

Case Report

Agro-Processing Value Chains Mapping and Technology Needs Assessment for Taita Taveta County, Kenya

Jackson Mutai , Stella Ndungu , Michael Cheloti* , Arthur Onyuka, Rukia Kemunto

Kenya Industrial Research and Development Institute, Nairobi, Kenya

Abstract

A value chain mapping exercise was carried out in Taita Taveta County, focusing on the agro-processing value chain. The survey carried out by the Kenya Industrial Research and Development Institute (KIRDI), was conducted as part of the Kenya Industry and Entrepreneurship Project (KIEP), supported by the World Bank. The aim of the survey was to explore the technological challenges and opportunities faced by small businesses to help them grow, innovate, and compete more effectively. By looking closely at value chains like rice, dairy, bananas, mushrooms, beekeeping, leather, and engineering services, the study mapped out the specific technology needs of local enterprises. To do this, researchers used both qualitative and quantitative methods, gathering insights through interviews, group discussions, and on-site visits with key players in these sectors. The findings from the mapping exercise, revealed several challenges holding these businesses back which include; outdated equipment, limited opportunities for value addition, poor access to markets, and weak infrastructure. On top of that, the high cost of inputs adds more strain to farmers and processors. The outcome of the survey doesn't stop at identifying problems; it offers practical solutions in an intervention matrix, laying out clear steps to help businesses improve productivity, enhance product quality, and boost income. With the right support, Taita Taveta's agricultural and livestock sectors have strong potential for growth and transformation.

Keywords

Value Chains, Mapping, Agro-processing, Entrepreneurship, Technology Needs, Sustainability

1. Introduction

The Kenya Industrial Research and Development Institute (KIRDI), through the Kenya Industry and Entrepreneurship Project (KIEP), conducted a value chain mapping exercise in Taita Taveta County to uncover the challenges small businesses face in agriculture and processing, spanning sectors like rice, dairy, bananas, and beekeeping [1, 2]. The findings highlighted key areas where intervention is needed to help local enterprises grow, innovate, and access markets [3].

This work aligns with Kenya's Bottom-up Economic Transformation Agenda (BETA), which focuses on empowering small businesses to drive grassroots economic growth [4]. By addressing these challenges, KIRDI is not only supporting BETA but also contributing to broader African development goals outlined in the African Union's Agenda 2063, which emphasizes inclusive and sustainable growth. Moreover, it ties directly into the UN's Sustainable Development Goals (SDGs),

*Corresponding author: mikechelo@yahoo.com (Michael Cheloti)

Received: 25 October 2024; **Accepted:** 13 November 2024; **Published:** 22 January 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.

particularly those on economic growth (SDG 8), innovation (SDG 9), and responsible production (SDG 12) [5].

Economic growth today must also tackle 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 [6]. By promoting sustainable methods, we can reduce waste, cut emissions, and help communities adapt to climate challenges [7]. Supporting the agro-processing sector in Taita Taveta through these lenses can lead to a future that is both economically prosperous and environmentally sustainable, benefiting people and the planet.

1.1. Background of Taita Taveta County

Taita Taveta County is located in Kenya's coastal region, approximately 360 kilometers southeast of Nairobi. The county is strategically positioned as a major gateway to Tanzania, offering both domestic and cross-border trade opportunities. The county's geography is characterized by a combination of plains, hills, and forested areas, with notable natural features such as the Tsavo National Parks and Lakes Jipe and Chala [8].

The economy of Taita Taveta County is predominantly driven by agriculture, with crop farming, livestock rearing, and mining being key economic activities. Agricultural production includes food crops such as maize, beans, and bananas, alongside cash crops like macadamia, avocado, and sisal. Livestock farming, particularly dairy production, is also an important part of the county's economy. However, the agricultural sector faces numerous challenges, including insuffi-

cient infrastructure, limited access to markets, and vulnerability to climate change [8].

This value chain analysis aimed to provide a clearer understanding of the specific challenges and opportunities faced by actors in Taita Taveta's agricultural and livestock sectors, with the ultimate goal of informing targeted interventions that can enhance productivity and sustainability.

The main objective of this value chain analysis exercise, was to identify technological gaps, constraints, and opportunities within the agricultural and livestock sectors in Taita Taveta County. By focusing on key value chains, the analysis aimed to enhance the productivity, efficiency, and competitiveness of Micro, Small, and Medium Enterprises (MSMEs) engaged in these sectors. Specific objectives of the survey were;

1. Map the Value Chains: Identify and illustrate the key activities and actors involved in agricultural and livestock value chains, from input supply to final product marketing.
2. Assess Technological Needs: Evaluate gaps in technology that hinder productivity and value addition, focusing on input supply, processing, marketing, and waste management.
3. Analyze Business Management Practices: Identify challenges in financial management, market access, and compliance with quality standards.
4. Develop an Intervention Matrix: Propose actionable solutions to bridge identified gaps and enhance competitiveness.
5. Strengthen Value Chains: Provide recommendations to improve linkages, boost MSME participation, and promote inclusive growth, especially for women and youth.

