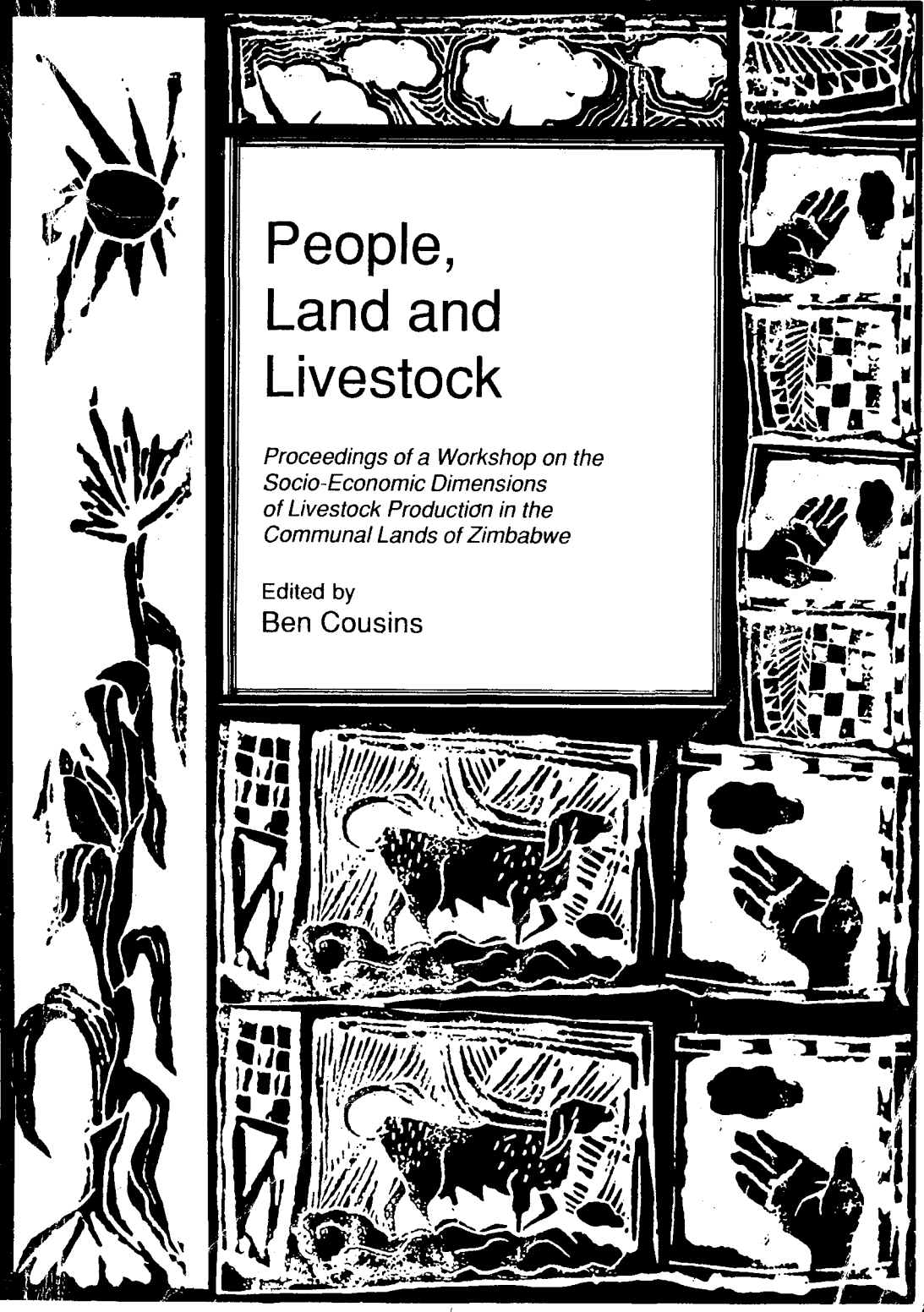

People, Land and Livestock

Proceedings of a Workshop on the Socio-Economic Dimensions of Livestock Production in the Communal Lands of Zimbabwe

Edited by
Ben Cousins

PEOPLE, LAND AND LIVESTOCK

Proceedings of a Workshop on the Socio-economic Dimensions of Livestock Production in the Communal Lands of Zimbabwe, held at Great Zimbabwe, Masvingo, 12th to 14th September 1988

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EXPLORING LIVESTOCK INCOMES IN ZIMBABWE'S COMMUNAL LANDS

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1. INTRODUCTION

This paper explores and examines two closely linked issues relevant to livestock production in Zimbabwe's Communal Lands (CLs). The first centres on problems peculiar to the measurement of the economic benefits of "subsistence" or "semi-commercialized" livestock production systems. The second focuses on our understanding of the distribution of these benefits.

Measuring the benefits of livestock in the Communal Lands

The economics of subsistence or semi-commercialized livestock farming systems is characterized by a distinctive feature. A high proportion of the economic advantages of having (owning, managing or accessing) livestock emerge as in-kind "intermediate products" such as manure and draught power used as crop production inputs or conversely outputs of fodder or crop residues used for livestock sustenance within a single household or lineage/kin group. Valuing the benefits of these products poses several methodological issues. In particular their effects are indirect and are tempered by numerous other factors such as varying soil types, differing agroecological conditions and varying factor endowments at the level of production.

Zimbabwe's CLs are no exception in this regard. Over a sustained period of time and over a wide range of agroecological conditions the percentage off-take from the peasant herd has been very low, ranging from 4-8 percent per annum. This compares with commercial ranches or beef enterprises which aim to achieve a sustainable off-take of around 20 percent per annum. The use of low off-take rates as an index of the productivity of the peasant livestock is witness to the methodological failure to understand the roles and functions of livestock (and hence the value of livestock benefits within this sector). We can safely assume on the basis of the low off-take figures that the value of "intermediate products" are likely to be a high proportion of the total benefits derived from livestock.

