

NEADAP Position Paper on East African Dairy Development



DRAFT FOR DISCUSSION

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NEADAP Position Paper

Authors

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Contents

Introduction	4
Trends and expectations in dairy production and consumption in East Africa – Snapshot of the sector	5
Farmer perspective	8
Literature/References	12

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Executive summary

NEADAP aims to support the decision-making process around investments in the East African dairy sectors¹. This document examines the demand development for dairy products in East Africa, sketches development trends of the dairy sector, highlights the perspective of the dairy farmer, and offers advice on key investments in the sector.

The populations in the different East African countries are growing rapidly. With urbanization and a growing middle class, this is leading to an increase in demand for dairy products. Supply of milk has been increasing over the past years, but this has mainly been through an increase of the herd, and only to a lesser extent via productivity increases. This threatens both economic and environmental sustainability. Land availability is becoming a leading limiting factor for this type of growth, and the focus should therefore be on improving productivity of the existing herd.

Farmers, including dairy farmers, are looking for a stable income. The three main farming systems in which dairy is produced in East Africa are the grazing or (agro-)pastoralist system, the mixed crop-livestock system, and the (semi-)specialised farming system [1]. Climatic shocks (such as severe droughts) and market shocks (such as trade barriers) affect farmers in these systems in different ways. To mitigate these risks, a diversification strategy is advised for East African farmers.

To establish self-sufficient and sustainable dairy sectors in East Africa, we advise to focus support on mixed crop-livestock farmers, intensifying production in geographic locations where dairy in combination with cropping has a comparative advantage, where market access can be assured, and where dairy farms are (or can be) clustered.

Introduction

In the midst of various challenges, dairy sector actors in low- and middle-income countries (LMIC) face the question how dairy can contribute to a resilient food system. Local realities are likely to prioritize food & nutrition security or local economic development over objectives that are more relevant in other regions of the world, such as reduced greenhouse gas emissions and other environmental impacts. Decisions on public and private investments in the dairy sectors in LMIC need to balance these considerations. As a partnership linking East Africa and Western Europe, NEADAP aims to support this decision-making process.

In our view, to establish self-sufficient and sustainable dairy sectors in East Africa it is essential to focus support on mixed crop-livestock farmers to intensify production in geographic locations where dairy in combination with cropping has a comparative advantage, where market access can be assured, and where dairy farms are (or can be) clustered. This support should focus on enhancing productivity, profitability, and resilience, while also ensuring maximum nutrient retention on or between farms. Doing so will effectively address the increasing demand for dairy products at affordable prices, promote healthy diets, and generate economic opportunities in the region, as has been argued in previous position papers [2] [3].

¹ NEADAP focuses on Ethiopia, Kenya, Uganda, Rwanda, Tanzania, Burundi

This paper examines the demand development for dairy products in East Africa, sketches development trends of the dairy sector, and highlights the perspective of the dairy farmer. Moreover, this paper discusses new insights into dairy development, with a particular emphasis on sustainability, in the broadest sense of the word, and the impact of market shocks. Finally, strategies for future dairy development are proposed which foster sustainable growth.

Trends and expectations in dairy production and consumption in East Africa – Snapshot of the sector

The East African population is experiencing rapid growth, with growth rates varying between 1.9% in Kenya and 3.2% in Uganda, according to World Bank data from 2021. This demographic surge is poised to drive an increase in milk demand, in addition, urbanization and an expanding middle class will further drive demand up. As depicted in Figure 1, milk consumption has increased over the last twelve years, and this trend is anticipated to continue in the years ahead.