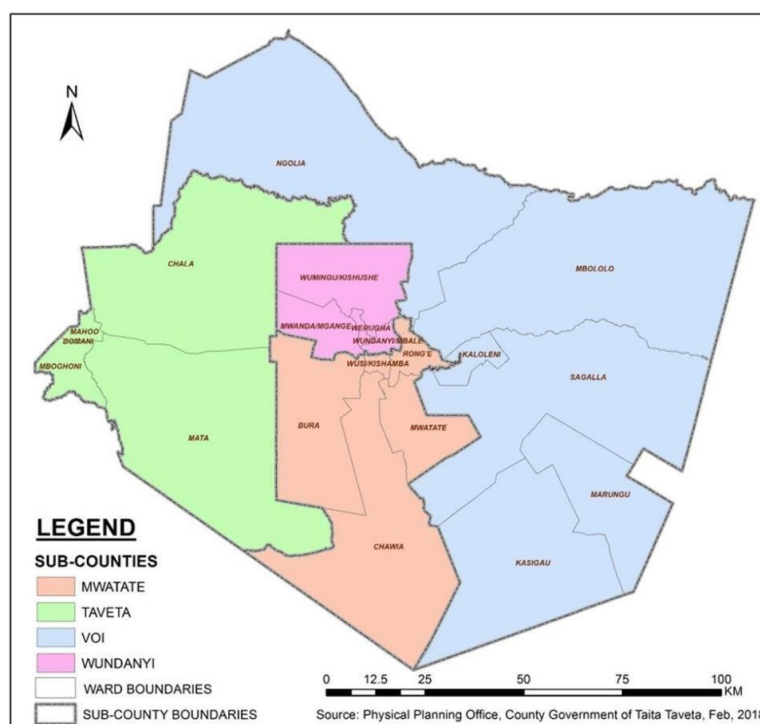


Figure 1. Taita Taveta County map showing Administrative and Political Units (www.researchgate.net).

This survey sought to create a roadmap for developing resilient agricultural and livestock value chains in Taita Taveta County, ultimately supporting the region's economic growth and sustainable development.

1.2. Scope of Work

This value chain analysis examines key agricultural and livestock sectors in Taita Taveta County, focusing on the challenges and opportunities within the local economy. The study covers rice, dairy, bananas, mushrooms, beekeeping, leather, and agro-processing engineering services, which are critical for the county's growth. By reviewing existing reports and engaging directly with farmers, small businesses, and industry experts, the study uncovers gaps in technology, business practices, and infrastructure. Field research, including site visits and interviews with value chain actors, provides a first-hand look at the tools and techniques being used in production, processing, and marketing.

The study spans various sub-counties, ensuring that both small- and large-scale operations are included. Data collection methods, such as questionnaires and focus group discussions, help build a comprehensive picture of the current landscape.

The findings will guide policy recommendations and targeted interventions aimed at boosting these value chains. Solutions will focus on introducing modern technologies, improving market access, adding value to products, and strengthening infrastructure. Ultimately, this research lays the groundwork for practical strategies that can help farmers and businesses in Taita Taveta County thrive.

2. Methodology

The methodology employed for this value chain analysis in Taita Taveta County was designed to ensure a thorough understanding of the agricultural and livestock sectors. It combined both qualitative and quantitative research methods to gather comprehensive data on the various value chains.

Data Collection Methods

1. *Literature Review:* An initial review of existing literature, reports, and studies related to the agricultural and livestock sectors in Taita Taveta County was conducted. This review helped establish a baseline understanding of the current state of the value chains and identified previous research gaps.
2. *Structured Interviews:* Key informant interviews were carried out with stakeholders across the value chains, including farmers, processors, marketers, and representatives from government and non-governmental organizations. A structured questionnaire was developed to guide these interviews, focusing on technological needs, business practices, and operational challenges.
3. *Focus Group Discussions:* Group discussions were organized with value chain actors to facilitate a deeper

exploration of the issues faced within each sector. These discussions encouraged participants to share their experiences, insights, and suggestions for improvement.

