# Is the Alpaca and Vicuña Industrial Process Sustainable?

*By Mike Safley*

## Sustainable is a word that means something different to almost everyone.

This word creates the opportunity for something to be simultaneously called sustainable or unsustainable. In the fashion and textile world, "sustainability" is a term often used to conflate the issues of global warming, climate change and environmental impact.

The modern use of the of the term sustainable has become "green wash." This allows clothing brands and textile manufacturers to claim that fast fashion sold cheap and made of petroleum products or recycled material is somehow "sustainable."



*Photo by @loudscape.nef*

*Picotani Vicuña Chaccu, 2019. The rarest, finest natural commercial fiber on earth. Photo by @loudscape.nef*

Brands know that the consumer values the word sustainable but the industry values low prices and high profit margins, as noted in the January 2022 issue of *Vogue*:

> *"Last year a lot of planning was done around fashion sustainability—but less action. The biggest theme as we head into 2022 is the interconnection between carbon emissions, equity, and supply chain.*
>
> *Other existing industry tactics have fallen short, sometimes to the point of impeding progress. Lower-impact materials that improve but don't transform supply chains, better cotton and recycled polyester, are key examples. Muhannad Malas [senior climate campaigner for advocacy group Stand.earth] sees a contradiction in how brands use, and talk about, recycled polyester in particular, which is fashion's most popular "sustainable" material, but is made from plastic, releases microfibers into the environment and perpetuates a dependence on fossil fuels.*
>
> *The proliferation of low-cost fossil fuels is largely responsible for how fashion came to operate the way it does today, says Malas. "Rethinking fashion without fossil fuels is going to help catalyze this conversation about how we deal with overproduction."* [1]

**The alpaca and vicuña industrial cycles** are demonstrably sustainable and should be a model for the textile industry, especially when compared to textile products such as cotton, oil based synthetic materials, and alternate natural fibers. Before we analyze and compare the alpaca industrial process to alternate textile fibers, it is important to note that alpacas and vicuñas produce the smallest amounts of natural fiber in the world. Together they produce about 7,000 tons of fiber annually, while cashmere goats produce 20,000 tons per year and sheep produce 2,000,000 tons per year. All these weights are for greasy, or unwashed, fleeces.

**Alpaca and vicuña fiber combined is .0035% of the total worldwide production of natural animal fiber. Of that amount, 15% is hand knitting yarn for the creation of handmade clothing, which requires no further industrial transformation.**

Fewer chemicals and less energy are required in the **alpaca industrial process** to scour or wash their fiber versus **sheep** and **cashmere goats.** Cashmere goat fleece contains an average of 6.1% grease, and sheep has 18.5%. Alpaca fleece contains an average of only 3.5% grease, thus requiring fewer chemicals in the cleaning process.[2]

1 Rachel Cernansky, "Sustainability: Where fashion is heading in 2022." *Vogue.* 5 January 2022.

2 *Why Alpaca?* Grupo Inca, Arequipa, Peru.

*Alonso Burgos and Peter Kothe in Arequipa, Peru, 1991, inspecting alpaca Tops. Tops is the last stage of the production process before the fiber is spun into yarn. Photo by Mike Safley*

All chemicals used to process **alpaca** fiber are certified environmentally friendly and specified by the appropriate certifying bodies. The dye complies with REACH norms that protect human health and the environment from risks posed by chemicals for the European Union and are OEKOTEX certified, which ensures textile products have been manufactured in sustainable processes. The alpaca textile factories in Arequipa, the center of alpaca industrialization, are run by hydropower, a zero emissions renewable energy source. (Personal observation and correspondence with Juan Pepper, the commercial manager for the largest alpaca manufacturer in the world.) It's important to note that the Arequipa region's alpaca fiber exports account for 95% of alpaca fiber sales.[3]

*More than 8,000 square meters of spinning frames producing white yarn in Arequipa. These frames must be shut down and cleaned when a different color of yarn is spun. Photo by Mike Safley*

The companies that process and manufacture clothing made from **alpaca and vicuña** are required by Peruvian law to comply with the following:

1) **The alpaca textile industry pays much higher salaries than minimum wage to factory workers and insures a safe workplace.**
2) **Fund government managed free healthcare for 100% of all Peruvian factory workers.**
3) **Fund a private sector managed retirement account for each employee.**

