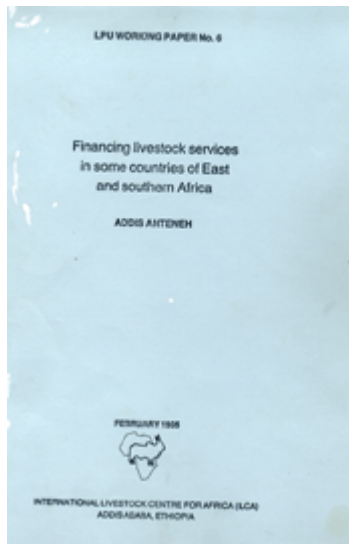


Financing livestock services in some countries of East and southern Africa

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LPU

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Table of Contents

Summary

Acknowledgements

1. Introduction

2. The role of livestock in the economy

3. The size and composition of recurrent expenditures on livestock services

4. Sources and methods of financing

5. Indicative measures of adequacy

6. Conclusion

References

Annexes

Summary

Like many other agricultural services, livestock services in most African countries are funded from central government budgets. In many cases government funds are becoming increasingly inadequate in the face of growing livestock populations and the high demand for such services. In many African countries staff expenditures have tended to take a large and increasing portion of total recurrent expenditure and *prima facie* this seems to affect adversely the effective provision of services at field level.

Government revenues originating from service fees have fallen far short of government outlays for livestock services and governments continue to subsidize heavily the cost of services. The number of staff available and the ratio between different staff categories affect the capacity of the services to carry out their functions more effectively.

This paper, which is the second in a series reviewing the financing of livestock services in Africa, describes the situation in six East and southern African countries. The contribution of the livestock sector to agricultural output and the size of the recurrent expenditure on livestock services are briefly discussed. The composition of expenditure in terms of staff and non-staff categories as well as the sources and methods of financing including revenues collected from service fees and sale of veterinary requisites are compared. Although the impact of the size and composition of expenditures on production or on the welfare of users cannot be quantified at this stage, some measures of adequacy are discussed. A comparison of some important patterns of expenditure of the six countries and of those reviewed in an earlier study is briefly outlined.

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1. Introduction

1.01 The paper is the second in a series reviewing the financing of livestock services in Africa. The first paper dealt with about 13 countries in West Africa plus Madagascar (Anteneh, 1983) and was based on a review of the available literature. Sources of data for the present paper are government and non-government published and unpublished documents as well as information supplied by individuals. The countries covered by the review are Botswana, Kenya, Malawi, Tanzania, Zambia and Zimbabwe. Unless otherwise indicated, sources of tables in text are the same as those indicated in the annex tables¹ and the reference list at the end of the paper.

1. Annexes A1 to A6 provide detailed information on expenditures and other related data summarized and discussed in the text.

1.02 The paper is divided into five sections. Section 2 which follows this introduction presents a brief picture of the role of livestock in the economies of the different countries. Section 3 deals with the size and composition of the livestock services budget. Section 4 reviews the sources and methods of financing in the countries considered. Section 5 attempts to evaluate the adequacy of livestock services by using measures which are normally used in assessing such services. Section 6 concludes with a comparison of some important patterns of expenditure in the West African countries reviewed in the first paper and in those dealt with in the present paper.

1.03 Like the first paper, this review also concentrates on the recurrent budgetary allocation by central government or the actual expenditure by the departments responsible for the provision of livestock services. Data on in-country local or regional allocations are hard to come by. An exception is Tanzania where there has been a deliberate attempt at decentralization.

2. The role of livestock in the economy

2.01 Table 1 below shows the share of livestock output in agricultural GDP in 1975 and 1980.

Table 1. *Livestock GDP (LGDP) as percent of agricultural GDP (AGDP) (1975 and 1980).*

Country	1975	1980	
	LGDP as % AGDP	LGDP as % AGDP	AGDP as % total GDP
Botswana	NA	80.0 ^a	23.7 ^b
Kenya	34.3	34.9	27.5
Malawi	6.2	7.2	37.4
Tanzania	23.8	24.5	40.1
Zambia	29.5	29.8	13.3
Zimbabwe	34.5	35.7	20.8

a. Ndzinge *et al* (1984). b. Ochieng (1981).

NA = data not available.

Sources: FAO (1983) and Jahnke (1982)

2.02 One can see from the above that livestock continues to be an important agricultural activity in the majority of these countries.

3. The size and composition of recurrent expenditures on livestock services

3.01 Table 2 below shows the size of the livestock services budget as a percentage share of total agricultural expenditure.

Table 2. *Percentage share of livestock services in total agricultural recurrent expenditure by governments.*

Country	1970/71	1971/72	1973/74	1975/76	1977/78	1979/80	1980/81	1981/82
Botswana	53	51	56	55	50	48	54	51
Kenya	NA	NA	33 ^a	32	30	37	23	27
Malawi	27	24	24	23	NA	21	21	23
Tanzania	23	NA	NA	64	61	34	47	34
Zambia	7	10	15	5	7	2	NA	4
Zimbabwe	10	NA	NA	10 ^b	6	9	10	19

a. 1974/75. b. 1976/77. NA = data not available.

Source: IMF (1982) for total agricultural expenditure.

3.02 Table 3 shows the average growth rate of actual expenditure over varying periods for the different countries.

Table 3. *Annual growth rates in certain governments' recurrent expenditure (percent per year).*

	Period covered	Livestock services		Agricultural services
		Current prices	Constant prices (1975)	Constant prices (1975)
Botswana	1970/71–1979/80	14.2	3.6	4.7
Kenya	1974/75–1980/81	9.9	4.8	6.2
Malawi	1970/71–1979/80	9.2	3.4	7.2
Tanzania	1974/75–1879/80	2.6	–3.0	–9.0

Botswana	SE	41	33	36	26	32	26	21	21
	NSE	59	67	64	74	68	74	79	79
Kenya	SE	NA	42	48	51	41	39	51	69
	NSE	NA	58	52	49	59	61	49	31
Malawi	SE	46	38	32	38	45	39	37	34
	NSE	54	62	68	62	55	61	63	66
Tanzania ^a	SE	76 ^b	70	71	60	55	60	61	54
	NSE	24 ^b	30	29	40	45	40	39	46
Zambia	SE	32 ^c	NA	NA	46	50	NA	45	NA
	NSE	68 ^c	NA	NA	54	50	NA	55	NA
Zimbabwe	SE	47 ^d	NA	57	61	54	49	48	32
	NSE	53 ^d	NA	43	39	46	51	52	68

a. Data for years prior to 1974/75 available only for central government, figures from 1974/75 include regional expenditure.

b. 1974/75 only.

c. Average of 1970–72 and 1974.

d. Average of 1971/72 and 1972/74.

