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Production Challenges and Socio-Economic Impact of Dairy Goat Farming amongst Smallholder Farmers in Kenya.

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ABSTRACT
Dairy goats were first introduced in Kenya in 1950s by British settler farmers in the highlands of Kenya. About 25 years ago the population was estimated at 6,000. The most recent estimate puts the dairy goat population in Kenya at 175,000. The rapid growth has been attributed to the NGOs like Heifer Project International involving smallholder farmers in a participatory approach.
The objective of this study was to identify opportunities and challenges amongst smallholder dairy goat farmers, and specifically to evaluate production levels, consumption trends and potential for growth and marketing. Sixty households were interviewed.
Amongst households 826 were women of whom 304 were widows, 226 were men. The mean family size was 9.24. There were a total of 4545 children in the households, amongst them 2200 orphans. 68% households had male heads, while 32% had female heads. However, in 74% of the households, females took charge of the daily management of the goat, while in only 26% households males were in charge.
Milk production levels ranged between half a litre and ten litres, with overall mean production of 2.15 litres per goat per day.
In total, 56.9% of respondents depended entirely on farming activities for livelihood, while 43.1% combined farming and off-farm activities for livelihood.
Only 12% used hired labour while 88% depended entirely on family labour for managing the goats.
None of the farmers had previous experience in managing a dairy goat. There was need for a systematic practical initial training with a focus on key areas such as feeding and feed resources, breeding, milking, health and record keeping. There was no standard record keeping format.
The small pieces of land, especially in Nyanza had a negative effect on dairy goat farming in terms of pasture and fodder production. In Oriang and Ndiru clusters all the family land available was utilized for subsistence farming.
There was lack of knowledge of feeding regimes for various categories e.g. the lactating doe, flushing and kids. None of the farmers had knowledge of estimating feed weights, and making appropriate mixtures of the available feeds.
Local goats were popular. Upgrading of these goats through crossbreeding would form entry point for a large number of farmers thus increasing dairy goat population faster.
Key words: Dairy goats, socio-economic, production, smallholder farmer.

1.0 INTRODUCTION

Worldwide dairy goats contribute between two and two and a half (2.5) percent of the total milk consumed. In the past 20 years there has been a significant rise in milk production, particularly in low income countries (Morand Fehr, Lebbie, 2004). Food and Agriculture (FAO) statistics (FAO, 2001) indicated that between 1980 and 1999, goat milk production worldwide increased by 55% while the goat population increased by 58%.
In developing countries goat milk is generally home consumed, or sold to neighbours, unlike cow milk which has an organized and regulated production and marketing (Agreste, 2001; Dubeuf, *et al.,* 2004).

Dairy goats were first introduced to Kenya in 1950s by the British settler farmers. The goats which originated from Europe were confined in the highlands. From the settler farms they spread to the adjoining peasant farms mostly through purchase of bucks for upgrading the indigenous breeds. In the 1970s and 1980s, dairy goats were introduced in various government institutional farms from where they were sold to farmers. During the same period, Kenya Government and the Food Agricultural Organization (FAO) started a sheep and goats project at the National Animal Husbandry Research Station, Naivasha and other sub-stations, for evaluation and research of exotic goat breeds.

Also in the early 1980s the Small Ruminant Collaborative Research Support Program (SC-CRSP) was started to carryout on-farm research on the dual-purpose goat in Western Kenya (Gichohi, 1998).
In recent times commercial dairy goat farming in Kenya has increased significantly both in high and medium potential regions. During the past 25 years dairy goat population has increased rapidly from an estimated 6000 (Stotz, 1981) to 40,000 (MOLD, 1995), 100,000 (Ahuya *et al.*, 2005) to the current estimate of 175,000.
The rapid growth has been attributed to the involvement of NGOs which came up with an innovative idea of targeting CBOs of smallholder peasant farmers (Ahuya, *et al.*, 2005).

2.0 MATERIALS AND METHODS

A cross-sectional survey was carried amongst smallholder dairy goat keeping households in the Coast Province, districts of Kwale and Taita / Taveta.
In Nyanza province, districts of Homa Bay, Migori, Suba, Siaya and Nyando; in Rift Valley province, district of Bomet.
Using a structured questionnaire, administered over a three months period in 60 households, the questions focused on demographic information, family structure, land-use, production, purpose for keeping dairy goats, sources of income, labour supply, consumption and sales of goat milk, water and feeds availability, housing, breeding, extension and record keeping and animal health, with samples collected for screening for mastitis.

