

Table 9. Fodder and Pasture Production in Kakamega District (1998)

Division	Napier grass (acres)	Desmodium	Sweet potato vines	Fodder trees (stems)	Improved pastures (ha)	Natural pastures (ha)
Ileho	186	-	-	4,500	25	464
Navakholo	176	-	-	2,500	-	1340
Shinyalu	235	-	-	900	40	370
Kabras	141	0.75	20	895	-	12,724
Lurambi	252	-	25	1,300	4.5	359.5
Municipality	270	-	-	-	4	104
Ikolomani	309	-	-	3,000		
Total	1,569	0.75	45	13,155	109.5	15,397.5

Source: MoARD. Kakamega District Annual report, 1998.

2.4.3 Bungoma District.

Bungoma District has relatively large farm sizes per household and hence a large proportion of the land is still under natural pastures. However, there is a move towards intensive or semi-intensive livestock management. This necessitates supplementation with improved pastures, fodder legume trees and grasses and also silage and hay. Some farmers in several Divisions of the District and especially in Webuye and Tongaren conserve excess forage in the form of hay and silage to be fed to the animals during times of forage scarcity (table 10), though there are some divisions of the District like Chwele, Kimilili and Sirisia where forage conservation has not been reported.

Tongaren and Kanduyi divisions of the District have the highest acreage of land under pastures and fodder production as compared to the other division with Webuye having the least (table 3). It is also because of this that the two Divisions also lead in milk production in the District. Comparatively, the District has witnessed fluctuations in the availability of natural pastures over the years since 1992, though the acreage under improved pastures and fodder including fodder trees has been increasing steadily since 1992 (Table 11).

Table 10. Pastures and Fodder Production per Division in Bungoma District (1998).

Division	Natural Pastures (Ha)	Improved Pastures (Ha)	Improved Fodder - Napier (Ha)	Fodder Trees (Stems)
Chwele	1,500	15	54.40	3,250
Kimilili	5,090	9.5	115.00	7,120
Tongaren	10,227	270	395.50	4,346
Nalondo	2,142	73	105.00	3,480
Sirisia	4,000	90	94.40	4,400
Webuye	844	35	228.00	2,090
Bumula	6,930	250	402.00	4,509
Ndivisi	1,960	6.0	71.28	3,560
Kanduyi	8,020	320	348.00	5,810
Total	34,473	1070	1813.58	38,565

Source: MoARD. Bungoma District Annual Report, 1998.

Table 11. Comparative pasture and fodder availability in Bungoma District (1992 - 1998).

Year	Natural pastures (ha)	Improved pastures (ha)	Napier grass (ha)	Fodder trees (stems)
1992	42,175	700	450	17,195
1993	43,370	852	680	21,000
1994	37,250	732	710	14,920
1995	37,300	792	899	20,520
1996	49,960	688	991	29,115
1997	48,320	722	1,323	32,100
1998	40,713	1,100	1,800	38,562

Source: MoARD. Bungoma District Annual Reports, 1992 - 1998.

2.4.4 Nandi District.

Natural pastures occupy a large acreage of land in Nandi District, and this coupled with the fact that land sizes per household are also relatively large explains why cattle management is mostly extensive grazing. There are also improved pastures in the District composed of a mixture of Rhodes grass and Nandi setaria grass and this supplements the natural pastures for grazing. Land acreage under Napier grass in the District has also been fairly constant over the years since 1996. Fodder legume trees and grasses, sweet potato vines, sunflower and oats,

even though on a marginal scale, are also grown by the farmers in the District for supplementation to cattle. There is no evidence of forage conservation in the District, therefore, training of farmers on forage conservation in times of plenty to be fed to animals during times of pasture scarcity, and on ways of improving the quality and quantity of these pastures without necessarily increasing land acreage under them is essential for better livestock nutritional management.

Table 12. Pasture and fodder production trends in Nandi District (1996-1998).