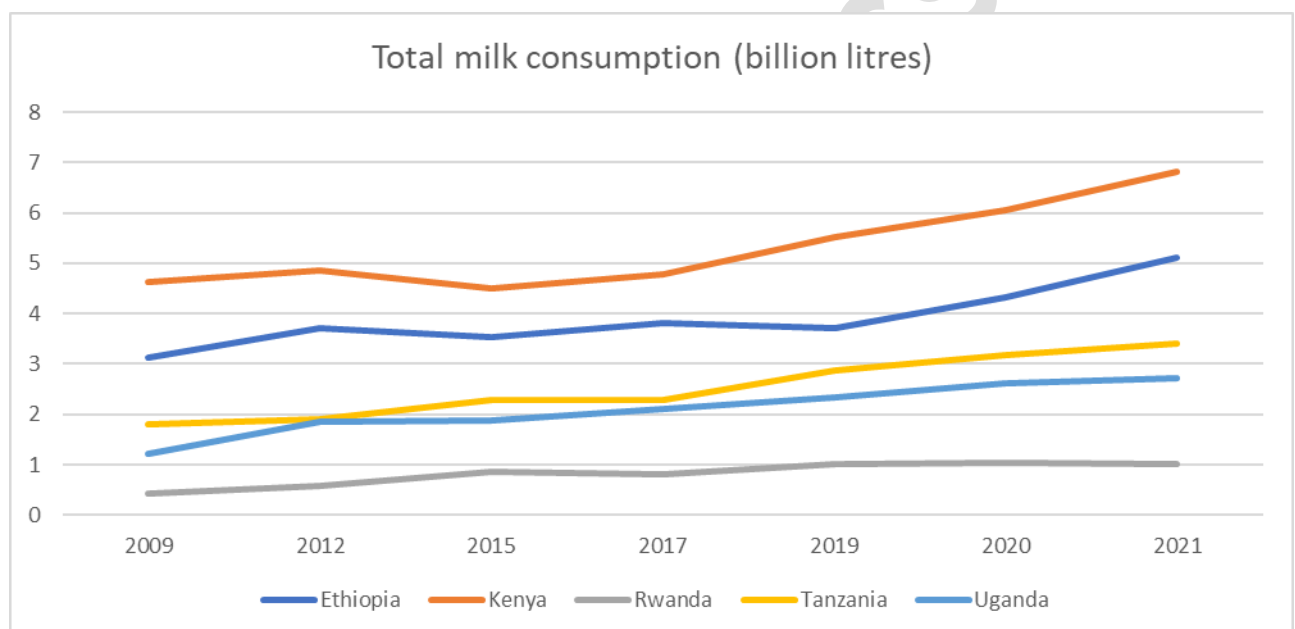


Figure 1: Milk consumption trends in Ethiopia, Kenya, Rwanda, Tanzania, and Uganda [4]

Dairy plays a pivotal role in the economies of Kenya, Tanzania, Ethiopia, Rwanda, Uganda, and to a lesser extent, Burundi. It yields a reliable income source for millions of farmers, while also addressing food security and nutritional requirements of the population. Governments are striving to safeguard the livelihood of their domestic dairy farmers while simultaneously ensuring access to affordable milk for their consumers. The increasing demand for milk necessitates matching production increments; otherwise, the gap will need to be filled through imports. Figure 2 illustrates the production trajectories for cow milk across the different countries. All five nations are still witnessing production growth, yet for Kenya, where the average annual production increase stands at 0.7% over a five-year span (2016-2021), and the yearly demand increase averages 5.6%, national production is failing to suffice future requirements. Consequently, Kenya has already commenced imports of milk and dairy products. The other countries also face this situation if their production cannot keep up with the demand growth. All East African countries are importing high value dairy products for the top end of the market, due to either quality or safety concerns.

