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Research Article

**KAZLEATHER 2030: A POLICY FRAMEWORK FOR
TRANSFORMING KAZAKHSTAN'S LEATHER INDUSTRY**

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ABSTRACT

The article considers the development of the leather industry of Kazakhstan in the context of industry diversification and sustainable production. The goal of the research is to assess the current state of the leather industry and develop policy-oriented recommendations to transform it into a competitive and environmentally sustainable industry. The methodology uses a mixed-methods approach that includes analysis of official statistical data, policy analysis, and semi-structured interviews with key industry actors. The findings indicate that the industry is characterized by limited deep processing, underutilized capacity, environmental costs, weak institutional coordination, and a shortage of personnel. Based on the comparative analysis of the European Union, Türkiye, China, and Uzbekistan, a framework concept for the KazLeather 2030 transformation is proposed that includes the e-vet&Traceability digital platform, the KazLeather Research Grant and the implementation of the KazLeather environmental standard. The research contributes to discussions on modernizing resource-based industries and offers practical instruments for upgrading value-added chains.

Keywords: Industrial policy, Institutional coordination, Kazakhstan, KazLeather 2030, Leather industry.

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INTRODUCTION

The leather processing industry develops closely alongside the agro-industry, light industry, and various other sectors, helping to increase the country's export income (Abdikerimova et al., 2022; Sundar, 2024; Usenbekov et al., 2020). At the same time, the development of this industry is also of great importance from an ecological perspective.

The world production of raw hides (by weight) was approximately 13.4 million tons (Helgi Library, 2022). Leather consumption amounted to approximately 5.7 billion square meters. The largest consumer is China (~1.3 billion m²), followed by Italy (~532 million m²) and the United States (~480 million m²) (IndexBox, 2024). In Kazakhstan, raw hides are produced in large quantities, but most are not processed. They remain in the steppe, causing negative environmental impacts.

Despite the growing number of studies devoted to industrial diversification and the development of value-added chains in resource economies, the leather industry remains understudied, especially in the context of post-Soviet countries. The existing studies mainly focus on the general problems of the agro-industrial complex, while research on institutional coordination, management mechanisms, and the design of industrial policy necessary for the industry's transition to greater value added and environmental sustainability remains fragmented and limited (Madiyev et al., 2025; Sambetaliyeva et al., 2025; Zhanaltay, 2023). In particular, in Kazakhstan, there has been insufficient study of how the fragmentation of the raw material procurement system and weak coordination among industry participants relate to the coexistence of abundant raw material resources, a low level of processing, and the underutilization of production capacities in the country. The current research is intended to fill that gap and employs a conceptual framework that integrates industrial policy theory, global value chain analysis, and resource-based diversification. Together, these approaches help explain how structural constraints shape the developmental trajectory of the leather sector.

From an industrial policy perspective, the efficiency of the sector depends on the coordination of institutional arrangements, policy instruments, and governance mechanisms (Chasovskikh & Starikov, 2022; Mohammadi, 2026). The global value chain approach emphasizes the importance of moving from the supply of raw materials to stages characterized by higher added value (DeRemer et al., 2025; Gvozdeva, 2025), while the resource-based diversification approach emphasizes the transformation of natural resources into industrial development opportunities (Yang et al., 2023).

Together, these approaches suggest that the sustainable development of the sector occurs when institutional coordination, value chain integration, and technological modernization mutually reinforce one another. Conversely, weak coordination among these dimensions results in persistently low levels of processing, productivity, and export complexity.

This study systematizes the coordination challenges within the leather industry of Kazakhstan. The findings suggest a potential link between these challenges and underutilization of the available raw material base for processing. Based on this,

the developed “KazLeather 2030” model includes practical recommendations, though an assessment of their effectiveness lies beyond the scope of this study.

Thus, the purpose of this study is to analyze the current state of the leather processing industry and to develop recommendations to transform it into a sustainable and competitive sector.