Pasture/Fodder Type	1996 (ha)	1997 (ha)	1998 (ha)
Napier grass	1332	1340	1336
Sweet potato vines	20.01	29.03	74
Mixture of Rhodes and Nandi setaria grasses	701.5	652	686
Pure stand Rhodes grass	-	-	-
Natural pastures	111,140	103,172	106,543
Fodder trees (Sesbania and Leucaena)	14	3.8	
Lucerne/Desmodium	14.4	15.7	8
Sunflower	-	-	6
Oats	-	-	12

Source: MoARD. Annual Reports: 1996 - 1998.

2.5 Milk production and marketing

Milk remains the major source of nutrition in terms of animal protein supply to many households in Western Kenya and the country as a whole (MoARD, 1996). Inappropriate animal management and nutrition at the smallholder farm level limits increased milk production and supply from the dairy industry. Lack of proper milk handling, storage/cooling, processing and marketing channels/facilities worsens the situation. The increased demand for milk and milk products prompts a need for action towards increased dairy production through the use of high-grade cattle and exotic crosses. Nandi and Uasin Gishu Districts in the Rift Valley Province remains the major suppliers of milk to most Districts in the Western Kenya and Nyanza regions of the country due to frequent shortages of milk in these areas.

Milk marketing in Western Kenya is mainly informal through hawking, milk bars, etc with liberalization of milk marketing in 1992 and the lifting of urban milk market monopoly previously enjoyed by the Kenya Co-operative Creameries (KCC). There are a few dairy farmers co-operative societies that still exist in the region to market members milk, after most collapsed or are on the verge of collapse. Other milk market outlets available for farmers in some areas within the region include private processors such as Kitinda, Nasyanda and Magharibi dairies in Bungoma District and Kaptumo, Kaigat, Kamnon and Lessos co-operative societies in Nandi District. They source milk from farmers for processing and

marketing. KCC is still operational in areas like Nandi where there are two cooling plants in Kapsabet and Lessos.

Formal milk marketing channels like co-operative societies and processing agencies are less developed in the region as a result of managerial problems with most being un-operational or operating under capacity. This results into a lot of milk spoilages and exploitation of small-scale milk producers by middlemen. The milk disposal outlets include household consumers, institutions, hotels and restaurants with the price ranging between Kshs 25 to 30 per litre depending on seasonal fluctuations in milk supply. Quality control measures undertaken by the Dairy farmers co-operative societies prior to milk intake include use of a lactometer and match test in some cases. The main constraints that have been cited to hinder the progress of these co-operative societies include managerial problems and competition from informal milk market agents.

2.5.1 Vihiga District.

Low acceptability of improved cattle breeds and AI services by smallholder farmers due to costs involved in various parts of the District has tended to lower the production of milk. Some farmers, for instance, have continued to keep zebu cattle as opposed to the improved dairy cows. This is largely attributed to the socio-cultural attachment to the breeds ie dowry payment, hardiness, prestige etc. This is despite the fact that improved breeds have higher milk yields, which can support setting up of milk based industries, for processing fresh/fermented milk, yogurt, ghee, butter, cheese etc. These would easily be marketed within the region and offer employment opportunities and a chance for appropriate skills development for the District's population in the new firms.

