Financing livestock and animal health services in sub-Saharan Africa:

The case of Cameroon, Ethiopia, Kenya, Mali, Tanzania and Uganda.

Background paper for the establishment of government contributions to the PanAfrican Control of Epizootics (PACE) programme

Organization of African Unity (OAU)
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Introduction

Agriculture is the most important sector of the economies of sub-Saharan African countries. It helps to sustain livelihoods by providing employment to a majority of the rural population. It also contributes significantly to the Gross Domestic Product (GDP) of these economies. In Cameroon and Kenya for example, agriculture accounts for 20 to 28% of GDP compared to about 36% in Mali and from 40 to 50% in Ethiopia, Tanzania and Uganda. Livestock is a key contributor to agriculture but its contribution is often understated as most livestock products do not enter the official market and thus are excluded from the official GDP contribution. Available estimates show that livestock contribute 10 to 20% of the agricultural GDP in Cameroon, Tanzania and Uganda whereas in Mali, the contribution is from 24 to 30% (Table 1).

The livestock sub-sector has enormous potential for improvement and the objective of most governments in sub-Saharan Africa is to increase the productivity of livestock so as to meet increased consumer demand, exports and at the same time raise farmers' incomes. One means toward the attainment of this objective is to improve the quality and delivery of animal health services. Provision of animal health services however, is constrained by several factors. Inadequate financing has been cited by several authors as one of the constraints (de Haan and Umali, 1992; Anteneh, 1991 and Cheneau, 1986). Until recently, the public sector played a dominant or exclusive role in the delivery of animal health services in most sub-Saharan African countries. As shown by Anteneh (1991) and de Haan and Nissen (1985), the government was the major employer of animal health staff with state subsidies to support disease control and animal health activities accounting for over 70% of the total recurrent expenditures on livestock services.

In the last decade or so, the ability of most SSA governments to continue to provide adequate financing for livestock and animal health services has declined. Tight fiscal resources, stagnation in economic growth and high domestic inflation have forced most governments to confront many issues. Most have set new priorities with strict implications on resource allocation. Funding of livestock and animal health services has suffered in the process and livestock production has declined. In Tanzania and Mali for example, the contribution of livestock to agricultural GDP dropped by 4% during 1993/94-1998/99 (Table 1). The index of per capita livestock production dropped by 10% and 6% in Uganda and Cameroon respectively between 1993 and 1999 (Table A1 Annex 1). For the same period, the per capita livestock production index in Ethiopia declined by only 1%. Per capita supply of meat and milk also fell by 9% in Uganda and about 7% in Cameroon (Table A1 Annex 1).

The public sector's inability to adequately finance livestock and animal health services has led to increased dependence on donor financing of these services and this has raised questions about the sustainability of livestock growth when donor funds dry up. Also, the

deteriorating livestock sub-sector and the increasing demand for better animal health services, has led to the argument that public provision of animal health services be replaced by more efficient private sector provision (Holden *et al.*, 1996; World Bank, 1995; Umali *et al.*, 1992). As recently argued by Turkson and Brownie (1999), if governments were to fund livestock and animal health services at least to levels determined by the contribution of livestock to the GDP, then the efficiency and effectiveness would improve, and privatization would not be necessary. As well, there would be little dependence on donor institutions to fund these services.

We demonstrate in this paper that inadequate government financing and/or poor resource allocation to livestock and animal health services are directly linked to non-sustainability and therefore the poor performance of the livestock sub-sector in sub-Saharan Africa. We then argue that if any level of sustainable development of livestock is to be achieved, governments will have to demonstrate commitment in the form of increased resource allocation to those livestock and animal health services considered to be of a public good nature (e.g. disease surveillance and monitoring, quarantine, drug and vaccine quality control, etc) and then pass over the other services to the private sector. The analysis of the patterns of expenditures for livestock and animal health services in a sample of six countries (Cameroon, Ehtiopia, Kenya, Mali, Tanzania and Uganda) has implications for ensuring the sustainability of the present Pan African Control of Epizootics (PACE) programme. Results of the analysis should serve as useful indicators of the ability of individual PACE member countries to sustain the programme once donor funds cease.

Following this introduction is the method of analysis. This is followed by an analysis of the patterns of expenditures in agriculture, livestock and animal health in each of the sample countries. A discussion of these results is provided together with their implications. Limitations of the study are then provided.

Table 1. Agriculture and livestock contribution to GDP (%) in Kenya, Tanzania and Uganda, 1993/94 to 1998/99.

	Country				
	Kenya	Tanzania		Uganda	
	Agriculture as % of total GDP	Agriculture as % of total GDP	Livestock as % of agriculture GDP	Agriculture as % of total GDP	Livestock as % of agriculture GDP
1993/94	26.51	3	12.52	48.14	15.60
1994/95	26.61	44.98	12.32	49.38	15.95
1995/96	27.90	47.14	11.03	45.14	19.55
1996/97	...	48.03	10.13	41.98	20.46
1997/98	...	46.80	10.67	44.62	18.22
1998/99	...	44.77	9.94	44.23	17.74

Table 1 cont. Agriculture and livestock contribution to GDP (%) in Cameroon and Mali, 1993/94 to 1998/99.

	Country				
	Ethiopia	Cameroon		Mali	
	Agriculture as % of total GDP	Agriculture as % of total GDP	Livestock as % of agriculture GDP	Agriculture as % of total GDP	Livestock as % of agriculture GDP
1993/94	51.0				
1994/95	49.7	23.00	10.11	35.89	28.14
1995/96	51.5	20.54	11.41	37.52	27.40
1996/97	50.7	22.05	10.06	34.26	29.26
1997/98	45.7	22.05	10.05	35.07	27.67
1998/99	46.6	21.58	9.98	37.27	24.18

Methods

Sample selection and field data collection

A sample of six countries – four in Eastern Africa (Ethiopia, Kenya, Tanzania and Uganda) and two in Central and West Africa (Cameroon and Mali) was selected from among the 32 PACE member countries. Field visits were made to the respective Departments of Veterinary Services (DVS) of the Ministries of Agriculture and or Livestock of these countries. Discussions were held with the Directors of Veterinary Services, PACE National Coordinators and other senior level staff of the Ministries on budgetary allocations to agriculture, livestock and animal health. Where necessary, additional visits were made to the Departments of Budgets within the Ministry of Finance. Secondary data on total and recurrent expenditures in agriculture, livestock and animal heath; gross domestic product; livestock population and production figures; and exchange rates were obtained from various sources in the respective countries.

In Mali, government expenditures in the Ministry of Rural Development are distributed into the following sub-sectors: Agriculture (mostly crops), livestock, fisheries and forestry. Data on livestock sub-sector expenditures and other parameters were collected from three main sources: The Administrative and Financial Division of the Ministry of Rural Development, the Department of Budgets of the Ministry of Economy and Planning, and the National Accounts Statistical Yearbook published by the Directorate of Statistics and Computers. In the livestock sub-sector there is no specific budget head for animal health. Rather, animal health activities are financed according to the projects that deal with animal health issues. Some of these projects deal with other activities such as production, nutrition, breeding and marketing. The general statement of the budget published each year provides a breakdown of the budget by Ministry, sector, department, project and region. For the livestock sub-sector, animal health expenditures were compiled from the allocations and expenditure returns provided by the relevant projects and by region. Data on other macroeconomic parameters were obtained from the statistical yearbook.

In Cameroon, livestock and animal health expenditure data were collected from the budget control unit of the Ministry of Livestock, Fisheries and Animal Industries (MINEPIA) and from the Department of Budget of the Ministry of Economy and Finance. According to the MINEPIA records, the livestock sub-sector budget is allocated according to administration, support to stockowners, animal health and sanitary protection, animal industries and development of fisheries. Animal health expenditures are further divided into expenses incurred by the National and Provincial Headquarters and the District Zoo-sanitary and Veterinary Centers (ZVCs) of the ten provinces of the country. Data on other parameters were collected from the *Annuaire Statistique du Cameroun.*

In Uganda, aggregate expenditure figures for the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) were compiled from various issues of the *Background to the Budget* published by the Ministry of Planning and Economic Development. Livestock and animal health expenditures were compiled from the *Final Appropriation Accounts* of MAAIF. Recurrent expenditures are reported according to product (e.g. crops, livestock and fisheries) and activity (e.g. extension, training, veterinary services and entomolgy, etc). Animal health expenditures were aggregated from expenses incurred by the Departments of Veterinary Services and Entomology. The development budget is reported by project, making it difficult to isolate development expenditures for livestock and animal health.

Aggregate expenditure figures in Tanzania were collected from the *Summary of Public Expenditure – Consolidated Fund Services and Supply Votes.* Recurrent livestock and animal health expenditures were compiled from Vote 43 for the Ministry of Agriculture and Livestock Development. Livestock expenditures came from the expenses of the Livestock Development Division while animal health expenditures were aggregated from veterinary services and other livestock disease control projects. Data on other macro-economic parameters were compiled from various issues of the *Tanzania Statistical Abstract* published by the Planning Commission, the *Economic Bulletin* and the *Economic and Operations Report* both published by the Bank of Tanzania.

Agricultural expenditures in Kenya were obtained from Vote 10 of *The Appropriation Accounts – Other Public Accounts* for the Ministry of Agriculture, Livestock Development and Marketing. Livestock expenditures were compiled from various sub-headings while animal health expenditures were compiled from the expenses incurred for the provision of veterinary services.

In Ethiopia, agriculture expenditure data were obtained from *Budgetary Revenue and Expenditure,* a publication of the Ministry of Finance. Total government expenditures were obtained from the *Statistical Abstracts* published by the Central Statistical Authority. Macro-economic data were obtained from the International Monetary Fund (IMF) statistical appendices for Ethiopia. It should be pointed out that detailed livestock and animal health statistics in Ethiopia were not available due to a number of reasons. First, there is no Ministry of Livestock on its own. Livestock is under the Ministry of Agriculture and Natural Resources. Secondly, within the ministry's structure, the

livestock department is combined with fisheries to form the Animal Resources and Fisheries Department. Thirdly, as a result of the regionalization policy, livestock and agriculture are jointly handled by the different agricultural bureaus in the various autonomous administrative regions. The regions do not report to the Federal Ministry of Agriculture and Natural Resources. Therefore, a detailed analyses for the livestock and animal health expenditures in Ethiopia can only be undertaken at regional level. Time constraints did not permit the exploitation of data on expenditures of livestock and animal health at regional level. This will be a subject for future when detailed cross comparison studies on the same subject are undertaken. Even at federal ministry of agriculture level, expenditure data were available for three years only, 1993/94 to 1995/96, as accounts for the years 1996/97, 1997/98 and 1998/99 had not been audited and thus not available for public consumption.

Data compilation and analysis

After the data were compiled from the various sources, measures and indicators to assess government commitment to animal disease control and livestock development in the sample countries were computed according to Turkson and Brownie (1999) and Anteneh (1991). The measures included the recurrent livestock expenditure as proportions of agricultural expenditure; animal health expenditures as proportions of total livestock expenditure; livestock and animal health expenditures as proportions of total, agricultural, and livestock GDP; the proportion of the livestock budget used for staff salaries, non-staff salaries and the ratio of salaries to non-staff expenditures; recurrent expenditure per veterinary livestock unit (VLU) and livestock GDP. Measures of how "appropriate" national governments are funding livestock services were calculated as the *R*-ratio according to Anteneh, (1991) as follows:

$$R\text{-ratio} = \frac{\frac{ARE}{AGDP}}{\frac{LRE}{LGDP}}$$

$$= \frac{ARE}{AGDP} * \frac{LGDP}{LRE}$$

where ARE is agriculture recurrent expenditure, LRE is livestock recurrent expenditure, AGDP and LGDP are agriculture and livestock Gross Domestic Product respectively. An *R*-ratio greater than one implies that the government is making appropriate funding available for livestock services whereas a ratio of less than one would mean that the government is spending disproportionately less than what livestock contributes to agricultural output.