The study addresses the following research questions:

1. What constraints hinder the development of the leather industry in Kazakhstan?
2. Which tools from international experience can be applied to the context of Kazakhstan?
3. How can a comprehensive public policy model be developed for the sustainable growth of the sector?

INTERNATIONAL POLICY EXPERIENCES

The comparative analysis of industrial policy frameworks in the European Union, Türkiye, China, and Uzbekistan reveals distinct yet complementary trajectories in the development of the leather industry. Despite differences in institutional and economic structures, all four cases demonstrate that targeted government intervention plays a decisive role in enhancing value addition, export performance, and environmental sustainability in the sector. A comparison of these cases makes it possible to examine complementary tools that could potentially be applied in Kazakhstan.

The European Union’s regulation-intensive model enables the production of high-quality leather products capable of competing in premium international markets. CEN TC 289 has developed 143 standards for leather, including environmental testing methods. At the same time, compliance with EU environmental and quality standards serves not as a trade barrier but as a mechanism for enhancing competitiveness, enabling European producers to maintain a strong position in high-income markets (Malinovskaya & Vorobev, 2024). In addition, the EU leather industry supports innovative cluster initiatives (e.g., the ELiIT project) and sustainable performance certifications, such as the PEFCR for Leather. The European Commission seeks to enhance innovation and competitiveness in the leather sector while safeguarding consumer health and protecting the environment. Leather processing utilizes agricultural by-products, such as frozen animal hides, transforming raw materials that would otherwise be discarded into valuable products. EU regulations governing the processing of such by-products (e.g., standards for the use of animal waste) are strictly enforced, as Europe generates approximately 20 million tonnes of animal waste, including skins, bones, and blood, each year, which must be recycled to conserve resources (European Commission, n.d.).

In contrast, Türkiye’s stimulus-driven policy model has facilitated rapid growth in leather exports. Under Türkiye’s incentive program, imported equipment is exempt from customs duties and VAT, and social contributions for newly created jobs are covered by the state (Gurulkan, 2019). The KOSGEB Small Business Fund also supports leather companies. For example, in 2022, Türkiye’s exports of leather and leather products increased by 18.2%, reaching \$2.2 billion. Footwear accounts for 58.3% of Türkiye’s leather production. Approximately 90% of

production complies with international environmental and sanitary standards, reflecting the sector's commitment to minimizing harmful environmental waste (Republic of Türkiye Ministry of Trade, 2024).

In China, industrial policy for the leather and footwear industry is guided by objectives of high-tech development and environmental sustainability. Under the 14th Five-Year Plan, the China Leather Industry Association (CLIA) aims to enhance production efficiency, adopt modern technologies, promote green production, and establish production clusters over the next decade. For example, the plan includes increasing water reuse in leather processing facilities by 10% and implementing 4–6 demonstration projects on the treatment of chrome fines (APLF, 2021). In China, enterprises are concentrated in integrated clusters (for example, in the regions of Zhejiang and Fujian) (Gerson, n.d.). This model demonstrates how industrial clustering, coupled with environmental improvements, can align large-scale production with sustainable development objectives.

Uzbekistan's institutional coordination model has yielded significant results in terms of export growth and industrial consolidation. The establishment of full-cycle production clusters, supported by tax and credit incentives, has facilitated the transition from raw material exports to the production of finished leather and footwear. Today, there are more than ten full-cycle cluster enterprises in operation. In addition, the association "Uzcharmsanoat" supports its members at all stages of the leather value chain, from deep processing of raw materials to the production of finished products. It also assists enterprises in adopting technologies that meet international standards and implementing quality management systems. Moreover, Uzcharmsanoat conducts market research and marketing activities to enhance the range and quality of domestic products, expand export potential, and support enterprises in accessing global markets. As a result of these efforts, exports have increased more than 8.3-fold in recent years (Baboev, 2022). This demonstrates that strong intermediary institutions can substantially enhance the effectiveness of industrial policies, particularly in developing industrial systems.

