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Sustainable growth of the Kenyan dairy sector – A quick scan of robustness, reliability and resilience

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Dairy in Kenya

Kenya has a vibrant dairy industry with an estimated value of 4% of gross domestic product. This vibrancy is anchored on the increasing domestic milk production (averaging 5.3% per year), processing capacity (averaging 7% per year), annual per capita milk consumption (averaging 5.8% per year, currently at 110 litres) and export potential (MoALF 2010ab, KDB 2015). The country is experiencing a growing demand for milk and dairy products driven by expanding urbanization and a rising middle class. This attracts both domestic and international investors who seek to seize opportunities in the domestic and export market (Business Daily 2016).

The expanding sector is characterized by an increasingly sophisticated supply chain. Chain actors include producers consisting of small-, medium- and large dairy farmers, with the majority consisting of about 1.8 million households who own one to three cows (KDB 2015, ILRI 2008). They are served by diverse public and private agro-input suppliers and service providers. Aggregators include milk bulking and chilling facility operators. Four out of 27 active processors control 85% of the milk intake, with 616 million litres processed in 2015 (KDB n.d., ACET 2015). The scale of retail operations varies from small shops to large supermarkets.

The dairy value chain is broadly divided into informal and formal market channels, based on compliance with regulatory frameworks for quality and safety standards and payment of statutory revenues. The bulk of marketed milk is raw fresh milk (ca. 70%), which is sold to consumers through informal market channels (KDB 2015).

3R Kenya

As part of the Dutch transition strategy from aid to trade in Kenya, Wageningen UR will implement a project that assesses and validates lessons learnt from the Netherlands Embassy's Agriculture and Food and Nutrition Security programme and other related programmes that support competitive market-led agricultural development. The 3R (Robust, Reliable and Resilient) Kenya from Aid to Sustainable Trade project investigates whether the lessons from the aid era can be transferred and scaled up in the coming trade era. 3R Kenya focuses on the aquaculture, dairy and horticulture sectors. The overall aim of the 3R Kenya project is to have well-informed stakeholder actions supporting the transition from aid to sustainable trade (people, planet and profit) in the selected sectors.

Dairy scan

This summary highlights findings of a scan of the Kenyan dairy sector conducted in the inception phase of the 3R project that aimed to understand: "How does the Kenyan dairy sector perform in terms of the robustness of the supply chains, the reliability of institutional governance and the resilience of the innovation system?". A SWOT analysis combining a literature review, stakeholder interviews, and a validation workshop, identified existing opportunities as well as challenges that could potentially impede sustainable growth in the sector. This analysis is considered to be useful for actors in the Kenyan dairy sector as well as international private and public actors interested in investments in the industry.

