

# TRADE IN VICUÑA FIBRE

## IMPLICATIONS FOR CONSERVATION AND RURAL LIVELIHOODS



International  
Trade  
Centre

TRADE IMPACT  
FOR GOOD



# Trade in Vicuña Fibre

Implications for Conservation and  
Rural Livelihoods

## About the paper

Once overhunted and on the brink of extinction, the vicuña species (a small member of the camelid family) is thriving again in South America's Andes region.

The decision to grant usufructory rights to communities to shear and sell vicuña fibre increased their economic incentive to sustainably manage and protect the species. As a result, vicuña populations have recovered and trade has grown by 78% since 2007, which is generating income for Andean rural communities and textile-processing sectors. This study maps the value chain, assesses the factors that have helped the species recover, and identifies current challenges facing the vicuña fibre trade, including the distribution of benefits and threats to conservation.

**Publisher:** International Trade Centre

**Title:** Trade in Vicuña: Implications for Conservation and Rural Livelihoods

**Publication date and place:** July 2018, Geneva

**Page count:** 50

**Languages:** English, Spanish

**ITC Document Number:** SIVC-18.13.E

### Citation

*Kasterine, A. and Lichtenstein, G (2018). Trade in Vicuña: the Implications for Conservation and Rural Livelihoods.* International Trade Centre, Geneva, Switzerland.

For more information, contact: Alexander Kasterine email: [kasterine@intracen.org](mailto:kasterine@intracen.org)

For more information on T4SD, see: <https://sustainabilitymap.org/>

ITC encourages the reprinting and translation of its publications to achieve wider dissemination. Short extracts of this paper may be freely reproduced, with due acknowledgement of the source. Permission should be requested for more extensive reproduction or translation. A copy of the reprinted or translated material should be sent to ITC.

Digital image on the cover: © Shutterstock

© International Trade Centre (ITC)

ITC is the joint agency of the World Trade Organization and the United Nations.

## Foreword by ITC

The recovery of the vicuña species in South America is a conservation success story.

Before 1980, this animal of the camelid family was almost extinct due to overhunting. The decision by the Peruvian government in 1980 to give communities the right to shear and trade vicuña wool has helped the species's population to recover across South America's Andes region. It has also helped to improve rural livelihoods across the region, especially for women who play a central role in the animals' capture and wool processing.

While the vicuña story in South America is an encouraging one for conservation and trade, the Vicuña Convention has identified challenges that remain in this industry, including the equitable distribution of benefits. Vicuña is the most expensive speciality fibre in the world, yet local communities' share in the value chain remains low due, in part, to limited value addition taking place in source countries.

This report sheds light on the unique vicuña value chain, from how the species is conserved and managed by smallholder farmers and livestock owners in the Andes, to how luxury fashion brands in Italy use and market this exclusive wool. As such, the report underscores how markets link some of the most economically-vulnerable people in the world to sophisticated service industries and wealthy consumers.

The International Trade Centre (ITC) designed this study in the context of its support to Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). I would like to thank the CITES Secretariat and Parties and the UN Environment World Conservation Monitoring Centre (UNEP-WCMC) for their invaluable contributions to this publication.

I look forward to this work contributing to further discussions among CITES Parties and other stakeholders on how models of legal trade incentivizes the sustainable management of wild flora and fauna, while considering ways in which natural resource value chains can benefit the rural poor in developing countries.



Arancha González  
Executive Director  
International Trade Centre

## Foreword by CITES

The trade in the fibre sheared from the emblematic vicuña, a camelid species inhabiting South America's Andes, is considered a success story of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The mechanisms of CITES promote the vicuña's sustainable use through legal trade.

CITES recognizes in its preamble that, '... peoples and States are and should be the best protectors of their own wild fauna and flora.' This notion has been embraced by the countries that raise vicuñas, foremost by Peru, as well as by Argentina, Bolivia and Chile. Through a well-regulated trade, giving local communities an incentive in conserving the species, the vicuña has come back from the brink of extinction to a healthy population once again.

For these achievements, the countries involved have to be commended. This report prepared by ITC highlights this exemplary work and how it was achieved. However, it also highlights the current challenges the species and the trade face and how they may be overcome. CITES can contribute to tackling these issues by providing scientific advice and guidance on matters related to the trade of this species in general.

As Chair of the CITES Animals Committee, it is my firm belief that CITES can and will play its role in supporting the range states of this beautiful species in achieving the long-term conservation of vicuña and the promotion of local livelihoods for many generations to come.



Matthias Löertscher  
Chair CITES Animals Committee  
Head CITES Management Authority Switzerland

## Acknowledgements

Alexander Kasterine, Senior Advisor at the International Trade Centre (ITC) and Gabriela Lichtenstein of Argentina's National Scientific and Technical Research Council (CONICET) prepared this report.

The authors wish to thank the expert inputs of: Daniel Arestegui of the Peruvian Institute of the Alpaca and Camelids; Yuri Beraun Baca of Peru's Ministry of Environment (MINAM); Jonathon Dyson, Jessica Galvez Durand of Peru's Office of Administrative Authority for the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES-Perú); Edmundo Giovannini, Henrik Kuffner, Gustavo Lozado of Incalpaca; Patricia Marino of Argentina's National Institute of Industrial Technology (INTI), Daniel Maydana, Francis Rainsford and Pablo Sinovas of the UN Environment World Conservation and Monitoring Centre (UNEP-WCMC). The analysis of the CITES trade database was kindly prepared by Becky Price of UNEP-WCMC. Kyungbo Han (ITC) provided research assistance to the study. The authors extend appreciation to ITC colleagues Anders Aeroe (Director, Division for Markets and Institutions), Simone Cipriani, Matthias Knappe, Claudia Uribe, and Joe Wozniak.

Cheryl Rosebush edited the report, and Natalie Domeisen and Evelyn Seltier from ITC oversaw quality and production management. Serge Adeagbo and Franco Iacovino provided graphic and printing support.

## Contents

Foreword by ITC	iii
Foreword by CITES	iv
Acknowledgements	v
Acronyms	viii
Executive summary	ix
<b>CHAPTER 1 BACK FROM THE BRINK OF EXTINCTION</b>	<b>1</b>
Governance of Vicuña use from Incan times to present	1
National management plans and regulatory framework	5
Convention on International Trade in Endangered Species of Wild Fauna and Flora	5
EU Regulations	6
US Fish and Wildlife Service	6
<b>CHAPTER 2 VICUÑA TRADE FLOWS</b>	<b>7</b>
Use of vicuña	7
Trade in vicuña from 2007-2016	7
Peru's vicuña fibre production	9
Pricing for Peruvian vicuña fibre	9
<b>CHAPTER 3 UNDERSTANDING THE VICUÑA VALUE CHAIN</b>	<b>11</b>
Luxury market demand	11
Management, capture and shearing	12
De-hairing (manual and mechanical)	13
Production and sale	14
Peru	14
Bolivia	14
Argentina	15
Chile	16
Ecuador	16
Topmaking, spinning, fabric and garment making	16
<b>CHAPTER 4 SUSTAINABILITY ISSUES</b>	<b>18</b>
Threat of climate change	18
Conservation management approaches	19
Approaches to traceability	20
Trade off between traceability and value chain needs	20
Guanaco as a substitute for vicuña	21
Animal welfare issues	22

Poaching and illegal trade	23
<b>CHAPTER 5 VICUÑA GOVERNANCE ISSUES</b>	<b>25</b>
Increasing value addition and competitiveness	25
Weak bargaining power of communities	26
Trade benefits for communities	26
<b>CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS</b>	<b>28</b>
Conservation policy success	28
Small share of value addition for local communities	28
Lack of competition among buyers	29
Improving women's working conditions	29
Traceability and transparency	30
<b>APPENDICES</b>	<b>31</b>
Appendix I    Text of the Convention For The Conservation And Management Of The Vicuña	31
Appendix II    Exports in vicuña fibre	33
Appendix III    Resolution No 355/2013 Vicuna Convention	34
<b>REFERENCES</b>	<b>35</b>

### Tables and Figures

Table 1	Timeline of vicuña conservation and commercialization .....	2
Table 2	Increase in vicuña numbers in Andean countries (1969-2012) .....	3
Table 3	National regulatory frameworks by 2017 .....	5
Table 4	CITES appendix on vicuña populations in Andean countries.....	6
Table 5	Share of natural fibres in global market.....	7
Table 6	Fibre sheared (kg) in Peru, by department (2013-2017) .....	9
Table 7	Prices paid for Peruvian vicuña fibre (2015-2017) .....	9
Table 8	Volume and value of Peru's exported vicuña fibre (2015-2017).....	10
Table 9	Comparison of vicuña fibre diameter (in microns) and comfort factor versus other natural fibres from the special fibres group.....	12
Table 10	Prices of vicuña garments.....	13
Table 11	Options for communities' vicuña upgrading strategies .....	25
Table 12	SWOT analysis of the vicuña value chain .....	27
Table A1	Exports of Vicugna vicugna hair 2007-2016 by importing country, in kg.....	33
Table A2	Main direct exporters of Vicugna vicugna hair and fibre by weight, 2007-2016, in kg .....	33
Table A3	Exports of vicuña fibre by type of processing, 2008-2012.....	33
Figure 1	Vicuña populations in the Andes .....	1
Figure 2	Change in vicuña numbers in the Andean countries 1969-2012.....	3
Figure 3	Main direct exporters of vicuña hair and fibre by weight (2007-2016).....	8
Figure 4	Exports of vicuña hair (2007-2016) by importing country .....	8
Figure 5	Vicuña production and processing stages in Peru .....	11
Figure 6	Stages of vicuña management in Peru.....	19

## Acronyms

Unless otherwise specified, all references to dollars (\$) are to United States dollars, and all references to tons are to metric tons.

ACOFIV	Bolivia's Community Association for Commercialization of Vicuña Fibre
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CONACS	National Council for South American Camelids
CUSCSS	Committees for the Sustainable Use of South American Wild Camelids
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FWS	United States Fish and Wildlife Service
GECS	South American Camelid Specialist Group of the International Union for Conservation of Nature
INTA	National Agricultural Technology Institute
ITC	International Trade Centre
IUCN	International Union for Conservation of Nature
MINAGRI	Peru's Ministry of Agriculture and Irrigation
OECD	Organisation for Economic Co-operation and Development
SAYDS	Argentina's Ministry of Environment and Sustainable Development
SERFOR	Peru's National Forest and Wildlife Service
SERNAP	Bolivia's National Protected Areas Service
SNV	Peru's National Vicuña Society

## Executive summary

Since pre-Colombian times, the fibre sheared from the vicuña animal (a small member of the camel family) has been an important resource for local communities across South America's Andes High Plain region. When overhunting threatened to drive the species to extinction, several countries, with strong leadership from Peru, spearheaded national and international measures starting in the 1970s that have helped to repopulate the vicuña species and reinvigorate sustainable local livelihoods in the region.

This study by the International Trade Centre (ITC) maps the value chain of the vicuña fibre in order to understand the factors that have helped the species recover from near extinction. It identifies current challenges facing the vicuña trade, including the distribution of benefits and threats to conservation. The work is based on a review of the literature, analysis of data provided by CITES Parties and the Vicuña Convention, and interviews in 2017 with key stakeholders in the vicuña sector.

### *Back from the brink of extinction*

Before the Spanish Conquest, vicuñas were the property of the Incas, who regulated capture and shearing activities across the empire. After the Spanish Conquest, the species became an open-access resource subject to indiscriminate hunting which decimated the population. Hunting intensified in the twentieth century, and by the 1960s, the species was near extinction. In response, the newly established Vicuña Convention of 1969 prohibited hunting. Trade became subject to a ban under the Convention on the International Trade in Endangered Species of Wild Flora and Fauna (CITES) as well as under regulations from the United States of America (US) and the European Union.

In 1980, the Peruvian government introduced a change of policy, and granted local communities the rights to shear the fibre of vicuñas. In accordance with strict regulations, communities began to capture vicuña and shear them for sale to international and national buyers. The result was a dramatic recovery in vicuña numbers as communities now had an economic stake in the species' survival. A live vicuña came to be worth more than the value of a poached one. Today, the vicuña population is thriving, with approximately 450,000 across the Andes.

### *Vicuña trade flows and production*

Over the last ten years, trade in vicuña fibre has increased by 78%. The annual value of these exports, largely from Peru, is approximately \$3.2 million, and Italy is the main destination market. Italy is also the major re-exporter of vicuña items sold mainly to China, Switzerland and the US.

The production process begins in farming communities that capture, shear and process the fibre into quality categories. Women manually clean the fibres (in cases under poor working conditions) before the fibre is shipped to either domestic or international buyers. For this work, communities capture about 2%-6% of the value of the final products.

### *Sustainability and governance challenges*

The main environmental sustainability challenges in vicuña management and trade include poaching, the development of captive management schemes, hybridizing vicuñas with alpacas, the impact of climate change on already degraded vicuña habitat, and the deterioration of grasslands due to overgrazing by domestic livestock. Broader governance challenges in the value chain include the reported poor working conditions and maintaining a robust traceability system in the face of unscrupulous traders and incentives to poach.

The fibre trade generates income for some of the most isolated and poorest communities in Latin America. Given communities' small share of final product value, there is a push to find ways to add value to the fibre at the community level. There are, however, many challenges to upgrade and transfer value addition technology and skills, such as design, to source country producers. The market is characteristic of a

oligopsony<sup>1</sup> due to only a few buyers, with Loro Piana purchasing most of the fibre. Given their strong branding position and ownership of machine processing, as well as the relatively small size of production compared to other natural fibre markets, the barriers for new entrants is high.

### *Recommendations*

- To ensure continued vicuña conservation under climate change scenarios, resources should be made available for further research by networks of non-governmental organizations (NGOs), universities and research centres on the scientific and socio-economic aspects of vicuña management, animal welfare, trade and habitat improvements.
- To increase the share of income that communities receive from the sale of vicuña fibre, initiatives are needed to strengthen producer associations, improve availability of market information, price transparency and increase competition between buyers.
- Encourage the participation of local communities in the Vicuña Convention and other national and international fora for decision-making.
- Policymakers and major buyers should take all possible steps to improve the working conditions of women in processing facilities while encouraging economic diversification in communities, exploring options for value addition.
- With respect to traceability, further efforts are needed to achieve the right balance between the necessary level of administrative burden in terms of reporting, inspection and permitting and minimizing regulatory costs for communities and companies.
- Provide training for customs and CITES authorities on processing yields and other customs control issues.

