



Bal

A SHEEP
WOOL VALUE
CHAIN STUDY
FOR KORZOK,
CHANGTHANG



Bal, the wool derived from the indigenous Chang luk (sheep of Changthang), has been the primary source of income for the Chang pas. Chang luk is also used as a beast of burden on trade routes and for meat. It is only from the 1960s with the closure of the international border with Tibet, that the focus shifted to rearing Chang ra (*pashm*-producing goat of Changthang). Indigenous craft skills developed over the centuries have therefore evolved around wool (*bal*) rather than *pashm*. With a growing emphasis on *pashm*, many of the traditional skills associated with *bal* are seeing a decline.

Recognising the potential for a sheep wool-based livelihoods programme, Jungwa Foundation has been working with nomadic women and herders from Korzok since 2018. The present study was commissioned to assess the constraints and opportunities of the sheep wool value chain in Korzok and identify ways by which the small producer can move up the value chain to derive higher incomes. The value chain study will assist in designing inclusive strategies/interventions aimed at enhancing the status of herders and weavers within the value chain, as well as identifying a community-based framework that promotes the scalability and sustainability of the organisation's interventions.

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by **Rekha Shenoy, Tara Sharma and Tsering Gurmet**

Edited by **Sveta Basraon**

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AUTHORS |

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FUNDED BY |

InterGlobe Foundation

Gurugram

<https://www.interglobe.com>

PUBLISHED BY |

Jungwa Foundation

Roka Bano House, Maneykhang

Old Town, Leh, Ladakh 194101

jungwa.foundation@gmail.com

<https://www.jungwafoundation.org>

ALL PHOTOGRAPHS BY |

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LAYOUT & DESIGN | **Studio Earth**, New Delhi

PRINTED AT | **Paramount Printographics**, New Delhi

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FEBRUARY 2025

.....
COVER SPREAD | *The Chang luk or Changthangi sheep*

FOLLOWING SPREAD | *Tso Moriri in late winter*

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List of Abbreviations/Acronyms

LAHDC	Ladakh Autonomous Hill Development Council
BRO	Border Road Organisation
FGD	Focus Group Discussion
GI	Geographical Indication
KII	Key Informant Interviews
NCF	National Conservation Foundation
NRLM	National Rural Livelihood Mission
RLF	Revolving Loan Fund
SHG	Self Help Group
SKUAST	Sher-e-Kashmir University of Agriculture Sciences and Technology
TR	Tibetan Refugees

..... FACING PAGE |
*A shepherd weighing freshly
sheared wool on a traditional
weighing scale (nya gu)*



Foreword

In 2017, on a warm July day, I set off for Korzok with Tsering Gurmet, a Chang pa from Korzok who was deeply interested in creating a wool-based livelihoods enterprise that could provide livelihoods to fellow Chang pas. During that visit, we visited many *rebo*—the traditional tents of the Chang pa—sitting down for a cup of tea with Chang pa women working on their *sked thags* (backstrap loom) creating a whole range of textiles largely for their personal use—carpets, blankets, tent wall covers, bags for storage and more. In some *rebo*, the women showed us heirloom pieces, their motifs derived from the landscape, giving us a glimpse of the Chang pa culture. It was here that the seed of Jungwa Foundation was planted, linking conservation with livelihoods. The weaving project has become the Foundation's flagship programme.

Sheep have been integral to Chang pa life and culture for centuries and it is only in recent decades that *pashm* has gained precedence in Changthang. In the 16th century, Mirza Haidar, a Central Asian adventurer visiting Changthang, gave a vivid description of the Chang pas and their herds of sheep—the indigenous Chang luk. The sheep impressed him with their ability to carry heavy loads for days, grazing along the way. The loads, consisting of salt, shawl wool, zedoary, gold, cloth, sugar, grain and rice would be offloaded and bartered over a mountainous landscape that stretched from *Hindustan* to *Khitai* (China). The barter trade that sustained Chang pa life till recently, remains in living memory of elder Chang pas. The Korzok Chang pas would travel twice a year to trade. The first time in early summer (May-June) when the sheep would be taken to Zaskar, Lahaul and Spiti where the shearing would take place. The wool would then be bartered for grain, sugar and other necessities. Just before winter, they would head off to Tibet to collect salt which would be loaded onto the sheep. This would be off loaded in Zaskar and Himachal Pradesh where it, along with local butter and cheese, would be traded again for grain.

Sheep wool, along with yak wool and hair, is essential to Chang pa material culture and is the primary fibre used for creating almost all necessities—from the dwelling (*rebo*), and furnishings within to Chang pa attire, ropes and trappings for tethering or leading animals and the large storage bags used for transporting wool and grain. The skill of spinning yarn by hand and weaving on the backstrap loom has been transferred from mother to daughter for generations. Unlike *pashm*, *bal* (sheep wool) is a fibre that Chang pa women are familiar with. Their expertise in spinning and weaving *bal*, on the backstrap loom remains unparalleled in Ladakh. While there is a great emphasis on developing the Ladakhi pashmina industry, its sibling fibre, *bal* has not received as much attention. Weaving with *bal* can generate significant employment opportunities across Korzok both for Chang pa herders and weavers.

Over the past six years, Jungwa Foundation has been working with a growing network of Chang pa women and herders to develop a sustainable livelihoods initiative rooted in Chang pa culture. Focussing on *bal* and nomadic textile skills, the programme aims at safeguarding Intangible Cultural Heritage (ICH) while improving quality of life. The past few years have unveiled the enormous and as yet untapped potential that exists in the sheep wool value chain. *Bal—A Sheep Wool Value Chain Study* was commissioned by Jungwa Foundation to define this potential and develop a strategic action plan in taking the livelihoods initiative forward. Securing livelihoods in Korzok itself may contribute to a reduction in rural urban migration currently being faced by many Chang pa groups across Changthang.

A scientific research project conducted by the Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST) has identified an undercoat in the fleece of the Chang luk which yields a fibre comparable in length and diameter to *pashm*. If future experimentation on this is successful, it opens up exciting opportunities for creating luxury fabrics similar to pashmina. Further research on the practical application of this finding is one of the key recommendations of our study.

This study would not have been possible without the support from several institutions and individuals. We are very grateful to InterGlobe Foundation for generously supporting this study. Our deepest thanks to the elected Councillor (Ladakh Hill Development Council) from Korzok, Shri Karma Namtak, for his keen interest and support. To the Sheep Husbandry Department in Leh and Korzok, our sincere thanks for sharing their data and knowledge with us. Lastly, we express our utmost gratitude to the many key informants and participants of the FGD in Korzok who shared their time with us, patiently responding to questions and sharing their knowledge and experiences.

—Tara Sharma
Director, Jungwa Foundation

Executive Summary

The sheep wool value chain study explores the processes and stakeholders involved from raw wool production to finished textile products in Korzok sector. Traditionally, woven by the Chang pas, sheep wool is a sustainable fibre that provides rural livelihoods to nomadic communities of Changthang. Strategic interventions through value additions can promote its use as a sustainable resource to transform rural economies.

Key Findings

1. Production and Sourcing

The study highlights the specific geographic source of Chang luk wool, emphasising the importance of the high altitude Chang luk breed, and the unique fibre it produces. It examines briefly the sustainable herding practices adopted by the Chang pas. The wool is currently sold in its raw form by herders, with limited value addition in Korzok.

2. Processing

The transformation of raw wool into textiles involves several stages, including scouring, carding, spinning and weaving. Traditionally, the Chang pas have processed wool for their personal consumption creating an assortment of textiles. Processed sheep wool, as yarn or textile, can generate rural livelihoods in Korzok and contribute to mitigating rural urban migration.

3. Market Channels

Currently almost 85% of sheep wool leaves Korzok in its raw form. Purchased by independent buyers, it is used in the apparel, furnishing and carpet industry. The study highlights the potential for creating a market for finished products from Korzok which can serve as a major source of rural employment. Increasing consumer awareness of the benefits of natural fibres presents growth opportunities which can be tapped to benefit local weavers and herders.

4. Challenges and Opportunities

Key challenges identified include lack of market development, absence of institutional frameworks for both herders and weavers, poor access to capital, lack of quality standards and design interventions and absence of innovation and knowledge on consumer preferences. Conversely, the rise of eco-conscious consumerism presents significant opportunities for weavers and the creation of a weavers facilitation centre in Leh for training, innovation and retail (and online retail) can link weavers with wider markets. Research has highlighted that Chang luk wool has the potential as a viable medium-type wool, ideally suited for the organised sector, particularly for finer-textured fabrics, second only to pashmina.

This value chain study provides valuable insights for stakeholders including the nomadic pastoralists, government and non governmental actors by identifying lacunas in the current value chain and the potential for value addition at different stages. By addressing the identified challenges and leveraging opportunities, the wool sector in Korzok can enhance its competitiveness and sustainability. Future strategies should focus on developing and strengthening community-driven institutions, innovation, collaboration, and market responsiveness to ensure continued growth and adaptation in an emerging market.

The study identifies gaps and value addition opportunities in Korzok's wool sector, offering insights for stakeholders. Strengthening community institutions, fostering innovation, collaboration, and market responsiveness are key strategies to enhance competitiveness, sustainability, and growth in this emerging market.

FOLLOWING SPREAD |
A herd of sheep and goats graze in high altitude grasslands at an altitude of approximately 14,500 ft a.s.l.





Introduction

Wool is one of the oldest natural fibres known to mankind. Though a relatively small part of the Indian textiles industry, it is an important sector for the country's rural economy. It employs 20 lakh people in sheep rearing and farming, and another 12 lakh in the organised sector (Wool Sector at a Glance, n.d.). In addition, there's a large decentralised sector encompassing hand and power looms and knitting.

The country has 74.26 million sheep, which yielded a total of 33.61 million kg of wool in 2022-23. (Wool Industry and Exports in India, 2024). Its sheep population is the third largest in the world, but it accounts for only 2% of global wool production due to the low average yield from Indian sheep. At 0.9 kg per sheep per year, India's average annual yield of wool is less than half the world average of 2.4 kg per sheep per year (Wool Sector at a Glance, n.d.). A mere 5% of the raw wool from India is classified as apparel grade, while 85% and 10% are carpet grade and coarse grade, respectively (Wool Sector at a Glance, n.d.).

India imports wool as the domestic wool output is inadequate to meet the needs of India's export-oriented wool industry—in 2020-21 India imported 81.62 million kg of raw wool (Wool Sector at a Glance, n.d.). In 2022-23 the country exported woollen goods (carpets, apparel, yarns, fabrics) valued at USD 1.69 billion (Wool Industry and Exports in India, 2024). In terms of value and volume, India is ranked first in the production and export of handmade carpets and floor coverings which include woollen products (Carpet Industry and Exports, 2024).

Wool is a sustainable fibre—it is renewable and biodegradable. Its unique properties—durability, water and flame resistance—make it a flexible textile fibre with wide applications.

