



# 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  
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## **FARMER OBJECTIVES AND LIVESTOCK FUNCTIONS**

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### **1. INTRODUCTION**

In order to properly describe livestock functions in the Communal Lands of Zimbabwe, and to understand farmers' objectives with respect to livestock, a close look at the farming systems and the environment in which these systems have developed is necessary.

This environment is usually described in terms of agro-ecological, socio-economic and socio-cultural factors, but the concerns of this paper mean that in addition to these, historical factors must also be mentioned. The Communal Lands (CLs), formerly called Tribal Trust Lands, are a product of 90 years of colonialism and a settler policy which used a wide range of policy instruments to discriminate against black farmers and in favour of white settlers (Mumbengegwi 1986). This resulted in the development of a distinct dualistic structure in the agricultural sector. The majority (>60 percent) of more than 800 000 peasant families in Communal Lands are located in Natural Regions IV and V which have very low agricultural potential, rainfall being the most critical factor.

Infrastructural development in the CLs was poor and the access of farmers to supply and service institutions was weak until independence in 1980. This resulted in very low levels of market participation by the peasantry. As a result of the

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changes in Government policy since 1980 which have emphasised rapid transformation of the rural areas, peasant farmers have improved their production of various crops. Rohrbach estimates that maize sales to the Grain Marketing Board (GMB) from the CLs was on average less than 5 percent of the total during the pre-independence period, but by 1985 a fifteenfold increase in market deliveries raised the communal sectors contribution to over 33 percent of the GMB's receipts (Rohrbach 1987, p146).

Despite this success in increasing crop production from the peasant sector, a similar achievement could not be reached in the case of livestock production. This is despite the fact that large numbers of animals are kept in the communal areas. Peasants have often been urged by government officials to increase their output and improve their contribution to the national meat supply, especially during periods of meat shortages. The prospects of increasing beef production in the CLs are, however, very low, and the general attitude of the government seems to be oriented towards the minimum goal of halting environmental degradation. This is clearly outlined in the First Five Year National Development Plan (Zimbabwe 1986, p27):

The most important aspect of livestock production which is occupying the mind of Government is the accumulated and continuing deleterious effects of over-stocking and over-grazing in communal lands which are causing severe and potentially irreversible ecological degradation. In addition, high population growth, particularly during the last three decades has led to more intensive cultivation on lands better suited for grazing or for forestry. It is estimated that about 40,0 percent of the communal areas are overpopulated while a further 30,0 percent are approaching their critical population density. A comprehensive national programme that focuses on these problems will be implemented during the plan

period. Such a programme will include stock control, better land management and destocking where necessary.

This policy stance towards livestock production in the CLs seems contradictory. On the one hand peasants are urged to contribute more to the national livestock industry on the basis of their high share of the national herd, but on the other their production environment is described as over-stocked and over-grazed and undergoing irreversible ecological damage.

This situation can partly be explained by looking at historical and macro-economic factors, but most of the explanation will be achieved if we can answer the question:

What are the functions of the different animal species in the present farming systems in the CLs and what are the farmer's objectives with regard to livestock production?

To answer this question we first have to look at the traditional relationships and functions of the different animal species for rural people, and their present roles. We then have to investigate the mixed farming systems in the different agro-ecological regions of Zimbabwe and the place of the livestock sub-systems within these.

## **2. THE SOCIO-CULTURAL ROLE OF ANIMAL SPECIES WITHIN RURAL ZIMBABWEAN SOCIETY**

It has long been recognised that livestock played a central role in the social and religious life of Southern African people before the cash economy was introduced by the settlers.

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In the Shona and Ndebele kinship systems a key role is played by cattle which fulfil various important functions. A brief description of the lobola system taken from the work of Chigwedere (1982) will explain this important role, but it will also show the contribution of other animal species to the organisation of traditional rural life.

Lobola is defined by Chigwedere (1982) as "all payments made by the bridegroom and his party to the father-in-law and his party to secure the service of a bride." He explains further that in traditional society the most important of these services was the issue of giving birth to children. Lobola can therefore be seen as a form of "children insurance".

During the initial marriage negotiations the bridegroom's party had to give a cock to the future father-in-law. It was killed and consumed during the negotiations. After the decisions on the small items and the bride's share the main marriage deal of lobola could take place, which consists of rusambo and cattle.

### **Main marriage deal**

Rusambo was compensation for the bride's services in house and field work and as soon as it was paid the bridegroom could consider himself as married. But this payment did not give him the title to the children of the marriage; this could only be claimed after paying cattle or their equivalent. Traditionally, the bride's greatest service to the husband and his family was to give children and so "keeping him alive". In cases of unsuccessful marriages cattle were used in exchange for children. For example if a man divorced a wife for whom he had

paid six cattle, after she had given birth to three children, his father-in-law had to refund him three head of cattle.

The cattle aspect of the marriage deal was thus for the purpose of securing rights over the children. According to Chigwedere there are many people in Shona society who have adopted the totem of their mother because their father could not claim them, not having paid cattle to their father-in-law. In this case the children belong to the mother and not to the father. Chigwedere argues that traditionally there was no doubt, "that one head of cattle was looked upon as equivalent to the service of one child".

Another example which expresses the high value of cattle in the context of the lobola system is the case of a mugariri, who is traditionally the poor man who could not afford to pay lobola for a bride. He therefore had to offer his services to the eligible father-in-law and he generally had to work for him for ten years. If this family was unable to give a wife to this worker he was usually given one head of cattle so that he could marry into another family.

