s
18/09/2002	112/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	Shopkeeper
18/09/2002	113/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	Student from Pachamaya
18/09/2002	114/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	ex-wildlife warden
18/09/2002	115/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	wildlife warden
18/09/2002	116/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	German tourists
18/09/2002	117/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	Shopkeeper
18/09/2002	118/2	Machaqa	NGO Satawi	Meeting	Satawi field staff
18/09/2002	119/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	School Teacher from San Andres de Machaca
18/09/2002	120/2	Machaqa	Nazacara Market	Meeting	Wildlife wardens from Machaqa
18/09/2002	121/2	Machaqa	Nazacara Town	Semi-structured interview	School teacher from Achiri
18/09/2002	122/2	Machaqa	Nazacara Town	Semi-structured interview	Wildlife warden from Berenguela
19/09/2002	123/2	Machaqa	Nazacara Town	Meeting	ALT technicians, communities along river Desaguadero
27/09/2002	124/2	La Paz	Ministry of Sustainable Development	Semi-structured interview	Director DGB
28/09/2002	125/2-128/2	Apolobamba	National Reserve Apolobamba	Participative observation	Opening ceremony for the new Vicuña Management Plan
07/10/2002	129/2	Machaqa border	Corpa Town	Semi-structured interview	ALT worker/member from Hiruito
07/10/2002	130/2	Machaqa border	Corpa Town	Semi-structured interview	Priest
07/10/2002	131/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	Doctor resident in La Paz
07/10/2002	132/2	Machaqa	San Andres de Machaca Festival	Group discussion	School teacher Jesus de Manquiri, ALT staff
07/10/2002	133/2	Machaqa	Nazacara Town	Meeting	Wildlife wardens
08/10/2002	134/2	Machaqa	Nazacara Town	Group Interview	Wildlife wardens from Paca Japis
08/10/2002	135/2	Machaqa	Chuncarcota Town	Meeting	Community/OTB authorities, Municipality authorities, communities
09/10/2002	136/2	Machaqa	Conchacollo Town	Semi-structured interview	Project coordinator North Machaqa
09/10/2002	137/2	Machaqa	San Pedro San Pablo	Semi-structured interview	*Mama thalla*
09/10/2002	138/2	Machaqa	Conchacollo	Semi-structured interview	Wildlife warden Conchacollo
09/10/2002	139/2	Machaqa	San Pedro San Pablo	Group Interview	School teachers San Pedro San Pablo
09/10/2002	140/2	Machaqa	Villa Circaya	Group discussion	*Mallcu* Villa Circaya, community

Date	Field note record	Location	Institution/community	Research method	Informant/s
					member
09/10/2002	141/2	Machaqa	Villa Circaya	Meeting	Community Villa Circaya
10/10/2002	142/2	Machaqa	Conchacollo Town	Semi-structured interview	Truck driver from Villa Pusuma
10/10/2002	143/2	Machaqa	Nazacara Town	Meeting	Wildlife wardens
10/10/2002	144/2	Machaqa	Nazacara Town	Group discussion	Shopkeepers
11/10/2002	145/2	Machaqa	Nazacara Town	Semi-structured interview	Head board of neighbours
11/10/2002	146/2-154/2	Machaqa	Nazacara, San Antonio, Kanapata	8 Household Interviews	Community members living alongside river Desaguadero
12/10/2002	155/2	Machaqa	Nazacara Pacajes Town	Semi-structured interview	Community member
12/10/2002	156/2	Machaqa	Nazacara Town	Semi-structured interview	Member San Antonio
12/10/2002	157/2	Machaqa	MAN-B	Semi-structured interview	Field Technician
12/10/2002	158/2	Machaqa	NGO Satawi	Semi-structured interview	Engineer
12/10/2002	159/2	Machaqa border	Aguallamaya	Meeting	ALT staff, community authorities
13/10/2002	160/2	Machaqa	Nazacara Town	Semi-structured interview	dung pile dealer (*abonero*)
13/10/2002	161/2	Machaqa	NGO Satawi	Group Interview/discussion	NGO Satawi staff
13/10/2002	162/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	Doctor
13/10/2002	163/2	Machaqa	San Andres de Machaca Town	Semi-structured interview	Machaqa authority (*Jacha mallcu*)
13/10/2002	164/2	Machaqa	NGO Satawi	Semi-structured interview	Technician, Machaqa authority
14/10/2002	165/2	Machaqa	San Antonio	Household Interview	Community member
14/10/2002	166/2	Machaqa	Nazacara Town	Meeting	Wildlife wardens
15/10/2002	167/2-169/2	Machaqa border	Nazacara	3 Household Interviews	Community members living alongside river Desaguadero
15/10/2002	170/2	Nor Pacajes border	Road to Jihuacuta	Semi-structured interview	INRA field staff
15/10/2002	171/2	Nor Pacajes border	Road to Jihuacuta	Semi-structured interview	*Mallcu*
15/10/2002	172/2	Nor Pacajes border	Jihuacuta Market	Semi-structured interview	Ice cream vendor
15/10/2002	173/2-175/2	Nor Pacajes border	Road to Vichaya	3 Household Interviews	Community member
15/10/2002	176/2	Nor Pacajes border	Road to Vichaya	Semi-structured interview	Gypsum (estuco) mine worker
15/10/2002	177/2	Nor Pacajes	Vichaya Town	Semi-structured interview	Road prefecture workers
15/10/2002	178/2-181/2	Nor Pacajes	Vichaya Town	4 Semi-structured interviews	Community members
15/10/2002	182/2	Nor Pacajes	Vichaya Town	Semi-structured interview	Wildlife warden Vichaya
16/10/2002	183/2-184/2	Nor Pacajes	Villa Chocorosi Town	Group interview	

