Continuous cow productivity monitoring survey: Farmer recruitment report

East Africa Dairy Development – Phase II

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Continuous cow productivity monitoring survey: Farmer recruitment report

East Africa Dairy Development—Phase II

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1. Introduction

In 2008, the East Africa Dairy Development (EADD) project provided extensive training on dairy productivity, business practices and operation, and dairy product marketing to 179,000 farming families in Kenya, Rwanda and Uganda. By 2012, EADD had supported 82 producer organizations contributing to the emerging dairy industry in eastern Africa. The second phase of EADD (EADD II) is a five-year project, running from 2014 to 2018. The overall project seeks to improve livelihoods and increase income of more than one million people in Kenya, Tanzania and Uganda through dairy production. This will be achieved by working with more than 136,000 farmers to improve dairy production and access to markets during the second phase.

Following the first phase of EADD, it was evident that timely and reliable data at farm level is critical, as a learning tool for livestock keepers to use for monitoring and evaluating change within the production systems. EADD II is incorporating a more comprehensive and responsive learning component in the project. In addition to evaluation surveys (baseline, mid-term and end term), the project is undertaking real time data collection at the farm level to track the impact of on-farm dairy productivity. The project embarked on tracking key dairy-related household data on a continuous basis in order to access critical and relevant information to drive decision making and impact. A baseline survey for the EADD II supported hub was carried out in 2014. A total of 27 hubs were surveyed (7 in Kenya, 8 in Tanzania and 12 in Uganda) and a recruitment survey was conducted between July and August 2015 to gather basic farmer information before the farmers participate in the longitudinal survey. The longitudinal survey entails collection of data on on-farm dairy productivity, on a monthly basis, until October 2018.

In Kenya and Uganda, a farmer-centric data collection system accessible by farmers on their mobile phones, Ng'ombe planner (http://np.azizi.ilri.org/ngombeplanner/), will be used to collect the longitudinal data. The farmers were trained on how to record their farm production and farm events using their mobile phones with additional support from site coordinators who follow up in cases of reported incidences. In Tanzania, the longitudinal data will be collected on a monthly basis by site coordinators (extension agents) using ODK (Open Data Kit https://opendatakit.org/), a computer-aided personal interview system (CAPI), given that no mobile service provider was available in this country to implement Ng'ombe planner.

This report provides summary information of the farmers participating in the longitudinal survey. The analysis is drawn from data gathered during the farmer recruitment survey. Section 2 of the report provides a brief on the survey methodology, while sections 3 and 4 provide regional and country specific summary statistics, respectively.

2. Methodology

The selected participating hubs are those supported by EADD II. Participant farmers for the longitudinal survey were randomly selected from the hubs' membership registers. The random sampling targeted 25 farmers per hub in each country with at least 1/3 of the 25 farmers being female farmers. The sample size was deemed sufficient to get sufficient data to represent the site, as well as cater for farmers who might drop out of the longitudinal survey (attrition). A few more farmers than the agreed sample size were invited to participate, which explains the higher sample size in some sites; in other sites, some farmers declined to participate and no replacement farmers were available. Only farmers with lactating cows at the time of the survey were included in the sample. For each farmer, a maximum of two lactating cows were identified for continuous monitoring. The two cows were identified in terms of their milk production i.e. best milk producer and worst milk producer in cases where farmers had more than two lactating cows. This was done to avoid any potential bias from farmers giving special attention to the cow(s) whose data is being collected. During the recruitment survey, data was collected on farmer characteristics, farm management practices, pedigree information on the lactating cows to be monitored and their milk production at calving. The survey tool was developed and deployed via ODK in the three countries (Kenya, Tanzania and Uganda). The ODK is a free source set of tools which helps organizations author, field, and manage mobile data collection solutions. The survey started in Uganda on 3 July 2015 and ended in Tanzania on 22 August 2015. A total of 27 hubs (7 in Kenya, 8 in Tanzania and 12 in Uganda) and 681 farmers were recruited (178 in Kenya, 198 in Tanzania and 305 in Uganda) as presented in Table 1.

Table 1: Number of farmers recruited

Country	Hub	Number of farmers
Kenya	Cherobu	26
	Kapcheno	26
	Kokiche	25
	Naitiri	25
	Ndanai	25
	Sot	26
	Torongo	25
Tanzania	Dabaga	25
	Ifunda	25
	Isaima	25
	Lukamo	25
	Mshikamano	24
	Mufindi	25
	Mviwambo	24
	Wawanjo	25
Uganda	Balawoli	28
	Bisheshe	24
	Buyende	25
	Endinzi	24
	Ishongorolo	25
	Kabujogera	23
	Kagulu	25
	Kanyanya	24
	Namwendwa	28
	Nyabuhikye	26
	Nyamitsindo	24
	Sanga	29

3. Results

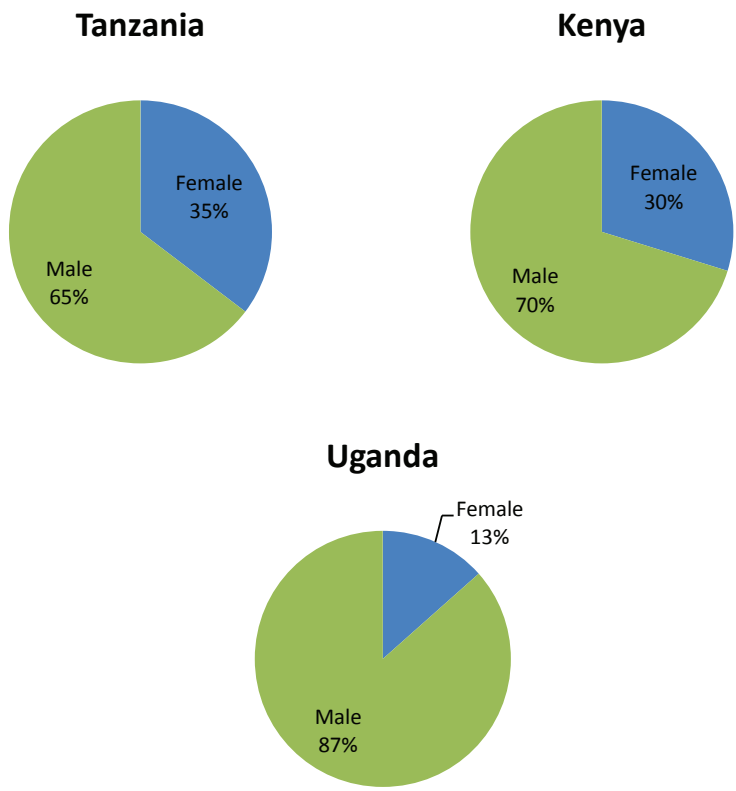
3.1 Regional characteristics

This section provides regional summary statistics at country level. For each country, information on farmer and farm characteristics, cows and breeding services is presented.