The review indicates that the effectiveness of industrial policy depends not on individual instruments, but on coordinated packages of measures that integrate regulation, incentives, and institutional coordination (Aiyar & Benatiya Andaloussi, 2025). The European Union experience highlights the concept of "regulatory modernization," in which strict standards stimulate innovation and facilitate upgrading along the value chain. In contrast, Türkiye, China, and Uzbekistan emphasize the role of investment and cluster mechanisms in promoting export growth and the dissemination of technologies.

METHODS AND MATERIALS

The study employed a mixed-methods approach, integrating quantitative and qualitative analyses to provide a comprehensive assessment of the leather industry's development potential and structural constraints. This approach was selected to supplement statistical findings with an analysis of practical and institutional constraints on the industry's development.

In addition, semi-structured interviews were conducted with 20 participants, including representatives of the Ministry of Agriculture of the Republic of

Kazakhstan (3), the Ministry of Industry and Construction of the Republic of Kazakhstan (2), “ST INVEST GROUP” (Semey Tannery) (2), and “SK PROTEIN” LTD (2), as well as rural residents (6) and farm owners (5). We conducted a targeted selection of participants based on the following criteria: direct involvement in the production, collection, or processing of raw hides and skins, or professional knowledge of the state regulation of the industry. This composition of interview participants made it possible to compare the positions of various stakeholders.

All interviews were conducted face-to-face using a pre-established interview protocol between June and December 2025. Along with general questions, follow-up questions that were tailored to the respondents' roles and practical experience were asked. This enabled the research team to account for the specific circumstances of each group and explore the causes of problems in detail.

The interviews were analyzed using a thematic approach to identify recurring issues in the leather industry. The insights were used to support and contextualize the quantitative findings. The findings were interpreted in the context of the participant groups represented in the study. A descriptive analysis was conducted using data from the Bureau of National Statistics of Kazakhstan, the Ministry of Agriculture, and industry reports reflecting key indicators of leather production and processing for 2015–2025.

The comparative analysis was conducted to identify the features of foreign models for supporting the leather industry. The empirical findings were interpreted from three theoretical perspectives. Within the industrial policy framework, institutional analysis was used to identify instruments of state support, the distribution of authority, and interagency coordination. The analysis of the global value chain made it possible to examine gaps between raw material collection, preparation, processing, and export. A resource diversification approach was used to analyze the depth of processing and to identify the potential for transitioning toward products with higher value added.

To synthesize the findings and develop the “KazLeather 2030” model, a structural-logical approach was applied to link the institutional, technological, and regional components of the industry's development.

RESULTS

Animal Hide Production

Animal hide production is directly linked to slaughter volumes. Meanwhile, according to the Bureau of National Statistics, cattle hide production declined in 2023 compared to 2022. Historical data show that cattle hide production reached its peak in 2022 at 3.45 million units before declining sharply to 2.55 million in 2023, with only a partial recovery observed in 2024–2025. The production of small animal skins declined steadily from 2022 onward (Table 1). After remaining relatively stable at around 7.9–8.1 million units between 2016–2022, it dropped significantly, reaching its lowest point of 6.4 million units by 2025.

As shown in Table 1, the decline in cattle hide production after 2022 appears to be associated with an increase in exports following the reduction of export customs duty from 200 euros per ton to 100 euros per ton (Ministry of Agriculture of the Republic of Kazakhstan, 2023). Export volumes, which have

historically been highly volatile, reached their peak in 2023. This is evidenced by a rise in export volumes from 3,680.4 tons in 2022 to 5,898.5 tons in 2023. As a result, processing enterprises faced a shortage of raw materials, which led to a sharp decline in leather production from 144,784.6 thousand sq. dm in 2022 to 48,136.7 thousand sq. dm in 2023. In fact, the 2023–2024 period recorded the lowest leather production volumes over the entire period analyzed, in contrast to the maximum of 155,285.9 thousand sq. dm in 2015, despite the overall domestic availability of raw hides.