Globally, the sheep rearing to exports value chain includes sheering the sheep for fleece, processing, extracting lanolin which is used in cosmetics and pharmaceuticals, carding, spinning into yarn, weaving into fabric and knitting, and other finished products like technical and performance apparel, blankets, carpets, upholstery and soft furnishings. Wool finds industrial applications too due to its resilience, absorbency, and flexibility. Felt is used for thermal and acoustic insulation, and as billiard and gaming table fabric. Lower grade or waste wool is used in oil spill clean-up products, and wool absorbents can also be used in other industries where chemical spills and leaks occur. In farming, waste wool can be used as a barrier to reduce soil desiccation during dry periods and as an insulator under moist conditions. Wool mulch is slow-release fertiliser (Wool Gaining Favor Outside of Apparel Industry, 1996).

BELOW |
A herd of Chang luk and Chang ra
being led out for grazing at the
onset of winter



In this value chain, the Union Territory of Ladakh occupies a special place as it produces some of the finest wool in India. With a sheep and goat population of 5.69 lakh, Ladakh produces 221.02 metric tons of wool and 55.06 metric tons of fine pashmina (Animal/Sheep Husbandry, n.d.). Ladakh accounts for 0.82% of India's total wool production.

The focus area of this study is the Changthang region in Ladakh and the indigenous Changthangi sheep or Chang luk raised by the nomadic-pastoralist tribe, the Chang pas.

Changthang (*Chang = Northern, Thang = Plateau*) is a high-altitude plateau in southeastern Ladakh, along the international border with China. It is a cold desert and the hardy Chang luk are well adapted to the sparse vegetation and extreme winters, where temperatures can go as low as -40 degrees Celsius. The animals are bred extensively in the transhumance production system^[1], and the herd typically includes Chang luk (*Chang = north, luk = sheep*) and Chang ra (goat) which produces the luxurious *pashm*^[2] fibre, in addition to yaks and horses.

In the winter of 2012 -13 and 2019, heavy snowfall in early spring led to significant loss of livestock, particularly goats. It was noted that herds with fewer sheep suffered higher mortality rates of the Chang ra which is more vulnerable to cold and disease. Elder Chang pas state that one sheep can provide warmth to four or five goats in severe winter as the goats huddle around the sheep to share body heat. When sheep are absent, goats pile up over each other, smothering the animal at the bottom. Currently, the typical herd composition is approximately 61% goats and 39% sheep.

[1] A practice of moving livestock from one grazing ground to another in a seasonal cycle, typically to lowlands in winter and highlands in summer.

[2] *Pashm* is the fine goat hair combed from the underbelly of the Chang ra or Changthangi goat. The word *pashm* derives from the Persian word for wool and pashmina is the yarn spun and fabric woven from *pashm*. In Ladakhi it is known as *lena*.

BELOW |

As climate change induced disasters have increased in recent times, Chang pas are reverting to traditional herd compositions with a minimum of one sheep for every four or five goats. This ratio reduces mortality rates among the Chang ra.



1.1 Aim of the Study

Historically, the Chang pas of Ladakh reared more sheep than goats as *pashm* was sourced from the Tibetan highlands. The Chang luk was the primary source of income for the Chang pas, used both as a beast of burden on trade routes as well as by providing wool and meat. It is only from the 1960s, with the closure of the international border with Tibet, that the focus shifted to rearing Chang ra. Indigenous craft skills developed over the centuries have therefore evolved around wool (*bal*) rather than *pashm*.

With a growing emphasis on *pashm*, many of the traditional skills associated with *bal* are seeing a decline. As Chang pas migrate to cities such as Leh or shift from pastoralism to tourism-related occupations in Changthang, the demand for traditional woven textiles has reduced.

Recognising the potential for a sheep wool-based livelihoods programme, following several field visits to Korzok, Jungwa Foundation began its livelihood programme in 2018. After six years of work with herders and nomadic women from the Korzok sector, the need emerged to develop a long-term, wider strategic action plan for livelihoods based on sheep wool production. A value chain study forms an integral part of this strategic planning and was thus commissioned to assess the constraints and opportunities of the sheep wool value chain in Korzok to enable the identification of research, development and policy interventions that facilitates the development of that value chain in Korzok. Most importantly, the aim is to identify ways by which the small producer can move up the value chain to derive higher income. The analysis of the value chain will assist in designing inclusive strategies/interventions aimed at enhancing the status of herders and weavers within the value chain, as well as identifying a community-based framework that promotes the scalability and sustainability of the organisation's interventions.

In 2018, Jungwa Foundation initiated a sheep wool-based livelihoods programme in Korzok. After six years, a value chain study has been commissioned to assess constraints and opportunities, enabling inclusive strategies to enhance herder and weaver incomes, scalability, and sustainability through research, development, and policy interventions.

..... BELOW |
*A Chang pa combs the
underbelly of a Chang ra
to remove valuable pashm*



FOLLOWING SPREAD |
*Chang luk tethered together for shearing.
The horns are painted at the time of shearing as
identification markers by the each herd owner*





The Chang luk and Its Wool (*Bal*)



2.1 The Chang luk and Its Role in Chang pa Life

The Chang luk is characterised as a medium-size sheep with adult rams weighing between 50-70 kg and ewes between 35-50 kg. Both horned and polled animals are found (Ganai, Misra, & Sheikh, 2010). The animals have medium to short tails. The Chang luk provides wool, pelt, mutton, milk, fuel in the form of pellets and manure, which is sold (Ahmed, Wani, Abbas, & Ghasura, 2021). The dung of Chang luk is a valuable fertilizer. Since they graze on arid cold desert rangelands, their droppings serve as a valuable natural fertilizer for vegetation.

ABOVE |
A family rounds up a herd of
Chang luk at the time for
shearing in Chumik Shalte

2.2 Physical Characteristics of Chang luk Wool (Bal)

The natural fleece of the sheep is in shades of white and black. The Chang luk yield an average fleece of 1.42 kg per animal (Ganai, Misra, & Sheikh, 2010), which is significantly higher than the national average of 0.9 kg. Male sheep demonstrate a greater wool yield compared to females at approximately 1.53 to 1.31 kg (Ganai, Misra, & Sheikh, 2010). As the sheep age, wool production increases, peaking at approximately 2.5 years, after which it stabilises or diminishes (Ganai, Misra, & Sheikh, 2010).

Significantly, studies on the Chang luk have highlighted that the staple length of its wool fibre is the most extensive among Indian sheep breeds (Ganai, Misra, & Sheikh, 2010 and Malik, et al., 2021).

PARAMETER	MEAN
Fibre Diameter	31.19 μm
Medullation	11.37%
Staple Length	11.34 cms
Number of Crimps	4.13
Mean Fibre Length	134.58 mm



FIGURE 1 | Physical Characteristics of Chang luk Wool
SOURCE | Malik, et al., 2021

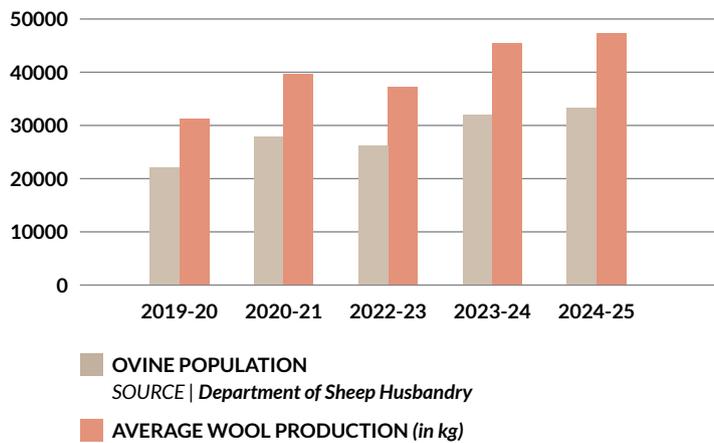
Research conducted by SKUAST has revealed that this breed has a double coat with a marked difference in the diameter and surface characteristics of primary and secondary fibres. This study concluded that Chang luk wool is a medium-type wool that can be used in the organised sector for finer-textured fabrics next only to pashmina. The study reported that the average fibre diameter of secondary fibres was $14.35 \pm 0.50 \mu\text{m}$ which was significantly lower ($p < 0.05$) than that of primary fibres ($40.04 \pm 1.4 \mu\text{m}$). The fibre diameter of secondary fibres is comparable to that of pashmina growing from the Chang ra, the Changthangi goats whose diameter range between 11 and 15 μm . The presence of a double coat and finer fibres may be attributed to the sub-zero temperature (which goes as low as -40°C) of the Changthang area (Malik, et al., 2021).

The Chang pas characterise the wool according to its coarseness and length. Coarser, longer fibre known as *ta-rju* is separated from finer fibre *jam-bu*. The latter is used for weaving *nam-bu* while the former is mixed with *jam-bu* for weaving carpets, blankets, etc. *Yun-bu*, the fine lambswool, is used in the weaving of *nam-bu* and is the finest fibre according to informants.

2.3 Wool Production in Korzok

There is no official data on wool production. If we calculate the total wool production using an average yield of 1.42 kg/sheep (Ganai, Misra, & Sheikh, 2010) then the total wool production for Korzok sector is approximately 47.334 metric tons in 2024. With a rising trend in sheep populations, there is an upward trend in wool production too.

CHANG LUK CENSUS AND WOOL PRODUCTION | KORZOK SECTOR



With a rising trend in sheep populations, there is an upward trend in wool production too.

FIGURE 2 | Sheep Census and Estimated Wool Production in Korzok sector

2.4 Traditional Use of *Bal*–Chang pa Weaving

Chang pa men and women weave gender-specific articles on gender-specific looms (Ahmed M., 2002). The women weave on a backstrap loom (*sked-thags*), and the men use a fixed-heddle loom (*sa'-thags*). Looms are portable, made of wood, rope and metal and passed down from generation to generation. In addition to weaving, men also braid the fibre to create a range of ropes, reins and slingshots.

Men and women weave different products from sheep wool on their respective looms. Generally, women weave many of the items utilised in their *rebo*, including, *nam bu* used for making their clothes, blankets (*tsog thul*), carpets (*tsog dan*), storage bags (*phy gyis*), and tent wall covers (*phug shar*). These are made from wool—both sheep wool (*bal*) and yak wool (*khullu*). Men, on the other hand, weave using the tougher hair of the goat (*ral*) and yak (*si pa*) to create the *rebo* (black tent of the Chang pa), *chal li* (shepherd’s blanket), and a variety of saddle bags (*lug-gal*), historically used to transport grain, salt and borax when they were traded.

Various products made exclusively from sheep wool or in combination with yak wool with their local names is captured in the following figure.