Farmer characteristics

Seventy six per cent (76%) of the farmers recruited were male farmers. Uganda had the highest proportion of male farmers and Tanzania had the highest proportion of female farmers (Figure 1). While efforts were made to include at least 1/3 female dairy farmers in each hub per country, this was not achieved in Uganda. This was due to cultural norms in some sites where male household heads are the ones who own cattle and therefore the female farmers would not participate in the survey.

Figure 1: Proportion of the gender of farmers recruited in Kenya, Uganda and Tanzania.



There was no significant difference (P<0.05) in the mean age between female and male farmers as presented in Table 2.

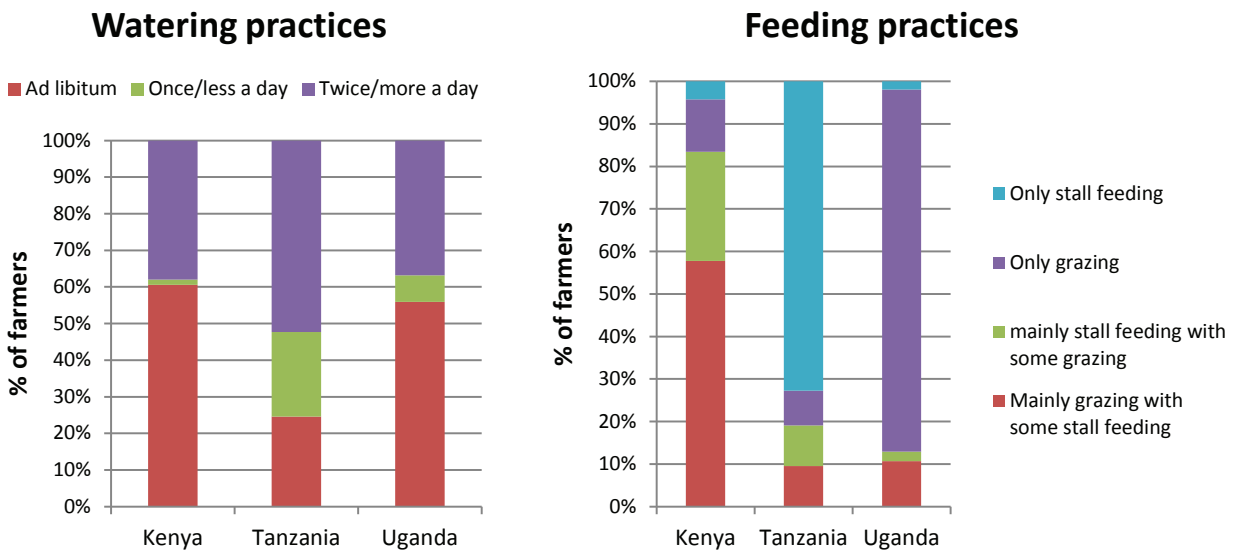
Table 2: Mean age of farmers by country

	Female		Male	
Country	N	Mean±SD (years)	N	Mean±SD (years)
Kenya	53	47.6±12.8	125	47.8±13.7
Tanzania	70	45.5±10.7	128	48.5±13.3
Uganda	41	48.5±13.6	264	46.1±13.0

Farm characteristics

Male farmers in Uganda and Tanzania had a higher mean number of cattle owned (39 and 7 respectively) than the female farmers (20 and 4 respectively). Both female and male farmers in Kenya had an equal mean number of cattle owned (Male: 7 and Female: 7). In Kenya, farmers had either one breeding bull in their farms or none. Male farmers in Uganda had up to five breeding bulls, while female farmers in Tanzania had a maximum of two or three breeding bulls. Generally, farmers in Uganda had a high mean number of lactating cows (Female:5, Male:9) compared to farmers in Kenya (Female:2, Male:2) and Tanzania (Female:1, Male:6). The farmers practiced various feeding and watering systems as presented in Figure 2. In Kenya, the main feeding system is mainly grazing with some stall feeding, while in Tanzania, the majority of farmers stall feed their cattle. On the other extreme, surveyed farmers in Uganda used only grazing as the main feeding system.

Figure 2: Feeding and watering practices of farmers by country.



Lactating cows

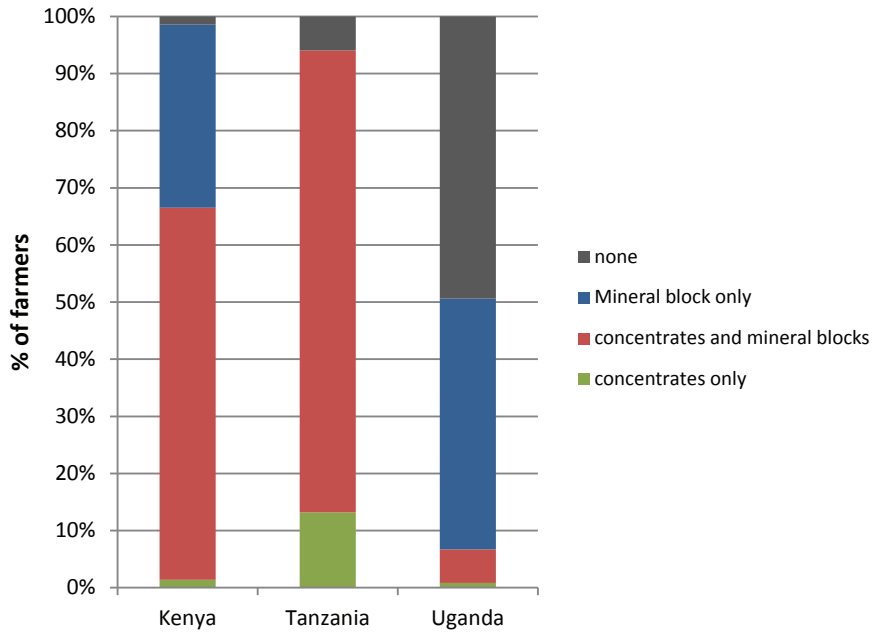
There was a significant difference (P<0.05) across the countries in the average age of the lactating cows. Cows in Kenya were significantly older (6.05 years) than cows in Uganda (5.89 years) and Tanzania (5.06 years). The mean age at first calving, in months, differed slightly across the countries (Kenya: 29.67, Tanzania: 30.64, Uganda: 29.66). Average milk production for best and worst cows, at calving, is presented in Table 3. The best morning and evening milk producing breed was pure Holstein Friesian in the three countries. However, the worst morning and evening milk producing breed differed across the countries. The worst morning and evening milk producing breeds were pure Holstein Friesian in Kenya, crosses of Holstein Friesian in Tanzania and crosses of Jersey in Uganda.