In his historical analysis of the lobola system Chigwedere argues that the vast number of bridegrooms did not pay lobola in cattle because cattle were very scarce and therefore most paid lobola in goats.

Traditional society was very flexible and almost any valuable item could be used to cover the various lobola payments. Sheep, however, were never used in any of these rituals because they were associated with witches.



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Besides the main marriage deal there were payments by the bride-groom in which cattle and goats played additional important roles in order to establish good links between the two families.

### **Chimanda or Masungiro**

According to tradition the wife goes home to her mother to deliver her first child and to enable this the husband has to re-establish official links with his father-in-law. A cattle and a goat were required for this ritual. If the wife was a virgin at the time of marriage a heifer was slaughtered and shared between the two parties and their relatives. Usually the goat became the property of the mother. If the bride was no longer a virgin the bridegroom brought only one goat, which was slaughtered and shared. The purpose of this ritual is to bind the two families closely together.

### **Mombe Youmai or Beast of Motherhood**

The groom was expected to pay a heifer to his mother-in-law after he had received two or three children. This payment was not obligatory and the decision was left to the bridegroom. But it was believed that the invisible religious forces of the mother-in-law would teach him a lesson if he did not pay. This heifer was accompanied by a young female goat which was slaughtered and consumed after the dedication of the two animals to the ancestors of the mother-in-law. After this heifer had given birth to two or three calves the son-in-law was then invited to the home and one of the calves was slaughtered and again dedicated to the ancestors of the mother-in-law. These would protect the grandchildren of the

father who had provided cattle for lobola and help them to prosper.

The payment for motherhood was very often done with goats because some families did not own cattle. If goats were used they had to be accompanied by hens which were killed on the day of the ritual.

Moudzizukuru or Imwazukuru

This means "goats for the nephews and nieces". This payment was also not obligatory, but it was believed that whoever did not pay would be taught a lesson by the respective spiritual forces. The goats were destined for the maternal grandmother and the paternal grandfather of the bride who should recognize the children from this husband as their grandchildren. A buck was given to the bride's father and slaughtered and consumed on this occasion. A doe was given to the mother of the bride and became part of her property. If a family did not have children none of the goats had to be given.

This review of lobola shows the socio-cultural importance of cattle in Zimbabwe but it also indicates the importance of goats and their various contributions to making a marriage a success. The lobola system was (and still is) very flexible in terms of the payments to be made. These are the result of negotiations or of commitments to traditional beliefs, and the amount of lobola therefore varies from case to case. The main payments do not usually have to be done all at once, which enables the bridegroom to increase his stock or even use his sisters' brideprice to pay for his own lobola. Very often sons get a cow from their fathers for herding the cattle or as a

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reward for the performance of other services to enable them to build up their own herd for their lobola payments.

Besides the functions of cattle and goats in the marriage rites, livestock still fulfill other traditional functions which influence the present life of people in the Communal Lands.

### **Mudzimu Bulls**

One bull in the family herd was and to a great extent still is dedicated to the mudzimu, the spirit guardian of the group. At times of great family mischief a spirit medium is asked what the reasons for this are, and may demand the sacrifice of the mudzimu bull.

In the GFA study carried out in 1986 (GFA 1987) a large number of mudzimu bulls was estimated to be still kept: approximately 50 percent of all the bulls kept by farmers.

### **Funerals**

Funerals play a very important role in the social life of the people in Zimbabwe because the death of a person changes his status from being a member of the living community to being a family spirit (Bourdillon 1987). It is an opportunity for the whole family and friends to get together. On these occasions an animal is ritually killed and its meat roasted for those attending the funeral. Depending on the status of the deceased the animal could be an ox or any other type of livestock, even a pig. Sometimes a goat which has been brought by the funeral procession will be sacrificed at the grave.

If a young family member dies a diviner is usually asked to diagnose the death and if a spirit is seen as the cause, he prescribes some ritual action to prevent further catastrophes. This often involves the sacrifice of the mudzimu bull to the spirit elders.

About one year after the burial another important funerary rite is held when the spirit of the deceased receives the full status of a family spirit guardian. This rite also requires the sacrifice of a beast but it is usually not performed for women and bachelors.

If there are angry spirits which attack a family harshly by causing a succession of deaths in a family, serious quarrels or loss of property and wealth, a diviner will be asked to diagnose the causes of the disaster. In order to appease the angry spirits a severe punishment which is in proportion to the severeness of the case will be necessary. The punishment will often require the sacrifice of a number of cattle.

The description of some of the main features of traditional rites and beliefs of Zimbabweans clearly indicates the spiritual functions of livestock and their importance in the socio-cultural context of rural life. Since these traditional beliefs and rites are still very important and influence various aspects of life in the communal areas, there should be no doubt that Communal Land farmers take these aspects into account in making decisions about livestock production.

Preliminary results of a survey to assess the meat consumption patterns in the CLs show that farmers usually do not slaughter animals unless there are special reasons. National holidays,

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school holidays and visitors are the main occasions for slaughtering animals besides the traditional reasons. On these occasions only chickens, goats, sheep or pigs are slaughtered, if they are available. The importance of the visitors, the number of visitors and the time the visitors spend on the farm influence the slaughter decision.

