

SYNOPSIS REPORT

A Systems Approach to Transforming Kenya's Livestock Feed Sector from Scarcity to Sustainability in Arid and Semi-Arid Lands (ASALs)



Based on findings from "Scarcity of Feed and Fodder: A Barrier to Sustainable Livestock Development," a joint report by Heifer International and ProDairy, Kenya



Executive Summary

Kenya's livestock sector is central to the national economy and livelihoods of millions of people, especially in arid and semi-arid lands (ASALs). Yet, its growth and resilience are constrained by a persistent, year-round shortage of adequate animal feed. This challenge is not simply about insufficient feed quantity. It also reflects chronic deficits in feed quality, particularly energy and protein, which undermine animal health, productivity, producer incomes and resilience to drought and other climate shocks.

To better understand where practical investment and partnership opportunities could expand supplemental forage solutions in Kenya's ASAL regions, the Kenya Livestock Marketing Project (KLMP) commissioned a targeted consultancy led by ProDairy. The study drew on key informant interviews across the feed-and-fodder system, engaging stakeholders from national and county government, producer and herder associations, and private sector actors, including seed and input suppliers, fodder traders and aggregators, transporters, mechanization providers, and buyers. Its purpose was to identify the real-world constraints, incentives and coordination gaps shaping feed availability, affordability and quality — especially during dry seasons and drought periods.

The consultancy's central conclusion is that feed scarcity is best understood as a systems challenge rather than a single technical gap. Rangeland degradation and rainfall variability, weak seed and input systems, informal markets without clear price-quality signals, and limited access to services, storage, finance and knowledge all reinforce one another. Because these constraints are interconnected, piecemeal solutions tend to produce limited or short-lived gains.

This synopsis moves from diagnosis to design. It uses systems analysis to identify core intervention principles, presented in Section 7, that can guide practical program logic and, ultimately, inform an integrated package of interventions to strengthen Kenya's livestock feed sector.

1. Background and Purpose

The KLMP commissioned this study to address what the report identifies as the single greatest barrier to a sustainable and profitable livestock sector in Kenya: the persistent scarcity of quality feed and fodder. Livestock is both a cornerstone of the national economy and the primary livelihood source for millions in ASAL counties. Yet growth is constrained by a structural, year-round nutrition deficit, particularly in energy and protein.

This synopsis distills the original report into a concise strategic framework to guide intervention choices. The findings confirm that Isiolo, Kajiado and Nakuru face deficits not only in dry matter availability, but more critically in energy and protein, with metabolizable energy (ME) deficits reaching as high as minus 60 percent. A 60 percent ME deficit means livestock receive only about 40 percent of the energy required to sustain basic biological functions and productive performance. This is not a marginal gap; it represents a severe nutritional crisis. At these levels, animals are unable to maintain body condition, reproduce effectively, or sustain viable milk and meat production. Instead, they shift into survival mode, characterized by rapid weight loss, declining fertility, collapsing milk yields and heightened mortality risk, especially during prolonged dry seasons. Over time, these deficits directly reduce household income, erode resilience to climate shocks and diminish herd value.

The report shows that these deficits are driven by interconnected structural challenges, including rangeland degradation, weak seed systems, underdeveloped feed markets and persistent gaps in extension services, technical support and knowledge dissemination. Together, these constraints illustrate that effective solutions cannot rely on isolated interventions. Instead, they require simultaneous, bundled interventions, coordinating and integrating approaches that address ecological, market and service-system bottlenecks.

What this synopsis covers

This synopsis condenses the longer learning document into a practical strategy framework by:

- Framing feed and fodder constraints as a system-wide challenge requiring coordinated solutions across ecology, markets and services.
- Differentiating operational scenarios so interventions can be tailored to local realities rather than applied uniformly.
- Summarizing the core principles and strategic priorities that can guide scalable program design, moving from isolated activities to integrated, resilience-building pathways.

