Animal draft power challenges in Zimbabwe

by

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This paper is published in: Starkey P and Kaumbutho P (eds), 1999. *Meeting the challenges of animal traction*. A resource book of the Animal Traction Network for Eastern and Southern Africa (ATNESA), Harare, Zimbabwe. Intermediate Technology Publications, London. 326p.

Abstract

More than 85% of communal area farmers in Zimbabwe use animal draft power for tillage and transport. Oxen provide more than 75% of this power, but cows and donkeys seem to be gaining prominence.

Research and development efforts on animal draft power technology are negligible when compared with work on beef and dairy cattle. A lot of work has also been done on implements, but without much consideration of the draft animals used on smallholder farms.

The country has experienced two severe droughts since 1990, but the extent of damage caused to the draft animal population is not known. Other challenges facing animal draft power development in Zimbabwe include the non-existence of appropriate on-farm feeding strategies, poor health management (particularly for donkeys), assessing the impact of training programmes for rural artisans, and development of affordable harnesses for donkeys. Appropriate farmer participatory approaches (including gender analysis) should be used in all efforts aiming to meet these challenges.

For there to be sustainable development of animal draft power in Zimbabwe, educational curricula should be revised and tailored to promote animal power instead of tractor power. Finally, animal draft power workers should share information, engage in collaborative activities, and avoid duplication of efforts. Meagre resources would then be used more efficiently to develop animal draft power.

Introduction

More than 70% of Zimbabwe's human population of about 10.3 million live in communal (smallholder) farming areas (Chiduza, 1994). Almost 90% of these people live in marginal agro-ecological regions III–V, where the soil is characteristically loose, sandy and infertile. Rainfall is less than 650 mm annually, and its distribution in the growing season (November–March) is very erratic. In some cases, the growing season may end prematurely. Dryland farming is, therefore, a very risky undertaking in these regions, and farmers are usually advised to plow early and ideally plant maize (staple crop in the country) by mid-November. This is only possible if animal draft power is available when it is required. Yet communal farmers always face a critical shortage of animal power. Communal farmers also use low input–low output technologies in production. As a result, the gap between the rate of increase in food production (2.2%) and population growth rate (3.2%) continues to widen (Chiduza, 1994).

This paper reviews the availability of animal draft power in Zimbabwe's communal farming areas, and research conducted to date. The major challenges for development of animal draft power are also highlighted.

Sources and availability of animal power

More than 85% of the 1–1.2 million communal farming households in Zimbabwe use animal draft power. Table 1 is a summary of the composition and availability of draft animals in selected areas of the country. Oxen provide about 75% of this power and are normally worked in pairs, although four or six animals are sometimes used in a team.

About 30–45% of communal area farmers have four or more oxen, which they consider as adequate animal draft power (Bratton, 1984; Christensen and Zindi, 1991). Thus, the majority of farmers do not have adequate animal draft power. For example, Francis (1993) found that only 5–8% of the farmers in Chinamhora communal area had sufficient draft animals. Farmers who do not own their own draft animals hire them from farmers who do, but their access to draft animal power is always untimely and associated with poor crop yields (Shumba, 1984; Francis, 1993).

Table 1: Availability of draft animals in selected areas of Zimbabwe

	Makoni	*Chirumanzu*	*Chivi*	*Mberengwa*	*Nswazi*
Agro-ecological zone	II	III	IV	IV	V
Number of draft animals	537	581	407	451	499
Draft animals per household	2.2	2.3	1.6	1.8	2.0
Composition of draft					
Oxen (%)	78	69	48	51	66
Cows (%)	18	22	19	11	9
Donkeys (%)	4	9	33	38	25

Source: GFA (1987)

Farmers may supplement their stock of draft oxen with cows and donkeys if these are available. There is no reliable information on either the number and distribution of draft oxen in the country, or the extent to which cows and donkeys are used for draft purposes. Because the draft capacity of cows is only 60–70% of that of oxen (Howard, 1980), ownership of two cows is normally counted as equivalent to one ox. Farmers believe that subjecting cows to work would result in reduced reproductive performance, so the use of cows for draft could be a useful indicator of the severity of the animal draft power problem. Although donkeys are more suitable for packing and carting tasks, they are particularly important for traction in marginal agro-ecological zones where successive droughts have killed off almost all the cattle.

Major animal draft power challenges

Farmer involvement

A lot of research and development attention has been focused on crops, particularly maize (Shumba, 1984; 1986), even when diagnostic studies highlight shortages of animal draft power and manure as critical production constraints. Considerable work has also been conducted on implements. Some available technologies, such as minimum tillage techniques, have not been widely accepted by farmers, principally because farmers were never consulted to provide an input into the technology development process.

Use and maintenance of equipment

Little or no literature is available on the proper use and maintenance of agricultural machinery by communal farmers. Complex implements, such as planters, need proper calibration and maintenance, but are sold without manuals. Although farmers set and maintain machinery incorrectly, poor quality is often regarded as the major cause of inefficient performance and the ultimate use of labour-intensive methods by farmers. Farmers also persistently remove the hitch assembly of the conventional, right-hand mouldboard plow soon after purchase. This is occurring against a background of vigorous campaigns that highlight why it is necessary to maintain it intact. Also, manufacturers have done little to develop a more farmer-acceptable product; they need to be involved in the training of farmers.

