

Case Report

Enhancing SMEs Competitiveness Along Value Chains Approach in Technology Dissemination in North Rift and Western Regions of Kenya

Michael Cheloti^{*} , **Arthur Onyuka**, **Ingrid Wekesa** , **Ephraim Njure** ,
Emmanuel Kariuki , **Gladys Mugo** , **Benard Kibet** , **Duncan Mugeru** ,
Anne Ndiege 

Kenya Industrial Research and Development Institute, Nairobi, Kenya

Abstract

Micro, Small, and Medium Enterprises (MSMEs) significantly contribute to Kenya's GDP and play a crucial role in job creation. Despite their importance, many MSMEs face challenges such as inadequate skills, limited access to technology, and barriers to scaling their operations. Recognizing these gaps, the KIRDI-KIEP training initiative was designed to unlock the potential of MSMEs by promoting technology dissemination and hands-on capacity building. The program not only offered practical training but also extended support through incubation programs and access to Common Manufacturing Facilities (CMFs). These resources gave entrepreneurs the opportunity to experiment, innovate, and refine their products in a supportive environment. The training aimed to equip participants with the skills and knowledge needed to launch viable commercial enterprises, address production challenges, and drive economic growth. Participants were selected based on business readiness, technology needs assessment, gender inclusivity, and a focus on youth empowerment. Priority was given to technologies with high market demand and community impact, including animal feed formulation, honey processing, fruit and vegetable dehydration, dairy processing, and soap and detergent production. The primary challenge for SMEs is limited competitiveness due to regulatory and infrastructure hurdles. This training provided practical skills to enhance scalability, competitiveness, and commercialization, contributing to sustainable development and economic growth.

Keywords

Value Chains, Technology Dissemination, Incubation, Micro-Small and Medium Enterprises

1. Introduction

Micro, Small, and Medium Enterprises (MSMEs) are vital to Kenya's economy, contributing significantly to the country's GDP and employment creation [1, 2, 11]. However, MSMEs often face significant challenges, particularly related to competitiveness, regulatory frameworks, and access to

technology and capital [3-5]. Addressing these gaps is essential to ensuring that these enterprises remain viable and contribute meaningfully to economic development [2].

The KIRDI-KIEP initiative, a collaboration between the Kenya Industrial Research and Development Institute (KIRDI)

^{*}Corresponding author: mikechelo@yahoo.com (Michael Cheloti), Michael.cheloti@kirdi.go.ke (Michael Cheloti)

Received: 21 August 2025; **Accepted:** 13 September 2025; **Published:** 8 December 2025



Copyright: © The Author(s), 2025. Published by Science Publishing Group. This is an **Open Access** article, distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

and the Ministry of Investment, Trade and Industry (MITI), aimed to address these gaps by enhancing MSMEs' competitiveness along various value chains. The training targeted key technological areas, including; animal feed ration formulation, honey processing, dairy processing, fruit and vegetable dehydration, soap and detergent production. By providing practical, hands-on training, the program sought to empower participants with the knowledge and skills needed to establish and grow their businesses, with a particular emphasis on gender inclusivity and youth empowerment [6].

This initiative aligns with the Kenyan Government's Bottom-up Economic Transformation Agenda (BETA), which prioritizes grassroots economic development through entrepreneurial training and technology dissemination [6, 7]. By enhancing MSMEs' capacity to leverage local resources and technology, this initiative contributes to broader efforts to promote sustainable economic development and environmental stewardship [8-12].

Sustainable economic growth today must also address issues around climate change. Kenya's Climate Action Plan emphasizes the need for businesses to adopt sustainable technologies and practices to enhance productivity while protecting the environment. By promoting sustainable methods during capacity building programs, we promote reduction of waste, cut emissions, and help communities adapt to climate resilient practices. Supporting the entrepreneurs through these lenses can lead to a future that is both economically prosperous and environmentally sustainable, benefiting the global population [7, 13, 14].

