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Cashmere value chain analysis in Mongolia

Value chain analyses assist in informing policy dialogue and investment operations. They help the understanding of how agricultural, aquaculture and fisheries development fits within market dynamics. They permit an assessment of the value chains' impact on smallholders, businesses, society, and environment.

The European Commission has developed a standardised methodological framework for analysis (https://capacity4dev.europa.eu/projects/value-chain-analysis-for-development-vca4d/info_en). It aims to understand to what extent the value chain allows for inclusive economic growth and whether it is both socially and environmentally sustainable.

With a production level of around 10,000 t, Mongolia is the world's second-largest producer of raw cashmere after China, and the second-largest exporter of cashmere yarn and garments. Cashmere production takes place within the context of the traditional herding livelihood in Mongolia, which has a special social, historical and cultural status, but has also transformed it, by providing an incentive for increasing goat numbers absolutely and relative to other livestock species, producing important environmental impacts. Cashmere processing is also a significant and well-remunerated source of urban employment, especially for women.

The European Union intervention

The Government of Mongolia is engaged in promoting the sustainable development of the cashmere value chain (VC) via the "One Billion Tree Initiative" launched by the President of Mongolia at the margin of the COP26. The objective to fight deforestation and climate change, combined with the need to create jobs and food security, is pushing toward diversification and transformation of main national raw materials, cashmere being identified among the strategic VCs.

The EU Delegation to Mongolia supports this national vision via its multi-annual indicative plan (MIP) 2021-2027. The MIP has identified "Sustainable ecosystem and agriculture

The value chain context

Mongolia is a resource-rich, landlocked open economy, with a total population of 3.29 million that makes the country among the least densely populated countries in the world. Out of a total land area of 1.5 million km², some three-fourths account for pastureland.

The Mongolian economy is dominated by the extractive industry. Agricultural products are the second-largest source of export revenues after mineral products.

management for rural development" as an area of action to strengthen Mongolia's transition to a greener economy, focusing on strategic VC's, including the cashmere one.

The EU has also supported initiatives such as the Sustainable Textile Production and EcoLabelling programme in Mongolia (STeP EcoLab) between 2018 and 2022.

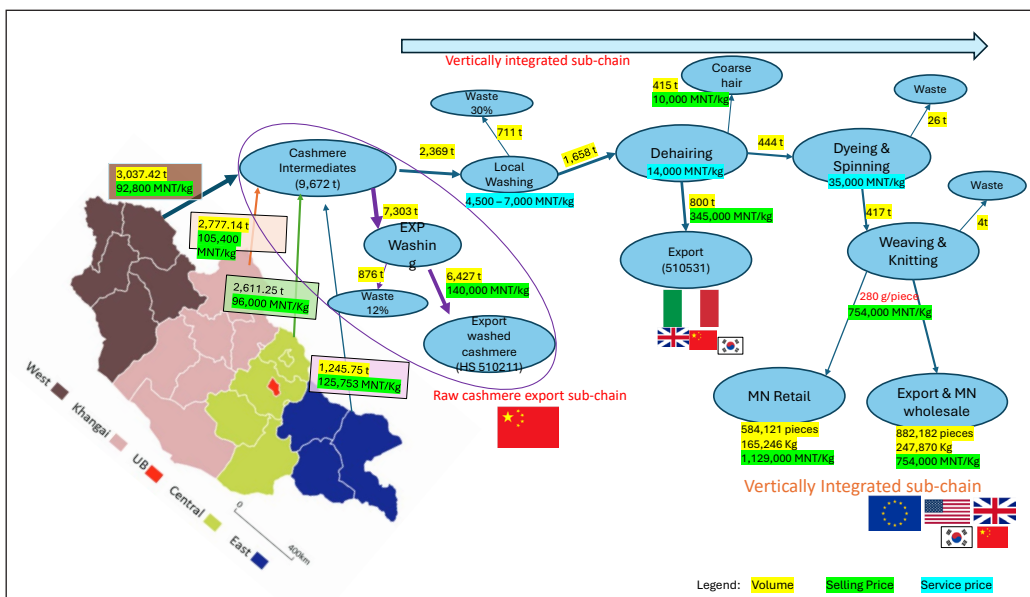


Figure 1: Flow chart of the VC

Functional analysis

Raw cashmere production reached **9,672 t** in 2022 from a **27.5 million goat population** (38% of Mongolian animals). Cashmere production is spread throughout the country (27% from the Central region, 13% from the East, 29% from Khangai and 31% from the West). Cashmere is hand-combed by herders in spring, starting from the East in March until June in the Western region. The highest fibre quality and price is reached in the East.