Date	Field note record	Location	Institution/community	Research method	Informant/s
16/10/2002	185/2	Nor Pacajes	Road to Titiri	Semi-structured interview	Member from Londorosi
16/10/2002	186/2	Nor Pacajes	Road to Titiri	Semi-structured interview	INRA field staff
16/10/2002	187/2-188/2	Nor Pacajes	Road to Calama Quintavi	2 Semi-structured interviews	Community members
16/10/2002	189/2	Nor Pacajes	Calama Quintavi	Semi-structured interview	Family sewing potatoes
16/10/2002	190/2-191/2	Nor Pacajes	Road to Pacollo	2 Semi-structured interviews	Community members
16/10/2002	192/2	Nor Pacajes	Pacollo	Household Interview	Wildlife wardens Pacollo Family members
16/10/2002	193/2	Nor Pacajes	Agua Rica Town	Semi-structured interview	Shopkeeper
16/10/2002	194/2	Nor Pacajes	Agua Rica Town	Semi-structured interview	School teachers
17/10/2002	195/2-196/2	Nor Pacajes	Road to Achiri	2 Semi-structured interviews	Community members
17/10/2002	197/2-199/2	Nor Pacajes	Achiri Town	3 Semi-structured interviews	Community members
17/10/2002	200/2	Nor Pacajes	Road to Huaripujo	Semi-structured interview	Community member from Jankomarka
17/10/2002	201/2	Nor Pacajes	Huaripujo Town	Semi-structured interview	Shopkeeper
17/10/2002	202/2	Nor Pacajes	Road to Santiago de Machaca	Semi-structured interview	Community member
17/10/2002	203/2	Paca Japis	Santiago de Machaca Town	Semi-structured interview	Wildlife warden Pairumani
17/10/2002	204/2	Paca Japis	Santiago de Machaca Town	Semi-structured interview	Wildlife warden's daughter
18/10/2002	205/2	Paca Japis	Santiago de Machaca Town	Semi-structured interview	Wildlife warden Santiago de Machaca
21/10/2002	1/3-2/3	La Paz	PNUD bi-national Programme	Semi-structured interview	ALT consultant
21/10/2002	3/3-4/3	La Paz	National Institution for Protected Areas	2 Semi-structured interviews	SERNAP officers
21/10/2002	5/3	La Paz	NGO Cedefoa	Group interview	CEDEFOA staff
21/10/2002	6/3-7/3	La Paz	MAN-B	Semi-structured interview	MAN-B project coordinator
22/10/2002	8/3	Machaqa	Capture and shearing San Antonio	Group discussion	Wildlife wardens, DGB technicians
23/10/2002	9/3	Machaqa	Construction enclosure Kanapata	Group discussion	Member San Antonio, Wildlife warden Pairumani
23/10/2002	10/3	Machaqa	Capture and shearing Kanapata	6 Semi-structured	Resident Kanapata, community

Date	Field note record	Location	Institution/community	Research method	Informant/s
				interviews	members San Antonio, Kanapata
24/10/2002	11/3	Machaqa	Construction enclosure Nazacara	Semi-structured interview	DGB technician
24/10/2002	12/3	Machaqa	Construction enclosure Nazacara	Semi-structured interview	Wildlife warden Pacollo
24/10/2002	13/3	Machaqa	Construction enclosure Nazacara	Participative observation	Wildlife wardens, community members, DGB technicians
24/10/2002	14/3	Machaqa	Construction enclosure Nazacara	Semi-structured interview	Wildlife warden Oruro
24/10/2002	15/3	Machaqa	Construction enclosure Nazacara	Semi-structured interview	Member Nazacara
24/10/2002	16/3	Machaqa	Construction enclosure Nazacara	Semi-structured interview	Wildlife warden Nazacara
24/10/2002	17/3	Machaqa	Construction enclosure Nazacara	Participative observation	Wildlife wardens
24/10/2002	18/3	Machaqa	Nazacara Town	Semi-structured interview	School teacher Nazacara
25/10/2002	19/3	Machaqa	Nazacara Town	Semi-structured interview	Member Eduardo Avaroa
25/10/2002	20/3	Machaqa	Capture Nazacara	Participative observation	DGB technicians, community
25/10/2002	21/3	Machaqa	Capture Nazacara	Participative observation	Communities authorities
25/10/2002	22/3	Machaqa	Capture Nazacara	Semi-structured interview	Wildlife warden Santiago de Machaca
25/10/2002	23/3	Machaqa	Shearing Nazacara	Semi-structured interview	Member Nazacara
25/10/2002	24/3	Machaqa	Shearing Nazacara	Participative observation	Member Nazacara
25/10/2002	25/3	Machaqa	Shearing Nazacara	Participative observation	Members Nazacara
25/10/2002	26/3	Machaqa	Weighing fibre Nazacara	Participative observation	Members Nazacara, members other communities
25/10/2002	27/3	Machaqa	Capture Nazacara	Group discussion	Members Nazacara
25/10/2002	28/3	Machaqa	Shearing Nazacara	Semi-structured interview	Member Nazacara
25/10/2002	29/3	Machaqa	Shearing Nazacara	Semi-structured interview	Member Nazacara
25/10/2002	30/3	Machaqa	Shearing Nazacara	Participative observation	Member Nazacara, DGB technicians, wildlife wardens
25/10/2002	31/3-32/3	Machaqa	Shearing Nazacara	Semi-structured interview	DGB technician
25/10/2002	33/3	Machaqa	Nazacara Town	Semi-structured interview	Wildlife warden Oruro
29/10/2002	34/3	Machaqa	Weighing fibre Jesus de Manquiri	Semi-structured interview	*Mallcu* Jesus de Manquiri
29/10/2002	35/3	Machaqa	Weighing fibre Jesus de Manquiri	Group Interview	*Mallcu* Huallaquiri, community members
29/10/2002	36/3	Machaqa	Weighing fibre Jesus de Manquiri	Participative observation	DGB technicians, community
29/10/2002	37/3	Machaqa	Weighing fibre Jesus de Manquiri	Meeting	Wildlife wardens MD, DGB technicians

