Global Gateway

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IMPACT SHEET: Sustainable Yak Leather (SYL)

Capacity building to the Mongolian vegetable tanned yak leather cluster on bio-leather and bio-leather products

Support the Vegetable Tanned Yak Leather Cluster in reducing the environmental impact of production, improving resource efficiency and adopting circular economy practices, enabling its members' integration to global greener value and supply chains

8 DECENT WORK AND ECONOMIC GROWTH

9 INDUSTRY, INNOVATION AND INFRASTRUCTURE

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PROJECT BACKGROUND

Prior to 1990, Mongolia's considerable livestock resources, were relatively stable. The hides and skins they provided were semi-processed domestically, and exported to the Soviet Union for finishing and the manufacture of miscellaneous leather products. Over the next three decades, livestock numbers tripled – to 71 million animals in 2019 – but the Country's tanning sector deteriorated. The initial decline was attributed to impacts of the transition to a market economy, and consequences of the booming leather sector in neighbouring China. Privatized tanneries in Mongolia struggled with: irregular quantity/quality of raw materials, reliance on outdated equipment and technologies, inadequately skilled human resources, limited market information/intelligence, and expensive financing. Only relatively recently, after considerable inputs to development of the livestock sector in general (for meat and milk production) has attention been devoted to the improved utilization of livestock by-products (hides and skins) despite the value of the final (leather) product often exceeding that of the primary products. Examples of others' initiatives targeting the leather sector in particular include: establishment of the Emeelt Eco Industrial Park, and establishment (and equipping) of the Central Leather Testing Laboratory. Within this context, the SYL project was designed, to focus on one discrete type of raw material (yak hides), from four particular provinces (Arkhangai, Bayankhongor, Khuvsgul and Uvurkhangai), using vegetable tanning (as an innovative alternative to traditional mineral-based methods).

CHALLENGE

Globally, tanning and the manufacture of leather products, has become dominated by China; which accounts for 25% of the world leather manufacture and 50% of footwear production. Accordingly, it is difficult for Mongolia's domestic industry to compete with the economies of scale enjoyed by its neighbour. However, as with any business, there is scope for specialisation, and yak hides along with vegetable tanning provide scope for special attention by Mongolia. While the tanning of all (maybe 10 million annually) hides and skins would benefit from improvement in Mongolia, those of yaks provide a relatively discrete supply, which (with proper attention to environmental issues and promotion/marketing) can provide easily identifiable products (for domestic and internal consumers) with scope for Geographical Indication. Moreover, many of the improvements targeted at yak hides, vegetable tanning and leather products manufacturing, would also be relevant to most other hides and skins produced in Mongolia; those destined for partial processing only, with finishing elsewhere after export.

PROJECT OBJECTIVES

The overall Objective is to support the Mongolian Vegetable Tanned Yak Leather Cluster in:

- reducing the environmental impact of production
- improving resource efficiency
- adopting Circular Economy practices

in order to allow the members' integration to global greener value and supply chains.

The specific objectives are to:

- Develop the production of bio-leather and the manufacture of associated bio-leather products.
- Establish sustainable and traceable supplies of hides of domesticated yaks, available as raw materials for the emerging, vegetable tanning industry.
- Reduce losses associated with existing (incomplete) collection of hides, and waste attributed to remediation and improper processing.
- Improve the efficiency and effectiveness of tanning, finishing, and leather products manufacturing operations.
- Enhance the skills of the Vegetable Tanned Yak Leather Cluster (and other leather MSMEs) on sustainable production and marketing;
- Enhance production of sustainable & environmentally friendly yak leather products suited to export markets.

TARGET GROUPS

- Herders engaged in livestock (yak) production.
- Traders and merchants supplying yak hides.
- Members of the Vegetable Tanned Yak Leather Cluster.
- Other leather MSMEs, including members of the Mongolian Association of the Leather Industry (MALI).

PROJECT ACTIVITIES

SUSTAINABLE PRODUCTION

Capacity building across the value chain:

Training tannery staff (raw material quality, etc.); training herders (animal husbandry welfare, etc.), butchers (slaughtering, etc.), traders & merchants (preservation, etc.).

Cleaner and advanced processing techniques:

Introduction of latest beamhouse techniques using new chemicals; introduction of latest vegetable tanning & finishing techniques; introducing low energy emission finishing.

Circularity, efficiency, and pollution control:

Training on new processes eliminating materials that constrain recycling; promoting enhanced process monitoring & control; promoting new effluent treatment system.

PROCESS CONTROL

Traceability, data management, and compliance:

Establishing process control traceability; installing database of process operations; process operations software licenses.

Quality assurance and standards verification:

Provision for laboratory analyses to confirm adherence to standards.

MARKET INTELLIGENCE

Market access and requirements analysis:

Trading requirements with international markets; needs assessment of producers/exporters of leather products.