Two main types of herders are identified: **small herders** with an average of 95 cashmere goats and **large herders** (~340 cashmere goats) (Figure 2). Both types of actors have similar herding practises, but present differences in costs and expenditures (assistant herders, trucks, high depreciation for equipment in large farms).

Cashmere VC	Average / Total	East	Central	Khangai	West
Yield of cashmere (kg/ animal)	0.351	0.309	0.363	0.312	0.408
Number of goats (in thousands, pieces)	27,569	4,031	7,191	8,907	7,441
Cashmere production (t)	9,672	1,246	2,611	2,779	3,036
- Small herders	5,685	732	1,535	1,633	1,785
- Large herders	3,987	514	1,076	1,146	1,251
Number of herder households with goats	211,549	28,174	50,687	76,199	56,489
- Small herders	180,541	21,694	42,222	66,293	50,332
- Large herders	31,008	6,480	8,465	9,906	6,157

Figure 2: Characteristics of cashmere value chain in Mongolia

The cashmere VC in Mongolia consists of two main sub-chains based on different level of product finalisation: i) the **raw cashmere export sub-chain**, based on export of scoured cashmere to China, ii) the **vertically integrated sub-chain** which integrates different stages of processing.

Raw cashmere sub-chain

The raw cashmere export sub-chain concerns around 75% of the annual production. Raw cashmere is collected from herders by middlemen, who move it to washing centres, from where cashmere is exported mainly to China (Figure 1). This sub-chain is expected to change significantly with the technical regulation (Annex to Government Resolution No. 380/2022) that limits the export volume of unprocessed cashmere up to 0.3% of coarse hair and intermediate fibres, reinforcing value addition and employment within the country.

Vertically integrated sub-chain

The vertically integrated sub-chain processes around 25% of the Mongolian raw cashmere. It includes the following

processing phases: sourcing by intermediaries (primary and secondary cooperatives, middlemen), sorting, washing, dehairing, dyeing, spinning, weaving, sewing or knitting of final products. Half of the cashmere is exported after dehairing, mainly to Italy where it is further processed. Mongolian apparel products are both sold internationally (EU, USA, UK, Korea) and in the local market.

Governance

Besides the VC actors, a variety of governmental, private, civil society and international actors contribute to the governance of the cashmere VC (Figure 3). The Mongolian government aims to develop a sustainable and economically efficient livestock sector that is resilient to climate change and ensures reliable food supply. The government strategy, supported by many international donors and organisations, is to develop a nomad system, which integrates sustainable steppe management and increase in value addition. Civil society plays an important role in representing the herders' voice in policy discussions and consultations, especially on discussions concerning rangelands.

There are several certification schemes at both herder and factory level, but they face a low level of harmonisation and recognition from the government. Of the herder/cooperative standards scheme, the Responsible Nomads code of practice for sustainable development standard (RNS) is in the process of increasing alignment with the Sustainable Cashmere Certification Committee (S3C) standard. Concerning processing and garment manufacture, the Wool and Cashmere Association (WCA) is an accredited certification body that can monitor and audit companies using the Sustainable Textile Standard (MNS 6926:2021). It also holds the registered trademark Mongolian Noble Fibre.

Herders co-operate in various cooperatives, Pasture User Groups (PUGs) and in non-formal networks but the coordination among them is usually weak. The weak financial capacity of cooperatives makes herders more dependent on middlemen who provide them with cash advances.

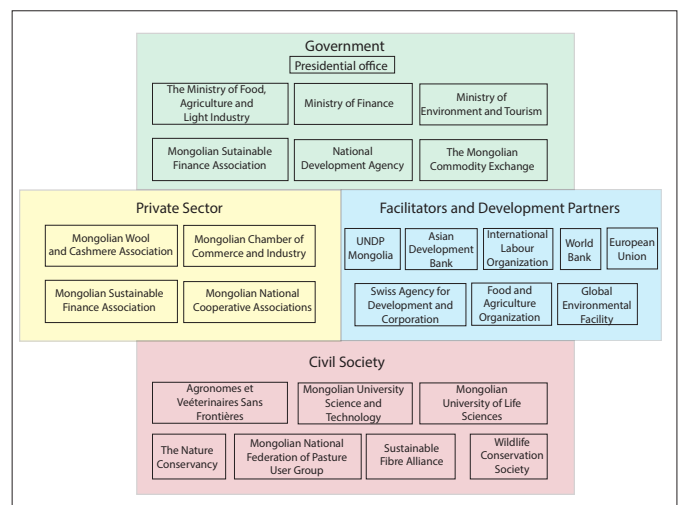


Figure 3: Governance scheme

What is the contribution of the value chain to economic growth?