3.0 RESULTS

3.1 Ratio of men to women in smallholder dairy goat farming areas in Kenya

Amongst the 1052 registered household members, 826 were women out of whom 304 were widows. 226 were men, out of whom 17 were widowers. The ratio of women to men was 4:1.

3.2 Sources of labour

Figure 1 shows the sources of labour for goat care. Only 7 (12%) the interviewed families depended on hired labour, while 51 (88%) depended on members of their family for labour.
Table 1 indicates the age brackets of those who cared for the goats. 63% of the family members caring for goats fell in the age bracket of 31 to 50 years old, 32% were aged above 50 years, while only 5% were below the age of 30 years.

3.3 Sources of income

56.9% of the goat keeping households depended entirely on their farms for livelihoods, while 43.1% had supplementary sources of income, mostly from employed member of family.
In Kwale 90.9% and in Bomet 71.4% of the families depended entirely on farms. Table 2 shows these differences.

3.4 Reasons for keeping dairy goat

Table 3 indicates in summary the reasons for keeping dairy goats, 74% of respondents kept the dairy goats for income, milk consumption and manure, 14% kept them for food and income, while 6% kept them for food, another 6% kept them for income, milk consumption, manure and breeding.

3.5 Milk production

Table 4 shows 63.8% of the households had at least one lactating doe, 60.3% consumed all milk produced, 27.6% had surplus milk to sell, while 18% had to purchase additional milk to meet household needs.
Figure 2 summarizes the ranges of production levels in various locations ranging between half a litre 10 litres, with a mean of 2.15 litres 10.6% of the goats produced above 4 litres.

3.6 Land use distribution

The distribution of family land in several sites indicated overall 55% allocated to crops, 35% to livestock while the homestead took 10%. An exception is Bomet, a traditionally livestock keeping community, with an average of 71.7% of family land set aside for livestock. At the extreme end, clusters in Nyanza Province had small pieces of family land averaging 3.7 acres out of which allocation for livestock ranged between 0.8 acres and zero, as in Table 5. In Oriang cluster, 5 out of 6 respondents had no land set aside for livestock, while in Ndiru cluster, it was not possible to estimate land for livestock use. In both cases communal land was used for livestock and hedge-rows were used for growing fodder trees and napier grass.

3.7 Sources of water

All respondents (100%) regarded water as a critical and limiting resource due to the seasonality of all the sources, and the long distances covered to fetch it. None of the clusters had quality piped water. Only 9% could afford to buy or build a tank for roof catchment, which was regarded as quality water by all. All who used river, well, dam and lake sources, regarded them as dirty and health risk for human and livestock use. Figure 3 shows the various water sources.

3.8 Sources of feeds

In Figure 4, the various feed sources are indicated. Most households depended on their own farms for forage production, especially napier grass, which was the most popular bulk feed in all the clusters. Fodder trees were grown in most clusters as hedge-rows. Potato vines were equally popular in all clusters, especially in Nyi Alego, Siaya district where farmers acquired extra land for growing potatoes for human and livestock use. In Oriang and Ndiru clusters, there was little or no land allocated for livestock. The farmers in Oriang depended on the lake shore for wild grasses.

3.9 Goat Housing

All the respondents had houses or shelters for goats based on designs provided by the sponsoring NGO but they had many variations in quality. Significant variations were also, noted in the quality of the materials. While all (100%) had slatted floors, 16% used planks, 80% used sticks and barely 3%, especially in Kwale district used mud for the outer walls. Only 10% of the farmers (in Kwale) used the insect-proof mesh recommended for tsetse fly- infested Coastal strip and parts of Nyanza province.

Most houses had approximately apportioned areas for bucks, kids, does and milking space, with feeding troughs to the outside.

3.10 The dairy goat breeds

In Figure 5, the overall distribution of the breeds shows that 54% of the goats on the farms were Saenen, imported from South Africa, German Alpine constituted 17%, Toggenburg were 10%, with 3% Anglo-Nubian. The 16% crosses represented undefined crosses.

