RESEARCH PROGRAM ON Livestock and Fish

Brief 8

More meat, milk and fish by and for the poor *January 2014*

Milk production, utilization and marketing channels in Tanga and Morogoro regions of Tanzania

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A study was conducted in Tanzania to provide a baseline understanding of the dairy systems in Tanzania. The preliminary results were to inform the envisioned research for development project targeted at improving rural based livelihoods through milk.

Study sites

The surveys were conducted in Morogoro and Tanga Regions of Tanzania. The study sites (districts) were selected to represent a spectrum of cattle production and market systems, the aim being to explore the potential to extend commercial dairying to marginalised areas.

The sites range from extensive/pre-commercial rural producers who predominantly own Zebu cattle and sell milk to rural consumers (R-to-R) to relatively more intensive/more commercial rural producers who have relatively more improved dairy genes in their herds and predominantly sell milk to urban consumers (R-to-U), usually via bulk traders (Table 1).

These strata also represent a gradient of increasing intensification. Using replicate regions (Morogoro and Tanga), two districts were selected in each region, one R-to-R and the other R-to-U.

Data collection

A baseline survey was conducted in October 2012-February 2013 to establish the situation on the ground and build a platform for project evaluation and measurement of project impact.

This brief focuses on milk yield, milk utilization, available marketing channels and challenges and opportunities of the smallholder dairy in Morogoro and Tanga regions of Tanzania.

Dairy herd composition and performance

The households in Lushoto owned on average one cow per household of either breed (Table 2). The remaining three districts had dairy households owning more local cows (11-18) compared to the improved breed.

Table 1: Study sites in Morogoro and Tanga regions

Key: R-to-R: Rural production to rural consumption (pre-commercial); R-to-U: Rural production to urban consumption (more commercial)

Region	District	Market access classification	Dominant production system
Morogoro	Kilosa	R-to-R	Extensive/agro-pastoral (Zebu)
	Mvomero	R-to-U	Extensive/agro-pastoral (Zebu) with significant semi-intensive and intensive (improved)
Tanga	Handeni	R-to-R	Extensive/agro-pastoral and extensive/sedentary (all Zebu)
	Lushoto	R-to-U	Extensive/sedentary (Zebu) with significant semi-intensive and intensive (improved)

Table 2: Average number of cows owned by breed

District	Improved breeds			Local breeds		
	N	Mean	Median	N	Mean	Median
Lushoto	146	0.9	1.0	21	1.1	1.0
Handeni	43	2.5	1.0	139	17.8	10.0
Mvomero	12	1.2	0.5	231	11.4	5.0
Kilosa	13	14.2	3.0	92	17.6	10.0
Total	**214**	**2.0**	**1.0**	**483**	**14.0**	**7.0**

Looking at the composition of dairy herd (Table 3), the share of cows in the herd dominates by over 30% followed by the potential replacements (heifers, female calves and pre-weaning females). This signifies the role of dairy among the smallholder farmers in Tanga and Morogoro regions, but sparking interest is the impact of dairy cows' performance on the production end of the dairy value chain.

This compounded with improved animal husbandry practices and strategic feed interventions especially in the dry season will not only ameliorate production but also sustain the dairying enterprise.

Household milk utilization

We now look at how milk is apportioned at household level and to do this we look at the previous day's milk production. This allows a 24 hour recall window to ensure reporting of as accurate information as possible.

Most of the milk produced in Lushoto (60%) was sold out as either fresh/fermented milk while in the other three districts the primary use was family consumption in either fresh or fermented form (Table 5). The surplus milk was sold through various market outlets as discussed below.

Table 3: Proportion of cows in dairy herd

Animal type	Lushoto		Mvomero		Handeni		Kilosa	
	cattle owned	%	cattle owned	%	cattle owned	%	cattle owned	%
Bulls	20	5.1	454	6.8	1046	13.7	378	7.0
Castrated adult	2	0.5	166	2.5	168	2.2	330	6.1
Immature males	41	10.4	756	11.2	637	8.4	465	8.7
Cows	158	40.0	2585	38.5	2657	34.9	1801	33.5
Heifers	95	24.1	1287	19.1	1654	21.7	1080	20.1
Female calves	41	10.4	526	7.8	509	6.7	478	8.9
Male calves	27	6.8	368	5.5	409	5.4	363	6.8
Pre-weaning male	7	1.8	290	4.3	272	3.6	260	4.8
Pre-weaning female	4	1.0	290	4.3	260	3.4	219	4.1
Total	**395**	**100**	**6722**	**100**	**7612**	**100**	**5374**	**100**

Looking at the dairy cow performance per lactation, the improved breed performed at 5 litres/day while the local breed produced 1.5 litres/day (Table 4).