Effects within the national economy

The **total value added** (VA) generated by the cashmere VC in 2022 is estimated at 1,919 billion MNT (€581 million). The direct VA from the VC actors (herders, processors, traders) accounts for 96% of the total VA whilst the rest (4%) is generated as indirect VA by the suppliers of goods and services (fodder, petrol, water, veterinary, washing and insurance services...).

The total VA is composed of Net Operating Profits (NOP) (74%, of which 40% of small farms and 25% of large farms) followed by interest on loans (10%) and depreciation (7%) (Figure 4).

The **contribution of the whole VC to national GDP** is nearly 4% while that of the farmers to the agricultural GDP is as high as 27.4%.

The **contribution of the VC to public finances** records a positive impact of 62,056 million MNT (€18.8 million) as taxes collected through the VC activities are higher than public expenditures on the VC. The **contribution to the trade balance is positive** (€366.5 million). The **rate of integration is 91%** meaning that a great portion of the value of the VC production remains within the national economy.

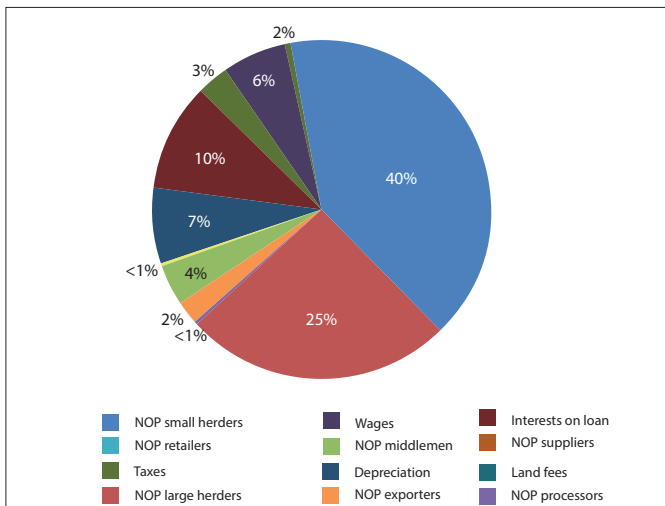


Figure 4: Distribution of the Total Value Added

Direct VA generation by sub-chains and VC stages

The raw cashmere sub-chain contributes by 64% of the direct VA due to the higher volume of cashmere entering this sub-chain whilst the vertically integrated sub-chain contributes by 36%.

However, the latter adds more value per t of raw cashmere (€84 thousand/t) compared to the raw cashmere sub-chain (€49 thousand/t), reinforcing the argument of developing local process in the country. Among the VC stages, production is currently the main contributor to the direct VA (74%) followed by processing (22%) and trade (4%).

Financial viability for the actors

The operations in the cashmere VC are **profitable for all activities** identified (Figure 5). Herders register high NOPs and Return on Turnover (ROT), due to low input intensity. The main costs for herders are fodder, petrol for transport, interests on loans and depreciation. The financial situation is more complex for downstream actors because processors require loans and debt

financing to afford buying high-price cashmere in the limited period between March and June, which is among the factors inhibiting the development of the cashmere processing.

