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Case Study

Exploring innovation and collaboration in the leather processing industry through the case study of the KIWANGO Leather Cluster

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Abstract
In the era of Industry 4.0, fostering innovation through strong collaboration among universities, industry, and government is crucial. However, the Tanzanian economy has faced challenges due to, among others, weak links between these entities. To address this, Sida initiated the Innovation Systems and Cluster Development Program (ISCP-Tz) in partnership with the University of Dar es Salaam. This was followed by a program at COSTECH focused on fostering innovation for socio-economic development. As part of these programs, 15 clusters, including KIWANGO Leather, were selected for documentation of their experiences. KIWANGO Leather exemplifies successful collaboration between cluster firms, the university, local government, and research institutions. Operationalizing guidelines for collaboration led to cooperative innovations, knowledge exchange, internships, and long-term partnerships established through Memorandum of Understanding (MoU). The cluster's experiences highlight a less-linear, inclusive innovation process with positive outcomes. Thus, this paper not only illustrates a less linear, inclusive innovation process, but also its results can motivate actors in emerging innovation ecosystems in the Global South to adopt and scale up suggested approaches for knowledge co-creation benefitting sustainable development. By adopting these approaches and fostering collaborative networks, countries can leverage their resources and expertise to drive innovation, create economic growth, and address societal challenges.

Article Highlights

1. Tanzania's ISCP-Tz program exhibits successful innovation through cross-sector collaboration, a blueprint for others.
2. Technology innovations in Tanzania thrive via diverse stakeholder cooperation, fostering adaptability and inclusivity.
3. Global South urged to adopt collaborative strategies for innovation, growth, and sustainable development.

Keywords Innovative clusters · Triple Helix processes · Innovation · Cluster guidelines · Innovation eco-system · Global South

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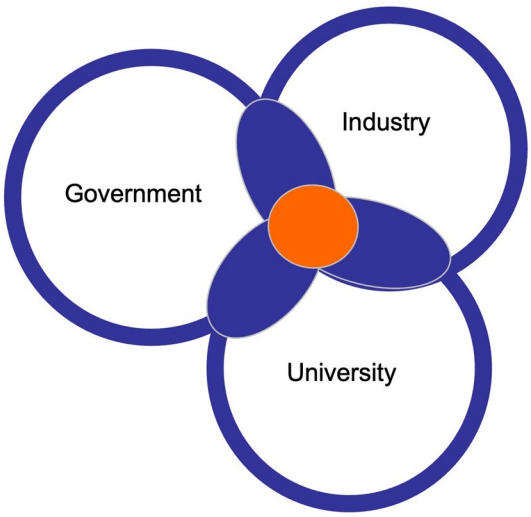

Fig. 1 The Triple Helix-University-industry-government relations. Source: [12]

1 Introduction

In the era of Industry 4.0, innovation plays a crucial role in creating economic value [1]. Universities are recognized as essential drivers of economic development and global competitiveness due to their significant contribution to innovation [2–4]. Therefore, many countries prioritize the quality and relevance of scientific research, as well as strengthened collaborations between industry, universities, and the government.

Tanzania is no exception to this trend. Recently, the Tanzanian government unveiled the third National Five-Year Development Plan (FYDP) for 2021/22–2025/26, with a focus on creating a strong, competitive economy and achieving middle-income status through increased investment in science, technology, and innovation. As a result, several universities with infrastructure to foster science, technology, and innovation have been established, leading to numerous innovations from graduate students and research initiatives aimed at addressing societal and industrial challenges [5].

However, Tanzania's industrialization plan faces obstacles due to weak links between knowledge sources (universities, knowledge institutions, and indigenous knowledge) and knowledge users [6]. Industries, small firms, and farms often perceive academics as overly theoretical and disconnected from reality, while universities tend to prioritize knowledge for academic success rather than sharing it with external actors for transformation [7, 8]. Studies have shown that intensive knowledge collaboration between universities and companies leads to the generation of technologies and innovations that would not be possible otherwise [9–11].

The Triple Helix Model, developed by Etzkowitz and Leydesdorff (Fig. 1) [12], highlights the importance of collaborations between academia, industry, and government in promoting innovation, economic and social development, and building knowledge-based innovation ecosystems. Active engagement with universities enables companies to access new expertise for community businesses [13]. The Triple Helix configuration has successfully assisted SMEs in growing their businesses through close collaboration and access to the knowledge and expertise required for developing market-competitive products [14].