Consumer, legal, and business readiness:

Training on consumers' demands and legal (eco-labelling etc.) requirements; preparation of green business plans.

CERTIFICATION

International certification pathways:

Plan for membership of the Leather Working Group (LWG); preliminary registration to join the Responsible Leather Round Table (RLRT).

MARKET LINKAGES

Supply chain and retail integration:

Establishing supply linkages with distributors in Europe; linkages with retailers' requirements.

Technology adoption and skills development:

Installation of CAD/CAM; training on CAD/CAM.

Access to finance:

Workshops with investors/institutions to promote green finance.

LESSONS LEARNED

The Project addressed two broad sets of challenges: those that motivated its initial design and those that emerged during implementation. At the outset, it responded to structural constraints including insecure access to raw materials, non-compliance with international quality standards, outdated tannery technologies, weak market intelligence, and limited skilled human resources. These were tackled through targeted teaching, training, and technical assistance delivered by a multidisciplinary team of specialists from internationally recognized organizations such as ELSEViE and INESCOP. During the four-year implementation period, additional external challenges arose, notably the after effects of the COVID-19 pandemic, prolonged closure of the Mongolia–China border, tightening of business lending by commercial banks, persistently high borrowing costs, elevated inflation, depreciation of the Mongolian tögrög, and delays in relocating tanneries from Ulaanbaatar. While pandemic-related disruptions were mitigated through adaptive measures such as expanded online training and rescheduled field activities, most other constraints were beyond the Project's control. Nevertheless, these conditions sharpened cluster members' focus on developing more realistic business plans, helping to shift away from overly optimistic assumptions and strengthen resilience.

Despite the longstanding nature of the issues affecting the livestock sector in Mongolian in general (and by-products utilisation in particular) the processing of hides and skins, and the manufacture of leather and leather products, still remain severely underdeveloped. In the absence of reliable statistics, it is obvious that many hides and skins (especially among the estimated 80% produced remotely (away from licenced slaughter facilities) remain uncollected; and therefore wasted. Among those raw materials that are collected, non-leather making components (residual fat, flesh and trimmings) contribute unnecessarily to tannery discharges (fleshings, sludge, suspended solids, dissolved solids, BOD, etc.). Removal and processing of some such non-leather making components at their source, would provide for: improvements in the leather making components, reduced transportation costs (and GHG emissions), and facilitate tanneries' waste water treatment. By the time of the start of the Project (December 2021) waste water treatment was expected to be the main attraction of the Emeelt Eco Industri Park, to be constructed to accommodate tanneries relocated out of Ulaanbaatar. At the end of the Project, construction of the plant had not started. And, the status of two other related industrial technology parks (in Khovd and Darkhan) was unclear. Recent (late 2024, early 2025) developments in various trade related organisations are expected to provide for improved effectiveness in various sectors in Mongolia, but this should be accompanied by more certainty about GoM' medium and long-term strategies for the future of leather in particular.

PROJECT ACHIEVEMENT

Most of the Project's activities were successfully delivered, spanning the full leather value chain—from training operators and technicians, to providing guidance on membership in international trade associations, modernizing outdated production processes, and supporting the adoption of computer-based enterprise resource planning (ERP) systems. Beyond these direct outputs, the Project generated a set of broader, practice-oriented outcomes. It demonstrated that techniques developed for yak hides can be transferred to other raw materials; validated vegetable tanning as a viable alternative to mineral-based processes; confirmed that full-grain vegetable tanning can be used to highlight natural patina rather than obscuring it through corrected-grain practices; and reinforced the strategic relevance of cluster development and industrial parks as effective models for advancing a more competitive and sustainable leather sector.

Ian Leach
European Profiles SA,
Scientific Project Manager

> Over the course of four years, the SYL project provided a range of inputs – technical assistance and equipment – throughout the yak leather value chain in Mongolia. A multi-disciplinary team of international and national experts shared insights on the latest skills required to produce internationally acceptable products, especially among increasingly environmentally-aware consumers. Capable of being applied more widely (to other raw materials) the innovations provide for the industry's advance (from increasingly unacceptable chrome-based tanning) to bio-leather products suitable for export.

Long-term project sustainability

While some Project results were designed as one-off interventions, most are intended to be sustained, expanded, or replicated—such as progressing toward membership in LWG, OEKO-TEX and/or RLRT, repeating training in hides and skins production and preservation, and further strengthening tannery staff skills. Much of this follow-up can be delivered in-house by trained staff using learning resources developed under the Project, with the sector's trade association (MALI) well positioned to lead and promote continued capacity-building. Both SYL Cluster members and MALI can also build on relationships established with international organisations and engage tertiary institutions such as the Mongolian University of Life Science (MULS) and the Mongolian University of Science and Technology (MUST) to integrate relevant training components into curricula, with MUST also contributing to basic and applied research for the leather sector. More broadly, the Project's core outcomes, including the use of yak hides, vegetable tanning, waste reduction, and circular economy practices, are likely to be sustained by market forces, as outdated technologies and products are increasingly rejected by consumers. In this context, the Project's exploration of domestic vegetable tannin sources has also informed the EU-funded International Trade Development in Mongolia (ITDM) project, which is conducting field trials on tannins derived from indigenous sea buckthorn (Hippophae rhamnoides).

