

Donkey power in rural transportation: A Botswana case study

BOTSWANA HAS MORE donkeys per person than any other country in the world.¹ These calm, quiet, and obedient animals provide an accessible and affordable source of power that is used to transport people, goods, and materials in rural Botswana.

BOTSWANA'S DONKEY population is just over twenty-nine thousand, 99.4 per cent of which are owned by traditional farmers.² Although the size of donkey herds varies from one to over 16, the average size on traditional farms is 5.3, while on commercial farms it is 15.6.² The donkeys are managed extensively by the traditional farmers, and are used all year.

Donkeys are 'pseudo-ruminants' or simple-stomached herbivores, so they depend extensively on grazing for food, making them inexpensive for farmers to feed. They are friendly towards humans and easily trained, and they are relatively cheap to buy, at about 50 pula (US\$20). Donkeys are always willing to work, provided they are healthy, and they can be used for both day-to-day transportation and pack loading, especially on uneven terrain which is not easily accessible by motor-vehicles. For all these reasons, the donkey is of great importance to rural transportation.

The survey

In order to document the use of donkeys in Botswana, a study was carried out in twenty villages in Kgatleng and Kweneng districts in the south-east of the country. One hundred randomly selected farming households that keep donkeys were surveyed in the two districts. Data was collected using questionnaires, interviews, and direct observations of the animals. The questionnaire and interviews covered herd size

Table 1: Donkey herd size and composition in surveyed areas (100 farmers interviewed)

Average donkey herd size	5.6
Average number of males	2.0
Average number of females	3.6
Herd size: 1-5	57%
6-10	34%
11-15	7%
>16	2%

Table 2: Management practices in traditional donkey husbandry

Grazing period	Overnight
Watering source	
● small dams	85
● streams	12
● boreholes	3
Watering frequency	
● daily	70
● every other day	30
Routine health care	
● none	100
Castration	
● burdizzo method	100
Age when trained to pull carts	3 years
Duration of training	1-12 weeks
Harness type	
● traditional harness (old tyre casing)	90
● improved breast strap (leather straps)	7
● breast strap webbing (strong cotton material)	3

and composition, source of stock, management systems, housing, feeding and watering, management practices (health care), and donkey-cart type and ownership.

Forty per cent of the farmers obtained their foundation stock through ALDEP, the Govern-

ment of Botswana's assistance programme, compared to 26 per cent who bought their foundation stock and a further 10 per cent who bartered for them. Only 24 per cent of farmers inherited their foundation stock. ALDEP subsidizes purchase by 85 per cent, enabling many poorer farmers to gain access to donkeys.

The average herd size and composition on farms keeping donkeys is shown in Table 1. The average number of donkeys per farmer was 5.6, with almost twice as many females as males, and most males are castrated. The donkeys often spend the night on ranges close to the owner's house (Table 2), but are not usually provided with roofed shelter. The animals depend on natural rangelands during both the wet and dry seasons, and they get their drinking-water from small dams, streams, and boreholes like other livestock under traditional management. The donkeys do not receive any routine health care. They are usually trained to pull carts by their owners, and the training lasts between one and twelve weeks, depending on the intended use of the animal.

Harnessing

Karim-sesay describes the main function of the harness as 'a means to transmit energy from the



Team of donkeys, two of which are wearing car-tyre harnesses.

casings — the choice of 90 per cent of farmers. Other common types include the improved breast strap and breast strap webbing. The traditional harness has no standard dimensions, rather the dimensions of the various components are determined by the amount of material available to the farmer. Karim-sesay notes, however, that the consequence of a breast strap harness that is too narrow or too short is discomfort to the animal, making it pull from the throat instead of from the chest, forcing it to slow down, and therefore affecting the performance efficiency. Improved donkey harnesses that are affordable to the farmers would be a great help.

Donkeys are used in a number of different ways in rural areas (see Table 3). In Botswana donkeys are generally hitched in multiples to pull carts. Multiple hitching can be abreast or in tandem, depending on the type of harness used. Starkey⁴ noted that animals harnessed with collars or breast bands are frequently hitched abreast. Total tractive pull increases as more donkeys are hitched together, but the tractive pull per animal decreases. Adding two animals to a four animal hitch only increases the pulling effort by 60 per cent of one animal,⁴ so hitches of more than six animals would have little advantage.⁵

In practice teams for pulling carts are of mixed ages and gender, and the teams can be as few as two or as large as eight. Donkeys pull carts on both roads used by other vehicles and on uneven surfaces.