Date	Field note record	Location	Institution/community	Research method	Informant/s
29/10/2002	38/3	Machaqa	Weighing fibre Jesus de Manquiri	Group discussion	*Jacha Mallcu*, DGB technician
29/10/2002	39/3	Machaqa	Weighing fibre Jesus de Manquiri	Semi-structured interview	School teacher Jesus de Manquiri
29/10/2002	40/3	Machaqa	Weighing fibre Jesus de Manquiri	Meeting	Wildlife wardens MD, DGB technicians
29/10/2002	41/3	Machaqa	Weighing fibre Jesus de Manquiri	Semi-structured interview	Member Jesus de Manquiri
29/10/2002	42/3	Machaqa	Bus to Nazacara	Semi-structured interview	Member Chama
29/10/2002	43/3	Machaqa	Bus to Nazacara	Semi-structured interview	Neighbour board Nazacara (Presidente Junta de vecinos)
29/10/2002	44/3	Machaqa	Nazacara Town	Semi-structured interview	Shopkeeper Nazacara
30/10/2002	45/3	Machaqa	Construction enclosure Huallaquiri	Participative observation	Widllife wardens, DGB technicians
30/10/2002	46/3	Machaqa	Construction enclosure Huallaquiri	Participative observation	Member Nazacara/Community warden
30/10/2002	47/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	DGB technician
30/10/2002	48/3-49/3	Machaqa	Construction enclosure Huallaquiri	Group discussion	Wildlife wardens
30/10/2002	50/3	Machaqa	Construction enclosure Huallaquiri	Participative observation	Community members
30/10/2002	51/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	*Mallcu* Huallaquiri
30/10/2002	52/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	DGB technician
30/10/2002	53/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	Wildlife warden Nazacara
30/10/2002	54/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	Member Huallaquiri
30/10/2002	55/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	DGB technician
30/10/2002	56/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	Member Jesus de Manquiri
30/10/2002	57/3	Machaqa	Construction enclosure Huallaquiri	Semi-structured interview	DGB technician
31/10/2002	58/3	Machaqa	Capture Huallaquiri	Semi-structured interview	DGB technician
31/10/2002	59/3	Machaqa	Capture Huallaquiri	Semi-structured interview	*Mallcu* Huallaquiri
31/10/2002	60/3	Machaqa	Capture Huallaquiri	Semi-structured interview	Wildlife warden Achiri
31/10/2002	61/3	Machaqa	Shearing Huallaquiri	Semi-structured interview	Member Nazacara
31/10/2002	62/3	Machaqa	Shearing Huallaquiri	Semi-structured interview	Member Jesus de Manquiri
31/10/2002	63/3	Machaqa	Shearing Huallaquiri	Semi-structured interview	Member Jesus de Manquiri
31/10/2002	64/3	Machaqa	Shearing Huallaquiri	Semi-structured interview	Member Jesus de Manquiri
31/10/2002	65/3	Machaqa	Shearing Huallaquiri	Semi-structured interview	Member Jesus de Manquiri
31/10/2002	66/3	Machaqa	Shearing Huallaquiri	Participative observation	Community members
01/11/2002	67/3	Peru	Desaguadero	Semi-structured interview	Member Tolacollo (Huancullani)