Clearly we are not completely ignorant of the other functions and roles of the residual herd. But analyses of these less visible aspects of peasant economy have remained at a rather rough and ready level of estimation of costs and returns. Budgets of varying degrees of sophistication, usually contain a fair number of assumed coefficients and values or are based on a few field observations which, more often than not, are then used to refer to some "model" or "typical" situation.

In the absence of adequate information, poor analyses, extrapolations and inferences are made for thousands of hectares of rangelands and their stock. A vast spectrum of agroecological conditions, farmer circumstances and objectives are compressed into "target groups" or "recommendation domains". The agenda for policy analysis has become compressed and narrow. Consequently technical and administrative dimensions of a modernizing development process have taken

precedence over other equally important issues. While largely ignored in the planning of community or self-help development projects such as grazing schemes, these broader equity issues can (and do) rapidly surface as stumbling blocks in project implementation or in the so-called subsequent "mis-management" of these schemes, for they are rooted in the highly inequitable distribution of the social costs and benefits of livestock husbandry within the CLs.

Understanding the distribution of the benefits of livestock within the Communal Lands

Assessing the distribution of the benefits of livestock is contingent upon better comprehending and valuing these hitherto poorly understood benefits. Improvements and developments on these two fronts will contribute to a better understanding of the roles that livestock play (if any) within wider structural processes of rural differentiation.

How adequate is the evidence on access, accumulation and distribution of livestock? How have our methodological approaches (such as household surveys) affected the measurement and understanding of patterns of livestock accumulation, issues of access and the emergence of inequalities within the rural economy? How and in what ways have they distorted the realities? Are there more appropriate or ideal units of analysis, approaches and research priorities? These are all important questions and issues which underlie a critique of much of the research which has been carried out on the peasant livestock sector.

Conceptual and methodological dragons do surround rural household surveys. They may, in some circumstances, give rise to exaggerated assessments of the degree of rural inequalities. However, to simply assert that access to livestock is generally wider than ownership is clearly not adequate either. Notwithstanding the profusion of local social and institutional mechanisms that secure access to productive resources and income, this alternate notion smacks of a "merry-equitable" rural Zimbabwe, which seems equally suspect. The aggregated effects of these access fostering mechanisms need to be qualified (or quantified) if we are to be able to assess their significance, i.e. to what extent do the mechanisms of access distribute the benefits of livestock?

Given the costs of research programmes capable of generating this type of information, we need to assess to what extent we can make better use of existing information through critical reinterpretation.

2. TOWARDS A METHODOLOGY FOR COMPARATIVE RESEARCH AND ANALYSES

The literature on peasant sector livestock economics in Zimbabwe is very limited. The International Livestock Centre for Africa (1986), lists 1542 items in its index to livestock literature microfiched in Zimbabwe. Approximately 14 percent of these references have been indexed under the section economics (NB. "economics" is very broadly defined). Within these items there is a further major distinction, that between the economics of "African" and "European" agriculture. The former is under-represented. Specific references on methodology

for valuing the peasant sector livestock benefits are absent. This finding is perhaps not surprising, for the technically biased nature of much of the literature on agricultural research is well established. The failure of policy interventions (found wanting on economic analysis) is perhaps not as equally well established.

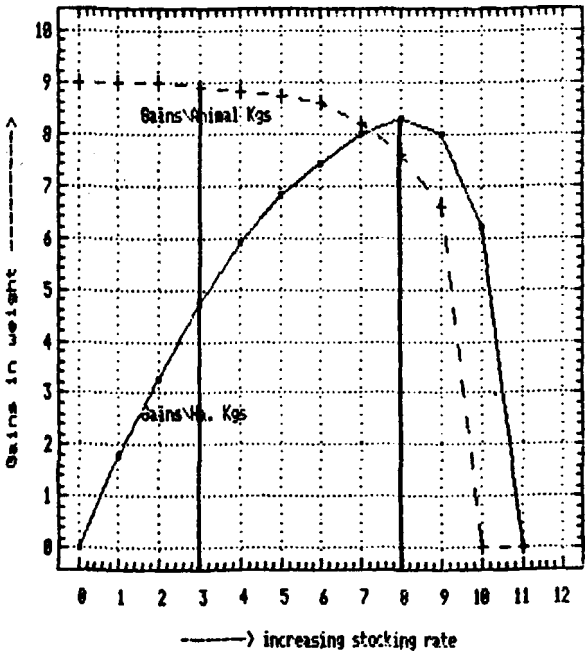
Behnke's (1985) study suggests that this state of affairs in Zimbabwe is not surprising for this predicament pertains Africa-wide. His observations on different methods for measuring the benefits of commercial versus subsistence forms of livestock husbandry provides a useful baseline for future studies and a framework for the re-analysis of existing information. While his analysis includes three different comparative measures (biological, economic and nutritional) this paper focusses narrowly on the economic aspects. This is a limitation for undoubtedly multiple measures for a comparative analysis are likely to be more robust, taking into account a wider range of relevant factors. Moreover, understanding and interpretation is enhanced as these factors often interact.

2.1 The trade-off between animal and land productivity

The major pitfall in the comparative analysis of pastoral productivity has been the use of indices of productivity on a per animal basis without taking account of different stocking rates and veld trends. Productivity of animals and the productivity of land are, within reasonable parameters, inversely correlated (Mott 1960). We thus have to be aware of a trade-off situation between these two. Gains per animal and gains per hectare are both a function of stocking rate (see

Fig. 1.). The glaring pitfalls of comparative analyses between "ranches" and "peasants" equally applies to comparative analyses within the peasant sector, where stocking rates and veld trends may show quite high variability.

