

Targeting dairy value chains in Tanzania: Process towards benchmark survey

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Abbreviations

AI	Artificial Insemination
DSI	Development Studies Institute
ILRI	International Livestock Research Institute
SUA	Sokoine University of Agriculture
TALIRI	Tanga Livestock Research Institute
TSH	Tanzanian shilling
TAMPRODA	Tanzania Milk Producers Association
MVIWATA	Mtandao wa Wakulima Tanzania (Tanzania Farmers Network)

Introduction

In sub-Saharan Africa and Tanzania in particular, milk is produced from a mixture of dual purpose, traditional cattle, cross bred dairy cattle and some dairy goats. In Tanzania, 98% of milk is produced by cattle while only 2% is goat milk. Data of a comprehensive sample census conducted in 2007/08 (URT, 2012) showed that there were about (21,280,875) head of cattle kept by 2,329,942 households. The number of cattle in the Mainland was 21,125,251 while in Zanzibar was 155,624. Of the 1,698,580 cattle keeping households, 71 percent kept between 1 and 10 heads of cattle. Most of the cattle were in Shinyanga, Arusha, Manyara, Tabora and Mwanza, however, the highest densities were in Arusha, Mara, Manyara, and Singida. Compared to previous 2002/03 census, there has been an increase in the number of all major livestock species with cattle showing an annual growth rate of 4 percent over the period 2003 to 2008.

In Tanzania, milk is obtained mainly from cows. Milk production from cows during the wet season was 1.6 billion litres and 0.9 billion litres during the dry season. Average milk production per cow was 3 litres during the wet season and 2 liters during the dry season, a difference of about 33.3 percent. The leading regions in terms of milk production during the wet season were Shinyanga (13%), followed by Arusha (12%), Tabora (9%) and Mbeya (10%). Milk prices varied between regions and for the majority of the regions, the prices of milk fluctuated between Tanzania shillings 255 and Tanzania shillings.711 for the wet season and between Tanzania shillings 291 to Tanzania shillings.676 in the dry season for Tanzania Mainland, while in Zanzibar, the average price of milk was slightly higher than that of the Mainland whereby the prices were Tanzania shillings 481 in the wet season and increased to Tanzania shillings.497 during the dry season. Highest prices were observed in Dar es Salam, Mtwara and Kilimanjaro regions during the dry season.

Efforts to improve milk production must go hand in hand with improvements in milk collection and processing systems. A major challenge is to achieve efficiency along the value chain. Farmers of dairy cows must be present in a given area in a sufficiently high density to permit economic collection and processing of milk during most part of the year.

The CGIAR is leading a major initiative to consolidate research and development efforts for a pro-poor transformation of the smallholder dairy value chains in Tanzania currently. Working in close collaboration with Sokoine University of Agriculture (SUA), the initiative led by ILRI and CIAT will involve and a range of other national and international Research and Development (R&D) partners. ILRI has secured funding from Irish Aid for an initial one-year inception to conduct research that will inform a potential four-year R&D phase to adapt dairy market hubs for pro-poor smallholder value chains in Tanzania (also referred to as the MoreMilkiT Project).

The specific research objectives during the initial one-year inception in 2012 are to: 1) assess the current status of the Tanzanian dairy sector and identify appropriate entry points and partners for promoting a more pro-poor development orientation; 2) develop a strategy for strengthening the policy environment to better support pro-poor dairy development,

capitalizing on on-going engagement with key policy actors and previous successes in Kenya and Uganda; and, 3) identify sites appropriate for piloting pro-poor dairy development interventions that have been successful elsewhere in East Africa, and assess how those interventions need to be adapted to the Tanzanian context. Other investors are also contributing to this effort including the IFAD-funded MilkIT feed innovations project and the BMZ-funded Safe Food Fair Food (SFFF2) project.

This report details the process towards random selection of 25 villages per district that formed the sampling frame for structured benchmark surveys that followed from Dec 2013 – February 2014. Complementary detailed value chain assessments conducted through Focus Group Discussions (FGDs) are available for some villages in this report. Namely, in Morogoro Region: Mbwade, Twatwatwa (Kilosa district), Kambala, and Manyinga (Mvomero district) and in Tanga Region: Sindeni, Kabuku (Handeni district), Kwapunda, Kwang'wenda (Lushoto district).

Rationale for choosing the four districts

The four districts in Morogoro Region (Kilosa and Mvomero districts) and in Tanga Region (Handeni and Lushoto districts) were identified based on a combination of spatial map overlays, see: [Targeting in Tanzania](#), stakeholder consultations, scoping visits: [Tanzania dairy value chain page](#) and R&D partner preferences. The spatial mapping mainly relied on socio-economic data (human population & poverty, market access and consumption), livestock density and livestock production systems.

The target districts represent extensive/pre-commercial rural producers who predominantly sell milk to rural consumers (R-to-R) and intensive/more commercial rural producers who are significantly engaged in selling milk to urban consumers (R-to-U), usually via bulk traders. The latter represents a growth path for upgrading of the former when surplus milk grows beyond volumes that neighbours can buy. The two regions of Morogoro and Tanga represent replicates, with one district in each representing R-to-R and the other R-to-U. These strata also represent a gradient of increasing intensification.