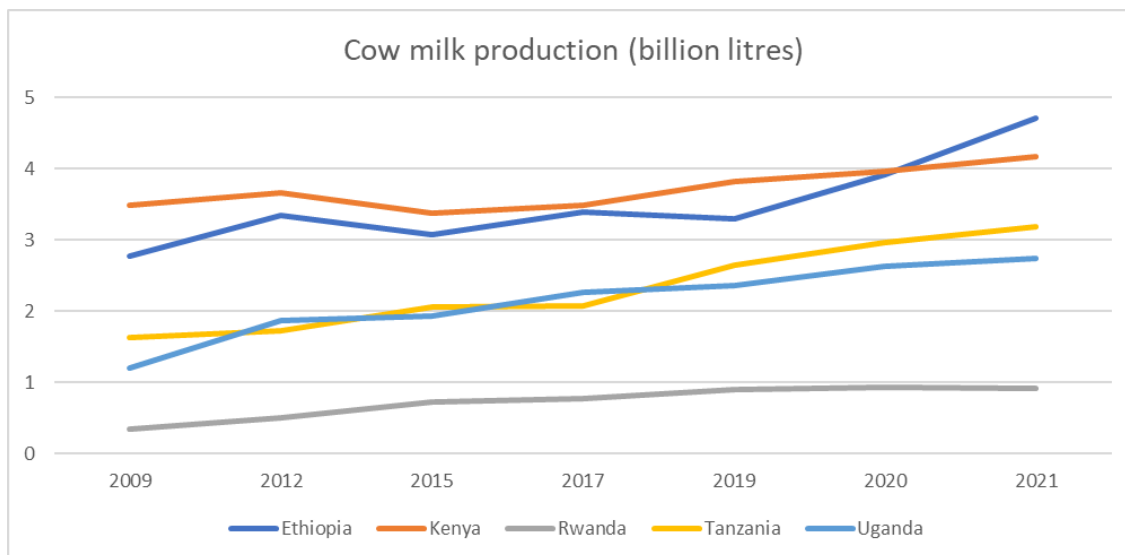


Figure 2: Production trends for cow milk in Ethiopia, Kenya, Rwanda, Tanzania and Uganda [4]

It is crucial to consider not only absolute production volumes but also to pay attention to the methods driving these increments. Increased volumes can stem from expanding livestock numbers or enhancing productivity. However, from a sustainability standpoint, the addition of more animals to already sizable herds intensifies pressure on natural resources, feed shortages, and manure management challenges and contributes to elevated greenhouse gas emissions. Therefore, the focus should be on improving the productivity of the existing herd.

Figure 3 shows the average changes in herd sizes, milk yield per cow, and total milk volume across the five East African countries for 2016 to 2021. While all nations observe an improvement in total milk volumes, the primary driver behind volume expansion continues to be the expansion of the herd size. Tanzania stands apart as the exception, limiting its herd size growth and compensating for this by enhancing milk yield.

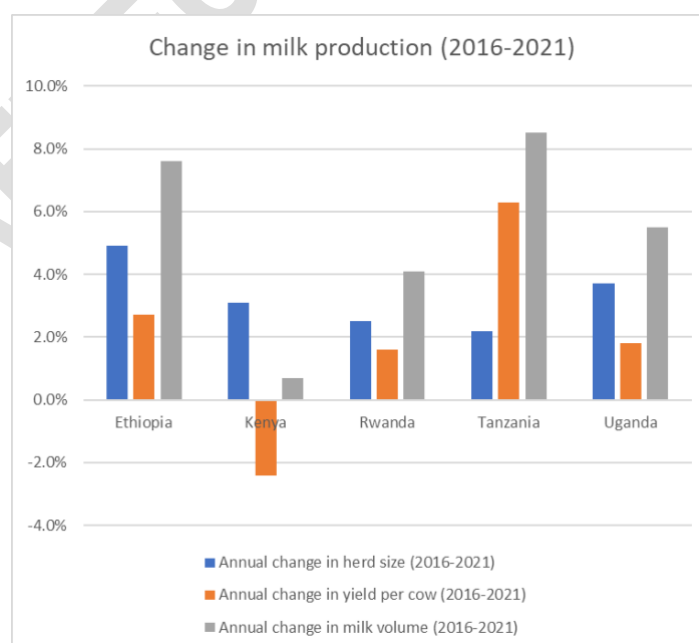


Figure 3: Average annual changes in cow numbers, milk yield per cow and total milk volume from 2016 to 2021 [4]

In East Africa, milk production is carried out across three broad farming system categories: the grazing or (agro-)pastoralist system, the mixed crop-livestock system, and the (semi-)specialised farming system [1]. Which of these offers most potential for dairy sector development?

- Within arid regions, the predominant setup revolves around mobile grazing systems, wherein pastoralists herd roaming ruminants. Dairy production within this system primarily caters to household consumption, albeit with occasional sales to traders or urban residents [5].
- Mixed crop-livestock systems are found in areas with relatively favourable agro-ecological conditions, often within densely populated regions marked by smaller farms. Here, milk assumes a pivotal role as a valuable byproduct, vital for household consumption, while any surplus may be traded. Like the grazing system, livestock in these settings provide livelihood support, serve to cycle nutrients, as source of fertilizer and fuel, as a store of wealth, as status symbol, and as insurance [6] [7].
- Specialized systems, on the other hand, embody a high-input, high-output dynamic. These systems tend to be found in densely populated regions nearby markets and robust infrastructure, enabling farms to access external feed sources and market their products with minimal transaction costs [8]. In such contexts, the paramount role of livestock lies in commercial production for the sale of marketed commodities.