Table 3: Average daily milk production by country

		Morning milk production		Evening milk production	
Country	Cow rating	N of cows	Mean±SD (litres)	N of cows	Mean±SD (litres)
Kenya	Best producer	132	7.26±2.55	132	4.24±1.50
	Worst producer	86	4.61±1.69	84	2.74±1.24
Tanzania	Best producer	47	7.21±2.81	46	5.72±2.36
	Worst producer	27	4.41±3.05	21	3.55±2.01
Uganda	Best producer	279	7.53±3.32	244	4.31±1.96
	Worst producer	251	3.42±1.78	195	2.01±1.27

The average lactation length of the cows was significantly different ($P<0.05$) across the countries, 256±245 days in Kenya, 196±163 and 153±128 days in Tanzania and Uganda respectively. A large proportion of farmers in Kenya and Tanzania gave their lactating cows concentrates and mineral blocks, while a large proportion of farmers in Uganda did not give their lactating cows any supplements (Figure 3). Farmers in Kenya gave their lactating cows an average of 1.66±1.02 kg of concentrates/day which was lower than what farmers in Tanzania and Uganda who gave their cows 3.33±1.75 and 3.87±3.58 kg/day, respectively. The difference between the amount of concentrates given to the lactating cows in Kenya, and Uganda and Tanzania could, partly, be due to the type of concentrates the farmers use. In Kenya, pure Ayrshire breeds were given more concentrates than the other breeds, while in Tanzania pure Holstein Friesian breeds were given more concentrates. In Uganda, the Ankole and Boran breeds were given more concentrates. There was a significant ($P<0.01$) correlation of 0.26 and 0.39 between the amount of concentrate given to the cows, and the morning milk and evening milk production respectively.

Figure 3: Supplementary feeding of lactating cows in Kenya, Tanzania and Uganda.



Breeding services

Different breeding services were available in the countries (Table 4). In Kenya, artificial insemination (AI) services from private service providers was the most available breeding method while for most farmers in Tanzania bull services from other farmers which they pay for, was the most available. Most farmers in Uganda used their own bulls for breeding as it was the most available.

Table 4: Availability of breeding services by country

	Kenya		Tanzania		Uganda	
Breeding Service	N	%	N	%	N	%
EADD hub/PO AI service	94	31.44	11	4.58	7	1.88
Government AI service	5	1.67	8	3.33	2	0.54
Other bull service (free)	78	26.09	67	27.92	85	22.85
Other bull service (paid)	20	6.69	117	48.75	60	16.13
Own bull service	19	6.35	33	13.75	199	53.49
Private AI service	83	27.76	4	1.67	19	5.11

Majority of farmers in Kenya (86%) and Tanzania (70%) preferred AI as a breeding service. Farmers in Uganda were spilt between AI (50%) and bull service (46%), 4% were indifferent. The main reason farmers preferred a particular breeding service was because they wanted a progeny of better breeds. The average cost of the different breeding services varied from country to country (Table 5).

Table 5: Average cost of breeding services by country

Country	Breeding Service	Mean±SD (US dollars)
Kenya	EADD hub/PO AI service	11.86±4.08
	Government AI service	5.00
	Other bull service (paid)	3.78±2.74
	Private AI service	15.18±9.58
Tanzania	EADD hub/PO AI service	
	Government AI service	12.50
	Other bull service (paid)	8.93±10.89
	Private AI service	11.33±1.04
Uganda	EADD hub/PO AI service	22.86
	Government AI service	49.29±53.54
	Other bull service (paid)	14.44±55.13
	Private AI service	57.79±99.87

Note: Exchange rates: 1 USD = KES.100, TZS. 2500 and UGS. 3500

In Kenya and Uganda, the decision on which breeding service to use was generally made by the household head, while in Tanzania the decision was mostly made jointly between the household head and the spouse. The proportion of farmers using the different breeding services available in their area is presented in Table 6.

Table 6: Use of the different breeding services by county

	Kenya		Tanzania		Uganda	
Breeding Service	N	%	N	%	N	%
EADD hub/PO AI service	60	28.30				
Government AI service	4	1.89	2	1.33		
Other bull service (free)	58	27.36	51	34.00	51	22.17
Other bull service (paid)	9	4.25	78	52.00	37	16.09
Own bull service	18	8.49	17	11.33	130	56.52
Private AI service	63	29.72	2	1.33	12	5.22

3.2 Country characteristics

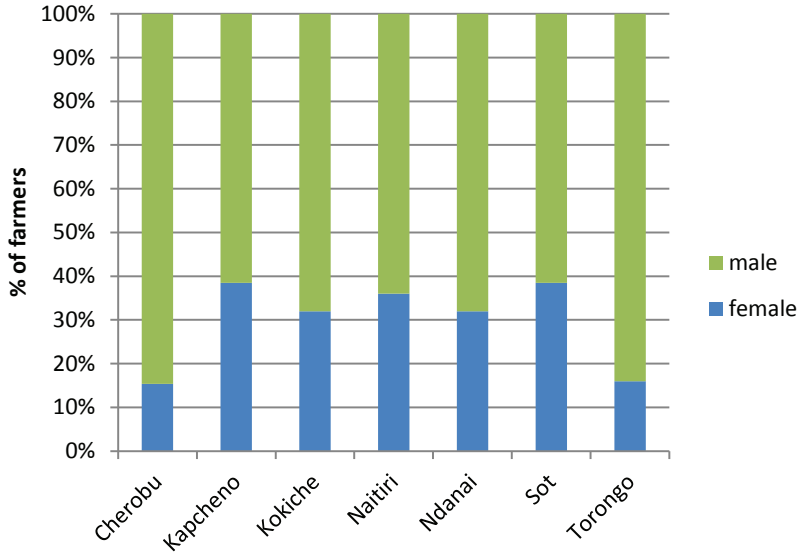
This section provides country specific summary statistics at hub level. For each country, hub information on farmer and farm characteristics, cows and breeding services is presented.