In 2005, the Swedish International Development Cooperation Agency (Sida) launched the Innovation Systems and Cluster Development Program (ISCP-Tz) to address the significance of the Triple Helix Model in fostering partnerships between academia, business, and the government, as well as the prominence of SMEs in Tanzania's industrial economy. The aim of ISCP-Tz was to support Tanzania's socio-economic development by involving academia, research, and development organizations in fostering, accelerating, and supporting the growth of innovative systems and clusters [8, 14]. The program resulted in the establishment of over 67 innovative clusters in Tanzania's mainland and Zanzibar [8].

In 2017, a continued program called the "Fostering Innovations for Sustainable Development Program" was initiated by Tanzania Commission for Science and Technology (COSTECH), Small Industries Development Organization (SIDO) and Sustainability Innovations in Cooperation for Development (SICD) with support from Sida. This program included an innovation cluster component with the goal of developing a method for replicating and scaling up

competitive and innovative clusters in Tanzania's emerging knowledge society. The program piloted the operationalization of five guidelines to guide the scale-up of competitive and innovative clusters. These guidelines covered areas such as technology and innovation assessment, intellectual property rights (IPR) issues, cluster research and innovation models, monitoring and evaluation frameworks, and guidelines for exports of cluster products. The cluster research and innovation model (CRIM) guideline were based on lessons learned from cluster project development in Tanzania, Uganda, and Bolivia, and was influenced by the collaborative approach of the Triple Helix Model [15].

As innovation processes are context-dependent and embedded in socioeconomic conditions, it is essential to consider and foster the ability of small firms and farms to innovate under conditions of scarcity [16]. This paper focuses on the KIWANGO Leather Cluster, an innovative cluster, and presents the outcomes of operationalizing the CRIM guideline. After introducing relevant concepts and methodology, the paper provides a comprehensive overview of the KIWANGO case and its achievements. It concludes with recommendations and conclusions specifically directed towards actors involved in Tanzania's emerging innovation ecosystem.

2 Concepts and methodology

2.1 Clusters[1]

A cluster is comprised of specialized firms or farms that are located in close proximity to each other within a specific geographical area. These clusters have linkages to suppliers, supporting organizations, and knowledge institutions. The firms within a cluster can derive benefits from shared assets such as natural resources, robust infrastructure, and access to a skilled and specialized workforce. Innovative clusters possess the potential for renewal and innovation, which in turn stimulate competitiveness and foster growth. Collaborations based on the Triple Helix model provide a policy framework that encourages shared vision and coordinated action. Trust among cluster firms and other actors within the cluster fosters social capital, which serves as a valuable asset for the cluster [17].

2.2 Cluster initiative

The Cluster Initiative refers to the collective effort of companies and organizations within a specific industry cluster, collaborating or competing with each other, to enhance value creation. It involves the conscious mobilization and organization of these actors and resources with the aim of fostering innovation and competitiveness among individual firms within the cluster initiative. The initiation of a Cluster Initiative can be driven by the government, academia, or private sector development agencies. The primary objective of such initiatives is to support the renewal and competitiveness of traditional industries by bringing together innovative actors from different sectors. Effective cluster facilitation plays a crucial role in promoting decision-making and collective action among stakeholders involved in the Cluster Initiative.

2.3 Innovative cluster

Embracing innovation, knowledge application, and sharing is a deliberate action that can transform a cluster into an innovative cluster, with innovation serving as the primary driver for achieving cluster competitiveness. An innovative cluster is characterized by its active pursuit of innovation. A crucial aspect of an innovative cluster is the conscious effort to bring together key actors in the cluster, namely the Government, Academia, and the Private Sector, through the Triple Helix configuration, enabling collective action [18].

2.4 The collaborative framework

Many African enterprises struggle to achieve economies of scale and capitalize on opportunities due to significant barriers within their internal functions. They fail to provide products with higher quality, lower prices, good after-sales service, larger production quantities, and homogeneous product standards [19]. Small and Medium Enterprise (SME) clustering,

[1] These definitions can be found in the Clusterpedia https://www.sicd.se/wp-content/uploads/2021/04/SICD-PACF-Clusterpedia-updated-II.pdf as developed within the context of VINNOVA (The Swedish Governmental Innovation Agency).

however, has the potential to establish domestic links between consumers, producers, and knowledge-producing sectors like universities and Research and Development (R&D) institutes [20]. Collaboration within clusters allows SMEs to share expenses and risks, reducing their level of risk [21].