Most leather raw materials are sourced from rural areas. In 2024, 63% of skins were sourced from private farms, 21% from collective farms, and 16% from large slaughterhouses. Only 7% of the collected skins are exported. The export structure is as follows: raw hides – 74%; semi-finished products (wet-blue) – 18%; and finished leather goods – 8%. The main export destinations are China, Türkiye, and Russia, indicating that Kazakhstan’s export potential is largely concentrated in low value-added products. Meanwhile, only 5% of hides are processed domestically, across eleven enterprises, which operate at just 6.3% of their capacity (APK Novosti, 2025; Government of the Republic of Kazakhstan, 2024; Ministry of Agriculture of the Republic of Kazakhstan, 2025).

Table 1
Production, Processing and Export of Leather

	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<i>Cattle Hides, in thousands</i>											
Cattle Hide	2,6886	2,7045	2,8605	3,065	3,2231	3,365,532	3,4379	3,4532	2,5484	2,8158	2,8757
Small Cattle Hide	7,750	7,8604	8,0012	7,9916	7,9555	7,9748	8,0502	7,957	6,9557	6,4551	6,4263
<i>Export of Cattle Hide, in tons</i>											
	2,9254	2,1839	1,9087	2,4776	2,3392	1,4983	2,1842	3,6804	5,8985	4,4535	8329*
<i>Leather Production, in thousand sq. dm</i>											
Cattle Hide	155,285.9	102,550.0	88,115.1	144,989.3	102,348.0	84,352.4	124,128.3	144,784.6	48,136.7	51,901.7	N/A

Source: Compiled by the authors based on data from: Key indicators of livestock development in the Republic of Kazakhstan, stat.gov.kz business-statistics; Ministry of Agriculture of the Republic of Kazakhstan, 2025.

The coexistence of low domestic processing rates and extremely low capacity utilization suggests that the problem is not limited to a shortage of raw materials but may also reflect a mismatch between raw material availability and industrial usability. A significant share of hides does not enter formal processing channels in a condition suitable for industrial use due to quality losses, fragmented sourcing, weak logistics, and irregular procurement practices. More than 80% of hides remain unprocessed in fields, creating negative environmental impacts.

The low level of domestic leather processing reflects significant technological backwardness.

The owner of the leather factory noted, “Farmers often neglect proper cleaning of hides, frequently damaging the leather in the process.”

A farmer stated, “Leather collection centers do not offer fair prices, and because processing enterprises operate inconsistently, there is no regular purchasing policy for leather.”

The analysis indicates that the system for forming the raw material base of the leather industry is fragmented and largely dependent on small-scale producers. At the same time, domestic processing capacity remains extremely limited. Qualitative interview findings indicate the presence of institutional gaps within the supply chain, particularly related to coordination mechanisms and information exchange.

Overall, the results highlight the industry’s reliance on raw materials, its low level of processing, and significant coordination failures among market participants. This is consistent with the findings of Sabyrkhanova and Ork Efendioglu (2026). In addition, evidence from interviews (n = 20) suggests the presence of coordination challenges among market participants, particularly in procurement practices, pricing mechanisms, and supply chain interactions.

Efficiency of State Support for the Industry

The primary objective of state policy is to expand agricultural processing, enhance value addition through domestic processing of raw materials, and promote the development of export-oriented industries. To achieve these goals, in 2024 the Government of the Republic of Kazakhstan approved the “Comprehensive Plan for the Development of Agricultural Product Processing for 2024–2028.” The plan outlines the launch of at least five investment projects for processing agricultural cattle hides, with a total capacity of no less than 5 million pieces of leather per year, along with the establishment of service and procurement centers for leather collection in each region (Government of the Republic of Kazakhstan, 2024).

By 2024, 20 leather collection centers had been established. Projects by “Protein” LLP, “Batu Agro” LLP, and “Iskefe Holding” LLP are currently underway. However, the production capacity utilization of these enterprises remains low.

During interviews, industry experts cited the following reasons:

- Limited own capital among processing enterprises.
- Low market competition and logistical challenges.
- Shortage of skilled professionals and technologists in the leather processing industry.
- Weak monitoring system for the proper use of financial instruments.
- Complexity and length of the subsidy application process.
- The allocated subsidies cover only 10–15% of the actual demand.
- Limited funding is allocated for research and the implementation of new technologies.