NA = data not available

3.07 In the case of Botswana, taking into account the relative low share of SE at the beginning of the period considered, one can see that consistent with the differential growth rates, the share of staff expenditures has declined from about 40% at the beginning of the period to about 20% in 1981/82. In Malawi, where the differential growth rate in SE and NSE is similar to that of Botswana, there has been a substantial decline in the share of SE, although to a lesser degree. One possible cause for this in both countries is the limited availability of professional and technical staff to provide livestock services. Another possible cause is the replacement of highly paid contract expatriate staff by local professionals without the total number being affected, although the extent to which this has taken place could not be determined. In Botswana the number of high-level veterinary staff remained at about the same level from 1973/74 through 1981/82 while the livestock population increased by more than 25% during the same period. FMD control campaigns from 1974/75 onwards have contributed to the increased share of NSE in total expenditure for livestock services. Increased fuel prices should have also resulted in higher transport expenditure.

3.08 In Malawi, a country comprising a much smaller area and a more densely settled livestock-keeping population, veterinary staff in total increased to about 1.2 times their number in 1971/72

against an increase of 1.5 times in the livestock population (LSU). In both Botswana and Malawi government officials have stated that fund availability is not a major constraint.

3.09 In Kenya the relative proportions of SE and NSE were very similar to those in Botswana at the beginning of the period. When available manpower is not a major constraint, the cause for the substantial reversal, during 1980–1982, of the percentage shares must lie somewhere else. The sharp decline in the percentage share of non-staff expenditures during these years is largely attributed to the financial crisis which set in at the beginning of 1980. This has obviously forced the government to cut down on funding the non-staff operating costs of livestock services while keeping a relatively large establishment of professional and technical personnel under continued employment. In 1980/81 there were about 2600 professional and technical staff of all categories in the government establishment for livestock development.

3.10 The composition of the livestock services budget in Tanzania presents a substantially different picture—SE has consistently had the larger share of total recurrent expenditures. The shares of staff and non-staff expenditures in total recurrent livestock expenditures are markedly different in the central government's budget compared to the regions (see Annex Table A4). We will return to this aspect at a later stage of the paper:

3.11 From Tables 4 and 5 above one can readily see that in Tanzania the SE percentage share remains higher than that of NSE despite absolute decreases in staff expenditure and the high growth rate of the absolute values for NSE. While the Tanzanian data for both SE and NSE show considerable fluctuation between years, this is more pronounced for the NSE figures (see Annex Table A4). Fluctuations ranging sometimes between 25 and 50% up or down from one year to another cast serious doubt on the reliability of the data found in official publications. Despite this, while financial constraints affecting NSE should partly explain the continued high percentage share of SE in total recurrent livestock expenditure, lack of data on the staffing situation of livestock services did not make it possible to see whether the prevailing situation in Tanzania is similar to that in Kenya.

3.12 There are significant differences between the composition of central government and regional budgets (see Annex Table A4). In Tanzania, a deliberate programme of decentralization of development including separate regional budgetary allocations has been in operation for some years. Such decentralization apparently started some time in 1972 but it did not become operational in budgeting terms until 1974/75. Published estimates on budgetary allocations are available starting from that year.

3.13 Table A4 in the annex shows that the composition of the recurrent livestock expenditure at the central government level in Tanzania is radically different from that of regional expenditure. During the period 1974/75–1981/82 staff expenditure at the central government level had on average a 38% share (with a range of 24–63% between different years) in the total recurrent expenditure on livestock services as opposed to an average of 77% (range of 61–93%) at the regional level or 63% (range of 54–76%) of the combined central and regional expenditures. Judging by the level of expenditure which obtained prior to 1974/75 and thereafter, there is no evidence that the decentralization process has substantially shifted expenditure on livestock services from the central administration to the regions. In other words, it seems that the

expenditure budget for livestock services at the central government level has more or less been maintained while additional allocations were made to the regions. This being the case, the relatively small share of operating expenditures which continued to be allocated at the regional level could be a signal of the potentially limited effectiveness of regionally posted staff without enough funds for transport and material inputs to provide veterinary and husbandry services. The causes for this situation are likely to be more fundamental than can be deduced from the figures shown. However, the reported intention of the Tanzanian Government to recentralize agriculture and livestock services is probably indicative of how much less effective than expected decentralization has been in the provision of field services.

3.14 The data for Zambia are not available continuously over the years, and calculating growth rates of the recurrent expenditures on livestock services does not make much sense. However, it can be generally said that total recurrent expenditure has declined in real terms over the years, with non-staff expenditures having decreased in 1980 to about 40% of the absolute figure in 1971. Staff expenditures fluctuated over the years, amounting in 1980 to about 90% of those in 1971, again in real terms. Staff numbers in all categories seem to have remained at the same level.

3.15. Although one cannot be conclusive on the basis of the data available (only for 4 years out of a possible 8), it seems probable that financial constraints have played an important role in the decrease of both the total recurrent and non-staff expenditures over the years. In the latter case in particular budgetary cuts seem to have been a more important cause. For example, in 1982, about 86% of all the reductions made from allocated budgets were accounted for by reductions in the non-staff budgets. These reductions were made due to economy measures which seem to have affected solely non-staff operating expenditures. In 1978, as much as 30% of the under-expenditure of the authorized budget for veterinary services was accounted for by "non-availability of vaccines and drugs".

3.16 In Zimbabwe the share of staff expenditure in the total recurrent expenditure on livestock services was relatively high during 1976/77, through 1978/79 but started declining relatively rapidly to become only 32% of the total in 1981/82. In current prices, total expenditures as well as expenditures in both categories of recurrent expenditure grew at very high rates, with NSE having increased by about 38% p. a. on average. As in other sectors of the Zimbabwean economy, the manpower situation during and after the liberation war became increasingly acute. Although only 1-year data could be obtained on the number of different categories of staff available, it is a fact that the out-migration of a considerable number of the professional/technical cadre of white Rhodesians has depleted the pool of adequately trained and experienced staff in livestock services. It is most likely that staff expenditure has been affected more by this event than the lack of funds in absolute terms.

4. Sources and methods of financing

4.01 In Botswana, Malawi and Zambia funding for recurrent expenditure on livestock services is provided by the central treasury through the department responsible for livestock services. The same is mostly true in Kenya. But here, community dips had been run by county councils until they were recentralized following misallocation problems which adversely affected animal disease control operations (FAO, 1981). As mentioned earlier, in Tanzania there are distinct regional allocations under the control of regional administrations, even though the funds are provided by the central government. At the same time, regions seem to be allowed to collect veterinary service charges but have no authority to use these funds without going through the central allocation process.² In Zimbabwe, dipping services used to be run by district commissioners who could use the proceeds from the dipping charges to run the service with some central government support when revenue fell short. This arrangement was said to work quite satisfactorily. Recently dipping services have been transferred to the Department of Veterinary Services which must surrender any collections from user fees to the Central Treasury. Dipping services are now provided free of charge (Madzima, personal communication).

2. Tanzania is strongly committed to central planning; funds collected have to be vetted through the planning process before they can be allocated to a particular activity (Mrisho, personal communication).