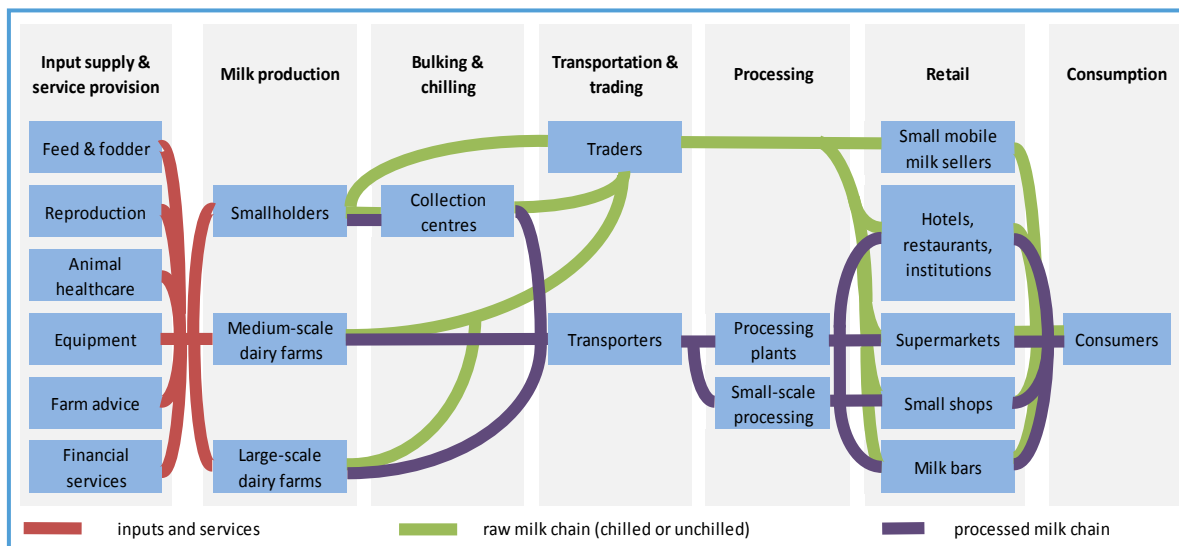


Figure 1. Overview of the dairy value chains in Kenya

Growth of the formal channel is possible via the chilled, processed chain by targeting capacity building and enabling policies. The *Kenya National Dairy Master Plan* defines strategic actions to enable a shift from informal to formal chain channels (MoALF 2010a).

Issues in the dairy sector assessed through the 3R framework

Robustness of the dairy value chain

Robust supply chain integration refers to efficient and trusted interactions between supply chain partners. Efficient interactions reduce transaction costs and the risks involved in enhancing product quality and safety and reinforcing sustainability and adaptability. A robust supply chain is essential to the success of the dairy industry in Kenya. The dairy value chain is complex, with a diversity of actors and a proliferation of inputs, services and dairy products (Figure 1).

The robustness of the dairy sector is approached from the perspective of sustainability, with a particular focus on economic, social and environmental sustainability. Challenges in the chain include low productivity and a fragmented market and concerns with quality and safety of dairy products. Addressing these challenges translates to seizing opportunities.

Addressing low production and productivity –

With smallholder milk producers dominating the industry, the vision of it becoming globally competitive will be difficult to attain. Most of these producers lack economies of scale and have low productivity coupled with seasonal fluctuations. They also lack the necessary resources to modernize and expand their enterprises. The increasing demand for milk is currently being met with more smallholder farmers taking up dairy across agro-ecosystems, rather than by sustainable intensification through smart investments in pro-

duction, marketing and human resources. This production strategy results in high production costs and presents ecological threats to land, soil, water, and biodiversity. Enhancing milk production and productivity requires support for entrepreneurial farmers through enhancing dairy farming practices and farm enterprise management, supported by innovative business models to ensure reliable access to inputs, services and finance. The opportunities are in leveraging economies of scale and producing safe milk.

Growing reliable and quality markets – The market challenges include unstable milk supply with cycles of abundance and scarcity, high cost of milk processing, poor milk quality and safety, and the risk of unfair competition from oligopolies in milk processing. Despite the challenges, the growth in demand for high-quality milk and diverse dairy products in both the domestic and regional markets, are opening investment opportunities. Medium and large-scale farms and entrepreneurial smallholders can benefit from delivering milk to expanding diverse, well-structured and trusted formal markets. Other market opportunities are offered by a growing demand for equipment for milk handling, bulking, chilling, processing and dispensing by various enterprises. The Government of Kenya and many county governments are investing in local milk-chilling and -processing equipment to drive growth of the dairy market.

Reliability of institutional governance of the dairy sector

Reliable institutional governance refers to a policy framework that supports investment and cooperation to enhance trade opportunities in the dairy sector. A reliable institutional governance framework can guide

Turning around the fodder challenge:

KMDP's work on production and business models

Access to quality fodder and feed remains a systemic issue hampering the sustainable growth of a competitive dairy sector in Kenya. SNV'S Kenya Market-led Dairy Program (KMDP) has an explicit focus on fodder supply chain development, aiming to increase efficiency and competitiveness of the dairy value chain (DVC). KMDP carries out various interventions in the area of fodder development, conservation and mechanization practices:

- 1. Promotion of fodder practices through the dairy farmers cooperative societies (DFCSs) Training and Extension (T&E) unit, Service Provider Enterprise Network groups and development of fodder development strategies*
- 2. Training of medium- and large-scale farmers with advice from international (Dutch) experts (in this case, PUM's senior expert program) and local agronomists (in this case, private dairy advisory service companies or local capacity builders, such as Perfometer Agribusiness Solutions Ltd)*
- 3. Training of commercial fodder producers (CFPs) on improving fodder production and marketing through the same partners*
- 4. Facilitating linkages between CFPs and local and international seed suppliers and between CFPs and dairy farmers.*

Training is conducted through demonstrations, on-the-job coaching, and field days, focusing on agronomic as well as business practices. Demonstration pilots are established for a range of fodder varieties, especially protein-rich varieties.