Kenya

Farmer characteristics

As evident from the results presented in Figure 4, out of the seven sites in Kenya, Torongo and Cherobu had the lowest proportion of female farmers recruited. This is because of the hubs having few registered and active female farmers, and some female farmers didn't attend the recruitment exercise. The other sites had at least 30% women farmers recruited.

Figure 4: Gender of farmers recruited in Kenya.



The mean age of the farmers in each hub is presented in Table 7.

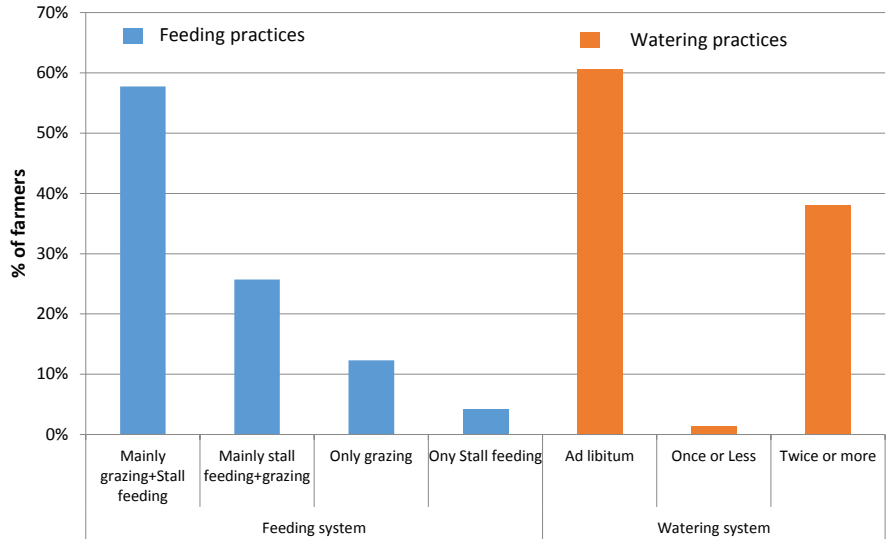
Table 7: Mean age of farmers recruited in Kenya

	Female		Male		All Farmers	
Hub	N	Mean±SD (years)	N	Mean±SD (years)	N	Mean±SD (years)
Cherobu	4	39.25±16.66	22	39.41±9.60	26	39.38±10.53
Kapcheno	10	48.80±10.58	16	51.50±14.03	26	50.46±12.66
Kokiche	8	38.38±10.97	17	46.24±11.89	25	43.72±11.97
Naitiri	9	50.56±17.20	16	50.94±9.98	25	50.80±12.69
Ndanai	8	44.88±9.13	17	41.29±10.53	25	42.44±10.05
Sot	10	51.10±9.00	16	48.50±13.08	26	49.50±11.56
Torongo	4	61.25±9.50	21	57.24±17.10	25	57.88±16.03

Farm characteristics

On average, the farmers had seven heads of cattle in their farms. The maximum number of breeding bulls kept on farm was one. Cherobu female farmers, Kapcheno and Kokiche male farmers did not keep any breeding bulls in their farms unlike farmers in the other hubs. The average number of lactating cows owned by either female or male farmers was two. More than half of all the farmers, mainly grazed their cattle with some stall feeding (57%) and provided water to the cattle ad libitum (61%) (Figure 5).

Figure 5: Feeding and watering practices of farmers in Kenya.



Lactating cows

The mean age of the lactating cows to be monitored and their age at first calving in presented in Table 8. Ndanai had the highest mean morning milk production from their best cows (8.73±2.99 litre/day) and worst milk producing cow (5.3±1.79). Naitiri had the lowest mean morning milk production from their best producing cows (5.53±1.92 litre/day), while Sot had the lowest mean morning milk production from their worst producing cows (3.67±0.81 litre/day). Sixty-five per cent of the farmers gave their lactating cows concentrates and mineral blocks, while 32% of the farmers gave their lactating cows mineral blocks only. On average, the cows were given 1.67±1.01 kg of concentrates per day.

Table 8: Mean cow age and age at first calving in Kenya

	Cows' age		Age at first calving	
Hub	N	Mean±SD (years)	N	Mean± SD (months)
Cherobu	19	6.74±4.23	20	30.65±7.58
Kapcheno	20	6.10±2.36	27	28.44±8.39
Kokiche	12	4.92±2.07	18	28.67±5.70
Naitiri	13	7.31±3.25	15	29.00±4.00
Ndanai	23	5.35±3.20	29	28.66±6.00
Sot	11	5.73±2.20	17	33.88±7.55
Torongo	15	6.27±2.19	19	29.63±7.31

Breeding services

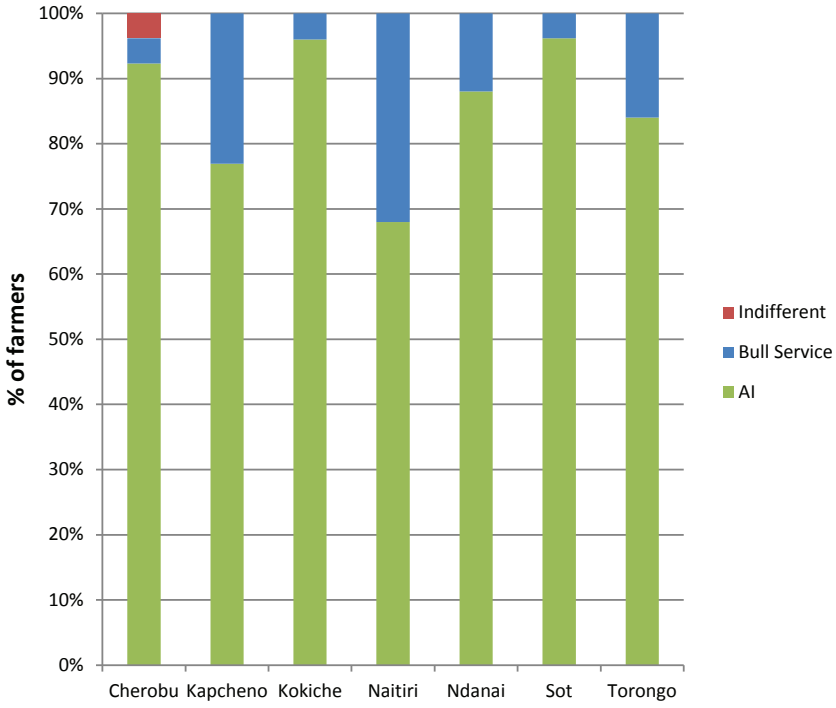
AI services from EADD hubs were available to 31% of the farmers, while AI from private service providers was available to 28% of the farmers. Only 6% of the farmers had their own bulls available for breeding. The use of the different breeding services available per hub is presented in Table 9.

