Guanaco Management in Argentina: Taking a Commons Perspective

Gabriela Lichtenstein
Instituto Nacional de Antropología y Pensamiento Latinoamericano
INAPL/CONICET, Buenos Aires

Abstract
This paper deals with wildlife as a non-conventional common-pool resource (CPR) in a country, Argentina, which is poorly represented in the commons literature. Many of Argentina´s public policies regarding natural resource management reflect the historical denial of indigenous and low-income rural communities by the State and the promotion of private property over common property. This paper discusses the challenges facing live shearing programs for guanaco (*Lama guanicoe*) in Argentinian Patagonia and the potential for incorporating lessons from the commons in order to promote sustainable use.
Keywords: *collective management, common pool resources, guanacos, vicuñas, desertification*

Resumen
Este trabajo analiza la vida silvestre como un bien común no convencional en Argentina, un país poco representado en la literatura sobre los bienes comunes. Se sugiere que en este país las políticas públicas con respecto al manejo de los recursos naturales reflejan, en general, el relegamiento histórico de las comunidades indígenas y rurales así como la promoción de la propiedad privada sobre la propiedad comunal. El estudio discute los desafíos que presentan las experiencias de esquila de guanacos (*Lama guanicoe*) en Patagonia y la potencial incorporación de enseñanzas sobre los bienes comunes para promover el uso sustentable de la especie.
Palabras clave: *manejo comunitario, recursos de uso común, guanacos, vicuñas, desertificación*

Introduction

Common pool resources (CPR) are natural goods or human-made systems characterized by the difficulty of excluding actors from using them and the fact that their use by one individual or group means that less is available for others; known as the *exclusion problem* and *subtractability problem* respectively (Ostrom 1990; Ostrom *et al.* 1999). The latter characteristic distinguishes CPR from pure public goods, which exhibit both non-excludability and non-rivalry in consumption.

While most literature on traditional commons deals with fisheries, forests, water management, irrigation and animal husbandry (Van Laerhoven and Ostrom 2007), wildlife use has not been as widely explored. This paper deals with wildlife as a non-conventional common-pool resource (CPR) in a country, Argentina, which is poorly represented in the commons literature.

Argentina encompasses diverse ecoregions and topographies ranging from the species rich Atlantic forest in the northeast, to the high altitude desert in the North West, the Valdivia temperate rainforest in the Southern Andes and the tundra in the far South. The total population is 40,091,359 (INDEC, 2010). With close to 90 percent of the country's inhabitants residing in cities, Argentina is home to one of the highest urban populations in Latin America.

The land tenure situation is dominated by private land ownership, with just 7 percent of the national territory in the form of 437 terrestrial protected areas (Elbers 2011) and a much smaller percentage in the process of undergoing titling to indigenous communities.[1] During the last few decades there has been an increase of land concentration and inequality (Slutzky 2007). According to the 2002 Agricultural Census, 70 percent percent of producers owned small properties (less than 200 ha, with an average of 48ha); whereas 1.3 percent of land owners owned 42 percent of productive land with properties averaging 18,500 ha (Van Dam 2007).

During recent years, the country has been undergoing a transition from a rural development model with locally-anchored small and medium sized producers to a large-scale, high productivity business farming model with delocalized management. This new model consists of the following features: a) land concentration in very few hands; (b) a spectacular advance in soybean production resulting in the expansion of the agricultural frontier towards the north, west and south of the country, c) the replacement of livestock land for crops in productive areas and the expansion of livestock grazing into forested areas; (d) an increase in the occupation and development of new land, promoted by provincial governments; (e) an across-the-board increase in land prices; (f) a consolidation and considerable increase in the leasing of farmland (particularly for soybean crops) through pooled investment funds; (g) the sale of government-owned land at derisory prices (IFAD 2011); and, h) rural-urban migration (Van Dam 2007). This shift is having an important impact on the environment in terms of habitat degradation, deforestation, introduction of exotic species, soil and water pollution and biodiversity loss (*e.g.*, FAO 2011). In social terms, it affects smallholders and the poorest rural people most acutely, leading to migration, loss of livelihood opportunities, and the deterioration of quality of life (Perez Carrera *et al.* 2008). Land concentration is further enhanced by the high proportion of producers in highly precarious informal tenure situations who are unable to title the land they are farming, in many cases after decades of occupation by several generations of the same family (IFAD 2011). Permissive mining laws created in the 1990s have led to large-scale open pit mega-mining that is having severe impacts on commons that are vital to nearby communities such as water or clean air.

Many of the rural poor with no land titles are indigenous people. According to the Complementary Survey of the Indigenous Peoples of 2004, 600,329 people declared themselves Amerindian or first-generation descendants of Amerindians.[2] In 1994, Argentina modified its Constitution of 1853, introducing advances in the rights of indigenous peoples, such as the recognition of the legal status of indigenous communities; as well as communal possession and ownership of their traditional lands. At an international level, Convention 169 of the International Labor Organization (ILO 169) was ratified in 2000. However, land titling for indigenous communities has moved forward very slowly and is hampered by procedural administrative and political barriers. In many provinces, indigenous people are facing forcible evictions from their ancestral territories (Carrasco 2011).

Argentina is a federal country comprised of 23 provinces, with legislative powers divided between the federal state and the provinces. Under the 1994 Constitution, the provinces are the original owners of the natural resources within the boundaries of their respective territories and they are exclusively empowered to determine their use. However, the Constitution also enables the federal government to make minimum requirement regimes, which are sets of rules granting common environmental protection for the national territory and setting the conditions for environmental preservation and sustainable development. International Conventions or Treaties signed by the country (*e.g.*, Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); CBD (Convention on Biological Diversity)) hold a higher hierarchy than national laws, which can contribute towards the conservation of CPRs by stopping "productive" law initiatives.

The National Law for the Conservation of Fauna declares wildlife *res nullius* - *i.e.*, without owner and subject to appropriation – with the exception being wildlife found inside protected areas. The chances of legally appropriating wildlife are higher for citizens with large incomes (*e.g.*, those that organize duck, dove or game hunting or fishing expeditions) than for the rural poor, as will be further explained in this paper. In the latter case, appropriation occurs mainly through subsistence hunting (Altricher and Basurto 2008).

Massive privatizations of CPRs took place during the 1990s, when state-owned enterprises dealing with oil, gas, water and sewerage, radio, electricity and highways, were sold off to the private sector under neoliberal government policies. Only a few years ago some of these companies re-established state ownership. Neither state-control, nor privatization have been able to overcome difficulties related to accountability, through a lack of legislation to prevent power concentration and transparency.

Figure 1. Round-up of guanacos (Photo by Sergio Aguirre)

Not surprisingly, Hardin's thesis, the *Tragedy of the Commons*, is better known in Argentina than Ostrom's *Governing the Commons*, and consequently, common property research is very limited. The number of presentations from Argentina at global conferences of the International Association for the Study of the Commons (IASC) from 1990-2011, or papers published at international journals on the topic was much smaller than in many other Latin American countries (Robson and Lichtenstein this issue, 5-31). There are likely a number of reasons for this: 1) The limited number of commons institutions in the country; 2) Most of the land in the country is privately owned and natural resources privately managed; 3) Interdisciplinary studies are not promoted by universities, research centers or grant awarding bodies; 4) Most of the literature on the commons is in English, whereas most of the literature studied at universities by social scientists is in Spanish; 5) To the best of my knowledge, there are no Argentineans who have attended graduate programs at the University of Indiana to study or work with Elinor Ostrom; and, 6) Funding restrictions to attend international conferences, undertake graduate studies abroad, or subscribe to international journals.

