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KENYA ACCESS TO RURAL FINANCE

KENYA DAIRY VALUE CHAIN FINANCE – RESEARCH AND RECOMMENDATIONS

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INTRODUCTION

USAID's Kenya Access to Rural Finance (KARF) program, implemented by Development Alternatives Incorporated (DAI), conducted research throughout the dairy value chain in four of Kenya's fifteen milk sheds for the purpose of recommending potential financial products to underpin the active engagement of Kenyan financial institutions in the sector on a commercial, for-profit basis. The exercise involved the collection and analysis of data for all primary actors in the dairy value chain, including: farmers (producers), artificial insemination service providers, dairy feed dealers, veterinary service providers, veterinary drug dealers, transporters and bulker/primary processors.

KARF omitted final processors from the data collection and analysis because these actors are very large businesses (Brookside Dairies and New KCC Dairies) and, as a result, their access to finance is not constrained. Further, these actors were not motivated to provide information regarding operational costs, revenues and profits.

This paper builds on a prior engagement for training Kenyan financial institutions and other key stakeholders in value chain analysis and financial product development completed during the first quarter of 2009. As a result of that training, several financial institutions requested assistance in dairy value chain analysis and product development.

OBJECTIVE

The overall objective of the analysis called for generating specific recommendations on low-risk, high-return financial products and broad financing strategies for the sector from the meticulous collection and analysis of a statistically significant data sample from all primary value chain actors in the Rift Valley and Central Highlands' four major milk sheds (Kabete, Nyeri, Nakuru and Eldoret). The analysis established critically important relationships between buyers and sellers within the dairy value chain; it also quantified volumes, revenues, costs, margins and returns; and it established the timing and seasonality of related cash flows.

The analysis and recommended financing strategies broadly served the mandate of KARF to "strengthen financial institution capacity to serve agricultural value chains and rural households" and "coordinate with other actors to push the frontier of financial services into underserved geographic locations and new product areas."

DATA COLLECTION METHODOLOGY

In order to properly collect key data underpinning the analysis of the dairy value chain and to create potential financing strategies, a statistically significant sampling strategy was developed based on the *Central Limit Theorem*¹. Thus, the size of the sample was selected to statistically comply with the normal distribution principles. The size of the sample and each piece of data collected was centered upon **dairy producers** using the sample size below. The sampling was anchored to producers because producers are the cornerstone of the dairy value chain. They buy the inputs and the supply the milk.

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{(1 - \% \text{ conf})^2} = \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{(1-93\%)^2} = 196$$

Where: **n** is sample size of the dairy producers interviewed
Z is the mass within 2 standard deviations of the mean in a normal distribution
p is the degree of variability in the sample (0.5 is maximum and lowest risk)
1-% conf is the acceptable error (93 of 100 interviews should be accurate)

The actual sample (n) was 230 farmers; actual confidence was 94 out of 100 interviews.

590 value chain actors were surveyed, including: producers, various input suppliers, transporters and primary processors. Initially, input suppliers and bulkers were selected through networking with artificial Insemination (AI) providers. The AI providers worked as enumerators for the data collection exercise. Input suppliers and bulkers were asked to name ten of their producer clients.

From the lists of producer-clients, producers were randomly selected, contacted and interviewed. The distribution of respondents by milk shed is shown below, indicating the number of interviews that remained in the sample after data cleaning, excluding inconclusive questionnaires:

Location→ Category↓	Kabete	Nyeri	Nakuru	Eldoret	Totals
AI Providers	16	18	14	11	59
Vet Services	22	22	26	4	74
Feed Supply	15	14	20	5	54
Producers	48	52	77	45	222
Bulkers	16	19	21	6	84
Transporters	16	17	20	8	61
Totals	133	142	178	79	532

¹ In probability theory, the central limit theorem (CLT) states conditions under which the sum of a sufficiently large number of independent random variables, each with finite mean and variance, will be approximately normally distributed. Since real-world quantities are often the balanced sum of many unobserved random events, this theorem provides a partial explanation for the prevalence of the normal probability distribution. The CLT also justifies the approximation of large-sample statistics to the normal distribution in controlled experiments (Rice, John (1995), *Mathematical Statistics and Data Analysis* (Second ed.), Duxbury Press).

MAJOR FINDINGS

As a baseline, the basis of selection compared field observations to how an optimal value chain functions in theory. From there, the observed inefficiencies were compared and contrasted to the baseline since a value chain functions optimally when all actors, from input suppliers to retailers, operate profitably. The generation of profit minimizes bottlenecks in the flow of products throughout the chain and it (profit) underpins opportunities for lower risk lending by financiers. For a potential borrower to be creditworthy, a lender must have confidence that the borrower is profitable and that the market the borrower sells into is also adequately profitable and therefore able to absorb greater volumes of product. In other words, before lending to a dairy producer for expanding production, the lender must understand that the producer's buyer is profitable and capable of absorbing greater volumes of milk.

For purposes of this study, profitability was defined as annual return on cost above 0%. Profit was calculated by dividing the annual gross margin by annual costs and multiplying the resultant figure by 100%. To differentiate profitable businesses from creditworthy businesses, the average annual interest rate for lending in Kenya was established at 18%. It was then multiplied by two since businesses that earn annual returns above 36% are considered creditworthy for the purposes of this analysis.²

Among the four value chains analyzed, consistent trends emerged. The trends were as follows:

1. Many producers are highly profitable and capable of demanding and paying for services (financial services included).
2. Milk transporters – from small bicycle traders to large truck operators – compete minimally and range from adequately profitable to extremely profitable. Small and large transporters are capable of supporting financial services.
3. Veterinarians and AI providers are, in general, not adequately profitable to support financing. However, many of these businesses cross sell both services and, by doing so, are adequately profitable to support financial services.
4. Feed dealers receive stock through supplier credit. Dealers, however, earn low margins on dairy feed and are not incentivized to increase feed supply versus working with other high turnover, high-margin products (poultry meal, pesticides, etc.).
5. Bulking operations range from loss making ventures (predominately cooperative and self help structured businesses) to moderately profitable ventures (primarily small private businesses) to a few extremely profitable larger private businesses (vertically integrated from milk production to processing and marketing). Only the last category is adequately profitable to effectively support financing.

² Rationally, a business is a potential creditworthy borrower if it can earn a minimum of double of the cost of finance. Businesses paying over half of their profits to a lender tend to suffer a self-perception of *working for the bank* and are therefore poor credit risks as they may be reluctant to repay.

6. All dairy value chain actors suffer from poor access to cash and limited rural outreach of savings and credit services. There are also very few financial product offerings customized to meet the needs of their businesses.

Field observations indicate that producers, transporters, AI and veterinary service providers are adequately profitable and therefore financeable. However, bulkers and feed suppliers do not appear able to source commercial-grade finance. Obviously, if a producer receives finance, a lender must be reasonably certain that inputs and market access do not constrain repayment capacity. Low profits and/or losses earned by feed dealers do not necessarily indicate that as demand for feed increases, dealers will increase supply. Likewise, low profits earned by bulkers do not necessitate that they will purchase increased milk volumes as supply grows.

DISCUSSION OF SUBOPTIMAL FEED SUPPLY

In the dairy feed supply chain, low profits have more to do with the spread of wholesale and retail price spreads for a relatively large, heavy item (feed) versus inefficiencies on the part of dealers. Most probably, the supply of dairy feed is a loss leading strategy retailers use to draw dairy farmers into their retail shops in order to sell more profitable products. Because optimal dairy productivity is achieved through a combination of the best breed of dairy cow with the ideal feed for that animal, the low profitability of formulated dairy feed sales is bad for achieving this optimization. Furthermore, providing dairy producers with finance to help earn higher profits (and thus comfortably repay debt) makes access to quality feed a constraint to growth.

While suppliers provide feed to wholesalers and large retailers on credit terms, this does not underpin adequate profitability to encourage high volume throughput. Field level observations in all milk sheds surveyed indicate that producers often found it difficult to find dairy feed. This situation significantly worsened during rainy seasons when poorly maintained roads led to dairy feed going undelivered. If feed margin sales were more attractive, retailers and wholesalers would subsequently stock higher volumes and maintain a *longer-term* stock of feed.

DISCUSSION OF SUBOPTIMAL BULKING

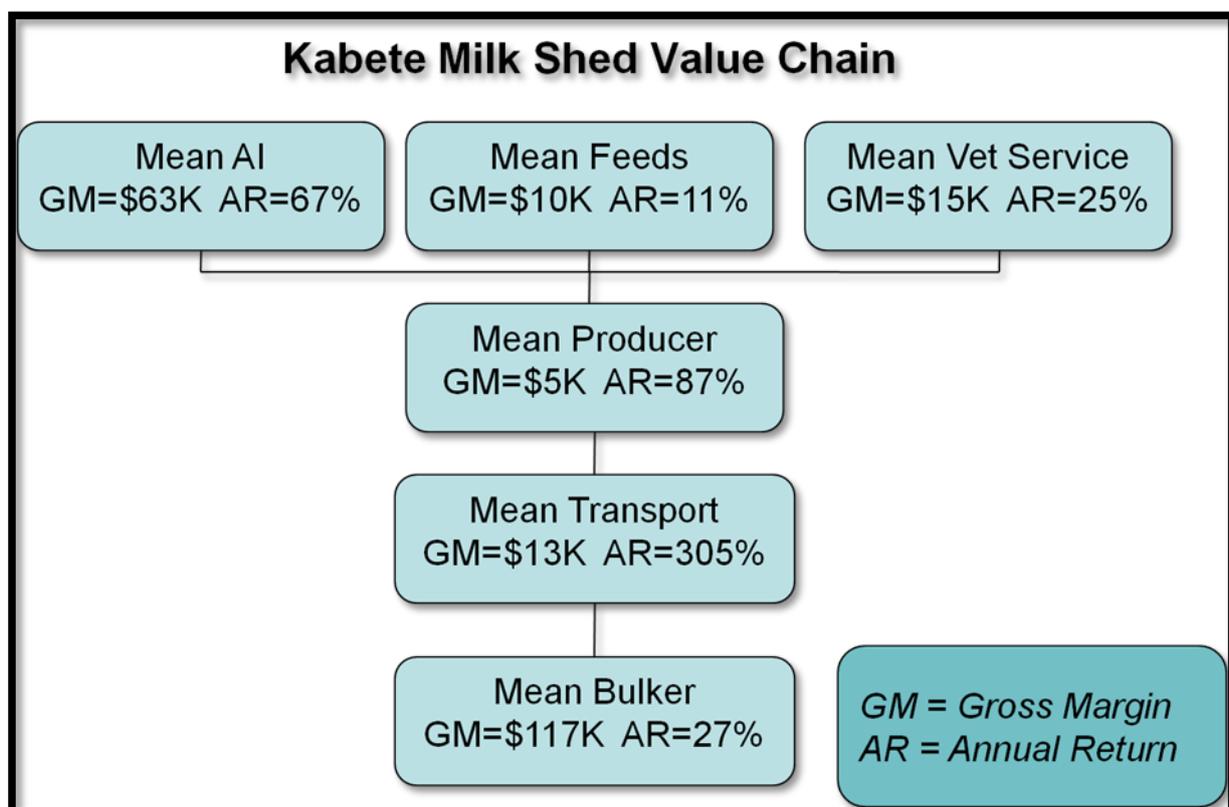
In the bulking chain, low profits earned by bulkers manifest through two pathways. First, either bulkers are highly competitive and pass maximum value through higher prices back to producers or, second, bulkers are poorly managed. The research from this study **strongly** supports the latter case. The majorities of bulkers sampled were poorly managed and, as a result, not only earn low or negative profits, but also pass low milk prices back to their producers (reinforcing the on-the-ground reality that volumes delivered will always be low).

This finding is supported by reliable secondary documentation noting that while there is unmet demand for dairy products at the retail level, as well as strong production from producers,

processors are the bottleneck and do not access adequate milk supplies from producers because they offer low prices³.

In spite of the fact that low profits are earned at the processor level, this is not a function of demand for raw milk. Therefore, if producers increase their milk deliveries, the market will easily absorb additional supply. Furthermore, expanding milk production and the growing role of private processors will naturally increase the profitability of the processor value chain. Donor-funded technical assistance programs, with some additional focus, can facilitate the better functioning, improved profitability and effective demand from this segment.

KABETE: SPECIFIC FINDINGS



In Kabete, on average all actors in the value chain were profitable. Kabete was, as a result, the best functioning value chain from the four milk sheds surveyed. This fact is attributable to the competitive business culture found in greater Nairobi and the geographic proximity to the Nairobi market.

³ This was particularly true for cooperatives, bulking operations registered as businesses but managed as cooperatives and self-help organizations due largely to high fixed costs, high management costs and high maintenance costs. Private bulking/processing operations were significantly more profitable and paid higher prices for raw milk to producers on average.

While all value chain segments were profitable, on average feed suppliers, bulkers and veterinary services providers were not adequately profitable to be considered creditworthy. Alternatively, AI providers, producers and transporters were, on average, creditworthy. AI service provision was competitively delivered. As noted earlier, AI providers often cross sell veterinary services which effectively depresses margins reported for AI and increases margins reported for veterinary services. In most cases, the combination of cross selling services is a creditworthy activity. Nonetheless, actors interviewed revealed they had little access to banking services beyond current accounts. Service providers felt that they could grow their businesses easily if they had appropriate transportation such as motorcycles and small 4X4s in order to reach more clients in less time.

Feed suppliers, on average, earned annual returns of 11%. When considering the imputed value of credit at 18% (though embedded credit), suppliers effectively earn a 29% annual return and approach the minimum creditworthy threshold of 36%. Nonetheless, feed suppliers are not, as such, profitable enough to be considered creditworthy. In Kabete, this constraint remains a critical problem to financial access.

Veterinary services are not considered creditworthy as a standalone activity but when sold in combination with AI services, taken together the activity is likely to be bankable.

Producers were profitable and creditworthy on average. Kabete has the highest level of producer commercialization as evidenced by the largest consumption of formulated feeds and the greatest incidence of zero grazing. Among the sample, 65% of farmers earned over a 36% annual return and, among these, the average annual return was 136%.

