



Agro-food Value Addition and Circular Food Systems in Kenya

A Roadmap Developed by a Cluster of Kenyan Agro-food Enterprises

EXECUTIVE SUMMARY

The Roadmap for agro-food value addition and circular food systems in Kenya sets out a practical pathway to scale value addition to primary agricultural, livestock and aquatic products and to strengthen circular food systems in Kenya. It is developed under the Advancing Bioeconomy Development in Kenya (ABDK) project, implemented by the Stockholm Environment Institute (SEI) with support from the Swedish International Development Cooperation Agency (Sida). The roadmap contributes to national and regional goals for industrialization, food and nutrition security, and green, inclusive growth by focusing on micro, small and medium enterprises (MSMEs) engaged in agri food processing, fortified and novel foods, and circular food innovations that reduce losses and waste.

The Cluster of Kenyan Agro-food enterprises transform raw materials into higher value foods and ingredients, including fortified flours and snacks, processed indigenous crops, animal source products, insect based foods and feeds, and upcycled by products for feed, fertilizer and bioenergy. These activities generate jobs, link smallholders to higher value markets, and reduce post harvest losses while improving food quality and safety. The roadmap describes how a bioeconomy approach using crops, livestock, aquatic products and organic waste as economic assets can build integrated, circular agri food value chains that are more productive, climate resilient and nutrition sensitive.

The cluster vision is a competitive and inclusive Kenyan bioeconomy where value addition and circular food systems connect farmers and processors to reliable markets, create decent jobs, enhance food and nutrition security, and convert biowaste into new value streams through innovation, climate resilient practices and collaboration along the agri food chain. To achieve this, the roadmap identifies coordinated actions across six domains: (1) financing; (2) certification and compliance; (3) markets; (4) technology; (5) infrastructure; and (6) capacity and skills. It highlights strong underlying strengths abundant biomass, growing demand for natural and health focused products, and locally innovated business models alongside major weaknesses such as financing gaps, complex regulatory requirements, and shortages in technology, infrastructure and skilled labour.

Three strategic opportunity areas are emphasized: market expansion and export development; financing and investment for value addition and circularity; and technology, innovation and skills for modern circular agri food systems. At the same time, three critical barrier clusters are identified: limited access to affordable and appropriate finance; complex, fragmented and costly certification and regulatory requirements; and inadequate technology, infrastructure and skilled human capital. The roadmap proposes enablers, lead institutions and specific policy actions to address these bottlenecks, including dedicated financing instruments, streamlined and better communicated certification pathways, shared processing hubs, cold chains, digital tools, and stronger training and R&D linkages.

Milestones are proposed for 2030 and 2040. By 2030, the roadmap envisages that many **Kenyan Agro-food** MSMEs will have better access to finance, increased and optimized production capacity, reduced dependence on rainfed agriculture, a fairer business environment and stronger human capital. By 2040, the cluster aims to operate within a fully supportive ecosystem featuring climate resilient infrastructure, advanced market intelligence and product diversification, robust strategies to manage geopolitical and global shocks, and well developed transport, energy, storage and digital infrastructure that supports competitive, circular, value added agri food enterprises across Kenya.

1.

An Overview of the ABDK Project

1.1 The ABDK Project

The Advancing Bioeconomy Development in Kenya (ABDK) project, implemented by the Stockholm Environment Institute (SEI) with support from the Swedish International Development Cooperation Agency (Sida), aims to accelerate the industrialization, modernization and scaling of Kenya's bioeconomy while generating lessons for the broader East Africa region. The project focuses on three core interventions: mapping bioeconomy private-sector actors and agripreneurs in Kenya and Sweden, developing bioeconomy roadmaps for different Kenyan bioeconomy actor clusters, and promoting collaboration and technology exchange between Swedish and Kenyan bioeconomy practitioners.

A central component of ABDK is the co-creation of roadmaps with selected bioeconomy clusters and the use of these cluster platforms to catalyse business-to-business partnerships between Kenyan MSME bioeconomy enterprises and Swedish bioeconomy companies. Through these partnerships, the project seeks to unlock investment, technology transfer and market access for high-potential bio-based solutions.