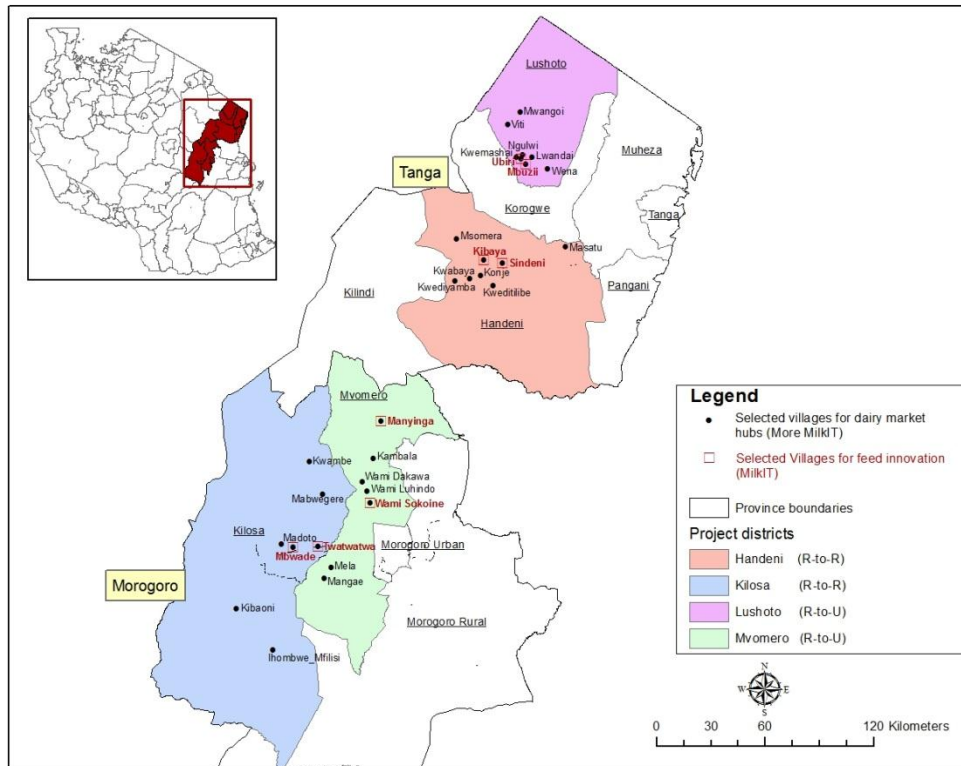


Figure 1: Map of selected field sites in Tanzania indicating the locations of selected villages for piloting dairy market hubs

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

The process described in this report took the site selection process a step further to identify specific sites where specific interventions will be carried out. The first step was to develop a long list of 35 villages that were selected based on available information on numbers of cattle keepers and cattle population. This was followed by a more detailed study in 25 of these villages where a checklist and participatory scoping procedures were applied to identify the sites for implementation based on a tool with criteria such as target groups, impact indicators, ease of assistance and access to markets/ inputs/services, potential for collective action, and availability of related development activities.

Teams

The survey Team involved the following

- Salim Werner Nandonde – Researcher and Team Leader from More MilkIT Project (ILRI/SUA)
- Fred Wassena –Researcher from MilkIT Project (CIAT/SUA)
- Goodluck Massawe – Researcher from DSI SUA
- Walter Mangesho – Researcher from TALIRI, Tanga
- Lukelo Msese – Assistant from SUA

Other officials from the respective districts included

- Lekason Shayo and Gloria Rwamugira (Handeni District Officials)
- Abeid Kiungulia and Fransis Hiza (Lushoto District Officials)
- Daniel Pangani (Mvomero District Official)
- Shayo K. (Kilosa District Official)

Brief description of target districts

Morogoro region

Mvomero district

It is a newly created district comprises four divisions (Turiani, Mvomero, Mlali and Mgeta), the total cattle population is 187,350 out of which 5% (9,314) is improved dairy. The majority of the 178,036 indigenous cattle are kept by agro pastoralists. A seasonality effect is a major constraint leading to long travel distances in search of feed and water. Flooding is a major constraint during the wet season as a result reducing grazing areas. Livestock keepers generally own large herds of cattle; Average milk production is about 5 litres per cow per day. Milk is mainly sold to the nearby Morogoro urban town by private milk traders, 5-20% of pastoralists and 10-15% of sedentary producers sell milk.

Kilosa district

Comprises 5 divisions- Kilosa, Kimamba and Magole lie in the lowlands; Mikumi lies in the midlands while Gairo lies in the upper highlands. Kilosa was formerly dominated by the sisal plantations until the collapse of the industry when cattle keepers became inhabitants. Area mainly inhabited by the Sangara tribe who have a poor milk drinking culture. However, other tribes with a strong milk drinking culture are present: Maasai, Sukuma, Barbeji (Mang'ati), Wakaguru and local Tanz immigrants.