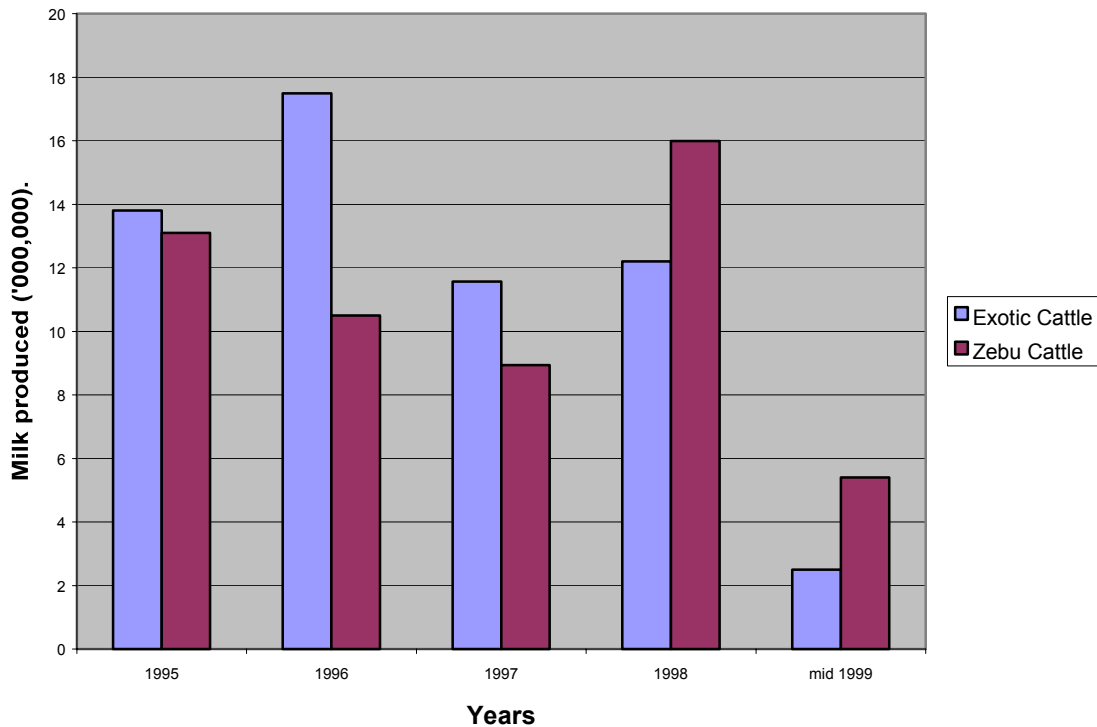
Lack of quality animal feeds aggravates the situation. Market skills and information are poorly developed in that even within the district, people tend not to know areas with effective demand for their milk products. Coupled with lack of storage facilities and cooling plants prices tend to fluctuate seasonally, with very low prices being offered to farmers for their produce. There is also a high demand for credit in the District for dairy development, however, the District has limited credit facilities and lending institutions, and where available, the demand for collaterals such as title deeds and high interest rates on loans offered to the farmers.

There have been high fluctuations in milk production from both the dairy and zebu cattle in Vihiga District over the period 1995 to 1999 (District Annual Reports, 1995-1999). These fluctuations could be attributed to seasonality in pasture production, a major feed resource for cattle in the region, and the need for more land for food crop production than livestock production, leading to less land under pastures and fodder production. The District has also witnessed minimal growth in cattle numbers over the years as a result of reduced feed supply due to land pressure. Sabatia Division of the District had the highest milk production levels by mid 1999, with Tiriki East Division having the least. This may be due to the presence of many research and extension activities on dairy production in the Division leading to more uptakes of dairy technologies.

Milk processing and marketing is also not well developed in the District and this limits the expansion of the dairy industry. This is because of the fewer number of dairy animals kept and managerial problems of the two co-operative societies i.e. Vihiga and Sabatia that had been formed to market farmers' milk. Most of the milk produced is consumed locally within the District, though however, this is not always enough and more has to be imported from the neighboring Nandi District that has surplus. Milk in the District is disposed off informally

through hawking and farm gate sales. Formal milk marketing is through Bunyore and Vihiga co-operative societies, though these are experiencing a share of managerial problems. There is also however a private milk processor, Luanda dairy farm that processes on small scale and sells fresh milk, yogurt, mala, milk shake and cheese.

Figure 6. Milk production trends in million litres for Vihiga District (1995 - Mid 1999).