# Sustainability

To clearly answer the question of environmental sustainability, we must **compare alpacas and vicuñas to the major alternate textile fibers: cashmere, cotton, and polyester.**

70% of the grasslands on the Steppes of China and Mongolia are overgrazed. **The indigenous people of Peru manage an age-old system of seasonal grazing that conserves a vast grassland as if it were a garden. This model of "holistic grazing" used by Peru's alpaca shepherds is known as "regenerative agriculture" which includes seasonal pasture rotations.**

## Consider cashmere's environmental sustainability, or lack thereof, with headlines like these:

**"From H&M to Gucci, Fashion Rethinks Cashmere, Citing Environmental Harm."**

*Wall Street Journal, May 15, 2019*

**"The Hidden Cost of Cashmere":**
"More grazing goats' compounds pressures on iconic and endangered wildlife. Multinational governments working to save snow leopards, saiga, ibex, wild yak, gazelles, wild camels, and Argali..."

*Forbes Magazine, February 16, 2017*

**"Possible Links Between Sandstorms and Cashmere Industry Raised":**
"Images of Beijing shrouded in an eerie yellow haze as sandstorms hit northern China with a vengeance this week…,"

"Now, questions are being asked by reports in China's local media about the role of the cashmere industry and the overgrazing it has caused...,"

"This degradation is now seen as a leading culprit in an increase in the number and severity of sandstorms likely to continue to be seen in Mongolia, China, Japan, and South Korea..."

*Business of Fashion Magazine, March 17, 2021*

3 "Peru is the world's leading producer of alpaca fiber" 06/11/2019. peru.info/en-us/foreign-trade/news/7/32/peru-is-the-world-s-leading-producer-of-alpaca-fiber

Peru, however, has impressive statistics when it comes to the environment. It is one of the world's top ten mega-diverse countries with 10% of the world's total plant species growing there. Its territory is about twice the size of the US state of Texas and has the second largest share of the Amazon Rainforest after Brazil.

The wildlife of the Andes is a collection of unique and awe-inspiring animals that have been protected by the indigenous Quechua people. They include over 500 species of mammals (109 of which are endangered or threatened), 1,800 bird and 600 reptile species (75% of which are endemic), and many represent larger populations of species that are at risk or endangered in other ecosystems.[4]

**Next, consider the environmental "sustainability" of cotton**, another prolific (plant-based) natural fiber. Despite the industry's claims of sustainability, multiple organic certifications, etc., the brands making these claims don't point out that it takes 5,263 gallons (or 20,000 liters) of water to produce two pounds of cotton.

The use of toxic chemicals by the garment industry is another great concern to both consumers and environmentalists. Cotton accounts for almost a 20% of the global usage of pesticides plus watershed degradation from fertilizer and the use of dye that makes some rivers run red.[5]

The brands that use large amounts of cotton like to feature "organic cotton" on their labels. There are 249,153 tons of organic cotton grown each year out of the total 24,750,000 tons produced. Organic cotton mitigates some of the environmental impact on the environment, but to say it is sustainable is a stretch of the imagination.

Kenneth P. Pucker of the *The Harvard Business Review* says, "Most company reporting in the context of sustainability is not a proxy for progress but often just, 'fanciful green wishing'." He concludes by saying, "During this same 20-year period of increased reporting and sustainable investing, carbon emissions have continued to rise, and environmental damage has accelerated...." [6]

Alpacas and vicuñas are grass fed on lands that are neither irrigated nor fertilized, and each of them drinks only 380 quarts of water a year. Additionally, they protect millions of acres of grassland that sequester $CO_2$, the main cause of global warming. In other words, alpacas and vicuñas are green machines!

*This alpaca is part of a 50 head herd. The grass you see is the typical Ichu grass. The key to not overgrazing is the traditional seasonal pasture rotation management by the Quechua shepherds.*

4 "Wildlife of Peru." https://en.wikipedia.org/wiki/Wildlife_of_Peru
5 Sofi Thanhauser, *Worn: A People's History of Clothing* (New York: Pantheon, 2022), 217.
6 Kenneth P. Pucker, "Overselling Sustainability Reporting." *Harvard Business Review.* May-June 2021 https://hbr.org/2021/05/overselling-sustainability-reporting.