2. Training Implementation and Discussions

The KIRDI-KIEP initiative was designed to empower local talent through tailored training programs that emphasized the utilization of low-tech resources to produce high-quality, market-ready products. In the North Rift region, for example, training in animal feed ration formulation was prioritized, addressing the needs of a significant portion of the population who engage in livestock rearing for milk and meat production. The prevalent deficiency of livestock feed in the region presents a unique opportunity for local communities to establish viable businesses in animal feed ration formulation.

In addition, the North Rift region's abundant vegetable production was leveraged to introduce training on the preservation of surplus vegetables through drying and packaging techniques. This initiative not only aims to reduce post-harvest losses but also enhances food security by enabling local farmers to access broader markets, including export opportunities.

In Baringo County, where beekeeping is a common practice, a critical gap in honey processing skills was identified. The program provided targeted training to equip entrepreneurs with the necessary competencies to transform their beekeeping activities into profitable commercial enterprises. By focusing on skill development in honey processing, the initiative aimed to enhance the economic viability of local beekeepers and promote sustainable practices within the industry.

This methodological framework ensures that the training provided is relevant, practical, and tailored to the unique needs of the communities involved. By addressing specific technological gaps and fostering a culture of entrepreneurship, the KIRDI-KIEP initiative sought to drive sustainable economic development in the targeted regions.

2.1. Migori ITTO, Migori County

At the KIRDI-Migori Centre, beneficiaries of the KIRDI-KIEP initiative underwent comprehensive training across various value chains, leading to the successful development of multiple products. The training encompassed several key areas:

2.1.1. Dairy Technology

Participants acquired essential skills in dairy processing, focusing on the production and preservation of milk products. Emphasis was placed on techniques such as pasteurization and the production of yogurt and mala, enabling participants to enhance product quality and safety.

2.1.2. Honey Processing

Training covered the entire process of honey production, from hive management to jar preparation. Participants learned best practices for harvesting and processing honey, ensuring optimal quality and flavor, which can be leveraged as a profitable business opportunity.

2.1.3. Drying Fruits and Vegetables

The training included methods for preserving fruits and vegetables, significantly extending their shelf life and creating new market opportunities for aspiring entrepreneurs.

In addition, four enterprises were visited and trained at Gloryca International College in SAA YOTE village, Suna West, Migori County. This training included practical lessons in the production of natural products, such as multipurpose liquid detergent and hand wash detergent soap. This initiative is pivotal in enhancing the performance and sustainability of the entrepreneurial community in Migori County.



Figure 1. Display of technologies for Nuts, Yoghurt and Honey-processing in Migori County, Kenya.

2.2. Eldoret ITTO, Uasin-Gishu County

Training in animal feed ration formulation was conducted in response to the needs of the local population, who predominantly engages in livestock rearing. The program emphasized the potential for communities to produce their feed supplies, fostering viable business enterprises that can enhance local food security. Additionally, participants explored dehydration technology for fruits and vegetables, a critical skill that not only prolongs the shelf life of produce but also opens avenues for new entrepreneurial ventures in food processing.



Figure 2. Display of technologies for Honey processing and animal feeds ration formulation in Eldoret, Kenya.

2.3. Kanduyi, Bungoma County

In Kanduyi, participants engaged in a training that focused on the formulation of detergents and bar soap. Through hands-on experiences, they gained insights into the science and craftsmanship involved in creating high-quality cleaning products. This training promises to improve hygiene standards within the community while providing exciting business opportunities.



Figure 3. Display of technologies for Multipurpose and bar soap training in Kanduyi, Bungoma, Kenya.

2.4. Malakisi ITTO, Bungoma County

The training in Malakisi centered on the versatile and nutritious potential of nuts. Participants explored the entire value chain, from harvesting to roasting and packaging. By em-

ploying innovative methods and sustainable practices, they are well-equipped to transform nuts into market-ready products, thereby enhancing local economic development.