---

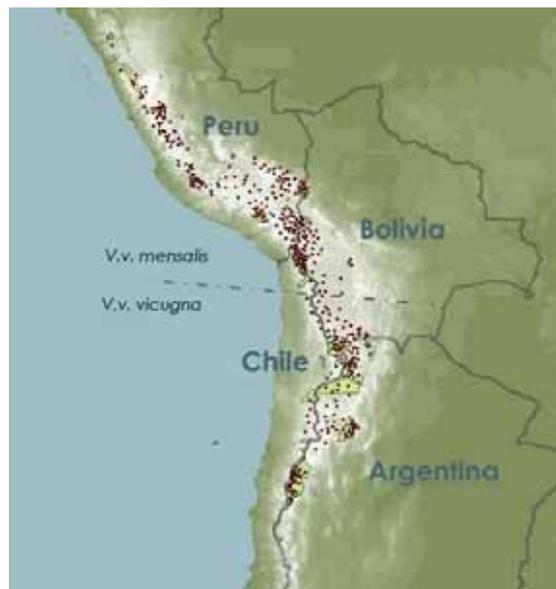
<sup>1</sup> Is a market in which a few buyers face a very large number of sellers. This market is comparable to that of oligopoly (Macmillan Dictionary of Modern Economics, Fourth Edition, David W. Pearce 1992)

## CHAPTER 1 BACK FROM THE BRINK OF EXTINCTION

The populations of vicuña, *Vicugna vicugna* — a small member of the camelid family in South America's Andes region — have followed a volatile trajectory over the past several hundred years.

Once hunted to near extinction, the species now thrives in the Puna and *Altiplano* (high plain) regions of the Andean mountains in Argentina, Plurinational State of Bolivia (Bolivia), Chile, Ecuador and Peru (Figure 1).

Figure 1 Vicuña populations in the Andes



Source: Wheeler & Laker, 2009.

### Governance of Vicuña use from Incan times to present

There are four members of the South American family of camelids – the wild guanaco (*Lama guanicoe*) and vicuña (*Vicugna vicugna*), the domestic llama (*Lama glama*) and alpaca (*Lama pacos*). Andean communities have used vicuña fibre since pre-Colombian times. During this time, the capture of vicuñas was heavily regulated and institutions were set up to control their use (Brack, 1980).

Vicuña fibre was used to make clothing for Incan nobility. Estimates suggest there were around 2 million vicuñas in Peru when the Spanish arrived (Wheeler and Hoces, 1997). After the Spanish Conquest, the species became an open-access resource subject to indiscriminate hunting which decimated the population. During this time, large quantities of hides and leather were exported to Europe (Laker et al., 2006).

Between 1937 and 1965, Peru traded approximately 1,270 kg of vicuña fibre (originating from hunted vicuña) with the largest importer at the time, the United Kingdom of Great Britain and Northern Ireland (UK). It was also during this period that the vicuña population fell from 400,000 in the 1950s, to around 10,000 by 1967. At this point, the vicuña species in the Andes was nearing extinction.

In 1969, Peru and Bolivia, under the newly established Convention for Vicuña Conservation, agreed to ban all hunting and sale of vicuña for a period of ten years (Laker et al. 2006). Argentina, Chile and Ecuador joined the convention later.

In 1970, the vicuña was listed as 'endangered' under the United States of America (US) Endangered Species Act. This led to a ban on the international trade and trafficking of vicuña products within the US. During the 1970s, the species was also listed as endangered by the International Union for Conservation of Nature (IUCN). In 1975, these measures were supported by the CITES Convention, which listed all vicuña

populations under Appendix I, This meant that the international community regarded the species as the “most endangered among CITES-listed animals and plants” and subject to a ban in commercial trade (Table 1).

Table 1 Timeline of vicuña conservation and commercialization

Year	Step
1969	The Vicuña Convention prohibits the commercialization of vicuña fibre for a period of 10 years in the signatory countries (Argentina, Bolivia, Chile and Peru).
1975	Species was included in Appendix 1 of CITES and so subject to a ban in commercial trade
1979	The ratification of the Vicuña Convention, with the new denomination of Convention for the Conservation and Management of the Vicuña, lifts the prohibition of the commercialization of the fibre of vicuña but linked to its sustainable management under specific rules and strict control of the signatory countries (Ecuador is included).
1980	Peruvian government introduces National Plan for the Utilization of Vicuña, in which legal markets were introduced.
1987	Certain vicuña populations from Peru were transferred to CITES Appendix II, meaning International trade in specimens may be authorized by the granting of an export permit or re-export certificate.
1995	CITES transfers export of vicuña fibre from Appendix I to II for all Peruvian populations.
1995-2002	Peru (1995), Argentina (1998) and Chile (2002) carried out their first commercialization of vicuña fibre in the framework of sustainable management and specific local regulations.

**Source:** Elaborated from Bolivia's National Protected Areas Service (SERNAP) 2010; CITES online ([www.cites.org](http://www.cites.org)), accessed 2018

Through the successful first stage of protection, the communities became involved in conservation and management programmes. However, competition remained for forage with alpaca and llama herds owned by local farmers, which reduced the incentive to protect vicuña.

In 1979, Argentina, Bolivia, Chile, Peru and Ecuador signed the Convention for the Conservation and Management of the Vicuña (Lichtenstein 2009). The Convention aimed to continue promotion of conservation and management of the vicuña. The Articles of the Convention set out rules on the use of vicuña including allowing regulated trade, prohibition of hunting and illegal trade, prohibition on export of live animals and semen, promotion of natural parks and reserves, as well as research, technical cooperation and information sharing (see Appendix 1).

In Article I of the Vicuña Convention, and in the signatory states' subsequent submissions to CITES meetings, Andean people that had been bearing the burden of vicuña conservation were named as the main beneficiaries of future vicuña use.

There is differing application of this principle in national legislation however. In Argentina and Chile, vicuñas are *res nullius* and the rights of usufruct are not specified. In Peru, the exclusive usufruct rights given to communities were later extended to persons and businesses distinct from those farming communities thus preparing the ground for large companies to take part in vicuña management. At present Bolivia is the only country where exclusive rights were granted to Andean communities to benefit from vicuñas (Lichtenstein et al. 2009; McNeill et al. 2009).

### Peru's national plan for vicuña use

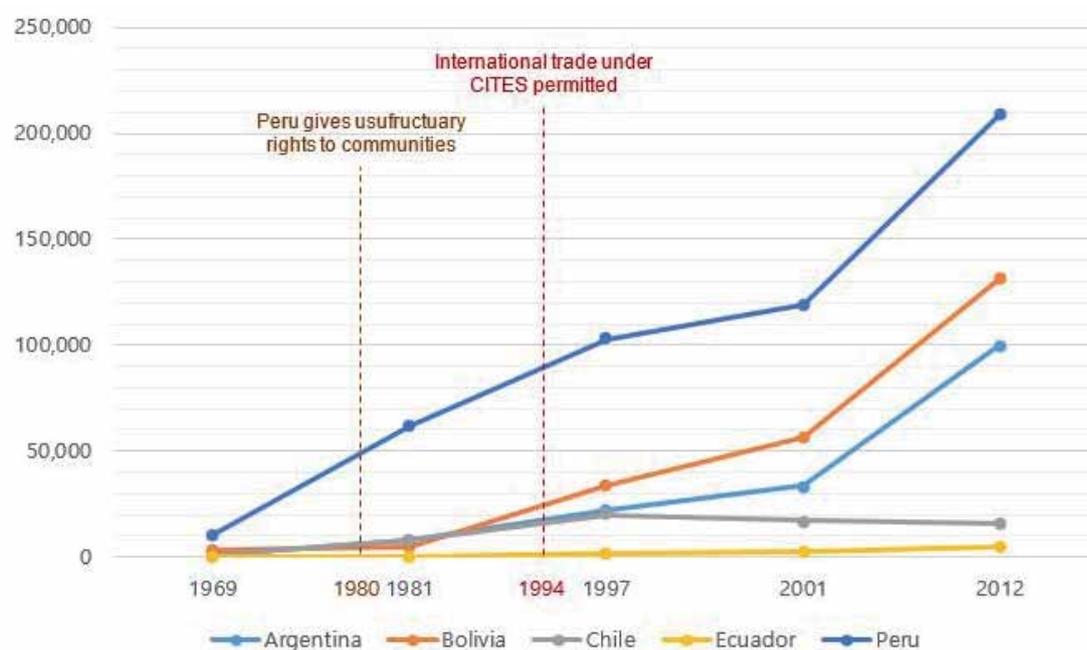
In 1980, a shift in policy towards sustainable use and legal trade of vicuña began as the Peruvian government introduced its National Plan for the Rational Utilization of the Vicuña. Under the plan, legal markets for vicuña fibre were introduced with local community participation. It was hoped that revenue generated by the legal trade of vicuña wool would give communities a financial reward for wildlife protection and generate additional productive activities to improve community livelihoods (Lichtenstein 2010).

Peru introduced further legislative changes in 1991 that have subsequently influenced policy development for vicuña management throughout the Peruvian High Plain (*altiplano*) region. The law (known as *Ley de*

*promoción de las inversiones en el sector agrario, Decreto Legislativo no.653*) shifted the emphasis on vicuña management from protection to sustainable use, by transferring technology and methods for the use of vicuña fibre as a means of local socio-economic development. At the time, the international trade was subject to a ban under CITES.

In 1994, this ban on trade was lifted by CITES Parties (see Figure 2) and the Government of Peru approved a law granting communities the right to manage the land used by vicuña and penalizing illegal game practices. By 1998, vicuña exports reached 2,500 kg (Laker et al. 2006). By 2012, regional vicuña numbers were estimated to be around 460,000 over a range covering approximately 250,000 km<sup>2</sup> (see Table 2). In 2008, IUCN reclassified the animal as “Least Concern” on its Red List.

Figure 2 Change in vicuña numbers in the Andean countries 1969-2012



Source: Wheeler and Laker (2009), and country reports submitted at the 30<sup>th</sup> Ordinary Meeting of the Vicuña Convention.

Table 2 Increase in vicuña numbers in Andean countries (1969-2012)

Country	1969	1981	1997	2001	2012
Argentina	1 000	8 200	22 100	33 500	72 700-127 072
Bolivia	3 000	4 500	33 800	56 400	131 547
Chile	500	8 000	19 800	16 900	15 500
Ecuador	0	0	1 600	2 000	4 824
Peru	10 000	61 900	102 800	118 700	208 899

Note: Ecuador received a donation of 100 vicuñas from Chile and Peru in 1988, and 77 vicuñas from Bolivia in 1993.

Source: Wheeler and Laker (2009) and country reports submitted at the 30<sup>th</sup> Ordinary Meeting of the Vicuña Convention.

According to the Organisation for Economic Co-operation and Development (OECD 2012), the following factors explain the success of the Peruvian government's response to overhunting.

- The Peruvian government ceded the right to fibre shorn from live vicuñas to local *campesino* (farmer) organizations, and later to companies. This gave the communities an interest in the species' conservation, since a live vicuña came to be worth five times the value of a poached one. Because only partial rights were transferred (for the fibre from live animals), the incentive to cull vicuña herds was removed. As reported by Lisung (2008), the General Manager of Incalpaca German Freyre underlined the importance of removing the valuable of fibre in the hands of poachers and commercializing it. In Peru, there is a saying in the industry that a "sheared vicuña is a saved vicuña" ("*una vicuña esquilada, una vicuña salvada*").
- Monopoly control over international trade was granted to a single international trading and processing cartel to maximize the exclusivity of the resulting products.
- All processed products were certified.
- The use of stricter domestic measures provisions, including measures applied by importing countries (primarily the EU and US) under Article XIV of CITES imposed a double-check procedure on exports from Peru, and assisted in policing the trade.
- States with vicuña formed the Convention for the Conservation of the Vicuña to coordinate all their conservation and market interventions and facilitate the transfer of technical assistance.

As a result of these interventions, communities came to see the vicuña as an asset rather than a liability or competitor over resources. The active participation of local communities in management activities helped extend the control of poaching over an expanse that would be impossible for local authorities to manage. Rural dwellers became custodians of the vicuña, and came to be the greatest stakeholders in its conservation. In some places, the vicuña is even referred to as 'the bank of the poor'. The opening up of legal trade led to the presence of field technicians, the development of management plans, government and NGO investments, and meetings and workshops supporting the organization of communities. Vicuña management gave visibility to what were normally marginalized populations. All these incentives resulted in a greater tolerance of, and care for, the species (Laker et. al., 2006).

According to Laker *et al* (2006), lobbying for the commercial use of vicuña was stronger in Peru than in other countries because of strong political pressure from local communities for access to a potentially valuable resource. As specific vicuña populations recovered, they were transferred to CITES Appendix II, thus enabling a legal international trade.

## National management plans and regulatory framework

Countries have implemented the following different types of rules and regulations for the conservation and sustainable use of vicuñas (Table 3).

Table 3 National regulatory frameworks by 2017

	Argentina	Bolivia	Chile	Peru
Ownership of the resource	Provincial governments	The national government	<i>Res nullius</i> – owned by no one	The national government
Benefits for Andean communities	Not regulated other than in Article 1 of the Vicuña Convention	Use rights	Not regulated other than in Article 1 of the Vicuña Convention	Limited ownership granted to communities and use rights later extended to other legal entities
Legal framework for conservation	National laws and decrees	National laws and decrees	National laws and decrees	National laws and decrees
National management plans	No	No	No	No
Form of management	Mostly wild management, few ranches remain active	Wild management only	Some on-going captive management	Captivity and in the wild
Size of enclosures	10 ha	No enclosures	24-243 ha	700-1 000 ha
Investment in management	Private and public	National government/NGOs	Public funds for infrastructure	Public funds to be repaid in cash or in kind (in vicuñas)

Source: Compiled by authors

## Convention on International Trade in Endangered Species of Wild Fauna and Flora

The international trade in vicuña is regulated by governments through the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). CITES is an international agreement that aims to ensure that the international trade in wild animal and plant specimens does not threaten their survival.

CITES works by subjecting international trade in specimens of selected species to certain controls. All import, export, re-export and introduction from the sea of species covered by the Convention has to be authorized through a licensing system. Each Party to the Convention must designate one or more Management Authorities in charge of administering that licensing system and one or more Scientific Authorities to advise them on the effects of trade on the status of the species. Vicuña in Bolivia, Ecuador, Peru and parts of Argentina and Chile are listed under Appendix II of the Convention which means exports may be authorized by the granting of an export permit. Specimens from parts of Argentina and Chile are subject to a ban on trade, listed in Appendix I (Table 4).

CITES allows international trade in fibre sheared from live vicuñas, and in fabric and items made from such fibre, including luxury handicrafts and knitted articles. The reverse side of the cloth must bear the logo adopted by the countries that contain the species' range, which are signatories to the Convention for the Conservation and Management of the Vicuña. It must bear the word 'vicuña' and the name of the country of origin. Other products must bear a label including the logo and the words 'vicuña', the country of origin, and the word 'artesanía'.