4.02 There is no evidence available in any of the six countries studied that recurrent expenditures for the provision of non-capital, on-going livestock services draw on any, external sources of financing. However, many livestock development projects are heavily dependent on external financing from several sources. There are details of sources of financing in the development budget estimates for Kenya and Malawi. In Kenya, up to 50% of capital items in livestock development projects have been financed by external loans and grants; it is only in a few cases that expenditures of a recurrent nature (e.g. salaries and wages of local project personnel, non-staff operating expenditures such as for transport) are financed from external sources. In contrast, in Malawi external loans and grants financed between 85 and 90% of the development budget expenditures and in almost all cases include both capital and recurrent items, the latter including personal emoluments. Despite initial plans to gradually shift the funding of recurrent expenditures to the revenue accounts of the government, it has been observed that the same projects continue to show the same share of financing from external sources over relatively long periods (e.g. UK financed projects).

4.03 Part of the problem arises because governments are unwilling to charge for certain, even beneficiary-specific, services to meet part of the operating cost necessary to maintain such services. In one case donor pressure to reduce service charges to a low level could have been the reason for the inability of government to maintain project-introduced services or even to re-introduce nominal economic charges—Kenya's AI service exemplifies this problem (Leonard, 1983).

Livestock-related revenue

4.04 There is no evidence from published information that any of the six countries charges livestock head taxes similar to those which used to be charged in West African countries.

4.05 Other taxes, charges and levies used are in the majority of cases associated with veterinary services, which normally include artificial insemination services. Export and import duties on live animals and livestock products are a feature of many of the surplus producing countries.³ Botswana has the most extensive tax levy on cattle export and livestock by-products which include blood-, bone-, and meat-meal as well as hides and skins. Tanzania levies export duties on meat products as well as hides and skins.

3. Kenya levies a cess on hides and skins exports which are earmarked for hides and skins improvement programmes (Leonard, 1983). Zimbabwe does not levy taxes on live animal exports (Rodriguez, personal communication).

4.06 In Botswana livestock-related revenue, including those charges that are directly associated with the provision of services, has been growing steadily over the past 10 years. In current prices livestock-related revenue increased more than six times from 315,000 pula in 1970/71 to 2.1 million pula in 1981/82. In Tanzania, livestock-related revenue increased from Tshs. 5.2 million in 1970/71 to Tshs. 33.2 million in 1981/82 i.e. by a factor of more than 6.

4.07 Livestock-related revenue constitutes a major portion of agricultural revenue⁴ in both countries, as shown in Table 6 below.

4. Agricultural revenue = government revenue from agricultural activities including livestock activities (service fees, charges, levies, proceeds from sales of inputs and produce, external trade taxes etc.) but excluding government revenue from agricultural income tax.

Table 6. *Percentage share of livestock-related revenue in total agricultural revenue (selected years and averages).*

	1970/71	1975/76	1981/82	Average
Botswana	NA	63	91	84 ^a
Tanzania	38	49	65	56 ^b

a. Average 1973/74 to 1981/82.

b. Average 1970/71 to 1981/82. NA = data not available.

4.08 As would be expected, considering that livestock production is the major activity in the agricultural sector of Botswana, the livestock subsector contributes a major portion of the agricultural revenue. Furthermore, livestock-related revenue is equivalent to about one quarter of the total gross expenditure on livestock services.

4.09 Due to lack of readily available data, calculations involving livestock-related revenue cannot be made for the other five countries. However, data on revenue collected from charges and fees on some of the services provided are available for most of the countries studied from government-published data of several years. Table 7 below shows the amounts of such collections over the years.

Table 7. Revenue from service fees, sale of inputs and produce ('000 national currencies at 1975 constant prices).

	Average 1970/71– 1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	Growth rate p.a. (%)
Botswana (Pula)	109	351	379	443	444	392	NA	29
Kenya (KShs)	1130	1172	1369	1073	736	708	1288	1.4 ^a
Malawi (MK)	379	435	449	408	342	309	NA	4.2
Tanzania (TShs)	3399	2128	3776	3600	5382	NA	NA	12.1 ^b
Zambia (ZK)	14	NA	NA	35	28	NA	19	5.2 ^a

a. 6 years to 1980/81.

b. 4 years to 1978/79.

NA data not available.

4.10 Three major categories constitute revenue from livestock services:

- a. veterinary fees and cesses;
- b. collection from the sale of drugs, vaccines, semen etc.; and
- c. proceeds from the sale of livestock and livestock products from research stations and similar establishments. For our purposes the more important and comparable figures are the revenues collected from the first two categories, as they relate more directly to the quantity of services provided.

4.11 The growth rates for some countries shown in Table 7 are impressive. However, a comparison of revenues collected per LSU using a common currency are more revealing as shown in Table 8 below.

Table 8. Revenue from service fees, sale of inputs and produce in US\$ per LSU^a.

	Average 1970/71– 1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81
Botswana	0.09	0.23	0.22	0.24	0.26	0.23	NA

Kenya	0.53	0.49	0.54	0.36	0.25	0.23	0.35
Malawi	0.95	0.89	0.85	0.78	0.68	0.54	NA
Tanzania	0.05	0.02	0.04	0.04	0.07	NA	NA
Zambia	0.02	NA	NA	0.03	0.02	NA	0.01

a. 1975 constant prices.

NA = data not available.

Source: Calculated by the author from Table 7 and annex tables.

4.12 One can see that while Botswana and Tanzania show relatively high growth rates of revenues collected in absolute terms, revenue per LSU has stayed at about the same level or has had a declining trend. Revenue collections per LSU in Malawi, although showing a gradual decline over the decade, still remain the highest.

Table 9. *Portion of livestock services expenditure covered by actual revenue (%)*.

	(1) LSR/TGE _v	(2) LSR/NSE	(3) LSR _{vi} /NSE
Botswana	11	17	15
Kenya	21	42	20
Malawi	26	43	12
Tanzania	15	25	17
Zimbabwe ^a	2.5	3.9	3.9

a. Based on only 2 years figures.

LSR = livestock services revenue from veterinary fees, sale of drugs, semen etc. and sale of produce.

TGE_v = total gross recurrent expenditure on livestock services.

NSE = non-staff recurrent expenditure.

LSR_{vi} = livestock services revenue from veterinary services and sale of inputs.

4.13 On the basis of the revenue data shown in Table 7 above, we can calculate how much such revenue could actually contribute to defraying the cost of the services. Table 9 shows the extent to which revenues covered recurrent expenditures irrespective of whether the proceeds were actually earmarked to the departments providing the services. Over the years shown, revenues constituted the following average percentage shares of the total recurrent expenditure and non-staff expenditure of livestock services.

4.14 Column (3) of Table 9 shows the average percentage share in non-staff expenditures (NSE) of the revenue collected from veterinary fees and the sale of inputs (LSR_{vi}). There is a reason for using NSE as a base in calculating the share of revenue in this manner. In the majority of African countries livestock services are a monopoly of government veterinary departments. For historical reasons, as well as for reasons of deliberate policy, this situation has been maintained. In the countries considered, except perhaps Zimbabwe, there is no evidence that governments have so far encouraged the private sector or government-promoted cooperatives to provide, on their own account, even some of the services.