Rademaker et al. (2016) found that silage production among member farmers of DFCSs had increased significantly in most collection and bulking enterprises, even if only few smallholders were growing and preserving new fodder crops (Rademaker et al. 2016). De Jong et al. (2015) found that these KMDP interventions support improvement of fodder quality and availability during the dry season, thereby reducing seasonality of milk production at medium- and large-scale farms and in a number of DFCSs, notably in Meru Central Dairy Farmers Cooperative Union (MCDFCU)'s in Meru region.

Specific to interventions with individual CFPs, De Jong et al. (2015) report that 50 CFPs were established as businesses, and that fodder production and conservation had increased. Moreover, Rademaker et al. (2016) found that sales of fodder seed suppliers had increased significantly. But CFPs and medium-scale farmers continue to face difficulties in accessing fodder seeds and equipment, including spare parts (De Jong et al. 2015). In Eldoret, the members of the Eldoret Dairy Farmers Association have come together to jointly harvest fodder using an innovative arrangement called the maize train, where different machinery owners combine their resources and schedule fodder production activities collectively. Thus, there is business in contracting services for fodder production and harvesting and in repair, maintenance, financing and leasing of equipment. However, commercial fodder production needs to be complemented by feed rationing to satisfy the nutritional requirements of dairy cows and so increase productivity.

While more systematic analysis of these approaches is needed, lessons learned so far indicate that fodder establishment and preservation have contributed to increased milk production among smallholders, thereby reducing seasonality of milk supply.

Sources: Ettema 2015, Perfometer Solutions 2015, Rademaker et al. 2016, SNV 2015, stakeholder interviews

the evolution of a common vision and coordinate sector players towards shared objectives.

Harmonizing regulatory instruments – Since 2010, the development of appropriate policy frameworks has been the responsibility of the Government of Kenya, while the development of the sector has been devolved to the county governments (Makoni et al. 2014). Dairy-specific policies are numerous and scattered, which raises questions about their coherence and enforceability. Generally, the enforcement of standards and regulations is limited, which does little to induce adoption and further innovation. Policies that directly target dairy research, training and extension are not yielding the innovations needed by the sector due to low engagement between relevant knowledge institutions and supply chain actors; consequently the ongoing research, training and extension is of limited end-user relevance.

Economic instruments and (dis)incentives for investment in dairy –The dairy value chain is ranked high as priority sector in two-thirds of the counties according to the agricultural sector development programme of the government. Economic instruments that are used to promote the sector include:

Subsidies – Counties are implementing growth models including the 'one cow initiative' and subsidy programmes for delivering AI and installing milk cooling tanks to promote inclusive dairy development, targeting resource-poor households, youth, women and the disabled. These initiatives reflect a wider orientation of policies in promoting 'hardware', but this is not matched with the development of 'software' solutions, targeted training and advisory services, and data collection and analysis. A market distortion effect is the likely result of these approaches.

Cess, levies and taxes – Attempts to improve access to financial services for farmers until recently were hampered by steep loan conditions. The Kenya Dairy Board (KDB) raises significant funds, with which it is expected to regulate and promote the dairy value chain. The environment for investors is rather unpredictable as the county governments are proposing to impose new taxes on many items. Unrealized tax opportunities for the sector include removal of VAT on dairy equipment, processed milk and feed ingredients, and the 60% import tariff on dairy products from outside the East African Community.

Soft instruments for promotion of collaboration and innovation, such as innovation platforms, public-private partnerships, and codes of conducts, are used sporadically, e.g. a pilot school milk program in Mombasa and Migori counties. Some starting points for increased collaboration exist, but increased stakeholder involvement, co-investment, and a more convincing role of KDB are needed for success.