Results

Expenditure patterns in agriculture, livestock and animal health services expenditures

In this section the patterns of public sector expenditure in agriculture, livestock and animal health is examined by country.

Cameroon

In Cameroon, the government spends 5 to 7% of the national budget on agriculture (Table 2). About 15 to 17% of this budget is used for livestock services. Expenditures in agriculture declined continuously from 1993/94 to 1998/99 as was the case with the expenditures in livestock services. The proportion of national budget used for livestock services has never exceeded 0.5% while the proportion used for animal health services was 0.06% in 1998/99. The proportion of livestock services expenditures that went for animal health services in 1998/99 (the only year for which data were available) was 16%.

Table 2. Share (%) of recurrent agriculture, livestock and animal health expenditure in total recurrent expenditure in Cameroon, 1993/94-98/99.

Year	Agriculture expenditure as % of total expenditure[1]	Livestock expenditure as % of total expenditure	Animal Health expenditure as % of total	Livestock expenditure as % of agricultural expenditure	Animal health expenditure as % of livestock expenditure
1993/94	7.28	...	...	16.94	...
1994/95	5.17	0.40	...	15.50	...
1995/96	5.08	0.31	...	14.22	...
1996/97	6.14	0.35	...	15.51	...
1997/98	5.54	0.37	...	15.16	...
1998/99	5.56	0.34	0.055	15.68	15.95

[1] Although the Ministry of Agriculture is separate from the Ministry of Livestock, Fisheries and Animal Industries, this budget is for both ministries.

During 1994/95 – 1998/99, the proportion of agriculture expenditure in GDP remained at less than 0.5% despite a steady increase from 0.3% to 0.4% (Table 3). Agriculture expenditure as % of agriculture GDP also increased from 1.3 to 1.8% during the same time period. The proportion of livestock services expenditure in GDP rose from 0.05 to 0.06% but remained quite small (Figure 2). As % of livestock GDP, livestock expenditures declined between 1994/95 and 1995/96 but rose to 2.9% in 1998/99. In 1998/99 only 0.01% of the GDP was used for animal health services while 0.5% of the livestock GDP was used for animal health services.

Table 3. Agriculture, livestock and animal health recurrent budgets as % of Gross Domestic Product, in Cameroon, 1994/95 to 1998/99.

Year	Expenditure share in GDP			Agriculture expenditure as % of agricultural GDP	Livestock expenditure as % of livestock GDP	Animal health expenditure as % of livestock GDP
	Agriculture[1]	Livestock	Animal health			
1994/95	0.303	0.049	...	1.32	2.02	...
1995/96	0.278	0.040	...	1.35	1.69	...
1996/97	0.363	0.056	...	1.65	2.54	...
1997/98	0.343	0.052	...	1.56	2.35	...
1998/99	0.391	0.061	0.010	1.84	2.92	0.47

[1] Although the Ministry of Agriculture is separate from the Ministry of Livestock, Fisheries and Animal Industries, this budget is for both ministries.

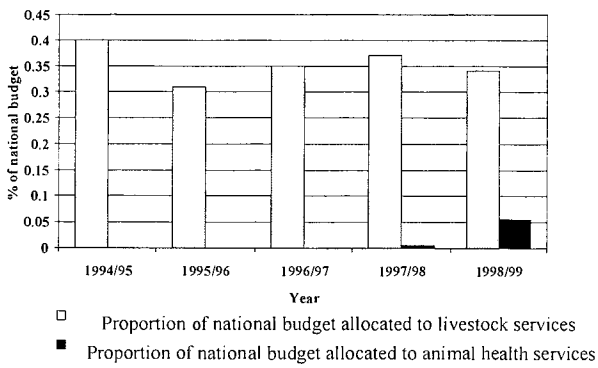

Figure 1. Proportion of national budget allocated to Livestock and animal health in Cameroon, 1993/94 to 1998/99.

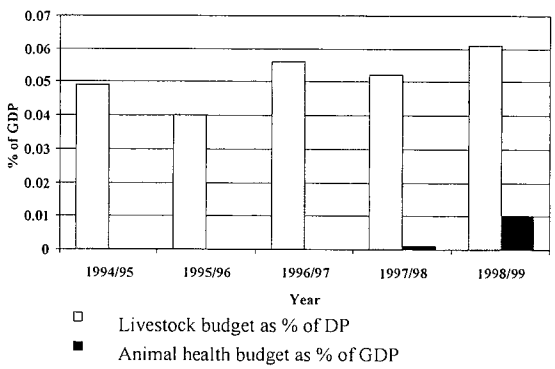

Figure 2. Livestock and animal health budgets as % of GDP in Cameroon, 1994/95 to 1998/99.

Table 4 presents the proportion of livestock services staff salaries in the total recurrent livestock expenditure and the ratio of staff to non-staff salaries for 1997/98 and 1998/99. Even though staff salaries rose in absolute terms from US$2.8 to US$3.2 million, the relative share declined from 56 to 54%. This implies that non-staff expenditure, which indicates the amount of budget available for operations, increased at a faster rate than staff expenditure. This explains the decline in the ratio of staff to non-staff salaries from 1.25 to 1.16. The average ratio of 1.21 indicates that for each dollar spent on staff salaries US$0.83 is spent on operational activities. The increase in non-staff expenditure was due to the decision to allocate operational funds to over 640 Zoo-sanitary and Veterinary Centers (ZVCs) within the country for the 1998/99 financial year.

A measure of how appropriate the government funded livestock services in Cameroon during 1994/95 - 1998/99 was calculated and is reported in Table 4 as the "*R*-ratio". Throughout the period, the *R*-ratio remained below one, suggesting that the government spent disproportionately less than what the livestock sub-sector contributed to agricultural output in Cameroon. The low *R*-ratios, which are all between 0.65 and 0.80, reflect a more than 50% decline in government funding of livestock and animal health services ralative to the period 1975/75 – 1978/79 when the *R*-ratio was calculated to be 1.43 (Anteneh, 1991).

Table 4. Livestock sub-sector staff and non-staff salaries and ratios of staff to non-staff salaries in Cameroon, 1994/95 and 1998/99.

Year	Livestock staff salaries (million US$)	Salaries as % of recurrent livestock budget	Ratio of staff to non-staff salaries	Ratio of agriculture expenditure in GDP to livestock expenditure in livestock GDP (*R*-ratio)
1994/95	...	...	...	0.65
1995/96	...	...	...	0.80
1996/97	...	...	...	0.65
1997/98	2.84	55.50	1.25	0.66
1998/99	3.23	53.65	1.16	0.69

What is of major importance in the financing of livestock services is the share of the budget that is actually spent per unit of livestock within a country. During 1994/95 – 1998/99 the Cameroon Government spent an average of US$4.9 million per year for the provision of livestock services whereas the livestock sub-sector contributed an average of US$223.0 million per year. For an annual livestock population averaging 7.4 million veterinary livestock unit, the average unit cost of providing these services is estimated at US$0.66, with a range from US$0.53 to US$0.80 (Table 5). If the government were to finance livestock services in proportion to its contribution to the GDP, it would have to spend from US$26.00 to US$33.00 per VLU.

Table 5. Livestock sub-sector recurrent expenditure per veterinary livestock unit in Cameroon, 1994/95 to 1998/99.

Year	Livestock GDP (LGDP) (million US$)	Livestock recurrent expenditure (LRE) (million US$)	Veterinary livestock units[1] (VLU) (1,000)	LRE Per VLU (US$)	LGDP per VLU (US$)
1994/95	187.0	3.78	7,072	0.53	26.44
1995/96	225.0	3.80	7,241	0.53	31.07
1996/97	233.0	5.91	7,407	0.80	31.46
1997/98	218.0	5.12	7,632	0.67	28.56
1998/99	252.0	6.02	7,638	0.79	33.00

[1] One veterinary livestock unit equivalent to 1 cattle, 10 sheep and goats, 2 pigs and 100 chickens.

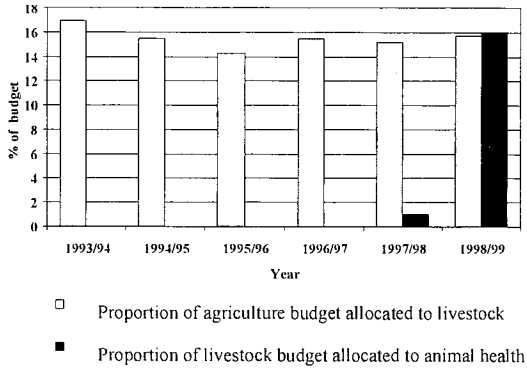

Figure 3. Proportion of agriculture budget allocated to livestock and animal health services in Cameroon, 1993/94 to 1998/99.

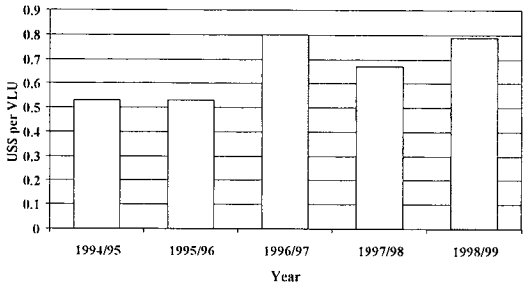

Figure 4. Livestock sub-sector expenditures per VLU in Cameroon, 1994/95 to 1998/99.

Ethiopia

Between 1993/94 and 1998/99, agriculture's contribution to the total GDP in Ethiopia was on average 49% (IMF statistics). This is obviously the most important sector of the economy yet the government only spends 5% its total recurrent expenditures on agriculture and less than 0.3% on livestock (Table 6). Ethiopia has the largest cattle population in Africa, about 35 million (FAO, 1999 estimates) yet, only 3% of the recurrent agricultural expenditures is spent on livestock activities. Even with the limited data available for livestock, this situation indicates that livestock needs more attention if its huge potential is to be fully realized. This calls for more government commitment in terms of increased expenditure allocations to both agriculture and livestock from the present situation.

Table 6. Share (%) of recurrent agriculture and livestock in total recurrent expenditures in Ethiopia, 1993/94 to 1998/99.

Year	Agriculture expenditures as % of total expenditures	Livestock expenditures as % of total expenditures	Livestock expenditures as % of total agriculture expenditures
1993/94	3.68	0.10	2.75
1994/95	3.58	0.08	2.34
1995/96	5.16	0.20	3.88
1996/97	7.17	...	...
1997/98	6.72	...	...
1998/99	6.17	...	...

Table 7 shows the staff salaries for livestock and fisheries personnel and the ratio of staff to non-staff expenditures. On average, the Government of Ethiopia spent US$0.47 million per year on staff salaries. This represent an average of 43% of the total recurrent expenditure. This implies that more funds were available for operational activities as can be seen from the ratios of staff to non-staff expenditures for the years 11994/56 and 1995/96.

Table 7. Personnel expenditures share (%) in total and recurrent expenditures

Year	Livestock staff salaries (million US$)	Salaries as % of recurrent livestock budget	Ratio of staff to non-staff salaries
1993/94	0.46	51.42	1.06
1994/95	0.38	46.16	0.86
1995/96	0.58	30.92	0.45

It was not possible to compute R-ratios for Ethiopia for the reasons of data unavailability and the inherent difficulties of segregrating livestock and animal health activities from the expenditure statistics obtained both from the Ministry of Agriculture and Natural Resources and the Ministry of Finance. Nevertheless, Ethiopia could not be completely ignored simply because it has the largest cattle population in Africa. A detailed analyses of livestock and animal health is planned in future which will incorporate the present constraints given the regionalization policy and autonomy of the various regions.

