KENYA HOUSEHOLDS AND LIVESTOCK SYSTEMS ADAPTATION SURVEY

BACKGROUND INFORMATION

A baseline study was conducted by the Livestock and Climate Initiative in Nandi and Bomet Counties to identify potential pioneers of climate change adaptation in smallholder dairy systems. A total of 10 sub-Counties and 40 wards were selected based on the agroecological potential for dairy production and the potential for scaling feed production and preservation practices from farmer to farmer. One thousand sixteen households participated in the survey in November and December 2022.

The following aspects were assessed during the study; household demographics, socioeconomic and institutional factors, livestock and crop production, relative vulnerability, innovation, food security, technologies, and practices. GPS-marked sampling points were distributed randomly per ward to identify households within the selected wards, and interviews were conducted with dairy-keeping households closest to the GPS point. The interview respondents were people responsible for livestock management within the household.

SUMMARY OF FINDINGS

I. SAMPLE SIZE

Four and six sub-counties were visited in Bomet and Nandi, respectively (Table 1).

Table 1: Number of households interviewed in Nandi and Bomet

Bomet		Nandi	
Sub-Counties	Number of households interviewed	Sub-Counties	Number of households interviewed
Bomet Central	154	Aldai	88
Bomet East	117	Chesumei	110
Chepalungu	89	Emgwen	66
Sotik	151	Mosop	154
		Nandi Hills	43
		Tinderet	44
Total	511	Total	505

2. BASIC CHARACTERISTICS OF THE STUDY POPULATION

The average age of household heads was 55 years, with the mean age in female-headed households being significantly ($p < 0.01$) higher than in male-headed households (Table 2). On the other hand, the average household size in female-headed households was 5 and 6 in male-headed households, and the result was significant at a 1% significance level.

Table 2: Basic characteristics of the study population for continuous variables

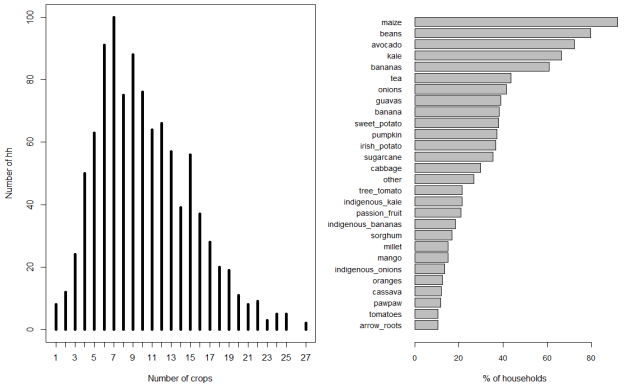
Variable	Total		Female		Male		
	Mean	Sd	Mean	Sd	Mean	Sd	t-test value
Age of household head(years)	55.79	13.97	61.5	13.16	54.98	13.90	4.96***
Household size	6.06	2.30	5.28	2.59	6.17	2.23	-4.10***

Note: *** indicates significance at 1% level; Sd means standard deviation.

3. CROP DIVERSITY

Different crops are grown by the different households (Figure 1). Most farmers grew between 6 and 13 crops, with maize, beans, avocado, kale, and banana being the most common. On the other hand, indigenous onions, oranges, cassava, pawpaw, tomatoes, and arrow roots were the least common.

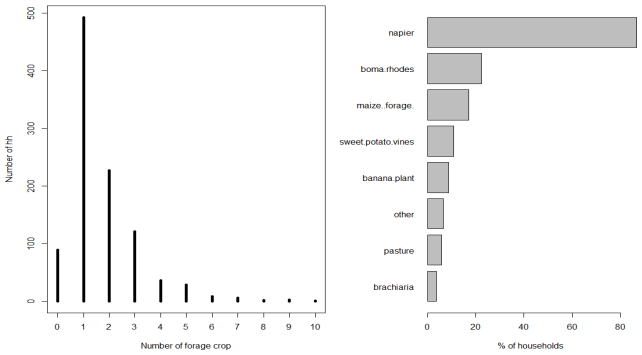
Figure 1: Diversity of crops grown by the households



4. FORAGE DIVERSITY

Forage diversity varies between different households (Figure 2). Most farmers grew Napier grass as a forage crop (>80%). In addition, Boma Rhodes, sweet potato vines, and maize grown as forage were popular second forage options. Bracharia and pasture were the least common forage crops.