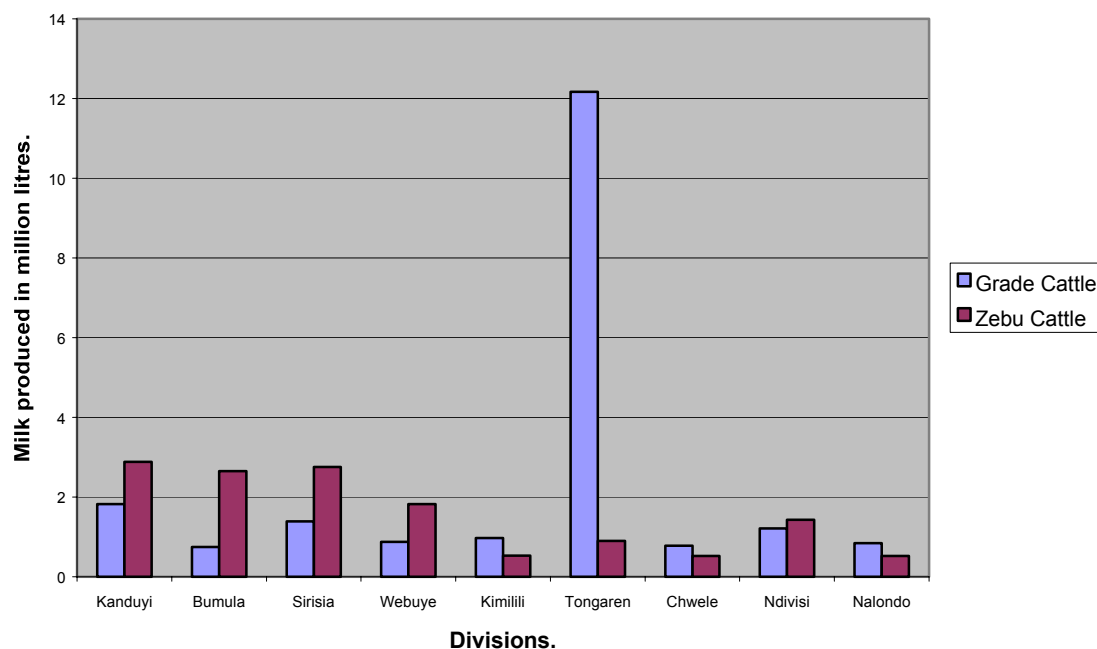


Source: MoARD Vihiga District Annual reports (1995-1999).

2.5.2 Bungoma District.

Milk production in Bungoma District has been fairly constant over the years since 1995 (Appendix 1). Tongaren Division of the District had the highest milk production levels over the same period with the other division having relatively high and comparable milk production levels. Milk production from dairy (grade) cattle was high in Tongaren Division as compared to the other Divisions of the District (figure 7). There is also quite a number of milk processing co-operative societies in the District as shown in table 13 below. These form the formal milk marketing channels in the District, though, however milk is also marketed informally through hawking and farm gate sales.

Figure 7. Estimated milk production in million litres for each division in Bungoma district (1998).



Source: MoARD Bungoma District Annual Report, 1998.

Table 13. Milk Processing Co-operative Societies in Bungoma District (1998).

Society	Milk handled (Litres/day)	Buying Price (Kshs/litre)	Consumer Price (Kshs/litre)	Products
Kitinda	27,000	20	40	Mala
Sang'alo Institute	21,600	20	30	Yoghurt
Nasyanda Dairy	24,186	20	28	Mala, Fresh milk
Magharibi Dairy	21,890	20	30	Fresh milk
Kimilili Mini Dairy	18,790	20	30	Fresh milk
Lutonyi Dairy				Fresh milk, Mala
Moonstar Dairy				Mala
Migide Dairy				Mala, Fresh milk, Yoghurt.

Source: MoARD. Annual Report, 1998.