The district has 626,618 people, Kilosa town has a population of about 33, 450 people (5% of the total district population). The total cattle population is 215,100 out of which 1% (2,405) is improved dairy. The majority of the 210,627 indigenous cattle are kept by agro pastoralists though there are some Maasai who are cross breeding. The average cattle size for sedentary smallholders is 2-3 cattle per household. A seasonality effect is a major constraint often leading to tribal conflicts over pasture and water. Average milk production: for Indigenous cows, 2-3 litres per day while improved cross breeds, 5-8 litres per day.

Tanga region

Handeni district

Area mainly inhabited by the ethnic Zigua tribe who are both farmers and sedentary livestock keepers. However in recent year there immigrated tribes from the northern Tanzania particularly the Maasai, Mbulus, Barbeig (Mangati) and Singwazi. The total cattle population is 126,780 out of which 1% (1,045) is improved dairy. The majority of the 124,735 indigenous cattle are kept by agro pastoralists. Average cattle size for sedentary smallholders is 4-5 cattle per household. Seasonality effects are a major constraint often leading to feed and water shortages. Area dominated by natural grazing and virtually no other alternative feed resources. Tanga fresh dairy is the only milk trader owning a milk collection centre in Handeni 3000 liters capacity; utilized 20-40%. The Ministry of Livestock helped mobilize farmers to register and deliver milk to the collection centre. There are no

formal groups existing. Farmers deliver milk as individuals or through informal cells/traders pooling milk for delivery and payment twice a month.

Lushoto district

Lushoto district is situated in the northern part of Tanga, the district lies on the foot of the western Usambara Mountains rising from 300 – 2100m above sea level. The lowland covers 25% of district, the estimated population of Lushoto is 437, 037 people. It has bi modal type of rainfall (800-2000mm per annum), and Average land size in highlands is 3 acres. The main inhibitors are the Sambaa and Pare.

There are 119,492 cattle of which 24% (29,200) are improved cattle. Improved cattle most found in the highlands where 65% of households own cattle, while indigenous in the lowlands. The average cattle per household in the highlands is 2-3 and more than 10 in the lowlands. The common feeds are crops residues, Napier grass, Guatemala grass, cut grass and grazing in the lowlands. Artificial insemination (AI) is being introduced in the highlands. Milk is sold to Tanga fresh Ltd (75%) through the existing 4 milk collection centres and 25% of the rest of the milk is sold locally.

Methodology

Steps:

1. A team of 4 persons from SUA and Tanga TALIRI was formed. The team first generated a long list of villages and trimmed it down to village sites where the detailed site selection tool was implemented in phases.

Phase one (pre-selection of villages)

2. Based on the information obtained from the district livestock officials a long list of up to 35 villages per district (Kilosa, Mvomero, Handeni, Lushoto) where primary dairy hubs with about 125 producers thought to be established were obtained (table 1). This gave 35 villages x 125 producers x 4 districts = 17,500 producers (some wards had more villages selected than others). This exercise necessitated visits to district headquarters and telephone calls to some ward officials where information at the district was not adequate.
3. In order to confirm the information given from the respective district office for the potential villages. Researchers visited these villages and less promising villages were eliminated based on number of cattle keepers and cattle population, key informant information and available information on main criteria ("potential impact" and "ease of assistance") so that 25 villages per district with a total of at least 12,500 producers across the four districts were obtained.
4. Moreover, local opinion were gathered on which hub interventions may be suitable in each village and categorized based on categories defined at the recent Outcome Mapping workshop as **a**, **b** or **c**¹. Also indicate which neighbouring village that may be aggregated with to form bigger hub units depending on proximity and ease of communication.

Phase two (administering the detailed checklist)

5. The team was expanded to include local district officials and was divided into two sub teams to fit within the timeframe: one in Morogoro and the other in Tanga).
6. Appointments were made in each of the 25 selected villages, followed by visits to particular wards/villages in a district to administer the detailed sites selection checklist to gather more in-depth data. . The checklist form was filled for each of the 25 villages per district including those involved in the qualitative VC assessments in June/July 2012. The interviews were with informed respondent(s) and GPS coordinates of centroid of each village were recorded.

¹ a) Hubs revolving around chilling plants (CPs) or just accessing them (if under-utilized and nearby) through transport arrangements; b) hubs revolving around check-offs for inputs & services provided through milk traders; and, c) hubs revolving around check-offs for inputs & services provided through cattle traders.

7. This was done to verify opinion on which types of hub interventions (a, b or c) may be suitable and number of primary hubs that may be aggregated to form bigger hubs depending on proximity and ease of communication.
8. In addition, lists of households per village from the village secretary were collected that could be used to guide sampling for the benchmark survey to follow.

Phase three:

9. The data collected entered in an Excel sheet and a brief report on the sites selected were documented according to an outline provided that included conclusion and recommendation on intervention sites and type of dairy hub intervention in light of the summaries.

Identification of potential sites

Sites for interventions in the Tanzanian dairy value chain (VC) have so far been identified down to district level. The districts in Morogoro Region are Kilosa and Mvomero districts while in Tanga Region are Handeni and Lushoto districts. These districts were identified based on a combination of spatial map overlays, stakeholder consultations, scoping visits and R&D partner preferences. The spatial mapping mainly relied on socio-economic data (human population & poverty, market access and consumption), livestock density and livestock production systems. Kilosa and Handeni districts represent pre-commercial rural production-to-rural consumption while Mvomero and Lushoto represent more commercial rural production-to-urban consumption.