Dairy business hubs and strengthening the supply chain - The EADD experience

While the growth of the dairy sector in Kenya presents many opportunities along the value chain, most smallholder dairy producers are unable to transition from subsistence to commercialized production. Key limiting factors include high transaction costs and other bottlenecks in accessing inputs and services (Kilelu et al. 2016). The dairy hub model is one innovative approach developed to address this challenge. The dairy hub entails a farmer-owned and -managed milk stock and chilling centres established in various rural areas. These centres become agribusiness centres that support and attract a network of businesses delivering inputs and services to the farmers who supply milk to the farmer-owned enterprise (Kruse 2012). The East African Dairy Development (EADD) project in Kenya aimed to support the development and scaling up of dairy hubs in the Rift Valley and Central Kenya regions (Mutinda et al. 2015).

The dairy hub aims to build robust dairy supply chains through a variety of business strategies and social relationships that are formed with the interests of all value chain actors in mind. Hubs can create opportunities for and transform private sector participation in the dairy sector. They have been proven to be potentially strong platforms for improving access to markets, inputs and services for men and women smallholder dairy farmers alike. Indeed, they are transforming rural regions (Kilelu et al. 2016, Mutinda et al. 2015).

CBEs add services and supplies such as agro-vet shops, animal health assistance, veterinary services, AI services and extension services. Farmers delivering to the chilling hubs have a credit facility based on their milk delivery. When they need input supplies or services, these are "checked off" from their balance. Hence the chilling hub functions as a financial intermediary trusted by all parties.

Resilience of innovation support systems

The ability to address the challenges and exploit the growing opportunities in the Kenyan dairy sector hinges on actors continually exchanging and applying knowledge, mobilizing resources and coordinating co-innovation networks.

Stakeholder collaboration – Due to the lack of a shared vision for the dairy industry, the linkages between various actors are generally weak. Besides some pockets of coordinated action, there is no coherent innovation system for problem solving and to sustainably exploit opportunities to drive innovation in the sector (Odame et al. 2009). This is characterized by supply-driven research, unresponsive to the sector needs, extension and advisory support systems that are equally ineffective, and education actors unable to meet the sector's demand for skilled personnel (Makoni et al. 2014, Muriuki 2011, Odame et al. 2009).

Furthermore, weak organizational capacity of various industry associations prevents effective interaction, investment facilitation and lobbying. Most donor-supported development interventions are not well-

coordinated with other initiatives, resulting in duplication of efforts and limited cross-learning and co-creation. These gaps reflect underlying institutional challenges including lack of trust and dependability among value chain actors (Kilelu et al. 2013, Kurwijila and Bennett 2011). There is need to strengthen networks through platforms to foster dialogue and co-learning to drive innovation in the sector. Such platforms need to be championed and driven by the sector stakeholders. KDB is seen as key facilitator for such platforms, but needs significant strengthening to effectively convene and collaborate with stakeholders.

Strengthening innovation support systems

– the role of emerging practical dairy training centres

The practical skill gap among dairy farmers and farm managers is a critical obstacle to the development of a competitive sector. KMDP supports three dairy farms that have gone into training as a business, to become practical dairy training centres (PDTCs). By collaborating with various actors, including Dutch experts, the PDTCs can offer farmers market-driven one-day and five-day practical short courses (pdtc.cowsoko.com). PDTCs have proven to be an important innovation in the KMDP T&E approach, although it is yet early to evaluate their impact. They are meeting and creating demand for practical skills in dairy production across a diverse clientele of dairy entrepreneurs.