Actor	Net Operating Profit*	Return on turnover*
Small herder Eastern small	5,070,042 MNT (€1,535)	75%
Small herder Central small	4,700,000 MNT (€1,422)	74%
Small herder Khangai	4,508,470 MNT (€1,365)	73%
Small herder Western	4,982,000 MNT (€1,508)	75%
Larger herder Eastern	14,026,805 MNT (€4,250)	75%
Large herder Central	12,705,536 MNT (€3,850)	74%
Large herder Khangai	12,038,470 MNT (€3,645)	73%
Large herder Western	13,713,777 MNT (€4,153)	75%
Middleman	10,927,148 MNT (€3,309)	0.80%
Exporter-washing (raw cashmere sub-chain)	1,077,538,140 MNT (€326,328)	4.60%
Exporter-dehairing (vertically integrated sub-chain)	942,620,580 MNT (€285,469)	15.40%
Large apparel producer (vertically integrated sub-chain)	453,568,663 MNT (€137,361)	22%
Small apparel producer (vertically integrated sub-chain)	345,387,000 MNT (€104,599)	6%
Retailer (vertically integrated sub-chain)	92,164,047 MNT (€27,911)	3.40%

Figure 5: Financial viability for the cashmere VC actors
*Net Operating Profit (NOP): Net income of the actor (excluding depreciation) *Return on turnover: Net operating profit/production

Viability in the international economy

The **Nominal Protection Coefficient (NPC) is estimated at 1**, meaning that the remuneration would be the same if international prices were applied. The **Domestic Resource Cost ratio (DRC) is 0.08**, denoting a **comparative advantage and viability** in the international economy. Thus, considering international markets and domestic factors' remuneration, the value of domestic factors used by the VC activities is lower than the value they produce.

The Mongolian cashmere value chain is crucial for nomad families resulting in significant income. It creates 27% of agricultural GDP and contributes positively to the national economy through taxes and exports. The value chain proves to be both financially profitable and sustainable, particularly at the level of herder families. However, the financial situations of the processors are more complex. The most challenging situation is observed at the level of integrated textile producers, who faces large costs of capital and long production process.

Is this economic growth inclusive?

Distribution of income among the actors

The NOP of the VC direct actors equals to 1,384,693 million MNT (€419.3 million) and small and large herders' profits account for 90% of this (55% and 35% respectively). Trade and processing industry shares only 10% of the VC profit, mainly due to relatively small number of processing actors in comparison to large number of herder households.

Job creation and employment

The cashmere VC creates **7,584 waged jobs in Full Time Equivalent (FTE)** of which 87% are permanent and 13% temporary jobs. Wages in the whole cashmere VC amount to 96,206 million MNT (€29.1 million). Women occupy 55% of the waged FTE jobs and receives 57% of wages. Permanent unskilled workers are the most frequent job category. The majority of jobs are created in the processing sector, namely

among 34 washing factories, 46 dehairing factories, 16 spinning factories, and 80 small and medium sized enterprises that focuses on garment production.

The economic growth driven by the cashmere value chain is inclusive. The value chain provides employment opportunities for a significant number of women across various age groups. Salaries in the cashmere transformation are on par with the national average, making employment in cashmere processing highly sought after. Herders, considered a vulnerable group due to their challenging nomadic lifestyle, benefit from the income of the value chain which contributes to the sustainability and viability of nomadic activities in Mongolia.

Is the value chain socially sustainable?

The following table and Figure 6 provide an indication of the main social consequences and context of the VC activities in six key domains.

Working Conditions	<ul style="list-style-type: none"> Valued work in the herding sector as part of an important traditional livelihood, but increasingly unattractive to younger generations, especially girls. Well-remunerated and generally attractive work in processing, generally high respect for labour rights, issues of child labour and job safety are being addressed.
Land and Water Rights	<ul style="list-style-type: none"> Lack of the clear legal framework and necessary reforms to promote good rangeland management at local/community level, while also to allow flexibility for longer-range migration in times of crisis.
Gender Equality	<ul style="list-style-type: none"> Significant employment of women by the VC at the processing level, favourable salaries and benefits, and opportunities for leadership for women. Weak registration of herding women as owners of land, livestock and major household assets, weaker access to credit than men. Herding women suffering some discrimination in terms of roles in decision-making, community leadership and workload despite the less severe inequalities than in many middle-income countries.
Food and Nutrition Security	<ul style="list-style-type: none"> Widespread concern about lack of dietary diversity and a high fat diet and their health consequences. Importance of the system of herder loans used by a significant minority to smooth consumption expenditure without raising problems of indebtedness associated with other forms of credit. Disappointing uptake of the system of index-based livestock insurance, despite its positive design features (not helping farmers to cover animal losses and thus income for food, especially in harsh winter conditions).
Social Capital	<ul style="list-style-type: none"> Increasingly strong role of PUGs in rangeland management. Significant and growing role of the cooperative movement, but low level of membership (only a third of herding households). High participation in producer organisations and in bagh assemblies (the lowest tier of local government). Generally good information flows, high levels of trust in the more integrated sub-chains.
Living Conditions	<ul style="list-style-type: none"> High levels of health service provision, housing and education, despite issues around education provided in rural areas.