The detailed site selection process took a step further to identify specific sites where specific interventions will be carried out. A checklist and participatory scoping procedures were applied to identify the sites for implementation based on a tool with criteria such as target groups, impact indicators, ease of assistance and access to markets/ inputs/services, potential for collective action, and availability of related development activities. This involved close collaboration with officials at ward level.

Data collection

The long list of 35 villages was developed based on the secondary data information from respective districts. Selected villages were regarded by the district authority as the most promising for dairy industry development in terms of numbers of cattle keepers and cattle population, milk production and number of households with cattle.

The list was then reduced to 25 villages and most of omitted villages were due to accessibility difficulties, for instance the village could have high production but located in very remote areas. Some were left in, particularly in Lushoto as representatives of semi-intensive production system which is actually not common in the district. Also some villages which were selected from the 35 villages lists given by the district offices were dropped and

replaced by other villages which the team after visiting could not see the potential as it was stipulated from the secondary data, this happened both in Handeni and Kilosa, for example, Chogo village near Kabuku in Handeni, refugees from Somalia used to live in this village, when the research team visited this village could not see livestock in this village, then they had to substitute with another village (Kwamkono) from the long list which they saw it had livestock potential.

Results

Long list of 35 villages

35 villages were proposed by each districts based on the impact and ease accessibility indicators as it was pre described by the researchers to the districts officials.

Table 1: Long list of 35 villages recommended from each district

Tanga Region				Morogoro Region			
Districts							
Lushoto		Handeni		Kilosa		Mvomero	
Ward	Village	Ward	Village	Ward	Village	Ward	Village
Lushoto	Magamba	Segera	Bongi	Dumila	Twatwatwa	Dakawa	Kambala
	Handei		Kwediymba		Kiduhi		Wame Sokoine
Soni	Lwandai		Kwenjugo mashariki		Madoto		Mela
	Kwesimu		Kweisasu		Mabwegere		WameLuhindo
	Kizara		Masatu		Kwambe		Milama
	Ngulu	Sinden	Sinden	Madoto	Mbwade		Kunke
	Mbuzii		Msomera		Ihombwe/M filisi		W/Dakawa
	Ngulwi		Komfugo	Zombo	Zombo		Dihombo
	Kigulunde		Kwenjugo magharibi		R/Mbuyuni		Msufini
Baga	Baga	Kwalugulu	Magamba	Ulaya	U/Kibaoni	Hembeti	Hembeti
Mbuzii	Kwang'wenda	Mgambo	Gendagenda	Kilangali	Kilangali		Kimambila
Mwangoi	Mwangoi		Mbagwi	Kidodi	Lumango		Lungo
	Viti		Konje	Rudewa	R/Gongoni		Mlumbilo
Dule 'M'	Dule	Vibaoni	Kwabaya		Ilakala		Mkindo
Bumbuli	Wena		Segera		Kondoa		Kisimaguru
Sunga	Tema	Kabukundani	Kabuku mjini	Mkwatani	Mkwatani		Madizini
Ubiri	Ubiri		Kwamkono	Msowero	Mvumi		Mndela
Shume	Hambalawe		Bangu		R/Peapea	Doingoya	Manyinga
	Mbokoi		Kwedibagala		Ilonga		Lubungo
	Makose		Zavuzza		Kivungu		Mangae
	Hamboyo		Kwaluwala	Kimamba" B"	Kimamba"B"		Vikenge
Usambara	Kwapunda		Mzeri	Mikumi	Mikumi		Lusanga
Kwemshasha	Nyassa		mbuyuni		Ruhembe	Mzumbe	Changarawe
	Bumbuli Kaya		Kwamagome		Dumila		Kidudwe
	Shashui	Kang'ata	Msaje	Magomeni	Magomeni		SangaSanga
	Masereka	Misima	kibaya	Ruaha	Ruaha	Mtibwa	Lukenge

Kwemashai	Kwemashi		Misima		Msowero	Melela	Melela
	Mavumo	Chanika	Kilimilang'ombe	Magole.	Magole.		Digalama
Malindi	Mnadani	Kiva	Kweditilibe	Kisanga	Kisanga		Kwadoli
Kwai	Migambo		Kibindu	Ruhembe	Kihelezo		Mafulu
	Kwefingo		Msasa		Msowero		Kibaoni
	Handei		Muungano B		Msimba		Tangeni
	Kiviricha	Kideleko	Kideleko	Kimamba "A"	Kimamba "A"		Digoma
Manolo	Manolo		Gole	Chanzuru	Chanzuru		Mlandizi
	Mambo		Kwamasaka	Mabwereb were	Kibaoni		Magali
16	35	11	35	19	35	6	35

Table 2: Number of cattle found during the survey for the 35 villages

N=35	Number of local cattle (LC)				Number of improved cattle (IC)			
	Handeni	Lushoto	Mvomero	Kilosa	Handeni	Lushoto	Mvomero	Kilosa
Total	87,943	6,769	94,327	131,840	770	10,126	5,281	2,103
Mean	2,513	193	2,695	3,767	22	289	151	60
Min/Hh	72	16				15		
Max/Hh	15,244	680	12,919	60,317	237	1,330	1,323	325

Short list of 25 villages

A detailed short list of 25 villages for each district was deduced from the 35 villages following researchers' visits to each village. These villages were selected based on combination of the impact and ease of accessibility indicators as in the guideline and the confirmation through physical visits.