A recent project review indicates a number of positive outcomes attributed to PDTCs (Katothya and van der Lee 2016). Firstly, interviewed lead farmers were unanimous that their participation in a five-day practical skills training at a PDTC triggered changes in their dairy farms. Secondly, six youths (all males) running the Bidii dairy promoter's enterprise interviewed in Meru attributed the successful start-up of their silage business to the five-day training at the Mawingu PDTC. They also reported that the exposure has triggered them to establish/improve their own dairy farming enterprises. Thirdly, the DFCS T&E staff interviewed also spoke highly of the effects of the five-day PDTC training on their role as facilitators of practical training to DFCS farmers. Fourthly, the PDTC manager interviewed highlighted three indicators that signal the increasing realization of the relevance of PDTCs: a) an increase in the number of enquiries and visitors to the PDTC; b) the interest that technical training institutes have been expressing for partnerships; and c) the high turnover of PDTC staff as a result of being poached by farmers and input supplier companies following contact made during visits to the PDTCs. Apart from the practical skills orientation of the training at PDTCs, other positive factors identified were the incorporation of new knowledge and innovations through international experts from Netherlands (training of trainers).

Despite this positive feedback about the relevance and impact of PDTCs, managers of PDTCs highlighted the inability to operate optimally as a major challenge to the new concept. This manifests itself in the inability to attract a break-even number of clients in an evenly spread schedule throughout the year. Reasons mentioned included the inadequate marketing of PDTC services and little willingness to pay for T&E services among potential clients.

Sources: De Jong et al. 2015, Katothya and van der Lee 2016, Otieno et al. 2015, stakeholder interviews.

New models for innovation support – Some new approaches to supporting knowledge transfer and innovation support are occurring in the changing dairy sector. The focus is on demand-driven, market-led approaches to dairy innovation support systems. Examples include practical dairy training centres, dairy business hubs, and private dairy business advisory services (Kilelu et al. 2016, Katothya and van der Lee 2016). These innovation support systems, coupled with emerging inclusive business models and public-private partnerships are targeting to build capacity in relevant practical skills and entrepreneurial attitudes of smallholder dairy farmers, sometimes linked to medium and large scale producers or international experts. Investments by county governments also present opportunities for new partnership investments that can drive innovation. Nonetheless, there is need to understand how well these models are working.

ICT and knowledge management – Development of ICT infrastructure has provided new opportunities for strengthening of innovation support systems, e.g. through development of dairy-specific applications that enable information and knowledge sharing. While many of these ICT initiatives are promising, uptake and effectiveness need critical assessment.

Conclusions and recommendations

The strong growth in demand for milk offers many opportunities to Kenyan and international actors that can translate into new investments and 3R sector development from production to marketing. The increasing commercialization offers concrete business opportunities in private training and advisory services, input supply and service provision to entrepreneurial smallholders, commercial fodder production, heifer supply, dairy product diversification, contracting and machinery for fodder production, equipment for milk handling, bulking, chilling, processing and dispensing by various enterprises; increased use of equipment requires capacity building in mechanical support services and spare parts supply.

However, for the dairy sector to be robust, reliable, and resilient, it will need to do more than react to market opportunities. It will require better supply chain integration, improved linkages and trustworthy interactions between chain actors to reduce transaction costs and improve milk quality and safety. Better supply chain integration dovetails with dependable regulatory and policy and innovation systems that ensure dynamic innovation of the sector and attracts trade and investment that support sustainable people-profit-planet sustainability.

While the policy ambition of the Government of Kenya's for the sector, embodied in the Kenya National Dairy Master Plan (MoALF 2010a), is to increase the share of the formal processed milk market, little headway has been made. Reasons for the strong position of the raw milk chains (chilled and unchilled) include consumer preferences, consumer purchasing power, and insufficient price/quality advantage of processed milk. The latter is a prime cause for inhibited growth of exports as well. The sector does show diverse market pathways to development that could roughly be distinguished in conventional, niche, and local bulk. What seems to be missing in the sector is debate on the relative advantages of and opportunities for these pathways.

This study identified gaps in entrepreneurial skills and chain fragmentation as the key limiting factors that inhibit growth to a robust, reliable and resilient sector. 3R's involvement in the sector should focus on approaches that counter these key limiting factors. It can do so when focusing on the priority areas that provide the entry points for implementation: "Quality of feed and fodder and of milk"; "Capacity building for producers skill development"; and "Reliable and competitive markets". The cross-cutting issues of "Policy lobbying and regulatory issues" and "Inclusion of women and youth" require attention in all efforts.

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