Figure 1: Productivity of land and animals



Thus measures of biological productivity and any subsequent analyses of the economic benefits, in the absence of any "standardising" account of stocking rate and veld trends, will remain isolated evidence with little basis for comparative use (or for extrapolation for planning purposes into "other" contexts).

Economic analysis must not....

> merely express in cash equivalencies the same misconceptions that had previously been measured according to biological criteria (Behnke 1985.)

It would seem essential then to standardize our biological measures (gains/per animal), land-based measures (gains/hectare), labour-based measures (gains/person) or ecological/energy-based measures of productivity by stocking rate and an assessment of veld trends, all other factors being constant. Importantly, this approach incorporates an understanding of the "opportunistic" strategy that peasant stock holders have vis-a-vis animal and veld conditions.

Within the predominantly mixed farming systems of Zimbabwe's CLs the relative contributions of grazing and arable lands (fodder and crop residues) would need to be assessed in any land-based measures of productivity.

Longitudinal studies and evidence are very rare. Policy analysis tends therefore to rely heavily on once-off cross-sectional studies. To this is added a further complication. The methodologies used for the calculation of intermediate products vary between different studies and assumptions. Comparative analyses are therefore complicated and constrained by the nature of this disparate evidence. Differentiating

between the effects of agroecological zone, seasonally specific features, differing farming systems, farmer objectives and the effects of differing assumptions and methods of assessing economic benefits is difficult.

Information will continue to remain severely limiting, partial or simply non-existent for some parts of the country.

2.2 Measuring the benefits of livestock: the current state of the art in Zimbabwe's CLs

The basic problem in economic analysis of the benefits of "subsistence" or "semi-commercialized" livestock farming systems lies in the valuation of intermediate products.

Subject to the farming system, various studies suggest that the total value of intermediate products can be in the range 35-80 percent of the value of directly measured cash-based transactions and exchanges (Behnke 1985). However the methodology for the calculation of these intermediate products varies, potentially giving rise to great variability in the way subsistence livestock is valued. The most common approach to the economic evaluation of these "intermediate products" is the attempt to define a replacement cost valuation of the non-marketed benefits.

A summary analysis of a few studies which have attributed economic values (or measures of relative significance) to the differing intermediate products within Zimbabwe's C.A.s. follows (see Table 1):

Table 1: Valuations of production: inputs to arable and production outputs

Study	Percentage of total (%)					
	Draught	Manure	Milk	Sales	Slaughter	Work
Danckwerts	41.7	7.6	28.6	17.6	4.5	na
GFA	38.7	9.8	40.9	10.5	na	na
ARDA Zone IV	48.2	18.8	5.8	27.2	na	na
Zone V	36.7	32.1	7.0	33.2	na	na
Scoones	29.5	2.7	38.3	11.5	na	18.0

Source: Scoones & Wilson 1988.

Variations in approach can easily give rise to some quite surprising degrees of variation in valuation of livestock benefits. Importantly, not all variations observed are methodologically derived but reflect the diversity of livestock husbandry systems on the ground. (Some of the more obvious reasons for these latter types of variability are looked at in Section 3 below). However the distinction between these two sources of variability is essential if any meaningful synthesis of separate studies and broader analysis is to be made.

Danckwerts' (1974) study of 20 grazing schemes and detailed analysis of 16 in Victoria Province was the first assessment of the economic valuation of CL cattle in the then Rhodesia. His analysis focuses on i) arable inputs (draught and manure), ii) home consumption (milk and slaughtering) and iii) net sales - the difference between purchases and their valuation less sales and their valuation in a single calendar year.

Danckwerts estimated the "market" value of ploughing per day at between $2.75-4.00 across 17 schemes and decided on an average of $3.00 This was based on the money received for ploughing for others within individual grazing schemes. (Ploughing for others accounted for as little as 7,9 percent of all ploughing recorded: only 1,2 percent for cash, 1,4 percent for beer and 5,.3 percent for free.) This valuation of $3.00 per day in a virtually non-existent market compared with $8.00/day for tractor ploughing. The disparity he explained on the basis of the quality/depth of the tractor-based option.

The manure valuation was based on the number of carts carried (presumably to arable fields) and was not imputed on the basis of production per animal and an assumed derived crop input benefit. The valuation was calculated on the basis of the replacement cost of the nutritive value of a ton of manure as derived from the Grasslands Research station findings ($2,00/-ton). Across the 20 schemes he enumerated 5627 cattle which produced 2280 tons of carted manure or an arable benefit of 0,4 tons per animal. His figures are also highly relevant to the discussion on access to livestock benefits. Assuming that his findings were representative of the wider situation, access to draught outside of ownership or management units was very limited in the early 1970s.

The valuation of milk was derived from the ruling price in each area multiplied by the estimated yields and lengths of lactation reported by individual stock owners. The appendix to Danckwerts' report, however, does not show these details, only the aggregated value per scheme.

The value of home consumption slaughtering was set at $30,00 per animal and was based on evidence from sales and purchases in the same calendar year. This was a blanket valuation and no specific per animal valuation was made.

The aggregate offtake for the 20 schemes in the year of study was only 2.75 percent which was below the average of 5 percent reported for the province in 1971. This was a net sales valuation and was based on an inventory by animal of all purchase prices and all sale prices. This figure was partially accounted for by a seasonally specific rate of herd increase.

Despite its dated nature the Danckwerts study remains centrally important to our understanding of livestock and the valuation of their intermediate goods within the CLs of Zimbabwe. The depth of his empirical work provides strength to his assessment of the proportional value of draught, manure, milk, slaughtering and sales. As is the case in the other studies reviewed here he does not take account of changes in herd valuation (as in a conventional commercial livestock trading account). His valuation therefore only focuses on disposable outputs and intermediate goods. Aggregated at the level of the grazing schemes and by virtue of being limited to a single year, his data does not facilitate analysis of trends in ownership patterns at the level of individual owner or management units.