Thus, although state support has yielded short-term results in the leather processing sector, long-term structural changes remain limited.

Institutional Coordination

Management of the leather processing industry at the state level is distributed across several governmental departments (Table 2). Their duties and responsibilities often overlap, and information exchange between them is weak.

Table 2
State-Level Institutions for Managing the Leather Processing Industry

Ministry of Agriculture of the Republic of Kazakhstan	Coordinating body for overall agro-industrial policy and processing initiatives
Ministry of Industry and Construction of the Republic of Kazakhstan	Registration, licensing and control of production standards of processing enterprises
“Atameken” National Chamber of Entrepreneurs	Advocacy for the private sector and coordination of grant programs
Regional Akimats	Responsibility for implementing local projects and developing infrastructure

Source: Compiled by the authors

This leads to blurred responsibilities, a disconnect between agriculture and industry, asynchronous support measures, and weak vertical coordination.

Workforce Skills Gaps

All interviewees reported that procurement centers and factories face a shortage of skilled leather specialists.

In the Republic of Kazakhstan, a professional standard for “Leather Goods Production” exists that encompasses 22 occupations related to leather work in product manufacturing. Additionally, the standard for “Footwear Production” (Ministry of Industry and Construction of the Republic of Kazakhstan, 2025) covers 10 occupations related to the design and manufacture of footwear.

College programs provide basic skills in materials handling, including leather, while universities offer degree programs in technology and design for light industry products, textiles, and leather. Despite these educational offerings, the sector faces a persistent talent shortage, largely due to the field’s limited appeal.

Despite formalized professional standards and educational programs in the Republic of Kazakhstan for training specialists in the leather and footwear industry, interview responses consistently point to a shortage of skilled personnel. This highlights an institutional gap between the training system and the industry’s actual needs, driven by the limited appeal of these professions and likely limited career and income prospects.

DISCUSSION

The results confirm that the challenges facing Kazakhstan’s leather industry are multifaceted, encompassing institutional, investment, technological, and behavioral dimensions.

As experts note, government policy prioritizes the formal implementation of plans over achieving final socioeconomic outcomes, often leading to inefficiency (Government of the Republic of Kazakhstan, 2021; OECD, 2023). In several programs, indicators are repeated, and there is no systematic monitoring of target indicators (24KZ, 2024; Abdikerimova et al., 2022; Forbes Kazakhstan, 2023).

The low level of processing and underutilized capacity highlight a persistent gap between the agricultural sector and the processing industry. This gap has endured for years despite government support programs, underscoring their limited effectiveness.

Unlike the EU, Türkiye, China, and Uzbekistan, where leather industry development is organized around an integrated value chain, policy in Kazakhstan remains fragmented. The raw materials segment, processing, logistics, and export are overseen by different institutions, with no stable coordination mechanism in place. This creates a “loose chain” effect, where farmers, collectors, and processors prioritize short-term gains over long-term partnerships. Interview data suggest that limited trust among market participants may further exacerbate these coordination challenges.

The findings suggest that sustainable development of the industry requires simultaneously addressing three key challenges: institutional integration of the value chain, technological modernization, and the establishment of quality and environmental responsibility standards. This is consistent with the core principles of industrial policy. The alignment of the goals and instruments of state regulation across related sectors is important here. As Gereffi et al. (2005) note, this alignment entails collaboration between government authorities and participants across the entire value chain. Therefore, DeRemer et al. (2025) note that, in the context of resource diversification, the development of an industry is linked to creating conditions for sequential transition from raw materials supply to production of goods with higher value added.

In the academic literature, the consequences of restrictions on raw material exports are noted to be ambiguous. Such measures can create price advantages for domestic processors while simultaneously reducing the revenues of raw material suppliers (Fung & Korinek, 2013). Research on Ethiopia's leather industry indicates that shifting exports toward finished products can entail difficulties for certain participants in the production chain (Fitawek & Kalaba, 2019). Therefore, the trend observed in Kazakhstan, characterized by a simultaneous increase in hide exports and a decline in leather production, should be examined with due regard for the interests of various stakeholders in the industry.