The most successful clusters involve partners from three segments: university, industry, and government, following the principles of the Triple Helix approach [22]. This collaboration ensures a constant focus on innovation [19]. Unlike the linear model of the past, the Triple Helix approach recognizes the interconnected stages and feedback loops that contribute to the innovation process [23].

Universities play a crucial role in industrial innovation as they generate and disseminate scientific and technological knowledge, which is increasingly vital for innovation [24]. As countries progress, the state's involvement in innovation shifts from being a public partner in dual relationships with industry or universities to becoming a participant in Triple Helix connections [25]. However, in many developing regions, the government absorbs other players and interferes with university and private sector activities, diverting resources away from productive innovation. Governments should focus on capacity-building and fruitful interface within the Triple Helix approach by reducing unproductive public action [26].

Collaboration between universities, government, and industry is influenced by the historical and cultural background of each country [27]. In Tanzania, despite having a policy in place (the National Science and Technology Policy of 1985, revised in 1995), there is still a lack of strong linkage between academia, industry, and government [28]. A large number of research outputs that remain inaccessible to intended users are the evident of a weak linkage [29]. Academia tends to develop ideas independently, often disconnected from real-world issues, while the transfer of research outputs to other agents is neglected [7]. Academic-industry collaborations remain primarily linear, with universities sending students to industries for practical experience. Building mutual trust through collaborative approaches is essential for strengthening these links.

Several factors contribute to Tanzania's weak links between universities, industry, and government. Lack of awareness among industry owners and universities, leading to distrust, is a significant factor [7]. Limited technology diffusion from foreign firms to local firms is attributed to a lack of motivation for establishing R&D entities within local affiliates [30, 31]. Additionally, the young age and limited resources of many Tanzanian universities hinder substantial industry-academia links, while the predominance of low-tech SMEs with limited technological capabilities further exacerbates the issue [32].

To promote solid and long-lasting partnerships, incentives for academicians should be revised to reward research and collaboration with businesses [33, 34]. Official agreements, such as memorandums of understanding, should be established to publicly express connections between academic institutions, SMEs, and the government, with enforcement measures in place [35, 36]. Given the large number of SMEs in Tanzania lacking research funding, academics should view this as an opportunity to develop modest partnership projects that can expand over time, involving graduates and postgraduate students in research and development [37]. This strategy aligns with the Fostering Innovation for Sustainable Socioeconomic Development Program in Tanzania, which is presented in this paper as part of its implementation outcomes.

3 The case

The case presented in this study focuses on the KIWANGO Leather Cluster, which was part of the pilot study for operationalizing the Cluster, Research, and Innovation Model (CRIM) guideline in Tanzania. The qualitative data for this case were collected from documented events and activities that occurred during the piloting of the CRIM guideline.

3.1 CRIM guideline

The CRIM guideline serves as a systematic approach to establishing partnerships between academic and knowledge-based organizations, firms and government agencies in a Triple Helix configuration. It encompasses preconditions, about 10 components, guidelines, and models for strategic choices. The preconditions include designating a focal person within a research institution, a cluster facilitator, and establishing a memorandum of understanding (MoU). The strategic choices encompass formal collaboration, joint owned intellectual property rights, joint knowledge and technology production, open innovation incubators, and co-developing innovation processes.

To assess the feasibility of the CRIM guideline in fostering innovation, it was operationalized within the KIWANGO Leather Cluster. The operationalization involved research institutions such as the Nelson Mandela African Institution of Science and Technology (NM-AIST) and the Tanzania Industrial Research and Development Organization (TIRDO).

Fig. 2 KIWANGO Leather cluster showroom at Usangi Village

Government agencies, including COSTECH, Small Industry Development Organization (SIDO), and Mwanga (Usangi) District Local Government, were also involved in the process. The operationalization of the guideline resulted in the generation of a case, which is presented in this study.

3.2 The KIWANGO leather cluster

The KIWANGO Leather Cluster, located in Usangi, Mwanga District, Kilimanjaro, operates in a region surrounded by the picturesque Pare Mountain ranges leading to Mount Kilimanjaro. Usangi serves as an administrative center for Mwanga District and is home to a population of over 4,000 people engaged in various economic activities, including subsistence agriculture, small businesses, and livestock husbandry. One of the prominent economic activities in Usangi is leather processing and manufacturing of leather products. This practice has a long-standing tradition in the area, supported by the abundant availability of natural tanning ingredients, hides, and skins. Recognizing the potential of this natural resource, 15 leather processors and shoemakers have united to form the KIWANGO Leather Cluster.

