

Pack donkeys, bicycles and carts: a case-study from Sukumaland in north-west Tanzania

by

Ally M Ngendello¹ and W C S Heemskerck²

¹ Lake Zone Agricultural Research Institute, Ari-Ukiriguru, Box 1433, Mwanza, Tanzania

² Royal Tropical Institute, 63 Mauritskade, 1092 AD Amsterdam, The Netherlands

Abstract

In Sukumaland animal traction is an important and integral part of the entire farming system. Oxen are traditionally used for land cultivation (both primary and secondary). Donkeys are commonly used for pack transport of bulky produce from fields to homesteads and markets. The importance of donkeys in the system declined in the 1970s with the improvement of roads and tracks which made possible the use of ox carts and the widespread introduction of bicycles, which replaced donkeys for carrying bulky produce on narrow roads. Recent surveys and casual observation in Kwimba District showed that the donkey is still a valued animal.

The average number of households owning donkeys per village and per district has gone up from less than 1% to 5% over the last seven years. Apart from other uses, donkeys are now used for long distance travel (80 km) transporting ox carts from the workshops and repair centres. The use of all sorts of donkey carts has also increased and offers new opportunities for donkey use. In view of the decline in cattle numbers, this paper outlines the historical development of donkey utilisation. It describes the management practices and indicates possible constraints and future trends in relation to the whole concept of animal traction.

Introduction

Donkeys are widely used in Tanzania, notably for rural transport. Their use is particularly important in semi-arid regions in the central part of the country.

A comparison of data in the 1984 Livestock Census (MoA, 1984) and the 1994 Agricultural Census (Statistics, 1994) shows an increase in the total donkey population from 217,276 to 277,427, which represents an annual increase of 2.5%. The total number of work oxen in the country increased from 836,373 to 1,225,460 over the same period, a 3.9% increase per year. Regional differences in donkey numbers are large. While

numbers in central parts of the country (Dodoma, Singida, Iringa) are still increasing, in northern parts of Tanzania the picture is more varied with increases in Mara, Kilimanjaro and Tanga and decreases in Arusha Regions.

In the Lake Zone (Mara, Mwanza, Shinyanga and Kagera Regions) the number of actual work oxen has decreased, 459,619 in 1984 to 386,587 in 1994, although the number of potential work oxen in 1994 was 774,628. The number of donkeys in the Lake Zone increased from 22,947 (MoA, 1984) to 34,984 (Statistics, 1994), which represents an annual growth rate of 4.1% which is higher than the national growth rate. The male/female proportion of donkeys is 2.45:1 in the Lake Zone and 1.37:1 at the national level, for which no explanation can be given.

The number of bicycles in rural areas was estimated to be 1.2 million for the country during the 1994 Agricultural Census or one bicycle for every three households. In the Lake Zone and particularly in Sukumaland this number appears to be a gross underestimate. Most rural households (including female-headed households) have access to bicycles (compared with one donkey for every thirty households in the Lake Zone).

The study on the improved use of donkeys in Sukumaland concentrated in Kwimba District in Mwanza Region. The estimated number of donkeys in Kwimba varies from 4000 to 10,000. Most farmers in Sukumaland are familiar with donkeys as draft animals. However, over the last 15 years the use of donkeys has declined in favour of the bicycle, but this has not led to a reduction in the number of donkeys, which means farmers are keeping donkeys while not using them optimally. Few farmers are aware of the wide range of possible uses of donkeys.

Traditionally donkeys were only used for pack transport of bulky produce from the fields to the homestead and market. Donkeys have traditionally

not been used for land preparation (not even on light soils) or for pulling donkey carts.

Methodology

The basis for the work on donkeys derived from different diagnostic surveys and field observations in specific villages of the Lake Zone. On-farm research in the Lake Zone was clustered in research villages representing the various Farming System Zones (ie, agro-ecological zones with a particular dominant farming system). In the research villages activities were organised with farmers using the group approach.

Preliminary information on donkey numbers, trends, utilisation and management were collected during the diagnostic survey using participatory rural appraisal. Primary information and data were obtained from farmers and by observation.

Based on the constraints identified and general discussions with farmers, donkey carts and wooden pack saddles were introduced and tested in some villages. They were introduced with the following main objectives:

- to assess the technical performance of light (single) donkey carts under farmers' conditions
- to assess the tasks a donkey cart can fulfil
- to compare the economic aspects of a single-donkey cart and an ox cart
- to assess the carrying capacity of wooden donkey pack saddles and their acceptability to farmers
- to assess the performance of a new harnessing system versus yoking, as traditionally used.

Two donkey carts were distributed to farmers in Mwampulu Village, Kwimba District for use in the Farmers' Research Group (FRG). Six wooden donkey pack saddles were also distributed to farmers for their evaluation. In both cases the trial design was of the Farmer Managed and Farmer Implemented type with little influence from researchers. Both carts and pack saddles were made locally but some parts like tyres and axles were imported.