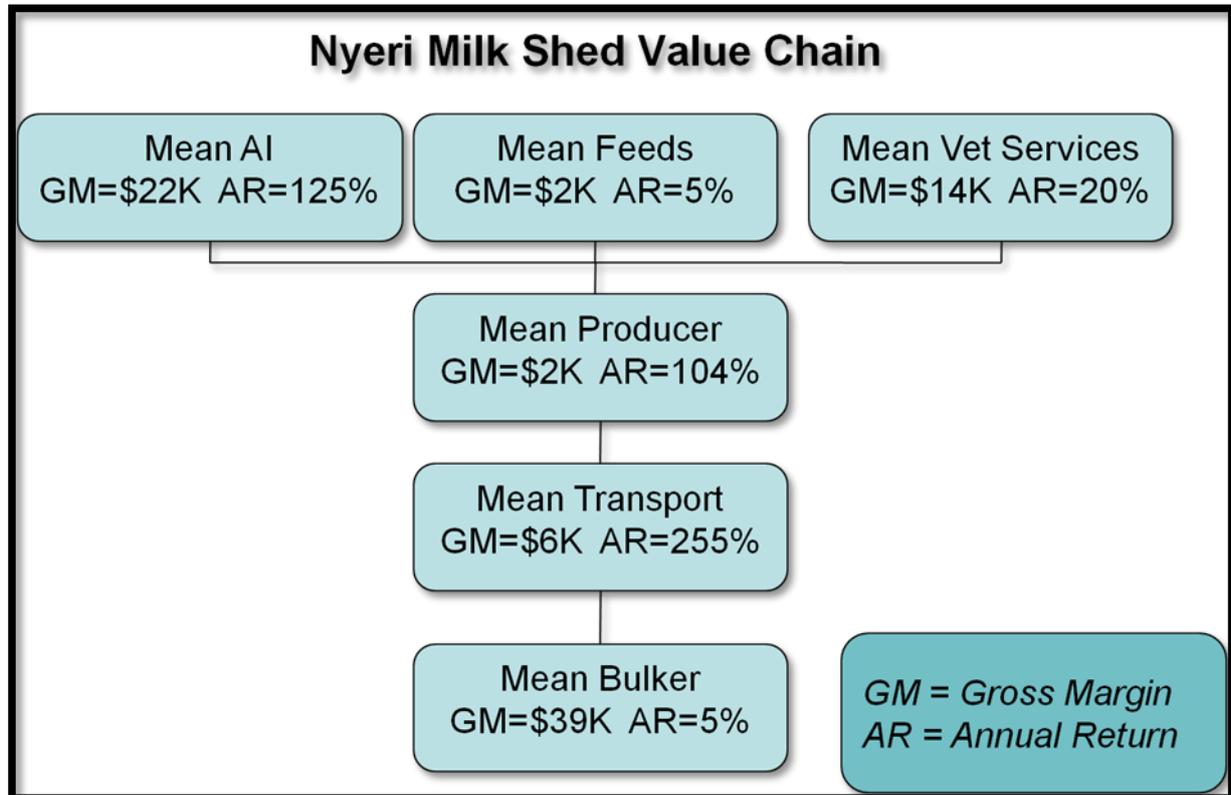
The remaining 35% of the sample was comprised of subsistence farmers (earning less than a 36% annual return). On average, however, these same farmers hold the exact number of dairy cows as small commercial producers but as a group they spend more money on the purchase of formulated feeds. The critical issue for these producers is the breed of their dairy herds. In general, they subsistence farmers in good feed but their substandard animals lack the ability to efficiently convert feed into increased milk yields.

Transporters were extremely profitable in Kabete, earning average annual returns above 300% and thus indicating low competition in this important value chain segment. Most likely, high profits earned by transporters further substantiate statements made in the literature reviewed for this study – i.e., much of the milk from producers never reaches the market. With such high returns, the motivation to pursue every last liter of milk born out of competition with other transporters is absent.

In Kabete, cooperative/self-help bulkers/processors were profitable on average. High competition for the purchase of milk by private buyers from Nairobi more than likely creates greater efficiency by Kabete-based cooperatives. Nonetheless, only one of the processors

interviewed in the sixteen sampled had annual returns above 36% (thus qualifying as creditworthy). That processor was a private firm.

NYERI: SPECIFIC FINDINGS



Nyeri is the least commercialized value chain among the four milk sheds sampled because commercial dairy production is a relatively new activity for this geographic area that traditionally relies on tea and coffee for its major agribusiness activities. All actors were, on average, profitable but most were not creditworthy.

As in other milk sheds, feed suppliers operate on very low margins, exacerbated since producers spend less on commercial feed versus the other milk sheds surveyed.

AI and veterinary service providers again cross sell services. If the two income generating activities are treated as complementary (cross sold), then the combined service is creditworthy. Taken individually as a standalone enterprise, veterinary services are not profitable enough to be creditworthy.

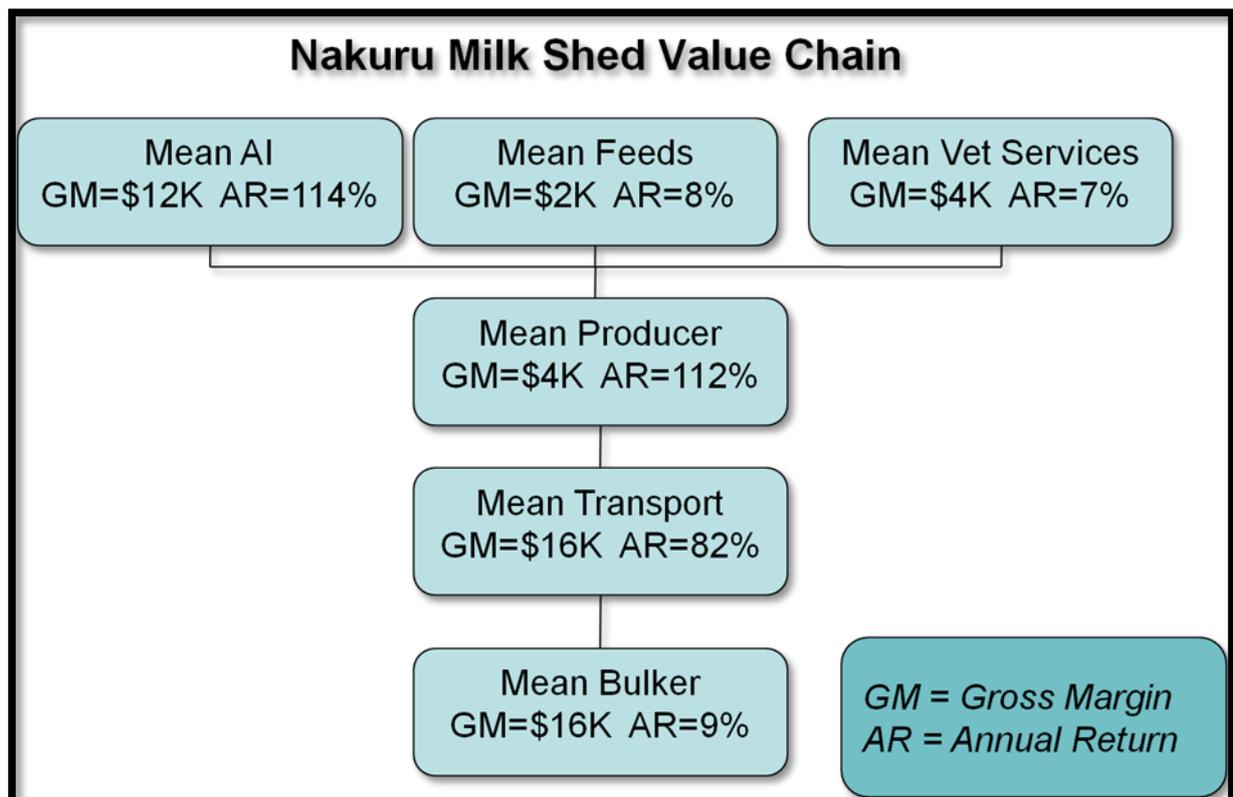
For producers, average annual returns were above 100%, indicating the average dairy farmer is creditworthy. Differentiating farmers earning annual returns above 36%, 67% of producers surveyed were creditworthy. Farmers earning annual returns of 36% or more averaged annual returns of 138%.

Subsistence farmers comprised 33% of the sample. In comparison with the cohort above, subsistence producers earned negative annual returns. Unprofitable subsistence farmers earned negative returns because they own more animals of lower quality than creditworthy farmers. They also pay more to feed their substandard breeds even though their milk yields are substantially lower.

Transporters in Nyeri, as elsewhere, were extremely profitable. On average, transporters earn over a 250% annual return. High profitability indicates that competition is inadequate to lower transport costs and the lack of competition very likely constrains the volume of milk transported from the farm gate to the processor. Moreover, high profits generated by transporters puts downward pressure on the average price paid for milk.

Bulking and processing are marginally profitable on average in Nyeri and the segment is dominated by cooperative actors. Cooperatives were unprofitable on average, earning average annual returns of -3%. Cooperatives are therefore not creditworthy. Likewise, private bulkers are not creditworthy since they earn average annual returns of 16% even though they are profitable.

NAKURU: SPECIFIC FINDINGS



In Nakuru, all value chain actors were profitable on average. The Nakuru area contains two unique bio-regions, highlands and lowlands, and each have relatively distinct farming subsystems. The lowlands possess a higher incidence of animal disease and zero grazing. The

use of formulated commercial feeds is also more common. In general, Nakuru is more aligned with Kabete in terms of overall commercialization – i.e., livestock numbers, commercialized input services, etc. Although, producers in Nakuru use more forage than their counterparts in Kabete for feeding cattle.

As in other milk sheds surveyed, AI providers in Nakuru are profitable unlike veterinary service providers. However, services are often cross sold and providers offering both services are creditworthy and likely to earn annual returns above 36%. Providers of these services are largely unbanked. They would greatly benefit from additional or improved modes of transport, allowing them to increase existing client outreach and market to underserved or unserved producers.

Feed dealers, as in other milk sheds, are marginally profitable in Nakuru. With average annual returns hovering around 8%, these businesses are not creditworthy. Likewise, feed dealers largely receive supplier credit raising their imputed annual return to 26%. Nonetheless, dairy feed is far less profitable than other products sold within the business since the input competes for shelf space which reduces its relative attractiveness.

Producers on average earn annual returns above 100%. Producers were disaggregated according to creditworthiness (earning annual returns above 36%). Of the farmers surveyed, 44% were creditworthy with the average producer earning annual returns around 140%. However, only 44% of this producer cohort is creditworthy. Nakuru farmers earn greater annual margins than most farmers in other milk sheds by having larger herd numbers. Although, the average number of creditworthy farmers is less than other areas, loan sizes have the potential to be greater in Nakuru than in other milk sheds.

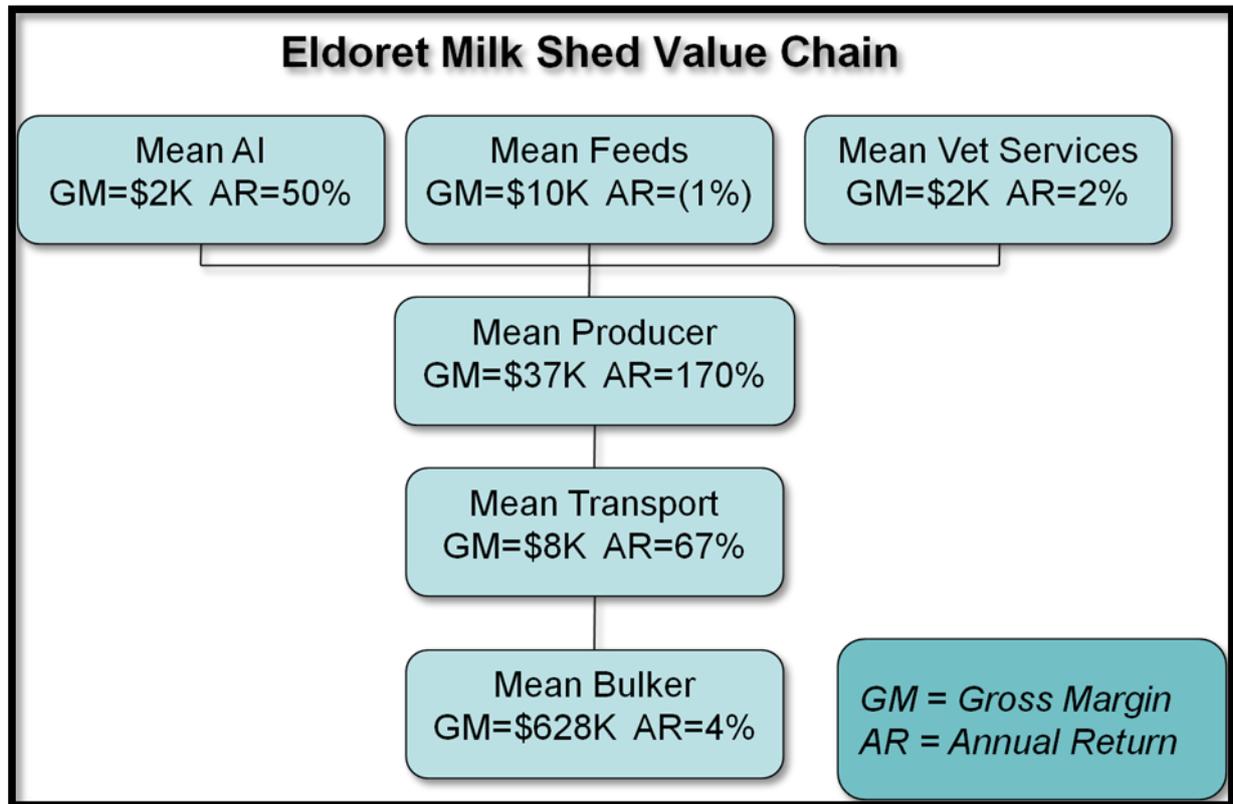
Farmers earning less than a 36% annual return comprised 56% of the sample. On average, producers from this cohort earn annual returns of just 6% and are not bankable. These farmers typically hold fewer cattle relative to their creditworthy counterparts. They also pay considerably more for feed inputs which indicates that their herds are comprised of inferior breeds due in large part to the consequences of post-election violence. Nakuru was negatively impacted by the destocking of livestock, therefore undermining years of successful breeding programs.

Unlike Kabete and Nyeri, transporters in Nakuru are more competitive. Average annual returns are approximately 80%, which demonstrates a level of fair, though not necessarily adequate, competition for milk transport services. More realistic profitability clearly enhances demand for milk produced. Transporters are creditworthy on average; individual operators have the potential to expand and more businesses could be added to the existing supply.

Bulkers and primary processors in Nakuru, as elsewhere, are dominated by cooperatives and self-help businesses. As witnessed in other milk sheds, private bulkers are far more profitable than their cooperative counterparts. In Nakuru, cooperative bulkers earn 8% average annual

returns while private bulkers earn approximately 24% annual returns. Both are profitable but neither is creditworthy.

ELDORET: SPECIFIC FINDINGS



Eldoret has the largest concentration of commercialized, large scale dairy operations with multiple producers in the sample holding cattle in numbers above fifty. Commercial production systems have two prominent strategies: (1) high-input, high-quality animals and (2) zero-input low-quality animals on large rangelands. The Eldoret value chain also suffered from unprofitable actors including feed dealers, veterinarians and bulkers. To a large degree, negative profitability stemmed from the ramifications of post-election violence.