FIGURE 3 | PRODUCTS MADE FROM SHEEP WOOL/HIDE IN KORZOK

<i>Nam bu</i>	A tabby woven textile made by women, used for making Ladakhi <i>goncha</i> and <i>sulma</i>
<i>Lak pa – Shang lak</i>	A coat worn by men which is stitched from several sheepskins with the fleece facing inwards
<i>Lak pa - Tar lak</i>	A sheepskin coat made from the hide of lambs
<i>Yo gar</i>	A cape worn by women made from lamb skin with the fleece facing inwards
<i>Ling tse</i>	A summer cape woven by women which is usually dyed in red and embellished with motifs woven in bright colours
<i>Phing pa</i>	Handmade felt made from the short fibres of lambswool
<i>Skey raks</i>	A narrow woollen sash tied at the waist over the <i>goncha</i>
<i>Tsawu</i>	A baby’s crib made of felt lined with warmed animal pellets (<i>lut</i>). The pellets are replaced every day once they are damp.
<i>Tsog dan</i>	A pile carpet woven on the <i>sked thags</i> by women. It is laid on the floor, inside the <i>rebo</i> .
<i>Kyong dan</i>	A tabby woven rug made from <i>bal</i> by women with another thicker underlayer woven in goat hair (<i>ral</i>) by men.
<i>Tsog thul</i>	A heavy pile blanket woven by women, embellished with simple designs
<i>Zang kos</i>	A simple tabby weave blanket woven by women
<i>Challi</i>	A heavy outer blanket woven by men, made from <i>bal</i> , <i>ral</i> and <i>khullu</i>
<i>Phug Shar</i>	A tent wall cover used to cover items stored along the inner periphery of the <i>rebo</i>
<i>Dol than</i>	A shelf liner used over the shelf of the rudimentary larder made of stone slabs where butter, meat, etc. are stored

Phi li	A cover placed under the stone mill (<i>ran tak</i>) while grinding barley. The ground flour collects on this and is then transferred for storage. Cheese (<i>chur pe</i>) is also laid out over the <i>phi li</i> to dry.
Phi guk	Bags for storing barley flour after it is ground
Tsang dur	Bag woven by a mother for her daughter at the time of her marriage. It is used to store her clothes, etc.
Gyi gu	Small bag woven by women to store valuables
Phi gyi	A brightly striped saddle bag woven by women. This is used to store grains, <i>chur pe</i> (dried cheese) and other dry food items.
Tag gal	Saddle bags woven by men which are tied to a yak or horse. These may be marked by a <i>yud</i> (a specific design used by each family to identify their bags).
Lu gal	Saddle bags for sheep woven by men; used to store grain, salt for the days of trade
Phed	Large bags woven by men for storing grain
Sta To	A small bag used to store food while traveling on horseback. Woven by both men and women
Jhola	A sling bag used by shepherds to store their lunch when they are out herding during the day. Women herders also carry wool they will spin while out herding.
Tsa gik/ Cha gik	Small bags used for storing tea and salt, respectively
Nang jam	First layer of a thick blanket placed over the horse. The lower part is made of felt (<i>phing pa</i>) and upper half is woven from <i>bal</i> .
Thing thing lung	Rope for tying a bell to the animal. The lower layer is made of <i>phing pa</i> over which is stitched, a knitted layer and embellished with piping at the border
Thur go	A long rope used to lead the horse
Strap	A metal bit for horses with woven reins, browband, cheekpiece and nose band
Lho	Saddle girths used to secure the saddle which are tied under the horse's belly
Met	A breeching rope tied under the tail, securing the saddle to the rear
Thak pa	Ropes used to tie objects which will be carried by yak, horse or by men
Sum thak	A variety of <i>thak pa</i> made with three <i>thak pa</i> for tying objects
Tar dak	A rope used to tie sheep while milking
Tset dang	A rope used to tie young lambs during the day while the mothers are grazing
Yung dak	A long rope used to tie <i>lug gal</i> onto the sheep when the Korzok pas traded
OI thak	Neck bands to tie sheep to <i>yung dak</i>
Rok	Rope used to tie a fore and hind leg of a horse to prevent it from straying far from the campsite
Ur do (Yugdo)	A sling shot used by shepherds to ward off predators
Taa	A braided bag used to store fuel—animal dung or woody shrubs collected from the mountains

BELOW LEFT |

Boots (*lham*) made from felt and leather

BELOW RIGHT |

The colourful *ling tse* woven from *bal* and coloured acrylic wool, worn by women in summer



ABOVE |

Shang lak, a sheepskin coat worn by men

The traditional attire of the Chang pas was made almost exclusively from animal fibres and hide. The traditional *goncha* or *gos* (a long coat worn by men) and the *sulma* (a flowing robe worn by women which is gathered at the waist) are made from *nam bu*. Chang pa women weave their *nam bu* using sheep wool (*bal*) in the warp and fine lambswool (*yum bu*) in the weft. In addition, the *shang lag*, a long, thick greatcoat made out of several sheep or goat skins stitched together and with the wool facing inwards, was used in the past by Chang pa men during the harsh winters. A similar garment was made out of lambskin—*tar lag*. Boots (*lham*) are made of animal hide and felt (*phing pa*) with *nam bu* stitched on for the shafts that protects the feet from the harsh terrain and severe winter. Felt was also used in the lining of the Ladakhi hat, *ti pi*. Sheepskin capes (*lok pa*) tied around their shoulders, are also worn by women, with the wool facing inwards. Another cape worn by women in Korzok is the *ling zi*, made from *bal* dyed in red and embellished with motifs using coloured acrylic yarn.

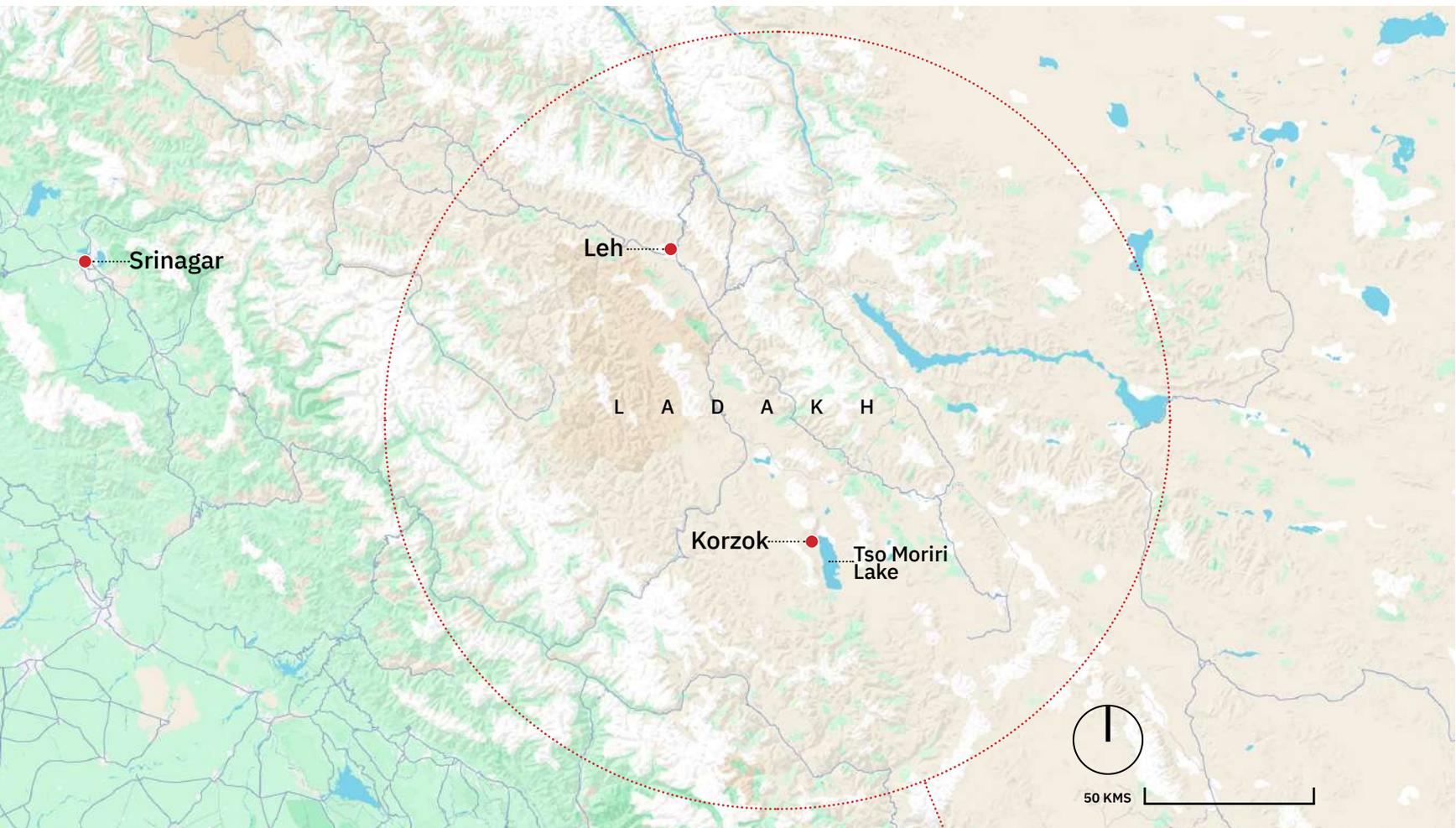
FOLLOWING SPREAD |

A family prepares to shift camp from Peldo to the summer camp at Korzok phu



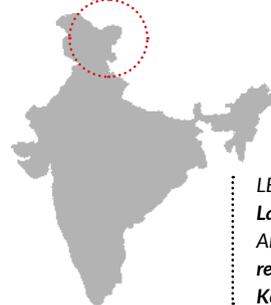


Study Methodology



3.1 Description of the Study Area

Korzok sector in the Nyoma block of Leh District comprises the settlements and associated grasslands and encampments of the Chang pas from Korzok, Tegazong, Chumur, Chumur TR (Tibetan Refugees), Sumdho, Sumdho TR and Angkung. The study was conducted in Korzok village which is the centre of this sector. Korzok village ($32^{\circ}58'05''\text{N } 78^{\circ}15'50''\text{E}$) is located on the Tibetan Plateau in southeastern Ladakh, at an altitude of 4567.15 metres above sea level (a.s.l.).



LEFT | Key map of India with Ladakh region marked in circle
ABOVE | Terrain map of Ladakh region showing location of Korzok and Leh



ABOVE |
*View of Korzok village with the
summer pastures, phu, above the
village and the Mentok Kangri glacier
looming above*

The village has evolved around the 17th/18th c monastery, the Korzok Gompa, which rests on a small hill, northwest of Tso Moriri lake in the Samad Rokchen valley. Korzok in the local language means the “middle of the mountains”. According to the Chang pas, the term “Korzok” is derived from two words: *Kor* is derived from *Kor pa*, the shepherds who manage the herds belonging to the gompa; *zok* refers to the large number of livestock of the gompa.

BELOW |

The dedication of the animals to the protector deity, Ishey Gonbo, during Korzok monastery's annual festival



The gumpa is the focal point of the Rupshu region and all Chang pas from Korzok-Tegazung gather to celebrate the annual Gustor festival in July-August. Traditionally, the Chang pas make donations in the form of butter, cheese and wool to the gumpa, and also maintain the livestock owned by the monastery. The gumpa owns some of the prime summer grazing lands in Pherse and Towoche which it leases out for grazing.

Livestock production is central to the economy in Korzok and the livelihoods of the Chang pas—as many as 95% of households derive income from the livestock. The Chang pas of Korzok are of two types: Pastoral nomads and agro-pastoralists. The nomads practise high-altitude pastoralism due the region's arid climate and sparse vegetation. They migrate seasonally around Tso Moriri, spending the summer months in and around Korzok and Pherse and the winter months at Tegazong. It is primarily in the summer months when they are camped around Korzok, that women set up their *sked thags* (backstrap loom) to weave using sheep (*bal*) and yak (*khullu*) wool from their own herds. Men too weave using the coarser yak (*si pa*) and goat (*ral*) hair on a fixed heddle loom (*sa-thags*).