For Ethiopia's livestock population of over 33 million VLUs, the total recurrent budget allocated to livestock is negigible. The livestock recurrent expenditures per VLU is less than US$1.00 (Table 8).

Table 8. Livestock recurrent expenditures per VLU in Ethiopia, 1993/94 – 1995/96.

Year	Recurrent livestock expenditure (LRE) (million US$)	Veterinary livestock units (VLUs) (1,000)	LRE per VLU (US$)
1993/94	0.89	33,842	0.03
1994/95	0.81	33,842	0.02
1995/96	1.90	34,231	0.06

Kenya

In Kenya 1.3 (US$30.8 million) to 2.0% (US$57.7 million) of the total recurrent budget is allocated to agriculture. Livestock and animal health services receive an average of 0.75% and 0.47% of the total recurrent budget respectively. What is encouraging about financing livestock services in Kenya is that the absolute amount of the livestock budget increased by 70% during 1993/94-1997/98 (Annex 1 Table A3) while the relative proportion increased by about half during the same time period (Figure 5). Animal health services have also benefited from the budget increase. The animal health budget increased from US$6.0 million in 1993/94 to US$15.6 million in 1997/98 (Annex 1 Table A3). The relative share doubled from 0.29% to 0.57% during this period (Table 9 and Figure 5).

Forty two percent of the agriculture budget on average, is allocated to livestock while animal health receives 50 to 70% of the livestock recurrent budget (Table 9). As shown in Figure 7 the proportion of the agriculture budget allocated to livestock increased during 1993/94-1996/97 but declined in 1997/98 while the proportion of the livestock budget allocated to animal health services increased continuously. The relatively large and increasing share of the livestock budget going to animal health services is a reflection of the importance the Government of Kenya has given to animal disease control. Throughout the period 1990-1996/97, animal health services in Kenya were financed solely from national sources. It was not until 1997/98 that the Department of Veterinary Services benefited from a Pan African Rinderpest Campaign (PARC) financing of the Emergency Programme for the Eradication of Rinderpest in Kenya (EPERK) amounting to ECU.

Table 9. Share (%) of recurrent agriculture, livestock and animal health expenditure in total recurrent expenditure in Kenya, 1993/94-97/98.

Year	Agriculture expenditure as % of total recurrent expenditure	Livestock expenditure as % of total recurrent expenditure	Animal Health expenditure as % of total recurrent expenditure	Livestock expenditure as % of agricultural expenditure	Animal health expenditure as % of livestock expenditure
1993/94	1.32	0.56	0.29	42.18	52.07
1994/95	1.76	0.74	0.43	42.07	58.76
1995/96	1.82	0.80	0.50	43.75	63.13
1996/97	1.91	0.83	0.54	44.98	62.44
1997/98	2.12	0.81	0.57	38.18	70.71

Table 10. Agriculture, livestock and animal health budgets as % of Gross Domestic Product in Kenya, 1993/94 to 1998/99.

Year	Expenditure share in GDP			Agriculture expenditure as % of agricultural GDP
	Agriculture	Livestock	Animal health	
1993/94	0.78	0.33	0.17	2.94
1994/95	0.75	0.31	0.18	2.81
1995/96	0.71	0.31	0.20	2.54
1996/97	0.68	0.30	0.20	
1997/98	0.67	0.26	0.18	

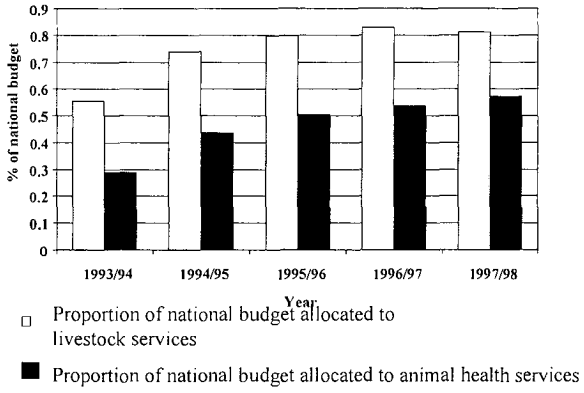

Figure 5. Proportion of national budget allocated to livestock and animal health in Kenya, 1993/94-1997/98.

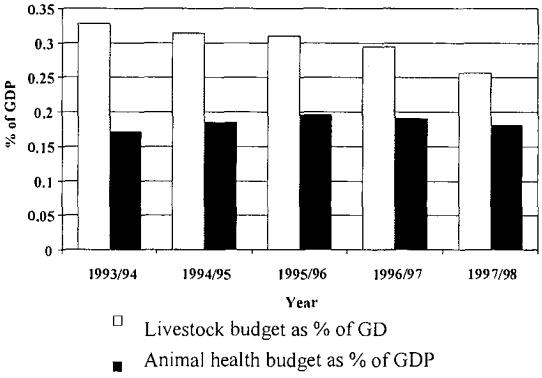

Figure 6. Livestock and animal health budgets as % of GDP in Kenya, 1993/94-1997/98

About one quarter of Kenya's GDP comes from agriculture while livestock contributes % of the GDP. Less than 1% of the GDP goes to support agriculture and about 0.3% goes to support livestock. For animal health services, only 0.2% of the GDP is used to provide these services. Whereas the proportion of agriculture and livestock budget in total recurrent budget increased during 1993/94-1997/98, the share of the GDP going to these sectors declined (Table 10 and Figure 6). This reflects the fact that Kenya's GDP increased at a faster rate than its recurrent budget. During 1993/94-1997/98 for example, total GDP increased by 150% from US$3.9 billion to US$9.9 billion (Annex 1 Table A4). The agriculture and livestock budgets increased by 70% and 87% respectively during this same period.

The proportion of staff salaries in total livestock services recurrent budget and the ratio of staff to non-staff salaries are presented in Table 11. The government spends on average, US$14.00 million per year on staff salaries. This accounts for more than two thirds of the recurrent budget. While staff salaries increased overall in absolute terms between 1993/94 and 1996/97, the relative proportion dropped from 71 to 65% during the same period. This implies that staff salaries increased at a faster rate than the recurrent budget. The increase in staff salaries was 72% compared to a 47% increase in the recurrent budget. This explains the drop in the ratio of staff to non-staff salaries (Table 11). The average staff to non-staff ratio of 2.26 suggests that for each dollar spent on staff salaries,

approximately US$0.44 was made available for operational activities. This is about five times greater than the operational expenditure incurred in Tanzania but about half of Cameroon's livestock services operational expenditures.

Table 11. Livestock sub-sector staff and non-staff salaries and ratios of staff to non-staff salaries in Kenya, 1995/95 and 1998/99.

Year	Livestock staff salaries (million US$)	Salaries as % of recurrent livestock budget	Ratio of staff to non-staff salaries	Ratio of agriculture expenditure in GDP to livestock expenditure in livestock GDP (*R*-ratio)
1993/94	9.30	71.43	2.50	
1994/95	16.71	73.16	2.73	
1995/96	14.41	65.71	1.92	
1996/97	15.11	65.35	1.88	

Table 12. R-ratios and livestock sub-sector expenditures per veterinary livestock unit in Kenya, 1994/95 – 1998/99.

Year	Livestock GDP (LGDP) (million US$)	Livestock recurrent expenditure (LRE) (million US$)	Veterinary livestock units[1] (VLU) (1,000)	LRE Per VLU (US$)	LGDP per VLU (US$)
1993/94		13.02	14,578	0.89	
1994/95		22.84	14,875	1.54	
1995/96		21.93	15,179	1.42	
1996/97		23.12	15,481	1.49	
1997/98		22.02	15,055	1.46	

Kenya's livestock population is estimated at about 15 million VLUs. With an average annual recurrent livestock services budget of US$20.7 million, the unit expenditure per VLU comes to US$1.36. The range is from US$0.89 to US$1.54 per VLU (Table 12). As Figure 8 indicates, unit expenditures increased by over 70% during 1993/94-1994/95 but dropped by 5% to US$1.46 in 1998/99. Overall, the level of expenditure in Kenya is relatively high compared to average expenditures of US$0.66 estimated for Cameroon, US$0.20 for Tanzania and US$0.13 for Uganda.

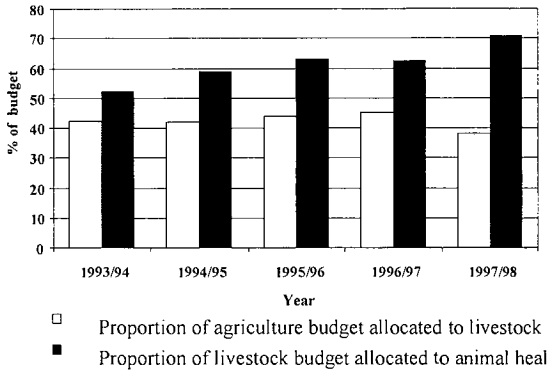

Figure 7. Proportion of agriculture budget allocated To livestock and animal health services in Kenya, 1993/94 to 1997/98.

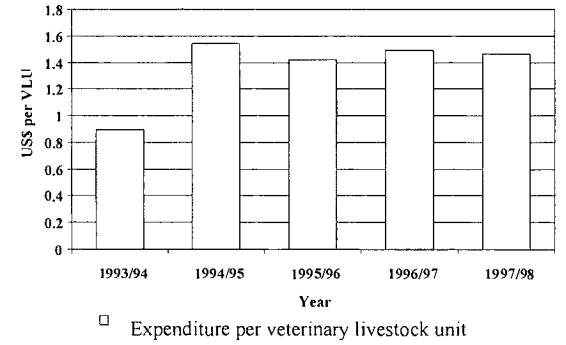

Figure 8. Livestock sub-sector expenditure per VLU in Kenya, 1993/94 to 1997/98.

Mali

The government of Mali spends an average of 2.4% of the total national recurrent budget on agriculture. The agriculture budget however, has been declining in both absolute and relative terms. Between 1993/94 and 1998/99 the proportion of the agriculture budget dropped from 3.8% (US$16.9 million) to 1.3% (US$6.0 million) (Table 13 and Annex 1 Table A3). Livestock's share in the total budget has persistently been below 1%; dropping from 0.96% (US$4.3 million) to 0.38% (US$1.7 million) during the same time period. Although quite small, the share of animal health in the total budget increased from 0.03% in 1994/95 to 0.1% in 1998/99 (Figure 9).

Approximately one quarter of the agriculture recurrent budget is allocated to livestock services. The provision of animal health services has received increased importance in recent years as shown by a four-fold increase in the proportion of the livestock budget devoted to animal health services (Figure 11). The pattern of budgetary allocation in Mali reveals that while the proportion of the total recurrent budget allocated to agriculture and livestock has been declining, the proportion of the total and livestock budgets allocated to animal health has been increasing. This reflects the degree of importance given to the provision of animal health services in Mali.

Table 13. Share (%) of agriculture, livestock and animal health expenditure in total expenditure in Mali, 1993/94-98/99.

Year	Agriculture expenditure as % of total expenditure	Livestock expenditure as % of total expenditure	Animal Health expenditure as % of total expenditure	Livestock expenditure as % of agricultural expenditure	Animal health expenditure as % of livestock expenditure
1993/94	3.77	0.96	...	25.44	...
1994/95	2.46	0.60	0.034	24.19	5.80
1995/96	2.78	0.58	0.032	20.98	5.35
1996/97	2.57	0.60	0.029	23.27	19.64

1997/98	1.50	0.39	0.077	25.92	27.98
1998/99	1.34	0.38	0.104	28.55	...