4.15 At the same time, livestock producers have had very little or no control on what government personnel do or should do (in the contractual sense) in terms of the quantity and quality of services rendered. In such circumstances, it would seem reasonable to argue that users should only be charged for the non-staff expenditures (the variable costs) incurred by government departments providing the services, and that government services should try to maximize the portion of the variable costs covered by user fees and charges. In such a case it would make more sense to see to what extent revenues from veterinary fees and the sale of inputs cover actual non-staff expenditures incurred.

4.16 The averages shown in Table 9 mask considerable fluctuations between the years. In the light of what contributions such revenues could make toward meeting the cost and maintenance of viable livestock services, it would have been worthwhile to go into more analysis of what causes underlie such fluctuations, on the premise that livestock services revenue from veterinary fees and sale of inputs is a function of non-staff expenditure rather than total expenditure for livestock services. Unfortunately, it was not possible to establish a discernible pattern in this relationship from the available data, partly because sharp declines or increases in partially non-recoverable expenditures affect the level of total non-staff expenditures. An example is the level of non-staff expenditure in Botswana in 1980/81 which almost doubled while revenues collected remained at about the same level as the preceding year (Annex Table A1). The increase in expenditure was a result of the outbreak of FMD for which vaccination is compulsory but free. Kenya's case is different in that in 1979/80 the proportion of revenue declined in absolute terms while non-staff expenditures increased by about 16% over the preceding year (Annex Table A2). In the case of Malawi, which is a country less subjected to epidemic outbreaks, both non-staff expenditures and revenues grew steadily at about the same rate thus resulting in less sharp fluctuations in the proportion of expenditure covered by revenues (Annex Table A3). Table 10 below depicts the situation in the three countries for which continuous data are available over several years.

Table 10. *Revenue from veterinary fees and the sale of inputs (LSR_{vi}) as a proportion of NSE (%).*

	Average 1970/71– 1973/74	74/75	75/76	76/77	77/78	78/79	79/80	80/81	81/82
Botswana	6	1.3	9.4	27.1	18.5	26.7	18.9	9.5	17.4
Kenya	NA	19.3	22.1	32.9	30.9	16.5	9.7	14.7	32.3
Malawi	16.2	16.3	14.8	10.6	7.2	9.9	13.0	4.5	10.7

NA = data not available.

4.17 Despite the fluctuations it is still clear that revenue from these sources, which the services would legitimately put a claim to as part of their funding requirement, accounted for no more than 25% of the expenditures actually incurred. Thus governments have continued to heavily subsidize non-staff expenditures even in cases where benefits from services provided almost totally accrue to the individual user. In certain cases this has resulted in the veterinary services being denied funds for operating expenses because of government fund shortages in spite of the declared willingness of users to pay higher fees.

4.18 A good example is Kenya's AI service which is reported to be encountering budgetary difficulties in several districts in providing uninterrupted services to farmers who have become heavily dependent on AI (FAO, 1981). The AI service is heavily subsidized (up to 97% of the average cost) by the government. The AI fee is currently Ksh 1 per insemination set (minimum of 3 inseminations) instead of Ksh 10 (grade) and Ksh 5 (zebu) charged up to 1971. Proposals to increase the fee have been made since the mid-1970s (Hopcraft, 1976) and were repeated in the early 1980s (FAO, 1981), but they do not seem to have been accepted, at least not up to 1983 (Githae *et al*, 1983). It is understood that farmers, particularly those with grade cows, are willing to pay higher fees to ensure a reliable service (Leonard, 1983).

5. Indicative measures of adequacy

5.01 Measuring the quantity and quality of services delivered for given outlays over a period of years is part of the test of the effectiveness of policy in resource use and management.

Quantitative data on the number of the ultimate beneficiaries served or on the effect on livestock productivity over time as a result of financial policy are not readily available at present for all the countries studied and/or services. However, there are proxies which can indicate the degree of adequacy of the prevailing financing situation. For our purposes, the following proxies are expected to indicate if the trend of financing livestock services in the different countries has tended to be similar to or divergent from generally accepted standards. These are:

- i. the expenditure to GDP ratio;
- ii. the proportion and ratio of staff to non-staff expenditures;
- iii. the number and proportion of technical staff of different categories.

5.1 Relative expenditure ratio

5.02 Table 11 shows the ratio between the expenditures⁵ to GDP ratios in the agricultural and livestock sectors of the countries listed.

5. Government recurrent expenditure on agricultural and livestock services.

Table 11. *Relative expenditure^a (expressed as a ratio) on agricultural and livestock services in agricultural GDP and livestock GDP (1980).*

	R
Botswana	1.3
Kenya	1.0
Malawi	0.3
Tanzania	0.5
Zambia	5.0
Zimbabwe	3.5

a/ The figure for each country represents the ratio obtained from:

$$R = \left(\frac{ARE(x_1)}{AGDP(y_1)} \right) \div \left(\frac{LRE(x_2)}{LGDP(y_2)} \right)$$

where ARE (x₁) = agricultural recurrent expenditure
 AGDP (y₁) = agricultural GDP
 LRE (x₂) = recurrent expenditure on livestock services
 LGDP (y₂) = livestock GDP

R can thus be expressed as:

$$R = \left(\frac{x_1}{y_1} \div \frac{x_2}{y_2} \right)$$

The ratio basically tells us the intensity of input expenditure in the livestock sector relative to the intensity in the agricultural sector as a whole.

R can also be expressed as:

$$R = \left(\frac{x_1}{x_2} \cdot \frac{y_2}{y_1} \right) = r_1 \cdot r_2$$

where

$r_1 \left(= \frac{x_1}{x_2} \right)$ is the ratio between ARE and LRE

and

$r_2 \left(= \frac{y_2}{y_1} \right)$ is the ratio between livestock sector output (LDGP) and agricultural output (AGDP).

Since r_2 is greater than zero but less than or equal to 1, then R is also a weighted average of the ratio r_1 .

SOURCE: Calculated from data in annex tables.

5.03 A ratio of more than 1 means that proportionately less is being allocated to livestock services than to other agricultural services in relation to their economic importance. The reverse will be true for values of less than 1.

5.04 One can thus say that Malawi and Tanzania spend proportionately more than the contribution of livestock output to agricultural GDP, and Zambia and Zimbabwe allocate proportionately less. As mentioned earlier, Tanzanian expenditure figures appear to be of questionable reliability. However, assuming that livestock GDP figures are reliable for all the

rest, the ratio for Malawi seems to confirm the evident effort that the government is making in livestock development. Zambia's case is clearly unsatisfactory from the livestock sector's point of view, while that of Zimbabwe may be a reflection of the difficult situation during the liberation war prior to 1980.