Table 9: Use of breeding services by farmers in Kenya

	EADD hub/PO AI service		Gov't AI service		Other bull service (free)		Other bull service (paid)		Own bull service		Private AI service	
Hub	N	%	N	%	N	%	N	%	N	%	N	%
Cherobu	6	20.00	2	6.67	8	26.67	3	10.00	1	3.33	10	33.33
Kapcheno	5	15.63			16	50.00	1	3.13	2	6.25	8	25.00
Kokiche	9	33.33	1	3.70	5	18.52			1	3.70	11	40.74
Naitiri	5	20.00			1	4.00	5	20.00	4	16.00	10	40.00
Ndanai	9	30.00	1	3.33	7	23.33			3	10.00	10	33.33
Sot	11	31.43			15	42.86			4	11.43	5	14.29
Torongo	15	45.45			6	18.18			3	9.09	9	27.27

The average cost of AI from EADD hubs was higher in Kapcheno (KES 1283±421) and lower in Torongo (KES 971±427) compared to the other hubs. Ndanai had the highest cost of AI from private service providers (KES 1818±1,967), while Sot had the lowest average price (KES 1120±109). The decision on which breeding service to use was mostly made by the household head. Figure 6 shows the preferred breeding service per hub. The main reason for the breeding method preferred was to have better breeds.

Figure 6: Preferred breeding service by farmers in Kenya.

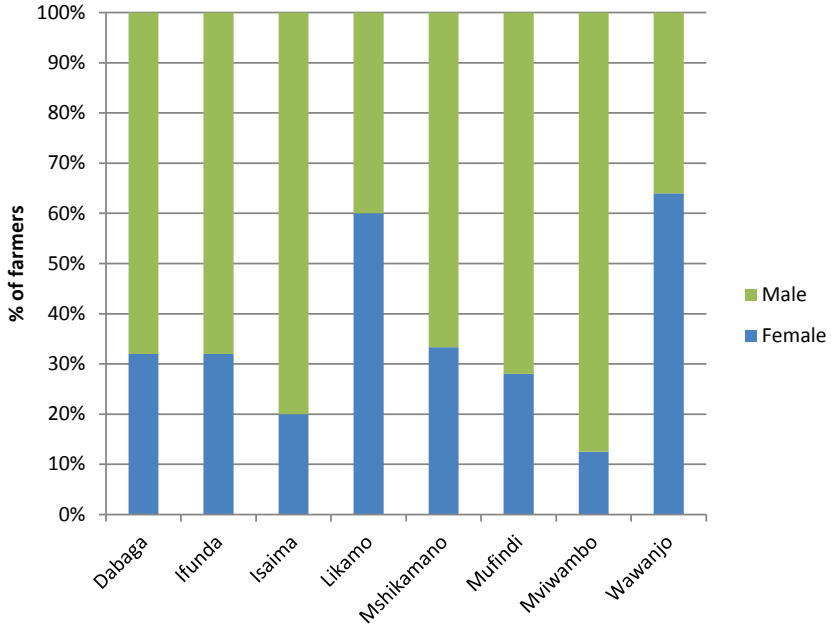


Tanzania

Farmer characteristics

Wawanjo had the highest proportion of female farmers recruited while Mviwambo had the lowest proportion (Figure 7).

Figure 7: Gender of farmers recruited in Tanzania.



The farmers across the hubs were of different ages. The mean age of the farmers per hub is presented in Table 10.

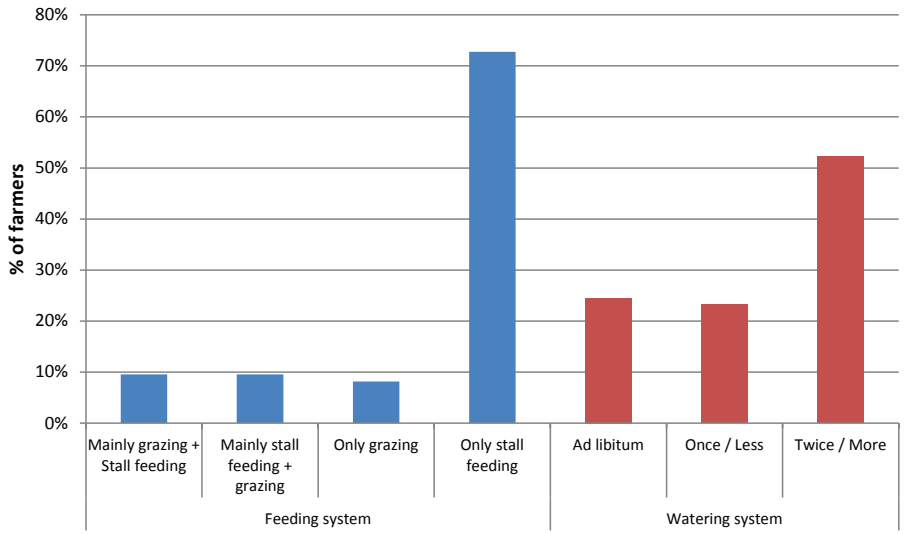
Table 10: Mean age of farmers recruited in Tanzania

	Female		Male		All farmers	
Hub	N	Mean±SD (years)	N	Mean±SD (years)	N	Mean±SD (years)
Dabaga	8	48.25±16.45	17	52.76±11.45	25	51.32±13.06
Ifunda	8	52.63±14.37	17	57.06±13.87	25	55.64±13.90
Isaima	5	41.80±5.63	20	41.45±11.01	25	41.52±10.07
Lukamo	15	44.20±9.50	10	47.40±13.13	25	45.48±10.94
Mshikamano	8	42.00±7.21	16	48.50±16.82	24	46.33±14.50
Mufindi	7	52.57±8.04	18	49.83±10.97	25	50.60±10.15
Mviwambo	3	49.00±5.29	21	46.86±13.34	24	47.13±12.56
Wawanjo	16	41.00±7.84	9	42.33±9.00	25	41.48±8.14

Farm characteristics

Mufindi had the highest mean number of cattle owned by both male (11±10) and female (9±12) farmers. The female farmers in Dabaga, Lukamo, Mshikamano and Mviwambo did not keep any breeding bull in their farms. All male farmers had an average on one breeding bull. The farmers had an average of one lactating cow in their farms. A large proportion of farmers practiced stall feeding only with more than half of the farmers giving water to their cattle twice or more in a day (Figure 8).