While agriculture and livestock contribute 35% and 10% to GDP in Mali respectively, less than 0.5% and 0.1% (Table 14) of the national recurrent budget is allocated to these sectors. Budgetary allocation as a proportion of GDP is not only small, but has been declining in the last five years (Figure 6). One percent of the agriculture GDP and another 1% of the livestock GDP is allocated to agriculture and livestock respectively. In both cases, the proportion has been declining in recent years. As shown in Figure 10 and Table 14, the proportion of total and livestock GDP devoted to animal heath, though quite small, has been increasing.

Table 14. Agriculture, livestock and animal health budgets as % of Gross Domestic Product, in Mali, 1994/95 to 1998/99.

Year	Expenditure share in GDP			Agriculture expenditure as % of agricultural GDP	Livestock expenditure as % of livestock GDP	Animal health expenditure as % of livestock GDP
	Agriculture	Livestock	Animal health			
1994/95	0.49	0.10	0.006	1.36	1.01	0.06
1995/96	0.44	0.10	0.005	1.16	0.99	0.05
1996/97	0.27	0.07	0.014	0.78	0.69	0.14
1997/98	0.23	0.07	0.018	0.67	0.69	0.19

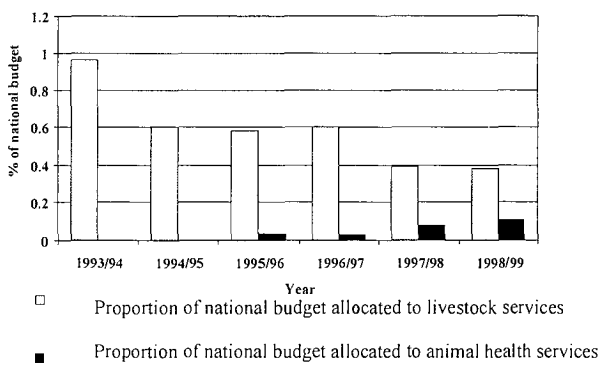

Figure 9. Proportion of national budget allocated to livestock and animal health in Mali, 1993/94-1998/99.

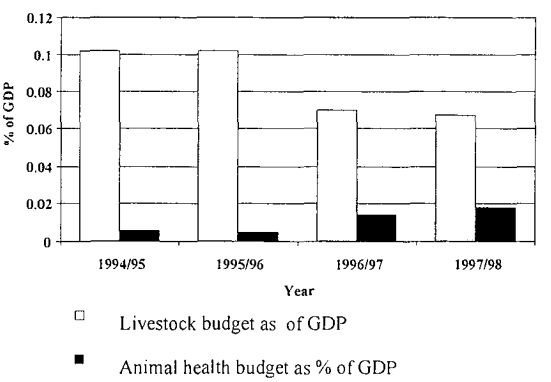

Figure 10. Livestock and animal health Budgets as % of GDP in Mali, 1994/95-1997/98.

According to the *R*-ratios reported in Table 15, it would appear that the Government of Mali funded livestock services relatively well during the 1994/95 – 1997/98 period. Except in 1997/98, the *R*-ratios are all above one, suggesting that the government made "appropriate" funding available to livestock services during this period. This reflects, perhaps, the importance accorded to animal health services through increased budgetary allocations. Interpretation of this result however, must be done in relation to the size of the total recurrent budget because when one examines the unit livestock recurrent

expenditure, the government did not spend any more than US$0.28 on average per VLU (Figure 12). This is not only small compared to an average annual expenditure of US$1.4 estimated for Ghana (Turkson and Brownie, 1999) and US$0.66 estimated for Cameroon, but is inadequate for a sector where each VLU contributes about US$120.00 to the economy. If livestock services were to be funded in relation to the proportion of its contribution to GDP, expenditures per VLU would average US$33.00 in Mali (Table 15).

Table 15. R-ratios and livestock sub-sector expenditures per veterinary livestock unit in Mali, 1994/95 – 1998/99.

Year	Livestock GDP (LGDP) (million US$)	Livestock recurrent expenditure (LRE) (million US$)	Veterinary livestock units[1] (VLU) (1,000)	LRE Per VLU (US$)	LGDP per VLU (US$)	Ratio of agric. expenditure in GDP to animal health expenditure in Livestock GDP (*R*-ratio)
1994/95	240.00	2.43	7,095	0.34	33.83	1.34
1995/96	265.00	2.62	7,358	0.36	36.02	1.18
1996/97	244.00	1.68	7,604	0.22	32.09	1.13
1997/98	249.00	1.71	7,785	0.22	32.00	0.97
1998/99	251.00	...	7,786	...	32.24	...

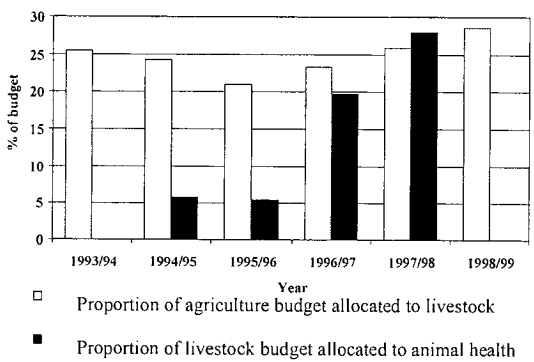

Figure 11. Proportion of agriculture budget allocated expenditures to livestock and animal health services in Mali, 1993/94 to 1998/99.

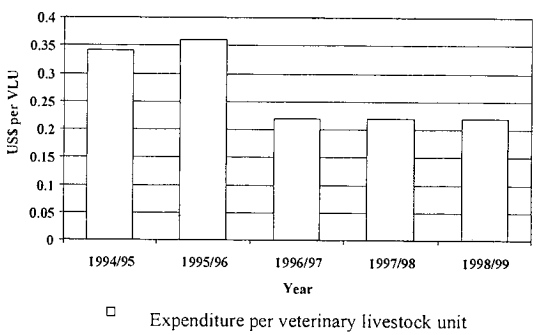

Figure 12. Livestock sub-sector per VLU in Mali, 1994/95 to 1998/99.

Tanzania

The Government of the Republic of Tanzania allocates on average, 3.6% of the total recurrent budget to agriculture. Between 1993/94 and 1994/95 the agriculture budget dropped by about two-thirds from 8.4% (US$41.1 million) to 2.2% (US$13.8 million). Since 1994/95 however, the agriculture budget has been increasing, although in 1998/99 the proportion was only 3.0% (US$22.9 million) (see Table 16 and Annex 1 Tabla A3). Like most other sub-Saharan African countries, Tanzania's livestock recurrent budget averages 0.5% of the total recurrent budget while the share of total budget going to animal health services is about 0.01% (Figure 13). The share of livestock budget increased between 1993/94 and 1995/96 but declined thereafter to 0.39% in 1998/99. The share of the animal health budget on the other hand, declined continuously from 0.05% in 1993/94 to just 0.002% in 1997/98. About 15% of the annual agriculture budget is spent on livestock whereas 6% of the livestock budget goes for the provision of animal health services.

What is interesting in Tanzania is that in 1993/94 when agriculture received a relatively large share of the total recurrent budget, only a small fraction of it (5.7%) was allocated to livestock Table 16). In spite of this small share going to livestock, 10.3% of it was allocated to animal health services compared to the other years when livestock received a relatively large share (13-20%) of the agriculture budget and only about 5% went to animal health services (Figure 15). This lack of coherence in resource allocation to livestock and animal health services makes it difficult to plan and coordinate activities.

Table 16. Share (%) of agriculture, livestock and animal health expenditure in total expenditure in Tanzania, 1993/94-98/99.

Year	Agriculture expenditure as % of total expenditure	Livestock expenditure as % of total expenditure	Animal Health expenditure as % of total expenditure	Livestock expenditure as % of agricultural expenditure	Animal health expenditure as % of livestock expenditure
1993/94	8.38	0.48	0.049	5.68	10.31
1994/95	2.19	0.45	0.025	20.72	5.41
1995/96	2.87	0.52	0.029	18.01	5.55
1996/97	2.90	0.51	0.018	17.69	3.58
1997/98	2.24	...	0.002	...	...
1998/99	3.01	0.39	...	12.96	...

Table 17. Agriculture, livestock and animal health budgets as % of Gross Domestic Product, in Tanzania, 1994/95 to 1998/99.

Year	Expenditure share in GDP			Agriculture expenditure as % of agricultural GDP	Livestock expenditure as % of livestock GDP	Animal health expenditure as % of livestock GDP
	Agriculture	Livestock	Animal health			
1993/94	1.34	0.076	0.008	2.78	1.26	0.13
1994/95	0.36	0.074	0.004	0.79	1.33	0.07
1995/96	0.40	0.072	0.004	0.84	1.38	0.08
1996/97	0.40	0.070	0.003	0.83	1.45	0.05
1997/98	0.29	...	...	0.62	...	...
1998/99	0.36	0.046	...	0.80	...	...

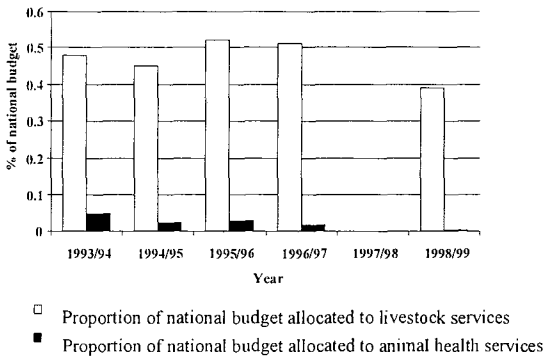

Figure 13. Proportion of national budget allocated to livestock and animal health in Tanzania, 1993/94-1998/99.

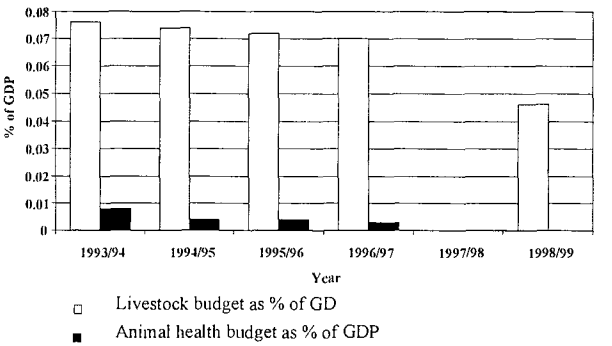

Figure 14. Livestock and animal health budgets as % of GDP in Tanzania, 1994/95-1997/98.

Agriculture contributes 44 to 48% of Tanzania's GDP, making it the most important sector of the economy. Livestock also make significant contributions to agricultural GDP with percentages ranging from 10 to 13%. In spite of this importance, public investment into these sectors is quite small relative to their contribution. As shown in Table 17, only 0.3 to 1.3% of the GDP is ploughed back into agriculture and only 0.05 to 0.07% is put back into livestock. The share of GDP going to animal health is negligible, not exceeding 0.008% (Figure 14). Approximately 1% of agriculture GDP and another 1% of livestock GDP are allocated to these sectors. These shares are not only quite small, but have been declining in recent years, reflecting increasing inability or lack of commitment to agriculture and livestock development in Tanzania.

Table 18. Livestock sub-sector staff and non-staff salaries and ratios of staff to non-staff salaries in Tanzania, 1994/95 to 1998/99.

Year	Livestock staff salaries (million US$)	Salaries as % of recurrent livestock budget	Ratio of staff to non-staff salaries	Ratio of agriculture expenditure in GDP to livestock expenditure in livestock GDP (*R*-ratio)
1994/95	2.58	90.46	9.48	0.60
1995/96	3.10	92.14	11.72	0.61
1996/97[1]	3.72	95.67	22.09	0.57
1998/99	2.64	88.96	8.06	0.77

[1] No data available for 1997/98.