BELOW |
A traditional rebo, the nomadic
black tent, woven from yak hair



The agro pastoralists, the Kor pa, work the high-altitude fields abutting Tso Moriri where grow they barley in the short summer months. The grain is used for their own and their animals' consumption.

The agro-pastoralists, the Kor pa, cultivate barley in high-altitude fields near Tso Moriri during the brief summer months. This grain sustains both their families and livestock, forming a crucial part of their subsistence in the challenging environment.

BELOW LEFT |

Bar headed geese at Tso Moriri

BELOW RIGHT |

Chang pas leading thier herds from Peldo to the summer camp at the phu



Tso Moriri is a freshwater to brackish lake and a wetland reserve. The area around Tso Moriri is rich in biodiversity and is a part of the Changthang Wildlife Sanctuary. It is home to a rare flora and fauna, including the snow leopard, Pallas's cat, Tibetan grey wolf, wild ass or Kiang, Tibetan gazelle, argali, woolly hare, Tibetan lark, black-necked crane and bar-headed geese.

Tso Moriri serves as the primary tourist attraction in the region. The Chang pas have established lodges, campsites, cottages, hotels, and restaurants in Korzok to capitalise on the short tourist season.

According to the 2011 Census of India, Korzok has 253 households. The effective literacy rate is 46.4%. Urban migration, livelihood transition, climate change and geopolitical disputes are affecting pastoralism in Korzok. Now, many elder members of the community have migrated to Choglamsar for better medical facilities, while some households migrate to Leh only during winter.

Korzok sector has a full-fledged Sheep Husbandry Department field office that serves sheep farmers in the region. The location of the office highlights the region's importance in terms of livestock production. There are two extension workers providing services to sheep herders in Korzok and Tegazong, respectively. According to the census data available with the Department of Sheep Husbandry, Korzok recorded a total sheep population of 33,334 in 2024. The population of sheep has seen a steady rise and has increased by almost 66% since 2019-20. Thus the quantity of wool being produced in this sector has also seen a corresponding increase. The region contains 442 breeders.

THIS PAGE |
Conducting focused group
discussions at Chumik Shalte



3.2 Data Collection

The study team applied a combination of techniques to capture the information for the sheep value chain analysis. Both secondary and primary information were used in the study. Secondary information was collected from the Sheep Husbandry Department, Leh and Korzok. Additionally, relevant literature and research publications from SKUAST were referred to provide a technical background and develop a basic understanding of how sheep production systems operate in the study area. Focused group discussions, key informant interviews, and visual observation were used to collect primary data. Different checklists were used for different groups of actors to guide focus group discussions and key informant interviews.

Focused Group Discussions (FGD)

Focus group discussions were conducted with two groups of herders in the nomadic camp sites of Chumik Shalte and Peldo. FGD was also conducted with female weavers in Korzok village. Age, gender and herd ownership size was considered for selection of participants in the FGDs.

Key Informant Interviews (KIIs)

Twelve key informants were interviewed. These included the village head, elderly members of the Chang pa community, weavers, spinners, individual staff from NGOs, private traders, local entrepreneurs, staff of the handloom department, and technical as well as field staff of the Sheep Husbandry Department.

3.3 Conceptual Framework

A 'value chain' describes the full range of activities required to bring a product or service from conception, through the different phases of production (involving a combination of physical transformation and the input of various producer services), delivery to final consumers and final disposal after use (Kaplinsky & Morris, 2002). Sheep value chains include all inputs and services that enable live sheep production (e.g., feed, services, and stock), transporting, processing, marketing of outputs, and the creation of value-added woollen products. As such, value chains include all of the vertically linked, interdependent processes that generate value for the consumer, as well as horizontal linkages to other value chains that provide intermediate goods and services. Value chains focus on value creation—typically via innovation in products or processes, as well as marketing—and also on the allocation of the incremental value (Webber & Patrick, 2010). Engendering informed, incentive-producing governance which is targeted at achieving high-value results is a key objective of value chain development (Webber & Patrick, 2010).



ABOVE |
A young shepherd leads
his herd around the lake

The value chain system includes a range of stakeholders. a) **value chain actors** who exercise ownership of the product or its value addition and cover risks involved in handling the product (Chang pa herders, weavers, traders, consumers etc); b) **value chain service providers** who provide at cost or free services to the actors (e.g. Department of Sheep Husbandry extension services, scouring/ combing units, transporters) and c) **institutional supporters** both formal and informal (the traditional village governance system (*goba*), monastery, Hill Council, etc.) (Legese, Haile, Dessie, Hussein, & Kuma, 2015).

Access to the value chain is influenced by a wide range of factors at the macro- and micro-level, including the nature of state and regional policy, the level of infrastructure and access to technology, as well as the character of markets.

In value chain analysis, vertical integration, and horizontal integration are the two basic strategies that groups of producers can use to improve their incomes. Vertical integration means taking on additional activities in the value chain: processing of wool, for example. Horizontal integration, on the other hand, means becoming more involved in managing the value chain itself—by producers improving their access to and management of information, their knowledge of the market, their control over contracts, or their cooperation with other actors in the chain (Legese & Hordofa, 2011).

FOLLOWING SPREAD |
Garmo Tsering, an elder Chang pa woman
feeds young goats at her winter campsite





Core Functions of the Sheep Wool Value Chain

The core functions of the sheep wool value chain of Korzok sector include input supply, production, processing, marketing and consumption and with each core function important activities and actors have been identified. This is illustrated below.

4.1 Input Supply

Breeding Stock

Input supply for sheep production includes access to breeding stock by sheep herders. While most sheep herders in Korzok, maintain their own breeding stock, in times of need they will purchase additional stock of Chang luk from within the community.

Veterinary Services and Support

The Sheep Husbandry Department provides a range of veterinary health care and extension services through two extension workers in Korzok and Tegazung. Free vaccination drives are conducted regularly for foot and mouth disease and brucellosis. In addition to the veterinary services, the Department of Sheep Husbandry also provides extension services such as providing advice and technical knowledge, and



supplying solar lights, modern insulated huts and tents to the herders. Predator Proof Corrals have been recently erected by the National Conservation Foundation (NCF) in Peldo and *Korzok phu* (nomadic camp in the pastures above the village) to protect small ruminants from predators and they have also provided mobile cribs for young kids to lower mortality rates in early spring.

Feed and Fodder

The need for additional feed and fodder arises in winter when access to winter grazing areas is reduced^[1]. The Department of Sheep Husbandry supplies pelleted concentrated feed and dry fodder during winter. Under the Changthang Development Package, the UT Administration has proposed the development of fodder farms at Tegazung and creation of a fodder bank at the block headquarters in Nyoma (Ladakh, n.d.).

Credit Services

Credit services are provided under the Kisan Credit Scheme. Herders may apply for loans calculated on the basis of the number of units (1 unit = 20 livestock) they own. This is a revolving loan with minimal interest rate of 3-4%.

FACING PAGE |

Most herders maintain their own breeding stock of Chang luk and when necessary supplement it by purchasing stock from within the community

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The need for additional feed and fodder is acutely felt in the winter months. With minimal grazing available, livestock are fed grain in the winter months.



[1] Due to border tensions with China, the Chang pas of Korzok Tegazung have lost access to traditional winter grazing pastures

4.2 Production

The *Chang luk* provides the Chang pas with wool, meat, pelts, milk, manure for sale, and dung for fuel. The study focussed on the first as this is a primary output of the wool value chain, but it may be mentioned that sale of sheep for mutton is also a significant output and may be sold in times of crisis ^[2]. The major production activities are listed below.

Herding

The Chang pas rear a mixed herd of sheep, goats, yaks and horses. The composition of the Chang pa herd is not random, but rather an adaptive response to the environment they inhabit, and the resources available. Sheep make up approximately 39% of the total ruminants in the study area while goat make up 61%. Herding practices involve moving livestock between fixed high pastures in summer and lower elevation winter habitats. The Korzok community uses the pasture areas of the Korzok valley in summer and Tegazong in winter. The herds are grazed on allocated pastures which are regulated by the community. *Tsa thrims* or customary laws of the land govern the migration calendar. Penalties are imposed on any transgressions by the headman (*goba*) or monastery for lands owned by it. This is done to prevent overgrazing of the rangelands and to conserve rangelands for the lean winter months. From time to time, the Chang pas separate the herds for grazing. In winter, soon after the lambing season, the bucks and rams are separated and led towards Tak Karpo, Narong for grazing, leaving the grass at Tegazung for female and young animals.

The arid cold desert of Changthang yield a variety of grasses, shrubs and perennial herbs on which the animals graze. The animals are herded out by the herders to the highland pastures every morning and return to the camp before sunset.



ABOVE |
A herd of yaks are shifted from Labgo to the winter camp at Tegazung

[2] An adult sheep may fetch between Rs. 8,000 and Rs.10,000 when it is sold for slaughter