Date	Field note record	Location	Institution/community	Research method	Informant/s
01/11/2002	68/3	Peru	Desaguadero	Semi-structured interview	Member Totoroma (Kelluyo)
01/11/2002	69/3	Peru	Desaguadero	Semi-structured interview	Resident Airihua (Zepita)
01/11/2002	70/3	Peru	Desaguadero	Group discussion	Community members
01/11/2002	71/3	Peru	Desaguadero	Group Interview	Resident Kelluyo
01/11/2002	72/3	Peru	Puno	Semi-structured interview	Tourist dealer
01/11/2002	73/3-74/3	Peru	Puno	Semi-structured interview	Ecological Police
02/11/2002	75/3-78/3	Peru	Desaguadero	4 Semi-structured interviews	Community members/minibus passengers
06/11/2002	79/3-82/3	Peru	Reserve Aymara Lupaca	Group interview	Road workers
06/11/2002	83/3	Peru	Reserve Aymara Lupaca	Semi-structured interview	Park warden
06/11/2002	84/3	Peru	Reserve Aymara Lupaca	Semi-structured interview	Member Collana
06/11/2002	85/3	Peru	Road to Desaguadero	Semi-structured interview	Minibus driver
06/11/2002	86/3	Peru	Desaguadero	Semi-structured interview	INRENA staff
04/11/2002	87/3	La Paz	Ministry of Sustainable Development	Group Interview	DGB Director, Technicians
04/11/2002	88/3	La Paz	National Institution for Protected Areas	Semi-structured interview	Director Apolobamba in SERNAP
04/11/2002	89/3	El Alto	MAN-B	Semi-structured interview	MAN-B project coordinator
11/11/2002	90/3	El Alto	Bus stop	Semi-structured interview	Shopkeepers
11/11/2002	91/3	Machaqa	El Alto-Nazacara	Semi-structured interview	Community member
11/11/2002	92/3	Machaqa	Nazacara town	Semi-structured interview	Wildlife warden Nazacara/San Antonio/Kanapata
11/11/2002	93/3	Machaqa	Nazacara town	Semi-structured interview	Shopkeeper from Nazacara
12/11/2002	94/3	Machaqa	Nazacara town	Semi-structured interview	Wildlife warden Pachamaya
12/11/2002	95/3	Machaqa	San Antonio	Household Interview	Member San Antonio
12/11/2002	96/3	Machaqa	San Antonio	Household Interview	Member San Antonio
12/11/2002	97/3	Machaqa	San Antonio	Participative observation	Poaching
12/11/2002	98/3	Machaqa	Nazacara Town	Semi-structured interview	Member Huallaquiri
12/11/2002	99/3	Machaqa	Nazacara Town	Semi-structured interview	Shopkeeper
12/11/2002	100/3	Machaqa	Nazacara Town	Semi-structured interview	Head board of neighbours
12/11/2002	101/3	Machaqa	Nazacara Town	Semi-structured interview	Member Huallaquiri
12/11/2002	102/3	Machaqa	Nazacara Town	Semi-structured interview	Wildlife warden Jesus de Manquiri/Huallaquiri
12/11/2002	103/3	Machaqa	Nazacara Town	Participative observation	Phone call from Yaru

Date	Field note record	Location	Institution/community	Research method	Informant/s
12/11/2002	104/3	Machaqa	Nazacara town	Semi-structured interview	Member Jesus de Manquiri/Nazacara
12/11/2002	105/3	Machaqa	San Antonio	Semi-structured interview	Member San Antonio
12/11/2002	106/3	Machaqa	Nazacara town	Semi-structured interview	Satawi field staff/Member Jesus de Machaca
12/11/2002	107/3	Machaqa	Nazacara Town	Participative observation	Director School/Community member
12/11/2002	108/3	Machaqa	Nazacara town	Participative observation	Director School/Wildlife warden Nazacara
12/11/2002	109/3	Machaqa	Nazacara town	Semi-structured interview	Wildlife warden Nazacara
12/11/2002	110/3	Machaqa	Nazacara town	Semi-structured interview	Shopkeeper
12/11/2002	111/3	Machaqa	Nazacara town	Semi-structured interview	Member Huallaquiri
12/11/2002	112/3	Machaqa	Nazacara town	Semi-structured interview	Member Huallaquiri
12/11/2002	113/3	Machaqa	Nazacara town	Semi-structured interview	Wildlife warden Nazacara
13/11/2002	114/3	Machaqa	Huallaquiri	Semi-structured interview	Member Huallaquiri
13/11/2002	115/3-116/3	Machaqa	Huallaquiri	Semi-structured interview	Mallcu Huallaquiri
13/11/2002	117/3	Machaqa	Santiago de Machaca Town	Participative observation	Opening ceremony for the new University
13/11/2002	118/3	Machaqa	Nazacara town	Semi-structured interview	*Mallcu cantonal*
13/11/2002	119/3	Machaqa	Nazacara town	Semi-structured interview	Member Kanapata
13/11/2002	120/3-121/3	Machaqa	Nazacara town	Semi-structured interview	Member Huallaquiri
13/11/2002	122/3	Machaqa	Nazacara town	Group interview	Members Eduardo Avaroa
13/11/2002	123/3	Machaqa	Nazacara town	Semi-structured interview	Director school
13/11/2002	124/3	Machaqa	Nazacara town	Semi-structured interview	Member Huallaquiri
13/11/2002	125/3	Machaqa	Nazacara	Participative observation	Corregidor Nazacara death
13/11/2002	126/3	Machaqa	Nazacara town	Semi-structured interview	Member Huallaquiri
14/11/2002	127/3	Machaqa	Nazacara town	Semi-structured interview	Resident in La Paz
14/11/2002	128/3	Machaqa	Nazacara town	Semi-structured interview	*Mallcu cantonal*
14/11/2002	129/3	Machaqa	Nazacara town	Semi-structured interview	Member Pacajes/resident Nazacara town
14/11/2002	130/3-132/3	Machaqa	Nazacara town	Participative observation	DGB technician arrival
14/11/2002	133/3	Machaqa	Conchacollo	Semi-structured interview	Member Conchacollo
14/11/2002	134/3	Machaqa	Conchacollo	Semi-structured interview	Member Conchacollo