5.2 Staff and non-staff expenditure

5.05 Field experience in the operation of animal health services indicates that the ratio of non-staff to staff expenditures should, as a minimum, be equal or close to 1—i.e. non-staff expenditures should account for at least half of the total expenditure (GTZ/SEDES, 1976; IEMVT, 1980). One can calculate the NSE:SE ratios for the different countries studied from the figures in Table 5. The calculations show that during the period 1975/76 to 1981/82 the NSE:SE ratios for Botswana, Malawi and Zimbabwe have increased from 2.02 to 3.8, 1.6 to 1.9 and from 0.7 to 2.1 respectively. The figures for Tanzania again fluctuate too much to give a meaningful trend, while those for Zambia are not available continuously. The ratio for Kenya has generally tended to deteriorate (from 2.4 to 0.4) during the same period.

5.06 The "ideal" NSE:SE ratio clearly cannot be identical in all situations and countries. However, the implication of a deteriorating ratio should be of serious concern to policy makers as long as services are funded from government budgets and delivered by government staff. To use the available resources to pay steadily increasing salaries to an increasing number of staff without providing the operating means necessary to deliver the services is clearly an inefficient way of running the services. This seems to be the case in Kenya while the other countries with reliable data appear to be able to avoid such a situation.

5.07 On the other hand, one must also be aware that a favourable NSE:SE ratio does not automatically depict an efficient operation of services. The factors which cause a rise in the NSE:SE ratio could be several: increasing non-staff expenditure resulting from rising fuel costs for transport, rising prices of veterinary requisites etc. These factors tend to affect the cost situation in all countries, but they do so to different degrees.

5.08 An important factor may be the absolute shortage of skilled manpower available for livestock services; this tends to put a limit to what governments can spend on this element in recurrent expenditures unless they recruit expensive expatriates directly: Under such a situation non-staff expenditures, particularly transport costs, are likely to rise quickly in order to make the limited staff more mobile. It is interesting to note that countries with small human populations but large land areas (e.g. Botswana) seem to fit this picture. *Prima facie* this would appear to be a more efficient use of resources. However, compensating for staff shortages by high non-staff expenditures must be evaluated for cost effectiveness before judging a high NSE:SE ratio to be more efficient.

5.3 Staff categories and proportions

5.09 One important aspect is that there be a proper balance between different staff categories so that the provision of services is effective at both the planning and management levels as well as the actual delivery of the service to the ultimate beneficiaries. Ratios of 1:5 middle- to low-level

(ML:LL) and a ratio of 1:3 high- to middle-level (HL:ML) staff are generally accepted as appropriate in livestock services (GTZ/SEDES, 1977).

5.10 The ratios are based on experience in the West and central African countries, particularly those in the Sahelian zone. These ratios can vary depending on several factors of which the major ones are as follows:

- i. the geographical distribution and density of the livestock population;
- ii. the production systems in which the services are provided (e.g. pastoral, settled systems)
- iii. the size of the individual herds with which the livestock services have to deal; and
- iv. the size of functions carried out by the different classes of professional and technical staff providing livestock services.

5.11 Factors listed under (i) – (iii) cannot be directly manipulated through financial allocations. The range of functions (factor iv), on the other hand, is partially dependent on how much money is made available to the veterinary services. It is therefore relevant to see how the range of functions of the veterinary staff influence staffing ratios.

5.12 Sandford (1983) distinguishes three levels of functions for purposes of estimating ratios between high- and low-level staff (middle- and low-level staff are treated together as auxiliary personnel). First, where the high-level staff are mainly concerned with visual diagnosis of diseases in the field, mass vaccinations against epizootic diseases and quarantine control, a ratio of 1 HL to 20–30 LL staff would be appropriate. Second, where the functions consist of more sophisticated diagnosis, preventive medicine on a herd/flock basis and simple advisory work to livestock owners, a HL to LL ratio of 1 to 10 would be more appropriate. Third, where the veterinarian carries out a full range of services including AI and the treatment of individual animals, a much lower ratio (of 1 to 3–5) between high-level and low-level staff would be required.

5.13 In most African countries, veterinary services have historically tended to emphasize disease prevention and mass treatment of the major diseases (Rinderpest, CBPP, trypanosomiasis, FMD, ECF). The ratios which are most relevant under such a situation are those related to the first and second . set of functions indicated .above. To that extent, the "appropriate" ratio between high- and low-level staff (1 to 5) established by CTZ/SEDES (see paragraph 5.09 above) on the basis of West and central African experience would be within the range of 1 to 25 to 1 to 10 suggested by Sandford and would be equally applicable to the East and southern African countries considered in this paper. Table 12 below shows the staffing ratios for five of the countries where data are available.

Table 12. Ratios between different staff categories (selected years).

		1974/75	1975/76	1977/78	1979/80	1980/81
Botswana	ML:HL ^a	1.6	1.6	1.7	2.3	2.3
	LL:ML ^a	4.2	4.3	3.8	3.1	3.3

Kenya	ML:HL	NA	2.6	1.8	1.2	2.6
	LL:ML	NA	5.1	5.7	7.2	5.2
Malawi	ML:HL	4.0	2.7	3.1	3.4	3.9
	LL:ML	6.4	6.5	5.5	5.8	5.5
Zambia	ML:HL	1.7 ^b	1.2 ^c	1.0 ^d	NA	NA
	LL:ML	1.9	1.9	1.9	NA	NA
Zimbabwe	ML:HL	NA	NA	NA	NA	0.9 ^e
	LL:ML	NA	NA	NA	NA	7.5 ^e

a. High-level: veterinary doctors and surgeons, senior livestock officers.

Middle-level: assistant veterinarians, livestock officers.

Low-level: field-level animal health and livestock assistants including those with some technical training.

b.1973

c.1975

d.1976.

e.1981/82

NA=data not available

5.14 As can be seen the general trend in Botswana is for the ML:HL ratio to increase and for the LL:ML ratio to decrease. This could perhaps be an indication of Botswana's efforts to mitigate the shortage of highly skilled manpower. If the high non-staff expenditures imply greater transport costs this then is consistent with the strategy of having a limited number of high-level staff who are more mobile. Only Kenya and Malawi display overall ratios between low and high level staff in the range 10–15 indicated above as being appropriate for the sort of functions being carried out.

6. Conclusion

6.01 Although one needs to be cautious about making generalizations, some contrasting patterns seem to emerge between the East and southern African countries reviewed in this paper and the West African countries reviewed in Anteneh (1983). Some of these findings are briefly summarized as follows:

- i. In real terms recurrent expenditures on livestock services seem to have increased at a considerably faster rate in the East and southern African countries;
- ii. The East and southern African countries for which data are available seem to have either maintained or increased the share of expenditure on livestock services in total agricultural recurrent expenditure;
- iii. In general the East and southern African countries have allocated a more "adequate" portion of total expenditure to non-staff expenditures;
- iv. The practice of applying user fees to finance services is more widespread in the East and southern African countries;
- v. in regard to staffing, the East and southern African countries tended to concentrate on increasing the number of low-level staff while the West African countries tended to concentrate on increasing middle-level staff.

6.02 Another interesting pattern that seems to emerge is that small countries in both groups (e.g. Sierra Leone, Malawi) seem to allocate proportionately much more to non-staff expenditures than the larger countries.