Results and discussion

Farmers' views on donkey use

In the Lake Zone donkeys are unevenly distributed. There is a positive relationship between the level of crop production and the number of donkeys found in an area, not only between households but also between zones eg,

studies in Kwimba District revealed the existence of relatively large numbers of donkeys in the heavy soils dominated farming systems (Farming Systems Zone 3 or Mbuga), where maize and chickpeas are predominantly produced. Oxen are extremely important for plowing the heavy soils which produce a good marketable surplus to be transported by donkeys to the market.

Farmer participatory surveys in Kwimba (Ebong et al, 1991 and Ahmed et al, 1990) showed that donkey use for transport of produce was overshadowed by the introduction of the bicycle and the improvement of roads, but that donkeys were still commonly used for transporting bulky produce to markets.

According to Ebong et al (1991), the combination of oxen and donkeys in animal traction supports both farming intensification and management of these draft animals. While oxen can be best used in plowing heavy soils, donkeys can be harnessed to plow light soils and to transport produce. Equally it was noted that the distribution of donkeys among farmers was rather skewed. Farmers who had a large herd of oxen (8-16 oxen/household) and a cropping area of more than 20 hectares possessed one or two pairs of donkeys (Ahmed et al, 1990).

Farmers estimated an increase in households owning donkeys from 1% to 5% over a period of about 15 years. In some villages a trend exists for some farmers to exchange oxen for donkeys (eg, Mwampulu Village). Discussion with farmers in Kwimba revealed that the number of donkeys declined rapidly in the 1970s. Most donkeys were then sold to be driven to the southern parts of the Lake Zone and beyond. Farmers observed that the introduction of bicycles was the major reason why donkeys lost their value for transport, notably for riding. However, in recent studies (Ngendello, 1994) and following formal discussions with the Farmers' Research Groups in Kwimba, it was indicated that donkey numbers as well as their uses are increasing gradually.

Insufficient data and information exist for quantification of the trends and the contribution of donkey ownership and use to the household economy. Indications are given in various reports that resource-rich households more often own donkeys than resource-poor households, in spite of the common belief that the threshold for owning and using donkeys by resource-poor households is lower than for oxen.

Donkey cart introduction

Donkey carts are expected to be successful in improving rural transport (Roeleveld, 1995). Donkey carts, mostly pulled by one donkey, are common in many parts of Africa. Donkey carts have many advantages over ox-drawn carts as they are less expensive, easier to handle (women and children can use them) and can pass along narrow tracks. They are faster and need one donkey instead of two oxen. Donkey carts can be manufactured in the districts by local craftsmen. They cost about 60% of the price of an ox cart (ie, Tsh 130,000 or US\$ 200). A single donkey cart produced in collaboration with Maswa Development Programme was tested in 1994 and 1995. Late 1995 a second type, a modification of a widely used locally made cart, was added.

In Tanzania, donkeys are normally harnessed with the same type of yoke as used for cattle, frequently resulting in neck wounds (Starkey and Mutagubya, 1992). The donkeys used in testing the carts were harnessed in two different ways. The first one used a breast-band and back saddle (developed by the Tanga Animal Draft Power Project), and the second one a breast collar and saddle developed by the Agricultural Engineering Department of the University of Nairobi. The former was much cheaper and easier to make than the latter (Roeleveld, 1995).

At the end of the year of assessment by the Farmers Research Group, Mwampuluwere, farmers expressed the following opinions on the carts:

Advantages:

- very light cart (only one or two donkeys are required)
- easy to handle on narrow roads and paths
- good harnessing
- strong axle and bushes
- comfortable for the donkeys (reduces stress).

Disadvantages:

- worn out tyres are difficult to replace (no spare parts in Tanzania).

Farmers were also asked to make comparisons between donkey use and ox use for rural transport (Table 1).

The information from farmers on donkey use was obtained from farmers involved in the testing of donkey carts. More general information was obtained from the diagnostic surveys.

Donkey pack introduction

Apart from pulling carts (which is a relatively new development) donkeys have traditionally been used for pack transport. Donkeys can carry up to 70 kg or more (Starkey and Mutagubya, 1992). The latter role has now to a large extent been taken over by the bicycle. Improvement of the carrying capacity of the donkey could possibly reverse this trend. A simple tool to facilitate this is the donkey-pack saddle, an A-frame placed on the donkey's back on which all kinds of containers, baskets and bags can be placed. A blanket is needed to protect against skin damage by friction. The blanket, made of two jute bags filled with cottonseed husks with fuzz, was copied from an early publication on ox-pack transport (King, 1940, cited by Roeleveld, 1995). The donkey pack saddle was introduced in 1995 in Kwimba District.

The wooden pack saddle was rejected by farmers due to the following reasons:

- the pack saddle allows only small quantities (maximum 40 kg) to be carried
- the saddle causes stress and wounds to the donkeys
- it is not very durable (lasts for only half a year).

