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Estimates of Cattle Mortality Rates in Morogoro and Tanga Regions in Tanzania

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Study sites

The benchmark survey was conducted in Morogoro and Tanga Regions of Tanzania. The specific 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. 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. The selected districts are: a) R-to-R: Kilosa and Handeni; b) R-to-U: Mvomero and Lushoto.

Table 1. Study sites in Morogoro and Tanga regions

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 & intensive (improved)
Tanga	Handeni	R-to-R	Extensive/Agro-pastoral & Extensive/Sedentary (all zebu)
	Lushoto	R-to-U	Extensive/Sedentary (zebu) with significant semi-intensive & intensive (improved)

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

Data collection

A benchmark survey was conducted in October 2012-Jan 2013 to establish the situation on the ground and build a platform for project evaluation and measurement of project impact. Presented in this document are results of data from this survey. Of interest here is the proportion of cattle reared by genotype and associated cattle mortalities.

Cattle breeds

Majority of the households in all the surveyed sites reared the indigenous breed of cattle except in Lushoto where most households kept the improved breed (88.5%). Table 2 shows the percentage cattle genotypes kept by site.

Table 2: Percentage of improved and indigenous cattle in the MoreMilkIT sites

District	Cattle keepers	%households with improved cattle	%households with local cattle	Herd size (sum)	% of improved cattle	% of local cattle
Lushoto	165	88.5	17.6	395	86.6	13.4
Mvomero	178	24.2	80.9	6722	3.9	96.1
Handeni	245	4.9	97.6	7667	0.7	99.3
Kilosa	106	12.3	93.4	5374	4.8	95.2
Total	694	30.8	73.6	20,158	4.5	95.5

Calculation of mortality rates

The study relied on farmer recall of occurrences and perception on causes of death in the previous year. The mortality rates reported here are estimates of farmers' retrospective report of deaths and associated causes. The mortality rate per year was computed as follows:

Mortality rate = Number of dead animals over period (12 months)
Average number of animals at risk (NAR)

Where: NAR = (Initial herd size + Current herd size)/2
Initial herd size = Current herd size - herd entries (purchases, births) + herd exits (sales, deaths) over the previous 12 months at the time of study

Looking at cattle mortality, 40% (281/694) of the households interviewed registered cattle deaths in the previous one year. A majority of these households associated the deaths to diseases (63%; 177/281). Highest death counts as a result of disease were reported in Handeni (564) followed by Mvomero (289). However, it's important to note a high count of deaths due to notifiable or epidemic diseases and clustered by household (e.g., in Handeni 339 deaths were reported by one pastoralist). The highest death counts were reported in Mvomero (775) and were associated with drought (Table 3). Again, in this district a single household reported a total of 285 out of 775 deaths.

Table 3: Count of households reporting death and (heads of cattle) succumbing to associated causes

Site	Cattle keepers	No. of households reporting death	Associated cause of death					
			Disease	Drought	Injury	Age/natural death	Other	Poisoning
Lushoto	165	9	6(6)	0(0)	1(1)	1(1)	1(1)	0(0)
Mvomero	178	103	50(289)	47(775)	12(18)	2(2)	2(2)	1(4)
Handeni	245	112	86(564)	12(64)	12(26)	1(1)	4(6)	2(2)
Kilosa	106	57	35(137)	13(83)	7(10)	3(7)	0(0)	2(2)
Total	694	281	177(996)	72(922)	32(55)	7(11)	7(9)	5(8)

The main diseases thought to have led to the death of their stock include tick-borne diseases especially in Mvomero, Handeni and Kilosa. This could be associated with the mode of feeding which is mainly grazing. Households in Lushoto were less aware of specific causes of cattle mortality (Table 4). This may be because they relied more on professional services whenever their cattle were sick.