The GFA study (1987) and Steinfeld (1987) have made their own independent economic valuation of livestock products. They present their methodology in two sentences.

> Valuations go by the equivalent of fertilizer cost for manure. Farm gate prices are used for the

valuation of meat and milk, and herd growth is also valued at the meat price equivalent.

Table 2: Value $ (Zim) of cattle functions, Chilimanzi and Mberengwa Household Survey 1986

Functions	Chilimanzi		Mberengwa	
	$(Zim)	%	$(Zim)	%
CROPPING INPUTS:				
Draught	140.00	21.9	84.00	25.6
Manure	41.00	12.6	16.00	4.9
Sub Total	143.00	44.1	100.00	30.5
OUTPUTS:				
Milk	97.00	29.9	140.00	42.7
Meat	61.00	18.8	0.0	0.0
Sub Total	158.00	48.7	140.00	42.7
Herd Growth	23.00	7.1	88.00	26.8
TOTAL	324.00	100.0	328.00	100.0

Sources: GFA 1987; Steinfeld 1987.

The interest in the GFA study findings lies in the fact that the same methodology has been used to compare the contrasting ecological regions of Chilimanzi and Mberengwa. In the climatically more favourable area of Chilimanzi, draught and manure appear to be more important and reflect the better cropping potential as compared with Mberengwa. The importance of milk in Mberengwa, they suggest, reflects a post drought response to herd reconstruction and rightly points out the need to take account of cyclical features not observed in cross sectional surveys. They suggest that in the longer run, meat

and offtake (sales) are likely to be more important. Table 3 illustrates the cyclical nature of CL cattle sales for the period 1980-85 (CSC Purchases Jan-Dec. for the series 1980,81,82,83,84,85). This pattern in the annual series of total numbers of cattle sold and value of sales is consistent with the GFA analysis.

Table 3: CSC Purchases. Communal Land Cattle Sales Jan-Dec, 1980-1985

	1980	%	1981	%	1982	%	1983	%	1984	%	1985	%
Males	27677	70.3%	35993	76.5%	44692	74.8%	55218	80.8%	53633	82.4%	16475	89.9%
Females	11684	29.7%	11048	23.5%	15023	25.2%	13134	19.2%	11474	17.6%	1848	10.1%
Total	39361		47041		59715		68352		65107		18323	
Index	100.0%		119.5%		151.7%		173.7%		165.4%		46.5%	
Millions $(Zim)	$4.29		$7.06		$10.29		$12.55		$14.14		$5.03	

(Current Year Nominal Values)

Source CSC 1986

A serious limitation of the GFA analysis centres on its use of the "average" household as derived from survey evidence. They make no analysis of the impact of differences in herd composition at the level of the household although they note that it has interesting implications.

Scoones (1987) and the Agricultural and Rural Development Authority, (1987) have recently valued intermediate products

and their overall assessments are summarised in Table 1. Both have, however, detailed their assumptions. A comparison of the two reveals the degree of latitude in assumptions that get built into budgets. There are big differences in the manure and milk valuations between these two assessments.

Scoones' valuation of milk is based on a study of 4 animals at differing stages of lactation. He uses an average production of 2,9 litres per day over a 300 day lactation, a calving rate of 0,7 and values this estimate of milk production at $0,50 per litre. His manure valuation is based on approximately one cart per beast per annum and the replacement cost he suggests, is variable, being dependent upon soil type. Thus he estimates that milk from CL cows will be 29 times ($290) more valuable than their manure ($10).

ARDA on the other hand estimates milk output on the basis of production coefficients of 45 percent weaning, 3 percent mortality and 10 percent culling. Their lactation period assumption is 150 days (half of the preceding assumption) at a yield of 1,8 litres per day of which they see only half being utilized by the household. ARDA valued the milk at $0.40 (20 percent less than Scoones).

To what extent are ARDA and Scoones measuring differing livestock systems and to what extent are we observing differences in assumptions? Clearly the relative values of intermediate products from livestock within the CLs of Zimbabwe vary as a consequence of a wide range of factors - agroecological region, herd composition, farmer objectives or responses to seasonally specific conditions such as post drought recovery or the need to realise livestock (assets) as

a consequence of drought or other expenditure requirements. If we are to generalize on the basis of research findings it would seem very important for all studies concerned with valuing intermediate products to fully and explicitly detail their assumptions and methods in these calculations. Only then will it be possible to distinguish between budgeting assumptions and variations in the livestock farming systems on the ground.

While there is a general consensus on the relative importance of the economic benefits of non-marketed "intermediate products" vis-a-vis the cash-based transactions and direct subsistence benefits from animals, it would seem that our understanding is weak.

3. UNDERSTANDING THE DISTRIBUTION OF LIVESTOCK BENEFITS WITHIN ZIMBABWE'S COMMUNAL LANDS

This section sets out to present evidence on the pattern of the distribution of cattle and hence their benefits, within the CLs of Zimbabwe.

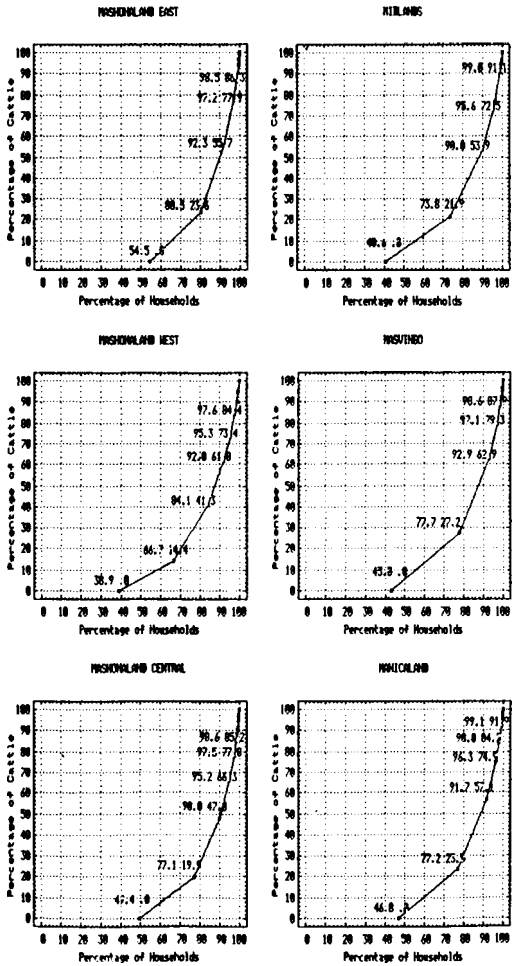
3.1 Inequalities in "ownership" versus access to "benefits"