6.03 That these differences in some important aspects of expenditures on livestock services exist cannot be totally coincidental. It is interesting to note that the East and southern African countries presently considered are British ex-colonies while most of the West African countries are French ex-colonies. These two groups of countries seem to use different political and economic as well as administrative processes in dealing with financing issues, which have probably given rise to the different expenditure patterns. This may have important implications for policy if the patterns listed above are a reflection of the use of different policy processes and instruments.

6.04 It would be beyond the scope of subsequent studies related to financing of livestock services to deal with all these aspects in depth. But further coverage of some countries that do not exactly have the above characteristics would be quite useful. Further, other in-depth studies would be of interest to see if the different pattern of staff and non-staff expenditures that seems to exist between small and large countries holds true e.g. by a review of the situation in such small countries as Swaziland and Lesotho who have at the same time an important livestock sector.

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Annexes

Table A 1. BOTSWANA - Actual Recurrent Expenditure Livestock Services - Vet. Dept. & Animal Prod. Div (D¹) Tsetse Control²
(000 Current Pula)

ITEM/YEAR	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
1. Staff Expenditure (SE)												
- Tsetse control	40	29	35	35	31	24	958	1,021	1,216	1,258	1,758	1,913
- Dept. of Vet. Services	408	449	445	463	656	726	1/					
- Division of Animal Prodn.	65	89	96	102	208	267						
Total Staff Expenditure	513	567	576	600	895	1,017	958	1,021	1,216	1,258	1,758	1,913
2. Non-Staff Expenditure (NSE)	642	693	701	1,123	1,672	2,094	1,665	2,828	2,578	3,598	6,741	6,990
Internal transport & travel	235	221	357	419	484	597						
- Tsetse control	29	26	31	32	36	49						
- DVS	178	161	260	313	342	408	171	184	205	253	473	627
- DAP	28	34	66	74	106	140						
Drugs, sera and vaccines.												
Semen (All services included)	77	248	90	298	487	658						
- Tsetse control	29	108	-	43	54	27						
- DVS	44	140	90	249	433	631	859 ^{2/}	876	743			
- DAP	4	-	-	6	-	-						
Disease Control Campaigns	126	5	5	38	42	94				1,650	4,197 ^{3/}	3,776
- Tsetse control	-	-	-	30	32	89	67	544 (FMD)	574			
- DVS	126 (FMD)	5	5	8	10	5						
- DAP	-	-	-	-	-	-						
Other operating expenditure	204	219	249	368	659	745						
- Tsetse control	43	48	53	77	93	106						
- DVS	124	103	124	239	382	418	568	1,224	1,056	1,695	2,071	2,587
- DAP	37	68	72	82	184	221						
3. Total Gross Expenditure (TGE _V) ¹	1,155	1,260	1,277	1,723	2,567	3,111	2,623	3,849	3,794	4,856	8,499	8,913
4. Livestock Services Revenue (LSR)	22	50	56	189	160	390	474	554	717	753	705	1,279
- Vet. fees and cesses	11	21	18	17	8	10	15	13	13	13	15	19
- Sale of drugs, Vacc. & Semen	-	6	8	101	14	287	437	510	675	667	628	1,200
- Sale of livestock & produce	10	13	20	71	138	93	22	31	29	73	62	60
5. LSR as % of TGE _V	2	4	4	11	6	12	18	14	19	16	8	14
6. LSR as % of NSE	3	7	8	17	10	19	28	25	28	29	10	18
7. Total Agric. Rec. Expend. (TAE _R)	2,176	2,453	2,635	3,068	4,612	5,674	6,222	7,631	8,579	10,197	15,846	17,610
8. TGE _V as % of TAE _R	53	51	48	56	56	55	42	50	44	48	54	51
9. Total Agricultural Revenue	NA	NA	NA	773	985	NA	1,118	1,167	1,283	1,562	2,234	2,329
10. Livestock Related Revenue (LRR)	315	450	358	657	622	850	1,056	1,089	1,226	1,442	1,357	2,123

¹ Not possible to separate from here onwards - 96% only DVS.

² All services under DAP from 76/77 onwards but included here for convenience.

³ Disease control campaigns include FMD, aerial spraying + other disease control.

Table A 1. BOTSWANA - Actual Recurrent

ITEM/ YEAR	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
11. LRR as % of TGE _v	27	36	26	38	24	27	40	28	32	30	10	24
12. LSR as % of LRR	7	11	16	29	26	45	45	51	58	52	52	60
13. LRR as % of Agricultural Rev.				85	63	NA	94	93	96	91	61	91
14. No. & Category of (vet. Ser. 4/ professional and (HL technical staff (ML (LL (HUSB.5/ (HL (ML (LL				24 41 173	25 3 192	25 44 192	24 36 210	24 36 200	25 44 237	25 41 198	23 57 240	23 66 247
15. Ruminant Livestock Popul. (000 LSU)	1,604	1,665	1,640	1,715	1,810	1,900	2,000	2,170	2,090	2,140	2,165	
16. TGE _v /LSU (current P)	0.72	0.76	0.78	1.00	1.42	1.64	1.31	1.77	1.82	2.27	3.93	
17. LSU (000) Per (HL (ML (LL				71 42 10	72 42 9	76 43 16	83 56 10	90 60 11	84 48 9	86 52 86	94 38 9	
18. Agricultural GDP (AGDP) (in mill. P)											68	
19. Livestock GDP (LGDP) (in mill. P)											68	
20. TAE _R as % of AGDP (amt. in mill P)											13.05	
21. TGE _v as % of LGDP (amt. in mill P)											8.55	

4/ Includes Tsetse control and AI (upto 1976/77)

5/ AI included from 76/77 onwards

6/ Total agricultural expenditure (TAE_R) is average of 3 years (1978/79-1980/81)

SOURCE: FAO Production Yearbooks 1972-1980; Republic of Botswana / Carl Bro 1982. Vo. II.

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: Ndzinge et al (1984); Ochieng (1981).

Table A 2. KENYA - Recurrent Expenditure Livestock Services ^{1/} - actual unless otherwise indicated - in 000 Kenya Pounds (current prices)