Figure 2: Forage diversity



Forage diversity varied between 1 and 3 forage crops (Table 3). Furthermore, forage diversity was slightly higher in Bomet than in Nandi (median of 2 in Bomet compared to 1 in Nandi).

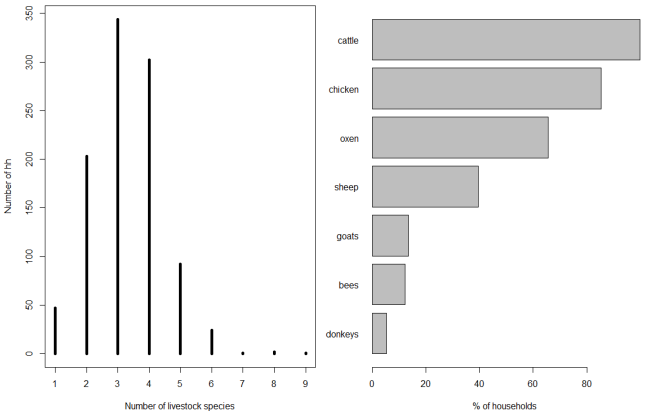
Table 3: Forage diversity by location

	Bomet	Nandi
Minimum	0.00	0.00
1st quartile	1.00	1.00
Median	2.00	1.00
Mean	1.98	1.45
3rd quartile	3.00	2.00
Maximum	10.00	9.00

5. Livestock diversity

Most small-holder farmers had between 3 and 4 livestock species, with cattle, chicken, oxen, and sheep being the most popular (Figure 3).

Figure 3: Livestock diversity



Most households had between 1 and 4 animals with no difference between locations (Table 4). Households in Nandi had a maximum of 9 livestock types, with their counterparts in Bomet having a maximum of 6.

Table 4: Livestock diversity by location

	Bomet	Nandi
Minimum	1.00	1.00
1st quartile	2.00	3.00
Median	3.00	3.00
Mean	3.10	3.45
3rd quartile	4.00	4.00
Maximum	6.00	9.00

6. MILK PRODUCTION

Milk yield was generally higher in Nandi, with most milk yield between 3 and 6.5 l/day/cow, compared to between 1.5 to 5.5 l/day/cow in Bomet (Table 5).

Table 5: Milk yield by location

	Bomet	Nandi
Minimum	0.00	0.00
1st quartile	1.50	3.00
Median	3.68	4.67
Mean	3.87	5.23
3rd quartile	5.50	6.50
Maximum	18.50	28.50

7. FOOD SECURITY

Households in Nandi reported experiencing less food shortage than households in Bomet (Table 6).

Table 6: Food security by location

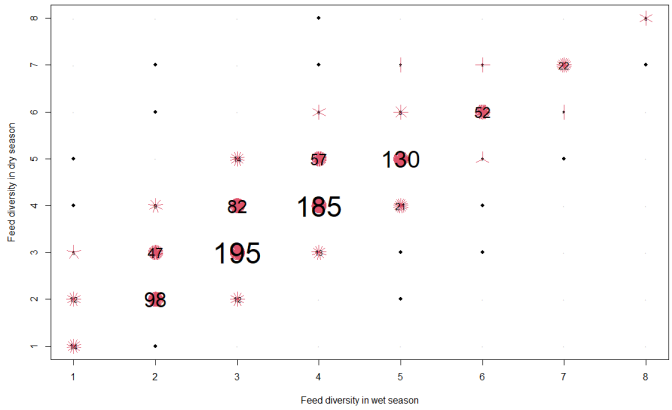
	Bomet	Nandi
Percentage of households with no food shortage	0.39	0.65
Percentage of households with 3 or more months of food shortage	0.40	0.22

65% of households in Nandi had no food shortage, and only 22% reported food shortage for three months or more. In Bomet, only 39% of households reported no food shortage, and 40% experienced food shortage for three months or more. Food shortages mainly happened during the first quarter (January, February, and March).