AI providers in Eldoret are profitable and marginally creditworthy. Similar to other milk sheds, veterinary service providers are less profitable but often double as AI providers. In Eldoret, even profitable AI providers did relatively low volumes of business and earned low annual margins. Many providers cited low demand (following destocking) and the inability to access adequate transport to reach existing and new clients.

In Eldoret, dairy feed dealers, on average, earn losses. Dealers sell other products and services which leads to overall profitability. But on a standalone basis, dairy feed sales cannot support financing.

Producers in Eldoret comprise of three categories.

- **Large commercial** with average holdings of fifty cows and average annual returns of 218%.
- **Small commercial** with average holdings of nineteen cows and average annual returns of 133%.
- **Subsistence** with average holdings of twenty-four cows and average annual returns of -6%.

The two commercial categories are both profitable and creditworthy; subsistence producers are not profitable or bankable.

In Eldoret, poor breeds significantly contribute to subsistence producer losses⁴.

Transporters in Eldoret are relatively competitive and earn average annual returns of 67%. Transporters are creditworthy; however, the supply is probably adequate but capital improvements at the individual business level are necessary to promote penetration into underserved geographic and more remote areas.

As is other milk sheds surveyed, bulking and primary processing are dominated by cooperatives and self-help businesses. Private bulkers, though small, are profitable and earn average annual returns of 16% – a reasonable profit, but inadequate to support commercial finance. Cooperative bulkers earn annual losses of -9%.

⁴ Obviously, cows eat approximately the same amounts of feed but weak breeds do not convert high cost feeds into milk with the same efficiency as do strong breeds.

MAJOR RECOMMENDATIONS

Based on the findings in the preceding sections, the following table summarizes recommended financing strategies, listed by relevance on a milk-shed-by-milk-shed basis. Products and strategies referred to as *Immediately Relevant* can be implemented following product development but do not, in principle, require further action. Products and strategies referred to as *Relevant with Development Partner Assistance* should only be implemented when existing technical assistance providers in the dairy sector provide appropriate support to potential borrowers in areas such as business development services or grants for infrastructure. Overall recommendations refer to suggestions relevant for all milk sheds and specific recommendations apply only to the milk sheds noted.

Product↓ Milk Shed→	Kabete	Nyeri	Nakuru	Eldoret
Savings-cum-Credit for Herd Improvement	Immediately Relevant	Immediately Relevant	Immediately Relevant	Immediately Relevant
Structured Savings for Income Smoothing	Immediately Relevant	Immediately Relevant	Immediately Relevant	Immediately Relevant
Structured Inputs Savings	Immediately Relevant	Not Relevant	Immediately Relevant	Relevant with Development Partner Assistance
Vehicle Leasing	Immediately Relevant for Transporters and Veterinarians	Immediately Relevant for Transporters and Veterinarians	Not Relevant	Not Relevant
Micro Leasing	Immediately Relevant for Bulklers	Immediately Relevant for Bulklers	Relevant After Bulker Technical Improvement	Relevant After Bulker Technical Improvement
Inventory Credit for Feed Supply	Relevant with Development Partner Assistance	Relevant with Development Partner Assistance	Relevant with Development Partner Assistance	Relevant with Development Partner Assistance
Traditional Micro Finance Lending	Immediately Relevant for AI and Milk Traders	Immediately Relevant for AI and Milk Traders	Immediately Relevant for AI and Milk Traders	Immediately Relevant for AI and Milk Traders
Structured Trade Lending	Immediately Relevant	Immediately Relevant	Immediately Relevant	Immediately Relevant
Cash Transfer Services	Not Relevant	Immediately Relevant	Immediately Relevant	Immediately Relevant

SPECIFIC RECOMMENDATIONS

In the four milk sheds researched, there was a strong immediate potential for particular products including: Savings-cum-Credit for Herd Improvement, Structured Savings for Income Smoothing, Traditional Micro Finance Lending and Structured Trade Lending.

SAVINGS-CUM-CREDIT FOR HERD IMPROVEMENT

Producer income relies on milk yield. Milk yield largely relies on a combination of two critical management factors that include optimal animal breed and formulated feed. While feed is the easier of the two to procure because it is a relatively low and ongoing cost and therefore it can be financed out of cash flows; animal breed is the more important factor. Overall, in order of investment priorities, the combination of breed and feed adds the greatest marginal income; followed by animal breed plus free range forage; followed by local breeds fed on formulated feed; followed by local breeds plus free range forage.

Research supporting this paper strongly indicates two opportunities of critical importance:

1. Small commercial producers represent 45% of the dairy producer population and as such equates to approximately 270,000 individuals earning average annual profits (equal to savings potential) of KES 254,000.
2. Properly fed improved breed Friesian dairy cows cost KES 125,000 and yield 35 liters of milk daily worth a minimum of KES 700 daily (or KES 21,000 monthly).

The capacity to save exists for small commercial dairy producers and those farmers exist in large enough numbers to justify the development of a specialized savings product. Based on the data collected, a product could be developed allowing producers to save a fixed minimum amount monthly until they have accumulated 50% of the value of an in-calf Friesian Holstein plus the value of dairy feed sufficient for four months, enabling the cow to be properly fed until it begins to produce income. Following the accumulation of this value (demonstrating producer financial discipline), the financier would lend the additional 50% of the original value of the animal to the producer. Loan repayments could be on a cash basis or deducted from milk deliveries to the producer's cooperative or private buyer.

This approach is probably the single most effective way to improve milk yields and ensure farmer income and repayment capacity in a low risk and feasible way. The financier benefits by increasing medium-term fixed liabilities and by having a well-collateralized, prequalified lending opportunity.

STRUCTURED SAVINGS FOR INCOME SMOOTHING

As noted above and from a statistical perspective, there are approximately 270,000 small commercial producers earning average annual profits (equal to the savings potential) of KES 254,000. This creates an untapped savings potential of KES 6.8B among producers, not considering related businesses. While cash generated in the four milk sheds is regular and robust; cash flow also suffers from seasonality. In fact, in the four milk sheds, it was noted that

income begins to drop away in October and there is very little income from milk sales in November and December as cows yield greatly reduced milk volumes.

For producers, the timing of this pronounced decline in income just prior to the holiday season and before the payment of school fees could not be worse from a household liquidity perspective. It is recommended, again based on the data, that a savings product be developed so that from February to October producers save a fixed contract amount either weekly or monthly (in principle, savings could be withheld from milk payments at the level of the cooperative or corporate buyer).

In November, December and January savings could be withdrawn in three equal payouts. Contract savings will therefore secure household cash flow, food security and sustain dairy operations in low income months. From the financier's perspective, again, this strategy locks in short-term liabilities that can be invested profitably in low-risk instruments. If savings can be mobilized from the producers' buyers, the collection of those savings will be very low cost.

TRADITIONAL MICROFINANCE LENDING

Outside dairy producers, there are many MSMEs that either support the dairy value chain or are supported by it. These include veterinary drug vendors, AI providers, input dealers, bicycle/motorcycle milk traders (usually referred to as *hawkers*) and milk bars.

Almost two hundred of these value chain actors were surveyed in the four milk sheds and less than ten stated that they had access to financial services beyond current accounts. These value chain actors are cash businesses; each have daily turnover of inventory; all earn daily income; and the majority of these actors produce high returns on small investments. In short, these value chain participants are traditional microfinance clients who are not yet banked.

There exists significant scope to roll out traditional microfinance loans to these value chain actors. Furthermore, most of these participants operate their businesses, at least in part, in urban and peri-urban trading centers making access to them relatively easy.

STRUCTURED TRADE LENDING

Structured trade normally refers to a situation where a lender controls risk by assuring that all transactions banked pass through the lender's institution. For example, in the tea value chain, a lender may lend to producers for inputs (in cash or in kind) and then recover the loan from payments from the tea factory to which the producers deliver. In this example, the borrower would assign his/her contract with the tea factory to the lender as collateral entitling the lender to payment for all tea delivered to the factory on behalf of the borrower. The lender then simply deducts the loan payment and rebates the balance to the producer's current account. Producers frequently deliver milk to cooperatives and are paid on account. Moreover, in the case of large producers, they hold contractual arrangements for quantity and price with large buyers such as Brookside and New KCC.

This reality, whereby sellers are paid on account by their buyers, presents an ideal opportunity for structured trade settlement for all types of credit. Producers can be financed for motorcycles and milk cans to facilitate delivery to buyers and loans can be settled from milk deliveries. Large transporters can expand their truck fleets through leasing and the leases can be settled against contracts with Brookside and New KCC. Small producer organizations can use either leases or asset finance to procure chilling units and the finance can be settled from deliveries.

INVENTORY CREDIT FOR FEED SUPPLY

Margins for dairy feed are very low and sometimes negative in the four milk sheds. Low margins are offset to a degree because major suppliers provide feed on credit terms. Wholesalers and retailers often stock dairy feed as a loss leader in order to get producers into their shops to purchase more profitable inventory. This, by itself, leads to inefficiencies in the supply of dairy feed given low margins earned. Dairy feed is frequently in short supply since sellers prefer not to stock it. Further, during rainy seasons, feed is often not supplied at all in rural trading centers because it is heavy and low value relative to other inventory and not seen as worth transporting on bad muddy roads.

While suppliers use credit as an incentive to move dairy feed to producers, Unga, controlling 70% of the formulated dairy feed market, prefers not to supply on credit. This opportunity represents both a major cost savings and a substantial management relief if Unga simply sold on cash terms.

Based on the data and subsequent calculations, 1,000 MT warehouses dedicated only to providing dairy feed, can adequately supply 1,000 small commercial dairy farmers for a month. Further, by taking the credit burden off of Unga and specializing in high volumes of dairy meals, the cost price of dairy meal can be lowered and attendant operations can be significantly more profitable than at present. Thirty operations fitting this profile could be easily sustained in each of the four milk sheds given the demand from small commercial dairy producers. In essence, each warehouse would stock an average inventory valued at KES 12M monthly.

In terms of credit, dairy feed inventory of this scale and significant value can easily support bank financing. The recommendation therefore is to work with rural stocking points on an inventory credit basis. That is, the lender will pay Unga for deliveries of dairy meal in cash. The inventory held at the warehouse will serve as collateral for its own financing. The rural warehouse owner will maintain the inventory. Buyers will pay for dairy meal at the local lender's branch and receive a voucher that can be redeemed at the warehouse for dairy meal. The lender will deduct the principal and interest payments from the buyer's payment and rebate the balance to the warehouse owner's account.

Unfortunately, while the market is well understood and Unga is eager to provide feed on these terms, immediate infrastructure investment is required for this arrangement to function properly. This approach is the best option for increasing access to dairy meal, expanding milk

yields and improving low-risk access to finance but the warehouses simply are not yet there. If a donor partner could fund or subsidize the construction of sound rural warehouses, the situation will be ideal for a high-value pilot.

PRODUCT RECOMMENDATIONS

STRUCTURED INPUTS SAVINGS (RELEVANT FOR KABETE, NAKURU AND ELDORET)

Based on the research, Kabete and Nakuru have the highest consumption of formulated dairy feed. Dairy producers suffer from reduced cash flow in November and December. The concept of structured savings can be taken one step further in Kabete and Nakuru by offering structured savings for formulated dairy feeds.

The structure of this product calls for a producer to set aside a small amount of money from February to October when cash flows are robust. The financier would then buy dairy feed forward on the basis of savings received (and probably be able to lower the cost of feed for the producer by handling many producers under the same arrangement). Rather than withdrawing cash, the producer would receive vouchers for purchasing dairy meal during November, December and January. Targeted savings of this nature would enable the producer to plan business in advance, allowing the financier to access short-term liabilities and develop relationships with feed sellers.

In Eldoret, it is clear that prior to last year's post-election violence, this product would also have been appropriate. When the dairy industry recovers or is assisted to recover by development partners, this product will also be relevant in Eldoret.

VEHICLE LEASING (RELEVANT FOR KABETE AND NYERI)

In Kabete, AI service providers, and milk transporters manage robust businesses with average annual returns of 67% and 305%, respectively. In terms of margins, these percentages translated to annual returns of KES 910,000 and 4.4M.

In Nyeri, AI providers, and milk transporters also manage similarly robust businesses with average annual returns of 125% and 255%, respectively. In terms of margins, these percentages translate to annual returns of KES 420,000 and 1.5M. These businesses are both creditworthy on their own and capable of sustaining competition from similar service providers.

AI service providers and veterinarians (cross-selling services) noted that they could easily double their businesses if they had access to motorcycles or small 4X4s since vehicles, enabling them to access their clientele and market to new clients more easily and efficiently.

Transporters interviewed were extremely profitable which indicates that financing new competitors should be relatively simple given that profits earned by a few can easily be shared with many more transporters therefore allowing the value chain to function more efficiently.

This situation creates an ideal platform for vehicle leasing, as opposed to lending, since lenders provides the asset itself, with a full maintenance contract, while holding the title to the vehicle until it is paid for in full. This scenario provides a perfect opportunity for risk mitigation because the lender owns the asset until it is paid for and, in the case of default, recovery of the asset is merely a matter of repossessing the vehicle. Furthermore, in the case of transporters, the lender can actually use a structured trade recovery system in which the transporter assigns his or her contract with Brookside or New KCC to the lender and the lender then deducts lease payments from the milk delivery payments.

MICRO LEASING (RELEVANT FOR KABETE AND NYERI, IMMEDIATELY; RELEVANT FOR NAKURU AND ELDORET WITH COMPLIMENTARY TECHNICAL ASSISTANCE)

In Kabete and Nyeri, there are large numbers of profitable MSMEs such as: (1) small milk traders (hawkers) who could easily grow their businesses with access to motorcycles equipped with milk cans; (2) small commercial producers who can benefit from on-farm milk chilling and transport; (3) AI service providers who could reach more clients with the benefit of a motorcycle; (4) etc. As with large asset leasing, micro leasing provides an ideal product for financing these opportunities in a low-risk manner. In short, the lender purchases the asset and then lends the asset to the borrower, with a built in maintenance contract, under a contract obligating the borrower to pay for the asset in the same manner the borrower would pay for a loan. Once the asset is paid in full, the borrower can purchase the title of the asset from the lender for a nominal fee of KES 1 or something similar. In the case of default, the lender simply recovers the asset as the lender holds the title.