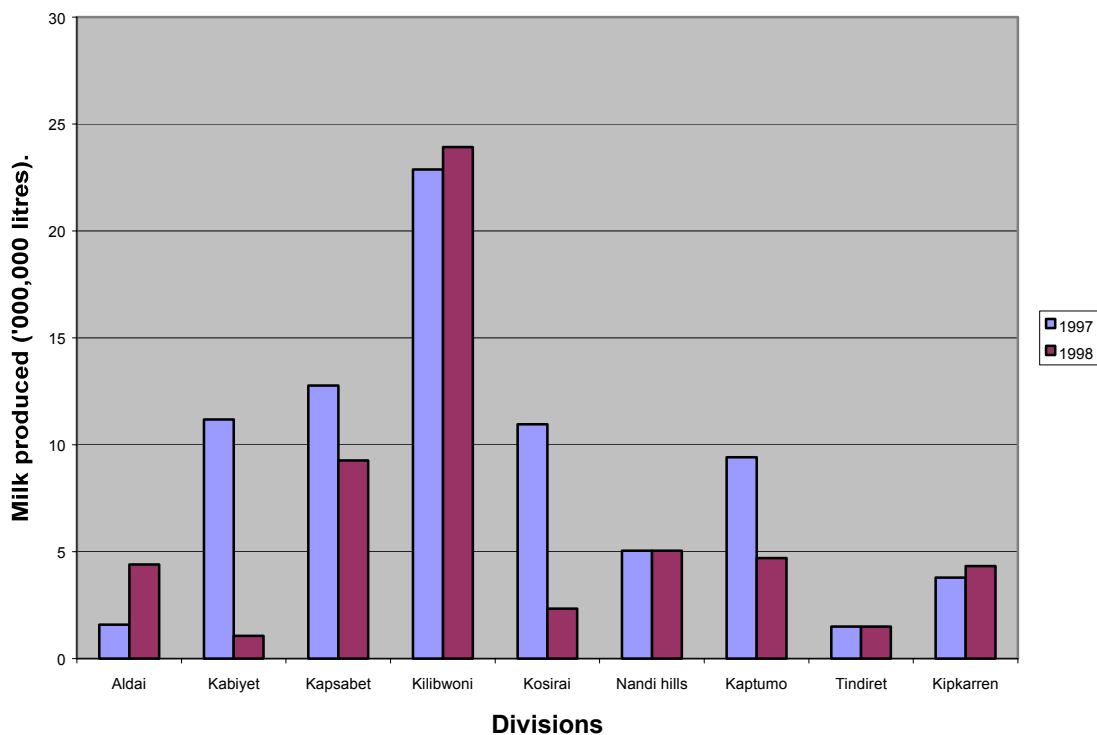
2.5.3 Nandi District.

The dairy industry is well developed in Nandi District and milk marketing is quite organized as compared to the other Districts in Western Kenya. Also the milk production levels are

high. Kilibwoni and Kapsabet Divisions of the District had the highest milk production from dairy cattle between 1997 and 1998 (Appendix 2), though there was a slight increase and drop in milk production from the two divisions respectively over the same period (figure 9). There was a major drop in milk production in Kosirai and Kaptumo Divisions of the District over the period between 1997 and 1998 (figure 8). Aldai Division of the District experienced a major increase in milk production from both dairy and zebu cattle between the same period.

Generally there was a major drop in milk production from dairy cattle in the District from 74.2 million litres in 1997 to 42.4 million litres in 1998, though the milk production from zebu cattle increased tremendously over the same period (Appendix 3).

Figure 8. Milk production (in million litres) trends for each division in Nandi District.



Source: MoARD Nandi District Annual Report, 1997-1998.

Milk Processing and Marketing Channels in Nandi District.

1. Kenya co-operative creameries (KCC) - has two cooling plants at Kapsabet and Lessos.
2. Lessos co-operative society - markets milk to KCC and has A.I service scheme.
3. Kamnon co-operative society - it operates in the central Division and is multipurpose, though it has A.I service scheme and markets milk.
4. Kaigat co-operative society - serves Nandi and Uasin - Gishu Districts and has an A.I service scheme.
5. Kaptumo co-operative society - it is multipurpose though processes and sells fermented milk (mala).

2.6 Constraints to dairy cattle production in the region

Experience within the Regional Research Centre mandate area reveals that biophysical and socio- economic constraints limit the productive and reproductive potential of the dairy herd on smallholder farms even though the soils and climate of the region provides a suitable environment for intensive crop and dairy production. The major constraints include:

- a) Inadequacy and poor quality feeds.
- b) Unavailability of suitable dairy breeds.
- c) High levels of mortality due to diseases and parasites.
- d) Poor management/husbandry practices.
- e) Reluctance by farmers to direct labour and management efforts from other farm activities to dairy production.
- f) Lack of cash for capital investment in basic infrastructure required for dairy production.
- g) Marketing problems for milk and milk products (poor milk prices, delayed payments, lack of market etc.)