2. Operating Context for Forage and Fodder Food Systems

The feed system in the target counties operates in a rapidly changing environment shaped by four interconnected realities. Together, these dynamics help explain why feed deficits persist and why incremental or isolated solutions often fail.

First, the sector remains heavily dependent on a degrading natural resource base. In Isiolo and Kajiado in particular, ruminant production still relies on natural rangelands that have been weakened by overstocking, weak grazing management and climate volatility. At the same time, shrinking mobility options — driven by land subdivision, settlement patterns, and social and political pressures against migratory pastoralism — concentrate grazing pressure locally, and deepen degradation and feed insecurity.

Second, the commercial forage market is largely informal and unstructured. Feed is commonly traded primarily by bale volume rather than weight or standardized nutritional quality, breaking the link between price and performance. With no reliable mechanism for buyers to reward higher-quality feed, low-quality fodder dominates the market. While such feed may help animals survive, it rarely supports productive growth, weight gain or sustained milk production.

Third, the system is in transition. Traditional pastoralist production is increasingly pushed toward more sedentary and semi-intensive models, creating greater demand for supplemental feed. Yet many producers often lack the technical knowledge, resources, market access and proof of profitability needed to adopt supplemental feeding effectively. Encouragingly, emerging markets and policy shifts — such as premium payments for higher-quality milk — are beginning to create incentives that can support this transition, provided feed systems are capable of responding.

Finally, supporting systems required to sustain a productive feed sector remain underdeveloped. Access to climate-resilient forage seed, especially native rangeland grasses, is extremely limited. Extension services — including farmer training, technical advisory support, animal nutrition guidance, forage production coaching and market information dissemination — remain thinly spread, with very high farmer-to-extension officer ratios.

As a result, many producers lack access to timely, practical knowledge on grazing management, feed conservation, forage establishment, ration formulation and climate-smart livestock practices. In addition, finance and appropriate mechanization remain out of reach for many small-scale producers. Together, these constraints reinforce a vicious cycle: low-quality feed drives low productivity and profitability, which in turn limits the capacity of producers and market actors to invest in the solutions needed to improve feed availability, quality and resilience.

3. Benefits of Investing in Feed and Fodder Systems

This systems diagnosis highlights feed and fodder as one of the highest-leverage investment opportunities in the livestock sector. Improving feed availability and quality delivers rapid, compounding returns — strengthening animal health and productivity, increasing milk and meat yields, and building resilience to recurrent drought across ASAL communities.

Economic impact: Stronger feed systems unlock new and diversified income streams through hay, seed and crop-residue markets, while creating jobs along the value chain — from youth-led mechanization and aggregation services to women-led seed systems and fodder processing enterprises. At the same time, improved feeding reduces livestock mortality during droughts, protecting one of the most important household assets and enabling faster recovery after shocks.

Social impact: Targeted investments in feed and fodder systems can expand both economic opportunity and local agency. Prioritizing the livestock enterprises that women manage — while supporting their leadership in seed banks, fodder cooperatives and related businesses — can strengthen women's economic participation, income generation and decision-making power within households and communities. More reliable access to quality feed also helps stabilize milk production throughout the year, improving household nutrition and food security, particularly for children and other vulnerable family members.

Climate and environmental impact: Feed system investments are also climate solutions. Reseeding degraded rangelands with native grasses restores biodiversity, rebuilds soil health and improves water infiltration, making landscapes more drought-resilient. At the same time, higher-quality feed increases livestock productivity, reducing methane emissions intensity per unit of milk or meat while contributing to carbon sequestration in restored soils.

4. Production Typologies for Targeted Impact

Given the fact that livestock systems across ASAL counties are not uniform, the report emphasizes the need to tailor interventions to distinct operating contexts rather than promote a single package across all geographies and producer groups. It identifies three archetypes that provide a practical lens for program design.