In Nakuru and Eldoret, similar opportunities exist but on a lower overall scale versus Kabete and Nyeri. The greatest obstacle facing micro leasing in Nakuru and Eldoret relate to low levels of commercialization in the milk processing and particularly within the cooperative sector. Therefore, while milk traders (hawkers) in both milk sheds and AI service providers in Nakuru are financeable, the bulkers are not. While micro leasing remains low risk because the lender controls ownership of the asset, one nonetheless doesn't want to lend to a borrower who may not service the debt. Should complementary technical assistance improve the business function at the bulker level, these cooperatives will be more ideal for financing and provide a larger overall opportunity.

CASH TRASNFER SERVICES (RELEVANT FOR NYERI, NAKURU AND ELDORET)

Dairy is a cash business with huge daily cash flows. However, with the exception of Kabete, access to cash for value chain actors was extremely limited. Producers frequently had to travel fifty or more kilometers to access current accounts where they were paid for milk. This problem slows all other transactions in the value chain as input suppliers rely on producers for payment, etc.

Clearly, cash flows are robust enough to justify ATM machines and/or agencies closer to purchase and sales points for milk in rural trading centers. Increased liquidity will have a multiplier effect by increasing profits (eliminating transport costs and time) and expanding

creditworthiness of value chain actors through the reduction of transaction costs for disbursements and repayments.

FINANCIAL INSTITUTION TECHNICAL ASSISTANCE

In order to realize the financial products and strategies outlined above, financial institutions require technical assistance. KARF now holds a complete data set of adequate statistical significance to design relevant products. While the demand side of the equation is well understood, financial institution capacity to supply products must not be taken for granted. At the most basic level, a financial product allows a financial institution to maximize profit and minimize risk. In rural finance, financial institutions often find it difficult to achieve these two ends. The breakdown occurs because financial institutions generally do not adequately understand the unique needs of their clients. A financial institution has a viable product if it meets both the needs of the financial institution and the unique needs of its client. Institutional needs include internal priorities, revenue requirements, operational capacity and timing vis-à-vis asset-liability management, etc. Client needs include business priorities, revenue requirements – after paying the costs of finance, capacity to advantage a product's benefits and timing vis-à-vis seasonality of the enterprise, etc.

This paper recommends a methodical approach to financial product development. The market demand for a given product, including the proposed client group's ability repay from cash flows enabled by the product, must be analyzed first and foremost. The internal capacity of the lender to adopt a new product and cost implications of that adoption must be analyzed afterwards. If these two are positive, then cash flows and timing considered from an asset-liability management perspective must be reviewed. Next, risk management strategies are elaborated and procedures developed.

Promotional strategies are then developed and product costing is finalized. The last step in product development must be an evaluation on the basis of the costs and revenues for the financial institution in comparison to the costs and revenues of the client. Only when it is clear that both the financial institution and the client are better off on the basis of the transaction is the product considered ready for market.

COMPLIMENTARY TECHNICAL ASSISTANCE

Some financial products are immediately feasible while others will only be possible with assistance from development partners. In Nakuru and Eldoret, the business culture among bulkers and primary processors is poor. In all milk sheds, the supply system for dairy feed would benefit from a major overhaul which will only be possible with donor resources. In Eldoret, the impact of post-election violence has been felt significantly by the dairy industry in terms of

destocking improved dairy cows, destroying infrastructure and effectively eliminating demand for paid input services. Again, without development partner assistance, revitalization will require a significant time before previous levels of commercialization are again realized.

Hence, in addition to financial services, development partners must give careful consideration to the provision of professional and competent BDS provision for dairy value chain actors. Furthermore, the industry would benefit greatly from the overhaul of the feed industry and its delivery channels. Finally, in Eldoret, investments in infrastructure and restocking of improved dairy cows will accelerate achievement of re-commercializing the sector in this extremely high potential milk shed.

DEFINITIONS OF POTENTIAL FINANCIAL PRODUCTS RECOMMENDED FOR DAIRY

Based on the results from the data analysis indicating qualified levels of demand for financial services, this paper recommends the development and marketing of financial products summarized in the table below. These products were presented at the research findings forum for Kenyan financiers and key donors and received an overall positive response. There are obviously other possible financial products that institutions may consider developing based on additional data analysis. This paper does not suggest any obstruction to efforts undertaken by financial institutions to invest or explore developing other new products. However, the potential products presented below are considered to be of high priority and merit consideration by financial institutions, in collaboration with other stakeholder partners in the immediate term.

As a rule of thumb, a financial institution should consider developing, piloting and implementing one or two new products over a twelve month period – at a maximum to ensure the relative success of each.

Financial Product 1: Income Smoothing Structured Savings	
Description	Regular contract savings deducted from milk deliveries during high season from January to September payable with interest in four fixed value withdrawals during the low production season (October, November and December, and may be extended to January/February) to enable producers meet their regular financial requirements and mitigate any temptation for borrowing from money lenders that tend to aggravate the producers' savings capacity. This approach can be targeted to specific expenses such as school fees, dairy feeds and Christmas shopping, and if necessary can be disbursed in-kind.
Potential Market	Commercialized producers in all the four milk sheds that will permit the realization of a minimum target of 300,000 potential clients.
Value	Minimum value of KES 2,000 per saver per month realizing a minimum of KES 600 million per month (or KES 7.2 billion annually) in low cost savings liabilities from the four milk sheds.
Timing	Allowing for the time to develop the financial product, the product can be reasonably inaugurated on the market beginning January 2010.
Risk and Risk Mitigation	Early withdrawal of savings: Embed forfeiture of interest on savings withdrawn early.
Complementary TA	Financial: Support for product development, product launch and marketing.

Financial Product 2: Savings-cum-Credit for Herd Improvement	
Description	The client saves monthly predetermined non-withdrawable portion of his/her milk revenue stream for subsequent investment in better breed and feed to step up his/her dairy operation. When the accumulated savings caps an agreed percentage of the investment requirement (50% of cost of cow(s) and 100% cost of four months dairy feed), the financier tops up the savings with a complementary loan for acquisition of the investment. Interest is provided on the savings. The client continues savings post access to credit and the accumulated savings are used to discharge client loan installment obligations.
Potential Market	Commercialized dairy producers (large and small) in the four milk sheds with on-going milk sales. The minimum number of potential clients for this product is 350,000.
Value	Minimum value of loan equivalent to 50% of the cost of one improved breed dairy cow and 100% cost of feed for four months totaling KES 90,000. Minimum KES 9,000 monthly per saver for maximum of ten months realizing annual savings of KES 37.8 billion and total potential loan portfolio of KES 26.25 billion.
Timing	Continuous savings (beginning January 2010 for a maximum of ten months) and credit disbursement as the savings cap the agreed percentage of the investment cost. Repayment period as agreed upon and depending on established savings capacity.
Risk and Risk Mitigation	<ol style="list-style-type: none"> 1. Client diverts loan: Disburse loan directly to dairy cow breeders/suppliers and feed suppliers on confirmation of delivery. 2. Client fails to acquire quality breed dairy cow(s): Partner with dairy professionals for sourcing suitable dairy cows. 3. Wilful default: Attach the cow(s); leveraging with loan guarantee programs. 4. Mortality and theft: Make livestock insurance and animal branding mandatory lending requirements.
Complementary TA	<p>Financial: Product development, savings mobilization strategy support, loan guarantees.</p> <p>Non-financial: Good dairy husbandry practices and other BDS support; breed selection; and support for financial institutions human resource capacity building.</p>

Financial Product 3: Inventory Credit for Rural Feed Supply	
Potential Market	Rural geographies in three milk sheds (Nyeri, Nakuru and Eldoret). Pilot with ten 1,000 MT warehouses in each milk shed. The client beneficiaries will be primarily those operating approved feed warehouses in rural areas, handling a minimum of pre-set volume of feed per given period of time and thus providing adequate access opportunities to the producers.
Description	Line of credit, secured by dairy feed inventory in an approved rural warehouse, settled through the lender when feed is sold and replenished as needed. The feed is supplied by contracted feeds manufacturers and loan disbursement is made direct to the feed suppliers. Buyers from the warehouse pay directly to the lender prior to accessing feed. A collateral management mechanism for the warehouse is agreed upon and put in place. Repayment for the line of credit is automatically offset from the sales proceeds directly deposited with the lender. Self-collateralizing inventory and structured payment for feed purchase reduce default risk.
Potential Market	Nyeri, Nakuru and Eldoret milk sheds: Ten 1,000 MT warehouses in each milk shed for a pilot are feasible (the actual potential for each milk shed is thirty warehouses). The client beneficiaries will be primarily those operating approved warehouses in rural areas and having contracts with feeds suppliers.
Value	Value of loan equivalent to 75% of the cost of feed inventory matching the holding capacity of the warehouse. Total value of potential line of credit is KES 12 million per warehouse per month and totaling KES 360 monthly.
Timing	Beginning as soon as possible once approved suitable warehouses are identified and feeds supply contracts are negotiated.
Risk and Risk Mitigation	<ol style="list-style-type: none"> 1. Feed inventory sales proceeds diverted by borrower: Collateral management of inventory allowing release of inventory for only sales made direct to the financier. 2. Loss of inventory (theft, fire and other hazards): Make insurance for inventory mandatory for the loan. 3. Price Risk: Fund only 75% of cost of inventory.
Complementary TA	<p>Financial: Product development; tripartite contract design and negotiation; and loan guarantees.</p> <p>Non-financial: Rural warehouse infrastructure development; and BDS for warehouse operators.</p>

Financial Product 4: Micro Lease Financing for SME Dairy Actors	
Description	Provision of assets such as processing equipment, motorcycles, small 4X4s, aluminum milk cans, IA quality-enhancing equipment, et etc. and secured by the asset itself on finance lease terms. The client makes a down payment of 20% of the cost of the asset but the financier retains ownership of the asset until the last rental installment is paid by the borrower upon which the ownership of the asset can be passed to the borrower on agreed terms.
Potential Market	Commercialized and private sector dairy actors in all the four milk sheds and cutting across bulkers, transporters, AI and veterinarian service providers, feed and drug dealers, and producers. Minimum of 300 leases per milk shed is realizable.
Value	Leases ranging between KES 300,000 to KES 800,000 per borrower with minimum value of loan equivalent to 80% of the cost of the asset/equipment to be leased and yielding a loan portfolio of between KES 360 million to KES 960 million annually.
Timing	This can be as soon as possible, especially with financial institutions currently offering lease products that would require limited modification.
Risk and Risk Mitigation	<ol style="list-style-type: none"> 1. Borrower default: Retrieve and dispose the asset. 2. Loss of asset (specific) through theft, accident, fire and other hazards: Make insurance for the leased asset (comprehensive insurance in the case of assets with relatively high value) mandatory requirement for the loan; Brand the leased assets; and recover through guarantees. 3. Poor quality assets supplied to borrowers: Partner with reputable vendors and TA entities in sourcing suitable assets. 4. Asset poorly maintained by the lessee: Service and maintenance of asset by vendors included in lease agreement and/or other contract with reputable third party maintenance and service providers put in place at the time of concluding the lease agreement.

Financial Product 5: Structured Settlement—Lease Financing	
Description	Provision of large assets such as large milk bulking and processing equipment and refrigerated 4X4 medium trucks secured by the asset itself with payments settled against milk deliveries to contracted reputable large processors. This would be a finance lease for a maximum of six years. The client makes a down payment of 20% of the cost of the asset but the financier retains ownership of the asset until the last rental installment is paid by the borrower upon which the ownership of the asset can be passed to the borrower on agreed terms.
Potential Market	All the four milk sheds. This will apply for commercialized private sector milk bulkers and transporters making direct sales to large processors. A minimum of twenty leases per milk shed is feasible and thus a total of eighty leases annually.
Value	Leases ranging between KES 1.5 million to KES 4.5 million per borrower with minimum value of loan equivalent to 80% of the cost of the leased asset/equipment and yielding a loan portfolio of between KES 360 million to KES 120 million to KES 360 million annually. The minimum value of lease is equivalent to 80% of the cost of the asset/equipment.
Timing	The existing high qualified demand (reflected by the significant profitability realized by transporters) warrants the introduction of the proposed lease product as soon as possible. Similar to the immediate previous proposed micro lease product, provision of this product may only require adjustments in existing lease products for financial institutions currently engaged in asset leasing.
Risk and Risk Mitigation	<ol style="list-style-type: none"> 1. Borrower default: Retrieve and dispose the asset. 2. Loss of asset (specific) through theft, accident, fire and other hazards: Make insurance for the leased asset (including comprehensive insurance) mandatory requirement for the loan; Brand the leased assets; and recover through guarantees. 3. Poor quality assets supplied to borrowers: Partner with reputable vendors and TA entities in sourcing suitable assets. 4. Asset poorly maintained by the lessee: Service and maintenance of asset by vendors included in lease agreement and/or other contract with reputable third party maintenance and service providers put in place at the time of concluding the lease agreement.
Complementary TA	<p>Financial: Support for asset finance lease product development; product marketing support; and loan guarantees.</p> <p>Non-financial: Support for BDS for borrowers; identification of suitable assets; and support for asset service and maintenance contract design.</p>

ANNEXES

ANNEX A

SUMMARY QUANTITATIVE FINDINGS

AI Services

	Annual Margin KSH				n	Annual Margin USD				n
	Min	Max	Mean			Min	Max	Mean		
All	(264,063)	49,527,355	2,360,927		51	(3,429)	643,212	30,661		51
Kabete	95,361	49,527,355	4,839,268		16	1,238	643,212	62,848		16
Nyeri	(103,792)	7,544,333	1,719,949		17	(1,348)	97,978	22,337		17
Nakuru	(264,063)	7,048,062	938,968		14	(3,429)	91,533	12,194		14
Eldoret	68,977	304,750	148,578		4	896	3,958	1,930		4

	Annual Return				n	Distribution of Annual Return above 36%/annum				n
	Min	Max	Mean			Min	Max	Mean		
All	-38%	564%	98%		51	37%	564%	131%		36
Kabete	14%	167%	67%		16	39%	167%	86%		11
Nyeri	-7%	486%	125%		17	46%	486%	158%		13
Nakuru	-38%	564%	114%		14	37%	564%	155%		10
Eldoret	8%	87%	50%		4	79%	87%	83%		2

Feed Dealers

	Annual Margin KSH				n	Annual Margin USD				n
	Min	Max	Mean			Min	Max	Mean		
All	(323,048)	8,710,200	405,865		49	(4,195)	113,119	5,271		49
Kabete	(153,000)	8,710,200	789,130		14	(1,987)	113,119	10,248		14
Nyeri	(311,604)	758,460	153,859		14	(4,047)	9,850	1,998		14
Nakuru	(323,048)	1,661,776	158,614		16	(4,195)	21,582	2,060		16
Eldoret	(321,496)	3,844,080	829,541		5	(4,175)	49,923	10,773		5