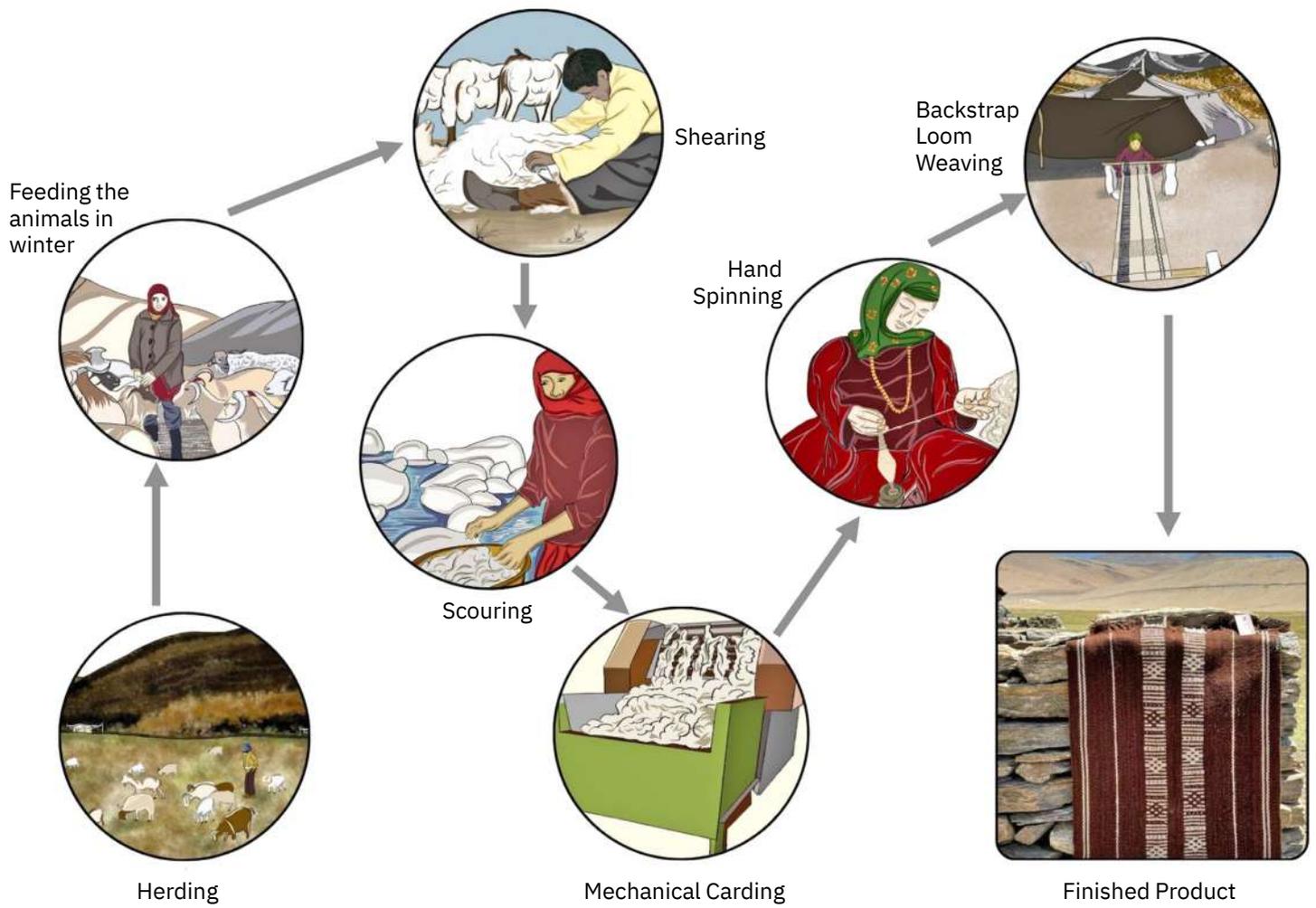


FIGURE 1 | Diagram showing core functions of the Sheep Wool Value Chain
 ILLUSTRATIONS CREDIT | Suchita Sinha

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The les, or animal pen, are located next to the rebo. Young kids are kept in an underground chamber, ri pul, to protect them from the cold. The pens are cleared of dung regularly and the droppings are used as fuel.



Breeding and Lambing

To breed sheep, herders use their own breeding animals or buy them from fellow sheep herders. The Chang luk are seasonal breeders and the breeding season mainly lasts from July to December. Lambing season is from December to March. Only natural mating is practised (the ratio of bucks to does is 11,035 to 13,805) and there is no facility for artificial insemination in the breeding tract. Currently, there is no scientific breeding programme to improve the genetic diversity of Chang luk. Unlike the Chang ra, there are no breeding and research farms for Chang luk in Ladakh.

The Chang luk exhibit a reproductive pattern characterised by a singular lambing event annually, yielding one offspring per ewe per lambing cycle. The incidence of twinning is less than 1%. The lambing season begins in December at higher altitudes and lasts until March. Notably, the main lambing season runs from December to February. The lambing rate (percentage of ewes giving birth) in Chanthangi sheep flocks ranges between 60 and 70%.

Feeding

In summer, the sheep live exclusively off natural grazing. In winter, they dig up plants with their hooves to eat. However, in severe winter, when the grasses are buried under snow, the animals are fed barley, pelleted concentrated feed, and dry fodder. To mitigate the nutritional deficit in winter, the Sheep Husbandry Department provides pelleted concentrated feed and dry fodder at subsidised prices. Herders may either barter wool for barley or purchase grain and feed from Leh market. Sheep may be fed up to 1 – 1.5kg of fodder per day while 200–400 gram of concentrated pelleted feed may be consumed in severe winters (Ganai, Misra, & Sheikh, 2010). Herders may also purchase milk to feed young lambs when needed.





Shelter

Sheep are kept outdoors throughout the year either tied out in the open (*kay ka*) or housed in a stone-walled, open-air pen known as *les*. The *les* is always adjacent to the *rebo* to allow the herders to ward off predator attacks in the night. Small ruminants are housed together once they return from grazing. During periods of heavy snowfall in winter, the animals within the *les* are hand fed by the herders. There is no drainage system in the paddock because this is not necessary in a dry and arid environment.

The *les* is further subdivided into smaller enclosures. At one end is a small enclosure for young animals where they will be kept in summer. Kids are more susceptible to the cold at birth and are housed in underground pens known as *re-pul* in the winter camps at Tegazung. The large central space inside the *les* is the *ses dang* where lambs are tied and kept with the ewes during milking. When lambs are sick, the Chang pas bring them into the *rebo* to tend. The pens vary in size but it was found that approximately 9 m × 9 m is sufficient to accommodate 300 animals in winter and 200 animals in summer (Ganai, Misra, & Sheikh, 2010). Women clean the enclosure while the animals are out grazing and collect the dung which can be dried and used for fuel or sold as manure.

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Shearing sheep at Chumik Shalte.

There is no segregation or gradation of wool at the time of shearing.



Shearing

The wool of Chang luk is sheared annually in June or early July. Lambs are an exception to this rule and are sheared twice in a year. The first shearing in summer yields the fine *yun bu* and the second shearing in early autumn yields small fibres which were traditionally used to make felt (*phing pa*).

Shearing sheep is a male occupation. It is a major event and the *deb-she* (mutual agreement of physical labour and goods) working groups are agreed upon in advance. These work teams are only intended for sheep shearing. Earlier shearing was done using traditional shears made locally from yak horn or wood. Nowadays, steel shears are used.

4.3 Marketing

At present, the Chang pas primarily sell or barter raw wool post shearing and there is no commercial processing of wool. There is no value addition to the raw material at the time of sale. For small buyers, wool is sold at the rate of Rs. 150/kg for white wool and Rs. 300/kg for black, brown or grey wool. The Tibetan Refugee middlemen who buy wool in bulk pay one rate of Rs. 150/kg. While rates have stagnated for the past several years, they are significantly higher than government approved rates in neighbouring Himachal Pradesh (Rs.80/kg in 2022-23) and Jammu & Kashmir (Rs.40/kg in 2020).

Of the total wool produced is Korzok, almost 50% is sold to Tibetan Refugees who take the wool to Himachal Pradesh, according to informants. Another 10% is bartered for grain in Leh^[3] where it is used to weave *nam bu* (handwoven wool fabric used in traditional clothing) and carpets. Twenty five percent is sold to small buyers from Leh (e.g private entrepreneurs and NGOs like Jungwa Foundation). The balance 15% is used by Chang pas for their own personal consumption. Chang pas select the best quality sheared wool for their use before storing the *bal* for sale.

[3] Two kilograms of wool is exchanged for six kilograms of grain

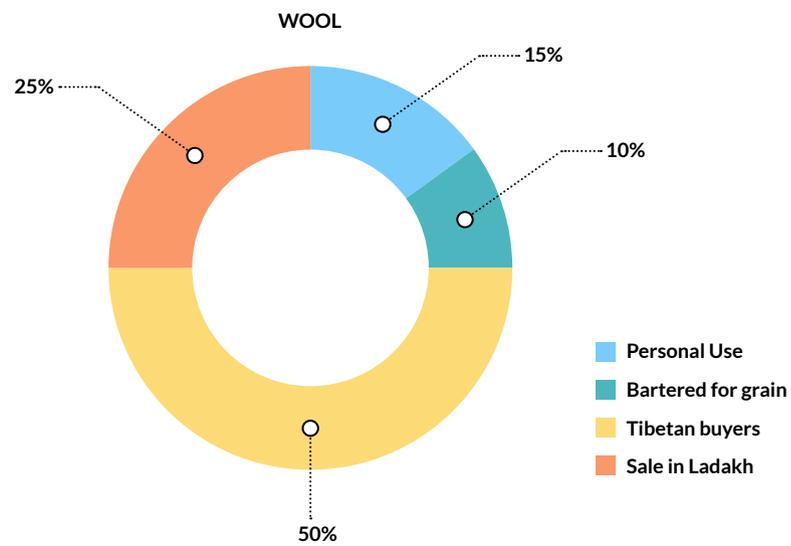


FIGURE 2 | Current markets for Chang luk wool

This shows that approximately 85% of the wool is sold in its raw form to buyers who will process it further for domestic or international markets.

4.4 Processing

For the Chang pas to benefit through both vertical and horizontal integration in the value chain, it is imperative that value is added by processing the raw wool before it reaches the market. Currently, the Chang pas only process wool for their personal consumption or for limited sale to tourists visiting Korzok.

To develop products from *bal*, different stages in processing are required.

1. **Scouring**

This is the first stage of cleaning the wool of contaminants which may account for 35–40% of fleece weight. This is done by washing the wool first by hand and then mechanically to remove lanolin (a waxy substance produced by the sebaceous glands), suint (a water-soluble deposit of sweat and dirt) and other vegetal residues.

2. **Carding and Combing (*dab-cis*)**

In the next stage, the fibres need to be untangled and impurities removed while separating long and short fibres. Earlier, this was done using pairs of wooden wool cards (*bal-shed*). Today, the wool fibre is mechanically processed in carding/combining units in Leh.

3. **Spinning (*khal-cis*)**

The wool is worked on by hand to prepare the yarns for the loom. Traditionally, it is spun by hand into yarn on a wooden spindle (*phang*). Spinning may be carried out through the year as women go about their daily chores. Today, the *ambara charkha* is also being used which allows the spinner to spin multiple threads at the same time on two or more spindles. This reduces the cost of production.

4. **Dyeing**

At this stage, the spun yarn may be additionally dyed. For *nam bu*, the fabric is dyed after it is woven. In Korzok, weavers may also use readily available coloured acrylic yarn to add colour to their weaves, in which case this stage is skipped.

5. **Twisting or Plying**

To prepare the yarn for the warp, it is doubled and then twisted. Traditionally, it is twisted on a wooden *yud phang*; today small electric *charkhas* are used. Weft yarn is doubled but not twisted.

BELOW |
Jungwa Foundation team purchasing
bal directly from the herders



THIS PAGE |

Wool is hand spun and twisted into yarn by nomadic women. The warp is laid by winding the yarn around pegs after which it is transferred to the loom.



6. **Warping the Yarn (*thags- 'dren-cis*)**

For backstrap loom weaving, the yarn is warped by winding it around wooden or metal pegs fixed to the ground.

7. **Weaving**

The warp is then released from the pegs and transferred to the backstrap loom (*sked-thags*) for weaving. Chang pa women weave in the summer months from May to October. Summer is the main season for weaving, as they are camped at one place, the Korzok phu (nomadic camp in the highland pastures above Korzok village), for several months. Elder women settled in Choglamsar or women residing in Korzok village, may weave throughout the year depending on the availability of wool. *Nam bu* and carpets are two of the main items that are being produced on a small scale for sale.

Private entrepreneurs and NGO's have in recent years been working with Chang pa women from Kharnak, Samad Rokchen and Korzok to train them on different aspects of processing outlined above and creating products that can be marketed. Jungwa Foundation has been training women from Korzok to create a range of furnishings and textiles on the backstrap loom.



ABOVE |
Tsering Angmo weaves on the traditional backstrap loom (*sked 'thags*)
BELOW |
Products created by the Jungwa Foundation team under the livelihoods programme

9. **Post-production Processing**

A final stage of finishing is carried out by private entrepreneurs before the product is marketed. This post-production processing involves cleaning and steam ironing the finished product. This stage is not carried out for products created for personal consumption by the Chang pas.



