

POLICY BRIEF:



Industry Knowledge Clinics: A Practical Model for Bridging the Academia-Industry Gap

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Executive Summary

Uganda's national development aspirations, particularly the industrialisation goals outlined in the National Development Plan III (NDP III) and the National Industrial Policy (NIP) 2020, rely heavily on translating knowledge from academic and research institutions into practical applications within industry. However, significant barriers impede this process, especially for Small and Medium-Sized Enterprises (SMEs). These barriers include limited access to technology, skills gaps often due to informal training, difficulty understanding complex technical literature, and weak formal connections between knowledge creators and users.

This policy brief proposes Industry Knowledge Clinics (IKCs) – a collaborative, demand-driven platform focused on translating scientific research into usable knowledge and skills for industry – as a practical solution. The effectiveness of the IKC model is evidenced by the "Identification of Standards Gaps in the Bakery and Confectionery Industries" (IDE-STABACO) project, a collaboration involving Makerere University, the Uganda National Bureau of Standards (UNBS), the bakery sector and Uganda National Council for Science and Technology (UNCST) as the convener and funder. This initiative successfully identified standards gaps, simplified complex baking standards into understandable and accessible pictorial formats (translated into local languages), and delivered targeted training to practising bakers and business owners via the IKCs model. The positive reception from the participants (bakers and business owners) and UNBS's formal adoption of the simplified standards highlight the model's success.

This policy brief recommends the formalization and the integration of IKCs into national strategies such as the Parish Development Model (PDM), Agro-industrialisation and private sector development, establishing dedicated funding, potentially via UNCST, incentivising academic participation, promoting the creation of practical knowledge resources, and strengthening coordination platforms to ensure IKCs effectively bridge the academia-

industry divide and contribute significantly to Uganda's industrialisation and socio-economic transformation.

1. Purpose: Aligning Knowledge Transfer with National Goals

Uganda aims for significant socio-economic transformation, prioritising sustainable industrialisation for inclusive growth and wealth creation, as detailed in Vision 2040, NDP III, and NIP 2020. NDP III specifically targets enhancing innovation, technology development, and transfer, aiming to increase R&D spending and improve Uganda's Global Innovation Index score. The NIP 2020 seeks to double manufacturing value added by 2029/30, emphasising skilled human resources, research utilisation, and technology adoption, particularly in priority sectors like agro-processing (including bakeries and confectioneries). Achieving these ambitious goals fundamentally requires effective University-Industry Knowledge Transfer (UIKT). Universities are crucial sources of the knowledge and skills needed to drive innovation, particularly within the SME sector that dominates Uganda's economy. Therefore, bridging the gap between knowledge generation in academia and its practical application in industry is not just beneficial,

but essential for Uganda to realise its national development aspirations. However, persistent barriers currently hinder this vital flow of knowledge.

2. Critical Analysis: Barriers and the IKC Solution

2.1 The Challenge: Persistent Barriers to Knowledge Application

Despite the clear policy imperative, translating research into policy and industrial practice in Uganda faces significant hurdles, mirroring global challenges but often amplified locally:

- **Skills Gaps & Informal Training:** Many workers, especially in SMEs like bakeries, acquire skills informally, leading to difficulties in understanding and implementing quality standards, safety protocols, and modern practices.
- **Limited Technology Access:** Outdated and inadequate equipment, often due to financial constraints, hampers productivity, quality, and safety standards compliance in sectors like baking.
- **Standards Complexity & Awareness:** Low awareness of existing standards, coupled with their technical complexity and potentially low formal education levels among practitioners, hinders practical application.
- **Weak Linkages & Coordination:** Uganda's innovation ecosystem suffers from a lack of formal, structured mechanisms connecting universities, research institutions, and industry, impeding knowledge flow and commercialisation. Weak coordination within the Science, Technology, and Innovation (STI) sector exacerbates this.
- **Insufficient R&D Investment:** Uganda's low Gross Expenditure on R&D (0.4% of GDP in 2019), with minimal contribution from businesses (0.01%), limits innovation capacity.
- **Cultural & Trust Gaps:** Perceptions of universities as detached "ivory towers" can undermine the trust needed for effective collaboration between academia and industry.

These interconnected barriers create a significant disconnect between national policy ambitions for industrialisation and the reality on the ground, hindering the ability of Ugandan industries, particularly SMEs, to innovate, improve quality, and compete effectively.