**3. THE SOCIO-ECONOMIC FUNCTIONS OF LIVESTOCK WITHIN THE FARMING SYSTEMS OF ZIMBABWE**

The functions of livestock in the farming systems found in the CLs are closely related to the cropping subsystem. Interactions between cropping and livestock subsystems result in relationships which are either competitive or complementary. Both subsystems compete for the allocation of land, labour and capital and a complementary relation exists with respect to draught, manure and crop residues. Ruthenberg (1980) points out that the strength of this relationship between the two subsystems is more pronounced

- the scarcer the land is
- the lower the producer prices are
- the higher the input prices are, and
- the less favourable the natural conditions are.

Land pressure exists in almost all CLs and most of them are located in regions of unfavourable natural conditions, and this explains the high integration and the complexity of the relationships between the two subsystems. The complex question of land pressure was examined by Cliffe (1986) who found that this pressure can take different forms e.g. a shortage of

grazing land, a shortage of arable land and a shortage of draught power, with different combinations of these also possible.

Due to the complexity of the question of land and the close relation of grazing animals, especially cattle, to the crop subsystem, livestock research in the CLs has given high priority to the improvement of cattle and goat production and animal productivity.

In the following section of the paper the important role of grazing animals will be discussed in relation to the different farming systems of Zimbabwe, and some preliminary results of a study of the contribution of non-ruminant species will also be presented.

### **3.1 Main characteristics of farming systems**

#### **3.1.1 The cropping subsystem in high potential areas**

The following table shows some of the main characteristics of the farming system in the high potential zones (Natural Regions I and II), as described in reports of surveys carried out by Rohrbach (1985) and GFA (1987). The surveys were carried out in the Mangwende and Makoni Communal Lands respectively. The average farmer in Mangwende has access to 2,8 ha of arable land and about three quarters of this was planted in the 1985/86 season whereas the average farmer in Makoni have access to 1,86 ha of which almost 90 percent was planted in the same season.

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**Table 1: Main characteristics of the cropping systems in Mangwende and Makoni Communal Lands**

Crop	Mangwende (n=108)			Makoni (n=248)		
	av. area ha.	total ha (%)	farmer growing (%)	av. area ha.	total ha (%)	farmer growing (%)
Maize	1,49	68,6	100	1,20	72,2	99
Groundnuts	0,21	9,5	90	0,17	10,3	35
Milletts	0,19	8,6	75	0,09	5,4	25
Sunflowers	0,11	4,9	27	0,11	6,7	26
Others	0,15	8,4	-	0,09	5,4	-
Total	2,15	100,0	-	1,66	100,0	-

Sources: Rohrbach 1987; GFA 1987

This table shows that the cropping systems in CLs in high potential areas are dominated by maize production which is the major cash and subsistence crop. Maize is planted by all farmers, who allocate on average more than 67 percent of their total arable land to maize. Sunflowers are also planted as a cash crop whereas the other crops are mainly planted for subsistence reasons. The Farming Systems Research Unit (FSRU) reported similar results for the Mangwende cropping systems in a survey which was carried out in 1984. It was also found that households with the husband working on the farm had significantly larger landholdings than those with the husband working off-farm or those with no husband. Fertilizers were used by more than 90 percent of the farmers in Mangwende and it was estimated that the farmers sell as much as 60 percent of their grain production in good years like 1985 (Avila 1986).

3.1.2 The crop subsystem in the low potential agro-ecological regions IV and V

Natural Regions IV and V which have low and unreliable rainfall cropping patterns are characterized by a greater diversification and a higher share of drought tolerant crops. Table 2 shows some examples of typical cropping patterns in Chivi (Natural Region V).

Table 2: Main characteristics of the cropping pattern in Chivi Communal Land

Crop	Chivi 1985 (1)			Chivi 1986 (2)		
	av. area ha.	total ha (%)	farmer growing (%)	av. area ha.	total ha (%)	farmer growing (%)
Maize	1,27	59,3	100	0,99	54	97,2
Sorghum	0,09	4,2	30	0,28	15	39,6
Groundnuts	0,28	12,9	69	0,20	11	41,9
Finger millet	0,25	11,6	70	0,15	8	31,9
Pearl millet	0,07	3,4	15	0,11	6	17,7
Groundnuts	0,14	6,4	78	n.s.	n.s.	n.s.
Sunflower	n.s.	n.s.	n.s.	0,07	4	9,7
Others	0,05	2,3	36	0,04	2	12,1

Sources: Rohrbach 1987, p158; GFA 1987

Surveys carried out by FSRU for the 1984/5 season and another by ICRA during the 1986/7 season showed that a higher proportion of land was allocated to small grains in low potential areas than to maize. Cropping in these areas is



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mainly for subsistence purposes because droughts occur in three out of five seasons. Studies carried out by the Agricultural and Rural Development Authority in 1982 and 1984 in Matabeleland South (Natural Regions IV and V) indicated that the proportion of households which are food deficit producers ranges between 20 and 95 percent. In Nswazi and Gwanda North approximately 20 percent of the households are forced to buy maize on a regular basis and in Gwanda South and in the Mtetengwe CL the proportion was 84 percent and 94 percent respectively (Agricultural and Rural Development Authority 1984, p30).

### **3.2 The livestock subsystem**

The importance of cattle in various traditional and cultural aspects and the multiple functions which they perform in the farming system show that they are by far the most desired livestock species for farmers in the CLs. The vital functions which are provided by cattle are: draught power and manure for crop production; provision of food in the form of milk and meat; and a long term investment which provides security, gives interests in form of calves and can be cashed in cases of need.