In the EU, the key driver is regulatory pressure and adherence to “green” standards. In China, it is cluster organization and scaling, while in Türkiye and Uzbekistan, the state plays an active role as coordinator and export operator. A common feature across these models is the presence of an “anchor” institution that connects the interests of business, science, and government.

Thus, the discussion of the results indicates that modernizing Kazakhstan's leather industry requires moving from an instrument-based approach to a systemic development logic —“building a coherent value chain and sustainable

rules of the game.” Without this shift, the industry will continue to rely on raw materials, even if funding is formally increased.

POLICY RECOMMENDATIONS

“KazLeather 2030” Industry Development Model

To establish a full-cycle leather processing system in Kazakhstan, enhance value addition and export potential, and reinforce the strategic objectives of agro-industrial policy, we propose the “KazLeather 2030” industry development model.

Statistical data revealed low recycling rates and underutilization of capacity, while documents and interviews helped to clarify institutional, financial, and organizational constraints. The identified lack of alignment among industry participants served as the basis for proposals on institutional support and coordination. Problems with the quality of raw materials and the limited adoption of technologies are shown within the technological component, which encompasses traceability and quality control. Logistical constraints and the predominance of raw material exports are reflected in the proposals for regional development and export orientation. The international experience has been used to refine the specific instruments being proposed. Thus, the “KazLeather 2030” model has been developed through a systematic synthesis of the analysis results. The specific instruments within the model are presented as potential options for industrial policy.

The proposed model integrates the research findings and core elements of the theoretical approaches. Thus, sectoral coordination and the monitoring of state support are grounded in the theory of industrial policy, while the traceability of raw materials and the interaction among participants are based on value chain analysis. Technological modernization, deeper processing activities, and regional specialization reflect an approach centered on resource diversification.

The “KazLeather 2030” industry development model is designed to modernize Kazakhstan’s leather processing sector across institutional, technological, and regional dimensions. It consists of three interrelated components (Figure 1):

1. **Institutional Support:** Reorganization of the regulatory and support system, including cluster management and the establishment of industry institutions such as the “Leather Industry Development Fund.”
2. **Technology and Innovation:** environmentally friendly processing, waste-free production, commercialization of research and development outcomes, and digital quality control.
3. **Regional Development and Export Orientation:** regional specialization, logistics optimization, international certification, and market access expansion.

Figure 1

“KazLeather 2030” Leather Industry Development Model



Source: Compiled by the authors

Within this model, it is recommended to strengthen veterinary control prior to slaughter at the level of leather producers (leather collecting centers) to enhance leather quality, establish direct connections with leather collection centers, and implement a unified digital registration system with timely input of relevant information.

At the processing level (tanneries and workshops), the plan includes adopting new environmentally friendly technologies (electrophysical, enzymatic, and chrome-free tanning methods), undertaking joint innovation projects with scientific institutions, and implementing a complete processing chain (salting → tanning → dyeing → finishing).

To boost export volumes (logistics and foreign trade), it is recommended to establish a unified marketing system under the “KazLeather Export” brand. Additionally, quality certification centers should be established in compliance with FAO and OECD standards.

The model establishes a continuous chain from producer (farmer) → processor (factory) → exporter (logistics center). The proposed model is expected to improve coordination across the value chain and reduce transaction costs, which, based on international experience, may contribute to increased production efficiency. Evidence from countries such as Türkiye and Uzbekistan indicates that cluster-based approaches and integrated value chain management have been associated with improvements in production efficiency.

Additionally, it is recommended that each region specialize in a specific function. For example, Turkestan Oblast could serve as the hub for raw material collection and primary processing, Almaty Oblast as the center for finished leather and footwear production, Abay Oblast as the hub for research and

workforce training, and North Kazakhstan Oblast as the center for waste-free biotechnology and protein powder production (Table 3).