Within this framework, the ABDK initiative supports four distinct clusters. Cluster 1 focuses on enterprises involved in value addition to primary agricultural, livestock and aquatic products, including agri-food processing, fortified and novel foods, and innovative circular food system approaches. The roadmap for this cluster outlines priority actions to scale value-added agri-food value chains that enhance nutrition and food security, advance circular economy practices, reduce post-harvest losses and waste, and contribute to Kenya's inclusive green growth and industrialization agenda.

1.2. Value Addition and Circular Food Systems in Kenya's Emerging Bioeconomy

Value addition transforms raw agricultural, livestock and aquatic products into higher-value goods, allowing farmers, producers and bioprocessing enterprises to earn more income, create jobs, and access new markets. It is a high-potential pillar for Kenya's inclusive bioeconomy, converting primary produce into processed foods, fortified products, and innovative ingredients that improve nutrition, reduce waste and create employment throughout value chains.

Value addition encompasses multiple pathways: processing staple crops like cassava, maize and pulses into shelf-stable flours and meals; developing fortified and functional foods that address malnutrition; transforming livestock by-products into value-added proteins and bio-based inputs; upcycling food processing residues into animal feed, fertilizers and bioenergy; and commercializing novel foods such as insect proteins and indigenous crops. These approaches link smallholder farmers to higher-value markets, reduce post-harvest losses, improve food safety and quality, strengthen food and nutrition security, and support rural industrialization and green employment.

A bioeconomy approach to food systems means converting biological resources—crops, livestock, aquatic products and organic waste—into valuable economic assets across integrated value chains. This generates livelihoods, enhances productivity, and advances circular practices where residues and by-products are reused rather than discarded. It requires coordinated investment in processing technology, quality certification, market linkages, skills development, and supportive policy so that Kenyan MSMEs can move from cottage-scale operations to semi-industrial, export-ready enterprises that embed circular and nutrition-focused business models while contributing to climate resilience and food security.

The Kenyan Agro-food Enterprises Cluster Roadmap



2.1 Cluster Vision

A competitive and inclusive Kenyan bioeconomy where value addition to primary produce, novel food products and circular food systems connects farmers and processors to reliable markets, creates decent jobs, enhances food and nutrition security, and transforms biowaste into new value streams driven by innovation, climate resilient practices, and strong collaboration across the agri food value chain.

Cluster 1 members and enterprises are listed in the annex.

2.2 Scaling Opportunities for Cluster Enterprises (MSMEs)

Micro, Small and Medium Enterprises in the agro-food enterprise cluster include processors of cereals, roots and tubers, indigenous crops, livestock and aquatic products, as well as enterprises producing fortified foods, novel foods and upcycled products from by products and organic waste. To unlock their full potential, coordinated actions are needed across six key domains: financing, certification and compliance, markets, technology, infrastructure, and capacity and skills.

Financing



» **MSMEs consistently identify access to affordable capital and working capital as a core bottleneck. Scaling will require:**

- Developing tailored financing instruments (grants, concessional loans, impact and climate finance, blended finance) suited to agri food value addition and circular models, including working capital for procurement, processing and inventory.
- Designing catalytic and long-term capital facilities that can fund machinery upgrades, cold chain infrastructure, certifications and product development without onerous collateral requirements.
- Strengthening financial literacy, investment readiness and record keeping so enterprises can meet the requirements of banks, SACCOs and impact investors.

Certification and Compliance



- » **Certification is both a gateway to premium and export markets and a major constraint for MSMEs.** Entrepreneurs report difficulties with multiple certifications for the same product (KEBS, KEPHIS, KENAS, KOAN), lack of clear information on requirements, high costs (especially for organic certification), and the presence of sub standard products leaking into the market through weak enforcement. Priority actions include:
 - Providing clear, consolidated guidance on domestic and export certifications, including KEBS, KS 1758, EAC and key export standards, in formats accessible to MSMEs.
 - Using cluster based or consolidated producer groups to fast track certification, reduce per enterprise costs and enable group audits.
 - Supporting pathways into organic, fair trade and other sustainability standards through subsidized audits, mentorship and partnerships with certification bodies.