Project contributions to Climate Change Mitigation and SDGs

Many of the Project's activities contribute directly to reducing greenhouse gas (GHG) emissions. Transport-related emissions were addressed by promoting preliminary fleshing and trimming at source, reducing non-leather material transport, and associated fuel use, by around 20%. Additional reductions can be achieved through alternative preservation methods that avoid the use of bulky, salt-based preservation.

The Project also reduced energy demand by replacing high-temperature, mineral-based processes with vegetable tanning, complemented by energy-efficient finishing techniques. More broadly, it supported exploration of domestic vegetable tanning sources, which, if scaled, could encourage sea buckthorn cultivation, helping stabilize fragile ecosystems and enhance carbon sinks.

The Project contributes to SDG 12 by advancing responsible chemicals and waste management, reducing waste generation, encouraging sustainable business practices and reporting, and strengthening scientific and technological capacity for sustainable consumption and production. These contributions include introducing more efficient chemicals that lower energy use and waste, deploying ERP systems to improve monitoring and control of inputs and outputs (including water and energy), and fostering networks with leading organizations to help enterprises stay aligned with emerging sustainability trends.

The SYL Project contributes to several SDGs, most notably SDG 6 (Clean Water and Sanitation), by promoting more efficient processing that reduces water consumption and lowers both the volume and pollution load of effluent discharges, while reinforcing long-standing plans to relocate tanning operations from residential areas to a purpose-built industrial zone. It also advances SDG 8 (Decent Work and Economic Growth) through improved occupational safety and health practices, the avoidance of hazardous chemicals and processes, and the elimination of substances that could leave harmful residues in finished leather products. In addition, many Project initiatives support SDG 9 (Industry, Innovation and Infrastructure) by accelerating the phase-out of outdated practices and introducing more efficient, innovative, and sustainable production techniques.

Impacts at a Glance

Economic Impact	• Networking during trainings, workshops and study tour, provided new contacts in export markets. • Closer collaboration between related entities (herders, slaughterers, traders, etc.) and improved common understanding of what constitutes 'quality' and how to achieve/maintain it. • Enhance production of sustainable & environmentally friendly yak leather products suited to export markets.
Environ-mental Impact	• Use of up-to-date technologies; more efficient uptake of reduced quantities of more innocuous chemicals, using less water and less heat. • Improved (more efficient) use of chemicals and water, will mitigate the need for large quantities of water. Coupled with improved preliminary treatment of liquors in tanneries (and – longer term – after relocation to the Emeelt Eco Industrial Park) will reduce the quantity and contamination discharged effluents.
Social Impact	• Attention to OSH was a significant topic in many inputs to teaching and training in the particularly hazardous environment of slaughter facilities and tanneries. • In the short term, communities in and around the existing tanning facilities will benefit from reduce pollution. Longer term, the benefits will be greater when all tanneries relocate away from the capital. • Women will benefit indirectly, as improved working conditions will reduce the well-meaning (but misguided) practice of discouraging women from working in previously 'dirty and dangerous' environments (rather than making them safe for all).
Climate Benefits	• Improved preparation of raw materials (in the provinces) to reduce transportation demands. Similarly, alternatives to salt preservation will reduce need to transport large quantities of salt.
Green Finance	• Two workshops (and subsequent networking) and development of a medium/long term joint venture to assess scope for tanning using extracts from sea buckthorn.
Target Group Engagement	• More than 12 SMEs engaged in project activities. • Engaged with at least 10 organisations and more that 170 individuals from MALI, MNCCI, SYL Cluster, SMEs, Provincial Administrations, etc. • More than 25 outreach activities organized (e.g. business associations, media).
Policy Develop-ment	• Improved preparation of raw materials in the provinces, use of alternatives to salt (for preservation, attention to the special requirements for treatment of vegetable tannin effluents, etc. • Relocation of tanneries out of Ulaanbaatar to the Emeelt Eco Industrial Park.
Europe-Asia Cooperation	• A study tour for more efficient use of more appropriate chemicals (and energy).

FUNDING

EUR 1,305,956.40
(EU Contribution: 80%)

DURATION

Dec 2021 - Dec 2025

PARTNERS

European Profiles S.A.

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INESCOP

Mongolian Association of Leather Industry (MALI)

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