The role of donkeys in integrated crop-livestock systems in semi-arid areas of Zimbabwe

by

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Abstract

Access to draft animal power is a major constraint to crop production in the smallholder farming systems of Zimbabwe. The 1992 drought reduced cattle populations by up to 50%. In semi-arid areas, donkey numbers have been steadily increasing since the mid 1970s. A structured questionnaire was administered to 154 households to determine the role of donkeys in cropping activities and other household draft needs.

On average there were six donkeys per household, with 60% of the households owning five or more donkeys. The major tasks carried out by donkeys were carting and plowing. Carting water occupied eight days a month whilst carting of crop inputs and outputs was seasonal. Carting of crop produce and crop residues averaged 12–16 days/month from March to May. Donkeys were most heavily used in November–January, the plowing season, when they worked for an average of 25 days/month. The donkey plays a crucial role in the livelihoods of many smallholder farmers in integrated crop-livestock systems and there is a need to improve its management.

Introduction

Livestock are a key component in the smallholder cropping systems in Zimbabwe as they provide critical inputs such as manure and draft power for cultivation, weeding and transport of produce. Cattle are the major source of draft power in the communal areas of Zimbabwe but frequent droughts and the resultant high cattle mortality has led to an increase in the importance of donkeys as draft animals, especially in dry areas. There are 420,000 donkeys in communal areas with approximately 85% owned by households living in semi-arid areas (CSO, 1996). There is at present inadequate information on the role of these donkeys. A study was therefore undertaken to examine the patterns of ownership and use of donkeys in smallholder farming households.

Methods

The data presented in this report were collected from two areas, Masvingo (latitude 20° South and longitude 30° East) and Sanyati (latitude 18° South and longitude 30° East). Masvingo has an altitude of 1000 m above sea level, receives a mean rainfall of 450–800 mm per annum and has mean annual temperatures of 20–25°C. Sanyati on the other hand has an altitude of 1500 m above sea level, receives a mean rainfall of 500–950 mm per annum and has mean annual temperatures of 15–20°C.

A structured questionnaire was administered to 102 farmers in Masvingo and to 52 farmers in Sanyati. The questionnaire sought to establish land ownership/access, crops grown, draft sources, ownership of donkeys, types and seasonal patterns of donkey work. The results of the survey were analysed using procedures of the Statistical Analysis System (SAS, 1990).

Results and discussion

Farmer characteristics and crop yields

The majority of the farmers surveyed were men, 85 and 75%, respectively, for Masvingo and Sanyati (Table 1). This represented those adults identified as household heads in the homesteads visited. As the sampling was random this also indicates that the majority of households in these areas are male-headed. There was no difference ($P>0.05$) in the amount of land owned or left fallow at the two survey sites (Table 1). However the amount of land put to different crops varied significantly ($P<0.05$). Over 60% of the land was put to maize in Masvingo while it occupied only 45% of the planted land in Sanyati (Table 1). Cotton is a major crop in Sanyati occupying about a third of the planted area but it is hardly planted in Masvingo. Yields are shown in Table 2.

Cattle and donkey ownership

The ownership of cattle and donkeys at the two survey sites is shown in Table 3. On average, the households owned 3.6 cattle each, with less than

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Table 1: Farmer characteristics and mean landholdings and areas (ha) under different crops

	Site		
	Masvingo	***Sanyati***	**± *SE***
Number of households	102	52	
Women surveyed %	15	25	
Men surveyed %	85	75	
Total area owned (ha)	5.76	5.54	0.28
Area left fallow (ha)	0.80	0.65	0.22
Maize (ha)	3.04[a]	2.20[b]	0.21
Cotton (ha)	0.07[b]	1.66[a]	0.07
Rapoko (ha)	0.39	0.20	0.15
Groundnuts (ha)	0.38	0.14	0.09

[a b] *Means in the same row with different superscripts differ significantly (P<0.05)*

Table 2: Mean yields (kg/ha) of different crops for the 1993/94 season

	Site		
Crop	***Masvingo***	***Sanyati***	**± *SE***
Maize	4259[a]	3013[b]	328.5
Cotton	456[b]	9560[a]	520
Rapoko	637[a]	93[b]	124
Groundnuts	426	163	83.3

[a b] *Means in the same row with different superscripts differ significantly (P<0.05)*

one ox each. In Zimbabwe, ownership of less than 4 cattle is considered as inadequate access to draft power (Mudimu, 1983; Christensen and Zindi, 1991). Thus, most households in these areas need to supplement the draft from cattle with other draft sources.