Type A: Community Conservancies and Commercial Ranches

Large-landscape systems, such as community conservancies and commercial ranches in Isiolo and Kajiado, fall under this archetype. Prioritization of investments in drought-resilient on-site feed production, rangeland rehabilitation, water infrastructure, and improved grazing management can stabilize productivity while restoring ecological function. Strengthening management of human–wildlife–livestock interactions further protects assets and livelihoods. In some cases, these systems also create pathways to monetize ecosystem services.

Type B: Peri-Urban Youth and Women Market Groups

Located in market-adjacent areas such as Kajiado and Nakuru, these groups are engaged in aggregation, finishing and small-scale commercial dairy. Their priority is access to affordable, reliable, high-quality feed and services that quickly improve productivity, margins and market competitiveness.

Type C: Village-Level, Women-Managed Herds

This archetype includes smaller household herds, often managed by women, where the primary goals are household well-being and resilience. Priorities include more consistent milk availability, improved food security, reduced daily labor burdens, and protection against drought losses. Interventions for this group must be low-risk, accessible, and clearly linked to household stability.

These archetypes establish the logic for the next step: Identifying the system constraints that cut across contexts, the opportunities that can be leveraged, and the ways intervention bundles can be adapted to each operating reality.

5. Constraints and Opportunities

Across counties and archetypes, the report highlights three constraint clusters that must be addressed together to shift the system, as well as three opportunity clusters that make the feed and fodder sector investable now.

On the constraint side, market and economic failures continue to limit progress. Feed markets lack reliable price-to-quality signals, creating a market in which low-quality fodder dominates because buyers cannot easily distinguish, verify or reward higher nutritional value. As a result, producers have little incentive to invest in better-quality feed. High transport costs in remote ASAL areas further reduce affordability, while limited access to finance and insurance constrains investment in fodder production, conservation, storage and risk management. A second constraint is seed and input system failures with shortages of certified, climate-adapted forage seed, particularly native rangeland grasses, and weak quality control in informal seed channels. Another is knowledge and service gaps. Extension systems are under-resourced; practical capacity in forage production and conservation is limited, and weak technical guidance can lead to costly malinvestment.

On the opportunity side, growing demand and untapped resources create strong market pull for productivity gains, while degraded rangelands and native drought-tolerant grasses present clear restoration and production potential. Viable technical and business innovations — including haymaking, silage, crop-residue fermentation, and simple water harvesting — are proven and ready to scale. Supportive policy and partnerships provide an enabling environment through county strategies, government agencies, research institutions (e.g., Kenya Digital Agriculture Platform and International Livestock Research Institute), NGOs and private-sector actors.

These constraints and opportunities indicate the need for an integrated response: First as strategic priorities (Section 6), and then as the core design principles that ensure those priorities produce durable systems change (Section 7).

6. Intervention Strategy Options

Building on the constraints and opportunities above, the report organizes its recommendations into four mutually reinforcing strategic priorities that together form an integrated intervention package. The sequence matters: Strengthen the natural resource base, improve production inputs and on-farm practices, build functioning markets and incentives, and invest in the human and institutional capacity needed to sustain adoption at scale.

Priority 1: Build the Foundation

Ecosystem Health and Water Management. Restore rangelands and reseed with native, drought-tolerant grasses; promote sustainable grazing management (e.g., rotational and planned grazing) with conservancies and community groups; and introduce water harvesting (e.g., contour bunds and spate irrigation) to improve forage establishment and enable fodder banks.

Priority 2: Innovate Production

Seed Systems and Fodder Technologies. Establish community seed bulking and distribution for priority forages; promote climate-smart, high-quality forage options, including *Brachiaria* hybrids, improved lucerne and native grasses, such as *Cenchrus ciliaris*; and build capacity in haymaking, silage, and crop-residue bio-fermentation to convert surplus and crop “waste” into reliable dry-season feed.