Table 3: Short list of 25 villages selected from each district

Tanga Region				Morogoro Region					
Lushoto District		Handeni District		Kilosa District		Mvomero District			
Ward	Village	Ward	Village	Ward	Village	Ward	Village		
Usambara	Kwapunda	Vibaoni	Kwamasaka	Zombo	Zombo	Mzumb e	Vikenge		
	Kiviricha		Kwabaya	Ulaya	Kibaoni		Lubungo		
Ubiri	Ubiri		Konje		Rudewa		Twatwatw a	Ilakala	Changaraw e
	Kizara	Sinden i	Kweisasu	Mbuyuni R.		Mtibwa			Madizini
	Handei	Kwamkono							Msowero
Soni	Shashu		Komfungo		Mkwatani		Mkwatani	Melela	
	Lwandai	Segera	Segera	Mikumi		Mikumi			
Shume	Viti	Misima	Masatu	Magomeni	Magomeni	Melela	Melela		
	Hamboyo		Msomera				Magomeni	Magomeni	Mela
	Hambalawei		Misima	Mbagwi	Madoto				Mbwade
Mwangoi	Mwangoi	Kibaya	Magamba	Mabwerebwer e		Kondoa	Hembeti	Kibaoni	
	Handei				Misima			Magomeni	Magomeni
Mbuzii	Mbuzii				Kwalugul u				
	Kwang'wend a	Magamba	Kisanga	Kisanga		Mkindo			
	Kigulunde	Kwamagome				Kilosa	Kimamba	Kambala	
Manolo	Mavumo	Kiva	Zavuz a	Kilangali	Kivungu			Diongoy a	Hembeti
	Manolo		Kwed itilibe			Kilangali	Kivungu		Dihombo
Lushoto	Ngulwi		Kideleko	Kwed imbanga a	Kilangali				Kivungu
	Magamba	Kideleko		Kilangali		Kivungu	Lusanga		
	Kwesimu	Bangu					Kidodi	Msowero	
Kwemash ai	Ngulu	Kabuku Ndani	Kabuku	Lumango	Mvomero	Dakawa			Digoma
	Kwemashai	Chanika	Kwe. Mashariki.				Dumila	Mabweger e	W. Sokoine
Bumbuli	Wena		Kwe. Magharibi	Dumila	Mabweger e				Dumila
	Mbokoi		Kwedi yamba			Dumila			
	Bumbuli Kaya	Kilimilang' ombe	Dumila				Mabweger e	Dumila	
10	25	10		25	14	25			6

Impact indicators

The criteria for the detailed site selection of the 25 villages for each district was based on the impact indicators, which included: number of farmers in the village keeping local cattle only, exotic cattle, their average milk yield per day during both low and peak seasons. In addition, issues related to market access were considered such as existence of market outlets and their respective farm gate prices during low and peak seasons. Also percentage of milk sold to different market outlets such as other households/neighbours, traders. Milk shops/bar, self-help groups, cooperative, and processors.

Moreover, issues related to market orientation such as farmers purchasing regularly inputs like feeds and animal drugs, veterinary and breeding services, and whether they are getting these services by paying cash or on credit bases. Other impact indicators were number of farmers using artificial insemination (AI) and type of feeding system in terms of percentage of the source of feeds; whether coming from grazing, residues, green fodder, concentrates were also considered.

Table 4: Farmers keeping local/exotic cattle and milk production

Production/demographic Variable	District			
	Mvomero	Kilosa	Handeni	Lushoto
No. of farmers keeping local cattle only	8784	827	5337	1080
No. of farmers keeping Xbred/ exotic cattle	210	37	271	393
% cattle keepers hhs in which women own cattle	2.4	4.5	5	36.3
Average milk for households keeping local cows only				
Average milk yield/ day per local cow, <u>peak</u> season(Ltrs)	3.22	1.29	2.08	4.8
% milk sold, <u>peak</u> season	64.08	71.64	81.48	79.4
Average milk yield/ day per local cow, <u>low</u> season(Ltrs)	1.52	0.76	0.65	3.06
% milk sold, <u>low</u> season	53.96	88.8	73	76.4
Average milk For households keeping Xbred/ Exotic cows				
Average milk yield/ day per Xbred/exotic cow, <u>peak</u> season(Ltrs)	5.2	11.09	8.29	7
Average milk yield/ day per Xbred, <u>low</u> season(Ltrs)	2.75	5.61	4.5	4.78
% milk sold, <u>low</u> season	50.12	90.22	77.82	79.2

Data source: 25 villages detailed site survey per district

Results indicate that Mvomero has the highest number of farmers keeping local cattle (8784), followed by Handeni district (5337), Lushoro (1080) and lastly Kilosa had few households (827). For the case of farmers keeping exotic breed, Lushoto had the highest number of farmers (393), followed by Handeni (271), Mvomero (210) and lastly Kilosa (37).