Over 90% of Tanzania's recurrent livestock services budget is used for staff salaries, leaving very little for operational expenses. Staff salaries increased from US$2.6 million in 1994/95 to US$3.7 million in 1996/97 but dropped back to US$2.6 million in 1998/99 (Table 18). The very high average staff to non-staff salary ratio of 12.8 gives a clear indication that field staff are grounded and unable to function effectively. On average, only US$0.08 is spent on operational activities for each US$1.00 spent on staff salaries. This means that administrative and field staff are unable to perform their duties efficiently because of inadequate or lack of operational funds. Compared to Cameroon, the only other country for which personnel expenditure data are available, field operations in Tanzania are highly restricted, in effect, depriving livestock owners of valuable animal health services.

As indicated by the *R*-ratios in Table 18, livestock and animal health services in Tanzania appear not to have received "appropriate" levels of funding to sustain field activities for the period 1994/95–1998/99. All the ratios are below one, indicating that livestock services received a disproportionate share of what livestock contributed to agricultural output in Tanzania. What is encouraging is that the *R*-ratio increased between 1994/95 and 1998/99, a reflection of more government commitment to livestock development.

Table 19. Livestock sub-sector expenditures per veterinary livestock unit in Tanzania, 1994/95 – 1998/99.

Year	Livestock GDP (LGDP) (million US$)	Livestock recurrent expenditure (LRE) (million US$)	Veterinary livestock units[1] (VLU) (1,000)	LRE Per VLU (US$)	LGDP per VLU (US$)
1993/94	185.19	2.33	15,521	0.15	12.00
1994/95	214.28	2.86	15,695	0.18	13.65
1995/96	244.05	3.22	15,815	0.20	15.43
1996/97	269.14	3.15	15,975	0.20	16.85
1997/98	313.67	3.86	16,137	0.24	19.44
1998/99	285.84	3.96	16,207	0.24	17.64

The Government of Tanzania allocates about US$3.2 million per year for the provision of services to a livestock population of 16 million VLUs (Table 19). This gives an average expenditure of US$0.20 per VLU. During the period 1993/94 - 1998/99, unit expenditure increased by 60% (Figure 16), meaning that over time, the government has become more committed to the provision of livestock and animal health services. If the livestock

services budget were to be allocated in proportion to its contribution to GDP, expenditures would average US$16.00 per VLU (Table 19).

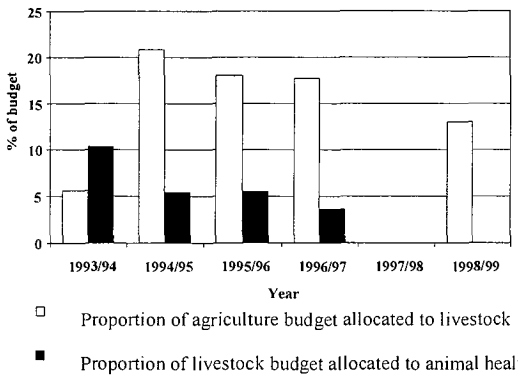

Figure 15. Proportion of agriculture budget allocated to livestock and animal health services in Tanzania, 1993/94 to 1998/99.

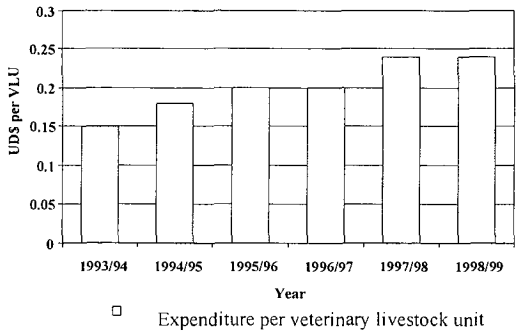

Figure 16. Livestock sub-sector expenditure per VLU in Tanzania, 1993/94 to 1998/99.

Uganda

In Uganda agriculture receives from the total recurrent budget, US$3.8 million on average per year while livestock receives about US$1.00 million. The agriculture budget has remained relatively constant over the last five years whereas the livestock and animal health budgets about doubled during 1995/96-1996/97 but dropped to US$0.74 million and US$0.51 million in 1998/99 respectively. On a relative basis, the proportion of the recurrent agriculture budget varies from 0.52 to 0.63% of the total recurrent budget while the livestock budget varies from 0.14 to 0.24% (Table 20). The share of the livestock and animal health budget exhibits a similar pattern of change, rising during 1995/96-1996/97 and then falling thereafter (Figure 17). About one quarter of the agriculture budget goes to livestock while more than two thirds of the livestock budget is allocated to animal health services Table 20). However, as Figure 19 shows, the share of the livestock budget going to animal health remained relatively constant during 1995/96-1998/99. The high proportion of the livestock budget devoted to animal health services reflects the importance the government has given to animal disease control in Uganda.

Table 20. Share (%) of agriculture, livestock and animal health expenditure in total expenditure in Uganda, 1995/96-98/99.

Year	Agriculture expenditure as % of total expenditure	Livestock expenditure as % of total expenditure	Animal Health expenditure as % of total expenditure	Livestock expenditure as % of agricultural expenditure	Animal health expenditure as % of livestock expenditure
1995/96	0.63	0.18	0.073	14.51	76.78
1996/97	0.61	0.24	0.133	29.76	73.68
1997/98	0.56	0.19	0.128	31.55	72.03
1998/99	0.52	0.14	0.074	20.50	69.86

Like in Tanzania, agriculture plays a key role in Uganda's economy, contributing 44 to 50% of the GDP. Livestock account for one fifth of agriculture's share. In spite of this, an insignificant share of the GDP is devoted to agriculture and livestock. As shown in Table 21, agriculture and livestock do not even receive up to 0.1% of what they contribute to the economy. Less than 0.5% of the agricultural and livestock GDP goes back into these sectors. Livestock and animal health expenditures as % of livestock GDP increased between 1995/96 and 1996/97 but dropped again by 1998/99 (Figure 18).

Table 21. Agriculture, livestock and animal health budgets as % of Gross Domestic Product, in Uganda, 1995/96 to 1998/99.

Year	Expenditure share in GDP			Agriculture expenditure as % of agricultural GDP	Livestock expenditure as % of livestock GDP	Animal health expenditure as % of livestock GDP
	Agriculture	Livestock	Animal health			
1995/96	0.067	0.010	0.007	0.27	0.38	0.27
1996/97	0.067	0.020	0.015	0.28	0.50	0.36
1997/98	0.057	0.018	0.013	0.37	0.40	0.26
1998/99	0.057	0.012	0.008	0.24	0.34	0.21

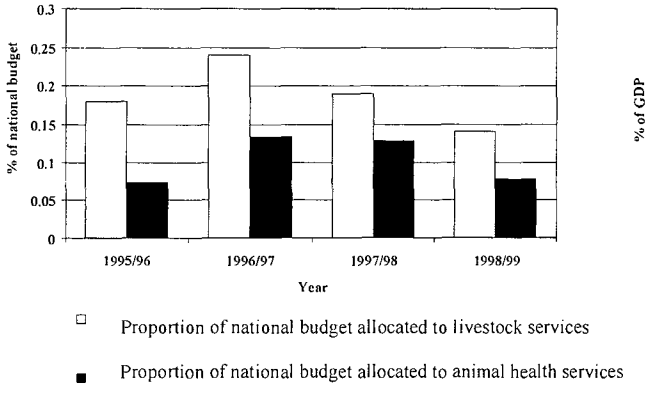

Figure 17. Proportion of national budget allocated to livestock and animal health in Uganda, 1995/96-1998/99.

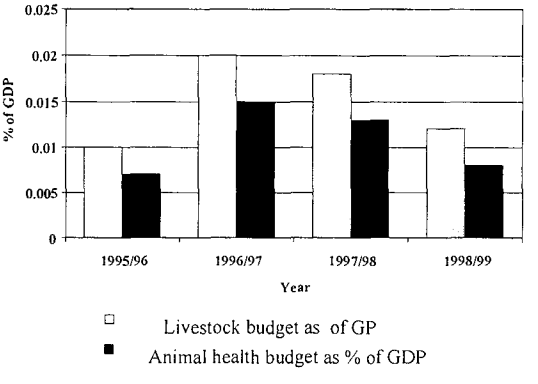

Figure 18. Livestock and animal health budgets as % of GDP in Uganda, 1995/96-1998/99

As shown in Table 22, the *R*-ratio of 1.36 indicates that the Government of Uganda provided "appropriate" financing to livestock services only in 1995/96 compared to the other years. What is interesting is that during 1995/96 when the government supposedly provided "appropriate" funding, the unit expenditure was quite low at US$0.08 per VLU. During 1996/97 when funding was inadequate as per an *R*-ratio of 0.69, the unit expenditure was more than doubled to US$0.17 per VLU. Thus, it is not that adequate funding was made available to livestock services in 1995/96 relative to 1996/97, but simply that the livestock services budget more than doubled during this period while the agriculture budget (the important variables used in calculating the R-ratio) remained about the same. The increase in agriculture and livestock GDP was not significant enough to alter this outcome.

For a livestock population of about 7 million VLUs, the Government of Uganda allocates approximately US$1.00 million per year, giving a unit expenditure of US$0.13 per VLU (Table 22). Unit expenditures more than doubled during 1995/96-1996/97 but declined thereafter to US$0.10 per VLU in 1998/99 (Figure 20). If the government were to fund livestock services in accordance with its contribution to GDP, it would be spending about US$70.00 per VLU.

Table 22. *R*-ratios and livestock sub-sector expenditures per veterinary livestock unit in Uganda, 1994/95 – 1998/99.

Year	Livestock GDP (LGDP) (million US$)	Livestock recurrent expenditure (LRE) (million US$)	Veterinary livestock units[1] (VLU) (1,000)	LRE Per VLU (US$)	LGDP per VLU (US$)	Ratio of agriculture expenditure in GDP to animal health expenditure in Livestock GDP (*R*-ratio)
1994/95	396.00	...	6,600	...	60.00	...
1995/96	507.00	0.56	6,769	0.08	75.00	1.36
1996/97	495.00	1.14	6,876	0.17	72.00	0.69
1997/98	533.00	1.18	7,076	0.17	75.32	0.58
1998/99	500.00	0.74	7,313	0.10	68.37	0.87

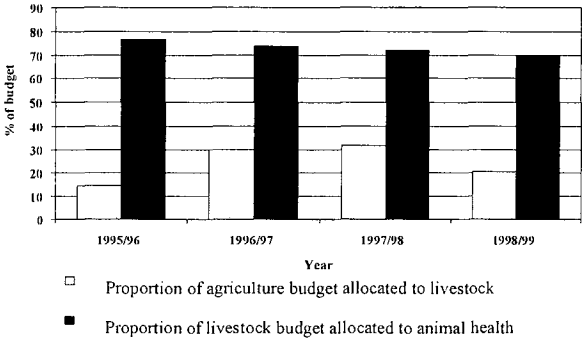

Figure 19. Proportion of agriculture budget allocated To livestock and animal health services in Uganda, 1995/96 to 1998/99.

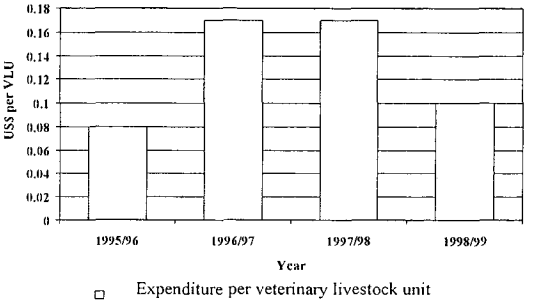

Figure 20. Livestock sub-sector expenditure per VLU in Uganda, 1995/96 to 1998/99.