4. *Site Visits:* Field visits were conducted to various production and processing sites to observe operations firsthand. This allowed the research team to gather contextual data on production processes, infrastructure, and technology in use.
5. *Observational Techniques:* Direct observations of farming and processing practices were made to supplement interview data. This included assessing the physical conditions of farms and processing facilities, as well as observing the handling and management of agricultural products.
6. *Data Analysis:* The data collected was analyzed using qualitative and quantitative techniques. Qualitative data from interviews and focus groups were thematically analyzed to identify key patterns and insights. Quantitative data from structured questionnaires were analyzed using statistical methods to summarize and quantify findings related to production, technology usage, and business practices.
7. *Stakeholder Consultations:* Consultations were held with relevant government officials and industry experts to validate findings and gather additional insights. These consultations ensured that the study remained relevant to local conditions and aligned with regional development goals.

This comprehensive methodology enabled the research team to provide an in-depth analysis of the agricultural and livestock value chains in Taita Taveta County, resulting in actionable recommendations for stakeholders.

3. Sectoral Value Chain Mapping Findings

The value chain analysis for Taita Taveta County focuses on several key agricultural and livestock sectors, each presenting unique opportunities and challenges. The following sections provide a detailed examination of the identified value chains, including the actors involved, production processes, and key findings related to technology needs and market dynamics.

3.1. Rice Value Chain

3.1.1. Input Supply

The rice value chain in Taita Taveta relies heavily on irrigation schemes and quality seed supply. Partnerships with institutions like the Kenya Agriculture and Livestock Research Organization (KARLO) have facilitated the distribution of high-yield seed varieties, such as the Komboka rice. However, farmers often face challenges related to access to quality inputs, including fertilizers and pest management tools.

3.1.2. Production

Rice is primarily cultivated in irrigation schemes within Taveta Sub-County. The production area has expanded significantly, with smallholder farmers cultivating rice for both

subistence and market purposes. However, issues such as flooding, inadequate water supply, and pest infestations have led to reduced yields.

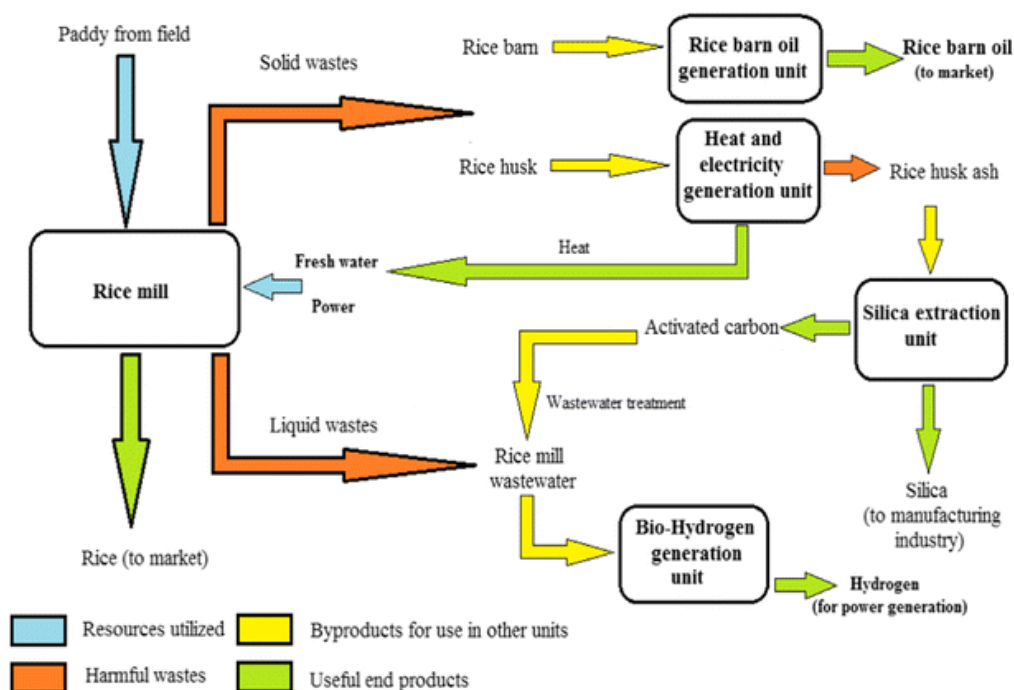


Figure 2. Showing production and process flow of rice (www.researchgate.net).

3.1.3. Processing and Value Addition

Currently, most rice processing is conducted manually due to the lack of mechanized processing equipment. This limitation results in low-value returns for farmers, as they are often compelled to sell unprocessed paddy rice at lower prices. Investment in modern milling and processing equipment is essential to increase value addition and profitability.