Table 4 CITES appendix on vicuña populations in Andean countries

Country	Appendix II	Appendix I
Argentina	Populations of Jujuy (1997) and Catamarca (2002). Captive vicuñas in INTA ranches (1997)	Populations of La Rioja, San Juan and Salta
Bolivia	All populations in the country (2002)	
Chile	Populations of the First Region (2002)	Rest of the country
Ecuador	All populations in the country (2013)	
Peru	All populations in the country (1994)	

Source: [www.cites.org](http://www.cites.org), the year the appendix was changed is shown in parentheses

## EU Regulations

The 27 member states of the European Union (EU) make up one of the three biggest wildlife consumer markets, together with the US and Japan. In the case of vicuña, 95% of exported vicuña fibre is imported by EU member states (TRAFFIC, 2009).

Global wildlife trading is implemented in the EU through Wildlife Trade Regulations (EC No. 338/97) and its amendments, together with implementing regulations. EU regulations are stricter than those of CITES and require import permits prior to the import of species contained in CITES Appendix II. This allows EU members to conduct their own assessment as to whether or not the export will affect the species survival as a whole. European countries can also suspend imports where it is found that they may be detrimental to wild populations or their native species (McNeill et al., 2009).

EU regulations mirror CITES listing (populations in CITES Appendix I are listed in Annex A to the EU regulations and populations in CITES Appendix II are listed in Annex B).

## US Fish and Wildlife Service

Vicuña was listed as "Endangered" in the United States Endangered Species Act, 1970. The ban remained in place in the United States until 2002. In 2002, the United States Fish and Wildlife Service (FWS) reclassified vicuña from Argentina, Bolivia, Chile and Peru from "endangered" to "threatened." This opened the door to importing legal fibre and products obtained from vicuña populations. Species status is reviewed every five years to ensure that all included species receive an adequate level of protection under the law.

FWS regulations state that those intending to import vicuña garments must have permission from the country in which they bought the item, and the label must display the logo of the convention and show the garment's country of origin. The requirements for importing, exporting and re-exporting vicuña fibre or vicuña products are similar to CITES.

## CHAPTER 2 VICUÑA TRADE FLOWS

As Chapter 1 highlights, the vicuña species in the Andes has experienced a significant and encouraging comeback, thanks to a change in the incentive structure for managing vicuña populations. Today, the species is thriving, with approximately 450,000 vicuña across the Andes. This chapter looks at the present-day appeal of vicuña fibre and gives an overview of some of the current trade and production dynamics.

### Use of vicuña

Vicuña produces one of the finest natural fibres in the world. The cinnamon colour of the fleece on the back and side portion of the body and along the neck and back portion of the head are very high quality in terms of fineness and comfort.

Vicuña fibre is exported as dirty fibre, pre-dehaired, dehaired or washed fibre or as products (threads, cloths and garments). Pre-dehaired fibre is the type that is exported the most. Due to its fineness, vicuña occupies an exclusive position in the luxury fashion market. It is used to produce garments, shawls and stoles mainly in Italy and re-exported to the United States of America (US), Japan and Switzerland (Arce Castañeda, CITES Management Authority of Peru, cited in Sinovas *et. al* 2017).

Other luxury fibres come from goats (mohair and cashmere), Tibetan antelope (shahtoosh), camel hair, llama, alpaca, angora and guanaco. All together, these fibres make up around 1% of global fibre market share (see Table 5).

Table 5 Share of natural fibres in global market

Type of fibre	Share (%)
Synthetic, petroleum-based	60
Cotton	36
Wool	2.1
Rare (vicuña, guanaco, cashmere, alpaca etc.)	1.0
Other plant fibres (flax, ramie and bamboo)	0.5
Other unidentified cellulose fibres	0.4

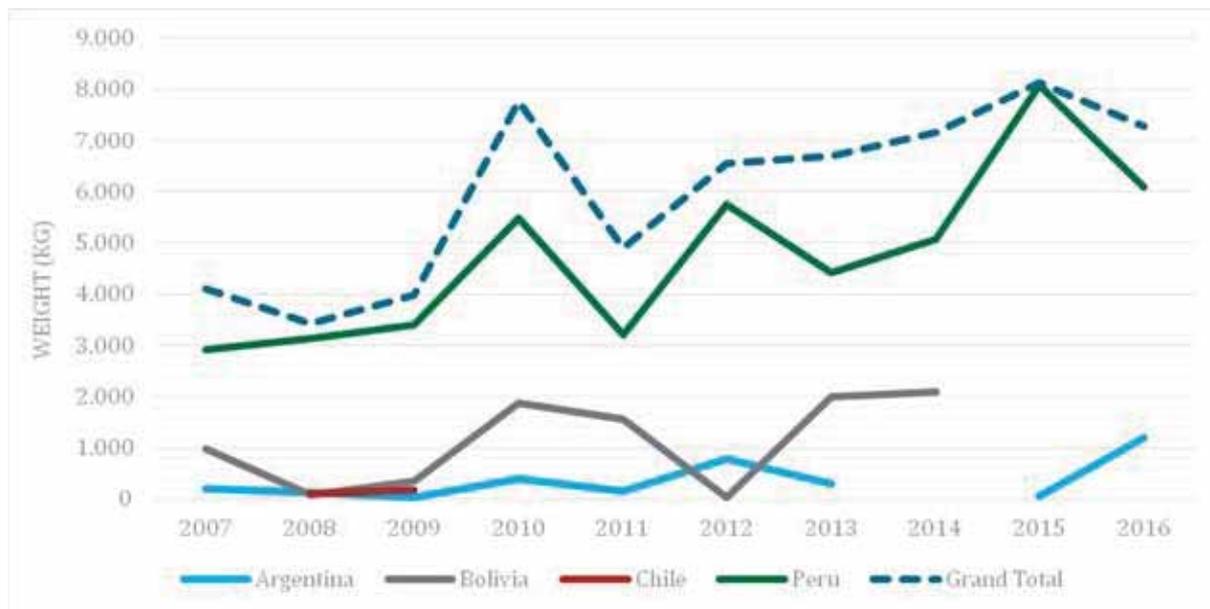
Source: FIA (2008).

### Trade in vicuña from 2007-2016

Figure 3 is a summary of direct trade in vicuña over the period 2007 to 2016, based on exporter-reported trade data extracted from the CITES Trade Database. Based on trade reported by Parties to CITES in their annual reports, global direct trade in vicuña during this period included approximately 60,000 kg of hair and fibre, almost all of which was from wild animals and traded for commercial purposes.

In general, importer-reported trade showed similar patterns to data reported by exporters. Exports increased by 78% between 2007 and 2016, with reported trade peaking in 2015 (see also Appendix 1). Peru was the main exporter of vicuña hair and fibre, accounting for 80% of exports, with Bolivia exporting most of the remaining 20%.

Figure 3 Main direct exporters of vicuña hair and fibre by weight (2007-2016)

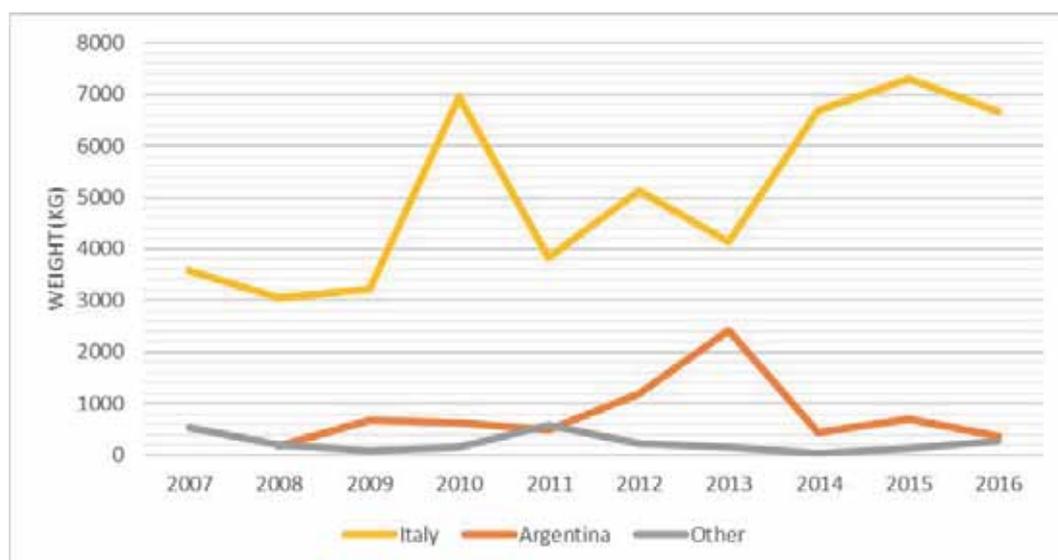


Source: UNEP-WCMC; CITES trade database (extracted on 25/01/2018). Missing data due to incomplete country submission of data to CITES. See Appendix 2 for data in table format

As Figure 4 shows, the major import markets for vicuña hair and fibres are Italy (84%) and Argentina (12%), with exports to Argentina peaking in 2013 (also see Appendix 1). Argentina is also a key re-exporter of vicuña fibre, with 62% of trade from Argentina reported as re-exports originating in Peru, Bolivia and Chile.

Italy is a key re-exporter of manufactured vicuña items, including cloth and garments. A total of 16,000 m<sup>2</sup> of cloth were re-exported from Italy between 2007 and 2016, almost all of which originated in Peru. Key import markets for re-exported cloth are Japan (18%), Republic of Korea (16%), China (14%) and the US (14%). The majority of the approximately 33,000 garments re-exported by Italy also originated in Peru and were mainly destined for China (31%), the US (24%) and Switzerland (14%) (CITES trade database).

Figure 4 Exports of vicuña hair (2007-2016) by importing country



Source: UNEP WCMC; CITES trade database. See Appendix 2 for data in table format.

## Peru's vicuña fibre production

The most recent figures provided by Peru's National Forest and Wild Fauna Service (SERFOR) show an increase of 2,142 kg in the country's sheared vicuña fibre collected between 2013 and 2017 (see Table 6). This represents a 29% increase in collected fibre over the five years. Peru's Ayacucho region collects the most amount of fibre (36%), followed by Puno (29%) and Huancavelica (16%).

Table 6 Fibre sheared (kg) in Peru, by department (2013-2017)

Region/Year	2013	2014	2015	2016	2017
Apurímac	274 443	321 193	445 811	430 897	500 332
Arequipa	320 142	654 045	706 254	971 637	801 813
Ayacucho	3 419 667	3 499 841	3 631 041	3 219 601	3 461 298
Cajamarca	45 919	24 455	49 756		
Cusco	327 534	263 620	405 501	366 281	323 177
Huancavelica	960 644	1 092 060	1 296 792	992 266	1 554 900
Ica	66 127		32 210	25 414	15 093
Junín	787 968	896 491	829 260	805 127	809 502
La Libertad	50 498	49 856	113 821	32 269	61 909
Lima	41 610	9 022	243 711	90 936	
Moquegua	33 802	20 468	22 732	39 529	27 483
Pasco	75 429	80 107	26 071		130 944
Puno	1 063 663	1 479 734	1 442 226	1 305 799	1 923 636
<b>Peru National total</b>	<b>7 467 446</b>	<b>8 390 892</b>	<b>9 245 186</b>	<b>8 279 756</b>	<b>9 610 087</b>

Source: Information submitted by regional governments and elaborated by SERFOR

## Pricing for Peruvian vicuña fibre

Official Peruvian data show that prices paid in Peru for vicuña fibre vary according to three processing categories (see Table 7). The basic commodity, called 'dirty fibre' (*fibra sucia*) fetched between \$310 and \$365 per kg in 2017 in domestic markets. In the same year, the price paid for 'pre-dehaired fibre' (*fibra predescerdada*) which is fibre subject to basic cleaning by hand was \$390-\$400 per kg. The third and highest value fibre, called 'dehaired' (*fibra descerdada*) fetched between \$1,350 and \$1,450 from international buyers in 2017. In Argentina, similar prices were paid in 2017 (\$380 per kg for dirty fibre) (CAMVI, pers. Comm. 2017).

Table 7 Prices paid for Peruvian vicuña fibre (2015-2017)

Year	National market			International markets		
	Dirty fibre (\$/Kg)	Pre-dehaired fibre (S/Kg)	Dehaired fibre (\$/Kg)	Dirty fibre (\$/Kg)	Pre-dehaired fibre (S/Kg)	Dehaired fibre (\$/Kg)
<b>2015</b>	\$270-\$380	\$390-\$420	\$625-\$715	\$370-\$475	\$420-\$450	\$650-\$1 600*
<b>2016</b>						
<b>2017</b>	\$310-\$365	\$390-\$400		\$355-\$420	\$400-\$450	\$1 350-\$1 450

Note: \*Depending on whether the process of de-hairing is manual or by machine (when the fibre is also washed).

Source: SERFOR

Between 2015 and 2017, despite the growth in sheared volumes, the volume of exports from Peru fell from 7,837 kg to 4,859 kg (see Table 8). The value of vicuña exports declined from \$4.1 million in 2015 to \$2.29 million in 2016.

The value of thread exports rose from \$14,381 in 2015 to \$20,923 in 2017. In 2016, \$8,400 worth of fabric was exported and this figure rose significantly to \$29,850 in 2017. Despite this, the value of vicuña garment exports fell slightly, from \$340,363 in 2015 to \$310,761 in 2017.