Avila (1986) summarized the roles of other animal species according to the preferences which were expressed by the farmers in Mangwende and Chivi with respect to the following functions:

for family food: poultry, goats, pigs, cattle  
for income generation: poultry, goats, cattle, pigs  
for cultural reasons : cattle, goats, poultry, pigs

A closer investigation of the above mentioned functions in relation to the cropping system is necessary to assess the

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contribution of animal husbandry to the farm output and also try to answer the question of the farmer's objectives in livestock production.

Table 3 presents ownership patterns of livestock in Mangwende (1984/87) and Makoni (1986).

**Table 3: Livestock ownership in Mangwende and Makoni Communal Lands**

Animal Species	Mangwende (1,2)				Makoni (3)		Kendeya (4)	
	FSRU 1984 owner (%)	av. no.	FSRU 1987 owner (%)	av. no.	GFA 1986 owner (%)	av. no.	FSRU 1987 owner (%)	av. no.
Poultry	87	15,0	96	21,3	96	15,2	92	21,2
Cattle	77	9,0	82	8,5	81	5,6	81	8,6
Goats	28	4,7	53	4,8	63	3,0	27	5,6
Pigs	5	3,6	100	6,2	22	3,0	100	
Donkeys	5	2,8	0	0,0	4	-	0	-
Sheep	2	1,0	1	-	4	-	5	
Rabbits	10	4,5	1	-	10	6,0	-	-

Sources: (1) FSR-Unit 1984; (2,4) Own Survey 1987; (3) GFA 1987

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### 3.2.1 Functions of cattle in high potential areas

In surveys conducted in Mangwende by FSRU it was found that farmers who own cattle have more arable land and also achieve higher yields than non-owners (Shumba 1985).

Shumba also estimated a decline in the cattle herd by comparing average cow and oxen ownership per herd. This trend seems to continue until 1984 but has changed slightly since then. The number of cows fell from 4,8 per household in 1975 to 3,5 in 1982, fell to its lowest level of 2,07 in 1984, and increased to 2,9 in 1987. Oxen declined from 4,7 per household in 1975 to 2,45 in 1984, and then increased to 2,8 in 1987. The average herd composition for 108 and 60 cattle owning farmers in 1984 and 1987 respectively in Mangwende is shown in Table 4.

Table 4: Cattle herd demography in Mangwende in 1984 and 1987

Year	Calves	Steers	Heifers	Bulls	Cows	Oxen	Total
1984 (1)	0,99	1,02	1,08	0,4	2,07	2,45	8,01
in %	10,98	11,38	12,05	4,42	34,14	27,17	100
1987 (2)	0,91	0,53	0,9	0,4	2,9	2,8	8,44
in %	10,7	6,2	10,6	4,7	34,3	33,1	100
Changes							
in %	-0,28	-5,18	-1,45	+0,28	+0,16	+5,93	+0,43

Sources: (1) Mombeshora 1984; (2) Own survey 1987 in Mangwende

### Draught Power

Cattle provide almost all the draught power but only 80 percent of the farmers' own cattle. The importance of draught oxen to the farmer can be seen in the very close cow to ox ratio of 1 to 0,96 which indicates that the draught function is as highly valued as the reproductive and milk producing functions of the cow.

A cow to ox ratio smaller than 1 (1:0,89) was calculated from a survey carried out in Kandeya East among 62 cattle keepers. Besides the low cow to ox ratio the purchasing behaviour of the farmers indicates the preference for oxen because 12 out of 20 purchased cattle were oxen. Although Kandeya is located in Natural Region III this high ratio can be explained by the cash crop orientation in the cropping pattern. The cropping system can be characterised as a pure cotton-maize system, with cotton as the main cash crop and an average land allocation of 48 percent (1,8 ha). Maize is the subsistence crop in bad years and an additional cash crop in good seasons because 43 percent (1,6 ha) of the land was allocated to it. There were a number of farmers who owned oxen only. Draught oxen enable the farmer to do planting and weeding in time, to benefit from mechanisation and hence to achieve higher yields and income.

In addition oxen contribute directly to the family income by providing draught and transport services to other farmers. Oxen provide 75 percent of the total draught power in Mangwende and similar results were estimated for Makoni. Only a few farmers own donkeys in these areas, and farmers tend to supplement with steers or cows in order to get a ploughing span of four animals. This is shown in Table 5.

Table 5: Contributions of different species and classes to draught availability

Type	Mangwende (1) % total draught	Makoni (2) % total draught
Oxen	75,56	78
Cows	17,29	18
Bulls	0,75	n.s.
Heifers	0,38	n.s.
Steers	1,69	n.s.
Donkeys	4,89	4

Source: (1) Mombeshora 1985; (2) GFA 1987

A monetary assessment of the contribution of draught cattle to the family income is rather difficult because it would require an estimation of all the indirect effects of draught power within the farming system. Draught power plays a crucial role in cropping systems with high cash cropping components and its importance increases as the proportion of the total farm income from cash crops increases.

#### Manure

Manure production is widely recognised as the second most important function of cattle in the Communal Lands because of its important role in maintaining soil fertility. It is generally expected that manure applied by CL farmers has a significant effect on yields.

Manure can be seen as a means of importing soil fertility from the grazing areas to the farmer's fields. This continuous

export of nutrients from the grazing areas results in serious ecological damage since under communal land ownership there are no incentives for the individual farmer to improve the grazing areas. This is often referred to as the "tragedy of the commons".