3.1.4. Marketing and Distribution

Farmers typically sell their produce to middlemen who transport the rice to larger markets in neighboring counties. This creates a lack of direct access to markets and diminishes farmers' bargaining power. Establishing cooperative marketing initiatives could enhance farmers' market access and profitability.



Figure 3. Showing polished rice on the left and unpolished rice on the right.

3.1.5. Gaps Identified

1. Limited access to modern rice processing facilities.
2. Insufficient knowledge on effective pest management and water conservation techniques.
3. Lack of organized marketing strategies leading to exploitation of farmers by middlemen.

3.2. Dairy and Dairy Products Value Chain

3.2.1. Input Supply

The dairy sector in Taita Taveta is supported by a network of small-scale farmers who primarily practice zero-grazing. Farmers rely on artificial insemination services and veterinary care provided at subsidized rates through cooperatives. However, there are reports of inconsistent quality in artificial insemination inputs, impacting herd productivity.

3.2.2. Production

Dairy production is concentrated in Wundanyi and Taveta constituencies, where farmers keep an average of 2 dairy cows each. The dominant breed is the Ayrshire, known for its high milk yield. Despite favorable conditions, the sector faces challenges such as fluctuating milk prices and seasonal variations in milk production.

3.2.3. Processing and Value Addition

Processing facilities like the Tagho Dairy Farmers Cooperative have made strides in value addition, producing fermented milk products such as yoghurt. However, opportunities for further value addition - like cheese and butter - remain underexploited due to limited processing capacity and certification issues.

3.2.4. Marketing and Distribution

The cooperative sells its products to local markets, hotels, and schools, but the lack of a reliable transportation system limits distribution capabilities. Regular collection failures by larger processors like New KCC can lead to spoilage and financial losses for farmers.

3.2.5. Gaps Identified

1. Inadequate infrastructure for value addition on dairy processing.
2. Limited access to reliable transportation for milk distribution.
3. Insufficient knowledge on value addition and marketing strategies.
4. Limited value addition and product diversification

3.3. Banana Value Chain



Figure 4. Showing basket, a table mat and a carpet made from banana fibers at Ziada Solutions.

3.3.1. Input Supply

The banana value chain is significantly bolstered by initiatives from Taita Taveta University, which provides quality banana seedlings and training in Good Agricultural Practices (GAPs). Farmers benefit from subsidized inputs, but the overall adoption of modern farming techniques is still low.

3.3.2. Production

Banana farming has increased in acreage and yields, making Taita Taveta County a leading producer in Kenya. However, many farmers face challenges related to water access, pest management, and inconsistent market prices.

3.3.3. Processing and Value Addition

Value addition activities, including banana ripening and processing into flour, are emerging but remain limited. Investments in processing facilities could enhance product diversity and marketability.

3.3.4. Marketing and Distribution

Farmers are organized into cooperatives, allowing them to sell bananas in aggregated lots to secure better prices. However, access to broader markets remains a challenge due to insufficient marketing skills and resources.

3.3.5. Gaps Identified

1. Limited infrastructure for value addition and storage.
2. Lack of marketing knowledge and skills among farmers.
3. Challenges in pest management and irrigation practices.

3.4. Mushrooms Value Chain

3.4.1. Input Supply

Mushroom farming has gained popularity as an alternative cash crop in Taita Taveta. Support from organizations like FAO has facilitated training and provision of equipment to farmers, predominantly women.

3.4.2. Production

Farmers cultivate mushrooms using basic techniques. However, the lack of adequate facilities for growth and drying hampers production levels.

3.4.3. Processing and Value Addition

While some farmers produce dried mushrooms for sale, further processing opportunities are largely untapped due to insufficient training in value addition techniques.

3.4.4. Marketing and Distribution

Mushrooms are sold locally, with farmers struggling to access wider markets. The establishment of cooperatives could enhance collective bargaining and market access.

3.4.5. Gaps Identified

1. Limited infrastructure for expansion of mushroom farming within the County.
2. Insufficient knowledge in mushroom processing and value addition.
3. Inadequate facilities for drying and storage.

3.5. Beekeeping and Honey Processing Value Chain

3.5.1. Input Supply

The beekeeping sector benefits from government initiatives providing beehives to local farmers. However, access to quality beekeeping equipment remains a challenge.

3.5.2. Production

Beekeeping is practiced by a growing number of farmers, with honey production being primarily focused on local markets. Training in best practices is essential for improving honey quality and production efficiency.

3.5.3. Processing and Value Addition

Currently, honey is often sold in crude form to brokers, limiting income potential. Establishing local processing facilities could allow for higher value-added products.