Table 8 Volume and value of Peru's exported vicuña fibre (2015-2017)

Year	Volume of vicuña fibre exported (kg)	Total value (FOB) of vicuña fibre exported	Volume of thread exported (kg)	Total value FOB of thread exported	Volume of fabric exported (kg)	Value (FOB) of fabric exported	Volume of garments exported (pieces)	Value FOB of garments exported
2015	7 837	\$4 208 364	5.04	\$14 381			457	\$340 363
2016	7 200	\$4 102 573	4.90	\$13 690	2.22	\$8 400	341	\$313 082
2017	4 859	\$2 299 762	6.70	\$20 923	7.47	\$29 850	355	\$310 761

**Note:** Not all the 2017 data has been recorded yet (SERFOR 2018). FOB: Free on Board

**Source:** SERFOR

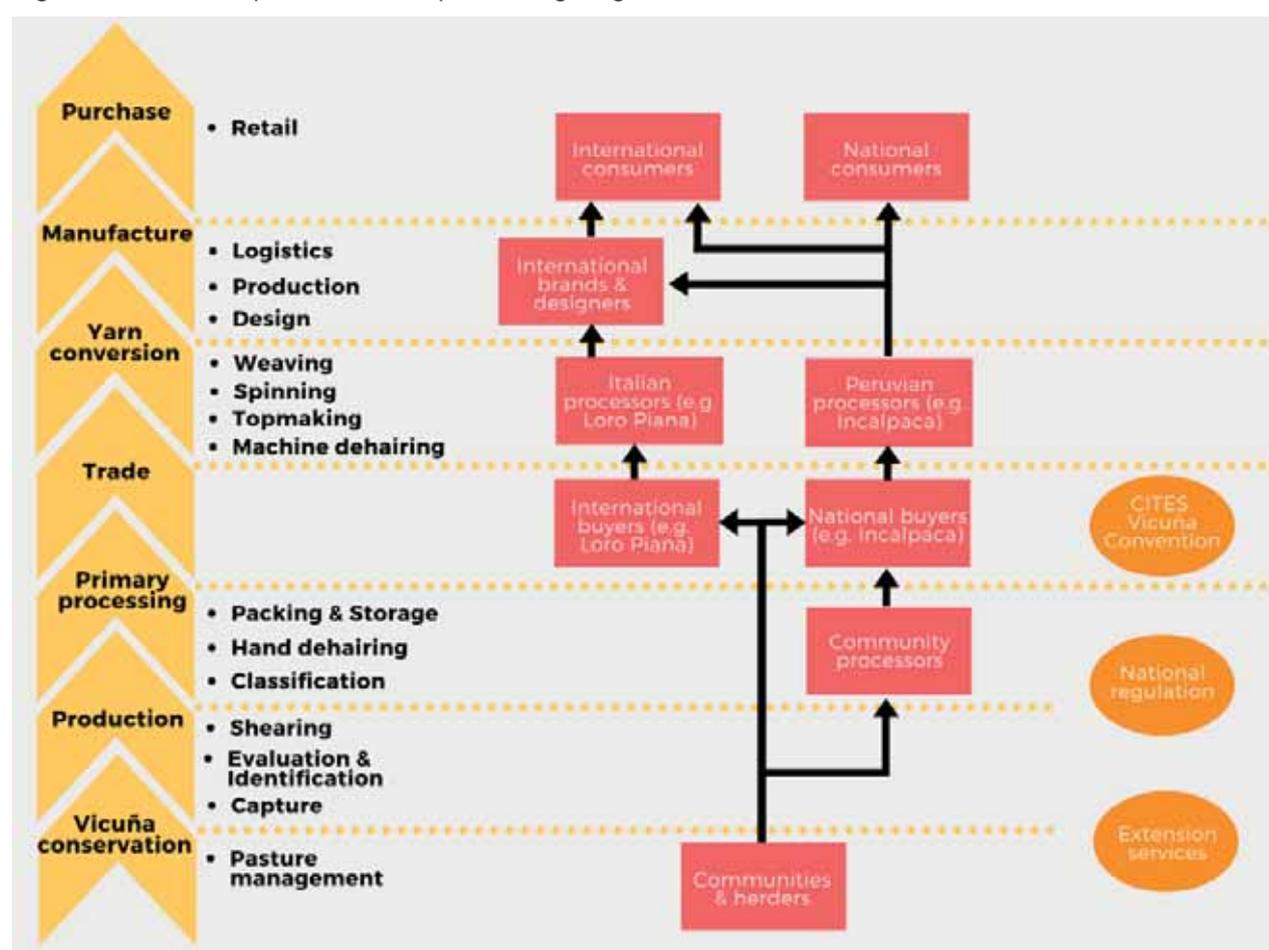
## CHAPTER 3 UNDERSTANDING THE VICUÑA VALUE CHAIN

As was established in Chapter 2, trends indicate growth in production and trade for vicuña fibre over the past 10 years, as the fibre continues to enjoy its exclusive place among the world's most luxurious and expensive wools. This chapter delves deeper into how the wool is produced in the four main Andean producer countries (Peru, Bolivia, Argentina and Chile), and takes a closer look at the dynamics of international demand for vicuña fibre.

### Luxury market demand

The value chain for vicuña extends from remote communities in the Andes through traders, processors, import and export authorities, to designers and retailers, to the final consumer (see Figure 5). Vicuña fibre is in high demand in luxury fashion markets. In addition to established markets in Europe, Japan and the US, there are emerging markets in China and Russia. The demand for luxury formal clothing in China has shifted in part to high-end casual and sportswear products that typically do not use vicuña fibre. Notwithstanding these changes in demand, there is long-term growth potential in China, particularly given rising incomes of consumers (Dyson, 2015).

Figure 5 Vicuña production and processing stages in Peru



Source: Elaborated by authors

Vicuña fibre is measured in microns referring to the thickness of the fibre: the smaller the micron, the finer and softer the wool (Table 9). The sale of fibre is either through public tenders, direct invitation or private sales. Most vicuña fibre is exported in raw form or with minimal processing. The vast majority of these exports go to Italy for processing into yarn and fabric. From there, the fibre is made into clothing primarily in Italy, but also the UK, Japan and the US.

Table 9 Comparison of vicuña fibre diameter (in microns) and comfort factor versus other natural fibres from the special fibres group

Fibre	Thickness (microns)	Comfort factor (%)
Vicuña	12-14	99
Guanaco	14-16	97
Cashmere	15-19	98
Yak	19-21	ND
Baby alpaca	22.5	90
Kid mohair	25	80

**Note:** Comfort factor (CF) is defined as the percentage of fibres of a fleece which are under 30 µm.

**Source:** Mincetur 2003; FIA 2008, Mueller et al. 2010

## Management, capture and shearing

The vicuña value chain begins with the management of the vicuña. The principle model in the largest range states, namely Peru and Bolivia, is wild management. Vicuña management activities in Peru include the national census (last one performed in 2012), monitoring of births, sanitary control, predator control, and improvement of pasture through fencing, irrigation and reseeded.

The production process in farming communities involves the following stages: capture of the vicuña, known as the *chaccu*, evaluation of the health of the animals, and identification for shearing. The shearing stage follows, which must take place from a live animal. It can be either manual or using machines. To maintain quality and high price, the fleece must be sheared in one piece. Approximately 200 grams is obtained from each animal which is sheared every two years. They can be sheared four times in their lifetime (Lisung 2008).

### The *chaccu*

The *chaccu* was originally a ritual celebration from the Inca Empire in which men, women and children from Andean communities organize the capture and shearing of vicuñas. The Incas carried out a *chaccu* every four years. The fibre was for the Incan nobility (Yacobaccio, 2009). This tradition is still alive today.

The *chaccu* consists in creating a funnel with nets and wires, into which vicuñas are captured and sheared. At the opposite side of the funnel are the people: peasants, tourists, authorities, etc making a human cord. These people hold a long rope that has several plastic lines with many colours in order to prevent the vicuñas from running away. The people responsible make a signal to begin the walking. After two hours, the path is narrow and vicuñas are captured (see Figure 6).

In the community of Pampa Galeras in Peru, the number of vicuñas captured can reach 2,000. Each community organizes its own *chaccu* for the shearing with different degree of support by local and national governments. Most of the time, men are responsible for shearing and women participate in the moving of vicuñas towards the funnel, gathering the fibre in bags, and are responsible for bringing food for all participants. Usually communities develop an annual campaign that includes capturing, evaluating and identifying the animals, shearing, classifying cleaned fleeces, and selling (Lisung 2008).

## De-hairing (manual and mechanical)

As described in Chapter 2, the fibre is mostly “pre-dehaired” by manually removing any hair, vegetable matter or dead material. In 2012, 78% of Peru’s vicuña exports were pre-dehaired and 20% was dirty fibre ie completely unprocessed (Annex 1, Table A3.). According to one industry source in Peru, around 50-60% of vicuña wool is exported to Italy by Loro Piana where it is de-haired with machines.

In the view of one Peruvian vicuña textile expert, manual de-hairing is better for maintaining the quality of the fibre, while also creating work in communities (G.Lozada, pers.comm 2017). Manual dehairing of fibre generates additional community jobs, especially for women. Manual dehairing of 1 kg of vicuña fibre generates \$75. The work requires one month working eight hours a day (30 grams per day). However, this work places a lot of strain on the eyes and carrying a risk of lung problems due to dust (Lisung, 2008).

Given these conditions, community groups have advocated for cleaning centres to provide women with aprons and face and eye protection as well as good light and work surfaces. Most fleece centres allow women to bring their children to work. Women are paid according to how much they clean rather than a fixed salary. After cleaning, the women pack the fibre and store it, usually in the cleaning centre or an association’s own centre.

Using machines for de-hairing creates large quantities of fibre in less time than manual de-hairing. However, de-hairing plants are capital intensive. To date, no Andean communities have this technology. Only Italy, Peru and Argentina have plants with the capacity to de-hair vicuña fibre mechanically. They are owned and operated by textile companies or local cooperatives.

The sale of vicuña at the community level makes up around 2-6% of the value of the final product. The proportion of the final retail price made up by raw material ranges between 2% and 3% for a scarf retailed in Europe, and between 5% and 6% for a scarf sold in Peru reflecting the lower transport costs and lower final product price (Table 10). This relatively low share of the final value added product is also the case in another wildlife luxury value chain, namely, python skins, where the share of value added in the communities is low in relation to the price of the final product (Kasterine et. al. 2012). As with vicuña, substantial value addition takes place in Italy using advanced processing technology and sophisticated design in the fashion industry.

Assuming a price of \$423 per kg of dirty fibre, a de-haired fibre yield of 69% (Lichtenstein *et al.* 2002) and a weight of 135 g for scarves made with 100% vicuña fibre and 200 g for stoles, it is possible to calculate an indicative price of raw material needed to produce the garments.

Table 10 Prices of vicuña garments

Garment	Size and weight	Price	Price of raw material	Proportion of final garment price made up by raw material price
Loro Piana vicuña stole	200 x 75 cm; 200 g	\$6 223	\$123	2.0%
Loro Piana vicuña scarf	135 x 32 cm; 135 g	\$3 111	\$83	2.7%
Loro Piana large scarf	175 x 43 cm	\$4 670	\$84	1.8%
KUNA vicuña stole	200/184 x 70 cm; 195 g	\$2 225	\$120	5.4%
KUNA vicuña scarf	180 x 30.5 cm; 135 g	\$1 350	\$83	6.1%

**Note:** The fibre price was estimated at \$423/kg. Dehaired fibre yield assumed to be 69%. Weight of scarf 135 g. Kuna products sold in Peru are also at lower prices: \$1,436 for stoles and \$854 for scarves in January 2014.

**Source:** Loro Piana; Kuna website <http://www.intifil-kuna.com/fw-gold-of-the-andes>, accessed on 25 January 2014.

## Production and sale

Different models of production and sale exist across the four main source countries. The production of vicuña fibre in Bolivia and Chile is carried out by communities whereas in the case of Peru it is mostly communities but also the private sector. In Argentina, although many communities are involved in wild management of the species, the majority of production comes at present from privately-owned ranches linked to Loro Piana and other private companies.

### Peru

#### Community sales

Until 2004, all domestic production was sold in bulk by Peru's National Vicuña Society (SNV) to a single client, the International Vicuña Consortium. The consortium was made up of the Italian companies Loro Piana and Zegna Agnona (Lichtenstein *et al* 2002, Lisung 2008). SNV was made up of farming community management committees that in turn formed regional associations. The SNV acted as the representative negotiating entity when selling fibre that had been collected via regional associations. In addition to negotiating with exporting companies, the SNV secured verification that the fibre was from live-shorn vicuñas (instead of poached ones). SNV facilitated the traceability process for individual communities, many of which would not have the capacity to compete.

Following the liberalization of the market in 2002, international buyers have used local agents to establish and maintain contact with communities, setting up the negotiation of price and purchase of fibre and arranging for inspections to take place, certificates to be granted and the export to proceed. National companies Incalpaca and Michell use their own staff to fulfil these tasks (Rainsford pers.comm 2017).

#### Main buyers

According to a report provided by the Peruvian government to the Vicuña Convention, companies that buy fibre in Peru include: ALMAR del Perú S.R.L, and to a lesser extent Michell and Cia S.A., Incalpaca Tpx S.A., Qori Exports S.R.L. and Coopecan Peru. According to Peru-based camelid fibre expert and buyer Francis Rainsford, Loro Piana is the largest buyer of vicuña (approximately 45-50% of fibre production). The Incalpaca group buys 20-25%, and the remaining 30-40% is divided between other companies including Michell and Leaf.

The Peruvian company Incalpaca carries out industrial processing to obtain clothing and fabric. In 2012, it exported capes, scarves, stoles, coats, sweaters and cardigans, to Chile, Japan and United States, followed by Australia, France and Russia, among others (MINAG, 2013). The Peruvian company Michell also processes and designs vicuña garments.

#### Community projects

The community of Lucanas in Peru produces 1,200 kg of vicuña fibre per year from its own animals, and 300 kg from a programme designed to increase vicuña numbers. According to Lucanas's leaders, the sale of fibre contributes to the community's social development, providing food supplements for the elderly, payments to the church, funding for education, heavy machinery and farm tractors. Investment projects are also in place, such as the fund for education, culture and sport, the community's parish clergy house and stadium and the International Vicuña Festival (ACOFIV, 2012). Revenues are also generated from the sale of vicuñas to other communities for repopulation programmes and for tourist *chaccus*. Management is directed by a manager, and all staff are paid.

### Bolivia

#### Community sales

Vicuña fibre sales from Bolivia are made as block transactions through the country's Community Association for Commercialization of Vicuña Fibre (ACOFIV), with 100% of fibre production awarded to the company which wins the national tender procedure. ACOFIV organizes the distribution of economic benefits to regional

associations, which then redistribute the benefits to communities. Community leaders distribute money among the families that manage vicuñas. Given the number of people involved in each management community, revenues are a supplement to other production activities.

### Buyers

There are two major buyer companies in Bolivia: Loro Piana, which exports to Italy, and the Argentinian firm Pelama Chubut, which exports directly to Italy or via Germany through Argentina.

There is one domestic company that buys fibre in bulk and processes it to the pre-dehaired, dehaired and cleaned levels. There are no registered mills or weaving facilities that work specifically with vicuña fibre. There are also no companies that produce vicuña garments. It is possible to find artisanal vicuña items made with illegal fibre on the black market, as there is no internal trade in legal fibre.

In Bolivia, the percentage of vicuñas sheared is low in relation to the estimated national population (3.4% in 2012), but this figure has been increasing each year.

The tradition of using clothing made from vicuña fibre, such as the shawls worn by urban indigenous women in La Paz, or the scarves worn by indigenous authorities and government officials, is maintained and common at social and official events. There are also reports of shawls, mantillas, ponchos and scarves being used at saint's day festivals and at the Carnival de Oruro, in Bolivia.