Conclusions and implications

Increasing livestock production is essential for poverty alleviation and food security in sub-Saharan Africa. In most of these countries, the livestock sector's priority is to increase the productivity and production efficiency of animals. Underpinning the increase in productivity is adequate provision of quality livestock and animal health services. Adequate budgetary allocation is a necessary ingredient for the achievement of this objective. The pattern of public recurrent expenditure in the countries examined in this study shows a clear downward trend during the period 1993/94–1998/99 in both absolute and relative terms. Consequent to persistent budget cuts, livestock and animal health services are under-funded in national budgets, particularly recurrent expenditures that are essential for motivation and effective field operation. The imbalance between government budgetary allocations and sectoral priorities portrays the inability or lack of commitment by governments to provide requisite resources for achieving long-term sectoral objectives. Livestock and animal health expenditures continue to be a disproportionate share of the total budget and what livestock contributes to GDP.

The results presented in this paper unify the six countries to share one common characteristic namely – budgetary allocations for livestock and animal health services hardly exceed 1% of the national recurrent budget. Other findings by Turkson and Brownie (1999) and Huhn (1990) support these results. Our findings also reveal that in none on the countries did livestock expenditure as a proportion of the GDP exceed 3%. However, this proportion differs among the countries. While Cameroon allocates up to 3% of its livestock GDP to livestock and animal health services, Mali allocates no more than 1% and Uganda no more than 0.5%. This illustrates differences in the degree of commitment by the different governments to adequate provision of livestock and animal health services. Because livestock contribute no less than 5% to total GDP in any of these countries, the overall goal of poverty alleviation and food security through increased livestock production is paramount. Yet public sector investment into the sector is negligible.

Another important finding of this study is that marked differences exist in intra-sectoral budgetary allocation among the countries. For example, the proportion of the agriculture budget allocated for livestock services varies from 15% in Cameroon and Tanzania to 25% in Mali and Uganda, and 42% in Kenya. With regard to the share of the livestock budget allocated for animal health services it varies from just 6% in Tanzania to 15% in Cameroon and Mali, 60% in Kenya and more than 70% in Uganda. This pattern of budgetary allocation reflects differences in the priorities of the different governments as far as increasing livestock production through animal disease control is concerned. Whereas Cameroon gives the same level of importance to animal disease control as it does to livestock production in general, Mali and Tanzania regard animal disease control as less important compared to other activities within the livestock sub-sector. The limited commitment to animal disease control appears to be changing in Mali however, as evidenced by the increasing share of the livestock budget going to animal health in recent years (see Table 13). In Tanzania on the contrary, commitment to animal disease control is declining as the falling share of the animal health budget in Table 16 illustrates. As far

as Kenya and Uganda are concerned, animal disease control appears to take precedence over other activities within the livestock sub-sector because animal health takes over 60% of the livestock budget.

Perhaps the most important finding of this study is that higher proportions of the total recurrent budget earmarked for livestock and animal health services do not necessarily correlate with higher levels of unit absolute expenditures. This fact is borned out by the differences between relative and absolute unit expenditures in some of the countries. Except in Kenya where a relatively high proportion of the livestock and animal health services budget provides an average expenditure of US$1.40 per VLU, in the other countries, unit expenditures are low in spite of a relatively high proportion of the agriculture budget earmarked for livestock and animal health. In Uganda for example, a relatively high share of the livestock and animal health budget provides a very small unit expenditure of only US$ 0.13 per VLU. This suggests that budgetary allocation for livestock and animal health services should not be based on relative proportions to the national budget, but on the absolute amounts that would be consistent with adequate provision of these services.

Overall, the size of the recurrent animal health budget in the countries examined in this study is not only small and inadequate for effective provision of services, but declining in absolute and relative terms. This has serious implications on effective provision of services. Delivery of animal health services in particular, is paralyzed in most countries, making it difficult to carry out disease surveillance, produce and distribute drugs and vaccines, and provide extension services. Since personnel costs account for more than half (Cameroon and Kenya and more than 90% in Tanzania) of the recurrent budget, this means that both personal emoluments and operating expenditures are spread too thin on a unit basis to have any real impact. This has made it increasingly difficult to motivate and retain technical staff within the livestock sub-sector. High staff to non-staff salary ratios suggests that very little is made available for field operation and maintenance of existing infrastructure and facilities. Loss of skills and deteriorating facilities have contributed to a weakening of the implementation capacity of most disease control programmes and thus may partly explain the low productivity of livestock.

Implications for sustainability of the Pan African Control of Epizootics programme

Inadequate financing of animal health programmes by governments in SSA has greatly undermined the efficient provision of adequate services to livestock owners. Most disease control programmes are non-sustainable because a larger portion of the cost is covered from donor funds and once these funds dry up, the disease situation worsens. For example, the Joint Project (JP-15) that was implemented in the 1960s and 1970s with the aim of eradicating rinderpest from Africa, was financed through aid from various international institutions and national governments. Although the project succeeded in substantially reducing the incidence of rinderpest in Africa and strengthening veterinary services to respond to other major diseases, rinderpest reappeared in several parts of Africa as most departments of veterinary services deteriorated immediately after the project ended. With external funding available, some national governments quickly cut their veterinary services budget; redirecting the proceeds to other priorities. When external financing ended, they found it difficult to sustain an efficient veterinary service. Routine vaccination and disease surveillance ceased as most departments of veterinary services deteriorated. Disease incidence and mortality increased as a consequence, leading to reduced livestock production.

National governments cannot and should not continue to rely on donor funding of animal health programmes indefinitely if they are to provide consumers with more and quality livestock products. Regardless of whether donor funds are available, national governments must show commitment to livestock development by not only making adequate budgetary provisions available to animal health services, but also encouraging greater private sector involvement as well introducing more cost recovery measures. The Pan African Rinderpest Campaign (PARC), whose aim was to eradicate rinderpest from Africa and restructure livestock services, received financial support from the European Union and national governments. For a sample of ten countries, external finding accounted for an average of 56% of the total programme cost while national governments made an average contribution of 44% (Tambi *et al.*, 1999). While this level of national commitment might have been "appropriate" for a single disease control programme, a multiple disease control programme such as the Pan African Control of Epizootics (PACE) would definitely require increased government commitment and greater private sector involvement. This holds true because whereas PARC was financed as a separate project under the Department of Veterinary Services, PACE will be an integral part of the DVS.

Unlike PARC which achieved the remarkable success of eradicating rinderpest from most of Africa, the PACE programme is designed to safeguard these benefits by establishing the groundwork for national governments to take over full control of epizootic and other major animal diseases in sub-Saharan Africa. The PACE programme has four main thrusts namely:

1. Reinforcing animal epidemiology services and control of major diseases by enhancing national capacities

2. Greater privatization of veterinary services and public/private linkages in the field to improve distribution of veterinary services and medicines

3. Rinderpest eradication from Africa through the elimination of the last reservoirs and verification of freedom

4. Control of major epizootic diseases

It is expected that rinderpest would have been eradicated from the remaining foci in East Africa (thrust 3) and that an increasing number of private individuals would have been involved in the provision of animal health services (thrust 2) by the time donor funding of PACE runs out. A functional epidemio-surveillance network for the control of major epizootic diseases (thrusts 1 and 4) will have to be sustained for any positive benefits to be realized. Unavoidably, this will be the task of national governments to fund and maintain such a network. Capacity building at the national level that is currently being provided under PACE is a necessary pre-condition for this. The epidemio-surveillance network will need to be institutionalized into the Ministry of Agriculture/Livestock and managed as a normal activity of the Department of Veterinary Services (DVS). Funding of field activities under the network will have to be provided under the normal DVS annual budget allocated by the Ministry of Agriculture/Livestock.

The practical implications of the results of this study for a sustainable epidemio-surveillance network and better control of major epizootics is that the low and declining pattern of government budgetary allocation to livestock and animal health services will hamper the effectiveness of the networks in most countries. While some countries may be able to operate their networks relatively more efficient than others because they are able to allocate more resources, the overall benefit to be derived from a regional network involving many countries will be stifled. If the groundwork established by PACE for effective animal disease control is to contribute to poverty alleviation and food security in sub-Saharan Africa, governments will have to be more committed through increased allocation of financial, human and physical resources to livestock and animal health services as well as encourage greater private sector involvement for greater cost recovery.

Shortcomings of this study

The conclusions presented in this study should be viewed within the context of the data used. In most cases, data on budgetary allocations were obtained from financial documents presented by the Ministry of Agriculture and/or Livestock and published by the Ministry of Finance. We acknowledge that differences may occur in some of the estimates reported not because of the method of calculation employed, but because of differences in the way different countries report and present their budgets. In Mali for example, the detail breakdown of the budget of the Ministry of Rural Development is by sub-sector (agriculture – crops, livestock, water, forestry). The livestock sub-sector budget does not have a specific budget head for animal health. Rather, animal health activities are financed according to the projects that deal with animal health issues. Thus, compilation of animal health expenditure data was based on expert identification of animal health activities within livestock related projects at national and regional level. In Cameroon on the other hand, the Ministry of Agriculture is separate from the Ministry of Livestock, Fisheries and Animal Industries. So the budget for the two ministries had to be combined. For the livestock Ministry, the budget is allocated according to activity (e.g. administration, animal health, fisheries development, etc). Unlike Mali and Cameroon, Uganda reports its recurrent expenditures by product (e.g. crops, livestock, fisheries) and activity (e.g. extension, training, veterinary services and entomology, etc).

Given the differences in presentation of budgets, strict comparisons of certain parameters across countries should be done with care. We do not purport to be exhaustive in our analysis because of data limitations.

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Annex 1.

Table A1. Total and per capita indices of livestock production in Cameroon and Mali, 1993 to 1999 (1989-91=100).

Year	Cameroon		Mali	
	Index of total livestock production	Index of per capita livestock production	Index of total livestock production	Index of per capita livestock production
1993	108.8	100.1	106.8	99.6
1994	110.7	99.0	106.7	97.2
1995	112.9	98.3	112.5	100.1
1996	114.7	97.1	115.3	100.1
1997	117.0	96.5	117.1	99.3
1998	119.0	95.5	123.3	102.0
1999	120.0	93.7	123.3	99.5

Table A1 cont. Total and per capita indices of livestock production in Kenya, Tanzania and Uganda, 1993 to 1999 (1989-91=100).

Year	Kenya		Tanzania		Uganda	
	Index of total livestock production	Index of per capita livestock production	Index of total livestock production	Index of per capita livestock production	Index of total livestock production	Index of per capita livestock production
1993	93.2	85.0	108.5	98.1	113.7	104.8
1994	94.4	83.8	108.7	95.2	109.8	98.4
1995	97.7	84.5	111.6	95.1	112.1	97.6
1996	103.1	87.2	111.4	92.5	113.4	96.0
1997	105.5	87.4	113.5	92.1	114.7	94.5
1998	100.9	81.9	117.2	93.1	118.9	95.3
1999	104.1	83.0	118.6	92.2	120.2	93.7

Table A1 cont. Total and per capita indices of livestock production in Ethiopia, 1993 to 1999 (1989-91=100).

Year	Ethiopia	
	Index of total livestock production	Index of per capita livestock production
1993	101.6	93.1
1994	102.7	91.5
1995	104.8	91.0
1996	112.2	95.0
1997	113.1	93.4
1998	114.1	92.0
1999	117.2	92.2

Table A2. Per capita supply of meat and milk in Ethiopia, 1993 to 1998, (Kg/person/ year).

Year	Ethiopia	
	Meat	Milk
1993	11.0	13.8
1994	10.7	13.4
1995	10.6	14.2
1996	10.9	15.5
1997	10.7	15.2
1998	10.5	14.8

Table A2 cont. Per capita supply of meat and milk in Cameroon and Mali, 1993 to 1998, (Kg/person/ year).