4.5 Consumption

Currently, the main consumers are buyers of raw wool who buy approximately 85% of the wool produced directly from the herders. This is being processed by private entrepreneurs largely outside Ladakh, according to informants. Once value is added to the raw material by these entrepreneurs, largely by weaving *nam bu* which is used in apparel, in addition to carpets and furnishing, it is consumed by local, national and international retail markets.

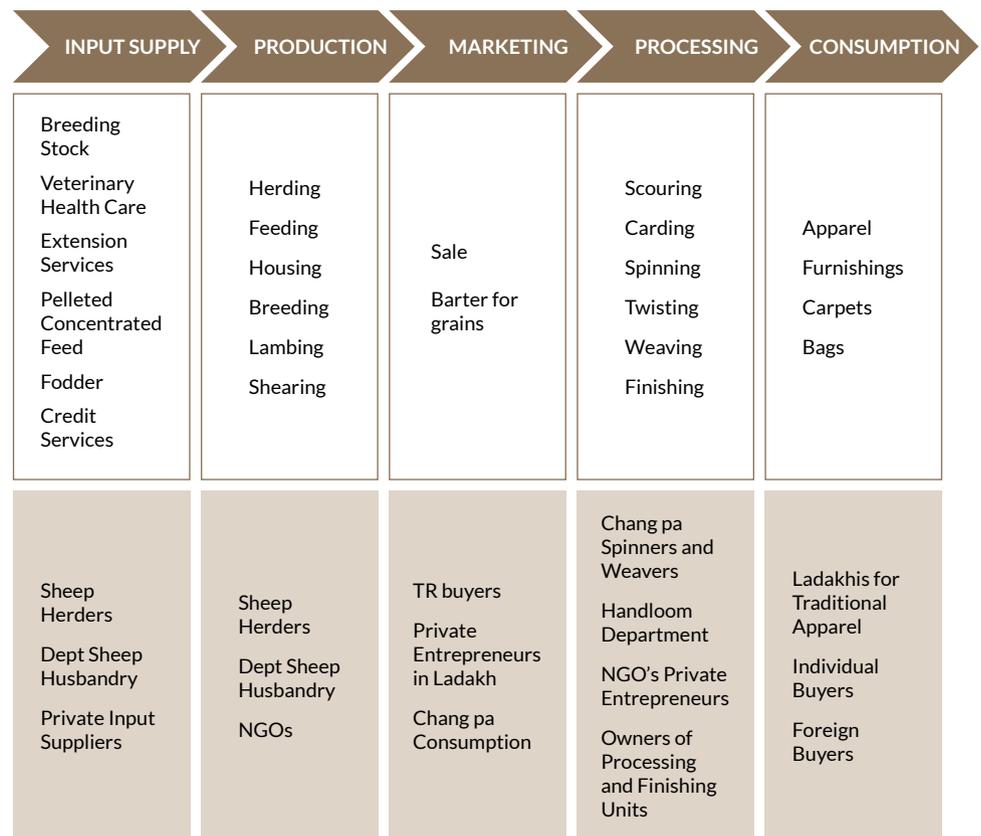


FIGURE 3 | Core Functions, Activities and Actors along the Sheep Wool and Value Chain in Korzok

FOLLOWING SPREAD |

A group of Chang pa women participate in a training workshop on backstrap loom weaving at Korzok organised by Jungwa Foundation and funded by InterGlobe Foundation





Constraints and Opportunities

Handlooms and handicrafts in India regained popularity during the post-independence era and the government's support for handlooms was crucial for their revival and growth. The Indian government recognised the potential of the handloom and handicraft sector and implemented various policies to support and promote it. Several institutions and organisations were established to develop and promote traditional crafts. Handloom and handicraft clusters were identified across India, and a package of support was provided under Handloom and Handicraft Cluster Development Schemes. These schemes and programmes led to the revival of indigenous crafts in many parts of India.

Chang pa weaving has yet to make an impact in India's handloom sector due to its unorganised and dispersed nature. It has received little attention from successive state and Central governments' handloom/handicraft development programmes and schemes. Only in recent years have some efforts been made to encourage Chang pa women to weave their products and sell them directly to tourists in Leh and other destinations. There are some NGOs and government initiatives that provide training and skill upgradation to women weavers across Changthang.

The study team interacted with women weavers and spinners in Korzok and Choglamser. Eight Self Help Groups (SHGs) are active in Korzok and these SHGs have received a Revolving Loan Fund (RLF)—Rs 8 lakh in total—from the National Rural Livelihood Mission (NRLM). Weavers are spread in eight SHGs of about 10 members each and there is no collectivisation of weavers nor aggregation of produce (wool) at this stage.

There are some initiatives from various stakeholders to upgrade the skills of weavers. In the summer of 2021, the Handloom Department conducted training focused on weaving *nam bu*. Additionally, the Handicraft Department provided training in carpet weaving and *nam bu* during the same year. The Army facilitated the distribution of 10 *thag sha* (looms) and solar lamps and organised a month-long workshop dedicated to the production of *nam bu* and shawls. There has been no attempt to consolidate and build on the knowledge provided to weavers during these one-time training events.

Jungwa Foundation is working with 35 community weavers and spinners in Korzok. They support weavers with training, design input, and production orders. Women weavers revealed that the income they earn from weaving for Jungwa Foundation has increased their self-confidence and self-esteem.

Discussions with herders, weavers and other stakeholders revealed that there are many issues at the ground level that are affecting the wool value chain. There is a lack of education and access to working capital, inadequate infrastructure, absence of market intelligence, and absence of an institutional framework. There are constraints both at the production and marketing levels. They are as follows:

5.1 Production Constraints

Herders

- **Weak horizontal linkages between wool producers**
Sheep herders in Korzok retain strong community links among themselves, exchanging animals for breeding, selling animals among themselves following a climate disaster or aiding members of their group on the day of shearing. However, in the absence of a cooperative or collective the wool produced remains in its raw stage at the point of sale. In the absence of a community-owned scouring and combing unit in Korzok, there is no value addition at the production stage, post shearing. Sheep farmers expressed an urgent need for a producer association/cooperative in Changthang.
- **Feed shortages in times of extreme weather events**
In 2013 and 2019, rare snowfall over several days in spring resulted in significant loss of livestock. While the Sheep Husbandry Department provides supplementary feed in winter in Tegazung, in times of crisis when the roads are blocked for several weeks it is impossible for trucks bearing additional fodder and feed to reach Tegazung.
- **Loss of livestock due to predator attacks**
In 2024-2025, the Korzok sector saw a loss of 1,531 animals due to predatory attacks, slightly lower than natural causes at 1,601. Of these 828 in Tegazung and 428 in Korzok were the highest in the sector. While the government does offer compensation for this, many herders do not claim it due to the extensive documentation required to substantiate the claim.

Weavers

- **Weak horizontal linkages between weavers**

There are eight women's SHGs in Korzok with weak horizontal linkages between them. Members usually source wool from family stocks and process it by hand, which affects the quality of the final product.

The restricted supply of high-quality processed wool (raw material) is a considerable challenge. Processed wool helps weavers in weaving products with a high-quality finish and maximise their profit. The scouring and combing unit is located near Leh, around 220 km from Korzok. Due to the high transportation costs, processed wool is prohibitively expensive for independent weavers. There is no collective purchase of processed wool by the SHGs.

While a common hall has been provided for the women by the local Councillor, it is rarely used by them for weaving activities as women weave or knit at home. Establishing an independent weaving unit necessitates substantial investment, and the limited availability of working capital poses a significant challenge for women weavers. While micro loans are offered by SHGs, they are insufficient to meet the financial requirements. Additionally, while the Handloom Department facilitates bank loans through the Mudra Scheme, the extensive paperwork involved serves as a barrier to obtaining these loans.

- **Product quality control and consistency**

Weavers have difficulty maintaining consistent quality in their products, which can affect their ability to attract and retain clientele. Currently, they do not follow any common production standards. Post-production finishing for commercial products also requires products to be transported to Leh, which is a deterrent for most weavers.

- **Production limitations on backstrap looms**

Most of the women weave on backstrap looms. There are some production constraints with weaving on the *sked thag*. There is a limitation on the maximum width that can be woven on the *sked thags* (12 inches is an outer limit). Although maintaining the backstrap loom's cultural value is crucial, exploring innovations in design as well as expanding the scope with the introduction of new looms for commercial production is also necessary to boost productivity and attract younger, tech-savvy weavers.

- **Lack of exposure to new design possibilities**

Chang pa women weavers in Ladakh are currently faced with limited exposure to modern designs and consumer preferences. Given the remoteness of the location, there is very little access to technology, innovative techniques, and efficient processes. Additionally, they are seldom presented with opportunities to collaborate with designers.





- **Lack of research on wool fibre**
One of the main production constraints emerging from literature review on Chang luk wool, is the absence of technical knowledge for harvesting and processing fine fibre from the undercoat of the fleece which is comparable to *pashm*. The Chang pas currently separate the shorter length *jam bu* from the fleece but are unaware of a fine fibre in the undercoat that make it comparable with *pashm* and hold the potential for creating luxury fabrics.
- **Decline in intergenerational knowledge transfer**
Young women today see little returns on backstrap loom weaving in the present situation. Senior women weavers inform the study team that there is no enthusiasm for acquiring these skills without an assurance of income. As a result, there is declining transfer of knowledge from the parent generation to the younger generation. Many weavers are moving to alternative employment, such as in the tourism industry in Korzok and Leh, as daily wage labourers and salaried workers in BRO, and in the Indian Army's road construction projects. Korzok is following the national and global trend where young men and women are moving to sectors where they are better remunerated.

5.2 Major Marketing Constraints

Herders

- **Weak vertical linkages between herders and other market actors**
The herders sell wool directly at the farm gate. They are unaware of the end use of the 50% of wool sold to Tibetan traders and at what price it is sold forward or what is the end use for the wool. Thus they are unable to negotiate rates even if the market rises. Herders lament that the market has stagnated over many years.
- **Lack of market development**
Chang pa weavers mainly weave for their own consumption and limited sale through the SHGs. The study team encountered many families that have woven beautiful rugs and blankets but never sold them in the markets. In the absence of a defined market, weavers have very limited vertical linkages with final consumers and are unfamiliar with market information and consumer preferences. Information about market and business services is crucial for the efficiency of the value chain. The weavers have no information about marketing and business opportunities. This also impacts their ability to adequately price their products.

..... LEFT |
..... *Padma Yangzom, seen here twisting yarn on*
..... *a wooden yu pang, is one of the senior weavers*
..... *in the Foundation's weaving initiative*

- Absence of institutional framework**
 There is no institutional framework in the form of a collective or cooperative to leverage access to capital, procure raw material or support the weavers with access to markets.
- Insufficient promotion of Chang luk wool**
 Chang luk wool is unique to Ladakh in India (as seen in section 2.2). It has the most extensive staple length of fibre among all sheep breeds in India and an undercoat that shares the same physical characteristics in terms of fibre diameter with *pashm*. However, unlike *pashm*, which has secured a Geographical Indication (GI) tag and is being promoted for global markets, there are insufficient efforts being made for Chang luk wool.