In this paper, I argue that Argentinean public policies with regards natural resource management reflect the historical denial of indigenous and low-income rural communities by the State, and the promotion of private property over common property. I do this by discussing the challenges facing guanaco (*Lama guanicoe*) live-shearing programs in Patagonia and the potential for incorporating lessons from the commons in order to promote sustainable use. Guanacos are among the few native large herbivores that inhabit South America and the most abundant free-ranging ungulates to inhabit the continent's deserts and high plateau scrublands and grasslands (Franklin 1983).

The methodology used in the collection of data included a mix of fieldwork and perusal of multiple secondary sources. Participant observation was performed during a field visit to Los Menucos, Río Negro Province, Patagonia (January 2007). Ranchers involved in guanaco management in this

locality were interviewed as well as different stakeholders involved (shearing group, inspectors of fauna, etc.). This was followed by trips to several locations in Río Negro and Chubut Provinces, where ranches that managed guanacos were visited and producers interviewed (Figure 2). Local fauna authorities from Chubut and Río Negro were interviewed along with technical staff from the Provincial Directions of Fauna. During the period 2007-2011, different stakeholders involved in guanaco management at national, provincial and local levels were interviewed. The perspective of policy makers was garnered through interviews with the National Director of Fauna and participant observation in workshops in Santa Cruz (2007), Chubut (2008, 2009, 2012), Mendoza (2009, 2011), and the National Bureau of Fauna, and National Institute for Agricultural Technology (INTA) (2004). Participant observation was also used during the crafting of the Guanaco Management Plan (2004) and Chubut´s provincial management plan (2008-2010). Secondary data were obtained from national documents, academic papers and international reports (*e.g.*, U.S. Fish and Wildlife Service (FWS); CITES).

Brief History of Guanaco Use and Management

There are two members of Old World camels living in Africa and Asia, and four members of New World camels living in South America – the wild guanaco (*Lama guanicoe*) and vicuña (*Vicugna vicugna*) as well as the domesticated llama (*Lama glama*) and alpaca (*Lama pacos*). Guanacos occupy a range of arid lands from sea level to 4,000 m above sea level in Argentina, Chile, Peru, Bolivia and Paraguay. The guanaco's wide distribution derives from its flexible behavior and social organization (Franklin 1983). Their social system is composed of family groups, male groups, female groups, and solo males (Franklin 1983). Some populations are sedentary and others migratory (Raedke 1979) as an adaptation to the changing environment and food availability. Given that they are a native species with special adaptations to the environment, they are more benign in their environmental impact than exotic European cattle, producing lower erosion due to a lack of hard hooves. Currently, approximately 95 percent of guanacos live in Argentina (Baldi *et al.* 2010). The expansive Patagonian cold desert land of shrubs and grasses has been especially favorable for the guanaco and can be considered the typical environment for the species (Franklin 1983) (Figure 3).

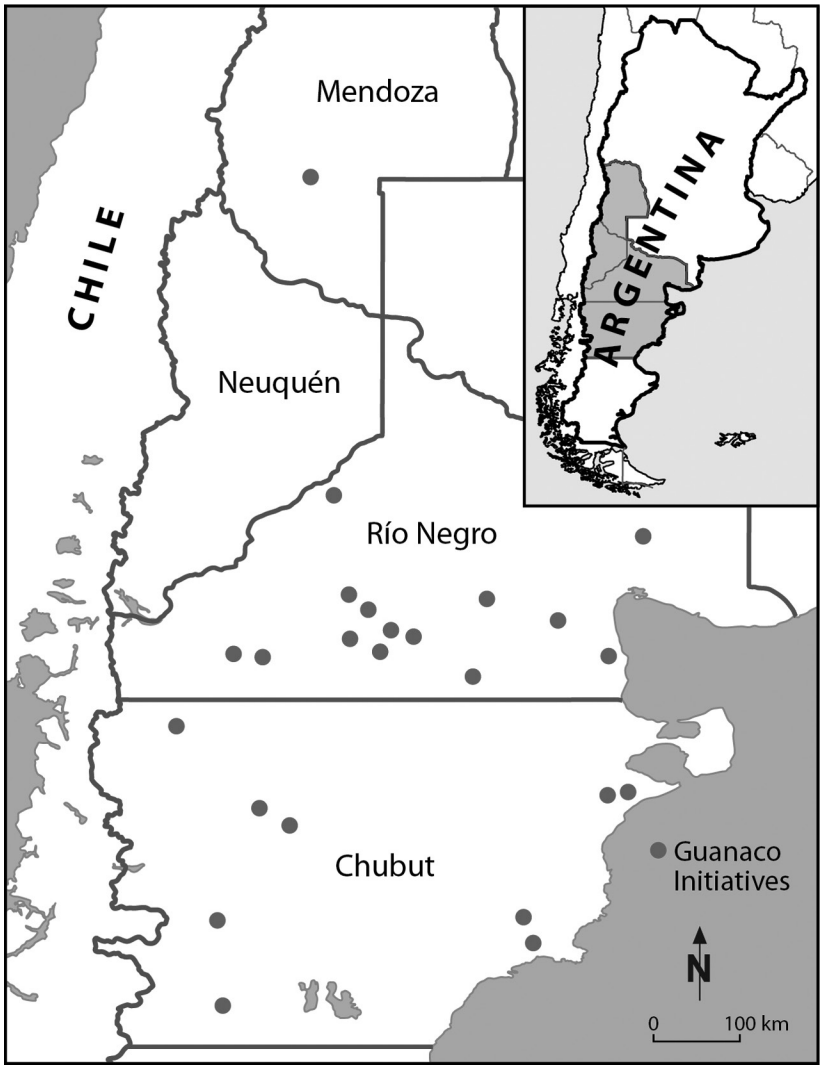

Figure 2. Guanaco management activities in Río Negro, Chubut and Mendoza provinces active during the period of study.