## Argentina

### *Private and community management models*

In Argentina, vicuñas are distributed over five provinces, but only two of these populations (Jujuy and Catamarca) have been transferred to CITES Appendix II. Only a small percentage of vicuñas are under management, with approximately 4% of the total population being sheared in 2012. In the case of Jujuy province, until 2005 the predominant management method was captive management (Lichtenstein, 2010). Wild management by local communities started in Cieneguillas, Jujuy in 2003, and was later followed by a cooperative in Santa Catalina (Arzamendia et. al 2008). Since 2014, nine indigenous communities of Yavi started community captures to jointly produce and commercialize the fibre.

In the case of Catamarca province, Laguna Blanca, a local cooperative of small holders, started managing vicuñas in the wild in 2005. In recent years, private companies have started buying land in the Catamarca plateaus and building large wild enclosures. A concern of luxury companies is to maintain a secure supply of vicuña. In response, the Schneider Group, one of Europe's leading traders and processors of fine wools and precious natural fibres, purchased 108,000 hectares of land in Argentina, with 6,000-8,000 vicuñas (Dyson 2015).

Local communities have expressed concern about the private investment in vicuña ranching. Specifically, they view ranches as competition, potentially reducing the market prices they will achieve (Proceedings of the International Meeting of Vicuña Managing Communities 2012 and 2017). These concerns were highlighted at the 30th Meeting of the Vicuña Convention (Resolution 355/2013, see Appendix III).

In 2012, 78% of vicuña fibre production in Argentina came from Loro Piana and Schneider Group.<sup>23</sup> Exports from Argentina were sent mainly to Italy. The rest of Argentina's exports are made by the company Pelama Chubut, which exports to Italy the fibre it buys from the National Agricultural Technology Institute (INTA) breeding ranches and satellites in Argentina, and re-exports fibre from Chile, Peru and Bolivia.

<sup>2</sup><http://www.losandes.com.ar/notas/2013/5/26/inversion-italiana-para-criar-vicunas-argentina-716706.asp>; [http://www.gschneider.com/index.php?page=details&type=news&id\\_news=4888](http://www.gschneider.com/index.php?page=details&type=news&id_news=4888) (accessed 14 January 2014).

<sup>3</sup>This led to a request for a report by the National Chamber of Deputies to the National Executive Branch, arguing that since Article I of the Vicuña Convention grants Andean communities the benefit of using this species, the participation of non-Andean private parties might not be compliant with that article (Parliamentary Act: 137 (19/09/2013)).

In 2016 in the Catamarca province, Loro Piana with Schneider Group bought 2,000 kg (70%) of Argentina's vicuña fibre (Patricia Merino, pers. comm. June 2017). Other buyers included the following: Pelama Chubut which bought 600 kg; Textil Los Andes which bought 200 kg. The average price paid to the producer was \$380 per kg (gross).

Pelama Chubut purchases fibre in bulk from INTA or from producers and then exports most of it after de-hairing at the company's own textile plant. The same company purchases pre-dehaired fibre from Chile and dirty fibre from Bolivia and re-exports it through Argentina. Argentina does not produce industrial textiles from vicuña, industrial yarns or plain cloth, and most of its fibre leaves the country with very little added value. There is a growing market for legally-sourced artisanal garments from Catamarca fibre weaved mostly in Belen, and Laguna Blanca. There are still artisanal pieces, such as scarves, shawls, ponchos (for high end consumers) and sweaters that come from illegally sourced fibre according to local sources.

As for community captures, in Laguna Blanca, 20% of all fibre obtained is sent to the Secretary of State for Environment and Sustainable Development for the Provincial Fibre Redistribution Programme, and 10% goes to the owner of the land where the captures took place. The remaining fibre (22 kg in 2012, and 27 kg in 2011) is distributed among the 33 partner families so that they can knit gloves, shawls, hats and poncho-style garments. The sale of these garments is a small supplement to their household economy.

## Chile

### Community sales

The number of animals managed each year in Chile varies depending on the interest among indigenous communities in carrying out capture/shearing on their lands, and in financing costs for the associated equipment and labour. Conflicts arising from the lack of internal agreement among rural families also affect camelid fibre production levels. Another limiting factor is the migration of Andean inhabitants to urban areas, which leads to a decline in livestock production in the countryside (FIA, 2009).

Most Chilean producers sell their fibre through tenders organized by a cooperative called Cooperandino Chile. The tender winner has always been Pelama Chubut, although prices fetched in Chile and Argentina differ from one another. There were no captures in 2012.

## Ecuador

Ecuador's vicuña population was transferred to CITES Appendix II at the beginning of 2013, allowing international trade. Captures are thus expected to begin in the country in the coming years.

## Topmaking, spinning, fabric and garment making

After *de-hairing* which takes place in Andean countries and Italy, the next stage is topmaking and spinning. De-hairing in Italy is undertaken primarily by Loro Piana but also another Italian company Alpha Tops (Kuffner pers.comm 2015).

The *topmaking* stage prepares the wool for the *spinning* process, at which point the wool is formed into a yarn.<sup>4</sup> The companies involved in vicuña are practically all located in Italy. In most cases, vicuña yarn spinners from Italy use the yarn for their own *weaving* units, or they sell it to a handful of Italian and British weavers. Yarn is also occasionally sold to private customers for hand-knitting purposes (Kuffner pers.comm 2015).

---

<sup>4</sup> Woolmark <http://www.woolmark.com/knowledge/manufacturing/worsted-system/topmaking>, accessed 16<sup>th</sup> April 2018

The market leader in processing and marketing vicuña is Loro Piana. Loro Piana is owned by LVMH the fashion holding company. According to press reports, all 100% pure vicuna products are made by Loro Piana. Some brands are selling blended products. Only a few brands are able to source directly without buying fibre through Loro Piana (BoF 2017). Incalpaca is an active buyer, processor and designer in Peru.

It was not possible to get information for this study from the European vicuña spinning industry about customers, quantity or price related to their own use within their production.

After the weaving process, at the stage of garment making, a number of companies from UK, Belgium and Germany, and a few North American, Japanese, Chinese and Australian companies enter the market of vicuña products. These companies buy fabrics from Italian or British manufactures, then design styles and produce garments. Since the garments are of very high value, the entire manufacturing process usually takes place within their home countries to assure quality and reduce the risks associated with production outsourcing. Fabric producing companies sell vicuña fabrics to haute couture designers, tailors, exclusive retailers or showrooms of leading luxury brands.

Other companies that have historically processed and manufactured vicuña products include: from Italy, Alpha Tops, Schneider, Colombo, Agnona, Emenegildo Zegna, Kiton, Brioni, Armani, Carlo Barbera, Fratelli Piacenza, Bottega Veneta/Gucci; Leaf of Japan; from the UK, Johnstone of Elgin, Hinchliffe & Sons, Holland & Sherry; Scabal of Belgium, Volkmar Arnulf Schneiderei in Germany, John H. Cutler in Australia, Domenico Spano in the US and Sartorialto in Canada.

Wild-sourced and sustainably harvested vicuña fibre could possibly obtain certificates such as the Global Organic Textile Standard. However, the luxury market rarely uses sustainability certification as brands look to maintain exclusivity of a product. In the case of wildlife products, the sector relies on the CITES certification to show provenance. Loro Piana has done some marketing around the conservation success of the vicuña trade.<sup>5</sup>



Loro Piana catalogue: Double breasted caban for sale at \$14,403.

**Source:** Loro Piana website, accessed 16th April 2018. Converted from Swiss francs to US dollars (1:1.042).

<sup>5</sup> [https://www.loropiana.com/en/our-world-Loro-Piana/Vicu%C3%B1a\\_la\\_regina\\_delle\\_Ande](https://www.loropiana.com/en/our-world-Loro-Piana/Vicu%C3%B1a_la_regina_delle_Ande) accessed 12 January 2018

## CHAPTER 4 SUSTAINABILITY ISSUES

The story of vicuña conservation and trade is largely one of success, both for the species and local communities that have benefited from its resurgence. There remain, however, several challenges facing the industry, ranging from environmental factors to issues related to competition and benefit sharing.

### Threat of climate change

Climate change has had negative impacts on ecosystems and biodiversity in the Andean highlands. Higher temperatures and reduced rainfall has decreased pasture yield and whilst led to increased incidence of pests and diseases (Baez et al., 2016; Anderson et al., 2016). This is likely to have a negative impact on the vicuña industry.

Climate-related indicators show a severe exposure of the Andes to climate risk. Vuille and Bradley (2000) investigated temperature variability in the tropical Andes from 1939 to 1998, showing an increase in air temperature by 0.10°C - 0.11°C per decade for the period, and 0.32°C - 0.34°C per decade since then. Vuille et al., 2008 anticipate an increase in temperature of 4.5°C - 5°C in the tropical Andes by the end of the 21st century.

Climate change has caused a steady decrease in annual rainfall in some Andean regions as well, leading to a high risk of drought (Haylock et al., 2006; Liebmann et al., 2007). Several studies show that the highlands of the Andes face extreme seasonal variations in precipitation (Liebman et al., 2007; Seth et al., 2006; Vergara et al., 2007). Research from Marengo et al. (2011) indicates a trend of wide fluctuations in rainfall with some dramatic drops in specific areas such as Northwest Argentina and the Bolivian *Altipano*.

The Andean highlands have experienced a significant loss of glaciers, and the pace of glacier retreat is accelerating (Perez et al., 2010; Rabatel et al., 2013; Urrutia and Vuille, 2009; Vergara et al., 2007) reducing the availability of water for animals and supporting plantlife.



Retreating ice cover near Chile's Lauca National Park, © Shutterstock

## Conservation management approaches

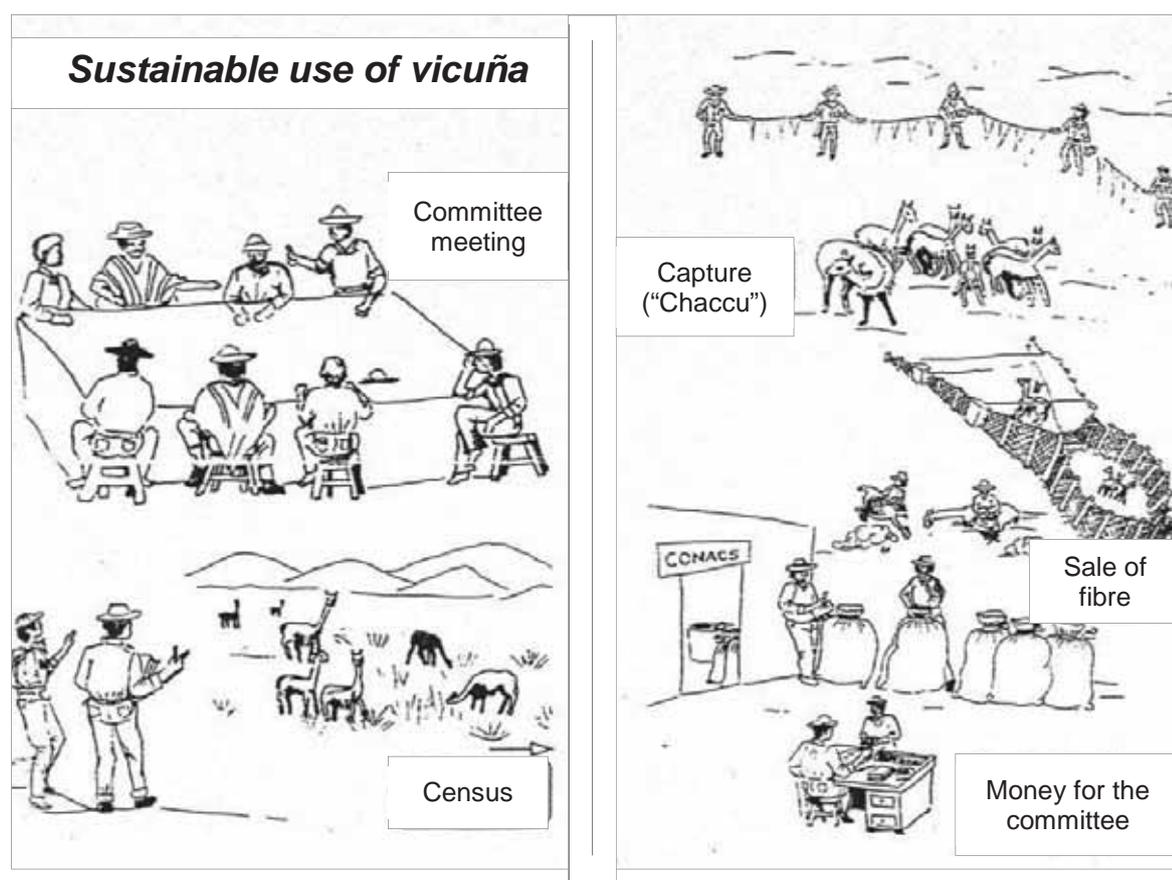
There are two major types of vicuña management: captive and wild. Management in captivity involves raising the animals in confinement with different forms of restriction on their movement and dispersion. Management in the wild involves animals that live free, are captured temporarily and then released.

Given the high demand for vicuña fibre, there have been attempts to increase productivity by enhancing animal capture through captive breeding, artificially selecting animals with more fibre, breeding hybrids with alpacas and even producing embryos to be implanted into llama surrogates. Artificial selection, and embryonic and genetic manipulation, however, are not permitted under the Vicuña Convention. As described by convention resolutions, country representatives should strive to maintain the wild nature of the species.

Andean countries implement different forms of vicuña management depending on their particular context, including social organization, production systems, systems for land occupancy and use of natural resources, and legislation.

In Peru and Bolivia, management plans were initially designed so that Andean communities could make use of vicuñas that roamed their communal lands through temporary captures, recreating the Incan *chaccus* or royal hunts. In Chile, Aymara families (indigenous peoples of the *Altiplano*) developed a mixed system for managing the animals both in the wild and in larger enclosures. In both countries, more fibre is produced from wild vicuñas than from captive animals. Maintaining populations in enclosures risks disrupting the natural organization of the animals, inhibiting genetic flow between populations, increasing the likelihood of inbreeding, genetic drift, artificial selection, and transmission of diseases (Vilá 2002).

Figure 6 Stages of vicuña management in Peru



**Note:** Translation from Spanish by authors

**Source:** CONACS, National Council for South American Camelids

In countries with a tradition of community life such as Bolivia and Peru, the use of vicuñas is promoted as a way of recognizing the species as a cultural asset of highland villages, in line with ancestral forms for managing biodiversity. Producing vicuña fibre also contributes to the recovery and re-creation of community employment and promoting the social restructuring of communities (MDRAYMA, 2008).