Figure 4. Display of technologies for processing of nuts at Malakisi, Bungoma County.

3. Discussion

The KIRDI-KIEP training yielded significant improvements in MSMEs' capacity to compete within their respective sectors. Participants reported improved skills in production processes, access to markets, and the ability to scale operations. For example, the dairy processing training helped small-scale dairy farmers in Eldoret diversify their products, leading to increased revenue and job creation. Similarly, honey processing in Baringo and Migori Counties resulted in the establishment of honey production cooperatives, which enhanced access to markets and increased competitiveness.

The focus on sustainability through the circular economy model further contributed to the success of the training. By adopting the 3Rs (Reduce, Reuse, Recycle) approach, participants were able to integrate environmentally friendly practices into their business operations. This not only enhanced their business viability but also contributed to climate change resilience, particularly in sectors such as nut processing and fruit dehydration.

Despite these successes, the program also faced challenges.

Regulatory hurdles, particularly related to licensing and compliance, remain a significant barrier to MSME growth. Infrastructure limitations, such as access to reliable energy and transportation, also constrains entrepreneur's ability to scale their operations. Addressing these challenges will be crucial to ensuring the long-term sustainability and competitiveness of MSMEs in Kenya.

4. Conclusions and Recommendations

4.1 Conclusion

The findings from this capacity building program underscore the critical role that training, Small and Medium Enterprises (SMEs) plays in empowering local communities to leverage technology and enhance their competitiveness along selected value chains. The KIRDI-KIEP initiative has demonstrated that targeted training not only equips entrepreneurs with essential skills but also fosters innovation and sustainable practices within the agricultural sector. A significant strength of the County Aggregation and Industrial Parks (CAIPs) is their capacity to facilitate the commercialization of available technologies across diverse regions. By creating an environment conducive to collaboration and knowledge sharing, CAIPs can enhance the overall competitiveness of local enterprises. The training programs provided through KIRDI-KIEP have shown that individuals can effectively harness new skills and knowledge, leading to transformative changes in local agricultural practices and contributing to broader sustainable development goals.

4.2. Recommendations

Based on the findings of this research, the following recommendations are proposed:

4.2.1. Continued Investment in Training Programs

It is essential to sustain and expand training initiatives that focus on technology dissemination and skills development for SMEs. This will ensure that entrepreneurs remain competitive and can adapt to evolving market demands.

4.2.2. Strengthening Collaboration among Stakeholders

Encouraging partnerships between government agencies, educational institutions, and private sector actors can enhance the effectiveness of training programs. Collaborative efforts can lead to the sharing of resources, expertise, and best practices.

4.2.3. Promotion of Sustainable Practices

Future training should emphasize sustainable agricultural practices and the importance of environmental stewardship.

This will not only benefit local economies but also contribute to global efforts in combating climate change.

4.2.4. Monitoring and Evaluation

Implementing robust monitoring and evaluation frameworks will help assess the impact of training programs on participants and their communities. This data can inform future initiatives and ensure continuous improvement.

In conclusion, the KIRDI-KIEP initiative serves as a valuable model for empowering local communities through technology training and entrepreneurship. By investing in the skills and knowledge of SMEs, we can drive economic growth, enhance food security, and promote sustainable development in Kenya. The insights gained from this study highlight the importance of ongoing support for such initiatives, which are vital for the future prosperity of local enterprises and their communities.

Abbreviations

BETA	Bottom-up Economic Transformation Agenda
CAIPs	County Aggregation and Industrial Parks
GDP	Gross Domestic Product
ITTOs	Industrial Technology Transfer Offices
KIEP	Kenya Industrial Entrepreneurship Project
KIRDI	Kenya Industrial Research and Development Institute
MITI	Ministry of Investment Trade and Industry
MSMEs	Micro-Small and Medium Enterprises
SMEs	Small and Medium Enterprises

Acknowledgments

We express our gratitude to the World Bank Group for supporting this capacity building program through a research grant to the Kenya Industrial Research and Development Institute (KIRDI). We also acknowledge the contributions of the Ministry of Investment, Trade and Industry (MITI) for enabling KIRDI to carry out this work, as well as the County Governments of Uasin Gishu, Bungoma, and Migori for providing an enabling environment for the trainings.