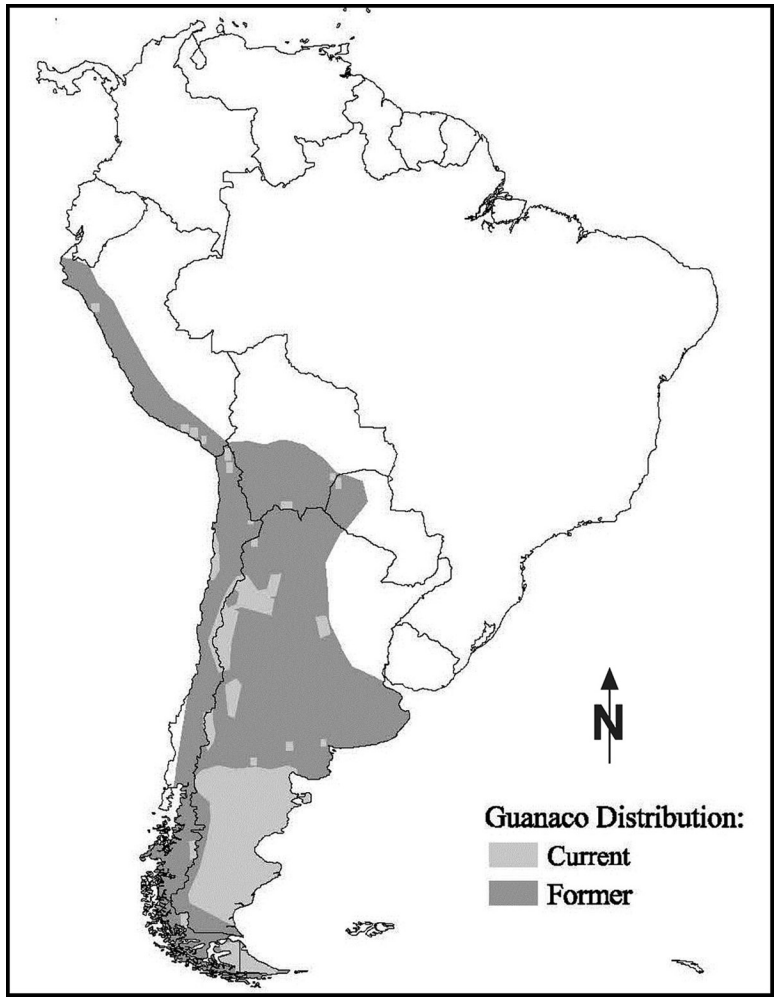

Figure 3. Current and former guanaco distribution in Latin America (from Baldi *et al.* 2010, 267)

Guanacos and vicuñas have one of the finest animal fibers (Figure 4); its insulating properties were acknowledged by early South American inhabitants. According to the archeological record, guanacos have been the most important source of protein in Patagonia for the last 10,000 years (de Nigris 2004). Accounts by nineteenth century naturalists and travelers reveal that temporary

movements by Patagonian Tehuelche hunter-gatherers were closely associated with guanaco migrations and vegetation availability (Williams 1979), with guanacos used for their meat, bones and hides, while their skins made warm *quillangos* (blankets made from the skins of 13-15 year-old guanacos). Guanacos were also used by other indigenous people; specifically by the Onas for clothes, food and shelter and to a lesser degree by the Yamanas (Furlong 1912).

Figure 4. Guanaco yarn produced by the Payun Matru Cooperative in Mendoza. (Photo by G. Lichtenstein)

Local hunting rules and regulations along with low human population densities and the lack of advanced weaponry prevented over exploitation. Raedeke (1979) estimated the pre-Hispanic guanaco population to have been 30 to 50 million based on carrying capacity of the territory they occupied. These numbers rapidly declined after the Spanish conquest and the introduction of firearms and horses. During the nineteenth century the impact of indiscriminate hunting and commercial sheep-rearing reduced the guanaco population to 7 million, and at present a mere 600,000 survive in a fragmented pattern (Figure 3).

The Desert Campaign

At the end of the nineteenth century, the Argentinean government launched the "Desert Campaign" (1879-1885), a military campaign to

Patagonia, with the aim of expanding the economic frontier and promoting Argentine's state formation and consolidation. The lands previously occupied by indigenous communities were appropriated by the State as "public lands" and transferred or sold to a few private landholders, thus creating a concentration of land for extensive sheep wool production (Bandieri 2005a). Thousands of indigenous people were methodologically subdued, killed, evicted or relocated to reservations in inhospitable and isolated places, destroying most communities and their previous relationship with the natural environment (Bandieri 2005b). In the case of the Tehuelches, they were reduced from a thriving culture to a handful of survivors (Williams 1979). Hundreds of years of discrimination resulted in many indigenous people losing or suppressing their identity and migrating to cities (Table 1), where they live in precarious economic situations. Indigenous communities became the great absentees from Argentina's "official history" and remain among the most destitute citizens in the country (Vom Hau and Wilde 2009).

Table 1. Some indicators of the present situation of indigenous population of Patagonia. (Source: INDEC. Encuesta Complementaria de Pueblos Indígenas 2004-2005.

Nation	**Self-identify**[1]	**Do not self-identify**	**Total that live in a community**	**Total that live in rural Patagonia**	**Total urban**
Ona	591	105	0	391	684
Tehuelche	6,655	3,935	0	854	9,589
Mapuche	84,444	29,236	1,3430	2,2279	90,789
Yamanas	0	0	0	0	

[1] Self-identifies, or does not self-identify, refer to whether they consider themselves as indigenous.

After the "Conquest of the Desert", fences and wires started to divide the territory of Patagonia and restrict the movement of people and animals. Local inhabitants were replaced by European settlers, traditional management gave way to European farming, and native species were replaced by sheep – this last change reminiscent of the elimination of bison by cattle producers in North America's Great Plains (Berkes 2008). Within 50 years of their introduction in Patagonia, sheep numbers peaked at 22 million, causing severe desertification (Aagensen 2000).

Guanacos were among the native species excluded from the model of development used in Patagonia. Traditional European farming activities imported into Patagonia did not consider the use of native species as complementary to introduced livestock production. Instead, guanacos were viewed as an obstacle to sheep ranching and thus killed, either illegally or in accordance with government authorization (Baldi *et al.* 1997). Thus, a species that had been considered a vital resource for traditional local communities quickly became a nuisance animal for the colonizers. Conflicts with sheep ranching, poaching, habitat degradation due to overgrazing, legal overhunting and the lack of sound management schemes further contributed to the demise

of guanacos. Today, the guanaco occupies only 40 percent of its original range (Puig 1995). Although the species is not threatened with demographic extinction on a continental scale, it is ecologically extinct in most of its remaining range (Novaro *et al.* 2000).

During colonial times, South American natural resources were transferred to Europe in large quantities. Not only silver but also, and to a lesser extent, vicuña and guanaco fiber and skins were exported in exchange for European goods (Yacobaccio 2009). This market demand continued throughout the following centuries. The strong demand for guanaco fiber and calves' pelts from Europe added to the negative perception of guanacos by sheep ranchers resulted in major exports of guanaco skins, and the issue of large numbers of permits to be issued for their slaughter (Baldi *et al.* 2010). More than 220,000 *chulengos* (guanaco calves) were killed legally for their pelts from 1976 to 1979 and the country exported more than 440,000 guanaco pelts from 1972 to 1979 (Ojeda and Mares 1982). Between 1984 and 1994, the government of Chubut, a Patagonian province with a large guanaco population, issued permits to kill 118,000 guanacos. The government based its quota on abundance estimates from landowners who claimed to have many guanacos on their properties (Baldi *et al.* 1997).

International, regional and national conservation efforts were successful in halting further population decline. Guanacos were included in the Convention on International Trade in Endangered Species of Wild Flora and Fauna (CITES, Appendix II) in 1978.[3] In 1993, CITES' Standing Committee recommended that all Parties suspend imports of guanacos from Argentina until the biological basis for its management program and its mechanisms for controlling trade were determined. Little changed in practice, however, with landowners continuing to press for hunting permits, while poaching continued apace due to a lack of human and material resources for law enforcement (Baldi *et al.* 2010). Only the live-shearing of guanacos appeared as a possible compromise that could unite conservation and sheep farming.