## Approaches to traceability

Andean countries differ in the systems and extent of traceability used in the supply chain for vicuña fibre. In Peru, the largest producer of vicuña fibre, the steps followed from fibre production through to its processing into fabric are as follows:

- Recognition and accreditation of members of Committees for Sustainable Use of South American Wild Camelids (CUSCSS);
- Scheduling of shearing with regional governments;
- State monitoring of vicuña population (under the care of management holders);
- Authorization of vicuña capture and shearing and issue of records;
- Supervision of vicuña capture and shearing by regional authorities;
- Issue of capture and shearing control sheet, which must be endorsed by CUSCSS management, and accompanied by a report submitted to the Department of Agricultural Promotion;
- Issue of vicuña capture and shearing record by the regional office. This document certifies and summarizes information obtained in the field by the vicuña capture and shearing supervisor, formalizes the activity, and validates the data entry of the main vicuña production activities;
- Operating permit for South American Wild Camelid (CSS) fibre collection centres and/or primary processing shops;
- Inspection of CSS fibre collection centres and/or processing shops;
- Supervision of CSS fibre at a collection centre;
- Supervision of CSS fibre in a processing workshop;
- Supervision of fabrics and/or garments made with CSS fibre. The only companies allowed to process and sell vicuña products are those which hold an enrolment certificate with the Single Register of South American Wild Camelids of Peru and a trademark use permit;
- CITES certificates are issued by the Ministry of Agriculture once the aforementioned steps have been undertaken.

## Trade off between traceability and value chain needs

### Buyers meeting regulatory requirements

There exists a tension between the need to demonstrate that fibre that is legally traded and traceable, and commercial pressures to speed up supply chain delivery through fewer regulatory controls. Industry representatives point out that heavy regulation reduces their competitiveness.

Existing systems are criticized by fibre middlemen and buyers as bureaucratic and slow. Delays to granting certificates means that traders are unable to deliver consignments in time for fashion seasons. However, improvements have been made in speeding up the delivery of CITES permits through electronic means.

These delays can mean traders are either unable to repay loans that they have taken out to purchase fibre or must have flexible arrangements with their creditors. This uncertainty deters new entrants to the market. The ability to have flexible financing arrangement contributes to the status quo of only established textile buyers remaining in the market.

According to fibre buyer Francis Rainsford, another factor is that established buyers have built up strong relationships with communities who may be unwilling to take the risk to negotiate with another buyer whose business reputation they know little about (pers.comm 2017). Notwithstanding this reluctance, according to discussions during the last meeting of Vicuña Management Communities held in December 2018, communities want to find other buyers as a way to counter what they perceive are low prices offered by the main buyers.

### Communities meeting regulatory requirements

In Peru, some small communities hire the company Almar to carry out their shearing and to fill out paperwork, as these are considered complex tasks. In Argentina, inspectors from provincial wildlife departments supervise the shearing. They issue a certificate of origin and legitimate possession indicating that the fibre has been legally obtained. For inter-provincial transport, permits must be issued by the pertinent provincial authorities. The export system is burdensome for small producers, communities and sellers who have to travel to Buenos Aires in order to complete the export process and get CITES permits. Larger trading companies usually have an office there. Once the shipment reaches its recipient, the company must submit the transport permit to the relevant authority within its validity period for inspection and recording. Exporting requires authorization from the relevant national authority and CITES permits must be obtained. Customs clearance permits are also required. These are issued upon completion of an inspection and verification of certificates of origin.

### Laundering

Despite regulations in place, there are opportunities and incentives to launder illegal fibre or other fibres (e.g. guanaco) into legal consignments due to several potential factors, including insufficient inspectors at shearings and processings, lack of capacity of customs to distinguish vicuña fibre from other camelid fibres, lack of customs and port inspections, and insufficient traceability during the addition of value in European countries. There is scope to launder poached vicuña pelts through officially registered consignments by claiming that the yield of de-haired fibre was better than expected.

### Guanaco as a substitute for vicuña

The guanaco is a wild camelid native to the arid, mountainous regions of South America. Guanaco fibre has similar characteristics to those of vicuña fibre. It is particularly prized for its soft, warm feel and is also used to manufacture luxurious fabrics. It is not widely used in the European fibre industry under its species name, although it is occasionally sold as substitute fibre (Kuffner pers.comm 2015).

Given its similar attributes and thickness with vicuña, there is the potential for guanaco fibre to be mixed with vicuña fibre. Misuse in this regard has been reported in the industry (Kuffner pers.comm 2015). This is due precisely to the great difficulty to differentiate between vicuña fibre and guanaco fibre, and because prices for guanaco fibre are significantly lower than for vicuña fibre (Marino pers.comm 2018). The potential for mixing is already observed in the cashmere sector, where yak and fine Merino sheep fibres have similar properties to cashmere (Cashmere and Camel Hair Manufacturers Institute, 2014).



Round up of guanaco in Payunia, Argentina, © Gabriela Lichtenstein

In Argentina, guanaco in the southern part of the country face a threat from ranchers (*estancieros*) who wish to replace them with sheep. Since 2015, producers from Santa Cruz province are hoping to get official support to start culling programmes of guanacos. There were attempts also to declare guanacos as a pest. In response, the local and state government are currently making efforts to establish programmes, and implement marketing and commercialization tools, in order to create a bigger market for guanaco fibre.

In Peru, the guanaco fibre manufacturing sector is relatively small and dominated by the Incalpaca company (Incalpaca, 2015). Manufacturers engage with guanaco fibre value chain at all nodes and mainly sell ready-made garments. Given that guanaco populations are threatened in Peru, the fibre processed in Peru is imported from Argentina (Gustavo Lozada, pers.comm, 2017).

## Animal welfare issues

The *chakkus* involve chasing, rounding, capturing, shearing and releasing the animals into the wild. Given the importance of following rigorous animal welfare standards in the management of this fragile wild species, the IUCN South American Camelid Specialist Group (GECS) developed a protocol for vicuña shearing (see Box 1). This sets out animal welfare conditions to be followed in captures performed in Argentina. It also influences protocols followed in other countries (Bonacic et al 2012). Animal welfare protocols place restrictions on the season when captures can take place, the minimum age of the animal for shearing, time span between shearings and so forth. These limitations place a constraint on the size of the yield of fibre obtained through capture.

Conservation specialists still have concerns regarding the lack of implementation of animal welfare protocols in several captures and the impact of fencing and translocation. In some communities, vicuña captures have become tourist attractions. The accompanied music and dancing next to animal enclosures and the proximity

of tourists to the animals during shearing places stress on the animals. Lack of precautions in shearing practices can lead to animal mortality and suffering.

#### Box 1 Animal Welfare considerations for wild vicuña shearing

- **Limitations on the number of vicuñas sheared:** It is recommended that animals are not sheared if they have less than 3 cm of fibre; if they are females in an advanced stage of pregnancy, yearlings or younger offspring; and if they are in poor nutritional health or showing signs of disease. Young animals, those with dandruff in their fibre, those that are sick, those that were sheared the previous season, or that have been recaptured must be released.
- **Limitations on the amount of fibre per animal:** The use of partial shearing is recommended so as not to affect the animals' thermo-regulatory capacity.
- **Limitations on the shearing season:** A relatively short season is suggested. This would reduce the risk of miscarriages that would occur if shearing were carried out close to the birthing season. It would also reduce the risk involved in herding offspring less than one month old and avoid shearing in rainy seasons that can lead to respiratory illness and diarrhoea.
- **Animal transfers:** The recommendation is to not transfer individual animals to limit the risks of loss of genetic variability and transmission of diseases.
- **Use of adequate infrastructure** designed specifically to prevent injury to the animals.
- Shearing using **workers that are qualified and trained** in animal welfare protocols.
- **Pre- and post-shearing monitoring.**

**Source:** Animal Welfare Considerations according to the IUCN GECS Animal Welfare Protocol (2013) and Technical Standard NTP 231.351-2007.

## Poaching and illegal trade

A 2013 study carried out in Bolivia revealed that poaching continues, albeit at a very low level of around 1% of the total population of approximately 460,000 vicuñas in the Andean region. Between 2008 and 2013, 3,289 animals were poached in the departments of Oruro (representing 80% of all poaching), Potosí (15%) and La Paz (5%) (Huallata et al., 2013). The total population in Bolivia at that time was around 131,547.

The same study found that 158 black-market vendors were selling fibre and goods from hunted vicuñas in different shops and markets in the cities of La Paz and El Alto; totalling 198 kg of raw fibre, 167 kg of spun fibre, 346 kg of blankets, 10 kg of mantillas, 3.3 kg of scarves and 0.72 kg of ties. The authors concluded that around 2,900 vicuñas were killed to produce that volume of fibre.

In the study, the price of one kg of raw vicuña fibre ranged from \$194 to \$224, and hand-spun yarn ranged from \$239 to \$269, while blanket prices ranged from \$630 to \$1,195, depending on the quality and appearance of the products. Fibre originating from neighbouring countries was also sold. This is consistent with anecdotal reports from Peru and Argentina stating that vicuñas were hunted in those countries to be subsequently taken to Bolivia, which is the exit port for illegal fibre. Only 27% of products found in fairs and markets were in fleece form, the rest were all in the form of spun fibre or artisan goods. This shows there is a large domestic market for artisan products in Bolivia.



Sale of vicuña fleeces and garments at a market in El Alto, Bolivia (©Corsino Huallata)

Several factors account for the persistence of poaching (IUCN GECS, 2015):

- High price for fibre, both for artisanal products and for industrial processing.
- The large expanse and isolation of the vicuña's range makes it costly to patrol.
- Competition for land leads to low tolerance of the vicuña, since it affects pastures and crop yields. This is also blamed for the spread of skin diseases, such as mange, among domesticated camelids.
- Limited economic benefits for management communities and delays in the distribution of profits from fibre sales.
- Lack of economic benefits for communities that do not manage vicuña.
- Local inhabitants' defencelessness in the face of hunters.
- Existence of illegal trafficking networks associated with drug trafficking, with equipment, vehicles and economic resources.
- Lack of adequate fibre traceability mechanisms.
- Lenient penalties for hunting offences.<sup>6</sup>



Vicuña's habitat is vast and isolated, making protection difficult. © Shutterstock

---

<sup>6</sup> In Bolivia, the criminal code contains no specific provisions that penalize poaching.

## CHAPTER 5 VICUÑA GOVERNANCE ISSUES

Value-chain governance refers to the vertical relationships among actors along the value chain that coordinate the range of activities required to bring the product from inception to the end user. Governance is about power and the ability to exert control along the value chain and about the related aspect of how much of the marketing margin is captured. It relates to the organizations or institutions, regulations and their enforcers that set the parameters under which the value-chain actors must operate. It is about information exchange, learning, standards and credit provision (FAO 2013).

For the Andean vicuña value chain, governance thus refers to the relationships between buyers (Italian and Peruvian textile processors), sellers (communities), service providers (agents, veterinary services, banks, extension services, support programmes) and regulatory institutions (Ministries of Agriculture and CITES authorities) that influence the range of activities required to commercialize vicuña wool for either national markets or export destinations.

### Increasing value addition and competitiveness

De Ruijter de Wildt et al. 2006 (cited in Mitchell et al. 2006) use the term ‘upgrading’ to describe the process of, ‘acquiring technological, institutional and market capabilities that allow firms (or communities) to improve their competitiveness and move into higher-value activities.’ People in poor, rural areas often have very few financial or other resources to access value chains. It is therefore important for producers to undertake horizontal coordination (i.e. organizing oneself with a number of others to allow for the bulking-up of produce or inputs, or access to technical support) as an important precursor to more conventional forms of upgrading (Mitchell et al. 2006).

Table 11 applies their typology of upgrading strategies to the vicuña value chain. Further research is needed to understand to what extent there are options to “upgrade” given limited value addition possibilities in communities, their weak bargaining position and very limited access to finance and technology. Notwithstanding these challenges, there are initiatives that government and the private sector can undertake including, capacity building to improve vicuña management and business development and building cooperative structures.

Table 11 Options for communities’ vicuña upgrading strategies

Type of upgrading strategy	What it means	Implementation requirements
Process upgrading	Improving value chain efficiency	Capacity building and advice to herders (e.g. with regards animal welfare, management, and shearing technology)
Product upgrading	Improving product quality	Capacity building to improve shearing, de-hairing techniques as well as spinning and weaving (for adding value at local level)
Horizontal coordination	Development of relationships among actors along the value chain	Build initiatives between communities to aggregate supply and coordinate negotiation with buyers (e.g. strengthening the International Association of Vicuña Managing Communities)
Vertical coordination	Developing relationships among actors between nodes along the value chain	Negotiate improvement of financial and non-financial benefits from buyers (e.g. disseminating research, supply chain and technological developments)
Chain upgrading	Applying existing skills to a new value chain	Economic diversification
Upgrading of the enabling environment	Changes to the external governance of the value chain	Change to national policy to direct financial resources from regulation (e.g. a tax) to communities; Fostering community participation at the Vicuña Convention

**Source:** Developed by authors from Mitchell et al. (2006) typology

## Weak bargaining power of communities

Community representatives complain that they receive insufficient financial benefit from the vicuña trade despite the prices paid for final products and the aim of implementing poverty alleviation projects (Brewin, 2007; Lisung, 2008; SERNAP, 2009; Stollen et al., 2009, Proceedings of the 33rd Ordinary Meeting of the Vicuña Convention, 2017). This view was also expressed by representatives of vicuña management communities at Bolivia's Association for the Commercialization of Vicuña Fiber (ACOFIV) in 2012 and, community representatives at the 2<sup>nd</sup> International Meeting of Vicuña Managing Communities (Jujuy, 2018). Resolution N001/2017 of the Convention suggests signatory countries to promote the creation of producer associations in order to improve marketing conditions and bargaining power of the communities.

The weak bargaining power of communities in the value chain with respect to perceived low prices can be attributed to (Lichtenstein et al., 2002; Sahley et al., 2004; Brewin, 2007):

- Relatively few buyers and a large number of sellers in the vicuña market;
- Geographical isolation;
- Lack of sufficient means of communication (there is usually no or highly limited access to telephone or internet in many communities);
- Fluctuating volume and lack of a common sales strategy between communities and countries;
- Lack of market knowledge and transparency in sales agreements.

## Trade benefits for communities

The impact of vicuña management goes beyond economic benefits (Lichtenstein 2009). Over the years, local communities and their institutions for collective action have been strengthened (ACOFIV, 2012), and ancient traditions and local knowledge have been revitalized (Cox, 2003).

Vicuña management has enabled communities to strengthen their claims over land and natural resources, define community territories (Sahley et al., 2004), offer incentives against urban migration, and develop and foster participation in the management of natural resources. Communities have received financing and technical support from NGOs and, in some cases, international cooperation funds. Vicuña management has given communities more visibility within their national governments.

This visibility was so important that it led Bolivian communities to continue wild vicuña management for ten years, despite not being able to sell the fibre (Renaudeau d'Arc, 2005).