Table 4: Count of households reporting diseases associated with cattle mortality

Site	No. of households reporting death due to disease	Tick-borne	Don't know	Other vector borne	General infection	Notifiable	Other
Lushoto	6	0	3	0	0	0	3
Mvomero	50	22	15	5	8	5	
Handeni	86	33	34	8	9	3	5
Kilosa	35	14	9	10	5	2	
Total	177	69	61	23	22	10	8

Generally, the highest cattle mortality rate was reported in Mvomero (12.3%) and the lowest in Lushoto (2.6%). Mortality rate was highest in local cattle particularly in Mvomero (13.3%) and Kilosa (8.4%). This compares to reported cattle mortality of 8.5-14.2% in Iringa and Tanga respectively (Swai et al 2010[1]). No deaths were reported in local cattle in Lushoto. These rates are generally lower that results from participatory epidemiology (PE) exercises conducted during focus group discussions conducted earlier that indicated mortality rates of between 15-20%.

[1] Swai ES, Karimuribo ED and Kambarage DM (2010). Risk factors for smallholder dairy cattle mortality in Tanzania. J S Afr Vet Assoc. 2010 Dec;81(4):241-6.

Table 5: Cattle mortality rates over one year period

Village	Cattle keepers	No. of dead cattle (including calves)	Average cattle mortality rate for all cattle (%)	Average improved cattle mortality rate (%)	Average Local cattle mortality rate (%)
Lushoto	165	9	2.6	2.9	0.0
Mvomero	178	1090	12.3	6.6	13.3
Handeni	245	663	7.9	10.6	7.5
Kilosa	106	241	8.0	1.0	8.4
Total	694	2003	7.8	4.0	8.8

The average cattle mortality rate as a result of disease was at 4.6%. Mortality due to disease was highest in local cattle (5.1%) (Table 6).

Table 6: Cattle mortality rates over one year period due to disease

Village	Cattle keepers	No. of dead cattle due to disease (including calves)	Average cattle mortality rate for all cattle (%l)	Average improved cattle mortality rate (%)	Average Local cattle mortality rate (%)
Lushoto	165	6	1.7	1.7	0.0
Mvomero	178	289	5.4	3.3	5.6
Handeni	245	564	5.9	5.5	5.7
Kilosa	106	137	4.6	1.0	4.8
Total	694	996	4.6	2.3	5.1

Looking at the herds which had calves (up to 12 months of age), the exotic herds had lower calf mortality rate (1.4%) as compared to the local herds (6.0%). The low mortality rate could be linked to fewer households with exotic calves in Handeni and Kilosa which are mainly pastoral zones and probably better management practices in Lushoto which was majorly a dairy cattle keeping zone.

Table 7: Calf mortality rate

Village	Exotic calves			Local calves		
	No. of households with exotic calves	No. of dead calves	Average mortality rate (%)	No. of households with local calves	No. of dead calves	Average mortality rate (%)
Lushoto	60	0	0.0	7	0	0.0
Mvomero	23	3	5.8	127	320	8.1
Handeni	3	0	0.0	200	134	6.5
Kilosa	7	0	0.0	89	36	2.3
Total	93	3	1.4	423	490	6.0

Calf mortalities among exotic herds linked to diseases was only reported in Mvomero (3.6%). On the other hand, local calves in Handeni had the highest mortality rate (5.0%) resulting from disease (Table 8).

Table 8: Calf mortality rate due to disease

Village	Exotic calves			Local calves		
	No. of households with exotic calves	No. of dead calves	Average mortality rate (%)	No. of households with local calves	No. of dead calves	Average mortality rate (%)
Lushoto	60	0	0.0	7	0	0.0
Mvomero	23	2	3.6	127	62	4.0
Handeni	3	0	0.0	200	82	4.9
Kilosa	7	0	0.0	89	19	1.7
Total	93	2	0.9	423	163	3.9

Conclusions

The mortality rates and causes of death as recollected by producers were slightly lower but largely reflect what was captured during the preceding participatory epidemiology exercises that were conducted in June/July 2012. It therefore appears that animal health is not a major constraint to improved productivity, given the mortality due to disease at only 4.6% per annum and mortality from all causes of only 7.8% (range 2.6-12.3%). Given that three quarters of cattle in selected sites are indigenous, it is not surprising that animal diseases do not seem to have a major impact. However, this would mostly likely change if genotypes or production system were to change in the extensive areas as is planned through breed improvement interventions.

The low mortality rates may be because farmers (especially those with relatively large herds) often fail to recollect deaths of young calves. The monitoring that will be put in place in these sites should provide a more accurate picture.