The KIWANGO Leather Cluster, which was initiated in 2011, officially registered as a Community-Based Organization (CBO) in 2013. Since its establishment, the cluster members have been actively participating in short course training at the Mwanza campus of the Dar es Salaam Institute of Technology (DIT). This training has provided them with essential knowledge and skills in traditional leather processing techniques and the creation of leather products. By utilizing these newly acquired skills, cluster members are able to generate income by selling their leather goods in the local market (Fig. 2). This income enables them to sustain their basic needs, such as food and shelter.

The KIWANGO Leather Cluster has encountered challenges related to the quality of its leather and leather products. These issues arise from the cluster's utilization of traditional leather processing methods, which present several difficulties. The inefficient and ineffective nature of the traditional process, combined with underutilization of the available raw resources, has led to tedious procedures and a loss of resources. Consequently, the quality of both the leather and the resulting goods has suffered, rendering them unable to compete effectively in the market.

3.3 The strategic choices for collaboration

In this subchapter, we will discuss the strategic choices for collaboration, namely formal collaboration, intellectual property rights, and joint knowledge and technology production. The challenges faced by the KIWANGO Leather Cluster prompted the cluster facilitator to seek assistance from TIRDO, and in 2017, a competent and motivated researcher was proposed by TIRDO to address the issues. This partnership served as the foundation for a doctoral dissertation case study (Fig. 3), with the objective of enhancing the conventional leather processing method by maximizing the utilization of tanning chemicals derived from local trees.

The researcher developed methods for extracting tanning ingredients from trees, resulting in a significant improvement compared to the traditional approach. While the traditional method utilized only approximately 50% of the tanning

Fig. 3 NM-AIST Student carrying out laboratory analysis during the development of the method of extracting tannins for leather tanning

Fig. 4 Research activities at TIRDO as a part of the pilot study to operationalize CRIM guidelines

agent found in tree barks, the new process ensures that around 95% of the tanning substance in tree barks is effectively utilized in leather manufacturing.

In 2020, the research on the novel tanning technique, utilizing substances derived from trees, was successfully completed. The collaborative efforts of TIRDO and NM-AIST led to the development of this innovative method, which aimed to enhance the traditional leather processing approach (Figs. 2 and 4). With the technology reaching a mature stage, it was ready to be implemented within the KIWANGO Leather Cluster.

Recognizing the significance of such collaborations in fostering innovation through the Triple Helix approach, COSTECH stepped in and provided funding to facilitate the transfer of this technology. The objective was to replace the outdated traditional leather processing method previously employed by the KIWANGO Leather Cluster, addressing real industry challenges by bringing together research, academia, and industry in a synergistic manner.

With the provided funding, the researchers from TIRDO and staff from SIDO collaborated on the design and fabrication of necessary equipment for the KIWANGO Leather Cluster (Fig. 5). This included the development of a tree bark milling machine, tanning extraction machine, and drum. The introduction of these machines, along with the utilization of the new recipe, significantly reduced the tediousness of work and greatly improved the quality of leather.

A comprehensive training program was conducted, involving 15 cluster members, to ensure they were proficient in operating the machines and implementing the new recipe for leather processing. The training also emphasized the best practices for effectively exploiting tanning agents from local plants. As a result of these efforts, the program yielded remarkable outcomes, enhancing both product quality and the leather processing procedures at the KIWANGO Leather Cluster.

Fig. 5 Technology transfer training to the KIWANGO cluster members during the pilot study to operationalize the CRIM guidelines

Fig. 6 KIWANGO Leather cluster exhibiting improved quality leather products as a result of collaboration between university, industry and government through CRIM guidelines

The implementation of the new methods resulted in several benefits. Firstly, it significantly improved product quality, making it more desirable in the market (Fig. 6). Additionally, it made the leather processing operations at the cluster less tedious, more cost-effective, environmentally friendly, and quicker compared to the traditional practices. For instance, the hair removal process now takes only 3 days, compared to the previous 9 day duration, and ensures complete removal.

The testimonies of the cluster members and customers further validate the success of these improvements. Their feedback reflects the positive impact of the changes, highlighting the enhanced quality, efficiency, and overall satisfaction with the new processes and products.