Current Guanaco Management Models

Guanaco and vicuña fine fiber can be obtained through live shearing without the need to kill individual animals. It thus provides a novel example of sustainable wildlife use. Guanaco fiber is amongst the finest animal fibers with an approximate diameter of 14.5 to 18 μm (Quispe *et al.* 2009). It belongs to the category of specialty or superfine fibers that also includes cashmere, angora, camel hair, alpaca and vicuña. Guanaco fiber is not on average as fine as that of the vicuña but is otherwise quite similar in its thermal properties, softness, colour variations, and presence of guard hair.[4] According to fiber experts, these two fibers are very difficult to distinguish even with a microscope (Proceedings of GEF Workshop, 2012). However, whereas wearing a vicuña garment is "a status symbol", guanaco fiber is not as widely known internationally (Lichtenstein 2011).

Guanaco management programs have the same underlying logic as community based natural resource management initiatives (CBNRM). The rationale is that by allowing the commercial utilization of fiber obtained from live-shorn individuals, the development of positive local attitudes towards conservation would be encouraged. In turn, this should result in some or all of the following: a decrease in poaching; the replacement of introduced livestock with guanacos; an increase in tolerance for guanacos on private lands; better management of total grazing pressure; reduced land degradation; improving vegetation and biodiversity outcomes; and, greater support for conservation measures.

The hope is that rather than continue to be antagonistic towards guanacos, producers would assist government efforts in monitoring and protecting the species. Getting local people involved in conservation is the only viable option to decrease conflict with domestic livestock and for effective stewardship over the vast areas inhabited by this species.

Vicuña and guanaco management projects have important differences (Table 2). While both sets of projects aim mainly at species conservation, whereas addressing poverty alleviation is an important goal in vicuña management, in the case of guanaco, the aim is to provide economic alternatives to Patagonian *estancieros* (ranch owners). In both cases it is sought to reduce the conflict between local producers and wild camelids.

The ranch owners that benefit from guanaco use have a long tradition of extensive sheep herding. For many of them, ranching has been in their family for generations, and their core competencies have developed around this economic activity. Their inclusion of guanacos has been a natural one, since guanacos have always existed as a wild species on their ranches. The decline in the price of sheep wool on international markets prompted the search for alternative sources of income, and guanaco management was pursued with the same logic as sheep ranching.

Table 2. Comparison between guanaco management in Argentinean Patagonia, and vicuña management in Bolivia.

Guanaco management	**Vicuña management**
Aim to link species conservation with economic incentives for local ranchers	Aim to link conservation with poverty alleviation
Main beneficiaries are sheep ranchers	Main beneficiaries are local communities
Production units are individual ranches	Production units are communities
Managed as private property with same logic as domestic livestock	Managed under common-property,
Investment is borne by each rancher	Investment borne by community, State, and NGOs
Fiber commercialization is done at individual level	Commercialization done at community, or national level
Benefits limited to few large land holders (capital & guanacos)	Large number of beneficiaries

The Guanaco National Management Plan

In 2006, Argentine national and provincial authorities, scientists and NGOs crafted a National Management Plan for Guanacos (Baldi *et al.* 2006). The overall goal of the plan was to ensure 'guanaco conservation', and in particular, the viability of wild, ecologically-functional guanaco populations and the persistence of the species throughout its geographic range (Baldi *et al.* 2006). The Patagonian provinces that harbor most of the country's guanacos - Chubut and Santa Cruz - were the first to adhere to the plan.

The Guanaco Management Plan had brought together "expert knowledge" in order to develop a plan that could ensure the conservation and sustainable use of the species and establish high technical standards for its management. Guidelines were provided for those involved with both captive and wild guanacos, along with requirements for inspecting shearing practices. High animal welfare standards during shearing were also included. One of the major challenges when designing a management plan for a wild species with a high economic value is to develop an accurate inspection system that functions at each step of the production and commercialization process, in order to deter smuggling and the laundering of products coming from dead individuals. The Guanaco Management Plan provides information about the permits required to transport fiber within the country until it is exported with a CITES permit. However, the plan did not envisage the possibility of generating added value to the fiber in Argentina, either by processing the fiber industrially or by creating handicrafts.

Neither local *estancieros* nor local communities that co-exist with guanacos in Patagonia were invited to participate in the process of developing the National Management Plan, which followed the more traditional top-down model. The lack of participation caused tension among these stakeholders and reduced the number of ranchers interested in taking part. The Plan was not designed to take into account the characteristics of guanacos as a common-pool resource, and the fact that they are a wild migratory species that moves from one property area to another. Rivalry is extremely important since the appropriation of guanacos by a neighbor (*e.g.*, by shearing or poaching) has an impact on the availability of guanaco fiber for nearby ranches. Conflicts occurred when low-income small-scale producers living at the base of Somuncura plateau, a vast Protected Area placed in the south center of Río Negro Province and North of Chubut province, complained to the authorities from Río Negro that guanacos were feeding on their pastures in winter and then migrating up the plateau in Spring, where they would be shorn by a wealthy land-holder, who was involved in the largest guanaco captures in the province. The land-holder, however, complained about small-scale producers poaching the guanacos that he wanted to shear. This issue would have probably have been solved if the benefits derived from shearing guanacos on the plateau were shared among local producers.

Such benefit sharing from this public resource was not discussed in the Plan. *Estancieros* were given ownership over all the fiber produced on their

properties.[5] In the case of *estancieros* performing captive breeding operations, they also received a restricted ownership over the first generation of guanacos born in captivity, allowing them to sell guanacos to other ranches within the same province.

Indigenous communities are also not mentioned within the plan, and the only role assigned to local communities is in relation to their status as recipients of environmental education. The two management options described under the National Management Plan (captive breeding and wild management) need a significant level of investment in infrastructure and labor (Guirola *et al.* 2009) and were designed mainly to benefit individual land-owners.

The Plan is basically a technical response geared towards satisfying the demand of ranch owners that harbored large guanaco populations on their properties, prepared in order to minimize the conflict over the species while ensuring its conservation.

Fiber Production and Commercialization

Guanaco fiber is produced either by captive or wild management on individual ranches (Figure 5).

Figure 5. Corraled guanacos
(Photo by Sergio Aguirre)

Shearing should be performed before parturition to avoid the separation of calves from their mothers. Given that the activity takes a few days per year it is compatible with sheep farming. The fiber is sold by individual ranchers to either one of two trading companies with a long history in Patagonia of exporting natural fibers. These companies also buy sheep wool from the same producers and thus have well-established contacts. The companies export guanaco and

vicuña fiber, mainly to Italy, where it is processed into finished goods. There is no formal market for guanaco fiber and, unlike merino wool or cashmere, there are no reference prices. As Argentina is the only country that exports guanaco fiber it is also not possible, unlike vicuña, to find reference prices at the regional level.

Given that ranchers produce and sell the fiber individually, the volume produced is small enough for them to have no option but to sell the fiber to middlemen for relatively low prices. Producers are unable to access international buyers, which are basically a very small number of Italian companies that have a long working relationship with the traders. According to interviews, international buyers require large volumes of fiber (between 1,000 and 5,000 kilograms), a sustained level of quality over time, and a continual supply. No individual fiber producer can fulfill this requirement on his own, and neither can a small group of producers. The guanaco fiber market is thus characterized by significant buyer power relative to negotiating capabilities, which limits the ability of the latter to capture more than a small portion of the value generated throughout the guanaco value chain (Guirola *et al.* 2009).