Markets



- » **Growing demand for natural, organic, healthy and sustainably produced foods domestically, regionally and internationally creates major scaling opportunities for Cluster 1 MSMEs.** Enterprises highlighted the need to:
 - Systematically explore and enter export markets such as the UAE, EU, China and priority African markets, building on rising global interest in African superfoods, indigenous crops and circular products.
 - Increase brand visibility and product recognition through profiling of enterprises, improved packaging and labelling, participation in trade fairs, and the development of strong cluster and national brands for Kenyan bio based foods.
 - Invest in digital marketing (websites, social media, online marketplaces) and e commerce channels to reach urban, regional and diaspora consumers.

Technology



- » **Entrepreneurs emphasized that mechanization and appropriate processing technology are critical to supplement human labour, increase efficiency and ensure consistent quality.** Scaling requires:
 - Facilitating access to locally appropriate machinery such as milling equipment, slicing and cutting machines, roasting and drying units, mixers, cream filling machines, oil presses, DC motors, and small scale automation and robotics that reduce losses and improve hygiene.
 - Supporting local design and manufacture of equipment where feasible, to reduce import dependence and improve after sales service and spare part availability.
 - Promoting adoption of digital tools for production planning, quality control, traceability and farmer/producer mapping, including apps and simple data systems that improve decision making.

Infrastructure



» **Infrastructure gaps from energy to storage and logistics directly constrain the scaling of value-added and circular food enterprises.** Priority areas include:

- Investing in cold chain systems (pre-cooling, refrigerated storage and transport) to reduce post harvest losses, extend shelf life and meet food safety requirements.
- Securing reliable and affordable energy, including renewable options, for processing, drying, chilling and packaging.
- Developing centralized bio organic or agri food parks where MSMEs can share utilities, laboratories, storage facilities, waste handling and support services.

Capacity and Skills



» **Human capital and organizational capacity underpin all other scaling efforts.** enterprises need to:

- Build technical skills in food safety, quality management, product formulation, fortification, packaging and circular processing (e.g. valorizing by products into feed, fertilizer or ingredients).
- Strengthen business skills in financial management, marketing, export readiness, standards compliance and investor engagement.
- Enhance farmer onboarding, supplier training and digital farmer mapping to secure consistent raw material quality and volumes and to integrate smallholders into higher value markets.

2.3. SWOT Analysis



Strengths

- Availability of raw materials and arable land: Kenya has abundant biomass resources from crops, livestock, and organic waste streams, alongside extensive arable land, providing a strong base for diverse agri-food and circular value chains.
- Strong and growing demand for natural and health-focused products: Rising consumer interest in natural, organic, functional, and wellness-oriented foods domestically and globally supports the commercialization and scale-up of products produced by the enterprises in the Kenyan agro-food cluster
- Locally innovated and scalable solutions: Many business and technology models in the cluster are locally developed and adapted to Kenyan realities, making them highly scalable and resilient. A growing body of relevant research and technical expertise further supports innovation.



Weaknesses

- **Financing challenges:** Enterprises face difficulties accessing affordable credit, confront high interest rates and strict collateral requirements, and have limited access to early stage, patient and risk tolerant capital. This constrains investment in technology, facilities, certification and growth.
- **Market and regulatory compliance hurdles:** Complex, fragmented and sometimes unclear standards, certification procedures and export regulations increase costs and delays, particularly for MSMEs with limited administrative capacity.
- **Gaps in technology, R&D, skilled labour and infrastructure:** Many enterprises lack modern processing equipment, effective R&D linkages and adequately trained technical staff, and are hampered by unreliable energy, limited storage and weak rural transport networks.



Opportunities

- **International and regional markets:** Growing global demand for sustainable, circular and bio based foods offers significant export potential, especially where Kenyan products can meet stringent quality and sustainability standards.
- **Emerging financing mechanisms:** Green finance, climate funds, impact investment and blended finance windows create new opportunities to unlock capital for value addition, circular business models and climate smart technologies.
- **Technological advancement:** Advances in food processing, biotechnology, precision agriculture, digital traceability and clean energy can improve efficiency, product quality, resource use and regulatory compliance across the cluster.