*This 100% pure vicuña shawl measures 29" x 83" and weighs 2.4 ounces. These shawls typically start at $2,000, which makes the finished shawl worth $833 per ounce or $120 per square foot. Photo by Brad Bourgeois.*

**Polyester pollutes the environment in many ways. We should ask, is there space in a sustainable global climate for synthetic fabrics?** A new report criticizes fashion's heavy use of plastic in its clothing, in the form of synthetic fibers.[7]

*It's worth repeating,*
*that the UN Sustainable Development Goals*
*number one priority is poverty alleviation.*
***"It's not more recycled plastic***
***in your collections."*** [8]

*In the report, called* Synthetics Anonymous, *Changing Markets Foundation argues that brands lack the commitment to shift away from synthetic fibers like polyester and nylon, undermining their stated concerns about sustainability. Synthetic fibers depend on fossil fuel production, and they shed microplastic fibers into the environment; these microplastics have turned up everywhere researchers have looked, with major effects on aquatic life and human health.*[9]

*In the 1990's, polyester gained popularity once more, thanks to the advent of microfiber. "Micro" was the fashion message of the 1990's" DuPont representatives announced triumphantly…," "Under 5 millimeters in length, and with diameters measured in one thousandth of a millimeter, microfibers are vastly more versatile in producing different fabric feels…,"*

*These fibers are so tiny that no washing machine filters, sewage treatment plants, or water treatments can stop them from being released into the rivers and seas of the world. Journalist, Brian Resnick says, "Once the tiny plastics are in the ocean, there is no way to remove them. They enter the diets of marine animals and accumulate throughout the food chain, He continues saying, "The plastic pieces are toxic on their own, but they can also act like sponges, soaking up other toxins in the water."* [10]

A 2018 study showed microplastics in the stomachs of three quarters of fish caught at mid ocean depths in the northwest Atlantic and in animals of the deepest part of the Pacific. *"The average person ingests over 5,800 particles a year." Every year, half a million tons of microfibers seep into the ocean, the equivalent of fifty billion plastic bottles…,* [11]

7 Rachel Cernansky, "Is there space in sustainable fashion for synthetic fabrics?" *Vogue*. 8 July 2021.
8 Elizabeth Cline, director of advocacy and policy at the nonprofit Remake, in Cernansky, "Sustainability."
9 Cernansky, "Sustainability."
10 Thanhauser, *Worn*, 217.
11 Thanhauser, *Worn*, 218.

*Indigenous Quechua shepherd standing proud with his premier alpaca stud male. Photography by Wasim Muklashy.*

"Concerns around the use of synthetic fibers also extend to their recycled versions, which have become more common for brands positioning them as 'sustainable.' Experts say that these fibers have about the same impacts on the environment as virgin synthetics." [12]

Urska Trunk, campaign manager at the Changing Markets Foundation highlights the issue perfectly: "This reliance on synthetic fibers basically perpetuates the industry's dependence on fossil fuel extraction—and that's in the midst of the climate crisis. This will inevitably worsen because no brand has made a clear commitment to phase out their reliance on fossil fuel-based fashion." [13]

During the most recent COP26 conference [United Nations Conference of Parties to tackle climate change], it was discussed that, "Ultimately, business leaders in the fashion industry—as in other sectors—need to increase awareness of the environmental and social impact created by the industry and the end use of its products. This will mean embedding a climate strategy to reach net-zero emissions as a core part of corporate strategy…, The agenda for fashion is multifaceted, but it is essential to secure the future of the industry." [14]

**"Customer demands are also changing, with environmental credentials becoming a prerequisite to compete, not a differentiating factor**. As such, companies should look to develop technological solutions to climate hazards across their ecosystems, whilst stimulating investment and assessing the carbon intensity of their full value chain." [15]

The fashion industry need look no further than the alpacas and vicuñas of Peru to find a model of sustainable textile manufacturing and a world-class example of how the producers and consumers can respect their environment. These indigenous shepherds manage the habitat of vicuñas and alpacas in such a fashion that the environment sequesters carbon, conserves water, and maintains a vast pristine, grassland in the same manner as their ancestors for the past 8,000 years.

12 Cernansky, "Is there space?"
13 Cernansky, "Is there space?"
14 Harry Bowcott, Leigh Chantal Pharand, and Libbi Lee (McKinsey & Company), "How Fashion Can Deliver on COP26 Ambitions."06 December 2021. https://www.businessoffashion.com/articles/sustainability/the-state-of-fashion-2022-bof-mckinsey-cop26-sustainability-climate-change/
15 McKinsey & Co., "How Fashion Can Deliver on COP26 Ambitions."