3.11 Source of Extension Advice

Table 6, summarizes the various sources of extension information, which included occasional visits from government extension agents (55%), group advice (60%), some form of residential training, (56%) and attendance at field days, (34%).

3.12 Record keeping

In Table 7, the types of records kept by farmers are shown. 96% had a form of animal identification, 60% had some milk records, 20% had health record, especially deworming and 10% had record for service and kidding.

4.0 DISCUSSIONS / CONCLUSIONS

The demographic information indicated that the overall ratio of women to men was 4:1, with 36.8% of the women as widows. Out of the estimated 4545 children in the entire sample, 220(48.4%) were orphans.

This data is consistent with the objective of the project to support poor families, especially women and children.

The fact that 95% of the respondents were aged above 31 years showed a major generation gap. The younger generation aged below 30 years preferred to seek off-farm employment, a finding which is consistent with the general tendency of migration of youth to urban areas.

1n 74% of the households women took responsibility for the goat management, an indicating the overall objective to empower women.

The fact that 60.3% of the households consumed goat milk indicated the increasing value of the dairy goat milk in the diet of the respondents. Although only about 27.6% had surplus milk for sale, there was a higher demand for goat milk as shown by the average higher prices of Kshs 30.00 per litre compared to Kshs 20.00 for cow milk.

Although the project has been on for only a few years, the impact amongst respondents, especially women was quite positive, with a potential for increased milk consumption and sales.

The land-size and finances were frequently mentioned as the most limiting factors to fodder production, purchase of concentrates and mineral supplements. Except for Bomet cluster which had a mean of 71% of family land set aside for livestock, land size a clear negative effect on fodder production, especially in Nyanza province.

The popularity of indigenous goats in all clusters were an indication of the high potential for rapid up-grading of local goats through cross-breeding with the exotic bucks. It was clear that the proportion of exotic bucks could not adequately fulfill this yet upgrading of the local goats would form an entry point for more interested farmers.

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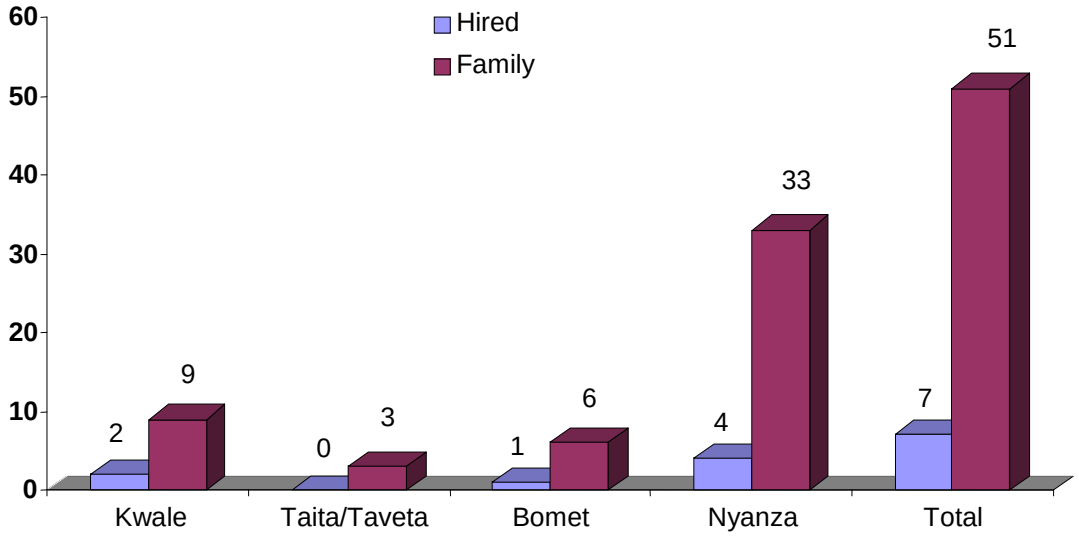