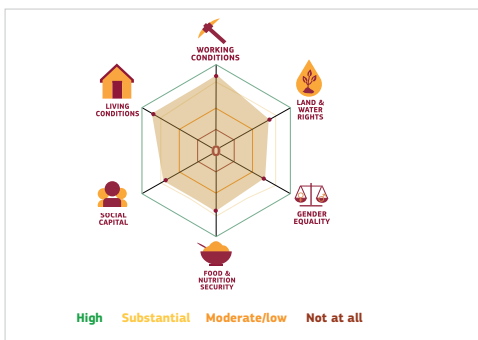


Figure 6. Social profile

The herding livelihood is valued positively and with pride but is also associated with the linked issues of gender inequality and the unattractiveness of the herding livelihood to younger generations, especially girls. A lack of dietary diversity is a major problem across rural and small-urban Mongolia, that needs to be tackled by measures outside the value chain. The development of community-level institutions for herders, Pasture User Groups and member-owned cooperatives, is progressing but still present in a minority of communities. The important issue of rangeland governance is being addressed through measures now progressing through parliament. Overall, there are no major social factors militating against further investment in the value chain and that such investment can enhance social wellbeing.

Is the value chain environmentally sustainable?

The environmental impacts of the cashmere VC are measured through Life Cycle Assessment (LCA) considering three areas of protection: **resource depletion**, **ecosystem quality** and **human health**. LCA results also show the VC's impact on **climate change**.

Total impact on areas of protection

The damage of the Mongolian cashmere VC on **resource depletion** shows a surplus cost (1.5 million USD\$ at 2013 values) for the reference year 2022. Mainly because of pollutants particulates released and greenhouse gas (GHG) emissions, the cashmere VC has a negative impact on **ecosystem quality** and **human health**. When all these impacts are expressed in a single score (Figure 7), livestock production systems are seen as the major contributor to the total impacts (70%), followed by the dyeing process (14%). Other stages account for 16%.

Contribution of all stages to climate change and resources depletion

Reducing GHG emissions in all sectors is a major issue for Mongolia that faces increasing climate variability and extreme weather events. Total GHG emissions intensity reaches over 900kg CO₂-equivalent per kg of cashmere garments leaving the factory. This value is far higher than emission intensities from other textile commodities. **Livestock** remains the **main contributor to the GHG emissions** of the VC (77% of the total GHG emissions), especially through enteric methane. Moreover, environmental impacts of the VC strongly depend on coal as an energy source, either directly in factories or in power plants to produce electricity (over 93% of energy in Mongolia comes from coal-fired power plants). Electricity uses are responsible for around 22% of the total GHG emissions all along the VC.

Potential impacts of chemical use along processing stages

Along with adding to GHG pollution, burning coal emits toxic and carcinogenic substances in the air, water and

land, severely affecting the health of miners, workers and surrounding communities. Other potential impacts on human health and ecosystems are related to use of chemicals in processing stages, especially dyeing, and discharge in the environment due to lack of water treatment. Release to the environment can contribute to **water eutrophication** (due to chemical oxygen demand, total phosphorus and total nitrogen and NH₃-N discharges) and **water ecotoxicity** (due to chromium, aniline and adsorbable organic halogens discharges).

Cashmere goat rearing as a driver of rangeland degradation

In Mongolia, the rangeland degradation dynamic is fast-moving and the contribution of cashmere goat rearing to this dynamic through overgrazing is significant. The move to a market economy has led cashmere producers to gradually increase their herds. Additionally, families have moved and concentrated around towns, including the capital, increasing grazing pressure around housing areas. The increasing grazing pressure is likely to decrease the global plant biodiversity of Mongolian steppes leading to less feed for animals. Furthermore, discussions could also be opened up about how pasture degradation could impact animal biodiversity. In most production areas, livestock shares rangeland with wildlife, especially with other wild ruminants.

Environmental impacts mainly occur at two stages of the value chain: cashmere livestock production systems and the dyeing process. For cashmere livestock production, there needs to be more awareness about methane emissions and rangeland degradation. Concerning the dyeing process, there should be a specific focus on potential pollution by water waste discharges and energy use, especially coal use.