In both Kenya and Ethiopia, the human population distribution among various farming systems spans the millions: the mixed crop-livestock systems encompass 35% to 45% of the population, while the (agro-)pastoralist systems account for 7% to 20% of the population. In contrast, the numbers are notably lower within the (semi)-specialised systems, as outlined in Table 1 [1]. These percentages likely hold true for the broader East African region, underscoring the integral role of the mixed crop-livestock and pastoralist systems in supporting both food security and the livelihoods of numerous individuals.

The impact of (semi)-specialised farms on national milk production is noteworthy. In Kenya, these farms contribute an estimated 30% to the total milk output (Nyokabi 2023). This statistic underscores the significant role played by a relatively modest number of (semi)-specialised producers in catering to a substantial portion of urban residents' milk needs [1].

The greatest potential for meeting the projected increase in demand lies in sustainable improvement of cow productivity among mixed crop-livestock farmers, and to a lesser extent with pastoralists. While (semi)-specialised farmers will continue to play a significant role, it is important to acknowledge that this system faces significant limitations from both a sustainability and an impact point of view.

Table 1: Human populations living in farming systems (data from years 2017-2021) [9] [10] [11] [12] [13]

Human population (million)	Ethiopia	Kenya
- Total	102-120	47-58
- mixed crop-livestock smallholders	35-50	20-30
- (agro-)pastoralists	7.5-12	5-9
- (semi-)specialised farmers	<0.07	<0.02

Farmer perspective

Farmers' perspectives on dairy production across various farming systems vary. These viewpoints also demonstrate adaptability in response to prevailing circumstances. When dairy constitutes a relatively minor proportion of income, it often serves as a side activity that contributes to overall farm performance by applying manure as fertilizer or as insurance for unforeseen circumstances. However, the landscape is shifting, influenced partly by the demographic shifts previously outlined. For example, the Southwestern region of Uganda around Mbarara is witnessing transformative changes due to increased demand and enhanced collaboration among input suppliers, farmers, cooperatives, processors, and government authorities.

A noteworthy transformation is the emergence of a new generation of entrepreneurial farmers who are succeeding their predecessors, characterized by a greater focus on business insight rather than prestige. This transition has been driven by improvements in business conditions. This shift in mindset is a positive trajectory, as it fosters a drive for enhancing productivity and streamlining efficiency within the value chain. Nevertheless, it is essential to recognize the associated risk: if farmers become overly specialized and external circumstances turn unfavourable, maintaining a stable income level could become challenging.

Sector developments

In this section, we will delve into significant trends shaping the sector. We will commence by discussing the cost and accessibility of feed, proceed to explore the average land size of farms, and ultimately analyse the prevailing market dynamics in the region.

Feed and fodder are the key inputs and constitute the major share of dairy production cost [2], and are therefore directly influencing the profitability of dairy production. Recent droughts increased the demand for commercial feed and forage and coupled with elevated global agricultural commodity prices have led to a further escalation in the cost share of feed and fodder. In the end this leads to lower production as some farmers stop dairy activities, others are just feeding their cows enough to stay alive. The quality of the sold forages is also questionable and might not lead to better production performance.

Directly linked to the availability of quality fodder is the farm size of farms in East Africa. Farm sizes are already small, and with the projected population growth a further contraction of farm sizes, and further expansion of the farmland in land-abundant areas appears to be inevitable [14]. Land-tenure management or the possibility to rent or lease land will be needed to support farmers to be able to create sufficient scale to grow their own fodder. A stable and profitable market will support farmers to invest in their dairy activities.

Initiatives like the East African Community common market aim to increase trade between member states and promote regional integration. However, the East African dairy market is also influenced by global price fluctuations. Recent years have shown that these global and regional fluctuations can severely influence the profitability of dairy farming. Diversification is therefore still an important strategy for farmers in East Africa.

Policy considerations

Meeting the demand

Demand for dairy products in East Africa will continue to increase over the next decade(s). Addressing this demand entails three potential avenues: expanding the livestock herd, enhancing productivity, or resorting to imports. The prospect of herd enlargement is not preferred, due to the associated strain on land resources and adverse environmental impacts. While imports remain an alternative, the prevalent foreign exchange difficulties in most countries diminishes their appeal. Nonetheless, the intra-regional option of imports within the East African Community (EAC) agreement could be considered, utilizing lower cost of production in countries such as Uganda. The optimal course of action lies in increasing the productivity of the existing herd, a preferred approach that strikes a balance between meeting increased demand and upholding sustainability concerns.