Conflicts of Interest

The authors declare that no conflicts of interest.

References

- [1] Ministry of Micro, Small and Medium Enterprises (Kenya). (2024). About MSMEs. Government of Kenya. <https://msme.go.ke/about-msmes>
- [2] Muthee, E., & Maina, R. (2023). Entrepreneurial social capital and performance of micro, small, and medium enterprises. *International Journal of Entrepreneurial Knowledge*, 11(2), 127–138. <https://doi.org/10.37335/ijek.v11i2.208>
- [3] Egbetokun, A. (2023). Business incubators in Africa: A review of the literature. *Journal of African Entrepreneurship*. <https://cepr.org/system/files/publication-files/JA%207487>.
- [4] Ngugi, J., & Were, E. (2023). Entrepreneurship training and MSME survival in developing economies: Evidence from Kenya. *African Journal of Business Management*, 17(4), 101–112. <https://doi.org/10.5897/AJBM2023.9507>
- [5] Gichuki, G. K., Karanja, K., & Atikiya, R. (2024). The moderating influence of legal and regulatory framework on the relationship between organizational structure and strategy implementation by devolved governments in Kenya. *Journal of Agriculture, Science and Technology*, 23(1), 171–210. <https://doi.org/10.4314/jagst.v24i1.11>
- [6] Katana, C. K., Peter, G. M., & Fwamba, R. (2025). Financial technology and financial performance of micro, small and medium enterprises in Kakamega County, Kenya. *International Journal of Research and Scientific Innovation (IJRSI)*, 120500151. <https://doi.org/10.51244/IJRSI.2025.120500151>
- [7] Lagat, D. J., & Njaramba, J. (2024). Accessibility of credit and performance of micro, small and medium enterprises in Nandi County, Kenya. *African Tax and Customs Review*, 8(1), 12. <https://atcr.kra.go.ke/index.php/atcr/article/view/121>
- [8] Mwakio, A. M., Mbogho, P. K., Omido, K. H., & Mwangandi, S. M. (2024). Impact of accessibility of digital financial services on financial inclusion among SMEs in Taita Taveta County, Kenya. *International Journal of Social Science and Humanities Research*, 2(3), 391–403. <https://doi.org/10.61108/ijsshr.v2i3.149>
- [9] Kenya Institute for Public Policy Research and Analysis (KIPPR). (2023). *Fourth Medium Term Plan (MTP IV), 2023–2027*. Government of Kenya. <https://repository.kippra.or.ke/handle/123456789/4856>
- [10] Office of the President (Kenya). (2024, December 15). *Innovative BETA programmes transforming lives of Kenyans – President Ruto*. <https://www.president.go.ke/innovative-beta-programmes-transforming-lives-of-kenyans-president-ruto>
- [11] ACCA Global. (2025, July). *Will the budget transform Kenya's MSMEs?* AB Magazine. <https://abmagazine.accaglobal.com/content/abmagazine/global/articles/2025/jul/business/will-budget-transform-kenya-s-msmes-.html>
- [12] Trade Facilitation East Africa Programme. (2023). *Kenya country profile*. TFEP. <https://www.tfep.org/kenya>
- [13] Micro and Small Enterprises Authority (MSEA). (2024). *Kenya Jobs and Economic Transformation (KJET) project*. <https://msea.go.ke/kjetproject>
- [14] Omondi, P. (2024). Sustainable entrepreneurship and MSME resilience in Kenya's green economy. *Journal of Sustainable Development in Africa*, 26(2), 55–70. <https://doi.org/10.5321/jsda.v26i2.2345>