The History of Guanaco Management

The guanaco live-shearing model started during the 1980s with intensive captive breeding operations similar to the ones used for domestic livestock (Amaya and Von Thüngen 1999). During the 1990s and 2000s, "extensive"[6] captive breeding was established in the Patagonian provinces of Santa Cruz, Chubut and Río Negro with technical support from the National Institute of Agricultural Technology (INTA), a national institution with a productive outlook on wild species management.

Attempts to capture, shear and release guanacos in the wild started in the late 1990s when several large sheep ranches in Río Negro and Neuquén began managing guanacos by conducting live capture and shearing and thereby producing fiber for export. Such wild management uses a "capture and release" system evolved for vicuñas from the Inca *chaku* tradition. Given the larger size and strength of guanacos, they are rounded up mainly on horseback or motorcycles into a trap, and then shorn and released (Carmanchahi *et al.* 2011). Ranch owners hire specialized sheep-shearing groups (*comparsas*) to work during one or two days for guanaco shearing (Figure 6). Whereas wild management has the potential to create economic incentives for species conservation and its habitat, the link between captive management and conservation is less obvious and the size of the economic returns much smaller (Lichtenstein 2010, Baldi *et al.* 2010).

Since 2002, the capture, shearing and release of guanacos to sell their fiber has increased in Patagonia, with thousands of guanacos shorn every year (Figure 7) and the fiber exported, mainly without added value. The high market value (USD $150/kilo) of guanaco fiber along with low prices for sheep wool has encouraged landowners to invest in management infrastructure. One of the provinces where guanaco management became important was Río Negro

where, by 2003, sixteen producers managed guanacos on their *estancias*. Captive breeding was performed by 62.5 percent, wild management by 25 percent, while 12.5 percent) performed both types of management. More than 12,000 guanacos were shorn in Río Negro during that year.

Figure 6. Many men are needed to handle a guanaco properly (Photo by Sergio Aguirre)

By 2006 there were eight ranches in Chubut, one in Neuquén and two in Santa Cruz (Baldi *et al.* 2010). Biologists began showing concern about the population consequences of live guanaco shearing at such a large scale (Baldi *et al.* 2010). After 2006 the situation changed dramatically (Figures 7 and 8). The trading companies showed less interest in guanaco fiber and started offering only USD $60- $80 per kilo. Most of the guanaco management projects suspended their operations because of the uncertainty of obtaining a good price for their fiber and resumed prioritizing the more reliable sheep ranching.

By 2010 most of the projects had stopped operating due to the difficulty in marketing guanaco, the decrease in the price of guanaco fiber and an increase in the price of sheep wool. By 2011, most of the wild management operations had halted and very few breeding ranches were still operating (Figure 7). The few projects that remain are seeking ways to add value to the fiber at a local level and find new markets. Fiber production under wild management was almost always greater than it was under captive management (Figure 8).

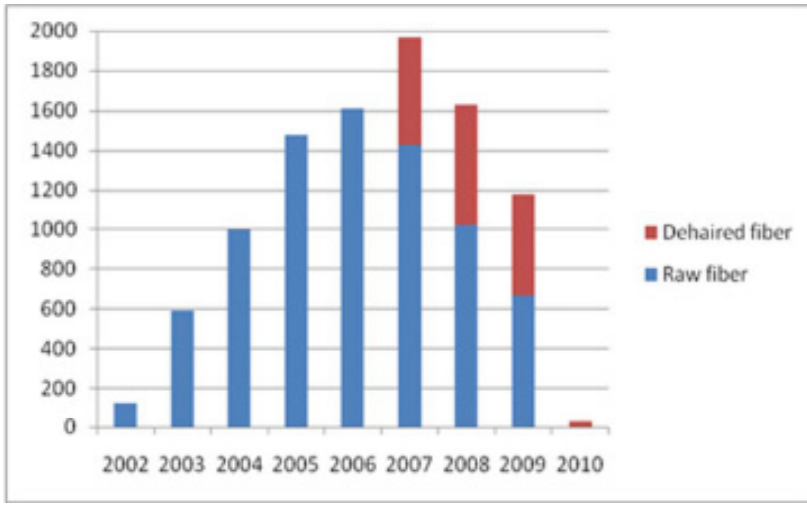

Figure 7. Kilograms of guanaco fiber exported (2002-2010) with different degrees of processing (Source: Ministerio de Agricultura, Ganadería y Pesca 2010).

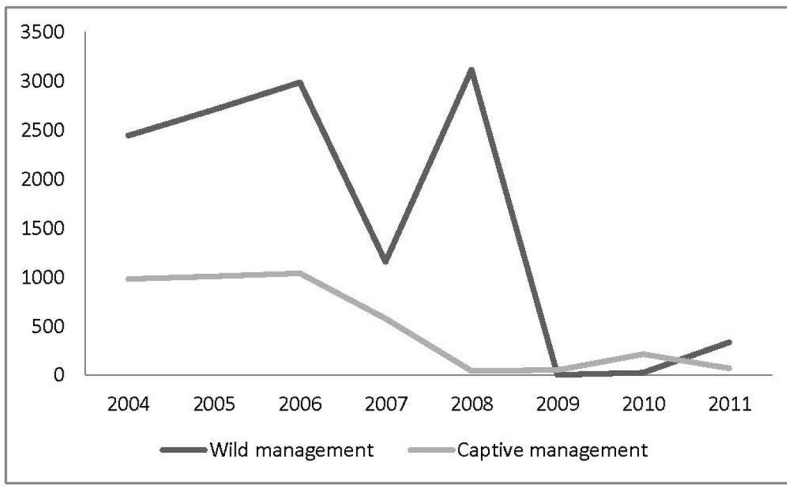

Figure 8. Number of guanacos shorn under wild and captive management

Given the low economic value of guanaco fiber in the national market and the difficulty in accessing international markets, there is a lot of pressure placed on provincial governments by landowners to be given hunting permits to kill guanacos on their properties. The argument is that guanacos compete with sheep for food and water and during the period 2004-2011 in Río Negro Province there are not enough resources for both. In the case of Santa Cruz,

guanacos are blamed for causing accidents on public roads because of their increasing numbers. The situation is more conflictive because of persistent droughts, overstocking and the historically bad management of ranches, and a generalized perception about the over-population of guanacos. In a short space of time, guanacos have switched from being an economic alternative to a pest and are portrayed as such on radios and in local newspapers.

Meanwhile, poaching is widespread: to reduce numbers and thereby allow more forage resources for sheep; to feed shepherd dogs; to sell the meat illegally in the poorest areas around Patagonian towns and cities; or to sell their fiber or *chulengo* pelts illegally (Baldi *et al.* 2010). The availability of illegal fiber further decreases the market price of legal fiber.