Year	Cameroon		Mali	
	Meat	Milk	Meat	Milk
1993	15.7	15.4	18.3	42.3
1994	15.4	15.1	18.4	41.7
1995	15.2	14.9	18.5	43.1
1996	15.0	14.8	18.5	44.3
1997	15.1	15.2	18.4	42.9
1998	14.9	14.2	19.2	43.4

Table A2 cont. Per capita supply of meat and milk in Kenya, Tanzania and Uganda, 1993 to 1998, (Kg/person/ year).

Year	Kenya		Tanzania		Uganda	
	Meat	Milk	Meat	Milk	Meat	Milk
1993	13.8	79.0	10.5	17.7	12.0	25.2
1994	13.7	77.7	10.1	17.6	11.5	23.4
1995	13.9	77.3	10.0	18.1	11.4	23.5
1996	14.4	80.6	9.8	17.6	11.2	22.8
1997	14.6	79.4	9.7	17.5	11.0	22.6
1998	13.5	76.7	9.7	19.2	11.0	23.0

Table A3. Recurrent agriculture, livestock and animal health expenditures in Cameroon and Mali, 1993/94-98/99 (million US$).

Year	Cameroon			Mali		
	Agriculture	Livestock	Animal health	Agriculture	Livestock	Animal health
1993/94	84.35	14.29	n.a.	16.90	4.30	n.a.
1994/95	24.39	3.78	n.a.	9.26	2.24	0.13
1995/96	26.72	3.80	n.a.	11.58	2.43	0.13
1996/97	38.10	5.91	n.a.	11.26	2.62	0.33
1997/98	33.76	5.12	0.05	6.48	1.68	0.47
1998/99	38.39	6.02	0.96	5.99	1.71	n.a.

Table A3 cont. Recurrent agriculture, livestock and animal health expenditures in Kenya and Tanzania, 1993/94-98/99 (million US$).

Year	Kenya			Tanzania		
	Agriculture	Livestock	Animal health	Agriculture	Livestock	Animal health
1993/94	30.87	13.02	6.78	41.08	2.33	0.24
1994/95	54.29	22.84	13.42	13.79	2.86	0.15
1995/96	49.30	21.57	13.62	18.65	3.36	0.19
1996/97	53.27	23.96	14.96	22.00	3.89	0.14
1997/98	57.67	22.02	15.57	18.23	n.a.	n.a.
1998/99	n.a.	n.a.	n.a.	22.93	2.97	n.a.

Table A3 cont. Recurrent agriculture, livestock and animal health expenditures in Uganda, 1993/94-98/99 (million US$).

Year	Uganda			Ethiopia	
	Agriculture	Livestock	Animal health	Agriculture	Livestock
1993/94	...	...	...	32.50	0.90
1994/95	...	...	...	34.76	0.81
1995/96	3.86	0.56	0.43	48.04	1.86
1996/97	3.83	1.14	0.84	63.03	...
1997/98	3.74	1.18	0.85	69.47	...
1998/99	3.61	0.74	0.51	70.36	...

Table A4. Total, agricultural and livestock GDP in Kenya, Tanzania and Uganda, 1993/94 to 1998/99 (million US$ at current prices).

	Country								
	Kenya			Tanzania			Uganda		
	Total GDP	Agric. GDP	Lives. GDP	Total GDP	Agric. GDP	Lives. GDP	Total GDP	Agric. GDP	Lives. GDP
1993/94	3,965	1,051		3,071	1,478	185	4,954	2,385	372
1994/95	7,272	1,935		3,862	1,737	214	5,026	2,482	396
1995/96	6,956	1,941		4,695	2,213	244	5,746	2,594	507
1996/97	7,874			5,528	2,655	269	5,762	2,419	495
1997/98	8,593			6,287	2,942	314	6,555	2,925	533
1998/99	9,900			6,428	2,878	286	6,371	2,818	500

Table A4 cont. Agriculture and livestock GDP in Kenya, Cameroon and Mali, 1994/95 to 1998/99 (million US$ at current prices).

	Country					
	Cameroon			Mali		
	Total GDP	Agriculture GDP	Livestock GDP	Total GDP	Agriculture GDP	Livestock GDP
1994/95	8,042	1,850	187	2,377	853	240
1995/96	9,603	1,972	225	2,577	967	265
1996/97	10,498	2,315	233	2,434	834	244
1997/98	9,841	2,170	218	2,566	900	249
1998/99	9,650	2,083	206	2,785	1,038	251

National government contributions to animal disease control programmes:

The case of the Pan African Control of Epizootics (PACE) programme

DRAFT

Organization of African Unity (OAU)
Inter-African Bureau of Animal Resources (IBAR)
Pan African Control of Epizootics (PACE)

Economics Unit
December, 2000

National government contributions to animal disease control programmes

Background

Increasing livestock production is essential for poverty alleviation and food security in sub-Saharan Africa (SSA). In most of these countries, priority is to increase the productivity and production efficiency of livestock. Underpinning the increase in productivity is adequate provision of quality livestock and animal health services. Adequate budgetary allocation is a necessary ingredient for the achievement of this objective. An analysis of the pattern of public recurrent animal health budgets in a sample of six countries (Cameroon, Ethiopia, Kenya, Mali, Tanzania and Uganda) reveals a clear downward trend in expenditure during the period 1993/94–1998/99 in both absolute and relative terms. Consequent to declining budgetary provisions, livestock and animal health services are under-funded in national budgets, particularly recurrent expenditures that are essential for motivation and effective field operations. The imbalance between government budgetary allocations and livestock sector's priorities portrays the inability or lack of commitment by governments to provide requisite resources for achieving long-term sectoral objectives. Livestock and animal health expenditures continue to be a disproportionate share of the total budget than what livestock contributes to GDP.

Analysis of the pattern of budgetary allocations in the six countries reveals one common characteristic namely – budgetary allocations for livestock and animal health services hardly exceed 1% of the national recurrent budget. Other findings by Turkson and Brownie (1999) and Huhn (1990) support this fact for a number of SSA countries. In none on the countries does livestock expenditure as a proportion of the GDP exceed 3%. However, this proportion differs among countries. While Cameroon allocates up to 3% of its livestock GDP to livestock and animal health services, Mali allocates no more than 1% and Uganda no more than 0.5%. This illustrates differences in the degree of commitment by the different governments to adequate provision of livestock and animal health services. Because livestock contribute more than 5% to total GDP in any of these countries, the overall goal of poverty alleviation and food security through increased livestock production is seen to be important. Yet, public sector investment into the sector is negligible.

In a majority of countries, major differences exist in intra-sectoral budgetary allocation. For example, the proportion of the agriculture budget allocated for livestock services varies from 15% in Cameroon and Tanzania to 25% in Mali and Uganda, and 42% in Kenya. With regard to the share of the livestock budget allocated for animal health services it varies from just 6% in Tanzania to 15% in Cameroon and Mali, 60% in Kenya and more than 70% in Uganda. This pattern of budgetary allocation again reflects differences in the priorities of the different governments as far as increasing livestock production through animal disease control is concerned. Whereas Cameroon gives the same level of importance to animal disease control as it does to livestock production in general, Mali and Tanzania regard animal disease control as less important compared to other activities within the livestock sub-sector. The limited commitment to animal disease control appears to be changing in Mali however, as evidenced by an increasing share of

the livestock budget going to animal health in recent years (see Background paper). In Tanzania on the contrary, commitment to animal disease control is declining as the falling share of the animal health budget illustrates. As far as Kenya and Uganda are concerned, animal disease control appears to take precedence over other activities within the livestock sub-sector because animal health takes over 60% of the livestock budget.

It is also interesting to note that higher proportions of the total recurrent budget earmarked for livestock and animal health services do not necessarily correlate with higher levels of unit absolute expenditures. This fact is borne out by the differences between relative and absolute unit expenditures in some of the countries examined. Except in Kenya where a relatively high proportion of the livestock and animal health services budget provides an average expenditure of US$1.40 per veterinary livestock unit (VLU), in the other countries, unit expenditures are low in spite of a relatively high proportion of the agriculture budget spent for livestock and animal health. In Uganda for example, a relatively high share of the livestock and animal health budget provides a very small unit expenditure of only US$ 0.13 per VLU. This suggests that budgetary allocation for livestock and animal health services should not be based on relative proportions to the national budget, but on the absolute amounts that would be consistent with adequate provision of these services.

Overall, the size of the recurrent animal health budget in the countries examined is not only small and inadequate for effective provision of services, but declining in absolute and relative terms. This has serious implications for effective provision of services. Delivery of animal health services in particular, is paralyzed in most countries, making it difficult to carry out disease surveillance, produce and distribute drugs and vaccines, and provide extension services. Since personnel costs account for more than half (Cameroon and Kenya and more than 90% in Tanzania) of the recurrent budget, this means that both personal emoluments and operating expenditures are spread too thin on a unit basis to have any real impact. This makes it increasingly difficult to motivate and retain technical staff within the livestock sub-sector. High staff to non-staff salary ratios suggests that very little is made available for field operation and maintenance of existing infrastructure and facilities. Loss of skills, inadequate motivation and deteriorating facilities thus contribute to a weakening of the implementation capacity of most disease control programmes.

National government commitment is key to sustainable livestock development

Inadequate financing of animal health programmes by governments in SSA has greatly undermined the efficient provision of adequate services to livestock owners. Most disease control programmes are non-sustainable because a larger portion of the cost is covered from donor funds and once these funds dry up, the disease situation worsens. For example, the Joint Project (JP-15) that was implemented in the 1960s and 1970s with the aim of eradicating rinderpest from Africa, was financed through aid from various international institutions and national governments. The project succeeded in substantially reducing the incidence of rinderpest in Africa and strengthening veterinary services to respond to other major diseases. However, immediately after the project ended

in 1976, rinderpest reappeared in several parts of Africa as most departments of veterinary services deteriorated. With external funding available, some national governments quickly cut their veterinary service budgets; redirecting the proceeds to other priorities. When external financing ended, they found it difficult to sustain an efficient veterinary service. Routine vaccination and disease surveillance ceased as most departments of veterinary services deteriorated. Disease incidence and mortality increased as a consequence, leading to reduced livestock production.

National governments cannot and should not continue to rely on donor funding of animal health programmes indefinitely if they are to provide quality livestock services. Regardless of whether donor funds are available, national governments must show commitment to livestock development by not only making adequate budgetary provisions available to animal health services, but also encouraging greater private sector involvement as well introducing more cost recovery measures. From 1986 to 1999 the Pan African Rinderpest Campaign (PARC), whose aim was to eradicate rinderpest from Africa and restructure livestock services, received financial support from the European Union and national governments. For a sample of ten countries, external funding accounted for an average of 56% of the total programme cost while national governments made an average contribution of 44% (Tambi *et al.*, 1999). While this level of national commitment might have been "appropriate" for a single disease control programme, a multiple disease control programme such as the Pan African Control of Epizootics (PACE) would definitely require increased government commitment and greater private sector involvement. This holds true because whereas PARC was financed as a separate project focussing exclusively on rinderpest disease under the Department of Veterinary Services (DVS), PACE is an integral part of the DVS and incorporates other major animal epizootics.