The average milk yield per day for local cattle during the peak season were high in Lushoto (4.8 liters), followed by Mvomero (3.2 liters), Handeni (2.1 liters) and Kilosa had the lowest milk yield (1.3 liters). The average milk yield per day for local cattle during the low season were high in Lushoto (3.1 liters), followed by Mvomero (1.5 liters), Kilosa (0.76 liters) and Handeni had the lowest milk yield (0.65 liters).

However, the percentage of milk sold during the low season was high in Handeni (81%), Lushoto (79.4%), Kilosa (71.5%) and lastly Mvomero (64.08%). On the other hand milk sold during the low season for local cow was high in Kilosa (88.8%), followed by Lushoto (76.4%), Handeni (73%) and lastly Mvomero (53.96%).

Results further showed a significant difference in milk yield between local cattle and exotic breed. Milk yield per day were very high both during the peak and low season for the households keeping exotic breeds, with an average of (11.0 liters) for Kilosa, (8.2 liters) for Handeni, (7 Liters) for Lushoto and (5.2 liters) for Mvomero during the peak season. During the low season, yet Kilosa had the highest milk yield per day (5.6 liters), followed by Lushoto (4.7 liters), Handeni (4.5 liters) and lastly Mvomero (2.75 liters).

The percentage of milk sold from exotic breed, in Kilosa about (90%) of the milk produced was sold, while in Lushoto (79.2%), Handeni (77.8%) and Mvomero (50%) of the milk produced was sold to different market outlets.

Various market outlets exist for farmers to sell their milk during the peak season as well as the low season. However, for Mvomero and Kilosa districts, farmers were selling their milk more to traders during both peak and low season, about (51% and 63%) and (56% and 66%) respectively. For the case of Handeni and Lushoto the market were; other households/neighbours (45%, 41%), traders (52%, 37%), Milk shop/milk bar (25%, 20%), Cooperative (1%, 62%), processors (85% only for Handeni) respectively for the peak season. During the low season farmers in Handeni and Lushoto sold their milk to similar markets as during the peak season (Table 5).

Table 5: Existing market outlets

Peak season (%)	District			
	Mvomero	Kilosa	Handeni	Lushoto
Other households/Neighbours	36.36	39.38	45	41
Traders	51.24	63.33	52.1	37.3
Milk shop/ milk bar	13.2	5.8	25.25	20

Self-help group/ cooperative	0	0	1	62
Processor	0	0	8.1	0
Other (specify)	0	0	14	0
Low season				
Other households/ neighbours	24.4	42.35	45.08	41.2
Traders	56.4	66.25	55.94	36.92
Milk shop/ milk bar	15.8	80	12.5	24.73
Self-help group/ cooperative	0	0	0	61.66
Processor	0	0	2.5	0
Other (specify)	0	0	15	0

Data source: 25 villages detailed site survey per district

Milk prices at different market outlets

Farm gate price of milk sold at various markets outlet varied not only among these market outlets but also between peak and low seasons. The minimum price was 400 Tanzania shilling per litre for the milk sold to cooperative and the maximum prices offered were 800 Tanzania shillings per litre for Handeni and Lushoto, 1000 Tanzania shillings for Mvomero and 1500 Tanzania shillings per litre for Kilosa. These prices were offered during peak season (Table 6a).

During the low season the farm gate price were slightly higher because for high demand of milk during this period and there is low supply of milk which is aggravated by scarcity of feeds for livestock. During this season farmers were not willing to sell milk to cooperative due to the fact that prices offered by other market outlets are higher compared to that offered by cooperative/self-help groups. For instance, other outlets offered 800 to 1500 Tanzanian shillings per litre as maximum farm gate price across all the districts and an average farm gate prices between 500 to 800 Tanzania shillings per litre.

Table 6a: Farm gate Price of milk sold to different market outlet during peak season (TSH)

District		Neighbour/hh	Traders	Milkshop/bar	cooperative	Processors	Others
Handeni	Mean	524	486.84	425	400	514.28	581.25
	Min	300	300	400	400	400	400
	Max	800	800	500	400	800	800
Kilosa	Mean	721.73	710	48	.	.	.
	Min	500	500	0	.	.	.
	Max	1500	1500	600	.	.	.
Lushoto	Mean	546	465.38	555.26	554.44	.	.
	Min	450	400	450	500	.	.
	Max	800	500	800	570	.	.
Mvomero	Mean	604.16	396	244	.	.	.
	Min	300	0	0	.	.	.
	Max	1000	700	800	.	.	.

Note: data not available

Table 6b: Farm gate Price of milk sold to different market outlet during low season (TSH)

District		Neighbour/hh	Traders	Milkshop/bar	Cooperative	Processors	Others
Handeni	Mean	672.91	657.89	500	.	1000	723.33
	Min	400	400	500	.	1000	500
	Max	1000	1000	500	.	1000	800
Kilosa	Mean	776.19	736.11	700	.	.	.
	Min	600	600	600	.	.	.
	Max	1500	1150	800	.	.	.
Lushoto	Mean	561.90	455.55	576.47	554.44	.	.
	Min	500	400	500	500	.	.
	Max	1000	500	1000	570	.	.
Mvomero	Mean	620	552	276	.	.	.
	Min	0	0	0	.	.	.
	Max	800	800	800	.	.	.