Table 12 shows the following analysis (strengths, weaknesses, opportunities, and threats):

Table 12 SWOT analysis of the vicuña value chain

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>• Strong international demand</li> <li>• High retail prices</li> <li>• High quality</li> <li>• Resilient species</li> <li>• Already established vicuña market</li> <li>• Increasing vicuña populations</li> </ul>	<ul style="list-style-type: none"> <li>• Weak bargaining position of communities</li> <li>• Very limited value addition by communities</li> <li>• Perceived low prices paid by buyers to communities</li> <li>• Intermittent supply of fibre</li> <li>• High transport costs due to remoteness of communities</li> <li>• Few buyers with experience and financing to enter to market as competition for established buyers</li> <li>• Domestic and international regulation imposes cost burden on industry</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>• Expand production in line with ecological limits</li> <li>• Explore sustainability certifications (Fair Trade, organic, etc.)</li> <li>• Adaptation strategy to climate change</li> <li>• Revitalize local craft tradition with fibre</li> <li>• Potential to use high market value to fund conservation efforts</li> <li>• Strengthening traceability and increasing the efficiency of supply chains</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of transparency in market</li> <li>• Climate change reducing quality of pasture</li> <li>• Poaching of animals</li> <li>• Volatility of international prices</li> <li>• Application of productive practices used in domesticated livestock on a wild species in order to improve fibre yield</li> </ul>

**Source:** Compiled by the authors based on the findings of the study.

## CHAPTER 6 CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations are made to policy makers at the international and national levels, as well as the industry itself and community organizations. The aim of these recommendations is to build on this success conservation policy, to find ways to increase the share of value addition captured by communities, increase competition between buyers, improve the working conditions of women and improve traceability and transparency in the value chain.

### Conservation policy success

The recovery of the vicuña from near extinction in the 1970s to the thriving levels of population today is a conservation success story. By assigning usufructuary rights to communities to shear and sell fibre from the vicuña, communities came to regard the vicuña as an asset not a liability. As a result, local people had the incentive to conserve rather than kill the species. Without this space for a legal trade that provides an income stream to communities from managing vicuña, it is likely that the vicuña would have continued to be hunted illegally and unsustainably to the detriment of the conservation of the species.

Poaching levels have recently increased in response to high prices, relatively weak controls and light penalties in place. However, the numbers are very low in proportion to the total population indicating that the legal commercialization of vicuña is resilient to external shocks and has successfully “crowded out” i.e. outcompeted the illegal trade.

Vicuña conservation based on commercialization of its fibre has however brought along new risks such as, diminishing genetic variability from enclosed populations, the existence of practices that do not follow animal welfare standards and that might cause mortality, using veterinary care for a wild species to breed paco-vicuñas and hybridization initiatives that might threaten the conservation of the species.

Recommendations:

- Further research and initiatives are desirable to understand the following:
  - how assigning communities the usufructuary rights to a species contributes to the successful conservation of that species.
  - how to achieve the right balance between increasing productivity while maintaining conservation of the wild species under rigorous animal welfare standards, all while respecting the rights of Andean communities and the agreements under the Vicuña Convention.
- Facilitate the creation of networks of NGOs, universities, research centres, and donors to encourage research on vicuña, pasture management and habitat conservation.
- Involve national and local actors that are capable and willing to devise, operationalize and implement pro-poor policies. Local communities need a voice in national fora and international conventions such as the Vicuña Convention.

### Small share of value addition for local communities

At present, the trade in vicuña fibre generates cash income for some of the most isolated and poorest communities in Latin America. Many are women who are responsible for vicuña management, and the basic processing of the fibre.

While vicuña fibre provides a source of income diversification in economically-deprived areas, there is the desire within communities and the Vicuña Convention to find ways to increase prices paid for the fibre, and to add value at the local level (proceedings of the 33rd Ordinary Meeting of the Vicuña Convention).

For the moment, value addition in communities is limited mainly to basic cleaning of the vicuña fibre. The largest proportion of value addition takes place at the machine processing, design and retail phases. Given

the very high level of sophistication of the machine processing and design sectors, there are major challenges to transfer that phase to source countries. Nevertheless, it is necessary to explore what opportunities exist for communities to add further value.

Recommendations:

- Formulate policies and ethical fashion initiatives that support an enabling environment for industry to capture more value through cleaning, de-hairing and producing yarns locally.
- Explore a joint commercial strategy among Andean countries to improve prices paid for the fibre.
- Find ways to improve information exchange (e.g. prices, potential buyers) between countries and among producers.

## Lack of competition among buyers

The vicuña market has the characteristics of an oligopsony in which there are few buyers purchasing from many thousands of sellers. Based on stakeholder interviews, it is evident that Loro Piana is the principle buyer, processor, manufacturer and garment designer of vicuña fibre. Given the oligopsonist nature of the current market structure, this suggests prices paid to producers may be lower than would be the case in a more competitive market structure. It is beyond the scope of this study to measure to what extent Loro Piana is a price setter or a price taker.

Barriers are high for new companies to enter the market as competitors of Loro Piana, given the high asset specificity of owning machine processing facilities, the relatively small size of vicuña production, and Loro Piana's strong design, branding and retail position.

Communities are in a weak negotiation position on price due, in part, to the lack of competition among buyers. Other contributing factors include the remote location of the communities, the lack of public information about fibre auctions, and difficulty for small-sized buyers to finance purchases particularly when delivery can be unreliable.

Sellers are also averse to taking the risk of entering new buying relationship particularly if they have transacted successfully with a buyer for many years. Sellers also lack information about prices paid in different regions reducing their negotiating power with buyers.

Recommendations:

- Strengthen producer associations in their organizational, management and business development capacities.
- Explore strategies to make the business environment more conducive to greater competition between buyers, thus pushing up prices paid to producers.

## Improving women's working conditions

This study has highlighted that while women benefit economically from the vicuña trade, unsafe or unhealthy working conditions during de-hairing provide insufficient protection. Any expansion of the trade should take this gender-specific impact into account.

Recommendation:

- Policymakers and major buyers should take all possible steps to improve the working conditions of women in processing facilities where the fibres are subject to primary cleaning. Given the rich textile tradition in Andean countries, local spinning and weaving should be encouraged (taking into account traceability).

## Traceability and transparency

There are differing levels of regulation and supervision of the domestic supply chain across the five vicuña-producing Andean countries. There is a trade-off between keeping supply chain costs low for communities, processors and traders, and ensuring conservation and animal welfare objectives are met.

The level of transparency in the supply chain is low given there is little publically available information about prices paid by European and national buyers for fibre. This restricts informed discussion about finding ways to improve the negotiating position of communities selling vicuña wool.

Recommendation:

- Further research is needed to improve the efficiency of the supply chain and to understand the optimal level of reporting, inspection and permitting requirements so that the balance between effective regulation and costs to producers and processors is achieved.
- The following actions should be considered by national authorities:
  - Improve the level of inspection supervising the traceability of the fibre along the commodity chain (from captures to processing plants). Provide training for customs authorities to distinguish vicuña from other camelid fibres;
  - Improve the availability of information for customs and CITES authorities on processing yields;
  - Increase the levels of inspections at ports to prevent smuggling;
  - Increase the level of transparency of prices paid by European and national buyers to improve the negotiating position of communities in the sale of vicuña fibre.

Implementing the full range of these recommendations will contribute to improvement in conservation outcome in the vicuña trade whilst improving the economic conditions of rural livelihoods for future generations.

## APPENDICES

### Appendix I      **Text of the Convention For The Conservation And Management Of The Vicuña**

The Governments of the Republics of Bolivia, Chile, Ecuador and Peru, with the objective of continuing to promote the conservation and management of the vicuna, and taking into account the experience acquired through the implementation of the Convention for the Conservation of the Vicuna, signed at La Paz on August 16th, 1969, have decided that it is necessary to draft a new Convention for the Conservation and Management of the Vicuna, in the following terms:

#### *Article 1*

The Signatory Governments agree that conservation of the vicuna provides an economic production alternative for the benefit of the Andean population and commit themselves to its gradual use under strict State control, applying such technical methods for the management of wildlife as the competent official authorities may determine.

#### *Article 2*

The Signatory Governments prohibit the hunting and illegal trade of the vicuna, its products and derivatives within the territory of their respective countries.

#### *Article 3*

The Signatory Governments prohibit internal and external trade of the vicuna, its products in their natural state and those manufactured therefrom up to December 31st, 1989. In case any of the Parties hereto reaches a vicuna population level, which in terms of management would allow the production of meat, viscera and bones, as well as the processing of skins and wool into cloth, it may proceed to their trade under strict State control. Trade in processed skins and in cloth may be carried out using marks and wefts which are internationally recognizable, registered and/or patented, after coordination with the Parties through the Technical-Administrative Commission of the present Convention and in coordination with the Convention on International Trade in Endangered Species of Wild Fauna and Flora (Washington, 1973).

#### *Article 4*

The Signatory Governments prohibit the export of fertile vicunas, semen or other reproductive material, with the exception of those destined to one of the member countries for the purpose of research and/or repopulation.

#### *Article 5*

The Signatory Governments undertake to maintain and develop national parks and reserves and other protected areas containing vicuna populations, and to extend the areas of repopulation managed as wildland areas, as a matter of priority and always under State control.

#### *Article 6*

The Signatory Governments agree to continue comprehensive research on the vicuna, including bioecological, socio-economic and other aspects. Likewise, they commit themselves to an active interchange of information through the Multinational Center for Documentation with headquarters in the Republic of Bolivia.

#### *Article 7*

The Signatory Governments agree to provide to each other technical assistance for management and repopulation of the vicuna, including the training of personnel, as well as dissemination and extension activities aimed at the conservation and management of the species.

#### *Article 8*

In order to evaluate the implementation of the Convention, to keep the Parties informed and to recommend solutions for problems resulting from its application, the Signatory Governments agree to create the Technical-Administrative Commission of this Convention composed of representatives of each of the countries. The Commission shall meet annually and its Statutes shall be approved at its first meeting.

*Article 9*

With a view to facilitating the application and interpretation of the present Convention, the Parties agree to define the following terms:

Conservation: Action aimed at management and use of the vicuna.

Management: The application of methods to increase the vicuna population until the grazing capacity of a specific region, zone or area has been reached, and thereafter to maintain a balance between those two factors, employing technically accepted methods, such as the translocation and/or culling of vicunas.

Use: The utilization of vicuna wool through shearing or from slaughtered animals, as well as the meat, skin, viscera and other derivatives. This term also comprises the indirect utilization of the vicuna for tourism, scientific and cultural purposes.

Culling: Slaughter of vicunas through appropriate methods, including the slaughter with firearms of sick animals, older specimens, unpaired males and, in justifiable cases, of family groups.

Poaching: The elimination, slaughtering or capture of vicunas without control or authorization from the competent State authority.

Illegal trade: Any form of transaction relating to vicuna and/or its products (sale, barter, import, export, transport, etc.) without control or authorization from the competent State authority.

Skin: Hide of the vicuna and its wool.

Hide: Skin of the vicuna without its wool.

*Article 10*

The present Convention shall enter into force provisionally on the date of its signature and finally from the moment when the third instrument of ratification is deposited with the Ministry of Foreign Affairs of Peru, Depositary of the Convention, which shall communicate it to the other Parties.

For the other Signatory Governments the provisional application of this Convention shall continue until such time as they deposit their respective ratification instruments.

*Article 11*

Any Contracting Party that wishes to withdraw from this Convention, shall communicate its intention to the other Parties through a Diplomatic Note addressed to the Depositary. Withdrawal shall be effective one year from the date on which the Depositary notifies the withdrawing Government that it has communicated its decision to the other Parties.

*Article 12*

This Convention shall remain open only for signature by the Republic of Argentina, being a Party to the Convention for the Conservation of the Vicuna, signed at La Paz in 1969.

*Article 13*

Due to its specific nature, the present Convention shall not be open for accession by other countries. In witness whereof the Plenipotentiaries duly accredited, have signed the present Convention. Done in Spanish, in the city of Lima on this 20th day of December 1979.

Source: <http://sedac.ciesin.org/entri/texts/vicuna.1979.html>, accessed 20 February, 2018  
In Spanish: <https://iea.uoregon.edu/treaty-text/1979-vicunasptxt>

## Appendix II Exports in vicuña fibre

Table A1 Exports of Vicugna vicugna hair 2007-2016 by importing country, in kg

Importer	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Grand Total
<b>Italy</b>	3,577	3,052	3,215	6,944	3,844	5,127	4,129	6,696	7,309	6,658	50,551
<b>Argentina</b>	170	670	627	488	1,192	2,420	435	690	359	7,050	14,101
<b>Other</b>	530	202	86	151	579	233	150	25	128	265	2,350
<b>Total per year</b>	4,107	3,424	3,970	7,722	4,911	6,552	6,700	7,156	8,127	7,282	59,952

Note: As reported by exporters in their annual reports to CITES.  
Source: UNEP WCMC; CITES database

Table A2 Main direct exporters of Vicugna vicugna hair and fibre by weight, 2007-2016, in kg

Exporter	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Grand Total
Argentina	205.37	127.34	38.18	394.58	149.93	777.13	293.28		51.4	1201.08	3238.3
Bolivia	980.16	78.18	357.73	1869.02	1556.35	27.2	1995.78	2084.99			8949.40
Chile		96	176.65								272.65
Peru	2921.17	3122.49	3397.45	5490.20	3205.11	5756.65	4410.81	5071.50	8076.03	6083.13	47532.31
<b>Grand Total</b>	4106.70	3424.00	3970.01	7753.80	4911.39	6551.98	6699.87	7156.48	8127.4	7281.99	59589.07

Note: As reported by exporters in their annual reports to CITES. Annual reports have not been received for Argentina (2014).  
Source: UNEP WCMC; CITES database

Table A3 Exports of vicuña fibre by type of processing, 2008-2012

Vicuña fibre by level of processing	2009		2009		2010		2011		2012	
	kg	%	kg	%	kg	%	kg	%	Kg	%
<b>Pre-dehaired fibre</b>	1,984	63.6	3,025	91.4	4,065	74.2	2,116	66.1	4514	78.2
<b>Washed fibre</b>	332	10.6	81	2.4	315	5.7	100	3.1	50	0.9
<b>Dehaired fibre</b>	200	6.4	5	0.2	395	7.2	0	0	23	0.4
<b>Dirty fibre</b>	604	19.4	199	6.0	706	12.9	988	30.8	1186	20.5
<b>Total</b>	3,120	100	3,310	100	5,481	100.0	3,204	100.0	5,773	100

Source: DGFFS, 2012; and MINAGRI 2013.