3.4 Testimonies

3.4.1 Testimony 1

"Previously, it would take us up to 9 days to remove the hair from the skin. Despite the lengthy process, the hair would remain embedded, and the foul odor was unbearable for the community. However, with the new technology, we now spend only three (3) days to completely remove all the hair without any unpleasant smell. To avoid these inconveniences, I used to prefer purchasing processed leathers from other cluster members while continuing with leather goods production. But now, I feel comfortable processing the leather myself." Cluster member.

3.4.2 Testimony 2

"Our traditional leather processing method used to take a whole month to produce a finished leather product. We are grateful to the researcher for introducing us to this more effective approach, as it enables us to produce two rounds of leather goods within a month, significantly increasing our income." Cluster facilitator.

Fig. 7 A Customer testimony captured through WhatsApp chat in Swahili (Translation: The belt I made with your vegetable-tanned leather turned out incredibly superb)

Table 1 Modes of collaboration in the CRIM Guideline

Collaboration mode	Description
Formal Collaborations	Cluster and TIRDO collaborated in various ways, including capacity building in product development and skills development. An MoU between the KIWANGO Cluster and NM-AIST has been signed and operationalized
Joint Ownership of Intellectual Property Rights (IPR)	During collaborative research, emerging innovations may require IPR protection. Partner institutions and cluster firms will conduct IP audits to determine ownership based on each partner's contribution. Ownership options will be guided by the institution's research and innovation policies to ensure mutual benefit
Open Innovation Incubator	The cluster facilities and the new system are open for partners to access for research, student field attachments, incubation, and startup activities. The cluster is currently incubating five groups of youths engaged in leather processing and product making. NM-AIST plans to send students for research on recycling and reuse of wastes generated by the cluster's activities. SIDO will use the cluster facilities for SME training in leather processing
Joint Knowledge and Technology Production	Collaboration between the cluster and TIRDO resulted in the production and utilization of various technologies and knowledge products crucial to the leather processing industry. The three parties (TIRDO, cluster, and NM-AIST) jointly wrote a proposal for an innovation grant to further support the cluster initiatives in leather products

3.4.3 Testimony 3

"In the past, we would have to boil tree bark for a considerable amount of time to obtain enough tannins for mixing with the hides/skin to create tanned leather. However, thanks to the technology developed in this project, which involves grinding and extracting tannins using a specialized tool, the process has become much easier. It has become so convenient that even my young daughter can comfortably participate in my enterprise." Cluster member.

These testimonies highlight the positive impact of the new technology and methods introduced to the KIWANGO Leather Cluster. They emphasize the reduction in processing time, improved product quality, elimination of unpleasant odors, increased productivity, and the ease of use for various members, including children.

3.4.4 Customer testimony 1

"The belt I made with your vegetable-tanned leather turned out incredibly superb (Fig. 7)."

3.5 Modes of collaboration

According to the CRIM guideline, the four modes or options of collaborations were realized. Table 1 provides a summary of the different modes of collaboration outlined in the CRIM guideline. These modes include formal collaborations, joint ownership of intellectual property rights (IPR), open innovation incubator, and joint knowledge and technology production. Each mode is briefly described, highlighting the key aspects and activities involved in the collaborative process. The table helps to illustrate the diverse nature of collaborations within the KIWANGO Leather Cluster initiative, showcasing the partnerships and strategies implemented to foster research, innovation, and knowledge exchange in the leather processing industry.

4 Achievements

The cluster initiative program has successfully achieved its intended outcome, which is to establish linkages between the university, cluster firms, and governmental bodies. In the implementation of this program, the key stakeholders essential for collaborating with the KIWANGO Cluster were identified and effectively engaged. These stakeholders include the research institutions (NM-AIST and TIRDO), local/regional government bodies in the Kilimanjaro region, SIDO, and COSTECH. Each of these institutions has played different roles in the co-creation of improved leather processing technologies, as summarized in Table 2.

Additionally, the collaborative efforts between the KIWANGO Cluster, NM-AIST, SIDO, and TIRDO have yielded capacity building and knowledge exchange among the participating parties. Scientists, interns, and staff members involved in the project have shown increased interest in leather technology, leading them to enroll in the Technical and Vocational Education and Training (SSTC-TVET) online course on leather technology. This course, sponsored by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Germany through the South-South Triangular Cooperation, have enhanced participating parties' ability to provide technical support to the KIWANGO Cluster.

5 Conclusion and recommendations

5.1 Conclusion

In conclusion, the collaborative efforts between the KIWANGO Leather Cluster, NM-AIST, SIDO, and TIRDO have demonstrated the power of partnerships in driving innovation and improving the leather processing industry. Through formal collaborations, jointly owned intellectual property rights, open innovation incubation, and joint knowledge and technology production, significant advancements have been made.