Manure production is enhanced by only a few farmers in Mangwende because only 17 percent of the farmers harvested and stored crop residues (Mombeshora 1985). Grant (1967 and 1982) identified the optimum quantity of manure as 10 tons/ha if the manure is to have a positive effect on soil fertility by increasing the cation exchange capacity, the exchangeable base and the ph level. The Department of Agricultural Technical and Extension Services (1985) estimated that only 0,46 tonnes of manure per ha were applied by the average livestock owner. Recent rough estimates by GFA for the Makoni amounted to 3,1 tonnes/ha but manure was only applied to 0,7 ha, and almost entirely to maize (97,4 percent). For this manure a monetary value of \$ 100 was calculated. In order to produce a sufficient amount of manure a farmer would need a herd of 10 to 16 cattle with an average annual production of 1,2 tonnes per Livestock Unit. However, this seems impossible considering the farmer's circumstances in these areas.

Manure production by cattle does not appear to play as important a role in these farming systems as was formerly assumed. Only 52 percent of the cattle owners in Mangwende apply manure (Shumba 1984) and farmers have to apply fertilizer in order to maintain soil fertility and to achieve high yields.

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### **Cattle Sales**

Since cattle herds are small and draught plays the same or even a more important role as breeding in this farming system, selling cattle is very unusual and is only done when cash is urgently required, for example to pay school fees. According to Avila (1986, p8):

Under no conditions would farmers sell cattle to purchase production inputs since farm enterprises are managed so as to ultimately assist the household in increasing its cattle numbers and not vice versa". Besides the productive aspects of cattle functions which hamper cattle sales, it can be assumed that even in households with sufficient cattle numbers the existing "surplus" will be given to sons, in order to create their own herds for future lobola payments.

### **Milk and Meat**

Almost all cattle owners in the CLs milk their cows. In situations of surplus milk they produce sour milk which they sell to neighbours for about \$0,60 per litre or which they give to their relatives. The calves are usually separated from their dams during the night to achieve higher milk yields.

Cattle are only slaughtered for traditional festivities as described above, and when there is no hope that a sick animal will recover from a disease. In such cases, because the meat is too much for the family to consume on its own before it perishes it is given to relatives, sold to neighbours and bartered for maize.

### 3.2.2 Small ruminant production in high potential areas

The pattern of goat ownership in Mangwende and Makoni Communal Lands as presented in Table 3 does not give a clear picture of goat ownership in the high potential areas, but it can be concluded that between 40 percent and 60 percent of farmers own goats. Less than 5 percent of the farmers own sheep which is probably due to the negative cultural attitudes towards sheep explained above. On average there is a flock of 3 to 5 goats or sheep per farm, which in most cases belongs to the women who acquire them through the marriage of daughters (chimanda).

Goats are an important source of meat for traditional or other important family festivities for households, and due to the small flock sizes they can hardly fulfil other roles. Only a few farmers barter or sell goats in these regions and manure production from goats contributes very little to the crop subsystem.

### 3.2.3 Poultry production in high potential areas

More than 90 percent of the farmers keep chickens which belong almost entirely to the women (95 percent). They are mainly kept as a meat source for the household for minor social events e.g. if visitors come to the farm. Of the farmers interviewed in the survey carried out in 1987 82 percent slaughtered chickens at an average rate of 17 birds per household. Eggs are commonly eaten in order to reduce the egg numbers per hen for hatching and hence to avoid losses. During the rainy season almost all eggs are taken for consumption because the chances of chicks surviving then are very slim. After a good cropping season roughly 10 percent of the women in Mangwende keep hybrid



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chickens for broiler production, which partly explains the higher number of chickens per farm compared to other regions. Among 73 pig producers in Mangwende who were surveyed the average income from chicken sales during the 1986/7 season was \$27,70, but only 35 percent of all farmers sold chickens. These farmers achieved an average income of \$77,73 from chicken sales.

These data on chicken production are in agreement with the qualitative findings of previous surveys about their role in the farming systems in the CLs. It shows the importance of chickens for household protein (meat and eggs) supply, and the sales of chickens are probably often the only source of cash income for women after crop sales.

### **3.2.4 Pig production in high potential areas**

The number of pig producers in communal areas with high agricultural potential is increasing, and the figures for Makoni presented in Table 3 show that 22 percent of the farmers keep an average of 3 pigs per household. FSRU estimated in 1983 that 5 percent of the farmers in Mangwende kept almost 4 pigs.

This seems to have changed in recent years. A baseline survey focusing on the role of pig production in Communal Lands was conducted in Mangwende and Kandeya in 1987. Preliminary results for Mangwende show that more than 50 percent of the farmers had less than 5 years experience of keeping pigs. The average herd size per household increased from 7,3 in 1984 to 10,6 in 1986. The herd size in September 1987 was only 6,79 animals per owner which was most likely a result of the seasonality of farrowings (the main farrowing season starts in August and lasts until

January). Pigs are usually kept in small kraals during the planting season and are on free range during the dry season. The majority of pig producers in the two communal areas keep pigs under low cost and low management systems.

The main functions of pigs in the farming systems are to provide meat for the household at important family events, to generate cash income, and as a short to medium term investment which can be cashed at any time and which is highly productive.

Pigs belonged to the women in almost 50 percent of all households. Thirteen percent of households in Kandeya bartered pigs for ploughing. The value of local pigs is equal to the value of goats because in the total sample 18 pigs were bartered for 18 goats.