Note: data not available

Other issues related to market were observed, such as if farmers were purchasing inputs on cash bases or procuring inputs on credit. Results indicate that most farmers across all district were purchasing inputs on cash bases, with highest percentage in Handeni (88.85%) followed by Kilosa (74.8%), Mvomero (62.7%) and lastly Lushoto (35.4%). Also farmers were asked if they access other services on credit such as, Veterinary, breeding services 35% to 54% responded to have received such service on credit across all the districts. Moreover, about 44.6% farmers in Handeni , 46% in Mvomero, 53% in Lushoto and 57% in Kilosa responded to be able to sell milk at least for six months.

For the case of selling milk at least for 1 head cattle per year, Handeni had highest percentage of farmers (74%) followed by Kilosa (50%), Mvomero(33%), lastly Lushoto (21%). These indicate the potentiality of these districts that at least a farmer will be able to sell milk from one cow per year (table 7).

Table 7: Market orientation issues (% respondents)

District	Farmers purchasing input	Procuring input on credit	Getting services e.g. vet., breeding on credit	Selling milk at least for 6 months	Selling milk at least from 1 head cattle/ yr
Handeni	86.8	.	54.04167	44.6	74.08
Kilosa	74.8	.	45	57.6	50.8
Lushoto	35.4	.38	40.2	53.16	21.44
Mvomero	62.76	2.4	35.48	46.04	33.44

Management practices

It was observed that in almost all the districts, above 40%, grazing is the main feeding system for their cattle, with exception of Lushoto where farmers supplement their animals with residues from their farms. Other practices included whether farmers were using artificial insemination (AI)., Very few were using this service, the highest percentages were observed in Lushoto (10.6%) the rest were below 5%, with Kilosa not doing AI at all.

However, farmers across all districts were regularly doing tick control practices, with highest percentages in Handeni (82.4%) followed by Mvomero (71.2%) Kilosa (46.8 %) and Lushoto (45.7%). De-worming was also practised, where about 57.7% farmers in Mvomero, 55.4% in Handeni, 46.4% in Kilosa and 39.2% in Lushoto were practising de-worming.

Table 8: Type of feeding system and other production practices

Feeding system	District			
	Mvomero	Kilosa	Handeni	Lushoto
% diet coming from grazing	64.08	67.6	62.4	43.6
% diet coming from residues	18.2	23	17.8	36.8
% diet coming from green fodder	9.08	1	1.36	18.8
% diet coming from concentrates	5.04	6.4	1.64	1.2
% diet coming from other, specify	0.4	3.4	0.6	0
Other production practices				
% farmers using AI	4.5	-	3.36	10.6
% farmers doing regular tick control practices	71.28	46.8	82.4	45.68
% farmers practising regularly de-worming	57.76	46.4	55.4	39.2

Data source: 25 villages detailed site survey per district

The attributes for ‘ease of assistance’

The site selection also considered easy of assistance indicators as criteria for selecting the villages, these indicators included; presence of farmers groups, the way the group assists or coordinates and manage activities such as milk bulking or chilling, access to inputs, physical services such as AI, financial services and if the group have linkage with Tanzania’s farmers network (MVIWATA) or the Tanzania Milk Producers Association (TAMPRODA).

Results show, there were few existing groups dealing with dairy in most of the villages, for instance, in Mvomero 76% of the farmers didn’t know any existing group dealing with dairy. And these farmers were neither linked to MVIWATA nor TAMPRODA (Table 9).

Table 9: Percentage of respondents with attributes for easy of assistance

Attribute	Mvomero		Kilosa		Handeni		Lushoto	
	Yes	No	Yes	No	Yes	No	Yes	No
Existing group dealing with dairy	24	76	-	-	40	60	32	68
Group opens to new members	8	92	-	-	64	36	12	88
linkage between the group with MVIWATA	4	96	-	-	0	100	0	100
linkage between the group with TAMPRODA	4	96	-	-	0	100	0	100

Data source: 25 villages detailed site survey per district

Discussion

From the national cattle demographic for the two regional, it show that, these two region have a good number of cattle, for example, data collected in 2006 across Tanga Region on cattle population show that of all livestock kept, cattle occupy (18.65 percent). Comparing to 2006 data and those of 2002/2003, there has been an increase of cattle in the Region. Specifically, in Tanga and Morogoro Regions the few facts with regards to cattle and milk production is as displayed in table 10 below.