Government commitments to sustain epidemio-surveillance networks established under PACE

Unlike PARC which achieved the remarkable success of eradicating rinderpest from most of Africa, the PACE programme is designed to safeguard these benefits by establishing the groundwork for national governments to take over full control of epizootic and other major animal diseases in sub-Saharan Africa. The principal objective of the PACE programme is to build on the achievements of PARC to eradicate rinderpest from Africa and set up a Pan-African network for the control of epizootics. The programme is intended to revitalize animal health services through strengthening national and regional capacities for the sustainable surveillance and strategic control of priority epizootic diseases, and ensuring that countries continue to follow international guidelines for the verification of freedom from rinderpest infection, thereby safeguarding animal health in Africa. This objective is expected to contribute to the goal of reducing poverty among those involved in stock farming by improving productivity, thereby improving their livelihoods and enhancing food security.

The PACE programme covers 32 countries in sub-Saharan Africa and is implemented by OAU/IBAR through national, sub-regional and regional programmes. It is financed

principally by the European Development Fund (EDF) but the national governments are required to make significant contributions to the programme as well. The PACE programme has four main thrusts namely:

1. Reinforcing animal epidemiology services and control of major diseases by enhancing national capacities

2. Greater privatization of veterinary services and public/private linkages in the field to improve distribution of veterinary services and medicines

3. Rinderpest eradication from Africa through the elimination of the last reservoirs and verification of freedom

4. Control of major epizootic diseases

It is expected that rinderpest would have been eradicated from the remaining foci in East Africa (thrust 3) and that an increasing number of private individuals would have been involved in the provision of animal health services (thrust 2) by the time donor funding of PACE runs out. A functional epidemio-surveillance network and the control of major epizootic diseases (thrusts 1 and 4) will have to be sustained for any positive benefits to be realized. Unavoidably, this will be the task of national governments to fund and maintain such a network. Capacity building at the national level that is currently being provided under PACE is a necessary pre-condition for this. The epidemio-surveillance network will need to be institutionalized into the Ministry of Agriculture/Livestock and managed as a normal activity of the DVS. Funding of field activities under the network will have to be provided under the normal DVS annual budget allocated by the Ministry of Agriculture/Livestock. The national networks are required to:

(i) Build up the institutional capacity of national animal health systems; and

(ii) enhance national capacities for planning, implementation, monitoring and evaluation of interventions.

The key elements required to ensure sustainability of the networks include:

(i) Commitment to enter and follow the OIE rinderpest pathway;

(ii) Continuation of the process of privatization of veterinary services and full cost recovery;

(iii) Progressive increase in government financial commitments to meet the full recurrent costs of a functional and effective epidemio-surveillance network at national level, which is to be linked effectively to regional and continental networks; and

(iv) Undertaking continuous assessment of environmental impact of stockbreeding management and its impact on rangeland conditions.

To ensure financing of the national networks (point iii), OAU/IBAR has prepared a framework on how national governments will "*progressively increase government financial commitment to meet the full recurrent costs of a functional and effective epidemio-surveillance network at national level*". This will be used as a dialogue point for discussion with the governments of PACE member countries so that by the time the PACE programme runs out, governments will take over full control and management of their networks.

The starting point for developing the framework was first to undertake a review of public animal health spending in a sample of six PACE member countries (see Background paper). The pattern of government budgetary allocations and expenditures on livestock and animal health was analyzed over a number of years (where the data allowed). The results were expected to give a valuable insight into the magnitude of the budgetary provisions availed by government to livestock and animal health as well as the budget allocation process. While providing the essential estimates required for determining the degree and level of government commitment, the background paper provided basic elements for judging the financial capabilities and willingness of national governments to make the financial contributions necessary for sustaining an effective epidemio-surveillance network.

Required national contributions

In order to effectively run the national networks on a sustainable basis, national government contributions are foreseen in three main areas: (i) Financial disbursements to meet the full recurrent costs of a functional and effective epidemio-surveillance network at national level. This will be used to meet the personnel and operational costs of the network. The personnel budget will cover the salaries and wages (including per diems) of the different categories of staff (professional, technical, administrative and field staff) while the operational budget will cover the cost of vehicle operation and maintenance, utilities (electricity and water, telephone, fax, e-mail and internet) and other incidentals. (ii) Existing infrastructure and equipment. These include buildings for office space, laboratories, border control posts and equipment such as office furniture, laboratory equipment, etc. (iii) Facilities such as government exoneration of duties.

At the present moment, the PACE programme is financed jointly by the European Commission (EC) and national governments. At the national level, EC funds cover the cost of equipment (e.g. computers and softwares, office furniture, refrigerators, etc); vehicles; salaries of technical assistance (for countries needing technical assistance) and additional support staff (e.g. secretaries, drivers, casual laborers); office, laboratory and field materials; and other operational costs (e.g. vehicle running and maintenance) incurred for training, workshops, and field activities. National governments provide personnel whose salaries are paid directly by the Ministry of Agriculture/Livestock; make

financial disbursements to cover the cost of some utilities and maintenance; and provide infrastructure and facilities.

Over the course of the PACE programme, national governments are required to gradually increase their financial and material contributions so that when EC funds run out at the end of the programme, they will be in a position to continue running the network. Based on previous experiences of government budgetary allocations to livestock and animal health, a format on how governments should gradually increase their contributions to PACE has been proposed. The format is based on the rationale that because national budgets are limited and declining over time, the government should be able to at least meet the first year recurrent cost of the network solely from national sources at the end of PACE when EC funds cease. To achieve this level of recurrent financing, governments should begin to increase budgetary allocations to PACE as from the second year of the programme.

Ethiopia: An example

The current PACE Global Plan (GP) presented by the Government of Ethiopia (GoE) is estimated to cost ECU6.8 million over the five-year life span of PACE. About two-thirds of this will be financed from EC funds and the remaining 34% from GoE (see Annex 1). EC financing will cover the cost of equipment (10.3%) which will be procured during the first year. The remaining EC funds (55.6%) will, together with the GoE contribution, cover the total running cost which is estimated at ECU6.1 million (89.7%).

Some of the proposed activities (e.g. rinderpest eradication, privatization) will phase out by the time the programme ends, leaving only the epidemio-surveillance network to monitor and support effective control of major epizootic diseases. This is what the government must strive to sustain. The proposed joint financing of the epidemio-surveillance network is estimated to cost ECU4.6 million, 50.2% of which will be financed from EC funds and the rest from GoE contributions. About half of the total recurrent cost of ECU4.5 million will be covered by contributions from GoE (i.e. about ECU464,000 per year). This level of GoE financing will be insufficient to fund an effective epidemio-surveillance network once the EC funds are no longer available. Thus, the government must gradually increase its contribution beginning from the second year in order to meet the annual recurrent cost of the epidemio-surveillance network.

As shown in Tables 1 to 4, we present a number of scenarios, in which we propose a gradual increase in GoE financial contributions to the PACE epidemio-surveillance network. Currently, GoE has committed a total of ECU2.3 million to the epidemio-surveillance network with a first-year provision of ECU391,000 and a provision of ECU485,000 in year 5. The required first-year recurrent cost is ECU892,000, 56% of which is EC funding. This first-year recurrent cost forms the basis for the recurrent expenditure required to start and run an epidemio-surveillance network.

Scenario 1.

Under this scenario, GoE increases its present commitment by 8% of the total first-year recurrent costs (GoE and EDF) and then to increase the annual recurrent commitment by a 3% cumulative annual increase thereafter. If this scenario is adopted, GoE will achieve a budget equivalent to 57% of the first-year total recurrent cost of ECU892,000. This means that GoE will have to commit an additional ECU509,000 under this scenario (Table 1).

Table 1. Additional government financial contributions required to finance epidemio-surveillance network in Ethiopia (1,000 ECU). Scenario 1: 8% initial increase in year 2 followed by 3% cumulative annual increase thereafter.

Running cost	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	% of first year cost
Proposed government contribution	391	483	486	475	485	2,320	
Required government contribution	391	554	597	622	663	2,827	
Additional government contribution		71	111	148	179	509	57.0
EDF contribution	501	451	458	428	387	2,225	
Total financing	**892**	**1,005**	**1,055**	**1,050**	**1,050**	**5,052**	

Scenario 2.

Under this scenario, GoE increases its present commitment by 10% of the total first-year recurrent cost and then to increase the annual recurrent commitment by a 3% cumulative annual increase thereafter. If this scenario is adopted, GoE will achieve a budget equivalent to 67% of the first-year total recurrent cost of ECU892,000. This means that GoE will have to commit an additional ECU598,000 under this scenario (Table 2).

Table 2. Additional government financial contributions required to finance epidemio-surveillance network in Ethiopia (1,000 ECU). Scenario 2: 10% initial increase in year 2 followed by 3% cumulative annual increase thereafter.

Running cost	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	% of first year cost
Proposed government contribution	391	483	486	475	485	2,320	
Required government contribution	391	572	619	647	689	2,918	
Additional government contribution		89	133	172	204	598	67.0
EDF contribution	501	451	458	428	387	2,225	
Total financing	**892**	**1,023**	**1,077**	**1,075**	**1,076**	**5,143**	

Scenario 3.

Under this scenario, GoE increases its present commitment by 12% of the total first-year recurrent cost and then to increase the annual recurrent commitment by a 3% cumulative annual increase thereafter. If this scenario is adopted, GoE will achieve a budget equivalent to 76% of the first-year total recurrent cost of ECU892,000. This means that GoE will have to commit an additional ECU681,000 under this scenario (Table 3).

Table 3. Additional government financial contributions required to finance epidemio-surveillance network in Ethiopia (1,000 ECU). Scenario 3: 12% initial increase in year 2 followed by 3% cumulative annual increase thereafter.

Running cost	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	% of first year cost
Proposed government contribution	391	483	486	475	485	2,320	
Required government contribution	391	590	642	673	705	3,001	
Additional government contribution		107	156	198	220	681	76.0
EDF contribution	501	451	458	428	387	2,225	
Total financing	**892**	**1,041**	**1,100**	**1,101**	**1,092**	**5,226**	

Scenario 4.

Under this scenario, GoE increases its present commitment by 14% of the total first-year recurrent cost and then to increase the annual recurrent commitment by a 3% cumulative annual increase thereafter. If this scenario is adopted, GoE will achieve a budget equivalent to 87% of the first-year total recurrent cost of ECU778,000. This means that GoE will have to commit an additional ECU598,000 under this scenario (Table 4).

Table 4. Additional government financial contributions required to finance epidemio-surveillance network in Ethiopia (1,000 ECU). Scenario 4: 14% initial increase in year 2 followed by 3% cumulative annual increase thereafter.

Running cost	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	% of first year cost
Proposed government contribution	391	483	486	475	485	2,320	
Required government contribution	391	608	666	700	733	3,098	
Additional government contribution		125	180	225	248	778	87.0
EDF contribution	501	451	458	428	387	2,225	
Total financing	**892**	**1,059**	**1,124**	**1,128**	**1,120**	**5,323**	

ANNEX 1

Table 1. EDF and national government financial contributions to PACE Ethiopia (1,000 ECU)

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	% of total
Total EDF contribution	1,521	715	882	785	596	4,498	66.0
Equipment	704	0	0	0	0	704	10.3
EDF running cost	817	718	882	785	596	3,795	55.6
Government contribution	391	483	486	475	485	2,321	34.0
Total running cost	1,208	1,198	1,368	1,260	1,081	6,115	89.7
Grand total	**1,912**	**1,198**	**1,368**	**1,260**	**1,081**	**6,819**	**100.0**

Table 2. EDF and national government financial contributions to finance epidemio-surveillance network in Ethiopia (1,000 ECU).

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	TOTAL	% of total
Total EDF contribution	614	451	458	428	387	2,338	50.2
Equipment	114	0	0	0	0	114	2.4
EDF Running cost	501	451	458	428	387	2,225	47.7
Government contribution	392	483	486	475	485	2,321	49.8
Total running cost	892	934	944	903	872	4,545	97.6
Grand total	**1,006**	**934**	**944**	**903**	**872**	**4,659**	**100.0**