The daily milk performance is evidence that the breeds do not fully exhaust their genetic potential. These results also demonstrate the need to improve the genetic potential not only of the predominant breed of cow commonly reared by the households in the study districts, but also the crosses available.

Table 4: Milk production per cow (by breed) per day per lactation

District	Improved breeds			Local breeds		
	N	Mean	Median	N	Mean	Median
Lushoto	38	4.2	3.0	4	2.4	1.8
Handeni	23	5.9	5.5	99	1.5	1.0
Mvomero	6	4.7	4.0	174	1.3	1.0
Kilosa	7	6.3	5.5	84	1.7	1.0
Total	**74**	**5.1**	**4.0**	**361**	**1.5**	**1.0**

Milk marketing and sales

Marketing channels for surplus milk was another downside with the smallholder farmers who had their milk sold directly to individual consumers or private milk traders (Figure 1).

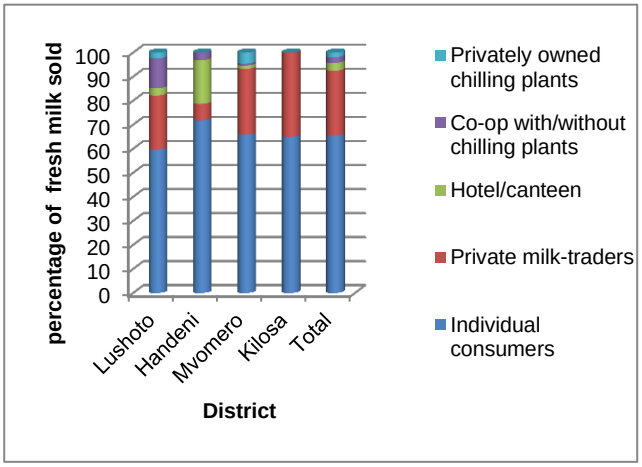
Local restaurants are the second major outlet in Handeni. Access to main urban markets could be facilitated through the cold chain, which in this case receives less than 20% of the surplus milk. This means only a small amount of milk reaches the urban population perhaps explaining the low per capita milk consumption in Tanzania (Njombe et al., 2011).

Table 5: Household milk utilization: Proportion of total milk sold, consumed and given to calves

District	Cow keepers (n)	Produced (mean)	% Consumed (fresh/ fermented)	% Sold (fresh/ fermented)	% Given to calves
Lushoto	114	2.4	37.0	60.0	3.0
Handeni	235	4.5	57.3	42.7	0.0
Mvomero	168	5.6	82.6	17.1	0.3
Kilosa	99	13.7	61.4	38.3	0.3
Total	**616**	**5.9**	**63.9**	**35.7**	**0.4**

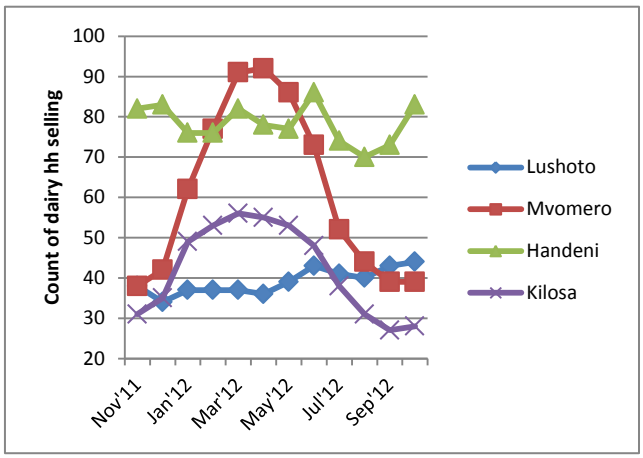
These marketing challenges were also reported during Focus Group Discussions (FGDs) conducted prior to the household survey. This was partly attributed to the locals' low or non-milk consumption culture and partly due to the lack of organized marketing institutions e.g cooperatives, through which milk could be bulked and marketed.

Figure 1: Milk marketing outlets used by dairy households



Zeroing on households selling milk, the number increased between January-May 2012 in Mvomero and Kilosa. This increase in number of households corresponds to the rainfall pattern in the two districts (Sikira et al. 2013) and hence feed availability.

Figure 2: Annual fresh milk sale pattern



The pattern of households selling milk in Lushoto and Handeni did not vary much over the year, except for a slight increase from August.

Dry season and low feed availability in the extensive system necessitated seasonal movement/migration (temporary transhumance system) of animals to areas where there is pasture and water. This in part affected not only milk yield but also consequent number of households selling milk. This explains the variation in the number of households selling milk throughout the year especially in the extensive dairy production systems.