There are some severe conceptual pitfalls associated with the concept of the "rural household" as so commonly used in rural surveys of the "real" world. Inter- and intra-household economic relations are normally much more illuminating about wider social and economic relations than those which are observed in the conceptually limiting but pervasive decision-making "family-farm" concept.

Scoones and Wilson (1988) suggest that an alternative anthropological approach identifies a large agenda of factors and social mechanisms that redistribute "apparent" inequitable ownership/management of livestock, eg. lineages, farmer groups and other mechanisms. However they make no assessment of the relative significance or importance of these mechanisms.
Most observers agree that access is wider than "ownership" or "management units" of livestock holdings as suggested by surveys. However, what is still needed is an assessment of the net effect of all these mechanisms that apparently enhance access. On the other hand, household-based survey evidence suggests the inequalities are very large. Analyses of the aggregated effects of livestock benefits within the farming systems suggest that access is wider than ownership but by no means equitable.

Appendix 1 and Figure 2 summarise the distribution of households by numbers of cattle managed or owned as per the findings of the CSO national household capability survey carried out in 1983 - 84. (At the time of writing, exactly comparable figures for Matabeleland North and South were not available).

Figure 2: Household distribution of cattle ownership



The data for the 6 provinces show up a remarkably similar pattern. Between 39-55 percent of all rural households are in the category stockless and at the of the distribution, the top 10 percent of the households in each province account for between 44-54 percent of all the cattle enumerated. Cliffe's (1986) summary of figures from several surveys in the 1980-82 period suggests a slightly lower level for the number of stockless households at that point in time. The early post-independence Research and Specialist Services (R&SS) studies of Mangwende and Chibi CLs estimated that only 25 percent of households were stockless in the mid 1970s. However, by the mid 1980s the figure for stockless households, in the same two CLs was estimated at 50 percent (Shumba 1984). The ILO rural incomes survey of 1986 (see Jackson et al. 1988) has come up with a strong confirmation and similar finding for a much broader sample of 20 enumeration areas covering the 5 main agroecological zones of the country.

The highly skewed pattern to stock holdings, as revealed by large samples and national surveys, suggests that the purposive sampling of small numbers of households on the basis of "owners" and "non-owners" of cattle has arguably been misleading. The marginal stockholders (who make up 15-20 percent of the population), are in many respects more closely associated with the 40-55 percent of households who are stockless, than they are with the top 10 percent of stockholders, who control half the total herd. It is against this degree of inequality that the mechanisms of access must redistribute the benefits of livestock.

Even on the basis of an assumed "dramatic growth" in the commercialization of draught power and other forms of access

within the CLs in the post independence period, Danckwerts' figures on ploughing for others seem to suggest that it is fairly safe to propose that the aggregate area cultivated under hire/exchange arrangements are still likely to be a small proportion of the total area cultivated in the CLs

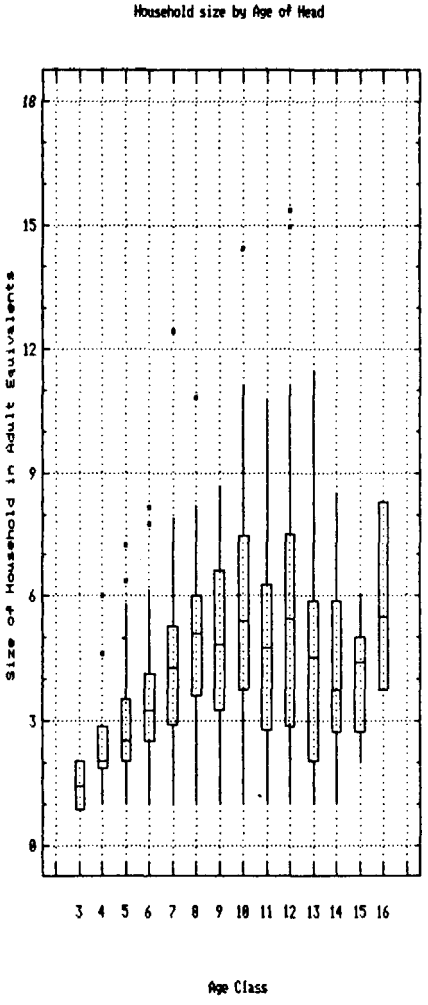
3.2 An expanded demographic analysis

There is a wider assertion that cyclical (inter-generational) processes are an important explanation of "apparent" inequalities in livestock ownership. The young households have less than the prime generation families who (naturally?) tend to gain the a large share of the livestock as they buy or inherit from the old, who are pensioning off their stock/assets.

An analysis of the ILO survey data shows that there is an apparent cyclical trend in stock ownership by age of household head. There is a higher degree of stocklessness in the younger and older age cohorts.