Threats

- **Restrictive or inconsistent policies and regulations:** Unclear, fragmented or shifting rules and tax regimes increase operational risk and costs, undermining the competitiveness of formal, compliant enterprises.
- **Climate change, droughts and floods:** Increasing climate variability threatens biomass availability, agricultural productivity and infrastructure, disrupting supply chains and raising production risks and costs.
- **Unfair business practices, insecurity and poor infrastructure:** Predatory intermediaries, poorly structured taxes, localized insecurity, and inadequate transport and energy infrastructure all erode margins and discourage investment in formal, value added and circular operations.

2.4 Key Opportunities for Expansion

- **Market Expansion and Export Development**

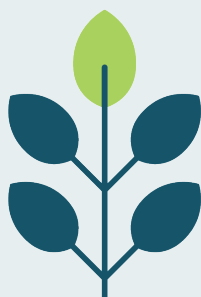
There is substantial scope to expand into premium domestic, regional and international markets, particularly in the UAE, EU, and emerging African markets seeking healthy, traceable and sustainably produced foods. By strengthening certification, branding, storytelling around Kenyan origins, and participation in trade fairs and digital marketplaces, Kenyan agro-food enterprises can position Kenyan value-added and circular food products competitively in global value chains.

- **Financing and Investment for Value Addition and Circularity**

New financing opportunities such as green and climate funds, impact investors, blended finance facilities and tailored MSME credit lines can be leveraged to unlock capital for equipment, facilities, certifications and innovation. Targeted financial instruments that recognize the specific dynamics of agri-food processing and circular models can accelerate the transition from micro-scale to semi-industrial operations, while also enabling enterprises to invest in climate-resilient and waste-valorizing technologies.

- **Technology, Innovation and Skills for Modern, Circular Agri-Food Systems**

Adoption of modern processing machinery, cold chains, digital systems and clean energy solutions offers major opportunities to improve efficiency, reduce losses, and generate higher-value products from the same or fewer resources. Coupled with stronger linkages between research institutions and industry, and expanded technical and managerial training, these technologies can drive innovation in fortified foods, novel proteins, upcycled products and circular value chains, positioning Kenya as a regional leader in sustainable food systems.



2.5 Key Barriers for Growth

- **Limited Access to Affordable and Appropriate Finance**

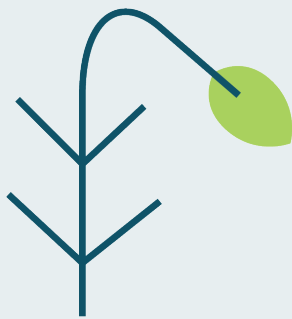
The absence of dedicated, affordable financing instruments for value-added and circular agri-food MSMEs—including concessional loans, blended finance and venture capital—creates high upfront capital burdens for equipment, facilities and certification, and leaves firms in chronic working-capital constraint.”. High interest rates, stringent collateral requirements and limited early-stage risk capital slow or prevent enterprises from upgrading technology, professionalizing operations and entering new markets.

- **Complex, Fragmented and Costly Certification and Regulatory Requirements**

Multiple certifying bodies, overlapping or unclear standards, and expensive audit processes, especially for organic and export certifications create significant barriers to formalization and market entry. For many MSMEs, navigating KEBS, KEPHIS, KENAS, KOAN and international standards without coordinated guidance or support results in delays, added costs and missed opportunities in premium and export markets.

- **Inadequate Technology, Infrastructure and Skilled Human Capital**

Many cluster actors still rely on manual or semi-manual processes, lack access to appropriate mechanization, and operate in facilities with limited cold storage, unreliable power and weak logistics connections. Shortages of skilled technical and managerial staff, constrained R&D linkages, and insufficient training on advanced processing and circular business models further limit productivity, quality consistency and innovation capacity. Addressing these structural gaps is essential for MSMEs to achieve the ideal future state of modern, competitive and circular value-added agri-food enterprises



2.5. Creating an enabling environment for Agro-Food Value Addition



The ideal situation for Kenyan agro-food enterprises on achieving optimum production is through fully equipped, scalable facilities that leverage affordable energy, quality raw materials, and advanced technologies. Such an operational success needs to be supported by a robust ecosystem featuring accessible capital, skilled human resources, and reliable infrastructure. Ultimately, sustainable growth relies on a stable geopolitical environment and favorable policies that ensure consistent market access and a competitive business climate.