8. CATTLE FEED BASKET

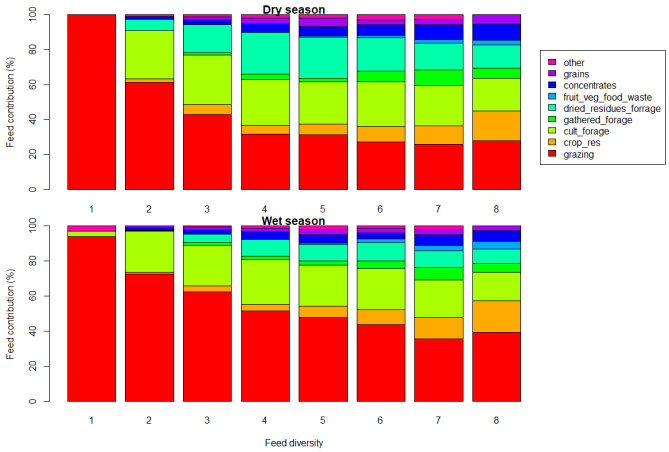
Most households had similar feed diversity in the dry and wet seasons (mostly between 2 and 5 items) (Figure 4). Some households add one item in the dry season to complete the feed basket and compensate for the lower grazing availability.

Figure 4: Feed diversity in the wet and dry seasons



Apart from grazing, cultivated forage and dried residues were among the most critical feed items in the cattle diet (Figure 5). The composition of the feed basket changed with the diversity of the feed basket. When the feed basket was limited to 1 element, cattle were only fed with grazing. When the feed basket was limited to 2 elements, cultivated forage was the first additional feed that appeared when the feed basket contained at least two elements. Grazing was the most important feed source, representing 60% of feed in the dry season and 70% in the wet season. The contribution of grazing decreased with the diversity of feed baskets and went down to 30% in the dry season or 40% in the wet season with the more diverse feed baskets. Dried residues forage, crop residues, and concentrates were other key additional feed sources for cattle.

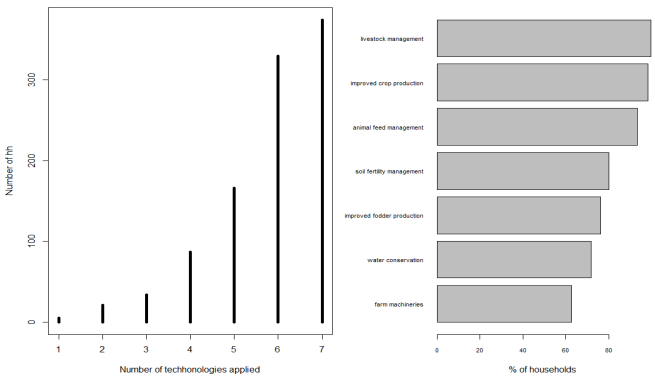
Figure 5: Feed contribution percentage in the wet and dry season



9. TECHNOLOGIES

The team assessed which technologies farmers were implementing. Livestock management, improved crop production, and animal feed management were the most implemented technologies (Figure 6). Among the most popular sub-technologies (>80%) were applying manure as crop fertilizers, weed control, deworming cattle, and giving cattle acaricides and salts or minerals.

Figure 6: Summary of technologies implemented by households



NEXT STEPS

The next step in the process is the analysis and identification of pioneer households for climate change adaptation. 81 households have been identified in the first round of the analysis using a set of indicators. These households will be assessed in a second round of interviews before the final list of pioneers is determined. The selected pioneers' households will participate in a six-month participatory data collection and learning phase. During this phase, the farmers will benefit from expert training, farmer-to-farmer field days, and potentially analysis of feed samples.

To get an update on the progress or to participate in forthcoming activities in your area, kindly contact your chief's office.

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