The following results from Kandeya and Mangwende demonstrate the important contribution of pork consumption to the nutritional status of households. Of the 149 households in the sample 72 percent slaughtered 309 pigs during the 1986/7 season. This results in an average consumption of 2,07 pigs per household per year in these two areas. In Kandeya 34,2 percent of the pig producing farmers sold pigs and in Mangwende the corresponding figure was 41 percent. The average gross income from pig sales was \$25,60 and \$208,20 respectively. But 56 pigs brought an average income of \$77,9 to the selling households in Kandeya and the 329 pigs sold in Mangwende brought an average gross income of \$507,10 to those farmers. This high gross income per selling household in Mangwende is due to the increasing number of farmers who have gone into semi-commercial pig production. They have become members of the Pig Breeders Association and have thus far marketed 142

pigs to Colcom, the pig breeders marketing organisation. These farmers had to devote a significant amount of their off-farm income to the initial costs of pig production, and they are using most of their maize production to feed their pigs.

### **3.2.5 The livestock subsystem in the low potential agro-ecological regions**

The increase in aridity as one moves from Natural Region I to Natural Region V has an impact on the relative importance of the crop and livestock subsystems within the farming systems in these regions. The farmers in the more arid areas have developed a more diversified cropping system and use more drought resistant crops in order to reduce the risk of harvest failures, and it can be considered as entirely subsistence oriented.

The change in the relative importance of different livestock functions as a reaction by farmers to the severe environmental constraints on crop production will be outlined briefly.

The pattern of ownership of livestock in Regions IV and V, as presented in Table 6, show that fewer farmers own cattle compared with high potential areas but more farmers own goats and donkeys. The average cattle ownership in Region IV (estimated in different years and in different surveys) was 75,1 percent in 1982 and increased to 77,0 percent in 1984. Results obtained by GFA in 1986 and ICRA in 1987 indicate a decline in the number of farmers owning cattle, most likely as a result of the droughts between 1985 and 1987.

In Region V only about 60 percent of the households own cattle, and the same trend in the level of ownership as found in Region V can be seen. (We should not include the results from the pig survey because they are biased towards livestock owners.) Goats can be found in more than 60 percent of all households in the all areas apart from Mtetengwa Communal Land and the ownership pattern seems to be fairly constant during the 1982 to 1987 period.

From the figures presented here it is obvious that people in Matabeleland South keep more donkeys than people in Chivi, (almost twice as many). The reason for the lower figures for donkey ownership in Nswazi is most likely due to the incidence of heavier soils and the necessity for draught power provided by oxen (Agricultural and Rural Development Authority 1984, p12).

Chickens are kept in more than 90 percent of all households and the findings of GFA in 1986 can be seen as proof of the trend of increasing pig production in all communal areas. It can also be seen that there were no pig producers in 1982 and increasing numbers are reported since 1984. The ownership of other livestock species among pig producers in Chivi is above the average.

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Table 6: Livestock ownership in Regions IV and V

Species Owned by Farmer	Year	Cattle in %	Goats in %	Donkeys in %	Sheep in %	Poultry in %	Pigs in %
<b>REGION IV</b>							
WENL.1	1982	80,8	67,3	65,4	n.s.	95,0	n.s.
MATS.1	1982	69,4	70,0	54,3	n.s.	95,0	n.s.
NSWA.2	1984	80,8	65,7	36,4	17,2	94,9	2,0
NSWA.3	1986	63,3	57,3	35,1	3,6	98,8	7,2
MBER.3	1986	61,0	75,1	41,8	2,8	98,0	0,0
CHIV.4	1984	77,0	48,0	24,0	3,0	87,0	3,0
CHIV.7	1987	70,9	67,0	22,0	n.s.	90,0	7,2
<b>REGION V</b>							
DBIL.1	1982	65,6	71,2	53,8	19,0	93,0	0,0
GWAN.1	1982	66,2	64,9	56,8	19,0	93,0	0,0
GWAR.1	1982	77,8	77,8	54,5	19,0	93,0	0,0
SHAS.1	1982	67,7	80,6	79,6	19,0	93,0	0,0
MTET.1	1982	59,0	3,0	58,0	0,0	94,9	0,0
CHIV.3	1986	60,5	64,5	33,9	4,0	95,2	9,3
CHIV.4	1984	72,0	61,0	29,0	4,0	n.s.	8,0
CHIV.5	1984	57,2	51,9	29,7	5,3	79,3	6,1
CHIV.6	1987	84,2	90,7	68,4	13,1	84,6	100

Communal Lands and Sources:

WENL.1 = Wenlock and MATS.1 = Matshetese CL, in Agricultural and Rural Development Authority 1982  
 DIBL.1 = Dibilishaba CL, GWAN.1 = Gwanda CL, GWAR.1 = Gwaranyemba CL and SHAS.1 = Shashi CL, in Agricultural and Rural Development Authority 1982  
 MTET.1 = Mtetengwe CL, in Agricultural and Rural Development Authority 1982

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NSWA.2 = Nswazi CL, in Agricultural and Rural Development  
 Authority 1984  
 NSWA3, MBER.3 = Mberengwa and CHIV3 = Chivi, in GFA 1987  
 CHIV.4 and 5, in Reh 1986  
 CHIV.6, own source 1987  
 CHIV7, ICRA 87

3.2.6 The functions of cattle in low potential areas

To estimate the different contributions of cattle to the farming system and to assess the farmer's objectives in cattle production the herd structure will provide some useful information.