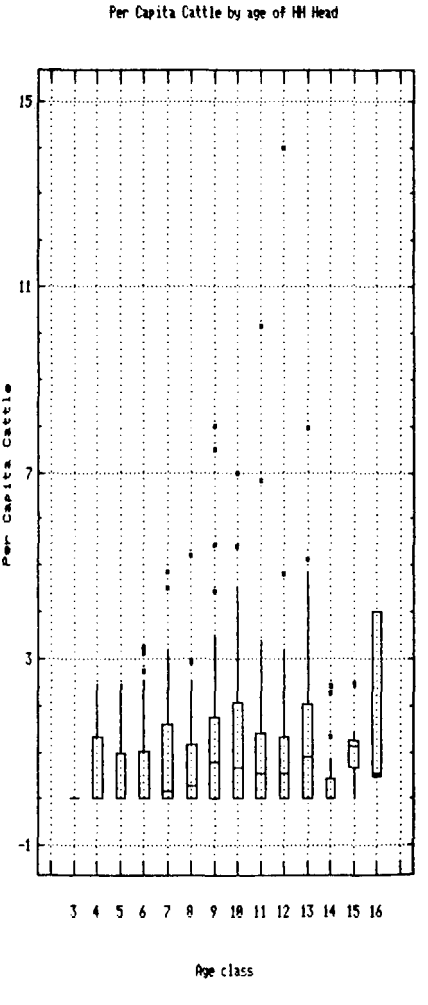
However, an expanded demographic analysis of the data reveals two important additional features. There is a high proportion of stockless households across all generations - between 40-60 percent; and that when ownership is adjusted by household size, the apparent age-based distribution is substantially eliminated (see Figures 3 and 4).

Figure 3:



NB 3=15-19Yrs 4=20-24Yrs etc.

Figure 4:



NB. 3=15-19Yrs 4=20-24Yrs etc.

Casual observation that the prime generation appear to have more animals can easily neglect the fact that they have more dependents. Statistical analyses which present only averages for each age cohort tend to give a false impression of "homogeneity" within cohorts and tend to imply an inevitable progression for all or at least the majority of rural households through the cycle of stock accumulation and losses over time. This is highly misleading, and is explained by partial analyses and small sample sizes which set limits on the degree to which data can be usefully disaggregated.

Our understanding and explanations of the patterns of distribution of cattle within the CLs has been very much affected by the grouping of data and the types of summary statistics used. The "with" versus "without" cattle categories have been misleading and limiting.

Further supporting analyses at this level of disaggregation are presented in Table 4. They illustrate that the pattern of the distribution of cattle is reflected interactively through the farming system and in both household and per capita incomes. The number of hectares cultivated, total agricultural production and marketings follow the same trend whereby the main feature to be explained is the degree of inequality within each age cohort (see Fig. 4).

Table 4:

Effects of Levels of Cattle 'Ownership' on:
Area Cultivated, Total Cereal Production & Marketings, and Yields.

Number of Households Arrayed by Level of Cattle ownership
and by Ecological Zone

	16-50 Head	8-15 Head	3-7 Head	1-2 Head	Nil
% HHs	(4.3)	(14.7)	(27.3)	(9.3)	(42.2)

ECOZONE	No.	% with HHs.	Credit	No.	% with HHs.	Credit	No.	% with HHs.	Credit	No.	% with HHs.	Credit	No.	HHs.
I	-	-		-	-		-	-		-	-			60
II	15	20.0%		23	30.0%		38	34.0%		16	13.0%			57
III	2	0.0%		27	33.0%		53	23.0%		13	15.0%			55
IV	3	0.0%		16	0.0%		39	5.0%		18	11.0%			44
V	6	6.0%		22	0.0%		34	0.0%		9	0.0%			49

Numbers of Hectares cultivated 1984-85, (mean per cell) arrayed by level of
Cattle ownership and by Ecological Zone

ECOZONE	Mean Ha.	Mean Ha.	Mean Ha.	Mean Ha.	Mean Ha.
I	-	-	-	-	0.9
II	2.7	1.7	1.7	2.3	1.0
III	1.8	2.3	1.9	2.0	1.2
IV	5.4	3.1	2.9	1.7	1.2
V	4.5	3.1	2.3	2.6	1.3

Total Cereal Production 1984-85 (mean per cell) arrayed by level of
Cattle ownership and by Ecological Zone

ECOZONE	91 Kg Bags	91 Kg Bags	91 Kg Bags	91 Kg Bags	91 Kg Bag
I	-	-	-	-	6.8
II	97.3	43.7	33.2	25.9	12.9
III	67.0	77.9	45.8	31.1	25.9
IV	27.0	23.4	25.3	19.5	15.0
V	31.0	31.0	17.6	16.0	7.2

Total Cereal Marketings 1984-85 (mean per cell) arrayed by level of
Cattle ownership and by Ecological Zone

ECOZONE	91 Kg Bags	91 Kg Bags	91 Kg Bags	91 Kg Bags	91 Kg Bag
I	-	-	-	-	0.2
II	79.9	32.3	20.2	17.1	6.4
III	56.5	64.2	31.7	185.0	16.4
IV	9.7	8.8	13.1	8.3	6.4
V	7.5	11.6	5.0	5.8	1.3

Cereal Yields per Hectare 1984-85 (mean per cell) arrayed by level of
Cattle ownership and by Ecological Zone

ECOZONE	Kilos/Ha.	Kilos/Ha.	Kilos/Ha.	Kilos/Ha.	Kilos/Ha.
I	-	-	-	-	607
II	2355	2299	1788	1178	962
III	3445	3109	2159	1675	1931
IV	414	694	780	764	754
V	62	904	646	560	520

Source ILCA Survey 1985.