	Annual Return				n	Distribution of Annual Return above 36%/annum				n
	Min	Max	Mean			Min	Max	Mean		
All	-36%	47%	7%		49	37%	47%	40%		4
Kabete	-4%	38%	11%		14	37%	38%	37%		2
Nyeri	-31%	38%	5%		14	38%	38%	38%		1
Nakuru	-36%	47%	8%		16	47%	47%	47%		1
Eldoret	-16%	11%	-1%		5	0%	0%	0%		0

Veterinary Service Providers

	Annual Margin KSH				n	Annual Margin USD				n
	Min	Max	Mean			Min	Max	Mean		
All	(639,064)	11,070,240	783,976		72	(8,300)	143,769	10,182		72
Kabete	(192,150)	9,765,346	1,180,176		21	(2,495)	126,823	15,327		21
Nyeri	(639,064)	11,070,240	1,094,938		21	(8,300)	143,769	14,220		21
Nakuru	(626,220)	5,277,600	308,800		26	(8,133)	68,540	4,010		26
Eldoret	(21,720)	427,155	160,021		4	(282)	5,547	2,078		4

	Annual Return				n	Distribution of Annual Return above 36%/annum				n
	Min	Max	Mean			Min	Max	Mean		
All	-66%	140%	16%		72	41%	140%	68%		13
Kabete	-17%	140%	25%		21	50%	140%	107%		4
Nyeri	-52%	83%	20%		21	41%	83%	53%		4
Nakuru	-66%	62%	7%		26	43%	62%	48%		5
Eldoret	-1%	7%	2%		4	0%	0%	0%		0

Producers

Large Commercial							
	n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l	
All	37	17%	K 3,495,987	234%	39.45	K	9.30
Kabete	5	11%	K 2,560,756	273%	21.40	K	7.13
Nyeri	2	4%	K 950,255	197%	12.00	K	9.73
Nakuru	4	5%	K 1,862,045	276%	19.14	K	4.87
Eldoret	26	63%	K 4,311,572	218%	50.50	K	10.87

Large Commercial							
	n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l	
All	37	17%	\$ 45,402	234%	39.45		9.30
Kabete	5	11%	\$ 33,257	273%	21.40		7.13
Nyeri	2	4%	\$ 12,341	197%	12.00		9.73
Nakuru	4	5%	\$ 24,182	276%	19.14		4.87
Eldoret	26	63%	\$ 55,994	218%	50.50		10.87

Small Commercial							
	n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l	
All	98	45%	K 254,855	127%	7.94	K	8.22
Kabete	25	54%	K 212,845	108%	7.60	K	9.75
Nyeri	32	63%	K 216,926	138%	4.81	K	7.41
Nakuru	31	39%	K 259,662	128%	8.21	K	8.01
Eldoret	10	24%	K 470,944	133%	18.70	K	8.36

Small Commercial							
	n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l	
All	98	45%	\$ 3,310	127%	7.94		8.22
Kabete	25	54%	\$ 2,764	108%	7.60		9.75
Nyeri	32	63%	\$ 2,817	138%	4.81		7.41
Nakuru	31	39%	\$ 3,372	128%	8.21		8.01
Eldoret	10	24%	\$ 6,116	133%	18.70		8.36

Subsistence							
	n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l	
All	82	38%	K 9,916	0%	7.58	K	15.27
Kabete	16	35%	(20,472)	-3%	5.00	K	19.96
Nyeri	17	33%	(7,299)	-3%	6.38	K	12.75
Nakuru	44	56%	K 35,928	6%	6.32	K	14.39
Eldoret	5	12%	K 53,070	-6%	23.80	K	10.10

Subsistence							
	n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l	
All	82	38%	\$ 129	0%	7.58		15.27
Kabete	16	35%	\$ (266)	-3%	5.00		19.96
Nyeri	17	33%	\$ (95)	-3%	6.38		12.75
Nakuru	44	56%	\$ 467	6%	6.32		14.39
Eldoret	5	12%	\$ 689	-6%	23.80		10.10

Transporters

	Annual Margin KSH				Annual Margin USD			
	Min	Max	Mean	n	Min	Max	Mean	n
All	(528,552)	6,829,880	885,658	58	(6,864)	88,700	11,502	58
Kabete	19,400	5,676,867	1,014,805	14	252	73,726	13,179	14
Nyeri	2,700	2,054,859	503,361	17	35	26,686	6,537	17
Nakuru	(528,552)	6,829,880	1,242,540	19	(6,864)	88,700	16,137	19
Eldoret	(11,000)	2,118,500	624,436	8	(143)	27,513	8,110	8

	Annual Return				Distribution of Annual Return above 36%/annum			
	Min	Max	Mean	n	Min	Max	Mean	n
All	-62%	2471%	185%	58	37%	2471%	294%	36
Kabete	11%	923%	305%	14	158%	923%	419%	10
Nyeri	9%	2471%	255%	17	49%	2471%	307%	14
Nakuru	-62%	528%	82%	19	39%	528%	187%	9
Eldoret	-1%	266%	67%	8	37%	266%	144%	3

Primary Bulkers/Primary Traders

	Annual Margin KSH				Annual Margin USD			
	Min	Max	Mean	n	Min	Max	Mean	n
All	(7,971,629)	151,674,806	8,524,022	62	(103,528)	1,969,803	110,702	62
Kabete	(1,345,020)	111,644,318	9,044,376	16	(17,468)	1,449,926	117,459	16
Nyeri	(7,971,629)	37,424,888	2,994,368	19	(103,528)	486,038	38,888	19
Nakuru	(590,177)	5,641,502	1,219,465	21	(7,665)	73,266	15,837	21
Eldoret	(135,040)	151,674,806	50,212,929	6	(1,754)	1,969,803	652,116	6

	Annual Return				Distribution of Annual Return above 36%/annum			
	Min	Max	Mean	n	Min	Max	Mean	n
All	-35%	211%	12%	62	37%	211%	78%	5
Kabete	-25%	211%	27%	16	40%	211%	100%	3
Nyeri	-12%	20%	5%	19	0%	0%	0%	0
Nakuru	-35%	51%	9%	21	37%	51%	44%	2
Eldoret	-14%	16%	0%	6	0%	0%	0%	0

ANNEX B: ADDITIONAL TECHNICAL ASSISTANCE OBSERVATIONS AND RECOMMENDATIONS

SUMMARY

Technical assistance and agriculture extension services work as a source information and a platform for training to ultimately increase productivity and profitability of businesses and/or individuals in the dairy value chain.

Not all milk sheds in the Kenya dairy value chain are homogenous even though it was noted that all sheds are treated as such. Likewise, milk shed production systems are not standardized which is due to many reasons, including: different bio-regions within the same milk-shed, dissimilar levels of commercialization and/or particular circumstances that affect performance such as post-election violence. Again, the interventions appeared to treat the milk shed production systems as standardized.

Heterogeneous milk sheds and business approaches require specific and customized interventions and not standardized templates. Technical assistance and extension services must function to enable actors working in different systems to operate efficiently and profitably given unique operating environments. Without customization in agriculture extension and sometimes business support activities, technical assistance will continue to run the risk of being counter-productive to private-sector market-driven forces creating a negative impact on the profitability of potentially competitive, efficient actors in the dairy value chain.

Therefore, to further develop the dairy sector and maximize the impact of donor investments, interventions require enhancement and better coordination to promote efficient, sustainable and long-lasting growth.

THE ROLE OF TECHNICAL ASSISTANCE AND EXTENSION IN A SUBSISTENCE FARMER'S PROFITABILITY

The cost of feeding dairy livestock is greater for subsistence farmers than for both sets of commercial farmers, even though small commercial and subsistence farmers possess the same number of animals. While subsistence farmers may not be able to immediately replicate the economies of scale for those of a small commercial farmer, the goal must be to approach the benchmark established by small commercial producers. This standard can be achieved by recognizing that breed is the absolute factor in generating output commensurate with the investment in feed. In such a scenario, farmers require technical support (and financing) to access improved breeds and attendant animal

husbandry practices to maintain improved breeds and maximize animal productivity while maintaining an optimal state of health, ensuring that the asset produces at maximum efficiency.

Equally important, subsistence farmers require customized assistance to improve business practices. Small commercial farmers better manage their feed and labor inputs which directly impact business profitability and the ability to grow and expand. Business skills can be enhanced through group training or one-on-one consulting; this relatively simple intervention will greatly impact the subsistence farmer's bottom-line performance and the capacity to increase milk yields. This approach was successfully utilized under the USAID Kenya Business Development Services program in the avocado value chain.

THE ROLE OF COMPLIMENTARY TECHNICAL ASSISTANCE TO BULKERS

Cooperatives

Cooperative bulkers generally earn returns far less than those generated by private sector counterparts. The expenses of cooperative bulkers normally exceed revenues, resulting from higher than average salary and maintenance costs. To stay in business, cooperatives retain membership by offering key services such as artificial insemination, vet-care and feed supply at lower costs than competitors. This reality partially binds producers to the cooperatives. As a result, cooperatives pay producers low prices stemming from inadequate levels of profitability. The producer ultimately loses because the farmer receives below market prices which, in turn, negatively impact profitability and the ability to grow and expand production.

The impact of technical assistance must assess its impact on long-held business practices and the outcome of those practices on overall market functionality. For example, a cooperative receiving financial support and other forms of assistance from an international organization often enables the cooperative to provide ancillary services such as artificial insemination or vet-care at very low and subsidized prices which undercuts the profitability and performance of private sector operators causing unnecessary and harmful distortions. As a result, private sector operators cannot compete with cooperatives on price which restricts the availability of choices offered to producers, further distorting the marketplace for quality inputs and services and locking farmers into a continuous cycle of low milk prices. Many producers balance this dilemma by selling morning milk to cooperatives and evening milk to hawkers that offer better prices for cash. This practice promotes an inefficient market for milk production and sales.

Assuming that cooperatives are a permanent feature of the sector and a major constraint to development of the dairy value chain, two solutions must be considered: (1) work with the private sector exclusively (or those unique cooperatives operating at sufficient levels of operational performance or profitability); and/or, (2) identify

cooperatives most likely to transform into commercial enterprises, operating along accepted best business practices. Again, a combination of these approaches can be applied to each unique milk shed on a case-by-case basis. When a cooperative is identified as a turnaround candidate, a plan must be formulated that identifies and documents a new business strategy and operating plan, clearly articulating performance targets, timeframes for change and requisite levels of external business consulting.

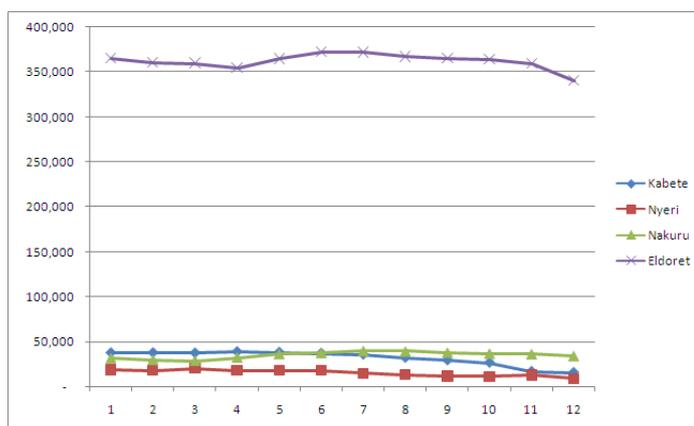
Failure to recognize the shortcomings of poorly performing cooperatives and enforce corrections as a stipulation to receiving support prolongs value chain inefficiencies and promotes misguided investment by donors and others. Ultimately, this continued practice reduces the overall competitiveness of the sector and, at the smallholder level, it negatively impacts the profitability of the farmer, locking producers into a cycle of depressed earnings and reduced income for their businesses and families.

Private Bulker’s Value Addition Equipment

Production of safe milk is a critical challenge for the industry at large and, in part, related to the inadequate supply of bulking centers in rural areas. Profitable private bulkers express interest to further develop storage and transportation capacity for milk through the acquisition of chillers, freezers and refrigerated transportation. Numerous bulkers operate in an information vacuum and do not possess the knowledge of where to procure appropriate equipment, how to maintain it after purchase or how to access finance to underwrite loans or lease costs. Technical assistance must be designed and implemented to source necessary assets for private bulkers, assuming those enterprises have up-to-date business plans and financials that can be modified to incorporate acquisitions and performance monitoring on a profit and loss basis.

CASH PLANNING FOR PRODUCERS AND BUSINESS TRAINING FOR MSMEs

During the calendar year, in months eleven and twelve, producers experience a decrease in milk production, resulting in a lower cash inflows.



Lower levels of milk production and reduced cash flows coincide with the Christmas season, immediately followed by the payment of school fees, placing additional financial stress on small dairy businesses, bearing in mind that farmers must continue to meet

input supply costs to maintain production. Technical assistance is necessary to help farmers successfully manage throughout down cycles and smooth earnings throughout the year. Working with financial institutions and technical assistance providers is needed to help farmers maximize production and profitability and not incur costs associated with non-traditional financiers like loan sharks and shylocks.

Many input suppliers, bulkers or transporters receive cash for the provision of services or product sales which are reinvested back into their business and/or used to meet household expenses. Unfortunately, most operators have not received training specific on how to run a business. This deficiency is a critical constraint to access finance. Lacking assistance in this crucial area, businesses face an impediment to profitability and expansion.

INCREASING RURAL ACCESS TO FEED INPUTS – DEVELOPMENT OF RURAL STORAGE FACILITIES

Breed and feed are the two primary factors affecting farmer productivity and profitability. Farmers indicated in interviews that access to feed on a timely manner inhibits maximization of quality milk yields. At present, feed dealers trade in a variety of inputs for dairy, beef, poultry and pork. Inventory credit for dairy feed shows high promise due to the demand for dairy feed and the lower comparative return against other animal feed inputs since the return on dairy feed is relatively low to other inputs. Establishing alternative distribution systems – such as inventory credit – is a viable solution to mitigate inefficiencies but it requires external support to develop rural storage infrastructure.

TARGET AUDIENCE: FINANCIAL INSTITUTIONS

Specific financial products are detailed in the body of this report. Technical assistance in this area must be focused on supporting the development, promotion and implementation of suitable products and services working in partnership with financial institutions, target clientele, providers of business development services and agriculture extension experts.

At present, access to financial services by dairy value chain operators remains minimal and sporadic. Current linkages between producers and value chain actors are primarily grounded on payment relationships with a financial institution. Unfortunately, this relationship infrequently extends into savings or credit facilities. To expand existing relationships, technical assistance can be provided as follows:

1. **Payment systems and convenient cash access points** are inadequate and constrain credit worthiness although these facilities are highly feasible. New approaches that utilize electronic transfer systems between processors and bulkers for payment into producer accounts could easily increase the throughput of money circulating in the dairy sector, enabling higher volumes or the frequency of purchase and sales by all operators in the system. Distances travelled by farmers to access cash is

uneconomical yet the volume of cash in rural areas justifies the establishment of ATM access points or other forms of agency linkages with banks in strategic or high density locations. Technical assistance must focus on building these linkages and access points.