Donkeys are the major source of supplementary draft power. Five to seven donkeys is the most common holding of which approximately 65% are mature and therefore suitable for draft. Table 4 shows that approximately 40% of households own four donkeys or fewer. This is viewed as inadequate access to sufficient draft power to plow five hectares within the plowing period (Muvirimi, 1995). Various hitching arrangements are used, donkey-only spans to supplement cattle spans, a mixture of donkeys and oxen in a four animal span and pooling resources with other households to form large donkey spans.

The ratio of foals to mature females is low (0.46 in Masvingo and 0.58 in Sanyati) implying a poor reproductive rate. If the role of donkeys in draft power supply is to be enhanced, there is need for research on the reproductive performance of donkeys in Zimbabwe to identify the constraints that cause these low rates.

Monthly distribution (days) of donkey tasks

The basic tasks assigned to donkeys are carting water, fuel wood, grain for grinding, manure from the pens to the fields, crop harvests from fields to storage and market places, crop residues from fields to homesteads for storage, plus plowing and weeding. Thus the donkey is used more as a carting animal (transport) than for cultivation tasks (plowing and weeding). On average, donkeys spend 8–9 days a month carting water throughout the year. The survey sites are in semi-arid areas and lack of readily accessible water for household needs like cooking and drinking is a serious problem. Water has to be carried over long distances, making fetching it by human labour only, very laborious. The donkeys thus serve a critical social role which would otherwise be performed by women, with much drudgery and preventing them from contributing to other household economic activities. The use of donkeys in carting firewood to the homestead and grain to the grinding mill are other examples of how donkeys contribute to the household economy and

Table 3: Mean cattle and donkey ownership per household in Masvingo and Sanyati

	Site		
	Masvingo	***Sanyati***	***± SE***
Cattle			
Number/household	3.6	3.6	1.63
Class of cattle/household			
bulls	0.5	0.6	0.43
oxen	0.6	0.7	0.39
cows	1.0	0.9	0.33
heifers	0.7	0.7	0.51
calves	0.8	0.7	0.16
Donkeys			
Number/household	5.3	6.8	2.61
Class of donkey/household			
mature male intact	1.0[b]	1.8[a]	0.17
mature male castrate	1.1	1.4	0.13
young male intact	0.5	0.6	0.08
young male castrate	0.4	0.5	0.07
mature female	1.3	1.2	0.12
young female	0.4	0.6	0.07
foals	0.6	0.7	0.09

[a b] *Means in the same row with different superscripts differ significantly (P<0.05)*

benefit women who traditionally carry out these tasks in these communities.

The donkeys are used for a total of 13–25 and 11–28 days a month in Masvingo and Sanyati, respectively, with peak working periods in January, March–May and December. These periods coincide with times of good grazing or availability of crop residues in the fields. However, donkeys are still used for at least 11–18 days a month during the dry season (August–October). This points to a need for further studies on nutritional needs and management of donkeys during this period of insufficient nutrient availability due to the reduced quality and quantity of natural pastures.

Approximately 39% of the total annual working days of donkeys were used for cropping activities at both sites. The tasks are concentrated in the periods April–June for carting crop harvests, July to September for carting manure and October to January for plowing and weeding.

Conclusions

The donkey plays an important role in many rural households in Zimbabwe by alleviating drudgery in the transport of crop inputs and produce, carting of essential household needs like water, fuel wood and the staple maize-meal. They also contribute to plowing and weeding. There is a need for more research and extension support in order to sustain

Table 4: Frequency distribution (%) of donkeys across households

	Site	
Number of donkeys	***Masvingo***	***Sanyati***
1-2	16	9
3-4	24	32
5-6	37	32
7-8	14	13
> 8	9	14
Total households	102	52

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and increase the contribution of donkeys in these farming systems. Nutrition and reproduction are critical areas needing urgent attention.

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