Barriers and Opportunities for Guanaco Management

Argentina harbors the largest guanaco population in South America and is in the privileged position of being the only country to produce large volumes of this luxury fiber. It is difficult to understand why the idea of promoting an alternative use of pastures in Patagonia, which would also increase resilience to economic and climatic shocks, has not been more easily embraced among producers. A review of commons literature reveals that there are some lessons from commons research that may hold benefits for the Argentinean experience and go some way to explain the lack of incentives to increase participation (in addition to historical and economic factors). Some of the issues that have undermined sustainable use efforts include the following:

a) *Guanacos have historically been considered a pest by ranchers and it is hard to change producers' perceptions and engage them in the activity.*
Given the historical replacement of native by exotic domesticated species that took place in Patagonia, and the imposition of European ideals of supremacy over nature, guanacos have been considered a pest rather than a resource for the last two hundred years. The situation parallels that of landholders in Australia that consider kangaroos a pest, who would like to eliminate this species, and are reluctant to engage in kangaroo management (Cooney *et al.* 2009).

b) *Competition with sheep is becoming more acute because of droughts, desertification and natural hazards.*
Severe desertification affects ~30 percent of Patagonia, and over 90 percent of Patagonia suffers from some degree of degraded soils, mostly because of unsustainable land use exacerbated by natural forces of erosion. The situation worsened in 2011 with the eruption of Puyehue volcano, which resulted in the demise of 500,000 sheep in Chubut province and extensive areas of land covered by volcanic ashes. Given than there is an overlap in what guanaco and sheep feed on (Baldi *et al.* 2001), the present situation of food limitation (and the low market price for the fiber) decreases even more the tolerance for guanacos on ranches. Landowners with a long tradition and expertise of sheep ranching will not change stock management for a new and uncertain production system.

c) *The small market for guanaco fiber.*
There is almost no market for guanaco fiber in Argentina and all the fiber is exported with very limited added value (Figure 7). Although guanaco fiber has been exported for a long time to Europe it is not as well known as vicuña fiber. A lower international demand, the lack of an established and transparent market, and low market prices have all discouraged producers.

d) *Lack of governmental support.*
Producers venture into guanaco fiber production at their own risk. Neither the national nor the provincial governments provide any level of investment or technical support. The design of local institutions for resource management has not been promoted. Ironically, there are more support schemes for sheep ranching (despite the desertification that results from overstocking) than to alternative and more environmentally-friendly activities.

e) *The uncertainty as to resource rights over guanacos and the unequal distribution of usufruct rights reduces the likelihood of producers becoming interested in joining the activity and promotes poaching.*
The diversity of property rights regimes that can be used to regulate the use of common pool resources is very large including the broad categories of government ownership, private ownership and community ownership (Dietz *et al.* 2002). Common scholars showed how, by shaping the incentives of users and managers, variations in forms of property rights make a difference in resource management outcomes (Agrawal 2003). In the case of guanaco management, there is a tension given that the resource is *de jure* state-owned, but exists as a *de facto* form of private property. This results in ranch owners and local producers complaining for "paying the cost" of guanaco conservation. Public ownership of a resource that is scattered either in Protected Areas or on private properties across an area the size of Patagonia creates open access conditions that result in poaching instead of sustainable use.

f) *Top-down approach to conservation, with the limited participation of stakeholders in the design of management plans, creates a disincentive.*
Work from common scholars in conjunction with other writings on participation, indigenous knowledge, and political ecology, has encouraged a new policy environment that challenged the perception of the State as best suited to resource control and management and increased the stakes of local communities (Agrawal 2003). National governments in many developing countries have turned to local-level common property institutions to decentralize the governance of natural resources (Agrawal 2002). This offers a promising new direction for guanaco management.

g) *Lack of common property institutions to manage a CPR.*
The lack of collaboration among ranchers reduced the chances of success. The nature of guanacos (as a CPR) makes their collective management a more

appropriate response than private management. Commons scholars have demonstrated that public ownership or state management does not exhaust the range of plausible institutional mechanisms to govern natural resource use (Agrawal 2003). The alternative that commons theorists have identified—community and common ownership and management—is rooted in the practices of millions of households around the world.

Common Property Management of Wild Camelids Elsewhere

The best-known example of a wild camelid species managed under common property is vicuña management in Bolivia (Lichtenstein 2010) (Figure 9). In this case, management is based on pre-existing Andean communities. However, new institutions for resource management have also been created, as well as strategic partnerships between the government and communities that resulted in social enterprises. Aymara- and Quechua-speaking communities use a capture and release system evolved from the Inca *chaku* tradition. (Lichtenstein 2010)

Fiber commercialization is managed by the National Association for Commercialization (ACOFIV-B), which has assembled nine Regional Associations for Vicuña Management (ARMV) from all over the country. The Regional Associations represent 77 management communities (CMV). Fiber production and commercialization is supported by national (*e.g.*, SERNAP, DGB[7]) and regional agencies (*e.g.*, Prefecturas), as well as NGOs and international cooperation agencies (*e.g.*, GTZ, AECI[8]).

Figure 9. Vicuña chaku in Bolivia (Photo Daniel Maydana)

According to Berkes (2007), for effective community based conservation, a project needs to find strategies to: strengthen existing commons institutions; build new linkages horizontally and vertically; engage in capacity-building; build trust; encourage mutual learning; and invest enough time and resources to achieve these objectives. Vicuña management under common property in Bolivia fulfills these requirements. It has developed stronger social institutions and a more favorable policy framework with regard to vicuña conservation and poverty alleviation when compared to other experiences in the region. Furthermore, the commitment to manage vicuñas in the wild under common property has been identified as the best strategy for managing this common-pool resource. The conservation outcomes of these experiences resulted in a steady increase of vicuña populations during the period 1987-2011 (Proceedings of the Vicuña Convention).

A New Approach for Guanaco Management

It would be impossible to replicate the example from Bolivia in Argentina given the structural and historical differences with regard to land tenure and social organization in both countries. However, it is possible to envisage Argentinean producers undergoing certain aspects of guanaco management collectively such as guanaco captures, fiber commercialization, fiber export, or participating in further steps of the commodity chain of the fiber. Producers could also develop local institutions that would work with the government in order to manage the resource. In the case of Australia, collaboration among landholders was suggested as a way to create greater landholder involvement in kangaroo management (Cooney *et al.* 2009).

Why should guanaco use only benefit better-off landowners? An alternative model to private management for guanaco was developed in Argentina by low-income goat pastoralists that lived widely dispersed in the Payunia Reserve (Mendoza Province). In 2005, some inhabitants of the protected area and its influence zone asked the Provincial Department of Renewable Natural Resources for technical advice in order to develop an alternative source of income and reduce conflict between their goats and guanaco populations. Local authorities saw the project as a way of creating incentives for local people to accept and help enforce the Payunia Protected Area (that was set up under a top-down management framework), and contribute towards guanaco conservation. Thanks to the active work of the Cooperative's President and the technical advisor, the project was supported by several stakeholders from both local and international levels, and the Cooperative's social capital increased.

The goal of the Cooperative is to develop a global market for luxury guanaco fiber and yarn, which will then provide long-term employment for the people of La Payunia and thereby improve local livelihoods. The Cooperative also aims to preserve the local culture and to encourage young people in particular to remain in La Payunia rather than leaving for the cities (Lichtenstein and Carmanchahi 2012). Guanaco captures are not only an economic activity

for the Cooperative members, but also a social and cultural event and an opportunity to meet and share experiences with a variety of people. These efforts are very much appreciated by the rural residents of what is a very isolated environment.