3.0 LIVESTOCK RESEARCH AND DEVELOPMENT PROGRAMMES IN THE REGION

The table below shows Research/Extension activities involved in livestock production in the region.

Activity	Present situation	Objective	Level of collaboration with the MOA/Dept.	Site of operation	Organization responsible
1. On-farm trials on dry season feeding strategies for dairy cows. Duration: 1999-2001	Demonstrations, on simple homemade ration formulations already conducted. 22 farmers going on with the trials.	Sustain milk production at economical levels even in times of drought. Sustain other dairy cow performances by provision of quality feeds.	-PRA in study areas -Planning and review meetings. -Farmers demonstration of -Implementation of other planned activities like following ups.	Vihiga	KARI
2. Use of dual purpose goats as alternative source of milk.	Farmers training not yet conducted. But 64 farmers on trials, 46 impact farmers registered.	-Provide alternative source of milk to farmers. -Improve husbandry practices for the goat.	-Not yet streamlined - But the depart. Of livestock prod. Pursuing on efforts to improve this.	Vihiga	Lagrotech.
3. Trials on Tumbukiza technology on Napier establishment.	Three cut of ten farmers doing well with the technology.	-Provide alternative to conventional way of Napier establishment. -Compare need requirement on husbandry practices for the two methods.	-Follow-ups -Review sessions.	Vihiga Siaya	KARI
4. Vaccinations against common diseases in indigenous birds.	-Little impact in cluster area. -But practicing farmers realizing improved turnover	-Create awareness on poultry vaccination.	-Extension staff in the field involved in all activities.	Vihiga Kakamega	KARI

improved turnover.		Siaya	
		Bungoma	
5. Sustainable natural resource management	-PRA already done -Farmers identified	Broadly, management of natural resource base with a view of improving production per unit area.	Staff both the MOA and KARI involved at all levels of operations.
			KARI/ICRAF - AHI (African Highland Initiative)
6. Development of small scale fish farming	Farmers identified and already to engage in fish farming.	-Provide a source of income -Improve nutritional status of participating household.	Identification of farmers demonstration in collaboration with the fisheries department
			LBDA
7. Provision of credit to organized groups and application of organic farming methodology and marketing of farmers produce.	Farmers already sensitized on the operations of the groups.	Assist farmers in identification and management of small-scale project at the above level.	Not yet quite streamlined
			Africa Now/Care Kenya/SCODP
			Vihiga
			Kakamega
			Bungoma
			Siaya
8. Provision of cows. Creation of alternative -A.I service approach	-Farm census on dairy cows to be done. -Office in place at the ground.	-Provision of soft credit for dairy production. -Provision of employment opportunities and A.I Services	To be through planning and execution of activities. Not yet very clear
			ABS/HPI
			Vihiga
			Butere/Mumias

4.0 LIVESTOCK EXTENSION SERVICES WITHIN THE REGION

4.1 Ministry of Agriculture and Rural Development (MoARD)

A) Livestock Development Project (LDP)

This project started in 1991 and has been running in phases. Phase I(1991-1994), Phase II (1995-June 1998) and Phase III was from July 1998 and is still on going. This project is co-funded by both the Finish Government and the Kenyan Government and is run under two ministries, the Ministry of Agriculture and Rural Development and the Ministry of Co-operative development. In western Kenya it operates in all Districts. However Nandi District does not have any component of the project.

The main objective of the project is to increase milk production in milk deficit areas. The main activirty under the project is upgrading of the local cattle by use of grade bulls (Bull Schemes) through natural services. They also carry out disease control (dips rehabilitation, issuance of spray pumps on cost sharing basis and community maintained animal health assistance), forage (fodder and pasture) production through establishment and maintenance of bulking plots and nurseries, training of farmers and staff, cow from cow rotation scheme under the women groups and support of dairy co-operatives on milk handling, marketing and training.