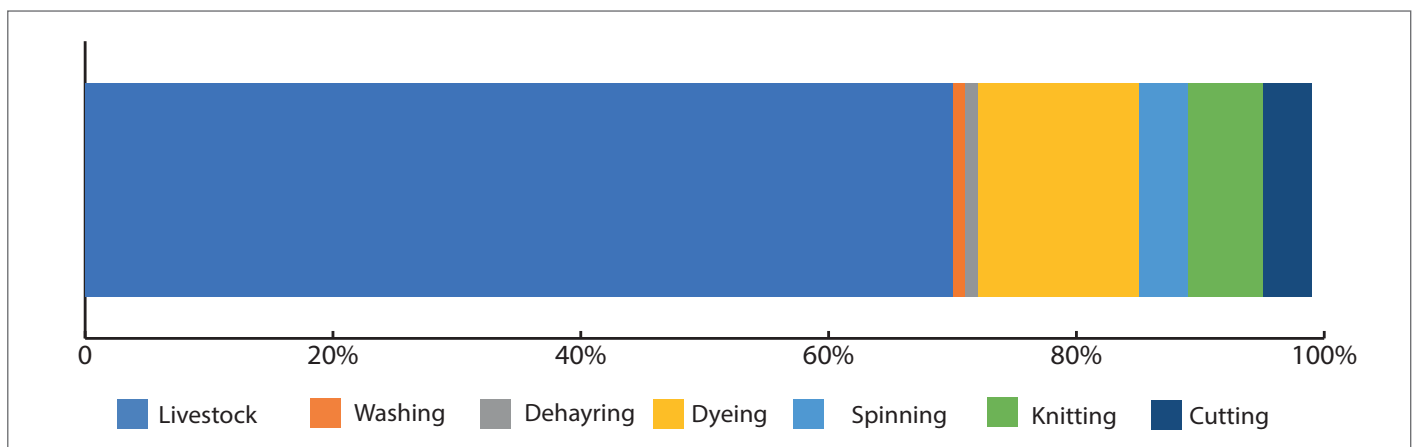


Figure 7: Contribution of the different stages to the overall damage of the Mongolian cashmere VC

Main findings and recommendations

Main findings

The cashmere VC is a source of rural livelihoods, high-grade urban employment and an important contributor to national economic growth and diversification of exports. However, the fact that local cashmere manufacturers need to operate with financial credits (at high interest rates) to finance the purchase of cashmere during the combing period, represents a significant cost at downstream level, that pushes companies to the edge of profitability. This limits the development of the sector competing with Chinese traders who have access to cheap capital. There also exist important environmental issues (rangeland degradation, renewable energy use and water treatment in processing, GHG emissions from livestock, etc.) to address.

Recommendations

Mongolia can enter a virtuous cycle of verifiable high quality driving higher prices so that herders can obtain increased income from fewer goats, with the right enabling actions and policies. Some of the most important recommendations arising from the analysis are as follows:

Production level

- Strengthen the policy and legal framework for herder access to rangelands; build capacities of soum governments and PUGs to support community management of rangelands; reduce overgrazing; retain flexibility for longer-range migration in times of crisis.
- Support herders through the improved design, management and communication of herder-level animal health services and livestock production advice.
- Promote livestock-based VCs to benefit from the marketing of other products beyond cashmere.

Processing level

- Reduce the negative environmental impacts of processing enterprises through i) increased use of renewable energy, ii) enforced existing standards on sustainable use of chemicals and wastewater treatment, and greater use of existing internationally recognised green certified chemicals.
- Promote the quality of processing activities, particularly dehairing. Supporting the development of regional processing centres outside Ulaanbaatar.

Trade level and export

- Foster collaboration of VC actors on enforceable standards and well-promoted voluntary labelling schemes to: incorporate animal health and welfare; guarantee herder incomes; incentivise higher quality production; incentivise caps on goat numbers relative to rangeland resources through higher farmgate price; drive increased demand for high quality Mongolian cashmere by active promotion of standards and labelling schemes to exporting companies.
- Foster mechanisms to increase availability of cash flow to intermediate actors of the VC.
- Promote member-owned cooperatives through a favourable policy environment and capacity-strengthening.
- Tighten the link between herder price and fibre quality, through an auction model.



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