Table 5:

Distribution of Communal Land Cattle across rural income groups

Cattle Losses 1975-80

Income Group	Number Households	Percentage Households Within Group	Total Head Lost	Percentage Total Loss
Top 20%	47	39.2%	405	29.2%
60-80%	36	30.0%	303	21.9%
40-60%	35	29.2%	240	17.3%
20-40%	42	35.0%	267	19.3%
Bot 20%	27	22.5%	170	12.3%
	187		1385	100.0%

Cattle Herd @ 1980

Income Group	Number Households	Percentage Households Within Group	Total Head Cattle	Percentage Total Cattle
Top 20%	71	59.2%	763	33.7%
60-80%	65	54.2%	499	22.0%
40-60%	63	52.5%	541	23.9%
20-40%	50	41.7%	334	14.7%
Bot 20%	28	23.3%	130	5.7%
	277		2267	100.0%

Cattle Herd @ 1985 and Percentage Change 1980 to 85.

Income Group	Number Households	Percentage Households Within Group	Total Head Cattle	Percentage Total Cattle	Percent Change 1980-85
Top 20%	86	71.7%	921	39.2%	120.7%
60-80%	85	70.8%	582	24.8%	116.6%
40-60%	73	60.8%	511	21.7%	-5.5%
20-40%	48	40.0%	236	10.0%	-29.3%
Bot 20%	27	22.5%	100	4.3%	-23.1%
	319		2350	100.0%	

Source: (re-analysed) ILO Incomes and Food Security Study 1986

3.3 Cattle, land, productivity and social differentiation

The close correlation between high incomes and the presence of cattle (both as assets and productive components within the farming system and wider rural economy) emerges strongly in many studies. Table 4 presents an analysis of the interactive effects of cattle on land utilization, arable agriculture and land productivity as drawn from the ILO data-base. On the basis of income assessments as derived from a wide range of both farm and non-farm sources, Table 5 analyses the patterns of cattle assets and herd growth as observed across five stratified rural income groups for the period 1980-85. When put together these two analyses present a fairly vivid picture of a social and economic process of differentiation within the CLs.

At the time of the enumeration in September 1985 only 22 percent of those households defined as "the poor" (the bottom 20 percent in the income analysis) had any livestock and in aggregate their stock holdings accounted for only 4.3 percent of all cattle enumerated. Seventy two percent of "the rich" (the top 20 percent in the income analysis) had cattle and in aggregate their holdings accounted for 40 percent of the total herd.

The impacts of various levels of cattle ownership on hectares cultivated, total cereal production, total cereal marketings and yields per hectare are presented in Table 4. Within each agroecological zone there is a positive association between total area cultivated and the five levels of cattle ownership. As one moves from the wetter CLs into the semi-arid areas of the country, the larger cattle owners or management units tend to embark on a land extensive arable agriculture. The total

cereal production, total cereal marketings and yields per hectare, follow a consistent pattern. Highest production, marketings and yields are found in the high potential areas when cattle ownership is highest and conversely the lowest production, total marketings and yields are associated with the driest areas in combination with the stockless households.

The analysis of herd changes between 1980 and 1985 as presented in Table 5 shows that the poor have suffered absolute losses in stock (a net loss of 30 head, i.e. 25-30 percent decline in their animals), while the rich (the top 20 percent), despite the protracted drought and wider economic recession, have gained animals (158 head, i.e. a 20 percent increase in their herd.)

Various analyses have been made in order to characterize the stockless. Socially, they appear to encompass a wide range of people and households. Single women are slightly more than proportionally represented, especially in the older age cohorts. Obligations of lineage or other groups may well operate in many circumstances to secure them access to draught power. But not in all cases, for example a socially estranged widow whose husband and sons were killed in the war as "sellouts".

4. CONCLUSION

Valuing the economic benefits of the "subsistence" and "intermediate products" of livestock within peasant farming systems is at a very rudimentary stage. Researchers should fully elaborate all their assumptions and calculations in any

valuation of either of these two sources of economic benefits. Only then will analysis be able to distinguish between budgeting assumptions and variations in the livestock farming systems on the ground. As and when the data-base improves, comparisons of animal and land productivity will need to be standardized by taking account of stocking rates and veld trends within the differing livestock farming systems found within the Communal Lands.

The liberation war and the recent severe droughts of the early 1980s, appear to have brought about a nation-wide 25 percent increase in the number of stockless households. Approximately half of all rural households are now stockless. Survey evidence on ownership or management units suggest that there is a high degree of inequality in the ownership/control over animals and hence access to the benefits of cattle. A preliminary analysis of patterns of accumulation and losses of cattle between different rural income groups since independence suggests that there is a polar trend to the pattern of social differentiation. Although there are numerous social and other mechanisms for achieving a broader access to the benefits of livestock, household-level analysis of the differential impact of cattle on arable agriculture within any agroecological zone and locality, suggests that while "access" may be wider than "ownership", it does not mean equity.

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APPENDIX 1

Distribution of households by numbers of cattle managed.

MASHONALAND EAST

No. cattle	No. HHs	% HHs	Mid point	Total cattle	Cum Total	Cum % cattle	Cum % HHs
0	54386	54,5%	0	0	0	0,0%	54,5%
1-5	25939	26,0%	2.5	64848	64848	23,6%	80,5%
6-10	11807	11,8%	7.5	88553	153401	55,7%	92,3%
11-15	4870	4,9%	12.5	60875	214276	77,9%	97,2%
16-20	1328	1,3%	17.5	23240	237516	86,3%	98,5%
21-25	960	1,0%	22.5	21600	259116	94,2%	99,5%
26-30	221	0,2%	27.5	6078	265194	96,4%	99,7%
31-35	221	0,2%	32.5	7183	272377	99,0%	99,9%
36-40	74	0,1%	37.5	2775	275152	100,0%	100,0%
41-45	0	0,0%	42.5	0	275152	100,0%	100,0%
46-50	0	0,0%	47.5	0	275152	100,0%	100,0%
50+	0	0,0%	50	1	275153	100,0%	100,0%
Total	99806	100,0%		275153			

Source CSO 1985.

Distribution of households by numbers of cattle managed.