Donkeys are also used for carrying both people and loads. Table 4 shows cart types and ownership. Items like firewood and drums of water are mounted on the carts in the rural areas, but the most common traction activity is the transportation of people and goods, which occurs throughout the year. People without donkeys can hire them in most rural communities; it would cost about 12 to 25 pula (\$5-10) to move household materials and goods over a distance of about 12km (but charges vary between districts). The animals' backs are protected with sacking or a blanket when loads such as bundles of firewood or bags of grain are carried. It is usually only small people or children who ride donkeys.

Potential for improvement

All draught operations require strength to pull, and the pulling must be done by the chest or shoulder (depending on the type of harness), with the legs providing the power and the back taking the vertical force. For the donkeys to have the endurance to pull for as long as possible, they must be in good health. Pearson and Smith observed that the amount of work an animal can do is proportional to its body weight,⁶ and the main constraint to donkey power is inadequate nutrition.⁷ The problem for farmers in Botswana is to provide sufficient quantity and quality food for the donkey. The efficiency of donkey-drawn carts could therefore be improved if their feeding and management could be improved. Management can be improved by rotating the work between teams of donkeys, giving them adequate rest and plenty of grazing time.

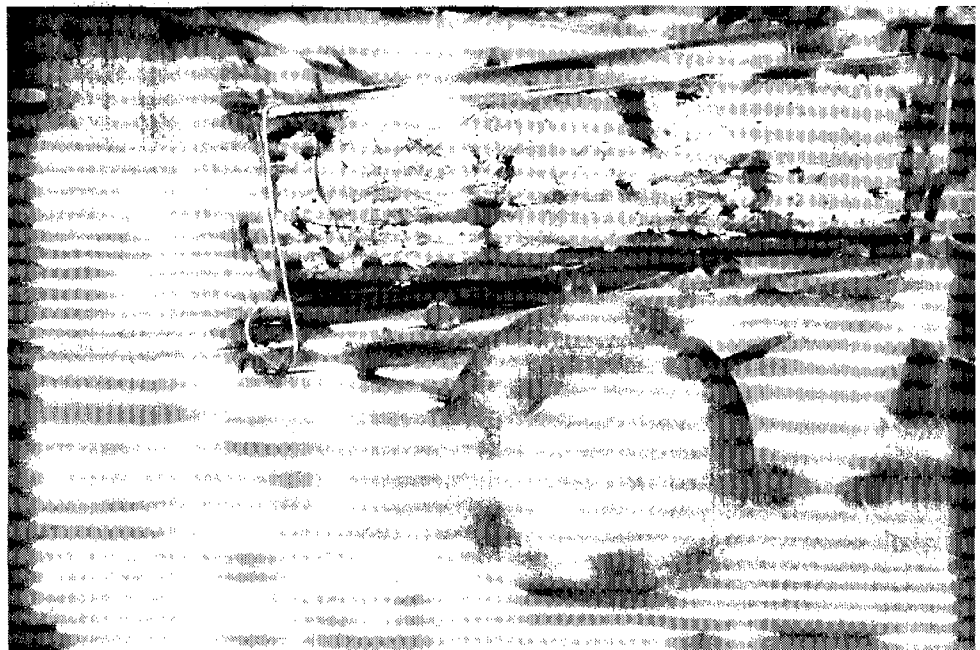
Donkey power is already the cheapest form of power available to people in rural Botswana, but there is still room for improvement. The future does look bright, especially with the

Table 3: Donkey's transportation activities in rural households

Activity	Number of animals/ team	Percentage of farmers practising
Transport (human)	2-8	100
Transport (household goods)	3-7	100
Pack carrying	1	20
Transport sand for building houses	3-6	50
Fetching water	3-6	100
Fetching firewood	3-8	100
Hire service	3-8	50

Table 4: Donkey cart types and ownership

	Percentage
Cart bodies	
● wood	30
● old vehicle bodies	65
● factory made from steel sheets	5
Wheels	
● pneumatic tyres	100
Ownership	
● male headed household	80
● female headed household	20



Old carts are renewed by mounting them on new wheels.

government's ALDEP assistance programme, which subsidizes donkey purchase and donates carts as part of an agricultural aid package. ●

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