4.2 Non-Governmental/International Organizations (NGOs)

The following is a list of other organizations working with the farmers in the region towards improving Livestock Production and other Agricultural activities.

Organization	District	Area of Interest
Dorcas Project International	Kakamega	Dairy
FARMESA	Kakamega	Dairy
Heifer Project International	Kakamega, Vihiga, Butere/Mumias	Poultry
1. Mumias Out-Growers	Kakamega, Bungoma, Butere/Mumias	Dairy
2. The Kenyan Indigenous Forest	Kakamega	Dairy
3. Organic Matter Management Network	Kakamega, Vihiga	Dairy/Beekeeping
4. CARD-ASSETS	Kakamega	Training
5. ILRI - East Coast Fever Immunization project by Dr. Kiara in Kakamega and Butere/Mumias Districts. The project aims at developing ECF Vaccines by collecting biophysical data with regard to East Coast Fever resistance within the area of operation		
6. Lake Basin Development Authority operating in the Bungoma is involved in multiplication of dairy cattle through sale of heifers and bulls to the farmers at 70% of the cost while the farmer provides the remaining 30%.		
7. Kitinda dairy in Bungoma is run by a private businessman and undertakes Napier establishment for farmers.		
8. Kaputanayi co-operative society in Bungoma operates as a non-governmental organization and receives donor funds to purchase dairy animals for the farmers.		
9. Mumias Out-growers Company (MOCO), a sugar cane growing farmers co-operative society, operates in Kanduyi and Bumula Divisions of Bungoma district and apart from		

offering AI services to farmers, gives them heifers and cows and also materials for zero-grazing units construction and spray pumps.

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District Annual Reports.

(i) Vihiga district, 1992-1999.

(ii) Nandi district, 1996-1998.

(iii) Kakamega district, 1996-1998.

(iv) Bungoma district, (1993-1998)

National Dairy Development Project.

A Gender differentiated study on impacts of intensive dairy farming on Socio-economic position of smallholder households in Vihiga district, Kenya.

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Appendix 1. Estimated Milk production and Trends in Bungoma District per Division (1995-1997)

Litres of milk produced/Year.					
Division	Grade Cattle	Zebu Cattle	Total (1997)	1996	1995
Kanduyi	1,422,000	2,865,600	4,278,600	5,147,802	5,983,000
Bumula	582,000	2,650,590	3,232,590	3,860,851	3,990,000
Sirisia	1,090,000	2,773,440	3,863,440	3,539,114	319,200
Webuye	744,000	1,906,200	2,650,200	4,182,589	6,783,000
Kimilili	902,400	517,104	1,419,504	4,504,326	5,985,600
Tongaren	16,056,000	8,887,328	16,943,328	8,043,440	9,975,000
Chwele	720,000	505,440	1,225,440	-	-
Ndivisi	360,000	1,360,800	1,720,800	-	-
Nalondo	826,800	526,122	1,352,922	2,895,638	3,990,000
Total	22,703,200	13,983,624	36,686,824	32,173,760	39,000,000

Source: MoARD. Annual reports, 1995 - 1998.

Appendix 2. Milk production levels in litres per Division in Nandi District (1997-998).

Division	1998		1997	
	Dairy cattle	Zebu cattle	Dairy cattle	Zebu cattle
Aldai	3,298,637	1,099,646	729,150	863,040
Kabiyet	794,524	261,841	11,141,130	38,040
Kapsabet	6,955,039	2,318,346	12,536,090	232,190
Kilibwoni	17,945,715	5,981,905	21,551,390	1,327,860
Kipkarren	3,244,320	1,081,440	3,719,275	65,610
Kosirai	1,755,000	585,000	10,914,820	47,385
Nandi hills	3,786,000	1,262,000	4,336,990	711,500
Kaptumo	3,525,000	1,175,000	7,800,275	1,621,300
Tindiret	1,118,346	372,782	1,472,870	29,160
Total	42,422,585	14,140,860	74,201,990	4,936,085

Source: MoARD. Annual report, 1998.