2. **Product development** is necessary to design suitable financial solutions throughout the dairy value chain, while reducing risk and maximizing the profitability of financial institutions. Technical assistance provided by firms specializing in agricultural finance have the skills necessary to provide this needed service, working closely with financial institutions, value chain participants, including business development providers and agriculture extension experts.
3. Assistance in **marketing** new agriculture products is essential to success – developing proper promotion strategies, associated campaigns, and the mix of appropriate distribution channels. Utilizing all available technical assistance providers is crucial to ensuring immediate impact and doing so requires coordination and collaboration.
4. **Guarantees**, though not always necessary, are sometimes required to offset risk and to properly incentivize financial institutions to enter a new product area. Technical assistance is necessary to structure guarantees, to design capacity building in new product areas and to monitor performance.

UNDERLYING PRINCIPLES OF COMPLIMENTARY TECHNICAL ASSISTANCE

Given varying factors and diverse requirements that affect productivity throughout the dairy value chain, technical assistance must be grounded on key fundamentals cutting across targeted interventions. Approaches require customization and a likeminded business orientation centered on the core business functions of profitability and cost containment, in addition to coordination with financial institutions, value chain participants, providers of business development services, agriculture extension experts and donor-funded programs.

This approach is new and it will require consensus among all actors and the coordination of available and deployed resources. Furthermore, providers of technical assistance must focus on their core competencies and skill sets to maximize the likelihood of success but coordinating closely with others working to advance the sector. In other words, KARF (and its partners in this endeavor, Inspired and the Financial Services Deepening Trust) must focus on financial services and Land O Lakes must focus on agriculture extension, recognizing both have the ability to add value in business development services given that each has specific proficiencies in this area. Therefore, ideas for action call for vetting through a provider with competencies in their specific area of specialization to maximize success and minimize waste. Implementation, in many instances, will require coordination of both parties and others.

Therefore, to improve the application of technical assistance and to upgrade the functionality of the dairy value chain, donors must promote the following orientations and best practices:

- All technical assistance and capacity building provided must be firmly anchored on achieving profitability for all actors operating in the value chain.
- If working with unprofitable value chain actors, support must be designed to move them to a path of sustainability by building customized business plans that outline clearly defined process and road maps, with time-lined benchmarks, to achieve long term operational and economic viability. Assistance must be contingent on this recommendation and failure to adhere to agreed upon plans and performance benchmarks must result in cancelation of partnership agreements. (Technical assistance providers must begin by understanding whether a business is profitable and able to ultimately achieve profitability.)
- Technical assistance must ensure that interventions and partnerships do not cannibalize private sector actors (subsidies must be reduced and eliminated overtime and costs must be rationalized within acceptable boundaries). Specific to cooperatives, technical assistance providers must fully understand how cooperatives function as businesses which includes comprehending balance sheets, income statements and cash flows so that costs can be aligned with economic realities and subsidies can be eliminated. Unrealistic costs and subsidies contribute to overall market inefficiencies in the dairy value chain.
- Technical assistance providers, at all levels, must possess the requisite skill sets and core competencies to adequately service value chain actors given their diverse needs and operational (geographic) realities.
- Technical assistance providers, in order to maximize results, must coordinate interventions and leverage unique skill sets through collaboration. One firm or a single advisory body, led by a donor(s), comprised of the leading technical assistance providers must coordinate support, ensuring the best possible application of resources.

ANNEX C: QUESTIONNAIRES

AI Service Providers

QUESTIONNAIRES FOR AGRI-BUSINESS

Explain background, request permission.

LOCATION:

BUSINESS NAME:

Date:

Contact:

VALUE CHAIN COMPONENT	ARTIFICIAL INSEMINATION PROVIDERS
------------------------------	--

QUALITATIVE COMPONENT

1. What is your source of materials and terms (cash/credit)?
2. Do you keep records of your business operations?
3. What is your access to finance? (Explain other sources of finance that you use?)
 Banks _____ Savings _____ Credit _____
 Supplier credit _____
 Other sources (specify) _____

If bank financing, how much did you borrow? _____ What did you borrow for? _____
 _____ . What's your interest rate? _____ For how long? _____. Would you borrow again? _____

4. Who are your 10 biggest clients/buyers?

	NAME	LOCATION	CONTACT
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

5. What equipment do you use? Do you own or rent it?
6. How do you transport your materials?

7. Do you rent or own the premises?
8. Please list the major problems/challenges you experience in your business?
9. Are you trained in Artificial Insemination services?
10. Could you double your business operations that you currently do? Yes, no? How or why?
11. Do you own transport? Specify.

QUANTITATIVE COMPONENT

1. How long have you been in business?
2. What are your peak sales period volumes? Please highlight in the box below.

MONTH	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Volume												

3. Cost and useful life of the equipment?

	Equipment	Cost	Useful Life	Source
1				
2				
3				
4				
5				

4. What is the cost of materials?

5. What are other costs you incur?

	ACTIVITY	COST PER MONTH
1	Salaries	
2	Security	
	Water	
	Electricity	
	Telephone/Communication	

6. What are your service charges?

	Service	Charge
1		
2		

3		
4		
5		
6		

7. What is the current volume of business (Artificial Insemination services) per month?
8. What is your average stock loss (%)?
9. How far is your furthest client?
10. Any other comments/observations?

Feed Dealers

QUESTIONNAIRES FOR AGRI-BUSINESS

Explain background, request permission.

LOCATION:

BUSINESS NAME:

Date:

Contact:

VALUE CHAIN COMPONENT	DAIRY FEEDS DEALERS
------------------------------	----------------------------

QUALITATIVE COMPONENT

1. What is your source of supplies and terms (cash/credit)? ____ Frequency of settlement ____
2. Do you keep records of your business operations?
3. What is your access to finance? (Explain other sources of finance that you use?)
 Banks _____ Savings _____ Credit _____
 Supplier credit _____
 Other sources (specify) _____

If bank financing, how much did you borrow? ____ What did you borrow for? ____ What's your interest rate? ____ For how long? ____ . Would you borrow again? ____

4. Who are your 10 biggest clients/buyers?

	Name	Location	Contact
1			
2			
3			
4			
5			
6			

7			
8			
9			
10			

5. What dairy product lines are you dealing in? What percentage of your business is in dairy? And do you deal in other product lines beyond dairy?
6. Do you rent or own the premises?
7. How do you transport your product(s)?
8. Please list the major problems/challenges you experience in your business?
9. Could you double your business operations that you currently do? Yes, no? How or why?

QUANTITATIVE COMPONENT

11. How long have you been in business?
12. Please list your 5 highest revenue generating products, their peak sales period volume in the box below. (kg/ltrs)

Product	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec

13. If you're renting, what is rent per month? ____ If own, what is the equivalent rental value per month? _____
14. What are the volumes per product per month, purchase and selling prices for your 5 major products for your most recent month?

	Product	Volume P.M.	C.P. / Unit	S.P. / Unit
1				
2				
3				
4				
5				

15. What are your transport costs?

16. What are your handling costs?

17. What other costs do you incur?

	Activity	Cost Per Month
1	Salaries	
2	Security	
3	Water	
4	Electricity	
5	Telephone/Communication	
6	Other	

18. What is your stock turnover rate?

19. Any other comments/observations?

Veterinary Service Providers

QUESTIONNAIRES FOR AGRI-BUSINESS

Explain background, request permission.

LOCATION:

BUSINESS NAME:

Date:

Contact:

VALUE CHAIN COMPONENT	VET-CARE AND DRUG DEALERS
-----------------------	---------------------------

QUALITATIVE COMPONENT

1. What is your source of your drugs and what are the terms (cash/credit)?
2. Do you keep records of your business operations?
3. What is your access to finance? (Explain other sources of finance that you use?)
 Banks _____ Savings _____ Credit _____
 Supplier credit _____
 Other sources (specify) _____

If bank financing, how much did you borrow? _____ What did you borrow for?
 _____. What's your interest rate? _____ For how long? _____. Would you
 borrow again? _____

4. Who are your 10 biggest clients/buyers?

	NAME	LOCATION	CONTACT
1			

2			
3			
4			
5			
6			
7			
8			
9			
10			

5. How do you transport your products purchased?
6. Do you rent or own the business premises? _____ If own what is the alternative rental value per month?
7. What are the major problems/challenges you experience in your business?
8. Could you double your business operations that you currently do? Yes, no? How or why?
9. Do you offer vet outreach services (specify)?
10. Do you own transport? Specify.

QUANTITATIVE COMPONENT

1. How long have you been in business?
2. What are your peak periods for sale of vet-care & drugs, please highlight in the box below.

MONTH	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
%												

3. What are the volumes per month, purchase and selling prices for your 10 major products for your most recent month?

	Product	Volume P.M.	C.P. / Unit	S.P. / Unit
1				
2				
3				
4				
5				
6				
7				
8				

9				
10				

4. What are your transport costs?

5. What equipment do you use? Cost and useful life of the equipment?

	Equipment	Cost	Useful Life	Source
1				
2				
3				
4				
5				

6. What are other costs you incur?

	ACTIVITY	COST PER MONTH
1	Salaries	
2	Security	
3	Water	
4	Electricity	
5	Telephone/Communication	

7. What is your stock turnover rate?

8. What are charges for other Services?

	SERVICES	Charge	Number per month
1	Vet-care		
2	Artificial insemination		
3	Other		

9. Any other comments/observations?

Producers

QUESTIONNAIRES FOR AGRI-BUSINESS

Explain background, request permission.

LOCATION:

BUSINESS NAME:

Date:

Contact:

VALUE CHAIN COMPONENT	PRODUCERS
------------------------------	------------------

QUALITATIVE COMPONENT

1. What is your source of supplies and terms (cash/credit)?
2. What is your feedings system?
3. Do you keep records of your farm operations?
4. What is your access to finance? (Explain other sources of finance that you use?)
Banks _____ Savings _____ Credit _____
Supplier credit _____
Other sources (specify) _____

If bank financing, how much did you borrow? _____ What did you borrow for? _____
_____. What's your interest rate? _____ For how long? _____. Would you borrow again? _____

5. How and where do you sell your milk?
6. What equipment do you use? Do you own or rent it?
7. Do you market all your milk? _____ What volume is not marketed? _____
8. How are you paid?
9. Are you a member of a producer cooperative or a producer association? Specify.
10. What vet services do you access, how frequently?
11. Who are your 5 biggest clients/buyers?

	Name	Location	Contact
1			
2			
3			
4			
5			

12. How do you transport your milk and inputs?
13. What are the major problems/challenges you experience in your farming operations?
14. Could you double your current milk production capacity? Yes, no. How or why?

QUANTITATIVE COMPONENT

1. What is the size of your land holding? Of that, what is the acreage used for dairy farming? Do you own it or lease it?
2. How long have you been keeping dairy cows?
3. How many cows do you have? A) In calf _____ B) Lactating_____ C) Other_____
4. What is the cost of a dairy cow? In calf _____ Not in calf _____
5. How many liters of milk per cow per day? A) Morning _____ B) Evening_____

6. What is the trend of production and price?

MONTH	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Liters per cow per day												
Avg. Price per liter												

7. How long is the lactation period?

MONTH	1	2	3	4	5	6	7	8	9	10	11	12
Liters per cow per day												

8. What is the calving cycle per cow and how many calvings before culling?
9. What is the most current selling price per liter?
10. What is the selling price of your progeny?
11. What is the selling price of the culled cow?

12. What are your feeding and other costs?

	Item	Quantity per day	Per month	Per year	Cost
1					
2					
3					
4					
5					
6					
7					
8					

13. What are your veterinary costs?

	Item	Quantity per application	Quantity per month	Cost	Frequency of application
A	Tick control				

B	De-worming				
C	Vaccinations & injections				
D	Other				

14. What is the cost of veterinary services?

	Service	Charge per application	Frequency	Cost per month/annum
1	Vet Care			
2	AI			
3	Other			

15. Where do you buy or get your inputs from?

16. Labor costs

	Activity	Costs per day	Cost per month
1			
2			
3			
4			
5			

6			
7			
8			

15. What are your infrastructure costs?

	Item	Cost	Lifetime
1	Housing		
2	Store		
3	Calf Pens		
4	Other		
5			
6			
7			

17. What are other costs you incur?

	Activity	Cost Per Month
1	Salaries	
2	Security	
3	Water	
4	Electricity	
5	Telephone/Communication	
6	Taxes	

18. What are your transport costs per month?

19. Any other comments/observations?

Transporters

QUESTIONNAIRES FOR AGRI-BUSINESS

Explain background, request permission.

LOCATION:

BUSINESS NAME:

Date:

Contact:

VALUE CHAIN COMPONENT	TRANSPORTERS/TRADERS
-----------------------	----------------------

QUALITATIVE COMPONENT

1. Do you buy milk or provide transport-hire services only?
2. If you buy milk, where do you buy from and on what terms (cash/credit)?
3. Do you keep records of your operations?
4. What is your access to finance? (Explain other sources of finance that you use?)
Banks _____ Savings _____ Credit _____
Supplier credit _____
Other sources (specify) _____

If bank financing, how much did you borrow? _____ What did you borrow for?
_____. What's your interest rate? _____ For how long? _____. Would you
borrow again? _____

5. How, to whom and where do you sell your milk?
6. What are your selling terms? (Cash/credit) _____ Frequency of settling? _____
7. Do you rent or own the transport you use?
8. To whom do you sell your milk?
9. What are your major problems/challenges in your business?
10. Could you double your business operations that you currently do? Yes, no? How
or why?
11. What is the longest transport trip?
12. Do you have difficulty accessing milk supplies? Specify.
13. Do you have difficulty marketing your milk? Specify.

QUANTITATIVE COMPONENT

1. How long have you been in the milk transport business?
2. What do you use for transport?
3. What is the current volume transported per trip?
4. If you transport with a vehicle, what is its carriage capacity?
5. What is the peak period of milk transport?

MONTH (30days)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Trips per day												
Trips per month												

6. What is current buying and selling price per liter? Buying_____ Selling_____
7. If hire services, what is the charge per liter ____ per trip____?
8. What is your average spoilage per trip/per month? Liters or percentage?
9. What are other costs do you incur?