Rural artisans

The Institute of Agricultural Engineering in Harare, the German Agency for Technical Cooperation (GTZ) and Intermediate Technology Development Group are running a joint programme to train rural (communal area) artisans to make and repair farm tools and animal-drawn implements. Another thrust of the programme is to provide cheaper and easily accessible spare parts for these implements and farm transport devices such as carts, wheelbarrows and four-wheeled wagons. The impact of the existing (trained and untrained) artisans on animal draft power development has not been assessed: such assessment would assist in identifying the constraints faced by the artisans so that sustainable solutions can be sought, and would also reveal the weaknesses of the current training programme for the artisans, which should be addressed.

Inadequate research

Draft animals have received negligible attention from researchers and policy-makers, compared with the work done with beef and dairy cattle. What little work has been done on draft animals has tended to concentrate on feeding management of Mashona oxen (Mupeta, Ndlovu and Prasad, 1990; Francis and Ndlovu, 1993; Francis, Ndlovu and Nkuuhe, 1994; Prasad, Khombe and Nyathi, 1994). There is little documentation on donkeys (Prasad, Marovanidze and Nyathi, 1991; on-going work funded by the UK Overseas Development Administration), probably because donkeys have a low socioeconomic status and research involving donkeys is considered backward and not glamorous by most agricultural scientists.

Although draft animals work for only short periods during the year, they need to be well fed if they are to be ready to work efficiently at the start of the cropping season. Considerable basic research has been done on nutrient requirements of draft cattle, but there is a need for much more research on how improved animal nutrition can increase efficiency under on-farm conditions. Knowledge of the needs, goals and resource endowment of farmers would play an integral part in the use of animal draft power. A thorough understanding of the range of feeding practices and various feedstuffs being fed to draft animals is also important. This, together with an idea of the nutritive value of available feedstuffs, would enable the formulation of rations which best meet the requirements of draft animals in the target farming systems.

Animal–implement disproportionality

Farmers concede that their draft cattle are becoming increasingly stunted, mainly due to poor nutrition (Tembo, 1989; Francis, 1993). Cows and donkeys are also increasingly being used for pulling mouldboard plows which have not been modified to allow for their lower liveweights and draft capacities. These trends have not been correspondingly matched by sufficient efforts to develop implements suited to weaker animals.

Need for affordable donkey harnesses

Although there have been extensive training programmes on making appropriate harnesses for donkeys, farmers continue to use inappropriate harnesses. Some commonly used harnesses injure animals during work, and it is quite common to find donkeys being neck-yoked together. Farmers argue that they cannot afford the recommended harnesses, and that the materials needed to make them are both scarce and too expensive.

Effects of droughts

The droughts of the 1991–92 and 1994–95 cropping seasons have reduced the country's animal draft power availability but the magnitudes of their effects are still not known. Furthermore, although hiring and lending of draft animals and implements between households is common during the cropping season, there is a need for systematic studies of the extent of this. Such studies should also quantify how late, when compared with draft owners, draftless farmers plant their crops and what are the related yield differences.

Health care

Intestinal parasites are a major cause of poor condition in draft animals throughout Zimbabwe. It is generally recommended that cattle should be dewormed at least twice a year (in April/May and October/November), and this empirical deworming strategy is already being used by communal farmers (Francis, 1993), although few scientific tests have been carried out to establish its effectiveness. Farmers also widely use traditional deworming remedies: scientific study of this indigenous technical knowledge may suggest ways to improve animal health care.

Information exchange

Although numerous people (farmers, researchers and trainers, implement manufacturers, non-governmental organisations, etc) are involved in different aspects of animal draft power, there has not been sufficient collaboration or communication among them. One result of this has been considerable duplication of efforts. One of the functions of the Animal Power Network for Zimbabwe (APNEZ), formed in September 1994, is to facilitate the exchange on information and coordinate all animal draft power-related work in the country.

Agricultural education curricula

All curricula in Zimbabwe's educational institutions (agricultural colleges and universities) emphasise tractor power, rather than animal draft power. Yet fewer than 3% of smallholder farmers

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in the country use tractors in crop production. Clearly, this anomally should be redressed.

Gender awareness

Acceptance of technological interventions by smallholder farmers depends on how the farming family and local community perceive them. All members of a farming family (men, women and children) have their own roles in agricultural production, but the work of women and children, and their knowledge and potential in promoting animal draft power technology, are often ignored. Most technological recommendations therefore tend to strengthen male-based models which in most cases are never adopted by farmers. Animal draft power workers need to consider seriously the linkages between age, gender and labour equations. Unfortunately, socio-cultural restrictions often make women and children reluctant to talk to outsiders. Inclusion of women in animal draft power teams could possibly solve this problem (Mutimba, 1994).

Conclusion

There are numerous challenges facing animal draft power technology development in Zimbabwe. Appropriate methods should be devised so that relevant technologies can be developed. Without doubt, individuals and agencies involved in animal draft power-related activities should now adopt bottom-up approaches in meeting these animal draft power challenges. This implies that farmer-participatory approaches in technology development should be used. Such a shift in approach would accord farmers (including women and children) and extension agents the opportunity to dictate what they specifically want. Ultimately, this would increase the chances of adoption of the developed technologies.

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