5.3 Prospects for Sheep Wool Value Chain Development in Korzok

The sheep wool value chain in Korzok is traditional, informal, and highly localised in nature. There is a lack of both vertical and horizontal integration within this value chain. Vertical integration will occur when herder families take on additional activities like processing of wool to improve their income. Horizontal integration will occur when the Chang pa herder families take more control, for example, by collectively forming a cooperative and having direct contact with the market.

Each Chang pa household operates as an independent economic entity, engaging with agents in an impersonal market. The interaction between producers and buyers is limited to the exchange of price information, with buyers frequently determining the prices. Value chains are most effective when their actors collaborate to produce high-quality products, thereby increasing income for all involved, rather than merely exchanging price information in the simplest forms of value chains, where products are sold to whoever is paying a better price. The number of weavers involved in creating products for markets is limited, and they primarily sell their products locally to the visitors.

The current informal value chain holds considerable potential for transformation into a formal and inclusive value chain. There is plentiful availability of raw material and a skilled workforce of weavers who have participated in various training and capacity building initiatives. Many young Chang pas also hold an interest in diversifying from family holdings of livestock to processing and selling of processed, wool, yarn or fabric.

With the declaration of Changthang as a district in 2024 and the ongoing Changthang Development package, there is a good opportunity to create sustainable rural livelihoods based on sheep wool in Korzok sector as an alternative industry to tourism. It is crucial for the herders and weavers to organise themselves into a collective along with young entrepreneurs from Korzok to enable the creation of direct market linkages for value added processed goods. This process can be facilitated by Jungwa Foundation with the development of a strategy to foster opportunities for creativity, build capacities for entrepreneurship, introduce new skills through design input, and facilitate access to infrastructure and more profitable markets. For the collective to succeed it will necessitate collaborations among multiple stakeholders including District administration (when it is established), LAHDC, UT Government agencies, Jungwa Foundation, and the Korzok Chang pa community including both herders and weavers.

The strategy will aid in the transition from the current informal value chain to an inclusive value chain governed by a community entity (cooperative, producer company, or similar). By adding value at various stages of production, processing and marketing, the Chang pa community, through the collective, can transition from providers of raw material to securing a stake/share in the value chain and becoming co-owners of the chain. This collective is also critical for ensuring the scalability and sustainability of the initiatives undertaken by Jungwa Foundation.

The strategy enables the Chang pa community to transition from raw material suppliers to co-owners of an inclusive value chain, fostering value addition, scalability, and sustainability through a collective entity, ensuring long-term benefits and shared ownership of initiatives by Jungwa Foundation.

FOLLOWING SPREAD |
A shepherd leads his herd across the salt plains in Puga. The sheep lick salt off the ground which is essential to their diet.





Key Actors and Service Providers

According to the value chain analysis framework, the actors in the value chain refer to those individuals or entities who engage in a transaction which moves a product from inception to end use. Actors must exchange money (or an equivalent service) as well as a product, which generally increases in value with each transaction. (Legese, Haile, Dessie, Hussein, & Kuma, 2015) The primary actors in the wool value chain in Korzok are the sheep herders, women weavers, transporters, processors, local council government, NGOs and government departments. Analysis of the characteristics of these actors and their marketing strategies helps in designing intervention measures.

1. Sheep Herders

The sheep herders of Korzok are primary actors in the value chain. They herd sheep at high altitudes in difficult conditions and the sheep provide high-quality wool. The herders sell their raw material at the campsite itself from where the wool passes through several other actors before it reaches the final consumer. The wool is sold in bulk on shearing and is not graded to meet specific market demands. Thus, there is little interaction with the final consumer and no vertical linkages between the producer and final consumer.

2. Processors

The pre-production processing is carried out at a scouring and combing unit in Choglamsar, 220 km from Korzok, in the suburbs of Leh. This plant is a service provider to NGOs, SHG's, private entrepreneurs and some sheep herders from Changthang. In addition, a post-production finishing of products for the market is carried out in Leh, privately by individual entrepreneurs or through services provided by cleaning units in Leh.

3. Women Weavers

Women from the Chang pa community weave exotic indigenous handmade products. Their engagement and skills are central to the wool value chain. The weavers operate either individually or through a local SHG or through initiatives like Jungwa Foundation's livelihoods programme. Through very few individual sales in Korzok there is a limited vertical integration with the final consumer. As an informal group, there are horizontal linkages being established among weavers which aid in fixing prices, discussing design interventions and some product development through facilitation meetings organised by Jungwa Foundation.

Sheep herders

Processors

Women weavers

UT Administration through Government Departments

Ladakh Autonomous Hill Development Council

NGOs and Private Entrepreneurs

Consumers

4. UT Administration through Government Departments

a. Department of Sheep Husbandry

The Department of Sheep Husbandry is the key service provider in the value chain. The primary department in sheep production, it actively collaborates with sheep farmers to promote the continuation of pastoralism. This department offers veterinary care, extension services (advice and technical knowledge) and credit facilities to these farmers. Additionally, it supplies pelleted concentrated feed and dry fodder at reduced prices during the peak winter season.

b. Department of Industries and Commerce

The Department of Industries and Commerce, UT of Ladakh has set up a store named “Brand Ladakh” at Leh Market. Additionally, it has set up a state emporium also known as “Brand Ladakh” in a commercially busy location on Baba Kharak Singh Marg in New Delhi. This department offers a platform for artisans, self-help groups, NGOs and entrepreneurs from Ladakh to showcase and sell sheep wool products through their outlets in both Leh and Delhi.

c. Handloom Department

The Department of Handloom Development (under the Department of Industries and Commerce) is enhancing the skills of weavers by imparting training in design and weaving, offering marketing incentives for handloom products, and encouraging their participation in handloom expos and melas at the national, UT, and district levels.

d. Handicraft Department

The Handicraft Department conducts workshops and training on *nam bu* and carpet making for the weavers.



5. Ladakh Autonomous Hill Development Council

The LAHDC, represented by the local councillor from Korzok, is an important actor in the value chain. Through the Council funds are allocated for various development projects in Korzok such as the construction of a multi-purpose hall for the use of the women's SHGs, creation of a museum on nomadic heritage, etc.

6. NGOs and Private Entrepreneurs

The NGO, Jungwa Foundation, works exclusively on backstrap loom weaving with sheep wool in Korzok within an informal value chain. It seeks to create vertical and horizontal linkages between various actors. It sources raw wool directly from the sheep herders of Korzok which is processed in the scouring and combing unit in Leh, after which it is distributed to community weavers in/from Korzok. Over the past six years the Foundation has been documenting traditional motifs and weaving skills of the Korzok Chang pas and has been working with community weavers to craft a range of products derived from sheep wool through product design and innovation. These include a range of bags and pouches as well as furnishings (rugs, cushion covers, table runners). The products are sold through their office in Leh as well as through participation in fairs and exhibitions in both Leh and Delhi. They liaise with the Department of Handlooms to participate in events organised by them. The project has trained 35 weavers in Korzok in hand spinning yarn and backstrap loom weaving of sheep wool into a range of marketable products.

7. Consumers

The consumers of sheep wool products include the Chang pa community themselves who use the wool for personal consumption, private entrepreneurs and NGOs who process the wool for the final consumer—domestic and international tourists, consumers through e-commerce portals, and individual consumers at trade expos and handloom melas.

FACING PAGE |

A handspun and handwoven rug made of sheep wool produced by community weavers under Jungwa Foundation's livelihoods initiative

FOLLOWING SPREAD |

A herd departs for grazing from the campsite at Peldo in early summer. Elder Changpas observe the browning of the rangelands over the past few decades due to inadequate timely winter snowfall.





Market Analysis

Currently, NGOs and entrepreneurs of Ladakh sell sheep wool products—admittedly a very small proportion of the overall output from Korzok—in local and national markets. There is some level of consumer engagement through handloom exhibitions and other festival fairs in Ladakh. Based on the experience so far, the existing marketing channels for sheep wool products are retail shops in Leh such as Brand Ladakh as well as trade expos, cultural festivals and handloom *melas*/exhibitions. The online marketplace has emerged as an effective platform for targeting domestic and international consumers.

There are three main products which can be marketed—processed wool to private entrepreneurs; hand spun yarn to knitters; and the finished textile in the form of carpets, furnishings, apparel, etc.

Potential Domestic Markets

The hotel and hospitality industry in Ladakh can provide potential markets for rugs and furnishings. The hotel industry is the largest market for carpets/rugs, furnishings and blankets and this industry is continuously growing. With the growth in hotels, boutique hotels, restaurants and luxury camps both in Ladakh and across India, there is a growing demand for furnishings. An increasing recognition of handmade sustainable furnishings presents a good opportunity to tap into this market.

Indian private collectors and individuals with an appreciation of tribal artisanal products are also a potential market for handwoven woollen crafts. Ladakh is the main market for *nam bu*, used in the making of *goncha* and *sulma*, traditional Ladakhi attire. A limited market exists for processed wool which can be used by private weavers/entrepreneurs and hand spun yarn for the growing network of knitters.

The range of bags and pouches created by Jungwa Foundation has received a good response from young Ladakhis keen to showcase their culture and support sustainable livelihoods. These products also perform well in exhibitions and sales in Delhi and Leh. Participation in exhibitions, farmers' markets and craft bazaars across major cities of India with craft demonstrations will help to highlight Chang pa weaving and help the craft to reach wider national audiences.





Global Markets

As the global market becomes more accessible through digital channels, Indian artisans and entrepreneurs have an unprecedented opportunity to showcase their crafts to a wider audience, opening new avenues of economic growth. A careful analysis of global market trends shows a growing inclination towards handmade goods, which are increasingly valued for their low environmental footprint, ethical production and cultural authenticity. These trends highlight the growing demand for goods that tell a story, and Chang pa weaves fits perfectly into this shift with its deep-rooted cultural narratives and craftsmanship integrity.

Identifying the right international markets is key to a successful export strategy. For example, markets with a strong Indian diaspora may provide a ready consumer base with an inherent appreciation for Indian handicrafts. Some of the regular/repeat foreign visitors to Ladakh can also play the role of brand ambassadors of these weaves. Likewise, regions where there is a high demand for exotic and artisanal decor or where environmental consciousness is a priority, offer good opportunities for Chang pa weavers. Countries with colder climates can be a potential global market. Case studies of successful Indian handicraft exports from other states of India may provide invaluable insights and inspiration. With further research into the fibre and the potential for creating fine, luxury fabrics, sheep wool may be able to reach wider global audiences and create niche markets in the future.

FOLLOWING SPREAD |
*A family feeds grain to their herd
during the harsh winter months*





Key Recommendations

The Chang pas have been creating locally-sourced, low-carbon, sustainable, environmentally-friendly, ethical, and regenerative products long before such practices gained popularity. Allowing this craft to diminish would result in the loss of a valuable repository of knowledge. Without access to markets, the Chang pas are limited to producing solely for their own subsistence, which may not appeal to the aspirational younger generation who may not be interested in traditional subsistence weaving. Better marketplaces have the power to revitalise and elevate the craft to new heights.