A table on Enablers, Lead Institutions, and Policy Actions

ISSUE	INSTITUTIONS	POLICY ACTIONS
<p>Market access (MSMEs struggle to break into and scale within profitable local, regional, and export markets for their value added and circular food products.)</p>	<p>Ministry of Trade & Cooperatives (GOK), KEPSA, Kenya Tourism Board, county governments</p>	<ul style="list-style-type: none"> • Ease of doing business; • Develop export corridors and preferential trade agreements; • Create co-branded 'Kenyan Value-Added Foods' label; • support participation in regional and international trade fairs
<p>Access to capital (No availability of affordable, appropriate finance for equipment, facilities, certification and working capital tailored to agri food MSMEs.)</p>	<p>Central Bank, KBA, KEPSA, DFIs, SACCOs, microfinance institutions, Ministry of ICT</p>	<ul style="list-style-type: none"> • Affordable capital mechanisms; • Create dedicated bioeconomy financing windows with concessional rates; establish guarantee schemes for food enterprise loans; support blended finance and impact investment vehicles
<p>Access to quality raw materials (MSMEs struggle to secure a consistent, safe and standardized supply of climate resilient raw materials in adequate volumes and at stable prices.)</p>	<p>Ministry of Agriculture, cooperatives, county governments, extension services</p>	<ul style="list-style-type: none"> • Formulations of quality assurance standards and their enforcement; • Organized value chains; • strengthen farmer organizations; • establish farmer training programs; • support contract farming agreements
<p>Technology access (MSMEs face difficulties obtaining and using appropriate processing, preservation, packaging and digital technologies needed to improve efficiency, food safety and traceability.)</p>	<p>KIRDI, KEFRI, universities, TVETs, Ministry of Education</p>	<ul style="list-style-type: none"> • Accessibility and availability of technology; • Support technology transfer and local manufacturing of appropriate equipment; • Establish incubation hubs for agri-food innovation; • Provide matching grants for technology adoption
<p>Fully equipped facilities (A large share of enterprises operate from small, informal, or underspec facilities that do not meet food safety, certification, or scale requirements, constraining formalisation and growth.)</p>	<p>Ministry of Industry, county governments, national and county development authorities, private sector</p>	<ul style="list-style-type: none"> • Organized value chains; • Support development of shared agri-food processing hubs and industrial parks with modern facilities; • Improve infrastructure for processing sites; • Link enterprises with facility management support
<p>Affordable and accessible energy (High tariffs, unreliable supply, and lack of grid access in some areas make energy a major cost and risk for processors, especially for drying, cooling, and milling operations.)</p>	<p>Ministry of Energy, KPLC, county governments, national and county development authorities</p>	<ul style="list-style-type: none"> • Harmonized taxes and levies; • Lowering the cost of energy; • Prioritize renewable energy systems for agri-food parks; • Subsidize electricity for food processing; • Support mini-grid connections and productive-use tariffs

<p>Access to relevant skilled human capital (shortage of workers and managers with practical skills in food technology, circular processing, equipment operation, quality management, and business administration).</p>	<p>Ministry of Education, TVET Board, universities, industry associations, Development partners</p>	<ul style="list-style-type: none"> • Integrate food technology and circular economy curricula into TVETs; • Establish apprenticeship and internship programs; • Support leadership and management training for enterprise owners; promote industry-recognized certifications
<p><i>Abbreviations are provided in the annex</i></p>		

2.7. Milestones: 2030 and 2040

By 2030

- **Capital access**
Affordable and accessible financing mechanisms in place that enable MSMEs to grow, innovate and scale bio based, value added food enterprises.
- **Production capacity**
Increased and optimised production capacities so enterprises can meet rising market demand and use biomass and feedstocks efficiently.
- **Reduced seasonality**
Begun transitioning from rainfed dependence to smart agriculture solutions, including irrigation, basic precision farming and climate resilient practices.
- **Fairer business environment**
Measures operational to promote equitable competition and transparency, with regulations actively enforced to protect enterprises from unfair practices.
- **Stronger human capital**
Ongoing investments in training, technical capacity and research expertise, providing a skilled workforce that supports innovation and operational excellence in Cluster 1.