The project has successfully built strong linkages between the university, cluster firms, and governmental bodies, creating a Triple Helix configuration that fosters cooperation and knowledge sharing. This collaboration has resulted in capacity building, knowledge exchange, and the development of valuable knowledge products, such as new recipes for leather processing using organic materials.

The positive outcomes of this collaboration extend beyond the KIWANGO Cluster itself. Scientists, interns, and staff members involved in the project have gained valuable knowledge and skills, enhancing their ability to support the cluster and contribute to the leather technology field. Moreover, the transfer of research findings and innovative technologies has positively influenced social and economic development.

The success of this case exemplifies the importance of collaboration between academia, industry, and government in driving innovation within the SME ecosystem. By following the CRIM guidelines and facilitating effective collaborations, it is possible to leverage university knowledge, enhance product value, and create substantial job opportunities.

5.2 Recommendations

Based on the information presented in the manuscript, the following recommendations can be made:

- Continued Collaboration: The successful outcomes of the collaboration between the KIWANGO Leather Cluster, NM-AIST, SIDO, and TIRDO highlight the importance of ongoing cooperation. It is recommended that the partners continue to work together, sharing knowledge, resources, and expertise to further enhance the leather processing industry. Regular meetings, joint projects, and knowledge-sharing platforms should be established to sustain and strengthen the collaboration.
- Scaling Up and Replication: Given the fact that innovation is context specific, but lesson learned can always be used through incremental innovation, the lesson learned from this case may be applied to other clusters in Tanzania and beyond Tanzania, provided that the contexts are similar. This would encourage the replication of successful models of collaboration, fostering innovation and driving economic growth in various sectors.
- Policy Support: Governmental bodies, such as COSTECH, should continue to provide financial and policy support to facilitate collaboration between academia, industry, and government. Policy frameworks should be developed or

Table 2 Role of partners in the innovation co-creation journey

Item	Cluster	NM-AIST	TIRDO	SIDO/CLUSTER
Stage of technology development	Ideation: conceptualizing the problem	Research on organic tanning agent	Design and fabrication of an extractor for preparing organic tannins from trees barks	Design and fabrication of barks milling machine, drum and provision of rental space
Contributions	Source of research ideas (technological challenge), human resource, experience, management	Support of PhD student research	Technology development facilitation (expertise)	Technology development facilitation (expertise), Land and buildings on hire
Year	2017–2022	2017–2020	2021	2022
Inventory of asset	Human capital: Talents, skills of members, experiences, knowhows Operational manuals: SOPs, management tools, system specifications	Intellectual asset technical inflation (knowledge product-paper, thesis, procedures)	• Human capital, skills, • Intellectual asset/capital: technical inflation (knowledge product) • Contact and reputations • Machinery (extractor) • IP asset – patentable (optimum parameter for using maize bran and papaya, extractor design), new system recipe of processing leather	• Agreement on the use of land, • Machinery (milling machine, drum)

revised to encourage and incentivize collaborative initiatives. Funding opportunities for research and development projects should be made available, specifically targeting collaborations that address industry-specific challenges and promote knowledge transfer.

- Capacity Building: To ensure the sustainability of the collaboration and to meet the evolving needs of the leather processing industry, continuous capacity building initiatives should be implemented. Training programs, workshops, and skill development courses can be organized to enhance the technical expertise of cluster members, researchers, and industry professionals. This will enable them to adapt to new technologies, trends, and market demands.
- Engagement of Stakeholders: It is crucial to involve a wide range of stakeholders in collaborative efforts. This includes not only researchers, industry experts, and government representatives but also local communities, consumer groups, and relevant associations. Their input and feedback can contribute to the development of innovative solutions, address societal concerns, and ensure the sustainability and acceptance of collaborative initiatives.

By implementing these recommendations, the collaborative efforts can be further strengthened, leading to sustained innovation, increased competitiveness, and socioeconomic development in the leather processing industry and beyond.

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Data availability All data generated or analyzed during this study are included in this published article.

Declarations

Ethical approval Not applicable.

Informed consent All participants involved in this study were provided with a detailed explanation of the research objectives, procedures, potential risks, benefits, and their rights as research participants. Participants were also be assured of the confidentiality and anonymity of their responses, and their data to be used solely for research purposes. All subjects depicted in this work have provided informed consent for the publication of their identifying information and images.

Competing interests The authors declare no competing interests.

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