Table 3
Regional Specialization Directions

Region	Orientation	Primary Obligations	Indicative targets
Turkestan Oblast	Raw material collection and salting center	Increase the number of production points (up to 200 units), create a logistics center	Attracting 40% of raw materials to the processing system
Almaty Oblast	Manufacture of finished leather and footwear	Building on the Turkish experience and expanding the “Iskefe” model	Increase the share of exported finished products to 25%
Abay Oblast	Scientific and Technological Center	Establishment of the KazLeatherLab laboratory for testing new eco-friendly processing methods	Improving processing quality, staff training
North Kazakhstan Oblast	Waste-Free Biotechnology	Expanding the experience of “SK Protein”, turning waste into protein	Reduce production waste by 90%

Source: Compiled by the authors

Here, regional selection is based on objective criteria reflecting the relative strengths of each area. In particular, the selection considers the availability of industrial and scientific-educational resources suited to each region’s proposed function, including specialized enterprises, established technologies, processing infrastructure, and opportunities for personnel retraining. This territorial specialization follows the principle of complementarity, meaning each region performs functions aligned with its resources, infrastructure, and institutional potential. This approach enables the creation of an end-to-end production chain from raw materials to finished products, supported by scientific expertise, while optimizing costs and maximizing synergistic effects.

The Western region is not excluded from the industry; it will participate in specific segments of the value chain.

Regional specialization could support a more balanced production structure in Kazakhstan and the development of specialized centers suited to each region’s characteristics. Accordingly, it is crucial to enhance state policy for the implementation of the “KazLeather 2030” industry development model, which should be pursued along three interrelated directions:

1. Modernization of financial and investment mechanisms, including the restructuring of subsidy, loan, and grant systems.
2. Strengthening institutional and sectoral governance by establishing a dedicated fund and a single coordinating operator.
3. Introduction of innovative and digital development tools, including the funding of scientific research.

A Unified Digital Platform “e-vet&Traceability”

Currently, veterinary control and raw material tracking systems are insufficiently automated. Digitalization should serve as the primary driver of the next stage of development in the leather processing industry, enabling real-time monitoring of raw material movements.

In this context, it is proposed to implement a unified digital platform, “e-vet&Traceability”. The proposed system could support the digital registration of veterinary data and product movements in line with international traceability standards (GS1, 2017).

This system includes four main functions:

1. Recording of veterinary data before and after slaughter.
2. Assignment of a unique QR code or RFID tag to each batch of leather raw materials.
3. Real-time monitoring of preparation, transportation, and processing stages.
4. Verification of raw material quality and origin through a traceability certificate.

The “e-vet&Traceability” system is structured into four modules:

1. Veterinary Module records the animal’s place of origin, vaccinations, slaughter time, and veterinary certificates.
2. Production Module tracks the stages of preparation, storage, salting, and processing of leather.
3. Logistics Module monitors transportation, warehousing, and export processing.
4. Analytical Module provides statistics, as well as product quality and efficiency indicators.

This system could support raw material quality control and help reduce waste, subject to effective implementation. Additionally, it could verify product origin during export, increasing reliability and trust in international markets.

If implemented in line with international standards, such a system could strengthen environmental and sanitary controls. Implementing a traceability system also enhances the potential for accessing export markets (Bispo et al., 2026).

The concurrent implementation of environmental certification and digital traceability could help align Kazakhstan’s leather processing industry with EU standards and strengthen export confidence. Subject to effective implementation, these measures could support the transition toward full-cycle production consistent with green economy principles.

Innovative and Ecological Development

Conventional leather processing commonly involves the use of chromium-based tanning agents and, in some applications, phenol-based synthetic tanning agents, which may pose environmental risks. Therefore, the future development of the industry should prioritize the adoption of cleaner and more resource-efficient technologies. Such innovations could reduce chemical and water consumption, mitigate environmental impacts, and potentially improve operational efficiency (Ardolino et al., 2024).