3.5.4. Marketing and Distribution

Local beekeepers often sell their honey through middlemen, which affects profit margins. Strengthening cooperative structures could improve market access.

3.5.5. Gaps Identified

1. Inadequate of modern processing facilities and equipment.
2. Limited knowledge and skills on effective beekeeping practices.
3. Inconsistent quality control measures for honey production.

3.6. Leather Value Chain

3.6.1. Input Supply

The leather sector is characterized by the availability of hides and skins primarily from local livestock farmers. However, the value addition of these by-products is minimal, with most farmers selling raw materials to brokers.

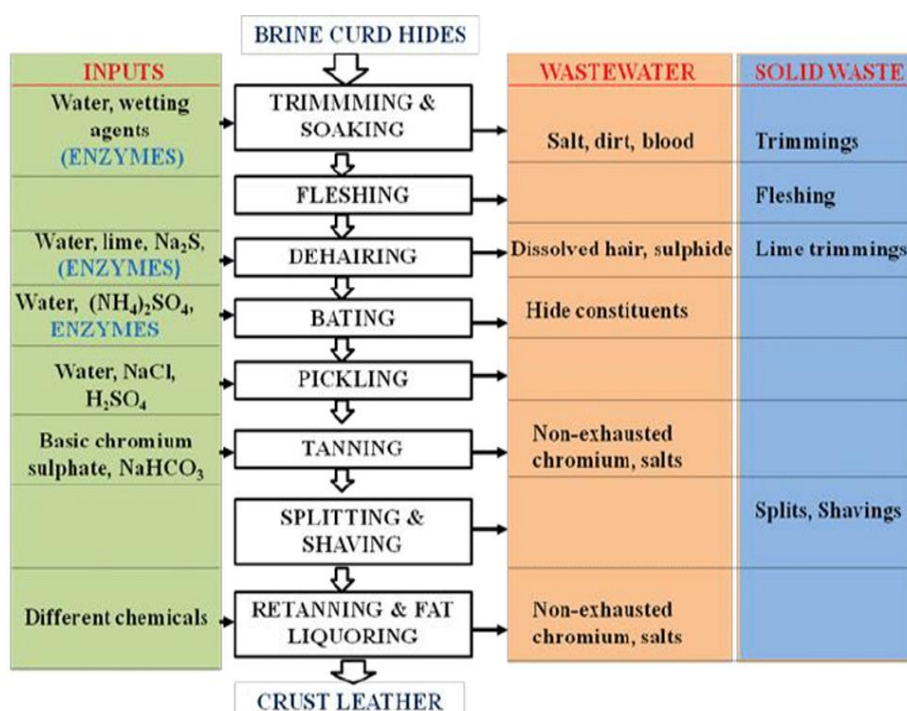


Figure 5. Showing the process flow of leather tanning (www.researchgate.net).

3.6.2. Processing and Value Addition

Processing operations often rely on outdated methods, resulting in low-quality leather products. Training and investment in modern equipment are critical for improving product quality.

3.6.3. Marketing and Distribution

Local tanneries struggle to market their products effectively due to limited resources and competition from synthetic alternatives.



Figure 6. Showing Leather toggling using sisal ropes (left) and poorly tanned leather (right) at Mwachabo CBO Tannery.