The project also developed important partnerships across institutional levels that were key to its success. Linkages were established with local and national Departments of Renewable Resources, field biologists and conservation NGOs. As the project developed, new collaborations were either permanently or temporarily developed from international to the local level. The ability of the Cooperative to collaborate with multiple partners contributed towards the project resilience and created a safety net. The collaborations also entitled Cooperative members to become more visible (*e.g.*, participating in conferences, meeting Ministers, etc.), increase their negotiating power with potential clients, and become more empowered. As time went on, the Cooperative activities became more diversified and members started working on other projects.

This experience shows that guanacos can be managed collectively and opens new alternatives for the participation of low-income rural communities. The case highlights that the collective management of guanacos not only provides economic benefits but also a large amount of non-economic benefits for local producers (Lichtenstein and Carmanchahi 2012). These, in turn, work as incentives towards improved participation and more sustainable use.

Conclusions

In contrast with the neighboring countries of Chile, Bolivia and Peru, in Argentina there has been no land reform. The land tenure situation is dominated by private land ownership, with land concentrated in very few hands. Local inhabitants were usurped by European settlers, traditional management gave way to European farming, and native species were replaced by imported domestic species. In a relatively short space of time, native species switched from being an economic alternative to a pest, particularly when they competed with domestic livestock.

Argentina's public policies for resource management reflect a historical denial of indigenous and low-income rural communities by the State and the promotion of private property over common property. The lack of appropriate institutions for resource governance, and the limited development of economic alternatives for rural people is reflected in the high urban population. The lack of empowerment of local communities is not surprising if we consider that the country has developed into one of the world largest soybean producers, where huge mechanized agribusiness needs land but not the labor of local communities.

Argentina is very wealthy in terms of natural resources, and harbors the largest guanaco population in South America. Sustainable use of guanacos presents the potential for promoting an alternative use of pastures in Patagonia, which would increase resilience to economic and climatic shocks. However, in

recent years, there has been a reduction in producers' willingness to participate in live-shearing experiences, while intolerance against guanacos is now widespread. A review of the commons literature reveals that there are lessons from research that could be of benefit to this sector. The uncertainty as to resource rights over guanacos, and the top-down approach followed during the development and implementation of the Management Plan should be re-visited in order to increase participation. There is a need to revise management strategies and create cross-scale interactions and partnerships as well as local-level common property institutions to decentralize the governance of this resource.

It is time for policy-makers in Argentina to start envisaging natural resource use and management in terms of linked socio-ecological systems and to include a multidisciplinary outlook on the environment. This would hopefully be supported by reforms in university education. A broader outlook should include the interests of indigenous and local low-income communities that have been historically neglected in favor of large-scale producers. Local communities should be integrated as an indispensable part of the efforts to conserve the environment. The case study on guanaco use in Payunia Reserve is a step towards this goal.

On the other hand, given that wildlife around the world sometimes lives in private properties and overlaps its range with domestic livestock owed by private landowners, it is also important for commons scholars to develop frameworks to deal with situations where local management by traditional communities has been replaced by the private management of large landowners. These situations open up new areas for commons investigation. Engaging the present diversity of stakeholders in conservation efforts, sustainable use initiatives and benefit sharing in Argentina is a challenge that must be taken up in earnest

Acknowledgements

I would like to thank Pablo Carmanchahi and Ricardo Baldi for introducing me into the complexities of guanaco conservation and management in Patagonia; and Federico Hollman for the data on guanaco fiber production in Rio Negro. Special thanks for Jim Robson for commenting on earlier versions of the manuscript, and David Robinson for his help with drawing the map and his contributions as an Editor.

Notes

[1] The data on the number of communities that are on the process of titling their land or have already been allocated communal land is not publicly available.

[2] This figure probably represents an underestimation of the total national indigenous population given the design of the survey, and the fact that because

of historical, social, political and economic factors some people deny or are not aware of their indigenous roots.

[3] CITES is an international agreement between governments. Its aim is to ensure that international trade in specimens of wild animals and plants does not threaten their survival. A State for which the Convention has entered into force is called a Party to CITES. Currently there are 175 Parties. The species covered by CITES are listed in three Appendices, according to the degree of protection they need. Appendix II, where guanaco is listed, lists species that are not necessarily now threatened with extinction but that may become so unless trade is closely controlled.

[4] Guanacos have a double coat similar to cashmere; the under coat is one of the finest natural fibres in the world, and boasts a uniform and very pale camel colour. The outer coat consists of much coarser fibres, guard hairs, these are a much darker and act to keep debris and moisture out. Guanaco fiber must go through the dehairing process which removes these coarser guard hairs and leaves the downy undercoat which is the valued part of the fleece

[5] It is interesting to note the contrast between the bargaining power of Patagonian estancieros with vicuña managers from Northern Argentinean provinces. In the case of vicuña management the provinces retain approximately 20 percent of the fiber and the animals brought up in captivity do not belong to the ranch owners.

[6] "Intensive" and "extensive" captive breeding differ in the size of enclosures.

[7] SERNAP stands for: Servicio Nacional de Areas Protegidas; DGB: Dirección General de Biodiversidad

[8] GTZ stands for: Deutsche Gessellshaft fur Internationale Zusammenarbeit and AECI: Agencia Española de Cooperación Internacional

References

Aagensen, D. 2000. Crisis Conservation at the End of the World: Sheep Ranching in Argentine Patagonia. *Environmental Conservation* 27: 208–215.

Agrawal, A. 2002. *Common Resources and Institutional Sustainability*. E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich, and E. U. Weber (Eds.), pp. 41-85. Washington, DC: National Academy Press.

_____. 2003. Sustainable Governance of Common Pool Resources: Context, Methods and Politics. *Annual Review of Anthropology* 32: 243–262.

Altrichter, M. and X. Basurto. 2008. Mobility of Common-Pool Resources and Privatization of Land Tenure in the Argentine Semi-Arid Chaco. *Conservation and Society* 6 (2): 154-165.

Amaya, J. and J. Von Thüngen. 1999. Cria de guanacos en semi-cautividad. Informe técnico 114. EEA INTA Bariloche. http://www.reivet.com.ar/archivos/cr_a_de_guanacos_en_semicautividad.pdf. Accessed 3 May 2012.

Baldi, R., C. Campagna, and S. Saba. 1997. Abundancia y distribución del guanaco (*Lama guanicoe*) en el NE del Chubut, Patagonia Argentina. *Mastozoología Neotropical* 4(1): 5-15.

Baldi, R., S. D. Albon, and D. Elston. 2001. Guanacos and Sheep: Evidence for Continuing Competition in arid Patagonia. *Oecologia* 129: 561-570.

Baldi, R., D. De Lamo, M. Failla, P. Ferrando, M. Funes, P. Nugent, S. Puig, S. Rivero, and J. von Thüngen. 2006. *Anexo I: Plan Nacional de Manejo del Guanaco*. Buenos Aires: Dirección de Fauna Silvestre. Secretaría de Ambiente y Desarrollo Sustentable.

Baldi R., A. Novaro, M. Funes, S. Walker, P. Ferrando, M. Failla, and P. Carmanchahi. 2010. Guanaco management in Patagonian rangelands: a conservation opportunity on the brink of collapse. In *Wild Rangelands: Conserving Wildlife While Maintaining Livestock in Semi-Arid Ecosystems.* (J. du Toit, R. Kock and J. Deutsch (Eds.), pp 266-290. Oxford: Blackwell Publishing.

Bandieri, S. 2005a. *Historia de la Patagonia.* Buenos Aires: Sudamericana.