Priority 3: Develop the Market

Enterprise, Finance and Quality Assurance. Scale youth-led contracting services for mechanization-for-hire, baling and transport; support fodder stores and aggregation centers; introduce simple forage quality grading linked to transparent pricing; and partner with financial institutions to design fit-for-purpose credit products for value-chain actors.

Priority 4: Strengthen Capacity

Demonstration, Knowledge and Learning. Establish integrated demonstration hubs that showcase the full package; deploy practical “farm coach” models for hands-on training and mentorship; and generate local evidence linking forage quality to animal performance to strengthen the adoption and investment case.

These priorities describe what should be done. The next section clarifies how interventions should be designed and delivered, so they address root causes, build trust, and create self-sustaining systems across different ASAL contexts.

7. Core Principles for Intervention Design

Based on the report’s findings and lessons from past experiences, five core principles serve as the guardrails for translating the strategy priorities into durable and scalable programming.

1. **Adopt a systems-based, integrated approach.** No single intervention, such as seed distribution alone, will solve the feed challenge. Packages must address ecosystem health, production technology, market function, and knowledge

and services together to create a reinforcing cycle of adoption, productivity and investment.

2. **Start with a diagnostic, not a prescription.** A standardized diagnostic tool should be used upfront to identify the binding constraints in each context, whether related to water availability, seed access, market dysfunction, animal health, extension support or community readiness. This helps ensure resources are directed toward the highest-impact levers and prevents solutions from being misapplied.
3. **Build markets through quality, transparency and trust.** Stronger feed markets require a clearer link between price, quality and value. This can be supported through simple, trusted and accessible mechanisms for assessing forage quality, including standardized visual grading guides linked to pricing and basic or mobile testing systems. Demonstrating the economic returns of quality feed is essential for both buyers and producers.
4. **Demonstrate viability through “seeing is believing.”** Integrated demonstration hubs or model farms are essential for showing how the full system works in practice — from rangeland restoration and forage cultivation to feed conservation, ration balancing and market linkage. Visible improvements in productivity and profitability help reduce perceived risk and accelerate adoption.
5. **Empower local actors as agents of change.** Consistent with Sustainable Locally Led Development principles, Heifer’s role is to facilitate, coordinate and strengthen local capacity so that cooperatives, conservancies, producer groups and youth- and women-led enterprises can own, manage and scale solutions independently, rather than depend on long-term external support.

8. A Path Forward

Guided by these principles, the immediate priority is to develop and deploy a data-driven diagnostic tool across high-potential areas, particularly in Isiolo and Kajiado. The tool should assess biophysical suitability, market access, service availability and community readiness. This will allow the project to identify optimal locations for Integrated Forage Hubs (IFHs) and support the development of detailed, site-specific operational plans grounded in evidence rather than assumption.

Building on that diagnosis, the next step is to define the minimum bundle of enabling services required for adoption and hub performance at each location, while also clarifying who provides each service and how coordination will be managed. This “bundle logic” should specify the necessary combination of extension and business development support, quality seed and other inputs, water access and storage, mechanization and aggregation services, credit and finance, storage systems and conservation infrastructure, and structured market or offtake arrangements.

Extension support in this context includes practical farmer training, forage production guidance, grazing and rangeland management advice, feed conservation techniques, ration formulation, animal nutrition support, and business and market advisory services. Ensuring these services are accessible and responsive will be critical to helping producers adopt and sustain improved feeding practices.

By applying diagnosis first and bundling second, consistent with the core principles laid out in Section 7, programs can move from fragmented activities to coherent, scalable pathways that reduce fodder scarcity while supporting inclusive, climate-resilient growth across local livestock value chains.

About Heifer International

Heifer International partners with smallholder farmers to sustainably address hunger and poverty in their communities while caring for the Earth. Since 1944, Heifer has supported nearly 60 million farming households, particularly those led by women, youth and Indigenous populations. Operating in 19 countries across Africa, Asia and the Americas, we aspire to collaborate with millions more smallholder farming households by 2030 through farmer-led, regenerative food systems.

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