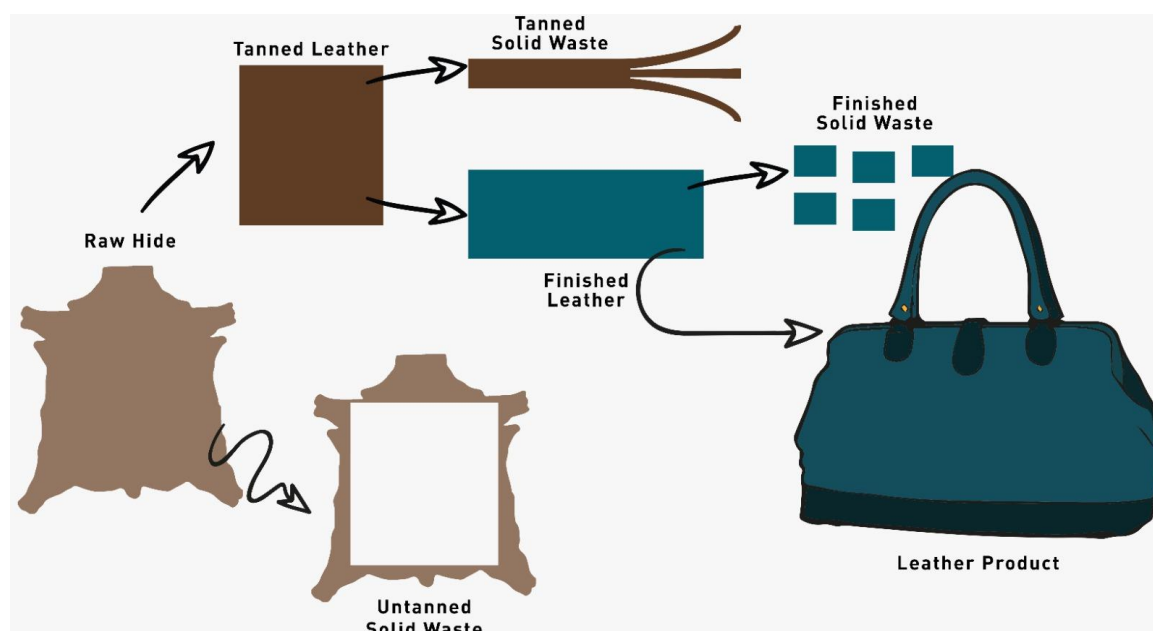


Figure 7. Showing solid waste management from leather tannery (www.authenticate.co.uk).

3.6.4. Gaps Identified

1. Lack of infrastructure for modern tanning hides and skins.
2. Lack of knowledge and skills on value addition along the leather value chain
3. Limited marketing strategies for leather products.
4. Insufficient knowledge on quality control, environmental and safety standards.

3.7. Engineering Service Value Chain

3.7.1. Input Supply

This sector provides essential services to the agricultural

industry, including the manufacture of tools and machinery. Local enterprises face challenges related to the procurement of quality raw materials.

3.7.2. Production

Manufacturing is primarily labor-intensive, with opportunities for mechanization remaining underexplored. Capacity-building initiatives can enhance productivity.

3.7.3. Marketing and Distribution

Local engineering firms primarily serve the regional market, but effective marketing strategies and business management practices are lacking.

3.7.4. Gaps Identified

1. Insufficient investment in modern manufacturing technologies.
2. Limited business management skills among entrepreneurs.
3. Challenges in accessing larger markets due to inadequate marketing strategies.

4. Intervention Matrix for Value Chains

The intervention matrix outlines specific challenges identified in each agricultural and livestock value chain within Taita Taveta County, alongside proposed interventions and the expected outcomes. This strategic framework is designed to guide stakeholders in addressing gaps and enhancing the productivity and competitiveness of the respective sectors.

4.1. Rice Value Chain

Table 1. Showing intervention matrix for the rice value chain.

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Limited access to modern processing facilities	Acquisition of modern processing equipment	Procurement of suitable machinery Training for operators	Increased efficiency in rice processing Higher product quality and market prices
Inadequate knowledge on effective pest management	Training on integrated pest management	Workshops and training sessions for farmers	Reduced crop losses Improved yields and profitability
Weak market linkages and bargaining power	Establishment of farmer cooperatives	Facilitation of cooperative formation Training on collective marketing strategies	Enhanced market access Better pricing for farmers' produce

4.2. Dairy and Dairy Products Value Chain

Table 2. Showing intervention matrix for the Dairy and dairy products value chain.

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Insufficient processing infrastructure	Expansion of dairy processing facilities	- Design and construction of new processing units	- Increased capacity for value-added dairy products - Improved product safety and quality
Fluctuating milk prices	Development of a price stabilization fund	- Establishment of a fund to support dairy farmers during price dips	- Enhanced financial stability for dairy farmers - Consistent income throughout the year
Lack of marketing skills	Training in marketing and branding	- Workshops on effective marketing strategies and brand development	- Improved market visibility for dairy products - Increased sales and revenue

4.3. Banana Value Chain

Table 3. Showing intervention matrix for the banana value chain.

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Limited infrastructure for value addition	Construction of banana processing facilities	Development of facilities for banana flour and other products	Increased value addition Diversified product offerings

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Insufficient knowledge in pest management	Training on pest management techniques	Workshops and demonstrations for banana farmers	Reduced pest-related losses Improved yields
Weak marketing networks	Formation of marketing cooperatives	Facilitation of cooperative marketing initiatives	Enhanced bargaining power Better prices for farmers' produce

4.4. Mushrooms Value Chain

Table 4. Showing intervention matrix for the mushroom value chain.