Figure 8: Feeding and watering practices of farmers in Tanzania.



Lactating cows

Table 11: Average cows' age and age at first calving of the lactating cows in Tanzania

	Cows' Age		Age at first calving	
Hub	N	Mean±SD (years)	N	Mean±SD (months)
Dabaga	4	5.50±4.04	5	26.80±1.79
Ifunda	6	10.83±3.76	9	38.89±19.17
Isaima	16	6.56±4.13	23	26.61±6.07
Lukamo	9	4.78±3.31	32	27.22±2.06
Mshikamano	3	5.33±2.08	24	30.83±10.28
Mufindi	16	5.75±2.46	18	38.00±11.50
Mviwambo	6	3.67±1.21	7	29.86±3.98
Wawanjo	6	4.00±2.00	12	31.92±6.49

Among all the hubs, Isaima had the highest mean morning milk production (9.88±3.47 litre/day) and mean evening milk production (8.88±4.13 litre/day) from their best cows. Dabaga had the lowest mean morning milk production from their best cows (4.75±0.50litre/day), while Ifunda had the lowest mean evening milk production from their best cows (4.92±1.59 litre/day). On the other hand, Wawanjo had the highest mean morning milk production (8.20±3.19 litre/day) and mean evening milk production (5.60±2.88 litre/day) from their worst cows. Eighty-one per cent of the farmers gave their lactating cows concentrates and mineral blocks, 13% gave their cows concentrates only and 6% did not give their cows any supplements. Farmers in Wawanjo gave their lactating cows an average of 4.23±2.73 kg of concentrates per day which was higher compared to the other sites (3.18±1.48 kg/day).

Breeding services

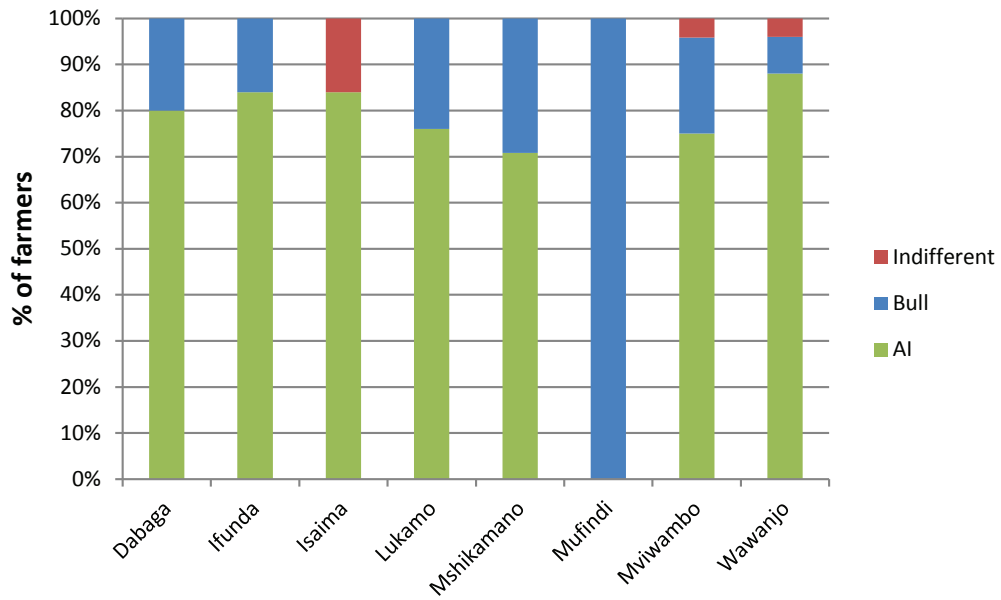
The most available form of breeding service was bull service from other farmers at a fee. This method was available to 49% of the farmers, while free bull service was available to 28% of the farmers. AI from private service providers was available to only 2% of the farmers, while AI from the government was only available to 3% of the farmers. The use of the different breeding services available per hub is presented in Table 12.

Table 12: Use of breeding services in Tanzania

	Gov't AI service		Other bull service (free)		Other bull service (paid)		Own bull service		Private AI Service	
Hub	N	%	N	%	N	%	N	%	N	%
Dabaga	1	9.09	1	9.09	8	72.73	1	9.09		
Ifunda			5	27.78	10	55.56	3	16.67		
Isaima			2	8.70	19	82.61	2	8.70		
Lukamo			16	69.57	5	21.74	1	4.35	1	4.35
Mshikamano	1	16.67			5	83.33				
Mufindi			5	26.32	5	26.32	8	42.11	1	5.26
Mviwambo			1	5.00	18	90.00	1	5.00		
Wawanjo			21	70.00	8	26.67	1	3.33		

AI from EADD hubs was available in Dabaga only. The average cost of bull service was high in Lukamo and Mufindi (TZS 30,000). More than 70% of all the farmers in the sites, except Mufindi, preferred AI to bull service. Interestingly, all the farmers in Mufindi preferred bull service to AI (Figure 9). The main reason for the breeding method the farmers preferred was to have better breeds.

Figure 9: Preferred breeding service by farmers in Tanzania.