No additional cows are needed to produce sufficient milk, provided farm practices are improved as shown in Figure 4. The crux lies in elevating milk output per cow while concurrently optimizing land utilization and increasing farm earnings. The fundamental factors driving this transformation include an intensified focus on fostering the availability and quality of fodder, alongside realising balanced rations. This emphasis is particularly crucial due to the substantial proportion of production costs attributed to feed [3]. In essence, farms of any cow count have the potential to enhance productivity through these means. However, those farms possessing a certain optimal herd size will be more effective.

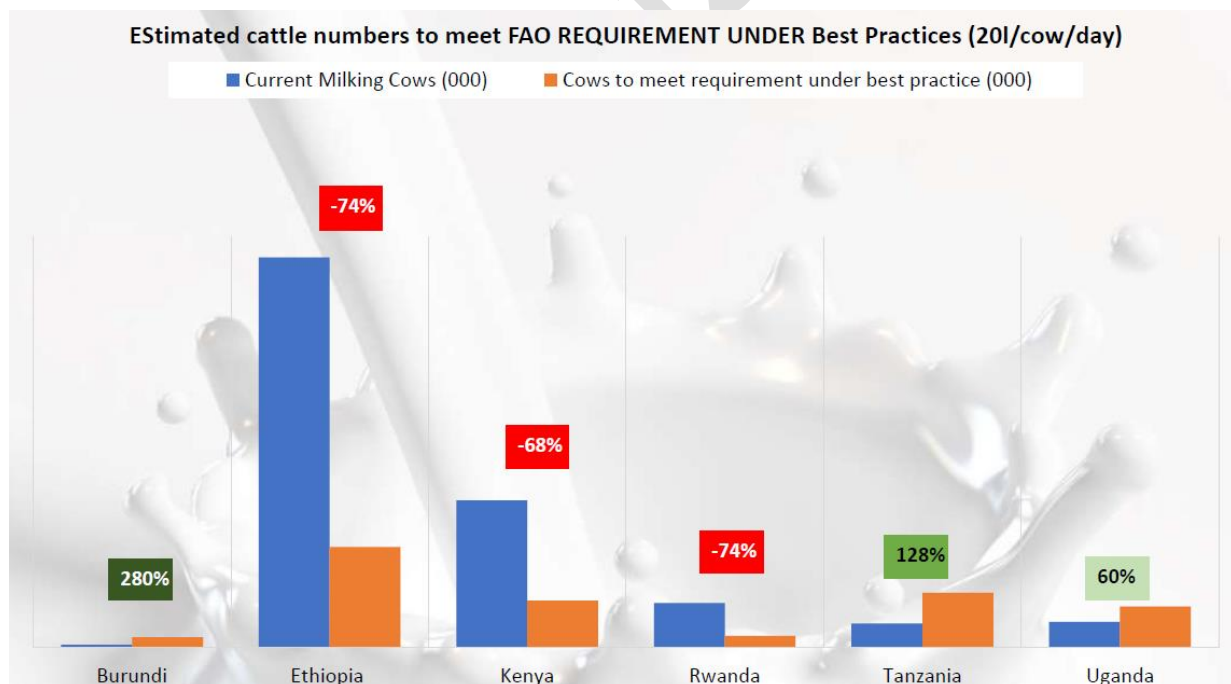


Figure 4: Estimated cattle numbers to meet FAO dairy intake requirement [15]

Experiences from other areas in the world show that farmers will not reduce their herd size when productivity increases but tend to specialize. From a short-term business perspective this makes sense. But this specialisation poses food system challenges (when forage replaces crops), may lead to environmental imbalance (if nutrients are not recycled) and also exposes farmers to the vagaries of the market (reducing their resilience).

Why focus on dairy as part of mixed crop-livestock farming systems

The mixed crop-livestock farming system is best positioned to support a self-sufficient and sustainable dairy sector in East Africa. All farming systems, agro-pastoralists, mixed crop-livestock, and semi-intensive, are complementary and contribute to food systems objectives [1]. Nonetheless, it is the mixed system that excels in both livelihood and sustainability goals. Given the substantial number of farmers engaged in this system, the potential to meet the growing demand for dairy products through enhanced productivity on these farms is evident.