MASHONALAND WEST

No. cattle	No. HHs	% HHs	Mid point	Total cattle	Cum Total	Cum % cattle	Cum % HHs
0	20799	38,9%	0	0	0	0,0%	38,9%
1-5	14871	27,8%	2.5	37178	37178	14,4%	66,7%
6-10	9286	17,4%	7.5	69645	106823	41,3%	84,1%
11-15	4249	7,9%	12.5	53113	159936	61,8%	92,0%
16-20	1713	3,2%	17.5	29978	189914	73,4%	95,2%
21-25	1268	2,4%	22.5	28530	218444	84,4%	97,6%
26-30	548	1,0%	27.5	15070	233514	90,2%	98,7%
31-35	343	0,6%	32.5	11148	244662	94,5%	99,3%
36-40	376	0,7%	37.5	14100	258762	100,0%	100,0%
41-45	0	0,0%	42.5	0	258762	100,0%	100,0%
46-50	0	0,0%	47.5	0	258762	100,0%	100,0%
50+	0	0,0%	50	0	258762	100,0%	100,0%
Total	53453	100,0%		258762			

Source CSO 1985.

Distribution of households by numbers of cattle managed.

MASHONALAND CENTRAL

No. cattle	No. HHs	% HHs	Mid point	Total cattle	Cum Total	Cum % cattle	Cum % HHs
0	31900	49,4%	0	0	0	0,0%	49,4%
1-5	17882	27,7%	2.5	44705	44705	19,9%	77,1%
6-10	8345	12,9%	7.5	62588	107293	47,8%	90,0%
11-15	3330	5,2%	12.5	41625	148918	66,3%	95,2%
16-20	1480	2,3%	17.5	25900	174818	77,8%	97,5%
21-25	740	1,1%	22.5	16650	191468	85,2%	98,6%
26-30	247	0,4%	27.5	6793	198261	88,3%	99,0%
31-35	164	0,3%	32.5	5330	203591	90,6%	99,2%
36-40	247	0,4%	37.5	9263	212854	94,7%	97,6%
41-45	41	0,1%	42.5	1743	214597	95,5%	99,7%
46-50	82	0,1%	47.5	3895	218492	97,3%	99,8%
50+	123	0,2%	50	6150	224642	100,0%	100,0%
Total	64581	100,0%		224642			

Source CSO 1984.

Distribution of households by numbers of cattle managed.

MIDLANDS

No. cattle	No. HHs	% HHs	Mid point	Total cattle	Cum Total	Cum % cattle	Cum % HHs
0	54800	40,6%	0	0	0	0,0%	40,6%
1-5	44918	33,2%	2.5	112295	112295	21,9%	73,8%
6-10	21862	16,2%	7.5	163965	276260	53,9%	90,0%
11-15	7637	5,6%	12.5	95463	371723	72,5%	95,6%
16-20	1122	0,8%	17.5	19635	391358	76,3%	96,5%
21-25	3366	2,5%	22.5	75735	467093	91,1%	99,0%
26-30	578	0,4%	27.5	15895	482988	94,2%	99,4%
31-35	254	0,2%	32.5	8255	491243	95,8%	99,6%
36-40	579	0,4%	37.5	21713	512956	100,0%	100,0%
41-45	0	0,0%	42.5	0	512956	100,0%	100,0%
46-50	0	0,0%	47.5	0	512956	100,0%	100,0%
50+	0	0,0%	50	0	512956	100,0%	100,0%
Total	135116	100,0%		512956			

Source CSO 1985.

Distribution of households by numbers of cattle managed.

MASVINGO

No. cattle	No. HHs	% HHs	Mid point	Total cattle	Cum Total	Cum % cattle	Cum % HHs
0	65796	43,0%	0	0	0	0,0%	43,0%
1-5	52999	34,7%	2.5	132498	132498	27,2%	77,7%
6-10	23258	15,2%	7.5	174435	306933	62,9%	92,9%
11-15	6399	4,2%	12.5	79988	386921	79,3%	97,1%
16-20	2379	1,6%	17.5	41633	428554	87,9%	98,6%
21-25	903	0,6%	22.5	20318	448872	92,0%	99,2%
26-30	451	0,3%	27.5	12403	461275	94,6%	99,5%
31-35	246	0,2%	32.5	7995	469270	96,2%	99,7%
36-40	492	0,3%	37.5	18450	487720	100,0%	100,0%
41-45	0	0,0%	42.5	0	487720	100,0%	100,0%
46-50	0	0,0%	47.5	0	487720	100,0%	100,0%
50+	0	0,0%	50	1	487721	100,0%	100,0%
Total	152923	100,0%		487721			

Source CSO 1984.

Distribution of households by numbers of cattle managed.

MANICALAND

No. cattle	No. HHs	% HHs	Mid point	Total cattle	Cum Total	Cum % cattle	Cum % HHs
0	70963	46,8%	0	0	0	0,0%	46,8%
1-5	46174	30,4%	2.5	115435	115435	23,5%	77,2%
6-10	21996	14,5%	7.5	164970	280405	57,1%	91,7%
11-15	7000	4,6%	12.5	87500	367905	74,9%	96,3%
16-20	2601	1,7%	17.5	45518	413423	84,2%	98,0%
21-25	1683	1,1%	22.5	37868	451291	91,9%	99,1%
26-30	765	0,5%	27.5	21038	472329	96,2%	99,6%
31-35	306	0,2%	32.5	9945	482274	98,2%	99,8%
36-40	230	0,2%	37.5	8625	490899	100,0%	100,0%
41-45	0	0,0%	42.5	0	490899	100,0%	100,0%
46-50	0	0,0%	47.5	0	490899	100,0%	100,0%
50+	0	0,0%	50	0	490899	100,0%	100,0%
Total	151718	100,0%		490899			

Source CSO 1984.