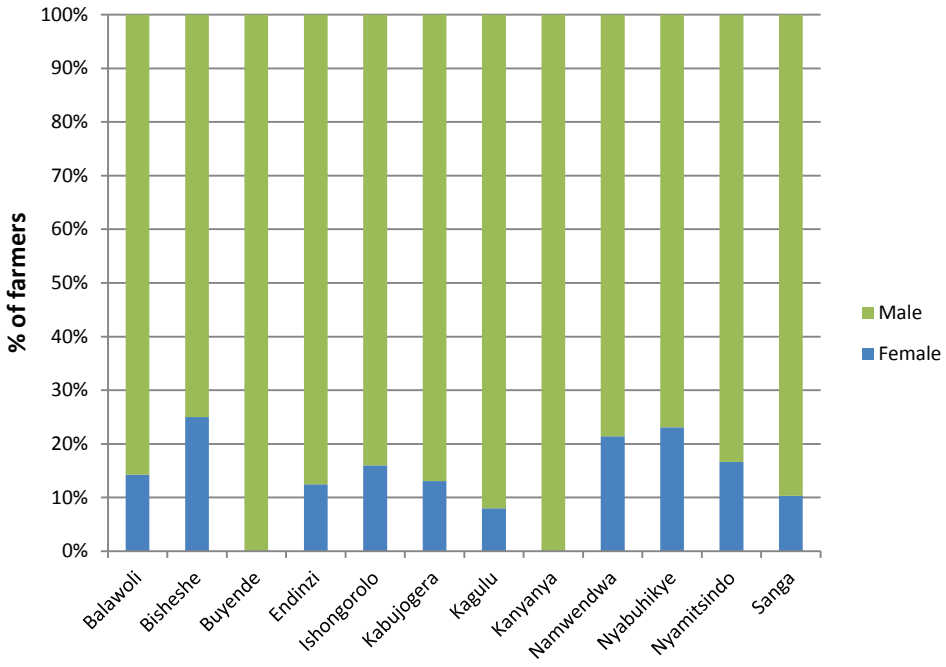


Uganda

Farmer characteristics

Female farmers comprised less than 30% of the farmers recruited in all the hubs. No female farmers were recruited in Kanyanya and Buyende (Figure 10). This is because culturally, cattle are owned by men.

Figure 10: Gender of farmers recruited in Uganda.



Across all hubs, Nyabuhikye had the highest mean age for female farmers (60.3±18.4), while Bisheshe has the highest mean age for male farmers (51.5±15.4) as presented in Table 13.

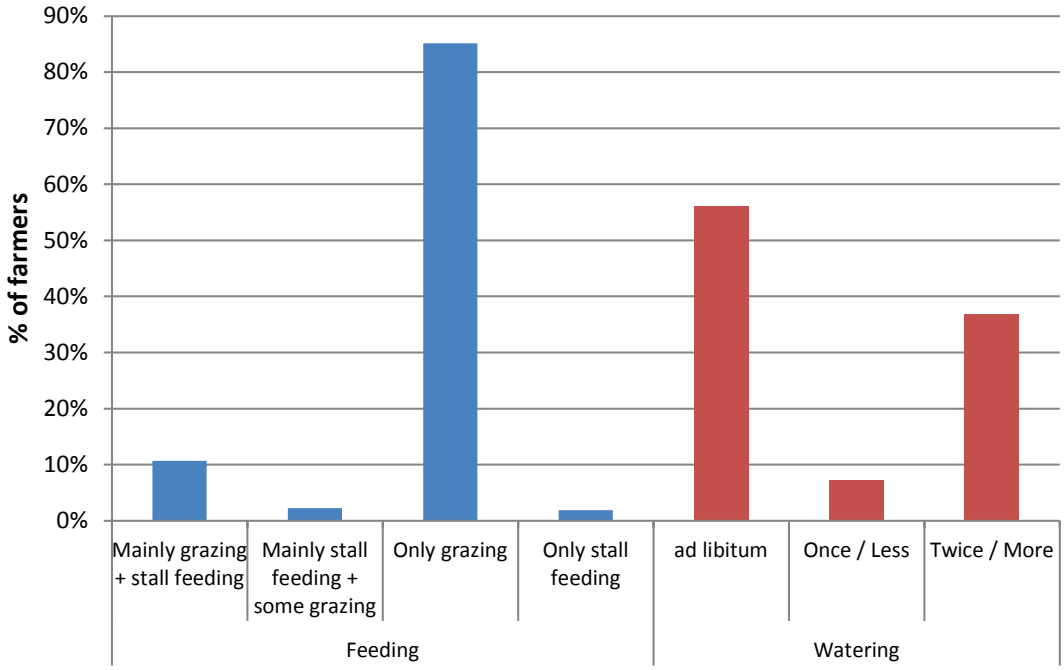
Table 13: Average age of female and male farmers recruited in Uganda

	Female		Male		All farmers	
Hub	N	Mean±SD (years)	N	Mean±SD (years)	N	Mean±SD (years)
Balawoli	4	48.75±6.18	24	44.58±11.97	28	45.18±11.34
Bisheshe	6	48.83±17.70	18	51.50±15.41	24	50.83±15.65
Buyende			25	41.68±12.89	25	41.68±12.89
Endinzi	3	43.67±10.02	21	49.48±12.86	24	48.75±12.51
Ishongorolo	4	53.00±15.10	21	43.90±14.49	25	45.36±14.67
Kabujogera	3	45.33±10.79	20	48.90±11.38	23	48.43±11.13
Kagulu	2	46.50±4.95	23	39.61±11.61	25	40.16±11.13
Kanyanya			24	43.88±8.70	24	43.88±8.70
Namwendwa	6	42.33±14.67	22	50.68±8.99	28	48.89±10.72
Nyabuhikye	6	60.33±18.42	20	50.50±17.31	26	52.77±17.71
Nyamitsindo	4	46.75±10.44	20	48.60±11.27	24	48.29±10.94
Sanga	3	42.33±4.93	26	43.73±14.30	29	43.59±13.58

Farm characteristics

Generally, male farmers had large cattle herds than female farmers. Both female and male farmers in Endizi had the largest cattle herds, 48±19 and 89±72 respectively, while Namwendwa had the lowest mean number of cattle herd, 3±2 and 10±18 for female and male farmers respectively. The average number of breeding bulls kept in the farms was one. Female farmers had an average of 5±4 lactating cows and male farmers had an average of 9±12 lactating cows. Most of the farmers practiced grazing only, with more than half giving water ad libitum to their cows (Figure 11).

Figure 11: Feeding and watering practices of farmers in Uganda.



Lactating cows

The mean age and age at first calving of the cows to be monitored is presented in Table 14.

Table 14: Average cows' age and age at first calving of the lactating cows in Uganda

	Cows' Age		Age at first calving	
Site	N	Mean±SD (years)	N	Mean±SD (months)
Balawoli	8	7.88±5.33	19	27.47±5.07
Bisheshe	5	4.60±2.41	18	24.17±0.86
Buyende	7	7.86±5.27	28	30.75±7.70
Endinzi	19	5.05±1.84	22	28.55±5.32
Ishongorolo	20	3.75±1.41	29	30.83±15.39
Kabujogera	6	6.00±4.82	26	27.81±7.13
Kagulu	11	4.55±1.69	16	30.25±9.50
Kanyanya	20	4.55±2.89	23	35.43±10.22
Namwendwa	16	4.88±3.83	24	27.38±5.87
Nyabuhikye	3	6.00±1.73	20	26.40±5.02
Nyamitsindo	18	4.83±3.26	17	28.65±7.29
Sanga	22	5.09±3.13	26	35.19±12.17

Sanga had the highest mean morning and evening milk production from their best cows, 9.57±3.10 litre/day and 6.32±2.36 litre/day respectively. Kagulu had the lowest mean morning and evening milk production from their best cows, 4.72±2.71 litre/day and 2.93±1.88 litre/day respectively. Nyabuhikye had the highest average morning milk production (4.48±1.98 litre/day) and the highest average evening milk production (2.56±1.28 litre/day) from their worst cows. Forty-nine per cent of the farmers did not give any supplements to their lactating cows, while 44% gave their cows mineral blocks only.