However, making this leap necessitates more knowledge, and many actors along the value chain can help supply this crucial component. The actors may include design and fashion institutes, textile/wool research institutions, and market players. Local council government and Jungwa Foundation need to collaborate and play a stronger role in developing a conducive ecosystem for the development of the wool value chain in Korzok. If given the necessary support, the wool value chain can move from its existing position of weavers supplying a small undefined market, to one which is organised and supplies defined market segments with differentiated products.

With a total estimated annual production of 47.334 metric tons (2024) of sheep wool in Korzok, there is a significant rural employment opportunity here. The following recommendations seek to improve procurement and processing of wool, product development, research and market access.

8.1 Invest in Decentralised Infrastructure at Korzok

With the setting up of a wool producers' association, rates for wool can be standardised. With the help of local entrepreneurs and local council government, the association can establish a **small-scale, decentralised scouring and combing plant** through a public private partnership. By selling processed wool to buyers in addition to raw wool, herders will be able to boost profit margins. An environmental impact assessment on the creation of such a facility needs to be conducted first though, as the area lies within the Changthang Sanctuary.





Establishing **wool banks** (processed wool reserves) at Korzok is a good investment in the wool supply chain. Jungwa Foundation has initiated a wool bank in Korzok from 2024 with the support of InterGlobe Foundation. The wool bank will provide timely and uninterrupted supply of high-quality wool to the weavers and it will be available till the next shearing season. This will allow for a continuous supply of raw material for the network of 35 spinners and weaver in/from Korzok. This will function as a revolving supply of processed wool available to weavers which is replenished every year.

8.2 Institutionalisation and Strengthening of a Weavers Collective

There is an immediate need to form a **weavers collective** in Korzok which would be linked with the wool producers association from where processed wool can be sourced. A producer organisation can reduce transaction costs, create economies of scale, increase negotiation power of producers and thereby increase competitiveness in the wool sector. It can also contribute shared skills and resources and enhance product quality through common production standards that can be devised by the collective with the support of Jungwa Foundation and their design team. The collective can play a vital role in marketing the wool and wool products. The collective can offer a range of products from hand-spun artisanal Himalayan yarn for domestic and international knitters to a variety of finished products.

8.3 Conduct Weaver Facilitation Meetings in Korzok

Traditionally, weavers weave on *sked thags* individually at the entrance of their *rebo*. The dispersed nature of weaving across the camps of the Chang pas poses challenges for collective creation and innovation. Therefore, it is essential to facilitate regular meetings for weavers to gather, collaborate, and create together. To begin with, Jungwa Foundation can organise these meetings at consistent intervals, between weavers from both Chang pa and Korpa groups in summer when the Chang pas are camped in/ around Korzok. Subsequently, these meetings can be organised by the collective.

... LEFT |
... *Sheep wool is not segregated or graded at the time of shearing which affects the overall sale price of the raw material*
...

8.4 Promote Entrepreneurship Among Chang pas

There is a need to promote entrepreneurship at different levels among the Chang pa community in Korzok. Women weavers can be enabled with innovative ideas for product design, and trained on maintaining product quality to meet consumer demands. New skills for production such as tailoring can open income-generating opportunities from home for both men and women. The existing women's SHG base formed under various government programmes can be leveraged to promote entrepreneurship and training. Equally, it will be crucial to impart entrepreneurship training to young tech savvy graduates from Korzok. With competent business and marketing skills, they can work with the collective in the business management and marketing roles.

8.5 Incubate a Young Weavers' Programme

Efforts to attract and sustain the interest of the younger generation of the Chang pa community require a multi-pronged approach that includes raising awareness of their cultural significance, providing training and skills development, creating market opportunities, and providing financial incentives. Additionally, celebrating the craft's heritage and adapting to changing consumer preferences can make traditional Chang pa weaving more attractive to the younger generation. Digital marketing and entrepreneurship training can open up employment opportunities for the next generation of weavers.

It is essential to design a '**programme for young weavers**' with funding and mentoring from Jungwa Foundation to support the new generation of weavers and ensure the continued practice of Chang pa weaving. Through organised training, design workshops, and ongoing mentoring, Jungwa Foundation may significantly contribute to the knowledge transfer from parents to young people. Similar initiatives by Civil Society Organisations have been successful in Kutch District of Gujarat and the younger generation has returned to weaving.

8.6 Support Product Innovation in Collaboration with Design and Fashion Institutes

The traditional products woven by the Chang pa community (for their own use) forms the basis for design and innovation. Innovation in product design is key to promoting wool products in the niche markets on a national and international scale.

The innovative contemporary products developed by Jungwa Foundation have met with success with specific national and international consumer groups in Leh and Delhi. The consumers are fascinated with natural dyes, traditional motifs that are associated with Chang pa way of life, and the designs and style of the products. Similarly, certain novel weaves featuring conventional designs with traditional motifs gained greater traction amongst overseas consumers.

To succeed in a competitive marketplace, it is imperative to work with national-level design and fashion institutes to innovate product designs and respond to changing consumer preferences and fashion trends. The fusion of tradition and modernity could result in a new perspective and new relevance for traditional Chang pa weaving. The addition of modern design features to traditional weaves and a combination of different colours makes these pieces versatile and attractive to both traditional and modern design enthusiasts.

8.7 Initiate a Pilot Project to Develop Fine Textured Apparels from Chang luk Wool

The findings from the SKUAST study concluded that the secondary fibre from the undercoat of the fleece had a finer diameter and smooth handle which could be employed for the creation of smooth-textured luxurious fabrics, ranking next only to pashmina. (Malik, et al., 2021). This research paves the way for new avenues in textile research and development concerning Chang luk wool, potentially necessitating advancements in both the harvesting, dehairing and other processing techniques of the wool.

Equally, fine lamb's wool (*yum bu*) identified by informants as the most prized sheep wool fibre can be used to develop fine quality apparel.

To create fine textured fabrics, a pilot project will need to be funded and initiated involving collaborations with Textile/ Wool Research Institutes, Jungwa Foundation, LAHDC and the future district administration. Based on the outcomes of the research and with the backing of textile research institutions, the Chang pa community could pursue a GI tag for Chang luk wool. The GI tag recognises distinct qualities and the reputation of products tied to their geographical origins^[6].

8.8 Market Development for Sheep Wool Products

Ongoing and dedicated efforts to develop markets are a must. It may be beneficial to allocate a distinct '**market development fund**' specifically aimed at exploring opportunities in Delhi NCR, Punjab, Himachal Pradesh, Mumbai, Hyderabad and Bengaluru. Meetings can be organised with heritage hotels and experiential resorts to showcase the products created by Jungwa Foundation's livelihoods initiative. In addition to participating in marketing events, Jungwa Foundation could host its own initiatives, such as craft demonstration-cum-awareness shows in Delhi NCR, Mumbai and other major cities, inviting individuals from diverse backgrounds. Likewise, standalone exhibitions could be considered in Bengaluru, where numerous corporate entities are situated and there is a growing appreciation for handloom and handmade goods.

8.9 Setting Up a Weaver Facilitation Centre in Leh

Establishing a weaver facilitation centre in Leh, the headquarters of the Union Territory of Ladakh, would provide ample access to amenities and markets, given the increasing number of tourists visiting Ladakh. The centre would also provide a space for fostering long-term collaborations with designers. This centre would introduce weavers to a diverse range of technologies, techniques, and processes that could enhance their craft. The facility will be equipped with comprehensive infrastructure, including both traditional and modern looms, as well as a tailoring unit, offering complete solutions for the beneficiaries/weavers.

Additionally, a small retail/compact outlet displaying an array of sheep wool products within the centre would serve as a unique experiential retail outlet—creating an immersive experience for both domestic and international tourists, where they can interact with the weavers and connect with the traditions behind Chang pa weaving. This could help build a brand-story for the tribal artisans.

[6] The Ladakhi Pashmina wool received GI tag in 2024.

Invest in decentralised infrastructure at Korzok.

Institutionalisation and strengthening of a weavers collective.

Conduct weaver facilitation meetings in Korzok.

Promote entrepreneurship among Chang pas.

Incubate a young weavers' programme.

Support product innovation in collaboration with design and fashion institutes.

Initiate a pilot project to develop fine textured apparels from Chang luk wool.

Market development for sheep wool products.

Setting up a weaver facilitation centre in Leh.

Conclusion

In conclusion, this study aimed to understand the current sheep wool value chain in Korzok and explore potential avenues for value addition to enhance rural livelihoods. The findings reveal that while the existing value chain offers limited income opportunities for local shepherds and weavers, there are significant gaps in processing and marketing that limit profitability.

By identifying key areas for improvement, such as investing in local processing facilities and creating access to processed wool for weavers, developing marketing strategies that highlight the unique qualities of Chang luk wool and Chang pa weaving through a facilitation centre in Leh, there is substantial potential to increase both income and employment in the community.

Implementing these strategies could not only bolster the economic resilience of rural households but also promote sustainable practices in sheep farming. Moving forward, collaboration among stakeholders—including local herders, weavers, non government and government entities—will be essential to realise these opportunities and foster a sustainable wool industry in Korzok.

This study highlights gaps in Korzok's sheep wool value chain that limit local income opportunities. Recommendations include investing in processing facilities, enhancing weaver access to wool, and marketing Chang luk wool's unique qualities via a facilitation center in Leh. These strategies can boost rural incomes, employment, and sustainability. Collaboration among herders, weavers, and stakeholders is vital to developing a resilient, sustainable wool industry in Korzok.



Key Informants and Discussants

Karma Tsering
Tsering Dorjay
Kalzang Damdul
Tsewang Sonam
Tsering Dorje
Sonam Tundup
ChimetDorje
Tsering Dolma
Sonam Dolma
Tsetan Palmo
Tundup Tashi
Sonam Tundup
JigmatTsetan
Tundup
Padma Thinley
Kamet Dorje
Jigmat Stanzin
Tsering Namgail
Sharap Dolma

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*A blanket of snow covers the nomadic
encampment at Tibra Gongma at the
onset of winter. Temperatures can
plummet to -35°C in winter.*



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Livestock rearing involves the entire family and at the time of shearing the women and children help in rounding up the herd

FOLLOWING PAGE |

Young lambs at Tegazung. The lambing season begins in December.





Jungwa Foundation promotes cultural and natural heritage conservation for the wellbeing of communities and the ecosystems they inhabit. The Foundation works with communities to conserve tangible and intangible cultural heritage, engages with communities for environment preservation, develops sustainable nature- and culture-based livelihoods for women and youth, and fosters the transfer of traditional knowledge to younger generations through educational outreach initiatives.

InterGlobe Foundation (IGF) is the philanthropic arm of InterGlobe Enterprises Private Limited, a leader in Aviation, Hospitality and Travel related services. IGF is committed to building a society that is just, equitable, inclusive and utilizes resources in a sustainable manner. It nurtures partnerships and supports initiatives that bring together resources and expertise in the areas of Culture and Heritage Preservation, Environment Protection and Conservation, and Livelihood Promotion, to make a meaningful and transformative impact.

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A SHEEP
WOOL VALUE
CHAIN STUDY
FOR KORZOK,
CHANGTHANG

PUBLISHED BY



JUNGWA
FOUNDATION

FUNDED BY



INTERGLOBE
FOUNDATION