Table 7: Cattle herd demography in Shashi 1982 and Chivi 1984/7

Year	Calves	Steers	Heifers	Bulls	Cows	Oxen	Total
Shashi 1982 (1) in %	4,80 29,4	2,61 16,0		0,19 1,2	6,19 37,9	2,52 15,5	16,33 100
Chivi 1984 (2) in %	0,28 5,06	0,64 11,57	0,97 17,59	0,62 11,32	1,57 28,43	1,44 26,02	5,53 100
Chivi 1987 (3) in %	1,07 11,6	0,78 8,4	1,64 17,0	0,60 6,5	2,95 31,9	2,25 24,3	9,2 100
Diff. %	+6,54	-3,17	-0,59	-4,82	+3,47	-1,72	

Sources: (1) Agricultural and Rural Development Authority,  
 Appendix 2  
 (2) Mombeshora et al. 1984, p9  
 (3) Pig Survey 1987

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In contrast to high potential areas herd structures in Natural Regions IV and V indicate that farmers regard the reproductive performance of cattle as more important than the provision of draught power. The cow to ox ratio was greater than 1 in all areas for which the necessary information was available. Despite increasing herd sizes the relative contribution of oxen in the herd declines, which is in agreement with the findings of ICRA (1987, p39).

### **Draught Power**

Cattle provide a substantial amount of the draught needed by farmers in these regions, but the high number of donkey owners indicates that draught power and transport provision by donkeys is significant. However there are quite substantial variations within the different Communal Lands, as shown in Table 8.

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Table 8: The contribution of different animal species to draught

Source Class of Stock	(1) GWAN.N % total	(2) GWAN.S % total	(3) NSWAS % total	(4) MBERE. % total	(5) CHIVI1 % total	(6) CHIVI2 % total	(7) MTET % total
Oxen	69	53	95	51	33	47	20
Cows	n.s.	n.s.	n.s.	11	25	34	n.s.
Cattle	69	53	95	62	70	84	20
Donkeys	26	44	0	38	30	13	57
Others	5	3	5	0	12*	6**	12

\* The 12 percent draught are provided by bulls (8 percent),  
heifers (2 percent) and steers (2 percent)

\*\* Includes draught by bulls (3 percent)

Sources:

- (1+2+7) Agricultural and Rural Development Authority 1982
- (3) Agricultural and Rural Development Authority 1984
- (4) GFA 1987
- (5) Mombeshora 1984
- (6) ICRA 1987

This table shows that the share of draught power provided by cattle is approximately 70 percent in Region IV, and declines to as low as 53 percent in Matabeleland South in Region V. In the cases of Nswazi and Chivi South (Chivi 2 in Table 8) the high proportion of draught power provided by oxen is most likely a consequence of the heavy soil types found there. It can be concluded that as aridity increases the importance of cattle for draught declines and the importance of donkeys increases.



**Manure**

Crop husbandry is a risky venture in Natural Regions IV and V, and risk reducing strategies practised by farmers include crop diversification and low levels of purchased inputs. Usually only seeds are purchased. Manure therefore plays an important role in maintaining or improving yields. More than 90 percent of the peasants who use manure apply it to maize.

The average amount of manure applied per household in Chivi was 1,4 tonnes, whereas in Mberengwa and Nswazi the estimates were 1,2 and 1,5 tonnes respectively. Differences in the total area on which manure was applied could be established between different regions. Manure was applied on average on 0,7 ha in Makoni, on 0,4 ha in Chivi and Nswazi, and on only 0,3 ha in Mberengwa (GFA 1987 p87). Farmers tend to concentrate their manure applications in order to achieve a yield effect, and these are usually made on the plots closest to the homesteads in order to overcome transport problems.

**The income function**

Although the surveys conducted by FSRU, ICRA and other researchers in Chivi (which stands as an example of a typical low potential area) did not find cattle sales making a significant contribution to farm income, the Agricultural and Rural Development Authority surveys contradict these findings. ICRA estimated that the income from the total livestock enterprise in 1987 contributed only 6,5 percent of the total farm income. The main sources of household income were established as follows:

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crops: 33,0 percent  
 remittances: 12,5 percent  
 off-farm income: 48,0 percent

Table 9 presents a summary of the findings of the Agricultural and Rural Development Authority surveys carried out in Matabeleland South.

Table 9: Cattle sales in Matabeleland South and main reasons for sales

	Gwanda N.	Gwanda S.	Nswasi	Mtetengwe
Mean total sales rate (%)	9,9	10,2	6,0	9,5
Percentage owners sold	51,0	71,0	35,0	50,0
Sales rate/seller (%)	19,5	12,9	17,6	23,0
<b>Reasons:</b>				
School fees (%)	31,0	17,0	30,0	27,3
Food (%)	46,0	60,0	54,0	62,0
Clothing (%)	5,0	9,0	0,0	4,5
Building materials (%)	2,0	6,0	7,0	1,1

Source: Compiled from the Agricultural and Rural Development Authority 1982, Report nos. 3, 5, 11, 12

This table shows the high percentage of cattle owners who sold cattle and indicates that the most important reason for cattle sales was to buy food for households needs. The second most important reason was the cash requirement to pay school fees. These data indicate that the peasants in Matabeleland South are

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highly dependent on cattle which provide the necessary security in this harsh environment and which are sold mainly in cases of high cash needs for school fees or in order to buy food to meet subsistence requirements.