2.2 The Solution: Industry Knowledge Clinics (IKCs)

Industry Knowledge Clinics (IKCs) provide an innovative, targeted, and interactive approach to overcoming barriers in University-Industry Knowledge Transfer. IKCs represent a practical and collaborative knowledge transfer model that transforms academic

expertise and research findings into usable knowledge and skills for specific industry stakeholders. Key features include:

- **Collaborative:** Involving academia, industry practitioners, and relevant regulatory bodies (like UNBS) to ensure relevance and buy-in.
- **Demand-Driven:** IKCs address specific, identified industry needs and knowledge gaps, often determined through prior diagnostic research such as the "Identification of Standards Gaps in the Bakery and Confectionery Industries" project, ensuring the content directly addresses real industrial problems.
- **Knowledge Translation:** A core focus is to simplify complex technical information, standards, or research results into formats that are easily understandable and accessible (e.g., pictorial guides, local languages, simplified non-technical English) for the target audience.
- **Interactive Delivery:** Typically using a workshop format, IKCs facilitate direct interaction, hands-on learning, practical training, and peer-to-peer knowledge exchange. Additionally, knowledge clinics can also be organised in the form of a webinar series targeting a specific niche of stakeholders. IKCs represent a shift from a 'supply-push' to a 'demand-pull' or 'co-creation' model of knowledge transfer, prioritising user needs and context, making knowledge uptake more likely, especially for SMEs.

3. Evidence in Action: The IDE-STABACO Bakery Standards Industry Knowledge Clinics

The "Identification of Standards Gaps in the Bakery and Confectionery Industries" (IDE-STABACO) project (2021-2023) provides compelling evidence for the IKC model. This collaborative research project undertaken by Makerere University, UNBS, and industry players, funded by Uganda National Council for Science and Technology via the Science Granting Councils Initiative (SGCI), identified significant standards awareness gaps, skills deficits, and equipment challenges in Uganda's bakery sector.

3.1 The Problem: Identified Gaps in Uganda's Bakery Sector

The IDE-STABACO research, conducted between January 2021 and July 2023, was a collaborative effort led by Professor Charles Muyanja from Makerere University's School of Food Technology, Nutrition and Bio-engineering, and Mr. Hakim Mufumbiro from the Uganda National Bureau of Standards (UNBS). Funded by Uganda National Council for Science and Technology (UNCST) through the Science Granting Councils Initiative (SGCI) II, the study aimed specifically to identify existing standards gaps in

the bakery and confectionery industry and propose solutions. The research uncovered several critical issues hindering the sector's development:

- **Significant Standards Gaps:** This diagnostic study confirmed a widespread lack of awareness and understanding among bakers regarding the quality and safety standards governing their operations. Many bakers found the existing standards documentation to be technically complex and difficult to apply in their daily work.
- **Persistent Skills Deficits:** A majority of bakers reported acquiring their knowledge informally, often from family members or friends, rather than through structured training programs. This resulted in a lack of foundational knowledge in crucial areas like baking science, hygiene protocols, and standards implementation, contributing to a recognized shortage of skilled labour in the sector.
- **Inadequate Equipment:** The research findings highlighted the common use of outdated and often poorly maintained production equipment. Many bakers used machinery that was difficult to clean effectively, posing significant risks to product quality and consumer safety. Access to modern, more efficient, and hygienic equipment was frequently limited by financial constraints.
- **Challenges in Enforcement and Market Access:** The study noted inconsistencies in the enforcement of existing standards and insufficient inspection and monitoring by regulatory bodies. Consequently, bakers who were not certified by UNBS faced substantial difficulties in penetrating formal markets, limiting their growth potential.

3.2 The IKC Intervention: Collaborative Research, Translation and Training

Addressing the identified gaps required a multi-faceted intervention built on collaboration and practical knowledge translation, characteristic of the IKC model:

- **Collaborative Framework:** The project operated within a Public-Private Partnership (PPP) framework. It involved Makerere University representing academia, UNBS representing the regulatory authority, and engagement with industry stakeholders, including specific businesses like Hot Loaf Bakery, Jovay School of Cookery, and Nakku Food Safety Consults Limited. This collaboration was facilitated and funded by UNCST through the SGCI.
- **Simplification and Translation of Standards:** A core output of the project was the simplification of complex technical standards relevant to the sector. Specifically, the Bread Standard (US EAS 43:2012) and the Cake Standard (US 1923:2020) were adapted into user-friendly formats. This involved creating pictorial representations of key processes and requirements and translating the simplified content into simple

non-technical English, Luganda, and Swahili languages, making the information easily understandable and accessible to a wider range of bakers.¹

- **Targeted Training Delivery via IKCs:** The project utilised the IKC format to disseminate the research findings and deliver practical training to bakers. A notable example were the IKCs held in Mbarara, Jinja, Lira and Kampala Cities in June and July of 2024
 - The training curriculum covered essential topics, including the requirements of the simplified standards, proper hygiene practices, labelling and packaging regulations, and strategies for implementing these standards in their businesses. Additionally, the Clinics provided training on proper branding and marketing of baked and confectionery products.
 - In Mbarara, Jinja, Lira and Kampala clinics alone, over 200 bakers from the different parts of Uganda received training directly from the Makerere University academic staff, UNBS standards officer and UNCST's Intellectual Property Officer.