ITEM/ YEARS	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82
1. Staff Expenditure (SE)	1,668	2,116	2,276	2,784	3,104	3,290	5,690	7,082
2. Non-staff Expenditure (NSE)	2,664	2,847	2,481	2,634	4,486	5,208	5,460	3,213
- Transport and travel	518	647	971	1,551	1,797	1,831	2,406	1,579
- Drugs, sera, vaccines & pesticides	195	309	215	211	288	447	911	399
- Other operating expenses	1,951	1,891	1,295	872	2,401	2,930	2,143	1,235
3. Total Gross Expenditure (TGE _V)	4,332	4,963	4,757	5,418	7,590	8,498	11,150	10,295
4. Appropriations in Aid (ISR)	1,130	1,363	1,847	1,491	1,099	1,180	2,082	1,889
- Veterinary Fees & cesses	279	370	579	584	555	279	548	758
- Sale of drugs, vaccines, etc.	235	260	238	229	186	225	255	279
- Sale of Farm Produce & Stock	585	689	1,005	604	319	585	1,043	822
- Miscellaneous	31	44	25	74	39	91	236	30
5. LSR as % of TGE _V	26	27	39	27	14	14	19	18
6. LSR as % of NSE	42	48	74	56	24	23	38	59
7. Total Agricultural Recurrent Expenditure (TAE _R)	13,215	15,511	12,268	17,876	22,211	23,051	47,530	38,274
8. TGE _V as % of TAE _R	33	32	39	30	34	37	23	27
9. Total Agricultural Appropriation-in-Aid (AIA)	2,316	2,321	2,925	2,593	2,266	2,191	3,141	2,948
10. LSR as % of Total Agricultural A-I-A	49	59	63	67	48	54	66	64
11. No. & Category of Professional	111	110	129	169	235	294	344	154
(HL)	289	282	329	319	338	356	331	408
(ML)	1,445	1,451	1,735	1,828	2,027	2,579	2,598	2,119
(LL)								
12. Livestock Population (000 LSU)	5,910	6,090	6,021	7,350	7,820	8,179	8,583	8,878
13. TGE _V per LSU (K Shs)	14.6	16.3	15.8	14.7	19.4	20.8	26.0	23.2
14. LSU (000) per								
(HL)	53	55	47	43	33	28	25	58
(ML)	20	22	18	23	23	23	26	22
(LL)	4	4	3.5	4	4	3	3	4
15. Agricultural GDP (AGDP) - (mill K sh.)					8,466			
16. Livestock GDP (LGDP) - (" " ")					2,946			
17. TAE _R as % of AGDP					5.00			
18. TGE _V " " " LGDP					5.00			

^{1/} Livestock under Ministry of Agriculture upto and including 1978/79, Ministry of Livestock Development from 1979/80 onwards.

^{2/} Excludes training.

SOURCES: Republic of Kenya. Appropriations Accounts. Several Years.
 " " " Estimates of Expenditure. Several Years.
 FAO Production Yearbooks: 1972, 1976, 1977, 1979, 1980, 1981.

Table A 3. MALAWI - Livestock Services Recurrent Budget
(Actual Expenditures in 1000 Current - Malawi Kwacha)

ITEM/YEAR	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83 ¹
1. Staff Expenditures (SE)	346	326	391	400	422	413	507	696	916	945	1,145	1,422	1,953
2. Non-Staff Expenditures of which (NSE)	339	358	453	552	509	682	1,069	1,136	1,127	1,503	1,931	2,710	2,384
- Internal transport & travel	(48)	(97)	(144)	(166)	(144)	(226)	(487)	(427)	(478)	(551)	(794)	(1,003)	(753)
- Drugs, sera vaccine	(21)	(22)	(39)	(40)	(42)	(44)	(60)	(82)	(77)	(116)	(86)	(155)	(190)
- Control of animal disease epidemics (campaigns)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(25)	(171)	(226)	(146)
- Other operating exp.	(270)	(230)	(270)	(346)	(323)	(412)	(522)	(627)	(572)	(811)	(880)	(1,326)	(1,295)
3. Total Gross Expenditure (TGE _V)	685	684	844	952	931	1,095	1,576	1,832	2,043	2,448	3,076	4,132	4,137
4. Appropriations in Aid (LSR)	234	230	266	375	416	468	528	523	496	533	504	788	921
- Vet. fees and cesses	(46)	(52)	(63)	(64) ^{2/}	(68)	(87)	(95)	(62)	(82)	(158)	(51)	(244)	(286)
- Sale of drugs & Vacc.	(11)	(13)	(13)	(15)	(15)	(14)	(18)	(20)	(30)	(38)	(36)	(47)	(50)
- Sale of livestock & produce	(177)	(165)	(190)	(296)	(333)	(367)	(415)	(441)	(384)	(337)	(417)	(497)	(585)
5. LSR as % of TGE _V	34	34	32	39	45	43	34	29	24	22	16	19	22
6. LSR as % of NSE	69	64	59	68	82	69	49	46	44	35	26	29	39
7. Total Agric. Rec. Expend. (TAE _R) ^{3/}	2,537	2,850	3,517	3,967	4,048	4,761	6,567	NA	9,700 ^{4/}	11,657	14,648	17,965	25,865
8. TGE _V as % of TAE _R	27	24	24	24	23	23	24	NA	21	21	21	23	16
9. No. & category of prof. & technical staff													
- III	10	10	10	10	16	16	14	16	16	16	16	18	18
- MII	34	34	37	40	40	43	43	49	53	54	58	70	70
- LI	268	255	256	256	277	280	268	270	315	315	234	388	400
10. Livestock Population (000 LSU)		466				599				665			
11. TGE _V /LSU		K 1.47				K 1.83				K 3.68			
12. LSU (000) per		47				37				42			
(III)		14				14				12			
(MII)		2				2				2			
(LI)													
13. Agricultural GDP (AGDP) (in mill K)										352			
14. Livestock GDP (LDGP) (" ")										25			
15. TAE _R as % of AGDP										34/			
16. TGE _V as % of LGDP										105/			

^{1/} Final estimates

^{2/} Dipping fees upto and including 1973/74; veterinary service fees thereafter

^{3/} Revised estimates excluding forestry but including fisheries

^{4/} TAE_R is average of 3 years (1978/79 to 1980/81)

^{5/} TGE_V is " " " (" " ")

SOURCES: Republic of Malawi. Approved Estimates of Expenditure on Revenue Account. Several Years.
: FAO Production Yearbooks. Several Years.

Table A 4. TANZANIA (continued)

ITEM YEAR	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77 ^{2/}	1977/78	1978/79	1979/80 ^{4/}	1980/81 ^{3/}	1981/82	1982/83 ^{3/}
B. REGIONS													
1. Staff Expenditures (SE)					39,785	48,149	43,487	39,032	39,312	38,736	41,630	46,057	
2. Non-Staff Expenditure (NSE)					<u>3,080</u>	<u>4,759</u>	<u>7,874</u>	<u>9,702</u>	<u>16,716</u>	<u>17,005</u>	<u>27,022</u>	<u>24,111</u>	
- Transport & travel					181	34	594	894	1,110	1,424	1,913	1,433	
- Drugs, vaccines, semen etc.					1,120	807	954	814	5,616	6,401	8,194	10,232	
- Other operating expenses					1,779	3,918	6,326	7,994	9,990	9,180	16,915	12,446	
3. Total Gross Expenditure (TGE _V)					42,865	52,908	51,361	48,734	56,028	55,741	68,652	70,168	
4. Regional revenue LSR (only Vet. charges)					NA	NA	NA	2,230	3,169	4,319	5,669	4,063	
5. LSR as % TGE _V													
6. LSR as % NSE													
C. TOTAL A + B													
1. Staff Expenditures (SE)					50,275	58,139	54,603	49,746	50,041	50,408	59,281	52,183	
2. Non-Staff Exp. (NSE)					<u>16,258</u>	<u>24,488</u>	<u>22,020</u>	<u>33,413</u>	<u>40,193</u>	<u>32,967</u>	<u>37,251</u>	<u>43,959</u>	
- Transport & Travel					401	259	829	1,270	1,512	1,836	2,308	1,603	
- Drugs, vaccines, semen					3,897	15,400	5,012	20,725	17,588	19,605	15,212	28,265	
- Other operating exp. semen					11,960	8,829	16,179	16,430	21,093	11,526	19,731	14,091	
3. TGE _V					66,533	82,627	76,623	83,159	90,234	83,375	96,532	96,142	
4. LSR								5,901	9,279	NA	NA	98,626	
5. LSR as % of TGE _V					NA	NA	NA	7	11	NA	NA	NA	
6. " " " " NSE								18	23				
7. TAE _R					<u>439,695</u>	<u>129,614</u>	<u>244,892</u>	<u>136,989</u>	<u>138,818</u>	<u>246,156</u>	<u>208,931</u>	<u>286,424</u>	
8. TGE _V as % of TAE _R					16	64	32	61	65	34	47	34	
9. Total LRR								9,769	15,989	NA	NA	33,161	
10. LRR as % TGE _V								12	18	NA	NA	35	
11. TAE _R as % of AGDP									2				
12. TGE _V as % of LGDP									4				
13. TGE _V per LSU					6.46	7.65	6.88	7.29	9.40	8.52	9.80		