Breeding services

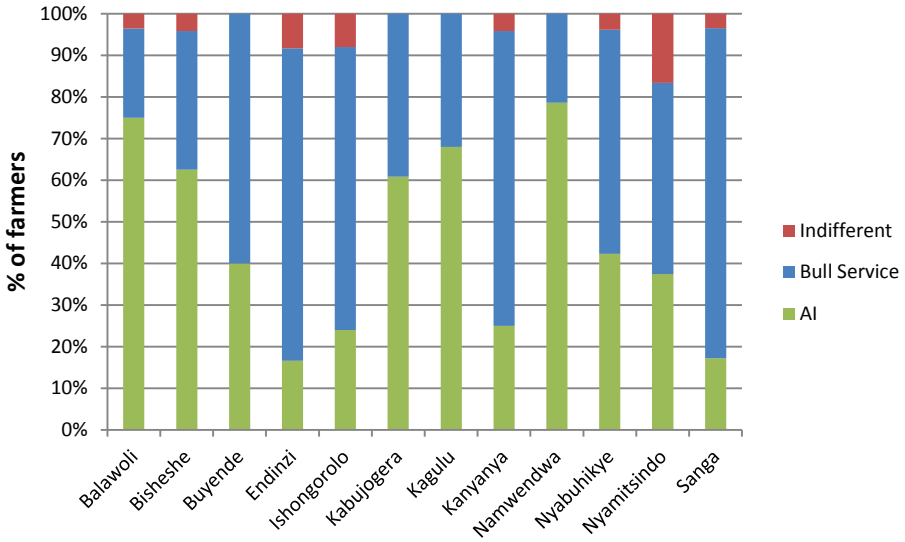
Own bull service was available to more than half of the farmers (54%), while AI service from government, private AI service providers and EADD hubs was available to 8% of the farmers. Free bull service from other farmers was available to 23% of the farmers. The use of the breeding services available in the different hubs is presented in Table 15.

Table 15: Use of breeding services in Uganda

	Other bull service (free)		Other bull service (paid)		Own bull service		Private AI service	
Hub	N	%	N	%	N	%	N	%
Balawoli	6	23.08	13	50.00	6	23.08	1	3.85
Bisheshe	8	47.06	1	5.88	8	47.06		
Buyende	3	16.67	6	33.33	7	38.89	2	11.11
Endinzi					21	100.00		
Ishongorolo	2	11.76			15	88.24		
Kabujogera	6	42.86			8	57.14		
Kagulu	11	57.89	4	21.05	4	21.05		
Kanyanya	2	12.50	0	0.00	14	87.50		
Namwendwa	3	13.04	12	52.17	5	21.74	3	13.04
Nyabuhikye	5	26.32			11	57.89	3	15.79
Nyamitsindo	4	20.00			13	65.00	3	15.00
Sanga	1	5.00	1	5.00	18	90.00		

The average cost of AI from private AI service providers was higher in Nyamitsindo (UGS 775, 000±601,040). The average cost of bull service was lower in Balawoli and Bisheshe at UGS 12, 500±6614 and 12,500±3535 respectively. The decision on which breeding service to use was mostly made by the household head. Namwendwa had the highest proportion of farmers preferring AI, while Endizi and Sanga had the highest proportion of farmers preferring bull service (Figure 12). The main reason for the different breeding services preferred was to have better breeds.

Figure 12: Preferred breeding service by farmers in Uganda.



4. Summary of findings

The survey was conducted in selected EADD II supported hubs in Kenya, Tanzania and Uganda. About 25 households per hub were sampled. The households were randomly selected from the lists of registered and active members in the hubs, with the aim of having one third of the farmers being women. The total number of farmers recruited in Kenya was 178, 198 in Tanzania and 305 in Uganda.

4.1 Farmer characteristics

There were no large disparities in farmers' age between male and female farmers in the three countries. Most of the farmers were in their mid to late forties. However, others were as young as 25 years old and as old as 80 years old.

4.2 Farm characteristics

Farmers in Uganda kept large herds of cattle, 39 on average, compared to farmers in Tanzania and Kenya, 7 and 6 on average respectively. However, farmers in Kenya had fewer breeding bulls compared to those in Tanzania and Uganda. Notably, the farmers had different feeding practices. The majority of Kenyan farmers practiced mostly grazing with some stall feeding. In Tanzania, most farmers practiced stall feeding only. However, in Uganda most farmers purely grazed their cattle. Very few farmers in Kenya and Uganda gave their cows water once or less per day. Water was given ad libitum. The proportion of farmers giving their cattle water once or less in a day was however higher in Tanzania.

4.3 Lactating cows

The cows to be monitored were on average not more than six years old, with the age at first calving being 29 months on average. The average difference in the overall morning milk production (7.4 litres/day) between the best cows and worst cows was 3.6 litres/day. Generally, milk production in the evening was lower than the milk production in the morning. Most farmers in Kenya and Tanzania used concentrates and mineral supplements for their lactating cows. A large proportion of farmers in Uganda did not give their lactating cows any mineral supplements or concentrates.

4.4 Breeding services

Various breeding services were available to the farmers. The availability of AI from the EADD hubs was much higher in Kenya than in Tanzania and Uganda, showing that the Kenya hubs are at a more advanced stage of development. The same applies to the availability of AI from private AI service providers. The number of service providers and the frequency of use depended on the availability and cost of the breeding service. The breeding methods were not all efficient with repeats being reported. Interestingly, in Tanzania, the choice of breeding service to use was mostly made

jointly between the household head and the spouse, unlike in Kenya and Uganda where the household head was the main decision maker. AI was most preferred in Kenya and Tanzania. In Uganda, there was an almost equal division between farmers preferring AI and those preferring bull services. The preference of the breeding methods was influenced mostly by the need of having a progeny of better breeds, then the cost of the breeding method.

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