Date	Field note record	Location	Institution/community	Research method	Informant/s
14/11/2002	135/3	Machaqa border	Hiruito	Group interview	Members Hiruito
14/11/2002	136/3	Machaqa border	Hiruito	Semi-structured interview	Member Hiruito
15/11/2002	137/3	Machaqa	Construction enclosure Conchacollo	Participative observation	Wildlife wardens
15/11/2002	138/3	Machaqa	Conchacollo	Participative observation	Wildlife Yaru, communities
15/11/2002	139/3	Machaqa	Capture and shearing Conchacollo	Participative observation	Community members, wildlife wardens
15/11/2002	140/3	Machaqa	Capture and shearing Conchacollo	Meeting	Wildlife wardens
15/11/2002	141/3	Machaqa	Chijipucara	Semi-structured interview	Mallcu Chijipucara, DGB technicians
15/11/2002	142/3	Machaqa	Chijipucara	Semi-structured interview	Wildlife warden Villa Pusuma
15/11/2002	143/3	Machaqa	Chijipucara	Group discussion	DGB technicians
15/11/2002	144/3	Machaqa	Chuncarcota Town	Semi-structured interview	Mallcu Chuncarcota, DGB technicians
15/11/2002	145/3	Machaqa	Chuncarcota	Semi-structured interview	Member Chuncarcota
15/11/2002	146/3	Machaqa	Chuncarcota	Group discussion	DGB technicians
15/11/2002	147/3	Machaqa	Conchacollo	Meeting	Mallcus
16/11/2002	148/3	Machaqa	Villa Pusuma	Semi-structured interview	Wildlife warden Villa Pusuma
16/11/2002	149/3	Machaqa	Villa Pusuma	Semi-structured interview	Member Villa Pusuma
16/11/2002	150/3-151/3	Machaqa	Construction enclosure Laquinamaya	Participative observation	Widllife wardens, community members, DGB technicians
16/11/2002	152/3	Machaqa	Construction enclosure Laquinamaya	Group interview	Members Luna
16/11/2002	153/3	Machaqa	Construction enclosure Laquinamaya	Group discussion	Member Luna, DGB technician
16/11/2002	154/3	Machaqa	Construciton enclosure Laquinamaya	Semi-structured interview	Wildlife warden Santiago de Machaca
17/11/2002	155/3	Machaqa	Capture and shearing Laquinamaya	Semi-structured interview	Mallcu Luna/ex-school teacher
17/11/2002	156/3-157/3	Machaqa	Capture and shearing Laquinamaya	Group discussion	Mallcus, community members, wildlife wardens, DGB technicians
17/11/2002	158/3	Machaqa	Capture and shearing Laquinamaya	Participative observation	Mallcus, community members, DGB technicians
17/11/2002	159/3-160/3	Machaqa	Capture and shearing Laquinamaya	Semi-structured interview	DGB technician
17/11/2002	161/3	Machaqa	Weighing fibre Laquinamaya	Meeting	Mallcus, community members, DGB technicians
18/11/2002	162/3-163/3	Machaqa	Laquinamaya town	Semi-structured interview	Wildlife warden Santiago de

Date	Field note record	Location	Institution/community	Research method	Informant/s
					Machaca
18/11/2002	164/3	Machaqa	Laquinamaya town	Semi-structured interview	Shopkeeper
18/11/2002	165/3-166/3	Machaqa	Laquinamaya town	Semi-structured interview	Mallcu cantonal
18/11/2002	167/3	Machaqa	Laquinamaya town	Semi-structured interview	Shopkeeper
19/11/2002	168/3	Machaqa	Laquinamaya town	Semi-structured interview	Wildlife warden Pairumani
19/11/2002	169/3	Machaqa	Laquinamaya town	Meeting	DGB technicians, wildlife wardens
19/11/2002	170/3	Machaqa	Capture Laquinamaya	Participative observation	Community members, wildlife wardens, DGB technicians
19/11/2002	171/3	Machaqa	Shearing Laquinamaya	Semi-structured interview	Community member shearing
19/11/2002	172/3	Machaqa	Shearing Laquinamaya	Semi-structured interview	Member Alcapari
19/11/2002	173/3-174/3	Machaqa	Shearing Laquinamaya	Semi-structured interview	Wildlife warden Santiago de Machaca
19/11/2002	175/3	Machaqa	Shearing Laquinamaya	Semi-structured interview	Member Luna
19/11/2002	176/3	Machaqa	Shearing Laquinamaya	Semi-structured interview	DGB technician
19/11/2002	177/3	Machaqa	Community lunch Laquinamaya	Group interview	Member Torrekelca, Member Luna
19/11/2002	178/3	Machaqa	Community lunch Laquinamaya	Group interview	Mallcus, community members
19/11/2002	179/3	Machaqa	Laquinamaya town	Semi-structured interview	Wildlife warden Collana
19/11/2002	180/3	Machaqa	Laquinamaya town	Meeting	Wildife wardens, DGB technicians
20/11/2002	181/3	Machaqa	Laquinamaya town	Semi-structured interview	Shopkeeper
20/11/2002	182/3	Machaqa	Construction enclosure Chijipucara	Semi-structured interview	Member Chijipucara/dung pile dealer
20/11/2002	183/3	Machaqa	Construction enclosure Chijipucara	Semi-structured interview	Community warden Chijipucara
20/11/2002	184/3	Machaqa	Construction enclosure Chijipucara	Semi-structured interview	Mallcu Chijipucara
20/11/2002	185/3	Machaqa	Construction enclosure Chijipucara	Semi-structured interview	DGB technician
20/11/2002	186/3-187/3	Machaqa	Construction enclosure Chijipucara	Participative observation	Community members, wildlife wardens
20/11/2002	188/3	Machaqa	Construction enclosure Chijipucara	Semi-structured interview	Jacha Mallcu/Member Chiijiupcara
20/11/2002	189/3	Machaqa	San Andres de Machaca	Semi-structured interview	Shopkeeper
21/11/2002	190/3	Machaqa	Capture aChijipucara	Participative observation	Member Chijipucara, rest of community
21/11/2002	191/3-192/3	Machaqa	Capture Chijipucara	Semi-structured interview	Community warden Chijipucara
21/11/2002	193/3-194/3	Machaqa	Capture Chijipucara	Participative observation	DGB technicians, wildlife wardens
21/11/2002	195/3	Machaqa	Shearing Chijipucara	Participative observation	Members Chijipucara, DGB