### **3.2.7 Small livestock and their functions in low potential areas**

#### **Goats**

The functions of small stock in Natural Regions IV and V do not differ very much from those in the high potential areas. As discussed earlier on, more farmers keep goats and sheep. The flock sizes are significantly higher than the ones in the high potential areas. In Chivi the average flock size for goats in 1984 was 6,21 per owner which was 32,9 percent higher than the goat flock in Mangwende (4,67) in the same year. Results from the pig survey show even higher differences for both areas with 15 animals per owner in Chivi and only 4,8 animals in Mangwende. The high flocks in the arid areas can be seen as means to accumulate wealth as security for difficult years, to generate cash income and to provide meat. Goat slaughterings occur more regularly and often not in the context of social occasions, and therefore contribute more significantly to the protein supply of households. Goat milk is hardly used by the peasants because it is seen as a traditional medicine.

There are no results available which show the income generated by goat-keeping farmers.

### Chickens

There is no difference in the role of chickens in the farming systems in high and low potential areas. Forty seven percent of the farmers sold chickens which generated an average income of \$107,30, which is 38 percent higher than the income received by farmers in Mangwende and more than twice as high as in Kandeya.

The farmers regard chicken manure as highly fertile and usually apply it in their gardens, or to fruit trees and to maize.

### Pigs

During the pig survey in Chivi farmers mentioned that they started pig keeping in order to make better use of their small grains in feeding these to the pigs. The pig producers who sold pigs (38 percent), sold an average of 3,6 pigs on the local market during the 1986/7 season. Their gross income was \$187,00 which was more than twice as much as the income received by farmers in Kandeya (\$78,00), but less than half the amount generated by farmers in Mangwende (\$507,00).

Pork consumption by pig owners in Chivi was significantly higher than in the other two regions. Seventy two percent of the pig owning households slaughtered 4,5 pigs on average, and the corresponding figures for Kandeya are 67,7 percent slaughtered 2,8 pigs and in Mangwende 73 percent slaughtered 3 pigs on average. About 50 percent of the farmers utilise pig manure.

4. SUMMARY AND CONCLUSIONS

Steinfeld (1987) estimated the monetary values of cattle functions in farming systems in different agro-ecological regions. These are presented in Table 10.

Table 10: Summary of the value of cattle functions per household

Function	Chilimanzi (NR III)		Mberengwa (NR IV)	
	Zim\$	in %	Zim\$	in %
Crop input functions:				
Draught	140	38,6	84	25,6
Manure	41	11,3	16	4,9
Crop total	181	49,9	100	30,5
Output function:				
Milk	97	29,9	140	42,7
Meat	61	18,8	0	0
Herd growth	23	7,1	88	26,4
Total	362	100	328	100

Source: Steinfeld 1987 in GFA 1987, p89

The calculations by Steinfeld (who used the replacement cost method) show that in Chilimanzi (now Chirimanzhu) the monetary value of the cattle functions of draught and manure amounts to 50 percent of the total of \$362. In Mberengwa milk production makes the highest contribution (\$140) to the total estimated cash value of cattle functions, amounting to \$328.

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The use of the replacement cost method for the estimation of the value of cattle output can only provide a rough estimate because too many questions remain unanswered. Some of these are:

What are the direct measured returns to draught?

How much manure is produced and how much of it is utilizable?

What amount of manure is applied and what is its nutritional value?

How much milk is produced by the cows ?

What are the opportunity costs of cattle production ?

Preliminary survey results on some aspects of chicken and pig production indicate their main roles which are to provide cheap meat for home consumption, thus increasing the nutritional value of the diet, and to provide an additional income source for the farmer. By utilizing household wastes, crop residues and harvest left-overs in the fields and transforming these into a high value product, meat, chickens and pigs improve resource utilization efficiency on the farms. The high prolificacy of the small stock enables the farmer to quickly increase the stock in good years and to build a broader resource base for pending bad seasons which can be called the security or insurance function.

Finally, a comparison of different cash values of production in different Communal Lands gives an impression of the relative

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contribution of the different subsystems to total farm output.

Mangwende and Chivi survey data show the following gross margins for maize and groundnut production under different input levels:

**Table 11: Gross margins for maize and groundnut production under different input levels, Mangwende and Chivi Communal Lands**

	Mangwende		Chivi	
	Yield t/ha	Returns (\$)	Yield t/ha	Returns (\$)
Maize:				
Low input	0,53	52	0,5	32
Medium input	2,3	167	1,2	78
High input	3,2	194	-	-
Groundnuts	0,65	222	0,38	63

Source: Makombe 1988

If these crop income data are compared with those of livestock it is clear that livestock plays an important role not only due to its invisible (socio-cultural) and indirect effects to the household's wealth, but also by contributing to the household's cash income. The total sample of 225 pig farmers from different regions in Zimbabwe achieved an average income of \$31,38 from chicken sales, and \$269,89 from pig sales. They slaughtered an average of 16,3 chickens and 2,47 pigs. The data for the output value of goats are not yet analysed, but it can be assumed that it is at least as high as the output for chickens. Hence, the

total output value of small stock tends to be as high as the estimated value for cattle functions, considered only in terms of slaughter and sales.

However, the socio-cultural aspects of livestock production and the specific roles that cattle play within the society even today are maintained by farmers in the communal areas. Profit maximisation is not the sole objective of the farmers. We need to know more about the socio-cultural dimension within the decision-making process with regard to livestock production, prior to policy making aiming at enhancing the commodity production aspects of livestock production.

The data presented here also provides evidence that livestock policy makers should focus their efforts not only on prestigious beef and dairy production but should allocate more resources to small stock enterprises if livestock production is to help improve the living conditions in the Communal Lands of Zimbabwe.

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