Table 1: Farmers' opinions on donkey versus ox use in rural transport

<i>Criterion</i>	<i>Donkey use</i>	<i>Oxen use</i>
Working environment	Harsh	Less harsh
Distance covered	Long	Short
Food and water requirement	Poor quality suffices	Good quality required
Transport speed	Fast	Slow
Health risks	Disease tolerant	More susceptible

Table 2: Advantages of donkeys over oxen for use in rural transport

<i>Criterion</i>	<i>Donkey use</i>	<i>Oxen use</i>
Price of one animal and cart	Lower for animals (Tsh 20,000–40,000 or US\$ 30–60) and carts (Tsh 130,000 or US\$ 200)	Higher for animals (Tsh 50,000–10,000 or US\$ 75–150) and carts (Tsh 200,000 or US\$ 300)
Handling ability and training required	Easy to handle and short period of training required	More difficult to handle and long training period required
Feed and water requirement	Not very demanding	Very demanding
Size of animals and carts	Smaller size allows use of paths rather than roads	Wider roads and tracks are required
Gender issue	Donkeys are easy to handle which allows women to use them for fetching water and firewood.	Oxen are traditionally managed by men making it difficult for women to use them for transport.
Working speed	Donkeys are not only fast but can cover long distances	Oxen are slow and are not suitable for travelling long distances
Health management requirements	Tolerant to most diseases, very little treatment required	Susceptible to major pests (tsetse and ticks) which are easily picked-up during work
Health risks	Disease tolerant	More susceptible

Discussion and conclusions

Donkeys used to be utilised for rural transport on narrow paths carrying produce on their backs to the market and vice versa. This particular use of the donkey has been replaced by the use of bicycles. However, new opportunities exist for donkeys in rural transport through the introduction of light donkey carts. Through the various diagnostic surveys, analysis of feedback from the farmers on the introduction of the donkey cart, and the introduction of the donkey pack saddle, a number of general advantages and disadvantages of the use of donkeys for rural transport compared to the use of oxen can be established (Table 2).

Farmers are under-utilising the existing donkeys, but a new niche for donkey use is developing ie, the donkey cart. Some constraints to the greater use of donkeys in rural transport are listed in Table 3.

Recommendations for future work

Realising the potential benefits of donkey traction in the area, especially for donkey carts, there is a need for further detailed

adoption studies, data collection on donkey distribution, numbers, trends in ownership, management aspects and utilisation.

Harnessing remains the main constraint, therefore farmer training and further evaluation activities are needed.

Currently, donkeys are only used for transport, there is a need for extending the use to other activities like plowing and weeding.

Development and promotion of suitable implements/equipment and harnesses for donkeys needs to be supported.

Research on appropriate management aspects such as feeding and health management is necessary for optimum work output and reproduction.

Socio-economic analysis of the benefits of the use of donkeys for animal traction (economic and financial) as well as for various farmer categories is required.

Table 3: Constraints inhibiting the greater use of donkeys in rural transport

<i>Constraint</i>	<i>Donkey use</i>	<i>Oxen use</i>
Social status	Donkeys normally owned by farmers who already have oxen	First priority for small farmers is to own some oxen
Availability of carts and animals	Donkey carts and donkeys are not readily available, spares are not readily available	Oxen are easily found while the availability of carts is improving rapidly
Capacity requirement	Donkeys are fast but can only be used for small loads	Slow but heavy loads can be transported
Multiple uses	Donkeys only used for transport, not a good investment	Oxen are used for plowing, weeding and provide a good investment through final slaughter value
Management	Little care is given, proper yoking practices are absent	Management practices are well established

References

- Ahmed U H, Binder K, Haag W, Katinila N, Meritan R, Ravnborg H M and Van Autreve A, 1990. *An analysis of agricultural and livestock production systems in Usagara divisions in Tanzania*. ICRA Working Documents Series II. International Centre for Development-oriented Research in Agriculture (ICRA), Wageningen, The Netherlands. 106 p + appendix.
- Statistics, 1994. *National agricultural census, 1993/1994 season*. President's Office, Planning Commission, Bureau of Statistics, Tanzania.
- Ebong C, Gijsman A, Husson O, Kivunge K, LI X, Rusamsi E, Timmermans M and Wongchanapai P, 1991. *An analysis of agricultural and livestock production systems in Misungwi Division in Tanzania*. ICRA Working Document Series 16. International Centre for Development-oriented Research in Agriculture (ICRA), Wageningen, The Netherlands. 111 p + appendix.
- MoA, 1984. *National Livestock Census*. Ministry of Agriculture (MoA), Dar-es-Salaam, Tanzania.
- A M, 1994. *Informal livestock survey part II: the Lusenii and Mbuga dominated Zones. Working paper No. 12*. Tanzania/Netherlands farming systems research project, Lake Zone, Ukiriguru, Tanzania. 83p.
- Roeleveld A C W, 1995. *Livestock state of the art paper 1992-1995 (First draft)*. Tanzania/Netherlands farming systems research project, Lake Zone, Ukiriguru, Tanzania.
- Starkey P and Mutagubya W, 1992. *Animal traction in Tanzania: experience, trends and priorities*. United Republic of Tanzania, Ministry of Agriculture. Natural Resource Institute (NRI), UK.