Date	Field note record	Location	Institution/community	Research method	Informant/s
					technician
21/11/2002	196/3	Machaqa	Shearing Chijipucara	Semi-structured interview	Member Chijipucara
21/11/2002	197/3	Machaqa	Shearing Chijipucara	Semi-structured interview	Jacha Mallcu/Member Chiijiupcara
21/11/2002	198/3	Machaqa	Shearing Chijipucara	Semi-structured interview	DGB technician
21/11/2002	199/3	Machaqa	Shearing Chijipucara	Semi-structured interview	Member Chijipucara
21/11/2002	200/3	Machaqa	Shearing Chijipucara	Semi-structured interview	Member Chijipucara
21/11/2002	201/3	Machaqa	Weighing fibre Chijipucara	Meeting	Community, DGB technicians, wildlife wardens
21/11/2002	202/3	Machaqa	San Andres de Machaca	Semi-structured interview	Shopkeeper/Member Chijipucara
21/11/2002	203/3	Machaqa	San Andres de Machaca	Group interview	DGB technician
21/11/2002	204/3	Machaqa	San Andres de Machaca	Group discussion	Wildlife wardens
21/11/2002	205/3	Machaqa	San Andres de Machaca	Group interview	Residents in San Andres de Machaca
22/11/2002	206/3	Machaqa	Bus San Andres-La Paz	Semi-structured interview	Member Santiago de Machaca
22/11/2002	207/3	Machaqa	San Andres de Machaca	Semi-structured interview	DGB technician
24-29/11/02	208/3	Peru	Arequipa	Meeting	MACS team members
27/11/2002	209/3	Peru	INCA Tops	Meeting	MACS team members, INCA manager
28/11/2002	210/3	Peru	Chakku Pampa Canahuas	Participative observation	NGO Conatura, MACS team, CONACS, community
29/11/2002	211/3	Peru	CONACS Puno	Semi-structured interview	CONACS technician
07/12/2002	212/3	Peru	NGO EDAS	Group Interview	EDAS staff members
07/12/2002	213/3	El Alto	Bus La Paz-Agua Rica	Group Interview	MembersChalluyo/Pacajes residents in La Paz
07/12/2002	214/3	Nor Pacajes border	Bus La Paz-Agua Rica	Semi-structured interview	Member AguaRica resident La Paz
07/12/2002	215/3	Nor Pacajes border	Bus La Paz-Agua Rica	Semi-structured interview	President Regional Association for vicuña management Nor Pacajes
07/12/2002	216/3-218/3	Nor Pacajes border	Bus La Paz-Agua Rica	Semi-structured interview	Member AguaRica resident La Paz
07/12/2002	219/3	Nor Pacajes	Agua Rica Town	Semi-structured interview	School teacher
07/12/2002	220/3	Nor Pacajes	Agua Rica Town	Semi-structured interview	Wildlife warden Calacoto
07/12/2002	221/3	Nor Pacajes	Agua Rica Town	Semi-structured interview	Community warden Jankomarca
07/12/2002	222/3-225/3	Nor Pacajes	Agua Rica Town	Semi-structured interview	Wildlife warden Calacoto
07/12/2002	226/3-228/3	Nor Pacajes	Agua Rica Town	Group interview	School teachers

Date	Field note record	Location	Institution/community	Research method	Informant/s
07/12/2002	229/3	Nor Pacajes	Agua Rica Town	Semi-structured interview	Community warden Jankomarca
07/12/2002	230/3	Nor Pacajes	Agua Rica Town	Household interview	Members Agua Rica
07/12/2002	231/3	Nor Pacajes	Agua Rica Town	Semi-structured interview	Resident in La Paz
08/12/2002	232/3	Nor Pacajes	Bus Agua Rica-La Paz	Semi-structured interview	Resident in La Paz
08/12/2002	233/3	Nor Pacajes	Bus Agua Rica-La Paz	Semi-structured interview	Member Vichaya
08/12/2002	234/3	Nor Pacajes	Bus Agua Rica-La Paz	Semi-structured interview	Field technician Comanche (SEMTA)
08/12/2002	235/3	Nor Pacajes	Bus Agua Rica-La Paz	Semi-structured interview	Member Quilla Quilla
09/12/2002	236/3	La Paz		Semi-structured interview	Taxi driver
09/12/2002	237/3	La Paz		Semi-structured interview	Boutique vendor
12-13/12/02	238/3	Peru	Arequipa	Workshop	NGOConatura, Vicuña committees
17/12/2002	239/3	La Paz	Ministry of Sustainable Development	Semi-structured interview	DGB director, Technician
21/12/2002	240/3	Machaqa border	Corpa Town	Semi-structured interview	School staff
21/12/2002	241/3	Machaqa border	Corpa Town	Semi-structured interview	Priest
23/12/2002	242/3	La Paz	Ministry of Sustainable Development	Semi-structured interview	DGB technician
23/12/2002	243/3	La Paz		Semi-structured interview	Garagist
23/12/2002	244/3	La Paz	Academy of Sciences	Semi-structured interview	Director