In this regard, it is proposed to establish a grant program titled “KazLeather Research Grant” to modernize leather processing technologies and enhance production efficiency. The program would aim to stimulate scientific research in leather chemistry, biotechnology, environmentally sustainable production, and the efficient utilization of processing waste.

The main directions of the program may include the following:

1. Development and implementation of environmentally friendly tanning and dyeing technologies.

Application of chromium-free and enzymatic processing methods, reduction of heavy metal residues, and the use of biological reagents.

2. Leather waste recycling.

Production of collagen and protein powder from processing waste. These by-products can be utilized in agriculture and the pharmaceutical industry.

3. Energy-saving technologies.

Implementation of water recycling systems in production and biological wastewater filtration methods.

4. Research in materials science.

Improvement of the physical and mechanical properties of finished leather products, including the integration of synthetic and natural materials.

Another important proposal is the adoption of the draft national eco-standard “KazLeather Green Standard.” This standard is in line with EU REACH and Leather Working Group (LWG) regulations. The main directions of green production are as follows:

- Implementation of water recycling and filtration systems.
- Adoption of biological reagents in processing.
- Recycling of leather waste and production of by-products such as glue, gelatin, and collagen.
- Generation of energy from renewable sources, including solar panels and biogas.

Monitoring of State Support

A mechanism is proposed to prepare the “KazLeather Progress Report” for monitoring the effectiveness of state policies in developing the leather industry.

This report should be prepared annually by the Ministry of Agriculture of the Republic of Kazakhstan and the Ministry of Industry and Construction of the Republic of Kazakhstan. It should be reviewed each year at government meetings, and necessary adjustments should be made for subsequent years.

It is essential that the report include data on recycling rates, export volumes, investment activity, environmental indicators, as well as the volume of raw materials processed in each region, product quality, the number of participants in cooperative initiatives, and employment figures.

It is also necessary to establish the KazLeather_DataHub statistical database for real-time data tracking.

To implement an automated monitoring system, it is recommended to add a module to the “e-vet&Traceability” platform. This module will enable monitoring of processed product volumes, quality levels, and compliance with environmental standards.

LIMITATIONS

The analysis was conducted using available, comparable data. The findings characterize the industry trends and institutional challenges. Checking the cause-and-effect relationships requires further research.

CONCLUSION

The conducted analysis demonstrates that Kazakhstan’s leather industry possesses significant potential. However, statistical data, industry documents, and in-depth interviews reveal that low processing levels, underutilized production capacity, limited evidence of effective institutional coordination, and limited trust among market participants are key factors constraining the sector’s development. Although state support mechanisms exist, their economic impact remains limited and insufficient to drive long-term structural transformation.

In this context, the proposed “KazLeather 2030” model is viewed not merely as another industry program, but as an attempt at institutional reconfiguration of the sector – a shift from a raw-material-based logic to an ecosystem approach. It integrates institutional modernization, ecological and technological transformation, regional specialization, and export orientation.

Additionally, the implementation of the “e-vet&Traceability” digital platform, the establishment of a national eco-standard, and support for scientific research are essential for developing a full-cycle leather industry.

Alongside this, it is crucial to foster trust between stakeholders. Where trust exists, farmers are more likely to improve raw material quality, while processing centers will accept higher-quality leather and reduce operational risks for processing enterprises.

This study contributes to the academic literature by analyzing institutional gaps within the value chain of Kazakhstan’s leather industry and their link to the low level of domestic processing. The findings also served as a basis for developing recommendations within the “KazLeather 2030” model.

Further research can assess the effectiveness of the “KazLeather 2030” instruments by comparing processing volumes and capacity utilization before and after their implementation and against corresponding figures for enterprises where these instruments were not used.

Ethical Commission Approval

Conducted through voluntary interviews with adult experts, the study examined the development of Kazakhstan’s leather industry, ensuring informed consent, confidentiality, and compliance with ethical research principles, with no formal ethical approval required (Official Letter No. 05-2/708, July 31, 2026, Akim of Zhanakala District).

Conflict of Interest Statement

There is no conflict of interest with any institution or person within the scope of this study.

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