Figure 1: Source of labour in smallholder dairy goat farming areas

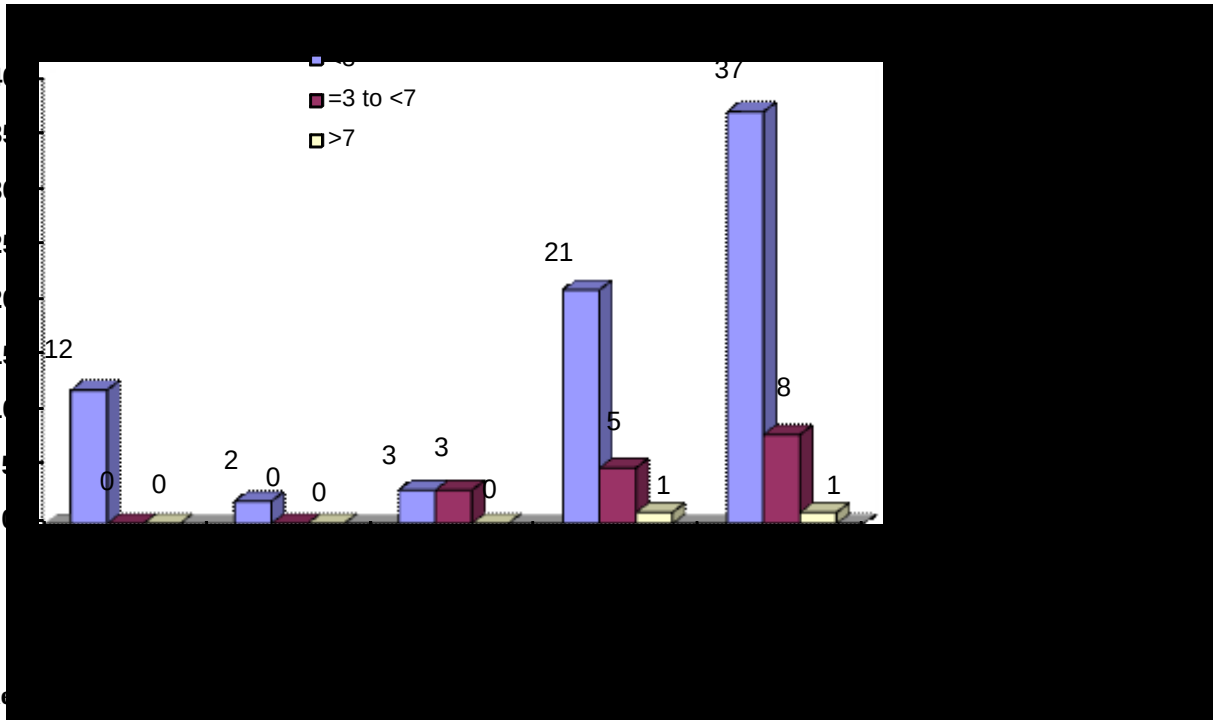

Figure 2: Freque

Kenya

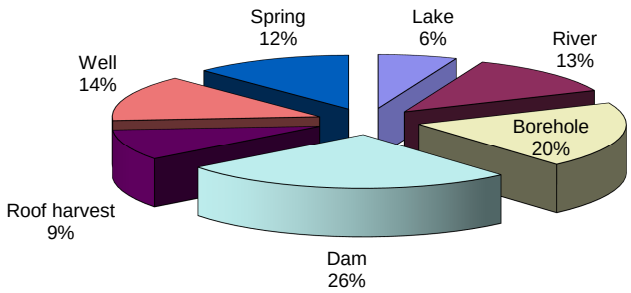

Figure 3: Sources of water to animals in SHD goat farming areas in Kenya

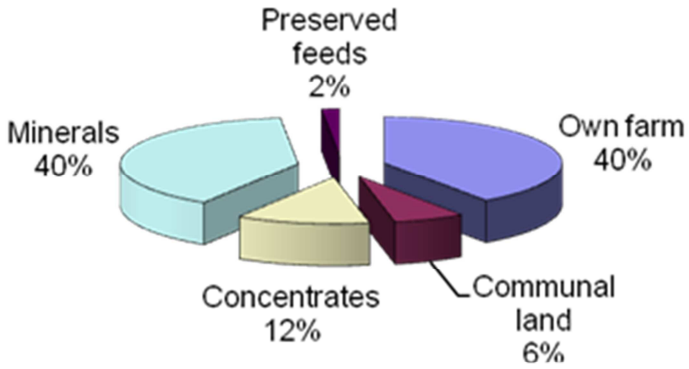

Figure 4: Sources of feeds for animals in SHD goat farming areas in Kenya

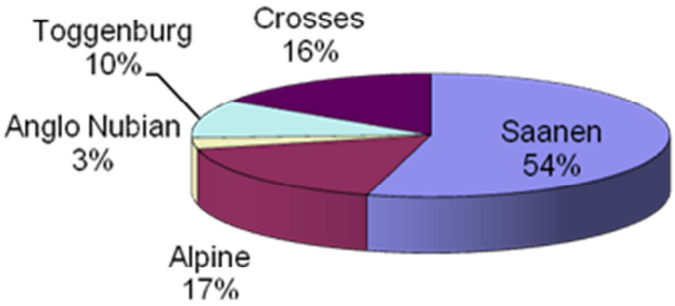

Figure 5: Goat breed distribution in SHD goat farming areas in Kenya

Table 1: Sources of Labour in Smallholder Dairy Goat Farming areas in Kenya

	Kwale		T/Taveta		Bomet		Nyanza		Total	
Age group	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
< 31	0	0	1	33	0	0	1	2	2	5
31 - 50	4	36	2	67	6	83	25	67	37	63
> 50	7	64	0	0	1	17	11	26	19	32

Table 2: Sources of Income among the smallholder dairy goat farmers in Kenya

	Kwale		T/Taveta		Bomet		Nyanza		Total	
Source of Income	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Off-Farm + Farm	1	9.1	3	100	2	28.6	19	51.4	25	43.1
Farm	10	90.9	0	0	5	71.4	18	48.6	33	56.9
Total	**11**	**100**	**3**	**100**	**7**	**100**	**37**	**100**	**58**	**100**

Table 3: Reasons for Keeping Dairy Goat

Reasons	**Number of Respondents**	**Percentage (%)**
Food	3	6
Income and Food	7	14
Income, Food and Manure	37	74
Income , Food, Manure and Breeding	3	6
Total	**50**	**100**