_____. 2005b. Del discurso poblador a la praxis latifundista: la distribución de la tierra pública en la Patagonia. *Mundo Agrario* [online] 6(11).

Berkes, F. 2007. Community-Based Conservation in a Globalized World. *Proceedings of the National Academy of Sciences* 104(39): 15188-15193.

_____. 2008. *Sacred Ecology*. Second Edition, New York: Routledge.

Carmanchahi, P. D., R. Ovejero, C. Marull, G. C. López, N. Schroeder, G. Jahn, A. J. Novaro, and G. M. Somoza. 2011. Physiological Response of Wild Guanacos to Capture for Live Shearing. *Wildlife Research*. 38: 61–68.

Carrasco, M. 2011. Argentina. In *El mundo indígena 2011*, K. Wessendorf (Ed.), pp. 201-210. Lima: Tarea Asociación Gráfica Educativa.

Cooney, R., A. Baumber, P. Ampt, and G. Wilson. 2009. Sharing Skippy: How Can Landholders be Involved in Kangaroo Production in Australia? *The Rangeland Journal* 31: 283-292.

De Nigris, M. E. 2004. *El consumo en grupos cazadores recolectores. Un ejemplo zooarqueológico en Patagonia meridional.* Buenos Aires: Sociedad Argentina de Antropología.

Dietz, T., N. Dolsak, E. Ostrom, and P. C. Stern. 2002. The Drama of the Commons. In *The Drama of the Commons*, E. Ostrom, T. Dietz, N. Dolsak, P. C. Stern, S. Stonich, and E. U. Weber (Eds.), pp. 3-35. Washington, DC: National Academy Press.

Elbers, J. 2011. *Las áreas protegidas de América Latina: Situación actual y perspectivas para el futuro.* Quito: UICN.

Franklin, W. L. 1983. Contrasting Socioecologies of South American Wild Camelids: The vicuña and the guanaco. In *Advances in the Study of Mammalian Behavior, Eisenberg*, J. F. and D. G. Kleiman (Eds.), pp. 573-629. New York: Special Publication of the American Society of Mammals.

FAO. 2011. State of the World's Forests 2011. Rome: Food and Agriculture Organization of the United Nations.

Furlong, C.W. 1912. Hunting the Guanaco. *The Outing Magazine*. LXI: 3-20.

Guirola, V., M. Khan, K. Newman, and J. Smidek. 2009. *The Guanacos of Argentina - Business Plan.* Haas School of Business, University of California. Report to Wildlife Conservation Society and South American Camelid Specialist Group. UICN.

IFAD (International Fund for Agricultural Development). 2011. *The Issue of Land in Argentina. Conflicts and Dynamics of Use, Holdings and Concentration.* Rome: IFAD.

INDEC (Instituto Nacional de Estadística y Censos), 2010. *Resultados del Censo.* http://www.censo2010.indec.gov.ar/index_cuadros.asp. Accessed 3 May 2012.

_____. *Encuesta Complementaria de Pueblos Indígenas 2004-2005*. http://www.indec.mecon.ar/webcenso/ECPI/index_ecpi.asp. Accessed 3 May 2012.

Lichtenstein, G. 2010. Vicuña Conservation and Poverty Alleviation? Andean Communities and International Fiber Markets. *International Journal of the Commons* 4(1): 100-121.

_____. 2011. Use of Vicuñas (*Vicugna vicugna*) and Guanacos (*Lama guanicoe*) in Andean Countries: Linking Community-Based Conservation with International Markets. In *CITES and CBNRM: The Relevance of CBNRM to the Conservation and Sustainable Use of CITES-listed Species in Exporting Countries*, Abesberg-Traun, M., Roe D., O'Cridoain, C. (Eds.). pp. 103-108. Gland: Switzerland UICN and London: IIED.

Lichtenstein, G. and P. Carmanchahi. 2012. Guanaco Management by Pastoralists in the Southern Andes. Pastoralism: Pastoralism: Research, *Policy and Practice* 2: 16.

Novaro, A. J., M. C. Funes, and R. S. Walker. 2000. Ecological Extinction of Native Prey of a Carnivore Assemblage in Argentine Patagonia. *Biological Conservation* 92: 25-33.

Ojeda, R. A. and M. A. Mares. 1982. Conservation of South American Mammals: Argentina as a Paradigm. In *Mammalian Biology in South America*, Volume 6. *Special Publication Series*, M. A. Mares, and H. H. Genoways (Eds.), pp. 505–521. Pittsburgh: University of Pittsburgh Press.

Ostrom, E. 1990. *Governing the Commons. The Evolution of Institutions for Collective Action*. Cambridge: Cambridge University Press.

Ostrom, E., J. Burger, C. B. Field, R. B. Norgaard, and D. Policansky. 1999. Revisiting the Commons: Local Lessons, Global Challenges. *Science* 284: 278–282.

Pérez-Carrera A., C. H. Moscuzza, and A. Fernández-Cirelli. 2008. Efectos socioeconómicos y ambientales de la expansión agropecuaria. Estudio de caso: Santiago del Estero, Argentina. *Ecosistemas*, 17(1): 5-15.

Proceedings of GEF workshop. Trelew, 14 and 15th March, 2012. Unpublished report.

Puig, S. 1995. Técnicas para el Manejo del Guanaco. Gland: UICN/CSE Ed.

Quispe, E., T. Rodríguez, L. Iñiguez, and J. Mueller. 2009. Producción de fibra de alpaca, llama, vicuña y guanaco en Sudamérica. *Animal Genetic Resources Information* 45: 1–14.

Raedeke, K. J. 1979. Population Dynamics and Socioecology of the Guanaco (*Lama guanicoe*) of Magallanes, Chile. Unpublished Ph. D. thesis, University of Washington.

Robson, J. and G. Lichtenstein. 2013. Commons Research in Latin America: An Overview. *Journal of Latin American Geography* 12(1): 5-31.

Slutzky, Daniel. 2007. *Situaciones problemáticas de tenencia de la tierra en Argentina.* Buenos Aires: Secretaría de Agricultura, Ganadería, Pesca y Alimentos.

Van Dam, C. 2007. *Tierra, territorio y derechos de los pueblos: indígenas, campesinos y pequeños productores de Salta.* Buenos Aires: Secretaría Agricultura, Ganadería, Pesca y Alimentos.

Van Laerhoven, F. and E. Ostrom. 2007. Traditions and Trends in the Study of the Commons. *International Journal of the Commons* 1(1): 3-28.

Vom Hau, M., and G. Wilde. 2009. *We have always lived here: indigenous movements, citizenship and poverty in Argentina.* Chronic Poverty Research Centre. Working paper 146. Brooks World Poverty Institute, The University of Manchester and IDAES, Universidad de San Martin.

Williams, E. G. 1979. An Ecological Perspective of Socioterritorial Organization among the Tehuelche in the Nineteenth Century. In *Peasants, Primitives, and Proletariat: The Struggle for Identity in South America*, D. L. Browman, and R. A. Shwartz, (Eds.), pp. 75-106. The Hague: De Gruyter Mouton.

Yacobaccio H. 2009. The Historical Relationship between People and the Vicuña. In *The Vicuña: The Theory and Practice of Community Based Wildlife Management*, I. Gordon (Ed.), pp. 7-20. New York: Springer.