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Lack of expansion facilities for mushroom farming	Provision of growing rooms and drying facilities	Design and construction of facilities for mushroom cultivation	Increased production capacity Improved product quality
Limited knowledge on value addition	Training on mushroom processing	Workshops on techniques for drying and processing mushrooms	Greater product diversity Enhanced market competitiveness
Insufficient market access	Development of local and regional market linkages	Establish partnerships with local buyers and processors	Improved sales and income for mushroom farmers

4.5. Beekeeping and Honey Processing Value Chain

Table 5. Showing intervention matrix for the honey processing value chain.

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Lack of modern processing equipment	Provision of honey processing facilities	Construction of processing units with modern equipment	Increased efficiency in honey production Higher product quality
Limited knowledge on effective beekeeping practices	Training on modern beekeeping techniques	Workshops on hive management and honey extraction	Improved honey yield and quality Enhanced income for beekeepers
Inconsistent quality control	Establishment of quality assurance protocols	Development of SOPs for honey processing and packaging	Consistent product quality Increased market trust

4.6. Leather Value Chain

Table 6. Showing intervention matrix for the leather value chain.

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Lack of modern tanning technology	Investment in modern tanning equipment	Procurement of machinery and training on its use	Improved quality of leather products Increased competitiveness in markets
Insufficient training in leather processing	Capacity building programs	Training workshops on leather tanning and production techniques	Enhanced skills for local artisans Higher quality output
Limited marketing strategies	Development of mar-	Facilitation of cooperative struc-	Enhanced market access

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
	Marketing cooperatives	Training for marketing	Better pricing for leather goods

4.7. Engineering Service Value Chain

Table 7. Showing intervention matrix for the Engineering services value chain.

Challenges and Opportunities	Intervention Measures	Activities	Expected Outcomes and Impact
Lack of modern manufacturing technologies	Investment in mechanization	Procurement of modern manufacturing equipment	Increased production efficiency Higher quality products
Limited business management skills	Training in entrepreneurship	Workshops on business management and financial literacy	Improved operational efficiency Increased profitability
Poor marketing and branding strategies	Development of marketing plans	Training on effective marketing and branding techniques	Enhanced market presence Increased sales volume

5. Discussion

The value chain analysis in Taita Taveta County sheds light on pressing challenges faced by MSMEs in the agricultural and livestock sectors, including outdated technology, limited value addition, and restricted market access [1, 3]. These issues resonate with findings from similar studies conducted in Kenya's arid and semi-arid regions, where limited infrastructure and access to modern equipment often hamper productivity and growth [9, 10]. A notable example is the Kenya Agricultural and Livestock Research Organization (KALRO) study, which found that outdated agricultural practices and high input costs constrained MSME growth across rural counties [11]. The findings from this survey emphasize opportunities unique to Taita Taveta, such as leveraging the county's diverse agricultural base to expand into value-added products like banana flour and processed dairy [8]. This focus on diversification aligns with insights from the World Bank's 2020 Kenya Industry and Entrepreneurship Project (KIEP), which stressed the potential for targeted interventions in specific crops and livestock to boost value chain resilience (World Bank, [2]).

By comparing these analyses, it becomes evident that while structural challenges are widespread, Taita Taveta has distinct strengths in crop diversity that could drive sustainable, sector-specific growth through tailored support for MSMEs [12, 13].

6. Conclusions

The value chain analysis conducted in Taita Taveta County has provided valuable insights into the agricultural and live-

stock sectors, revealing both the challenges and opportunities that exist within these vital industries. The findings highlight the need for strategic interventions to enhance productivity, value addition, and market access for Micro, Small, and Medium Enterprises (MSMEs) engaged in these value chains. The findings also suggest that effective management practices are essential to support MSMEs, ensuring they access resources, training, and technology. Strengthened management can drive productivity, sustainability, and long-term growth across these value chains.

Key conclusions drawn from the analysis include:

1. *Technological Gaps*: A significant barrier to growth in the agricultural and livestock sectors is the lack of access to modern processing equipment and value addition technologies. Investments in mechanization and technology transfer are essential to improve efficiency and product quality.
2. *Capacity Building*: There is a pressing need for targeted training programs to enhance the skills and knowledge of farmers and processors. This includes training in modern farming techniques, pest management, value addition, and business management practices.
3. *Market Access*: Establishing cooperative structures can empower farmers to collectively market their products, thereby improving bargaining power and access to better prices. Strengthening linkages between producers and markets is crucial for sustainable income generation.
4. *Infrastructure Development*: Improving infrastructure, such as processing facilities and transportation networks, is vital for enhancing the efficiency of the value chains. Investments in infrastructure can facilitate better supply chain management and reduce post-harvest losses.
5. *Collaboration and Partnerships*: Engaging stakeholders

from various sectors, including government, NGOs, and private enterprises, is critical for implementing effective interventions. Collaborative efforts can leverage resources, expertise, and technology to drive growth in the agricultural and livestock sectors.