By 2040

- **Droughts and floods**
Adaptive strategies, climate-resilient infrastructure and integrated water management fully in place, significantly reducing the impact of extreme weather on production, processing and logistics.
- **Shifting consumer preferences / consumer behavior**
Strong market-intelligence systems and diversified product portfolios that allow enterprises to continuously anticipate and respond to changing consumer demand.
- **Geopolitics / global shocks**
Robust risk-management and diversification strategies that mitigate supply-chain vulnerabilities, trade disruptions and geopolitical shocks for Cluster 1 value chains.
- **Better infrastructure**
Well-developed transport networks, reliable and affordable energy systems, adequate storage and cold-chain facilities, and strong digital infrastructure underpinning efficient production and market access.



ANNEX

List of members and enterprises

	NAME	ORGANIZATION
1	Irene Mumo	True ways Enterprises Ltd
2	Thenya Samuel	Enable Youth Entreprises
3	Belinda Ogolla	VG Foods limited
4	Lilian Katungwa	Flavor Infusion Ltd
5	Terry Wangechi	Dermody Skincare
6	Elizaphan Mahinda	Kieru Limited
7	Alex Mwangemi	Magarimu Farmers
8	Elizabeth Mbogo	Botanic treasures
9	Naftali Mutahi Njege	Horizon Business Ventures (HBV)
10	Samwel Njagi	Rwani Smile Ltd
11	Andrew Egala	Green Without Borders
12	Newton Ouma	Teko fats
13	Charity Maina	Hoftor Ltd
14	Beatrice Muema	Woodlands Co.ltd
15	Martin Salano	Super Moringa Supplies
16	Judy Otieno	Super Moringa Supplies
17	John Shikuku	Bunyala Agri Climate Industrial Park limited
18	Mwanaidi Wangia	Famwa Ltd
19	Joseph Gathuka	Our desire limited
20	Judy Mwende	Ustawi Nutritional care
21	Lynne Odiwa	Nature Best Green Culture
22	Mary Karoki	Onja Foods

ABBREVIATION / ACRONYM LIST

ABDK	Advancing Bioeconomy Development in Kenya
AGRA	Alliance for a Green Revolution in Africa
DFI	Development Finance Institution
EAC	East African Community
EAC-BIO	East African Regional Bioeconomy Strategy
EPRA	Energy and Petroleum Regulatory Authority
GOK	Government of Kenya
ICT	Information and Communication Technology
KAM	Kenya Association of Manufacturers
KEBS	Kenya Bureau of Standards
KEFRI	Kenya Forestry Research Institute
KEPHIS	Kenya Plant Health Inspectorate Service
KENAS	Kenya Accreditation Service
KEPSA	Kenya Private Sector Alliance
KFS	Kenya Forest Service
KIRDI	Kenya Industrial Research and Development Institute
KOAN	Kenya Organic Agriculture Network
KNCCI	Kenya National Chamber of Commerce and Industry
KPLC	Kenya Power and Lighting Company
KS	Kenya Standard (e.g. KS 1758)
MSME	Micro, Small and Medium Enterprise
NACOSTI	National Commission for Science, Technology and Innovation
NGO	Non-Governmental Organization
OFSP	Orange-Fleshed Sweet Potato
R&D	Research and Development
SACCO	Savings and Credit Cooperative Organization
SEI	Stockholm Environment Institute
Sida	Swedish International Development Cooperation Agency
SME	Small and Medium Enterprise
SWOT	Strengths, Weaknesses, Opportunities, Threats
TVET	Technical and Vocational Education and Training
UAE	United Arab Emirates
VAT	Value Added Tax