3. Follow-up period (Year 2003)

Date	Field note records	Location	Institution/community	Research method	Informant/s
04/02/2003	7/4	La Paz	Netherlands Cooperation Agency	Seminar	SNV staff
11/02/2003	8/4	La Paz	University	Semi-structured interview	Professor
11/02/2003	9/4	La Paz	NGO Semta	Semi-structured interview	Field technician
11/02/2003	10/4	La Paz	Viceministry of Popular Participation	Process documentation	
12/02/2003	11/4	La Paz	IICA-FOMRENA	Semi-structured interview	Project coordinator in Bolivia
13//02/2003	12/4	La Paz	CIPCA	Semi-structured interview	Anthropologist
15/02/2003	13/4	La Paz	Ministry of Sustainable Development	Semi-structured interview	DGB director
15/02/2003	14/4	La Paz	IICA-FOMRENA	Semi-structured interview	Project coordinator in Peru
15/02/2003	15/4	La Paz	Fibre weaving cooperative	Semi-structured interview	Fibre dealer
21//02/2003	16/4	La Paz	ACCRA	Semi-structured interview	Project coordinator
26/02/2003	17/4	La Paz	Institute of Ecology	Semi-structured interview	Director
28/02/2003	18/4	La Paz	Ministry of Agriculture	Semi-structured interview	SIBTA coordinator
05/03/2003	19/4	La Paz	Fundacion Altiplano	Semi-structured interview	Project coordinator
06/03/2003	20/4	La Paz	Ministry of Sustainable Development	Semi-structured interview	DGB technician
06/03/2003	21/4	La Paz	CIDESA	Semi-structured interview	Project coordinator
08/03/2003	22/4	Machaqa	Nazacara Festival	Participative observation	Community members
09/03/2003	23/4	Machaqa	Nazacara Town	Interview	*Mallcu* Jesus de Manquiri
10/03/2003	24/4	Machaqa border	Road to La Paz	Group Interview	Bus passengers
10/03/2003	25/4	Machaqa border	Chama Town	Semi-structured interview	Shopkeeper
11/03/2003	26/4	Machaqa border	Corpa Town	Participative observation	Health service
11/03/2003	27/4	Machaqa border	PIEB	Semi-structured interview	Project coordinator
13/10/2003	28/4	Sud Lipez border	Government	Participative observation	Government, communities
15/10/2003	29/4	Sud Lipez border	Camelids Congress	Semi-structured interview	Prefecture Potosi
15/10/2003	30/4	Sud Lipez border	Camelids Congress	Semi-structured interview	Camelids specialist
02/11/2003	34/4	Argentina	MACS Project	Meeting	MACS team members

Appendix B.

Letter of Introduction to Communities

Sr Autoridad originaria
Ayllu/Comunidad:

Tengo el agrado de dirijirme a Ud. para solicitar su autorización y apoyo para dialogar con Ud. y algunos miembros de su ayllu/comunidad.

Se trata de un estudio universitario dentro del área comprendida entre los rios Mauri y Desaguadero con el objetivo de conocer qué está pasando con la vicuña en dicha zona.

A través de este estudio se ofrece por un lado, compartir y discutir con los distintos miembros de su comunidad/ayllu los resultados obtenidos para luego contribuir con un documento escrito sobre el diagnóstico de todo el área visitada.

Espero que el compartir un espacio para el intercambio de experiencias e información sobre el recurso vicuña sea de vuestro agrado e interés general.

Esperando que encuentre mi acercamiento agradable,

Lo saluda atentamente,

Lic. Nadine Renaudeau d'Arc

Appendix C.
Description of vicuña capture and shearing events

Once the community has confirmed their interest to participate in the vicuña capture and shearing event (see Chapter 6 for factors affecting the initial involvement of communities), the key decision-making arrangements and management activities involved in the two-days VCSE can be divided into five stages as illustrated and described in the following paragraphs[60].

Stage 1: Selection of vicuña capture site

According to DGB technicians, the basic criteria to be used to select an appropriate site for the vicuña capture are: high density of vicuñas, easy accessibility and near a source of water where vicuñas go to drink every day, as seen in Plate 7.1.

Plate 7.1 Vicuña capture enclosure in AMC Kanapata

[60] This description has been prepared and presented

Information on these conditions is produced by wildlife wardens through their monthly census reports on the status of vicuña populations. Information on the daily patterns of activities of vicuña populations are determined by the time and space displacements, such as their sites for eating, drinking and paths that they use to move from one space to the other. This is part of the local knowledge of people living in the same area where vicuña is found. Once the location of the capture site is selected, the second stage in the event is the construction of the vicuña capture enclosure.

Stage 2: Construction of the vicuña capture enclosure

The capture enclosure (*manga de captura*) is a structure for enclosure and capture of animals made by *Eucalyptus sp.* posts between 2.5 m and 3 m long by 10 cm width that are unified by a fish net (type Raschell) of 200 m long by 2 m wide. The capture enclosure is installed forming a V-shaped design that permits the round up of vicuñas to a corral at its end. The length of each arm and its orientation points towards a water point, forming a V-shaped enclosure, as seen in Plate 7.2.

Plate 7.2 Design of the vicuña capture enclosure in AMC S.A.Lipez

Source: Courtesy Pete Oxford

The design of the capture enclosure and strategy of round up can vary depending on the topography and density of vicuñas. The size depends on the number of posts available and number of people available to round up vicuñas. In this regard, the DGB officers' technical advice during a meeting with the wildlife wardens was that:

> *The design of capture enclosure should be based on 200 posts that we should take as ideal number. Laquinamaya worked with 141 posts. The minimum has been Jesus de Manquiri with 120 posts. You should take into account that the size of the enclosure can compensate for the lack of people* (Meeting, 15/11/2002, 140/3).