Table A 5 ZAMBIA - Department of Veterinary Services + Tsetse Control
000 current Kwacha (actual expenditure or revenue)

ITEM YEAR	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
1. Staff Expenditures (SE)	703	844	967	NA	1,151	NA	NA	1,572	1,766	NA	1,784	NA	2,768
2. Non-Staff Expenditures (NSE)	1,910	2,290	1,932	"	1,728	"	"	1,858	1,764	"	2,170	"	3,943
Transport & Travel	261	346	214	"	270	"	"	326	286	"	298	"	686
Drugs, vaccines, etc.	463	589	685	"	641 ^{1/}	"	"	530	495	"	569	"	724
Other operating exp.	1,186	1,355	1,033	"	817	"	"	1,002	983	"	1,303	"	2,533
3. Total Gross Expenditure (TGE _V)	2,613	3,134	2,899	"	2,879	"	"	3,430	3,530	"	3,954	"	6,711
4. Appropriations-in-aid (ISR)	20	12	1	"	22 ^{2/}	"	"	44	39	"	39	"	51
Vet. fees & cesses	20	12	1	"	22	"	"	44	39	"	39	"	51
Sale of drugs, vaccines	-	-	-	-	-	"	"	-	-	"	-	"	-
Sale of farm produce & stock	-	-	-	"	-	"	"	-	-	"	-	"	-
5. LSR as % of TGE _V	1	1	...	"	1	"	"	2	2	"	1	"	1
6. LSR " " " NSE	1	1	...	"	1	"	"	2	2	"	1	"	1
7. Total Agric. Recurrent Expend. (FAE _R)	24,876	46,468	31,452	"	19,340	"	"	79,746	56,044	"	222,175	"	182,800
8. TGE _V as % of FAE _R	11	7	10	"	16	"	"	5	7	"	2	"	4
9. No. & Category of professional & technical staff	(III. NA MII. NA ILI. NA)	NA NA NA	19 25 43	15 25 48	NA NA NA	20 24 45	21 22 42	NA NA NA					
10. Livestock Population (000 LSU)	1,106	1,141	1,177	1,212	1,433	1,279	1,303	1,336	1,295	1,480	1,542	1,594	
11. TGE _V / LSU	2.35	2.75	2.47	NA	2.01	NA	NA	2.57	2.73	NA	2.57	NA	
12. LSU (000 LSU) per	(III. NA MII. NA ILI. NA)	NA NA NA	59 47 27	81 48 25	NA NA NA	64 53 28	62 59 31	NA NA NA					
13. Agricultural GDP (AGDP) (Mill. ZK)									216				
14. Livestock GDP (LGDP) (" ")									65				
15. FAE _R as % of AGDP									26				
16. TGE _V as % of LGDP									5				

^{1/} Materials + CBPP + FMD + AI.

^{2/} Paid services introduced in 1974.

SOURCES: Republic of Zambia. Financial report. Several Years.

: FAO Production Yearbooks. Several Years

: Annual Reports of the Department of Veterinary Services 1972, 1973, 1975 and 1976.

Table A 6. ZIMBABWE - Recurrent Expenditure Livestock services - Dept. of Vet. Services
000 Z \$ (Estimates unless otherwise indicated)

ITEM/YEAR	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83
1. Staff Expenditures (SE)	1,384	1,451	NA	NA	NA	2,270	2,420	2,802	2,911	3,361	6,217	8,588
2. Non-Staff Expenditures (NSE)	1,444	1,840	"	"	"	1,739	1,529	2,362	3,002	3,570	12,947	13,270
- Transport and Travel	524	586	"	"	"	888	813	1,180	1,532	2,030	3,157	3,000
- Drugs, vaccines, etc.	138	139	"	"	"	851	280	472	666	678	1,411	1,812
- Other operating expend.	782	1,171	"	"	"	436	436	710	804	862	8,379 ^{2/}	8,458
3. Total Gross Expenditure (TGE _v)	2,828	3,291	"	"	"	4,009	3,949	5,164	5,913	6,931	19,164	21,858
4. Appropriations-in-Aid (LSR)	NA									NA	463	570
- Fees and cesses	"									NA	281	344
- Sale of drugs, vaccine etc.	"									NA	182	226
5. LSR as % TGE _v										NA	2.4	1.6
6. LSR as % of NSE											3.6	4.3
7. Total Agric. Recurrent Expenditure (TAE _R)	29,205	34,748	NA	NA	NA	38,852	65,246	67,762	63,628	66,939	99,643	141,910
8. TGE _v as % of TAE _R	10	9	NA	NA	NA	10	6	8	9	10	19	15
9. No. & Category of professional & technical staff											53	46
(III)											349	
(ML)												
(LL)												
10. Livestock Pop. (000 LSU)	4,185	4,221	4,287	4,563	4,667	4,882	4,484	4,092	4,532	3,871	4,078	NA
11. TGE _v per LSU (current Z\$)	0.66	0.78	NA	NA	NA	0.82	0.88	1.21	1.30	1.79	4.70	NA
12. LSU (000s) per											77	89
(III)											12	
(ML)												
(LL)												
13. Agricultural GDP (AGDP) (mill Z\$)										462		
14. Livestock GDP (LGDP) (mill. Z\$)									(35%)	162		
15. TAE _R as % of GDP										14		
16. TGE _v as % of LGDP										4		

^{1/} Actual expenditure from Report of the Comptroller and Auditor-General, 1978.

^{2/} Dipping services reintroduced: 50% and 45% of other operating expenditure in 1981/82 and 1982/83 respectively.

SOURCES: Republic of Zimbabwe. Estimates of Expenditure. Several Years.

" " " " Report of the Comptroller and Auditor-General (1978).

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Agricultural Marketing Authority. Economic Review of the Agricultural Industry of Zimbabwe. Several Years.

Madzima (Personal communication).