	Item	Cost Per Trip	Cost Per Month	Cost Per Annum
1	Rent or hire charge of vehicle			
2	Fuel			
3	MV Taxes			
4	Labor			
5	Security/Parking fee			
6	Cleaning charges			
7	Insurance			
8	Service and maintenance			
9	Telephone/Communication			
10	License			
11	Local Taxes			
12	Other			

10. What is the cost and useful life of the transport and equipment?

	Item	Capacity	Cost	Useful Life	Source

1					
2					
3					
4					
5					

11. Any other comments/observations?

Bulkers/Traders

QUESTIONNAIRES FOR AGRI-BUSINESS

Explain background, request permission.

LOCATION:

BUSINESS NAME:

VALUE CHAIN COMPONENT	BULKERS/TRADERS
------------------------------	------------------------

QUALITATIVE COMPONENT

1. How do you source your supplies and on what terms (cash/credit)?
2. Do you keep records of your operations?
3. What is your access to finance? (Explain other sources of finance that you use?)
 Banks _____ Savings _____ Credit _____
 Supplier credit _____
 Other sources (specify) _____

If bank financing? How much did you borrow? What did you borrow for? What's your interest rate? For how long? Would you borrow again?

4. How, to whom and where do you sell your milk?
5. What are your selling terms? (Cash/credit)
6. Do you handle any other milk products? Specify.
7. Do you deal in other products? If yes, specify _____
8. Do you rent or own a) business premises? ____ b) transport _____
9. Who buys your milk?
10. What are your major problems/challenges in your business?
11. Could you double your business operations that you currently do? Yes, no? How or why?
12. Do you have difficulty accessing milk supplies? Specify.
13. Do you have difficulty marketing your milk? Specify.

QUANTITATIVE COMPONENT

1. How long have you been in business?
2. What is the peak period of milk purchase and sales?

MONTH (30days)	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Avg. per day												
Avg. volume per month												
Avg. Price per liter												

3. What is the current quantity of milk purchased per day?
4. What is current buying and selling price per liter? Buying_____ Selling_____
5. What is your average spoilage per month? Liters or percentage?
6. What are your transport costs per liter? Inward_____ Outward_____
7. If you own the building, what would be the rent value per month?
8. What are other costs you incur?

	ACTIVITY	COST PER MONTH
1	Rent	
2	Salaries	
3	Labor	
4	Security	
5	Water	
6	Electricity	
7	Transport (general)	
8	Service and maintenance	
9	Telephone/Communication	
10	License	
11	Taxes	
	Other	

9. Cost and useful life of the equipment & transport?

	Item	Capacity	Cost	Useful Life	Source
1					
2					
3					
4					
5					
6					
7					
8					

ANNEX D ENUMERATOR WORKPLAN

E=Eldard Ssebbaale; N=Nafula Awori; A=Asaph Besigye; R&MR=Rich Pelrine & Mark Rostal; Enu=Enumerator

15-Jun	mon	Enumerator Orientation						
16-Jun	tue	Enumerator Orientation						
		Kabete-4 Enu		Nyeri-4 Enu	Nakuru-2 Enu		Eldoret-4 Enu	
		E	N	E	A	N	N R&MR	
17-Jun	wed	E	N		A		Orientation	
18-Jun	thu	E	N		A		R&MR	
19-Jun	fri	E	N		A		R&MR	
20-Jun	sat	E	N		A		R&MR	
21-Jun	sun	E			Enumerators Un-Supervised		N	
22-Jun	mon	E			Enumerators Un-Supervised		N	
23-Jun	tue	E			Enumerators Un-Supervised		N	
24-Jun	wed			E		N		
25-Jun	thu			E		N		
26-Jun	fri			E		N		
27-Jun	sat			E		N		
28-Jun	sun			E		N		
29-Jun	mon			E		N		
30-Jun	tue			E		N		
1-Jul	wed			E		N		
2-Jul	thu			E		N		
3-Jul	fri			E		N		
4-Jul	sat			E		N		

Location	Strategy
Kabete	Eldard and Nafula will combine enumerators from Kabete and Nyeri forming a team of four and finish data collection in seven days.
Nyeri	Eldard will shift with the four enumerators after completing Kabete and complete Nyeri start to finish.
Nakuru	Asaph will begin in Nakuru with two of the ABS enumerators (reputed to be good researchers). Upon Asaph's departure the enumerators will work unsupervised for three days and then be joined by Nafula (as a supervisor) to see the work through to the end.
Eldoret	Eldoret is complicated. During orientation for the other three sets of enumerators, Mark and Rich will recruit four enumerators (from the AI people recommended by Kevin). From there Mark and Rich will move to Eldoret and give a one day orientation. Following the one day, Mark and Rich will lead separate teams for three days. Nafula will take over these teams on day for and complete the work with an additional three days.

ANNEX E

PRESENTATION TO FINANCIAL INSTITUTIONS



KENYA ACCESS TO RURAL FINANCE

Dairy Value Chain Financing Research Findings

Rich Pelrine, Team Leader, INSPIRED International
Asaph Besigye, INSPIRED International
Eldard Ssebbaale, INSPIRED International
Nafula Awori, INSPIRED International

16 July 2009



Objective

- Carefully collect and analyze data from all value chain actors in four major milk sheds:
 - Relationships of buyers and sellers
 - Revenues, costs, volumes, margins and returns of a statistically significant sample
 - Seasonality of cash flows
 - Low risk financing opportunities
- Recommend sound financing strategies for Kenya's financial institutions
 - Savings, credit, leasing, structured trade and hybrid strategies

Sampling Strategy

- Cover Kabete, Nyeri, Nakuru and Eldoret Milk Sheds using locally recruited dairy professionals as enumerators.
- Anchor all data collection to **dairy producers** using the following sample size

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{(1 - \% \text{ conf})^2} = \frac{(1.96)^2 \cdot 0.5 \cdot 0.5}{(1-93\%)^2} = 196$$

Where: **n** is sample size

Z is the mass within 2 standard deviations of the mean in a normal distribution

p is the degree of variability in the sample (0.5 is maximum and lowest risk)

1-% conf is the acceptable error (93 of 100 interviews should be accurate)

Actual sample used was 230 farmers; actual confidence was 94 out of 100 interviews.

Sampling Coverage

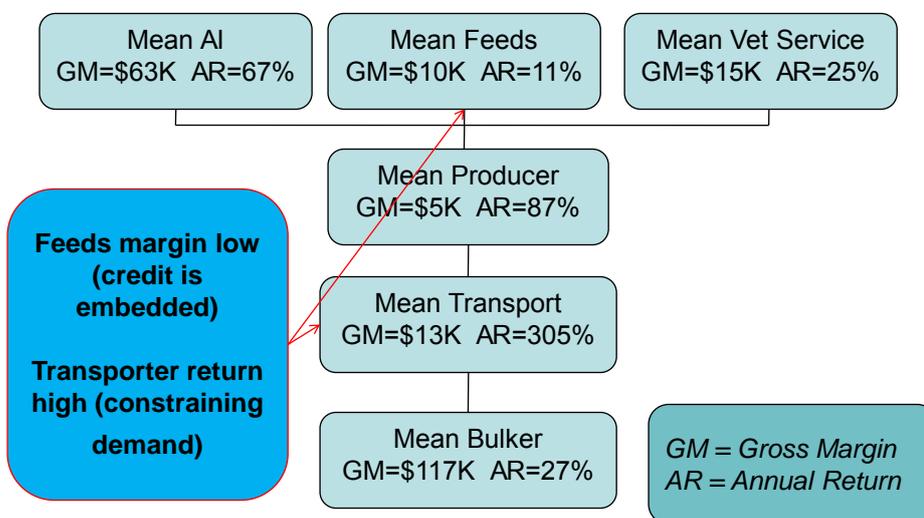
Location→ Category↓	Kabete	Nyeri	Nakuru	Eldoret	Total
AI Providers	16	18	14	11	59
Vet Services	22	22	26	4	74
Feed Supply	15	14	20	5	54
Producers	48	52	77	45	222
Bulkers	16	19	21	6	62
Transporters	16	17	20	8	61
Total	133	142	178	79	532

- 590 interviews actually conducted with 58 excluded by quality control.

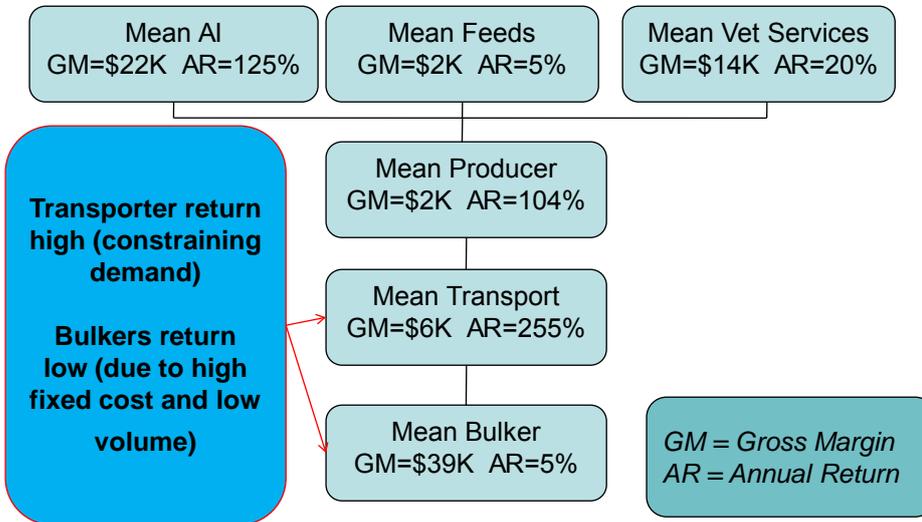
Overview of Value Chain Function

- Before considering what products show promise for financing value chain actors, an overall analysis of profitability of each value chain segment and the buying and selling relationships between segments must be done.
 - If a buyer is not profitable, increasing his/her supplier's capacity to supply will be disastrous.
- The following four slides give an overview of actors' average profitability within the four milk sheds.

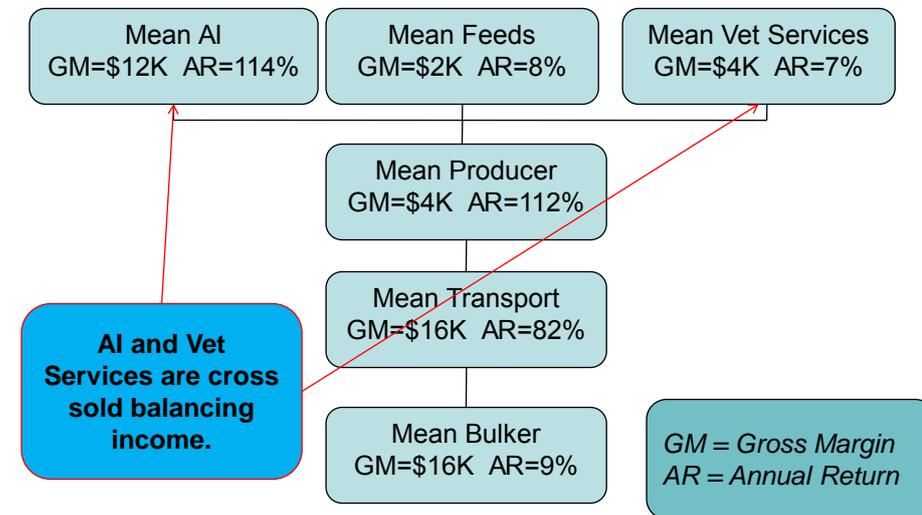
Kabete Milk Shed Value Chain



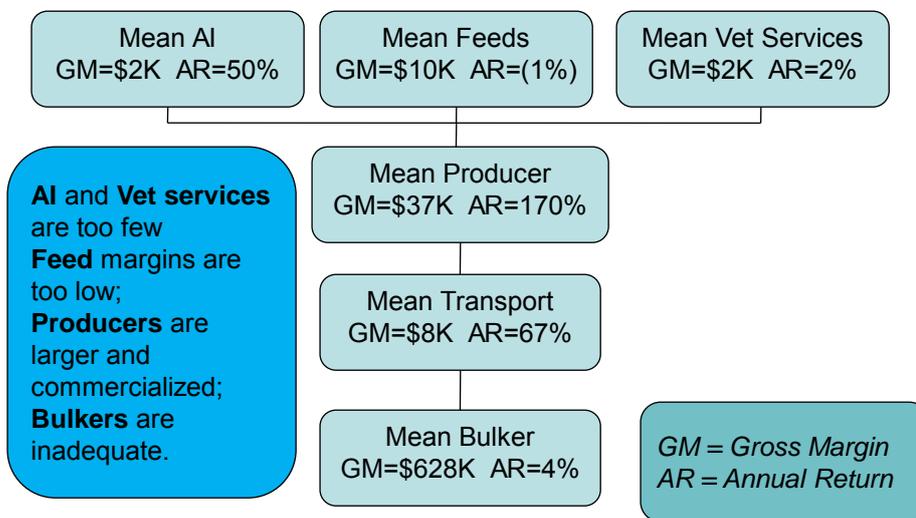
Nyeri Milk Shed Value Chain



Nakuru Milk Shed Value Chain



Eldoret Milk Shed Value Chain



Introduction Summary

- All actors must be adequately profitable for a value chain to function optimally
 - This is not the case in the four milk shed studies (particularly at the bulker/trader level).
 - Eldoret is the worst case; producers are commercialized but input supply and off-take marketing are not adequately commercialized.
- Milk sheds are not homogeneous
 - Neither within milk sheds nor across milk sheds are production systems standardized.
 - Financing strategies must emphasize those aspects that are broadly shared and avoid aspects particular to a given geography.