Table 10: Cattle and milk production: number of milked cows by category of cattle, season and region during the 2007/08 agricultural year

Region	Wet season			Dry season		
	Improved breed	Indigenous breed	Total	Improved breed	Indigenous breed	Total
Number of animals						
Morogoro	3,421	83,461	86,882	3,166	75,912	79,098
Tanga	15,704	180,071	195,774	15,464	135,154	151,018
Quantity of milk produced(liters)						
Morogoro	4,335,705	45,498,479	49,834,183	3,139,350	26,859,686	29,999,036
Tanga	18,339,797	57,769,531	76,101,728	12,017,546	26,082,546	38,100,124

Source: Tanzania Agriculture Sample Census - 2007/08

Table 11: Facts concerning cattle production in Tanga Region as of 1st October 2003

	Details Tanga	Details Morogoro
Cattle population	378,338	461,063
Cattle density per km ²	15	7
Improved dairy cattle population	27,683	5,052
Improved beef population	298	26
Milk production per year	224,336 liters	111,017 lts/day wet season

Source: National Sample Census of Agriculture 2002/2003

Proportional wise, in the region indigenous cattle have been mostly kept followed by dairy cattle and lastly improved beef cattle. Improved beef cattle have only been kept in Handeni district (table 12).

Table 12: Estimated number of cattle by type and districts in Tanga in 2006.

District	Indigenous	Improved/exotic cattle		Total Cattle
		Dairy	Beef	
Pangani	10,677	3,708	-	14,385
Muheza	26,788	5,414	-	32,202
Korogwe	57,742	3,491	-	61,333
Tanga	9,400	5,600	-	16,000
Handeni	84,020	667	6,465	91,145
Kilindi	122,298	178	-	122,476
Lushoto	90,000	13,500	-	103,500
Total	400,925	32,558	6,465	441,041

Source: Tanga regional commissioners' office 2006

However, data obtained from the Tanga regional office indicate that, the region until December, 2011 had 717,270 indigenous cattle and 59,124 improved cattle and milk production had reached 54,100,000 litres with an average of 4,508,333 litres per month. This is an indication of continuous increase in cattle population in the region.

Specifically, looking at the selected districts Handeni and Lushoto, 2011 data show that Handeni district 124,908 indigenous cattle and improved cattle of were about 1,045. Lushoto had 119,492 indigenous cattle while it had the largest number of improved cattle within the region of about 29,200. Still this indicates that there continuous increase in both improved as well as indigenous cattle in the selected districts.

On the other hand, Morogoro region have the very same trend in increase of cattle, by looking at the proportions of the distribution of cattle among the districts table 13 below

Table 13: Estimated number of cattle by type and districts in Morogoro in 2006

District	Indigenous	Improved/exotic cattle		Total Cattle
		Dairy	Beef	
Kilosa	212,708	2,332	-	216,040
Kilombero	66,821	1,285	-	68,106
Ulanga	96,818	445	-	97,263
Mvomero	146,414	16,940	9,473	172,827
Morogoro urban	940	3,230	-	4,170
Morogoro rural	30718	2,527	2,690	35,935
Total	554,419	26,750	6,465	593,341

Source: Morogoro regional commissioners' office 2006

Based on this data, the two regions have potential for milk production, both from the indigenous as well as the breeds. Moreover, results from the survey conducted on the 25 villages on each districts (Table 4) have also shown that the selected districts had large number of improved cattle, which is a good indication of more milk production given that farmers could be following the required practises.

Conclusions and recommendations

Based on the impact and easy of assistance indicators, the selected areas have potential for milk production. However, farmers in these areas use grazing as the main feeding system; but they can be taught how to conserve pastures which can be used during the dry season where it had been observed that farmers do shift far away their homestead for search of pastures hence low supply of milk during this period.

It has been noted also that, traders and neighbours or other households are the main market outlets for farmers to sell their milk. Only in Handeni district few farmers sell milk through Cooperative/self-help group and processors while to the rest of the districts results indicated to have no cooperatives and processors therefore farmers have no access these market outlets which are very potential as reliable market outlets.

Moreover, farmers across all districts showed to have little knowledge on the existence of the Tanzania's Farmers Network (MVIWATA) as well as the Tanzania Milk Producers Association (TAMPRODA). As noted, these have greater contribution on improving dairy sector and livelihood of livestock farmers not only around the project areas but also the dairy sub sector. Therefore the MoreMilkIT project has to call for stakeholder meeting and create awareness of the importance of farmers joining these associations.

Recommendations

- Data available at district (local Government Authorities) are not in line with what on the ground, so it could be better if the project conducted its own survey to the selected representative villages so as to have a true picture of the dairy sub sector.
- Farmers should be encouraged to form cooperatives/groups so that they can join efforts and sell their milk to established milk collection centres wherever possible.
- Households should be encouraged to join farmers groups and associations such as MVIWATA and TAMPRODA so that they can benefit not only by acquiring knowledge and skills obtained through these associations but also through group rules that enhance adoption of improved livestock farming practices.
- Training on the values, skills, and attitude of viewing Dairy as a business should be enhanced because this is the mentality that is lacking among livestock farmers especially the Maasai community where milking is left for women, despite being the starting point for productive, market oriented farming.
- Efforts should be directed towards resolving the low ability of farmers in purchasing inputs because this was identified many farmers were not using inputs such as supplement feeds for their cattle. The effort would naturally be multifaceted, including changing the mind-set of farmers because towards using inputs might at times be perceived not important rather than real.

Annex 1: Long list of 35 villages selected for detailed sites selection

Annex 2. Checklist for data collection in 25 villages per district