Among the prime challenges faced by mixed crop-livestock farms lies the parcelling of land due to inheritance, resulting in farms reaching an economically nonviable scale. Resolving this predicament demands a suite of solutions encompassing reforms in land tenure policies, diversified employment opportunities, and enhanced farm management practices. These combined measures culminate in elevated productivity, improved livelihoods, and enhanced nutrient cycling.

Why focus on dairy clusters with sufficient land and potential

The development of a thriving dairy industry is a multifaceted endeavour depending upon sustainable business cases. In the context of dairy, this entails the prerequisite of having adequate land either directly on the farm premises or in close proximity, facilitating forage production and efficient manure application. Subsequently, within a clustered framework, the cultivation of services can be initiated and continually refined, fostering heightened productivity, innovation, and the incubation of novel enterprises [16]. This, in turn, sets the stage for concurrent upgrading across the farm, market, and contextual domains.

Even within these clusters, the land-tenure system, and possibilities to rent or lease land may influence yields and the responsibility farmers feel for proper soil fertility management [2]. To enhance sustainable production for smallholder dairy farmers, cooperatives could play an important role in supporting farmers through the creation of feed master plans which create circularity and environmental sustainability within a geographical area. Such plans could influence policies and options for most effective use of the land and initiate new business opportunities.

Conclusion

The populations of East African countries are steadily increasing, consequently driving the demand for dairy products. Dairy production in East Africa has been growing, but primarily through enlarging the size of herds, with limited advancements in productivity. The surge in population also contributes to the scarcity of land. Farms are diminishing in size due to subdividing after inheritance, and peri-urban farmers face threats from expanding cities driven by accelerating urbanization.

To establish self-sufficient and sustainable dairy sectors in East Africa, it is advisable to focus support on mixed crop-livestock farmers to intensify production in geographic locations where dairy in combination with cropping has a comparative advantage, where market access can be assured and where dairy farms are (or can be) clustered.

Due to the considerable number of mixed crop-livestock farms, they possess the potential to meet the increasing demand for dairy products in the upcoming years. A holistic strategy

is necessary to both mitigate risks for farmers and curb the environmental impact of dairy production. Enhancing cow productivity should be aligned with improving other farm activities. The diversified income streams of mixed crop-livestock farms enhance their resilience and amplify their capacity for retaining nutrients on the farm.

Strategies

With the position paper as a guiding framework, NEADAP aims to enhance its approach for the period from 2024 to 2028. NEADAP's mandate will persistently centre on the identification, documentation, sharing, and contextualization of successful dairy development concepts within the East African region. Furthermore, NEADAP will consistently harness its partnerships with both local and international stakeholders, actively participating in policy and strategic discussions to make meaningful contributions. Drawing from the insights presented in this position paper, three strategic directions have emerged:

- 1. Emphasis on solutions for mixed crop-livestock dairy farmers with enough land:** NEADAP intends to collaboratively develop a three-pronged approach that comprehensively delves into the requisites and available resources to ensure a year-round feed supply for dairy farmers in specific geographical regions. Initial attention will be directed towards areas boasting abundant land resources and untapped potential. This approach is not confined to addressing feed availability alone; it encompasses pivotal aspects such as effective extension services, manure management and optimizing water resources.
- 2. Promotion of sustainable solutions for existing (semi)-specialized farms:** A prime illustration of this strategic trajectory involves championing effective practices for managing manure. Through advocating the valorisation of this invaluable resource and curtailing its environmental impact, NEADAP strives to endorse and upscale sustainable practices within the (semi)-specialized farming community.
- 3. Increasing the attractiveness of the dairy sector:** NEADAP will contribute to making the dairy sector attractive, for young and upcoming farmers, for policy makers and for small-scale producers serving Base of the Pyramid (BoP) consumers.

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**Netherlands East Africa
Dairy Partnership**

Netherlands East Africa Dairy Partnership

The Netherlands East African Dairy Partnership (NEADAP) offers a platform for exchange of knowledge and experience to tackle current challenges and leverage further development in East African dairy. NEADAP core partners are Agriterra, SNV, Solidaridad and Wageningen University & Research (WUR), each with their own knowledge, expertise, networks, local partners and projects in East Africa.



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