Looking at the returns made from the milk sales, the local restaurants offered the best price per litre of milk (USD 0.54) in Lushoto and Handeni while individual milk buyers offered the highest price per litre of milk (USD 0.48) in Mvomero and Kilosa. Private milk traders had the lowest offer in the 4 districts. This corresponds to information gathered during the FGDs.

Challenges and opportunities

The average land acreage held by 50% of the smallholder farmers interviewed ranged between 5-8 acres in Kilosa, Handeni and Mvomero. This is adequate to support sufficient reserve for livestock fodder and pastures. However, as noted in the farmer group discussions; lack of knowledge on livestock fodder, pasture improvement and techniques on feed conservation are hindrances to improved production that when addressed will plow the seasonal feed availability and milk yield variations.

The average cattle kept range between 29-45 total livestock units (TLU) in Handeni, Mvomero and Kilosa. Majority of these cattle are the indigenous Zebu. Majority of the milk produced (70%) is from the indigenous breeds and only 30% is produced by the commercial dairy breeds.

The annual milk production performance remains low between 311 and 1160 litres per annum by improved and local breeds respectively.

Availability of artificial insemination is contributory to low genetic improvement in the project sites. Only 9% of the smallholder farmers reported availability of AI services and only as few as 2% reported use of the very services. Improvement of dairy breeds genetic will raise the production potential to desired levels so as to elevate milk production per cow and hence realize marketable milk volumes and enable farmers to earn premium prices.

Conclusions

The 5 litres/cow/lactation and 1.5 litres/cow/lactation for improved and local breeds respectively do not express the full genetic potential of dairy cattle in smallholder households of Tanga and Morogoro. Through improved breeding and strategic intervention measures to improve animal husbandry and feeding, the dairy cow's performance would have a significant improvement.

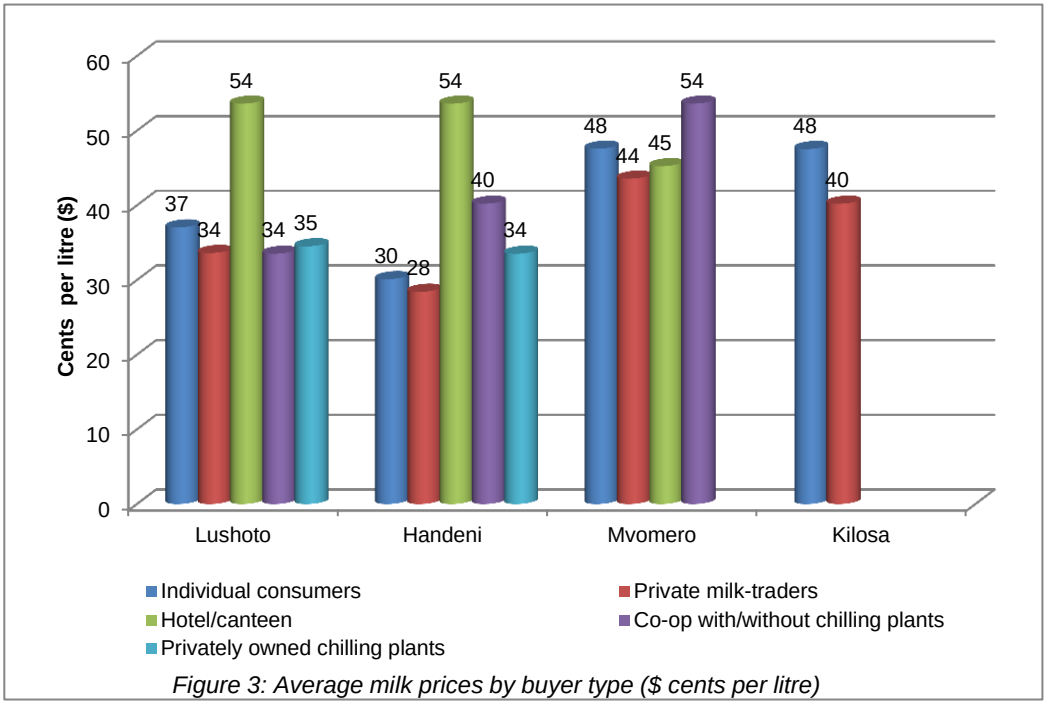


Figure 3: Average milk prices by buyer type ($ cents per litre)

Campaigning for milk marketing institutions, which are largely absent in the study areas, and promotion of local consumption of milk will impact both on household economy as well as household nutrition. Reviewing value addition and quality control of locally value added milk products will also increase household options.

To support the production end of this value chain would also require high value forage crops, advancing fodder preservation for the dry seasons and promoting home-made feed rations.

References

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