In summary, addressing the identified challenges through the proposed interventions can significantly enhance the productivity and competitiveness of Taita Taveta County's agricultural and livestock value chains. By implementing these strategies, stakeholders can promote sustainable development, improve livelihoods, and contribute to the overall economic growth of the county.

Abbreviations

CBO	Community Based Organization
BETA	Bottom up Economic Transformation Agenda
FAO	Food and Agriculture Organization
GAPs	Good Agricultural Practices
KARLO	Kenya Agriculture and Livestock Research Organization
KIE	Kenya Industrial Estate
KIEP	Kenya Industrial Entrepreneurship Project
KIRDI	Kenya Industrial Research and Development Institute
MSMEs	Micro Small and Medium Enterprises
SDGs	Sustainable Development Goals

Acknowledgments

The authors express heartfelt gratitude to the World Bank group, KIRDI management and the KIRDI-KIEP project leadership led by the PI, for facilitating the sectoral value chain mapping survey in Taita Taveta County. Special thanks go to Ms. Gertrude Shuwe and Mr. Anthony Wamati for their support and connections to key informants, as well as the County Manager at Kenya Industrial Estate (KIE) for valuable insights on MSMEs growth. Lastly, the authors sincerely appreciate all the respondents for their time and contributions, which were vital to the success of the survey.

Author Contributions

Jackson Mutai: Conceptualization, Data curation, Formal Analysis, Investigation, Methodology, Software, Validation

Stella Ndungu: Conceptualization, Formal Analysis, Investigation, Methodology, Visualization

Michael Cheloti: Data curation, Investigation, Methodology, Validation, Visualization, Writing – original draft, Writing – review & editing

Arthur Onyuka: Conceptualization, Formal Analysis, Investigation, Methodology, Project administration, Resources, Supervision, Validation

Rukia Kemunto: Conceptualization, Data curation, For-

mal Analysis, Investigation, Methodology, Validation, Visualization

Conflicts of Interest

The authors declare no conflicts of interest.

References

- [1] Kenya Industrial Research and Development Institute (KIRDI). (2022). Value Chain Analysis Framework: Methodology and Guidelines. Nairobi: KIRDI.
- [2] World Bank Group. (2020). Kenya Industry and Entrepreneurship Project (KIEP). Project Appraisal Document. Washington, D. C.: World Bank.
<https://doi.org/10.1596/978-1-4648-1492-4>
- [3] Taita Taveta County Government. (2021). County Integrated Development Plan (CIDP) 2020-2025. Mwatate: Taita Taveta County Government.
- [4] Kenya Vision 2030. (2020). Second Medium Term Plan 2018-2022. Nairobi: Government Printer.
- [5] FAO. (2020). Promoting Sustainable Agriculture in Kenya: The Role of Women Farmers. Rome: Food and Agriculture Organization.
- [6] Ministry of Agriculture, Livestock, Fisheries, and Cooperatives. (2021). National agricultural sector climate change action plan 2021-2026. Nairobi: Government Printer.
- [7] Kenya Agricultural and Livestock Research Organization (KARLO). (2019). Annual Report on Agricultural Productivity in Kenya. Nairobi: KARLO.
- [8] Taita Taveta University. (2021). Research and Innovations in Agricultural Development: Progress Report. Voi: Taita Taveta University.
- [9] Kenya National Bureau of Statistics (KNBS). (2018). Economic Survey 2018. Nairobi: Government Printer.
- [10] Makori, E., & Kinyua, T. (2021). Infrastructure and market access in agricultural value chains: A case study of Kenya's ASAL regions. *Journal of Rural Studies*, 45, 87-98.
<https://doi.org/10.1016/j.jrurstud.2021.02.008>
- [11] Kenya Agricultural and Livestock Research Organization (KARLO). (2020). *Challenges and opportunities in agricultural value chains in Kenya's ASAL regions*. Nairobi: KARLO Press. <https://doi.org/10.1234/karlo2020.03>
- [12] International Food Policy Research Institute (IFPRI). (2021). *Supporting MSMEs in Africa's agri-food systems for growth and food security*. Washington, DC: IFPRI.
<https://doi.org/10.2499/9780896293983>
- [13] Muriithi, B. W., & Matz, J. A. (2015). Welfare effects of vegetable commercialization: Evidence from smallholder producers in Kenya. *Food Policy*, 50, 80-91.
<https://doi.org/10.1016/j.foodpol.2014.11.001>