The clinic methodology incorporated interactive elements. For instance, asking participants to list their main business challenges at the start served not only as an engagement tool but also confirmed that the issues identified by the bakers themselves closely mirrored the findings of the IDE-STABACO research, validating the study's relevance.

3.3 Demonstrated Impact and Outcomes

The IDE-STABACO project and its associated IKCs yielded tangible results, demonstrating the model's effectiveness:

- **Enhanced Knowledge and Skills:** The clinics directly addressed the identified knowledge and skills deficits by providing bakers with targeted training on standards, hygiene, and best practices.
- **Positive Industry Feedback and Validation:** Bakers participating in the clinics expressed optimism that applying the learned standards and achieving certification would significantly improve their ability to access wider markets and operate more profitably. Some participants explicitly noted that understanding standardization would give them a competitive edge. The fact that the problems bakers articulated aligned with the research findings further validated the practical relevance of the IKC's focus.
- **Institutional Adoption and Legitimacy:** A significant outcome was the formal adoption of the simplified, translated, and pictorial baking standards by the Uganda National Bureau of Standards (UNBS). This institutional endorsement provides legitimacy to the simplified materials and creates a pathway for their wider dissemination and use across the entire sector, potentially impacting far more bakers than those directly trained.

● **Contribution to Broader PPP Goals:** The project successfully demonstrated how targeted PPPs in research and innovation can foster university-industry collaboration and address specific technology and knowledge bottlenecks, thereby contributing to the overarching goals of the SGCI PPP initiative aimed at increasing industrial competitiveness and productivity. The IDE-STABACO project serves as a practical illustration of how the 'Triple Helix' concept – fostering interaction between university, industry, and government – can be effectively operationalized in a developing country context to address the specific needs of SMEs. The IKC acted as the crucial mechanism facilitating this three-way collaboration between Makerere University, the bakers and associated businesses, and UNBS, leading to tangible outcomes for the SME-dominated bakery sector. While highly effective for knowledge and skills transfer, the IKCs did not directly address the barrier of access to modern equipment, suggesting IKCs are most impactful when potentially integrated with broader SME support mechanisms.

4. Policy Recommendations

To institutionalize and scale the IKC model for broader national benefit, the following actions are recommended:

1. **Integrate IKCs into National Strategies:** Formally incorporate the IKC model into NDP IV, NIP 2020, and STI plans as a key mechanism for practical University-Industry Knowledge Transfer, especially for SMEs in priority sectors.
2. **Establish Dedicated Funding:** Create sustainable funding streams (e.g., via UNCST) for the full IKC lifecycle, promoting PPPs for co-funding.
3. **Incentivize Participation:** Review academic reward structures to explicitly value knowledge translation activities like IKCs, alongside traditional metrics. Offer institutional recognition for active participation.
4. **Promote Practical Knowledge Resources:** Support the creation and sharing of simplified, translated, sector-specific knowledge materials (like the IDE-STABACO standards) via accessible platforms (e.g., UNCST's TECHNOMART and the National Repository of Uganda).

5. **Strengthen Coordination Platforms:** Enhance mechanisms for regular dialogue between industry, academia, and government/regulators to identify needs and facilitate IKC implementation, strengthening UNCST's coordinating role.

5. Conclusion

Bridging the academia-industry divide is crucial for Uganda's industrialisation. While traditional knowledge transfer methods have limitations, Industry Knowledge Clinics offer a proven, practical, and collaborative solution tailored to SME needs. The IDE-STABACO project demonstrates the IKC model's ability to enhance skills, improve standards compliance, and foster vital partnerships. By adopting the recommendations to integrate IKCs into policy, provide sustainable funding, incentivize participation, support resource development, and strengthen coordination, Uganda can leverage this effective model to build a more innovative, skilled, and competitive industrial sector, driving progress towards its national development goals.

Selected References

1. National Planning Authority (NPA). (2020). Third National Development Plan (NDPIII) 2020/21 – 2024/25. Kampala, Uganda.
2. Ministry of Trade, Industry and Cooperatives (MTIC). (2020). National Industrial Policy 2020. Kampala, Uganda.
3. Muyanja, C., & Mufumbiro, H. (2024). Identification of standards gaps in the bakery and confectionery industries (IDE-STABACO). IDRC Digital Library, accessed April 20, 2025, <https://idl-bnc-idrc.dspacedirect.org/items/75671307-c03f-4dbd-a6ca-f25ce98200d4>
4. SGCI Africa. (2023). How are PPPs in research and innovation strengthening Uganda's manufacturing sector? Accessed April 20, 2025, <https://sgciafrica.org/resource/how-are-ppps-in-research-and-innovation-strengthening-ugandas-manufacturing-sector/>
5. Wanyama, O. (2024, June 19). New study pokes holes in bakery sector. Daily Monitor.
6. Budget Directorate, Ministry of Finance, Planning and Economic Development. (2023). Budget Framework Paper FY 2023/24 - Programme 13: Innovation, Technology Development and Transfer.