Table 4: Farmers whose goats were in production, the number who consumed their own milk and those who sold per cluster.

Regions	**Kwale**	**Taita**	**Bomet**	**Nyanza**	**Total**	**Percentage (%)**
Farmers having goats in production	8	2	4	23	37	63.8
Farmers consuming goats milk	8	-	4	23	35	60.3
Farmers able to sell milk	3	-	1	12	16	27.6
Farmers who purchased additional milk	2	3	1	5	11	18
Farmers interviewed	11	3	7	37	58	

Table 5: Land Allocation between Crops, Livestock and Homestead

Cluster/District	Land for Livestock	Land for Crops	Land for Homestead	Total
Kwale	2.4	8	0.9	11.3
Bomet	6.1	1.8	0.6	8.5
Serone	30	40	8	78
Andimo	1.3	2	0.5	3.8
Nyalienga	1.2	3.8	0.3	5.3
Imbo	1.2	1.6	0.3	3.1
Oriang	-	-	-	-
St. Monica	0.4	1.2	0.5	2.1
St. Mary's	0.8	1.2	0.5	2.1
Ndiru	-	2.1	0.5	2.6
Nyi Alego	0.4	1.4	0.25	2.05
Mean	**1.7 (35%)**	**2.7 (55%)**	**0.5(10%)**	**49**

Table 6: Sources of Extension Services

	Kwale	Taita	Bomet	Nyanza	Total	Percentage (%)
Extension	5	1	6	20	32	55
Group Advice	8	2	7	18	35	60
Field Day	1	1	5	14	20	34
Training	7	1	7	18	33	56
Respondents	11	3	7	37	58	

Table 7: Record Keeping

Record & Region	Identification of animals; names, tag	Milk yields	Service / kidding dates	Treatments
Kwale	11	9	3	4
Taita / Taveta	3	0	1	1
Bomet	7	4	1	0
Nyanza	37	23	1	7
Total	**58/60(96%)**	**36/60(60%)**	**6/60(10%)**	**12/60(20%)**

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