The construction of the capture enclosure depends on the number of posts available. Posts as well as fishnets have been provided by DGB. In Lipez Chichas and Mauri-Desaguadero, three rolls of fishnet are brought every year by the DGB and used in rotation amongst communities. For example, the ARMV Machaqa received 500 posts in the year 2000, 250 posts were shared by *Ayllus* Yaru, Alto, and Bajo Achacana, while 250 posts were shared by *Ayllus* Choque, Collana and Laquinamaya, as shown in Plate 7.3.

Plate 7.3 Transport of posts in AMC Laquinamaya

The construction of the vicuña capture enclosure requires digging of holes of 40cm approximately for 170 to 200 posts (3 meters high). The depth is up to the elbow (~50cm). Once the hole is made, the posts are placed and covered with soil. Two people participate in digging each hole: one to make the hole, the other to take out the earth, as shown in Plate 7.4.

Plate 7.4 Digging holes in AMC Laquinamaya

The installation of the fish net is a task requires a minimum of three people: one to adjust the net to the top of post, the second person to stretch net on the top, the third person to stretch net on the bottom and adjust with nails to post. The net in the corral has to be reinforced with rope. The timing and efficiency at this stage depends on the size of the enclosure to be built, but also on the number of people and tools available, as shown in Plate 7.5.

Plate 7.5 The installation of the fish net in San Antonio de Lipez

The tasks during the second day require a larger number of people, especially for the round-up and capture of vicuña, as a key determinant for accomplishing this stage.

Stage 3: Round-up and capture of vicuña

The round up of vicuña is organized depending on the number of people that have turned up on the day of the event. There are three walkie-talkies brought by DGB, used by three main groups. Groups are distributed in different points far away from the corral to surprise vicuñas that are inside and outside the enclosure. The DGB technicians control the decisions within this strategic plan, they organise the people through the wildlife wardens and give the initial signal to walk in one line and then run. One technician divides people in three groups and distributes them in different distant points. Once they are given the signal (through walkie-talkies), these groups of people aligned in their spots start to walk slowly decreasing the distance from each other until they join other groups in the same line.

Strings with coloured pieces of cloth attached to them, locally named *banderoles*, are held between two people in the row and used to cover the gap left between people as one vicuña can escape through a meter gap. Some vicuñas become alert and the line of people start to advance more quickly, linked by the banderoles and acting as a mobile human fence. Finally, people start to run until the vicuñas are enclosed in the corral, as illustrated in Plate 7.6.

Plate 7.6 Round-up of vicuña in AMC Huallaquiri

Source: Courtesy Antonio Orosco-Mita

Once vicuñas and people arrive to the corral, the next stage consists in holding the animal (generally between two people), paying special attention not to twist the long neck (which is particularly fragile). Next front and back legs are tied up together with a special rope made from lama wool (*chaku*), following the same traditional method as domestic animals, and the vicuña is laid down on the floor.

All animals with scabies are treated[61]. Any injury is treated with Iodine. All animals are counted and those to be sheared are identified. Those vicuñas ear-tagged from last year, are also recorded. Off-spring younger than two years old

[61] Scabies is an infectious skin disease which is caused by a parasite and skin becomes rough and uncomfortable. In these cases, scabies was treated with an injection of *Ivomex*, a special remedy against the disease.

are not sheared and are kept together, females[62] are first sheared and afterwards released again with offspring. Amongst adults, those that had been shorn last year were not sheared. This is related to the requirement from DGB to have fibre longer than 1.5cm.

Stage 4: Shearing of vicuña fibre

The vicuña to be sheared is laid down on top of a mat and at least two people are needed: one to hold the head and the other to shear the vicuña, as shown in Plate 7.7.

Plate 7.7 Shearing of vicuña in AMC Relave

The methods used to shear sheep and llamas, using tins and knives, generally give a low quality product. DGB technicians provide scissors to avoid community members using tins and knives, as shown in Plate 7.8. A set of 15 scissors was available at the beginning of the capture season and only 3 remained towards the end. The shearing is partial otherwise; vicuñas would not be able to survive the cold night temperatures (Bonacic, 1996), as shown in Plate 7.8.

[62] During the season of vicuña capture, females are gestating and lactating.

Plate 7.8 Shearing of vicuña fibre

Stage 5: Weighing of fibre shorn and certification

In the following stage, the fibre of each animal is kept in an individual plastic bag and one plastic bag corresponds to the fibre shorn from one animal, as shown in Plate 7.9.

Plate 7.9 Fibre shorn in AMC Huallaquiri

Each bag is weighed using an electronic balance brought by DGB, as shown in Plate 7.10. All wildlife wardens and a few community members, record the weight, and contribute to the adding up to total sum. The weight is recorded in two official papers: the Community Minutes (*Actas de la Comunidad*) that also records the names of the participants and their community of origin and the DGB official record. These are both signed and stamped by community authorities and DGB technicians respectively. The fibre is put in a plastic bag with the name of the community and taken away by the DGB technicians to the offices in La Paz where it is officially stored until future commercialisation. Finally, a break for a community lunch is also part of each day's activities. The community provides food and drinks for all participants.

Plate 7.10 Weighing of vicuña fibre in AMC Huallaquiri

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