Specific Observations: Producers

		Large Commercial					
		Small Commercial					
All Kabete Nyeri Nakuru Eldoret		n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l
		All	98	45%	\$ 3,310	127%	7.94
Kabete	25	54%	\$ 2,764	108%	7.60	9.75	
Nyeri	32	63%	\$ 2,817	138%	4.81	7.41	
Nakuru	31	39%	\$ 3,372	128%	8.21	8.01	
Eldoret	10	24%	\$ 6,116	133%	18.70	8.36	
		Subsistence					
All Kabete Nyeri Nakuru Eldoret		n	% of Total	Avg AM	Avg AR	Avg # Cows	Feed Cost/l
		All	82	38%	\$ 129	0%	7.58
Kabete	16	35%	\$ (266)	-3%	5.00	19.96	
Nyeri	17	33%	\$ (95)	-3%	6.38	12.75	
Nakuru	44	56%	\$ 467	6%	6.32	14.39	
Eldoret	5	12%	\$ 689	-6%	23.80	10.10	

Specific Observations: Private Bulklers

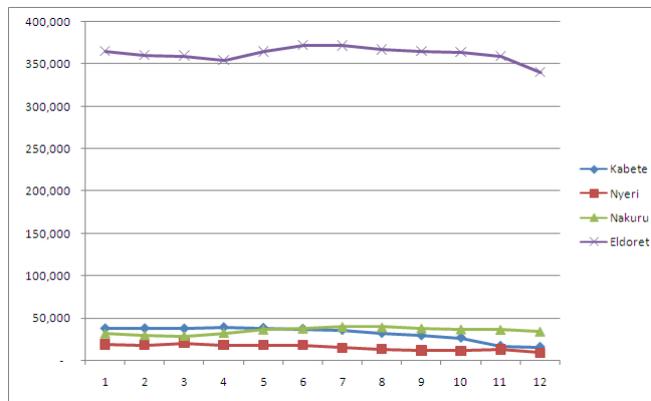
Kabete		Nyeri		Nakuru		Eldoret	
n	# > Median	n	# > Median	n	# > Median	n	# > Median
11		5		11		5	3
Median	26%	Median	15%	Median	3%	Median AR & AM	921,943
Max A	211%	Max A	17%	Max A	37%	Max AR & AM	145,533,900

Values in Shillings

Specific Observations: Producer Savings Capacity

	Large Commercial	Small Commercial	Subsistence
N	102,304	270,968	226,728
Avg AM	3,495,987 /=	254,855 /=	9,916 /=
Potential Savings	357,653,983,007 /=	69,057,409,376 /=	2,248,153,216 /=
USD	\$4,644,856,922	\$896,849,472	\$29,196,795

Specific Observations: Producer Cash Flows



Cash Flows Drop Off Dramatically Beginning in October; Nakuru and Eldoret also Experience a Dip in March

General Field Observations

- Increased TA is relevant to move MSMEs to commercial levels and enable financing.
 - Smallholders need cash planning assistance
 - Other MSMEs need business training
- Seasonality for all actors creates a need for income smoothing and opportunities for savings development
- Payment systems and convenient cash access points are inadequate and constrain creditworthiness
- Access to appropriately defined financial services, outside of current accounts, is minimal and sporadic

General Field Observations—continued

- Eldoret, and to a large degree Nakuru, are unique cases due largely to post election violence
 - Quality livestock were killed (setting back eight years of breeding programs)
 - Input sales were disorganized through destruction and reduced demand
 - Based on interviews, output sales were also slowed as a result of reduced quality dairy herd and reduced quality input supply.
- Donor support is underway to revitalize the dairy industry and offers opportunities to complementary financial services.

Overview of Financial Services Recommendations

- Savings capacity is huge, untapped and capable of underpinning greater production and productivity.
 - Conventional savings needs bolstering
 - Targeted savings for income smoothing needs development
 - Savings-cum-credit products for improving dairy herds should be developed
- Payment systems and cash access points are woefully inadequate and highly feasible.
- Leasing/Asset finance has high potential
 - Low cost value adding equipment is highly demanded
 - Transporters are not competing
 - Outreach for MSME input suppliers can be greatly enhanced with small assets such as motorcycles and small 4X4s

Specific Product Recommendations

- Inventory credit for specialized, high volume feed dealers shows high promise
 - Supply and demand are well understood
 - All actors expressed willingness
- Roll out of existing conventional savings and credit products remains relevant.
 - Microfinance for small service providers such as AI, milk transporters, etc.

Product Specifications

Product	Income Smoothing Structured Savings
Description	Regular contract savings deducted from milk deliveries from January to September payable with interest in four fixed value withdrawals (October, November, December, January). This can be targeted to specific expenses and disbursed in kind.
Potential Market	Four milk sheds, commercialized actors (300,000 potential clients).
Value	KES 2000 minimum monthly per saver (upwards of KES 600M)
Timing	Beginning January 2010
Risk/Mitigation	Early withdrawal/interest penalty
Complementary TA	Support for product development and marketing

Product Specifications

Product	Inventory Credit for Rural Feed Supply
Description	Line of credit, secured by dairy feed inventory, settled through the lender when feed is sold and replenished as needed.
Potential Market	Nyeri, Nakuru and Eldoret milk sheds, ten-1000 MT warehouses each for a pilot (30 per milk shed potential).
Value	KES 12M per warehouse monthly (KES 360M monthly)
Timing	Beginning as soon as possible
Risk/Mitigation	Inventory diverted/collateral management; loss of inventory/insurance and guarantees; price risk/fund 75% of inventory value
Complementary TA	Support for product development, marketing, guarantees, subsidization from donors for infrastructure.

Product Specifications

Product	Savings-Cum-Credit for Herd Improvement
Description	Monthly contract savings for 50% of the value of improved breed cow(s) and 100% of the value 4 months dairy feed. Savings topped up with a complementary loan when savings target is achieved.
Potential Market	Four milk sheds, commercialized actors (350,000 potential clients).
Value	Minimum KES 9000 monthly per saver for maximum 10 months
Timing	Beginning January 2010;
Risk/Mitigation	Diversion of loan/disburse to breeder; lender asymmetric information/partner with cattle specialists; willful default/attach the cow and other assets; mortality or theft/require insurance and branding
Complementary TA	Support for product development, marketing, guarantees

Product Specifications

Product	Micro Lease Financing
Description	Provision of assets such as processing equipment, motorcycles, small 4X4s, etc. secured by the asset itself.
Potential Market	Four milk sheds among commercialized and privates sector dairy actors—minimum 300 leases per milk shed
Value	KES 300,000 to 800,000 per borrower
Timing	Beginning as soon as possible
Risk/Mitigation	Default/recovery of asset; loss of asset/insurance and guarantees; poor quality assets/partner with reputable vendors; assets poorly maintained/include maintenance of asset by vendor in lease agreement
Complementary TA	Support for product development, marketing, guarantees

Product Specifications

Product	Structured Settlement—Lease Financing
Description	Provision of large assets such as large processing equipment, refrigerated 4X4 medium trucks secured by the asset itself with payments settled against milk deliveries.
Potential Market	Four milk sheds—minimum 20 leases per milk shed
Value	KES 1.5M to 4.5M per borrower
Timing	Beginning as soon as possible
Risk/Mitigation	Default/payment through lender and recovery of asset; loss of asset/insurance and guarantees; poor quality assets/partner with reputable vendors; assets poorly maintained/include maintenance of asset by vendor in lease agreement
Complementary TA	Support for product development, marketing, guarantees

Next Steps

- KARF and other donor funded partners are ready, willing and able to support the development of these and similar products.
- We await your expressions of interest.

ANNEX F

INSPIRED'S TERMS OF REFERENCE

Terms of Reference

Identifying Effective Value Chain Financing Opportunities for Kenya's Dairy Sector

7 May 2009

Background:

In November 2008, USAID/KARF (KARF) engaged the services of INSPIRED International (INSPIRED) to establish a structured trade finance facility enabling grain trade between Kenyan maize millers (as buyers) and Ugandan farmer organizations (as suppliers) with financing through a bank with operations in both countries. In the course of this consultancy, KARF became familiar with INSPIRED's core competencies in value chain analysis for financing agribusiness and lender financial product development for agribusiness. INSPIRED has delivered extensive training and product development consultancy for analyzing and financing agribusiness in both Rwanda and Uganda, as well as, consultancy supporting KARF in Kenya. KARF requested that INSPIRED train some of KARF's partner financial institutions in an effort to help them to engage in agribusiness finance more meaningfully. This training took place in March 2009 and was very well received by the banking and agribusiness communities.

On the basis of the interest generated, KARF in collaboration with Land 'O Lakes (LOL), another USAID implementing partner, requested that INSPIRED return to Kenya to conduct a value chain analysis targeting the identification of financing strategies for dairy sector businesses. Financing of dairy is considered a critical programmatic objective of both KARF and LOL. Further several financial institutions had expressed interest in pursuing the financing of this value chain given its overall importance to the Kenyan and regional economies, its reliance on tangible fixed assets and its regular cash flows.

Scope of Work:

The following bullets outline specifically the tasks required to realize the goal of mapping the value chain for dairy from a financier's perspective in order to drive out financial products that will facilitate better functioning of the dairy value chain more broadly. Absent from the tasks are issues that are not specifically related the business and financing aspects of dairy production, processing and marketing. The critical tasks for purposes of this analysis will be:

- Review and reduce existing documented information to that information appropriate for supporting the case for financial services provision;

- Survey key financial sector actors to determine their qualified interest in terms of preferences for savings products, loan products, lease products, etc.;
- Survey key risk management service providers to determine precisely what commercially available or publically funded agricultural risk management services exist and at what cost including weather index insurance, price insurance, futures, options, etc.;
- Survey dairy agribusiness business actors at all levels of the value chain, understand their goals, opportunities and constraints;
- Analyze all of the data generated on qualified supply while at the same time disaggregating demand data to determine low risk financing opportunities that will facilitate the overall function of the value chain, and matching the supply, risk management and demand; and
- Recommend high impact, high return, low risk financing strategies that will facilitate the overall functioning of the value chain using a largely private sector (and thus sustainable) strategy based on costs, risks and benefits.

Sequencing and Time Required for the Specific Tasks:

The following table details the tasks, the indicative dates these tasks will be realized and the Level of Effort required for each task. Travel schedules for the consultants are also included.

Specific Task	Indicative Dates	Person Days		
		Ssebbaale	Besigye	Pelrine
Review of extensive existing documentation on the dairy value chain. <ul style="list-style-type: none"> • This will give the consultants a general sense of the market linkages between actors, the gross margins earned, the volumes of transactions and an overview of who the actors are. 	June 5-6		2	2
Travel from Kampala to Nairobi	June 7		0.5	0.5
General meeting with LOL, DAI and other stakeholders to discuss any last minute changes to the Terms of Reference, finalize practical/actionable research objectives, select five representatives, commercialized milk sheds from LOL's 14 and select LOL staff and consultants to serve as enumerators for data collection.	June 8		1	1

<p>Initial one-on-one meetings with existing and potential financiers to specify level of interest in financing dairy.</p> <ul style="list-style-type: none"> This will give the consultants a prima facie perspective on the degree to which particular financiers are willing and able to engage and how (traditional lending, saving products, term finance, leasing, structured trade, payment systems, etc.). 	June 9-10		2	2
<p>Initial meetings with risk managers (insurers, guarantors, collateral managers, etc.) specified by LOL and DAI.</p> <ul style="list-style-type: none"> This will provide the consultants a broad understanding of the mechanisms available to mitigate or lay off financing risks. 	June 11-12		2	2
Travel from Kampala to Nairobi for Ssebbaale	June 12	0.5		
<p>Development of field data questionnaires and specification of data collection strategy/logistics.</p> <ul style="list-style-type: none"> This will include developing the final questionnaires, the plan for travel; and the plan for training and use of enumerators. 	June 13-14	2	2	2
Group orientation of all 10 to 15 enumerators providing a broad overview of the objectives, the tools and the use of the tools.	June 15	1	1	1
<p>Field based orientation of two to three LOL enumerators in 5 milk-sheds and supervision of initial field data collection and processing.</p> <ul style="list-style-type: none"> Five out of 14 milk-sheds will be analyzed and those five will be chosen to be the most representative of the entire 14. LOL can include enumerators (their staff, consultants, affiliates, etc.) from other milk sheds to attend this data collection exercise. Approximately three person days will be spent in each of the five milk sheds. 	June 16-21	6	6	6
Travel from Nairobi to Kampala	June 22	0.5	0.5	0.5

<p>Field data collection by enumerators for two weeks with telecommunication follow up by INSPIRED.</p> <ul style="list-style-type: none"> • Rather than spending the time in the field after orienting enumerators, INSPIRED proposes to follow up by telephone and email to supervise the data collection after the enumerators are trained. This is meant to save cost while delivering a reliable product. 	<p>June 22— July 5</p>	<p>1</p>	<p>1</p>	<p>1</p>
<p>Travel from Kampala to Nairobi</p>	<p>July 5</p>	<p>0.5</p>	<p>0.5</p>	<p>0.5</p>
<p>Review of data collected with field teams</p> <ul style="list-style-type: none"> • Any ambiguities in the data will be clarified; • Any missing data will be identified and a strategy for collecting it developed. 	<p>July 6</p>	<p>1</p>	<p>1</p>	<p>1</p>
<p>Data Analysis and initial financial product and strategy recommendations on a milk-shed by milk-shed basis.</p> <ul style="list-style-type: none"> • Data collected from the milk-sheds will be analyzed carefully by INSPIRED’s team. The highest profit, lowest risk, underfinanced value chain segments will be identified and the transactional relationships between and among segments will be defined. This data will be considered concurrently with risk mitigation and management instruments available and with the broad consideration of what financiers are interested in pursuing. 	<p>July 7-11</p>	<p>5</p>	<p>5</p>	<p>5</p>
<p>General presentation of findings and recommendations to broad stakeholders.</p> <ul style="list-style-type: none"> • This general presentation is meant for non-financial specialists with an interest but not necessarily the technical qualification in the results of this survey. 	<p>July 13</p>	<p>1</p>	<p>1</p>	<p>1</p>
<p>Specific presentation to an audience of prequalified, interested lenders.</p> <ul style="list-style-type: none"> • This presentation would be for an audience of 	<p>July 14</p>	<p>1</p>	<p>1</p>	<p>1</p>

lenders and enable them to ask for clarifications in full detail. It is further the actual <i>sales pitch</i> for the financial products.				
Draft Final Report	July 15-16	2	2	2
Travel from Nairobi to Kampala	July 17	0.5	0.5	0.5
Totals		22	27	27
<p>Product Development with particular lenders.</p> <ul style="list-style-type: none"> Time required will be dictated by what in particular each financier is interested in and to what degree they require or request consulting support to achieve development and roll out of the product. 		To Be Handled Under a Separate Contract Depending on the Interests and Availability of Banking Partners		

Deliverables/Illustrative Outputs:

Deliverables for this Terms of Reference will be:

- A brief Summary of Documents Reviewed;
- Field Data Questionnaires and a written Data Collection Strategy;
- Presentations of the summary recommendations in PowerPoint for both the broad stakeholder audience and the financier audience;
- Summaries of potential financial products and strategies with a relative ranking of the same in terms of feasibility and lender interest;
 - Illustratively these may include:
 - Savings products for inputs and veterinary services;
 - Warehouse receipts/inventory credit products for raw and processed milk;
 - Electronic payment systems for milk delivery and lines of credit secured by electronic records;
 - Lease products for milk storage, transport and processing equipment; and
 - Structured trade products whereby credit can be recovered from buyers.
- A final deliverable including hard copies of spreadsheets clearly indicating the value, volumes, timing, gross margins, returns and annualized returns on a milk shed-by-milk shed basis. Accompanying these spreadsheets will be text reviewing the relative opportunity for a financier and defining the risks and how those risks can be managed. Annexed to the deliverable will be all data collected from the field surveys.

Timing:

INSPIRED can commit to begin this work by 8 June and complete it by 17 July (considering two weeks of data collection by field enumerators in the middle of the assignment).