## Appendix III Resolution No 355/2013 Vicuna Convention

### RESOLUCIÓN No. 355/2013

#### CONSIDERANDO

Que en virtud a lo expuesto en el informe país de la República Argentina a esta XXX Reunión Ordinaria de la Comisión Técnico-Administradora del Convenio de la Vicuña, en sentido de que empresas privadas realizan el aprovechamiento legal de fibra de vicuña en ese país.

Que numerosas fuentes de información pública dan cuenta del origen extra andino de algunas de estas empresas privadas.

Esta información corrobora la profunda preocupación expresada por los delegados comunales de Perú y Argentina en la 1ra reunión de la Directiva de la Organización Internacional de Comunidades Manejadoras de la Vicuña, en sentido de que el aprovechamiento de la fibra de vicuña por la empresa privada cambia el espíritu del Artículo 1 del Convenio de la Vicuña el cual reza "Los Gobiernos signatarios convienen en que la conservación de la vicuña constituye una alternativa de producción económica en beneficio del poblador andino y se comprometen a su aprovechamiento gradual bajo estricto control del Estado, aplicando las técnicas bajo el manejo de la fauna silvestre que determinan sus organismos oficiales componentes".

Que durante los últimos 45 años, la recuperación de la vicuña ha sido en parte esfuerzo de las comunidades en cuyas tierras la vicuña tiene su hábitat y han asumido de manera comprometida su conservación.

Que el aprovechamiento de la fibra por parte de las comunidades supone un complejo e intenso esfuerzo que incorpora la materia prima en la cadena de valor de la fibra de vicuña, sin embargo apenas le reporta una pequeña parte de los beneficios económicos que genera la misma.

Una eventual competencia en el aprovechamiento de la fibra de vicuña por parte de empresas privadas extra andinas podría poner en riesgo la base social en la cual se sustenta la conservación de la vicuña.

#### LA COMISIÓN

#### RESUELVE

1. Solicitar a los países signatarios del Convenio que se pronuncien tan pronto como sea posible sobre casos de autorizaciones de aprovechamiento de la fibra de vicuña otorgadas a empresas o personas particulares extra andinas, y si corresponde amplíen la información sobre estas autorizaciones.
2. Pedir a la Comisión Técnico-Administradora del Convenio de la Vicuña explicar los criterios técnicos, sociales y legales para la definición de los beneficiarios del aprovechamiento de la vicuña.

## REFERENCES

- ACOFIV-B. (2012). La Paz, Bolivia: Memoria del Primer Encuentro Internacional de las Comunidades Campesinas e Indígenas de Manejadores de Vicuña de Bolivia, Perú, Chile, Argentina y Ecuador.
- Anderson, E. P., Marengo, J., Villalba, R., Halloy, S., Young, B., Cordero, D., Gast, F., Jaimes, E., and Ruiz, D. 2011. Climate Change and Biodiversity in the Tropical Andes – Chapter 1: Consequences of Climate Change for Ecosystems and Ecosystem Services in the Tropical Andes. Inter-American Institute for Global Change Research.
- Arzamendia, Y., Maidana, R., Vilá, B., & Bonacic, C. (2008). Wild vicuñas management in Cieneguillas, Jujuy. In E. Frank, M. Antonini, & O. Toro (Eds.), *South American Camelids Research* (Vol. 2, pp. 139–146). The Netherlands: Wageningen Academic Publishers.
- Báez, S., Jaramillo, L., Cuesta, F., & Donoso, D. A. (2016). Effects of Climate Change on Andean Biodiversity: A Synthesis of Studies Published until 2015. *Neotropical Biodiversity*, 2(1), 181–194. <https://doi.org/10.1080/23766808.2016.1248710>
- BoF (2017). Inside the business of vicuña, the wool worth more than gold. <https://www.businessoffashion.com/articles/intelligence/inside-the-business-of-vicuna-the-wool-worth-more-than-gold>
- Bonacic, C., Feber, R. E., & Macdonald, D. W. (2006). Capture of the vicuña (*Vicugna vicugna*) for sustainable use: Animal welfare implications. *Biological Conservation*, 129(4), 543–550. <https://doi.org/10.1016/j.biocon.2005.11.021>
- Brack, A. 1980. Situación actual de la población de vicuñas en Pampa Galeras y zonas aledañas y recomendaciones para su manejo. In: Unpublished manuscript. Proyecto Especial de Utilización Racional de la Vicuña., p. 15pp, Ministerio de Agricultura y Alimentación, Peru.
- Brewin, L. 2007. *The vicuña industry in Peru: Has the vicuña lived up to its reputation as the gold of the Andes?* MSc Globalisation and Latin American Development, Institute for the Study of the Americas.
- Cox, A. 2003. *Politics of conservation and consumption: The vicuña trade in Peru*. Retrieved from University of Florida: [http://etd.fcla.edu/UF/UFE0001367/cox\\_a.pdf](http://etd.fcla.edu/UF/UFE0001367/cox_a.pdf)
- Dyson, J. (2015). *Report on vicuña market*. Jonathon Dyson.
- MDRAYA. 2008. Informe de la Republica de Bolivia a la XXVII Reunión Ordinaria del Convenio de la Vicuña.
- FAO 2013b Botswana Agrifood Value Chain Project Beef Value Chain Study, published with the Government of Botswana.
- FIA. 2008. Resultados y lecciones en producción y comercialización de fibra de vicuña. Proyectos de innovación en región de Arica y Parinacota y Región de Tarapaca.
- GECS. 2012. Criterios de bienestar animal para el manejo de vicuñas, *Vicugna vicugna*. Comisión Bienestar Animal Grupo de Especialistas en Camélidos Sudamericanos, UICN CSE. [http://www.camelidosgecs.com.ar/pdf/ba\\_vicunias\\_2012.pdf](http://www.camelidosgecs.com.ar/pdf/ba_vicunias_2012.pdf). Accessed in October 2013.
- Haylock, M. R., Peterson, T. C., Alves, L. M., Ambrizzi, T., Anunciao, Y. M. T., Baez, J., . . . Vincent, L. A. (2006). Trends in Total and Extreme South American Rainfall in 1960-2000 and Links with Sea Surface Temperature. *Journal of Climate*, 19(8), 1490–1512. <https://doi.org/10.1175/JCLI3695.1>
- Huallata Ibarra, C., Velasco Coronel, A., and Manani Plata, B. 2013. Diagnostico de la cacería furtiva y tráfico ilegal de derivados de la vicuña. Proyecto de valorización de la economía campesina de camelidos. VALE: IUCN (2015). Poaching of vicuña and the illegal commercialization of fiber: a persisting problem, IUCN-SSC-GECS
- Kasterine, A., Arbeid, R., Caillabet, O., & Natusch, D. (2012). *The trade in South-East Asian python skins*. International Trade Centre. Geneva: ITC.

Kuffner, H. (2017). Personal communication, 19<sup>th</sup> May 2017

Laker, J. and Gordon, I. 2006. Desafíos para el uso sostenible de la vicuña y el rol del Proyecto Manejo de Camélidos Sudamericanos Silvestres (MACS). B. M. Vilá (ed.), *Investigación, conservación y manejo de vicuñas*, pp. 9-15. Buenos Aires, Proyecto MACS.

Lichtenstein, G., Oribe, F., Grieg-Gran, M., and Mazzucchelli, S. 2002. Manejo comunitario de vicuñas en Perú. Estudio de caso del manejo comunitario de vida silvestre. *Poverty, Inequality and Environmental Series No. 2*, International Institute for Environment and Development, Earthscan, London.

Lichtenstein, G. (2009). Vicuña conservation and poverty alleviation? Andean communities and international fibre markets. *The International Journal of the Commons*, 4(1), 100–121. <https://doi.org/10.18352/ijc.139>

Lichtenstein, G., & Renaudeau d'Arc, N. (2008). Retórica y praxis de la participación local en los proyectos de manejo de vicuñas. *Cuadernos XXI del Instituto de Antropología y Pensamiento Latinoamericano.*, 21, 133–141.

Liebmann, B., Camargo, S. J., Seth, A., Marengo, J. A., Carvalho, L. M. V., Allured, D., . . . Vera, C. S. (2007). Onset and End of the Rainy Season in South America in Observations and the ECHAM 4.5 Atmospheric General Circulation Model. *Journal of Climate*, 20(10), 2037–2050. <https://doi.org/10.1175/JCLI4122.1>

Lisung, L. L. (2008). *Peasant communities, the first link of the commodity chain of vicuña fiber*. Iowa State University.

Lozado, Gustavo (2017). Personal communication, 13<sup>th</sup> July 2017.

Marengo, J. A., Pabón, J. D., Díaz, A., Rosas, G., Ávalos, G., Montealegre, E., Villacis, M., Solman, S., and Rojas, M. 2011. Climate Change and Biodiversity in the Tropical Andes – Chapter 7: Climate Change: Evidence and Future Scenarios for the Andean Region. Inter-American Institute for Global Change Research.

Marino, Patricia (2017). Personal communication, 12<sup>th</sup> June 2017

McAllister, R. R., McNeill, D., & Gordon, I. J. (2009). Legalizing markets and the consequences for poaching of wildlife species: The vicuña as a case study. *Journal of Environmental Management*, 90(1), 120–130. <https://doi.org/10.1016/j.jenvman.2007.08.014>

MINAGRI. 2012. Informe Perú para la XXIX Reunión Ordinaria del Convenio para la Conservación y Manejo de la Vicuña.

MINAGRI. 2013. Informe Perú para la XXX Reunión Ordinaria del Convenio para la Conservación y Manejo de la Vicuña.

McNeill, D., Lichtenstein, G., & Renaudeau d'Arc, N. (2009). International policies and national legislation concerning vicuña conservation and exploitation. In I. Gordon (Ed.), *The vicuña: The theory and practice of community based wildlife management* (pp. 63–80). New York: Springer. [https://doi.org/10.1007/978-0-387-09476-2\\_6](https://doi.org/10.1007/978-0-387-09476-2_6)

Mitchell, J., Keane, J., & Coles, C. (2009). *Trading up: how a value chain approach can benefit the rural poor*. London: Overseas Development Institute.

Mueller, J.P., Cancino, K., Rigalt, F., and Lamas, H. 2010. Calidad de las fibras de camélidos sudamericanos en Argentina. In: E. C. Quispe and V. G. Sánchez (Eds.) *International Symposium on Fibers from South American Camelids*. Available online.

OECD. (2012). *Illegal Trade in Environmentally Sensitive Goods, Trade Policy Studies*. Paris: OECD.

Perez, C., Nicklin, C., Dangles, O., Vanek, S., Sherwood, S., Halloy, S., Forbes, G. (2010). Climate Change in the High Andes: Implications and Adaptation Strategies for Small-Scale Farmers. *International Journal of Environmental, Cultural, Economic and Social Sustainability*, 6(5), 71–88. <https://doi.org/10.18848/1832-2077/CGP/v06i05/54835>

- Rabatel, A., Francou, B., Soruco, A., Gomez, J., Caceres, B., Ceballos, J. L., Wagnon, P. (2013). Current State of Glaciers in the Tropical Andes: A Multi-Century Perspective on Glacier Evolution and Climate Change. *The Cryosphere*, 7(1), 81–102. <https://doi.org/10.5194/tc-7-81-2013>
- Rainsford, Francis (2017). Personal communication, 22<sup>nd</sup> June 2017.
- Renaudeau d'Arc, N. 2005. Community-based conservation and vicuña management in the Bolivian Highlands. Doctorate thesis presented to the University of East Anglia, United Kingdom.
- Sahley, C., Torres, J., & Sanchez, J. (2004). Neoliberalism meets pre-Columbian tradition: Campesino communities and vicuña management in Andean Peru. *Culture & Agriculture*, 26(1&2), 9–17.
- SERNAP 2010 Conservación y aprovechamiento de la vicuña en áreas protegidas Experiencias de la Cooperación Alemana
- Seth, A., Rauscher, S. A., Camargo, S. J., Qian, J. H., & Pal, J. S. (2007). RegCM3 Regional Climatologies for South America Using Reanalysis and ECHAM Global Model Driving Fields. *Climate Dynamics*, 28(5), 461–480. <https://doi.org/10.1007/s00382-006-0191-z>
- Sinovas, P., Price, B., King, E., Hinsley, A., & Pavitt, A. (2017). *Wildlife trade in the Amazon countries: an analysis of trade in CITES listed species. Technical report prepared for the Amazon Regional Program (BMZ/DGIS/GIZ)*. Cambridge, UK: UN Environment - World Conservation Monitoring Centre.
- Stollen, K. A., Renaudeau d'Arc, N., & Lichtenstein, G. (2009). Local participation in vicuña management. In I. Gordon (Ed.), *The vicuña: the theory and practice of community based wildlife management* (pp. 81–96). New York: Springer.
- TRAFFIC, 2009. Definición de acciones prioritarias en el Perú para mejorar el manejo y conservación de la vicuña. Draft manuscript.
- Urrutia, R., & Vuille, M. (2009). Climate Change Projections for the Tropical Andes Using a Regional Climate Model: Temperature and Precipitation Simulations for the End of the 21<sup>st</sup> Century. *Journal of Geophysical Research*, ●●, 114.
- Vergara, W., Kondo, H., Pérez, E., Méndez, J. M., Magaña, V., Martínez, M. C., Ruíz, J. F., Avalos, G. J., and Palacios, E. 2007. Visualizing Future Climate in Latin America: Results from the Application of the Earth Simulator. Latin America and Caribbean Region Sustainable Development Working Paper 30. World Bank.
- Vilá, B. (2002). La silvestria de las vicuñas, una característica esencial para su conservación y manejo. *Ecología Austral*, 12(1).
- Vuille, M., & Bradley, R. S. (2000). Mean annual temperature trends and their vertical structure in the tropical Andes. *Geophysical Research Letters*, 27(23), 3885–3888. <https://doi.org/10.1029/2000GL011871>
- Vuille, M., Francou, B., Wagnon, P., Juen, I., Kaser, G., Mark, B. G., & Bradley, R. S. (2008). Climate Change and Tropical Andean Glaciers: Past, Present and Future. *Earth-Science Reviews*, 89(3-4), 79–96. <https://doi.org/10.1016/j.earscirev.2008.04.002>
- Wheeler, J. C., & Hoces, D. (1997). Community participation, sustainable use, and vicuña conservation in Peru. *Mountain Research and Development*, 17(3), 283–287. <https://doi.org/10.2307/3673855>







**Street address**  
International Trade Centre  
54-56 Rue de Montbrillant  
1202 Geneva, Switzerland

P: +41 22 730 0111  
F: +41 22 733 4439  
E: [itcereg@intracen.org](mailto:itcereg@intracen.org)  
[www.intracen.org](http://www.intracen.org)

**Postal address**  
International Trade Centre  
Palais des Nations  
1211 Geneva 10, Switzerland

The International Trade Centre (ITC) is the joint agency of the World Trade Organization and the United Nations.