

# Improving animal traction technology

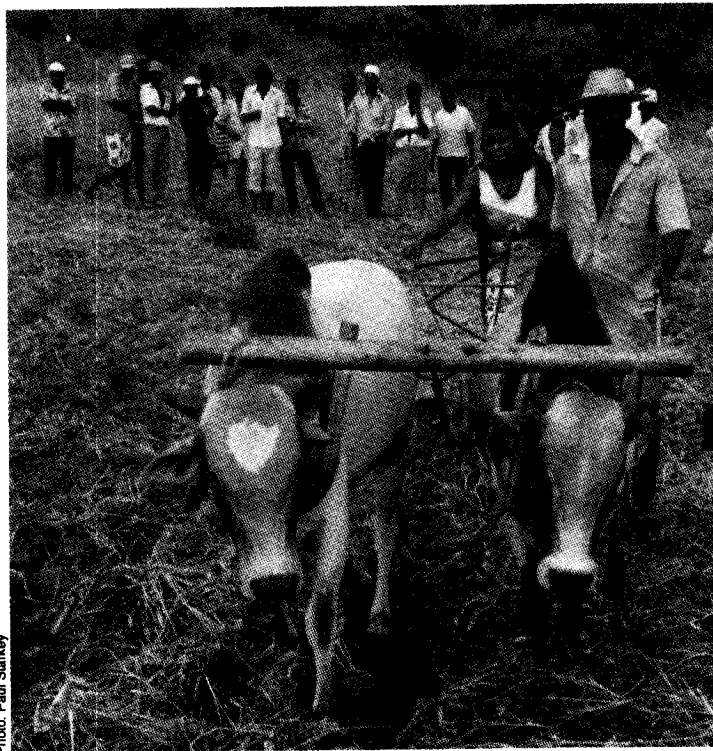
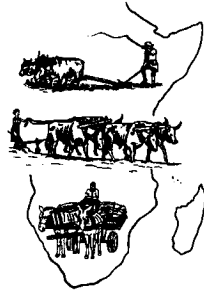


Photo: Paul Starkey

# The transfer of animal traction technology

# Transfer of animal traction technology: lessons from project experiences in Zimbabwe, Cameroon and Tanzania

by

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## Abstract

*Transfer of animal traction technology is defined as dissemination of knowledge and skills to people and includes extension or training.*

*Analysis of the extension and training approaches of three different projects suggests the following recommendations: farmers must be interested in what is taught; farmers must be able to use the new technology immediately after training, ie, they must have their own animals and implements; and training is ideally done with the farmers' own animals and implements and on their own fields.*

*Farmers must take over training and extension activities themselves (within families or from farmer to farmer) as soon as possible because the use of extensionists is costly and transport-intensive. Furthermore, extension staff often find animal traction technology relatively unattractive. Without intensive supervision, the quality of extension and training services deteriorates rapidly. Training of staff must always be accompanied by financial and logistical support and supervision as they work on the farms.*

*Animal traction technology must be introduced gradually, in a certain sequence, and not all at once. The technology must be profitable. Farmers are first interested in power-intensive operations such as plowing and carting. Later they adopt control-intensive operations such as planting and weeding.*

*When introducing animal traction to a new area, training and extension is quite straightforward: the main problems relate to economics, supply of animals and implements and animal health. When attempting to improve existing animal traction systems, the choice of extension topics and the upgrading and management of staff pose major difficulties.*

## Introduction

Transfer of animal traction technology has two main meanings. It can refer to the transfer of ideas, techniques or implements from one area, where they have worked effectively, to another; for example, transfer from industrialised countries to developing countries. This type of transfer is important in order to save unnecessary research and development work. It helps us to avoid reinventing the wheel.

In a narrower sense, transfer of animal traction technology can refer to the dissemination of knowledge or skills—transferring or communicating ideas and techniques to the people. Transfer, in this sense, involves basic extension and training.

This paper concentrates on the latter aspect of technology transfer—on agricultural training and extension. It briefly describes three projects on which the author has worked; these differ considerably and cover a range of extension and training approaches. It then discusses some general conditions which facilitate transfer of animal traction technology, and some obstacles frequently encountered.

## WADA oxen project, Cameroon

The Wum Area Development Authority (WADA) oxen project was based in Bamenda, North-West Province of Cameroon. It later became the Project for Promotion of Permanent Farming Systems based on Animal Traction (PAFSAT). The project started with a one-year residential course for new farmers. It rapidly changed to a system involving four-week training courses in temporary training centres. This allowed participant farmers to sleep in their homes, and was much more successful. Credit was provided for oxen and implements, initially from the project, and later from an independent institution. Project extension workers provided follow-up services, including the project's animal health programme.

Later, the character of the project changed from a mechanisation or oxenisation project to a farming systems development project, also advising hand-hoe farmers.

Recently, marketing of crops was identified as one of the major bottlenecks for the farmers, and the project is trying to assist by transporting and selling crops.

This sequence of changes in the main focus of this project reflects two basic findings about agricultural development. First, that mechanisation, and particularly animal draft technology, is an integral part of the farming system. If the intensity of

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agricultural production and the labour situation call for mechanisation, it can be introduced very rapidly. If not, even the best training and extension system will not establish the technology permanently. The second key point is that a farmer's choice of technology is very much influenced by economics.

The effects of these two conditions are very difficult to observe, particularly during the initial phase of a project when there is a temptation to introduce some additional incentives such as free services and soft loans to attract the first farmers who take on additional risks.

In the Cameroon project, when project progress was not as expected reasons were mainly sought in the training and extension approach and messages. In practice, the real causes of slow transfer were the inappropriate farming system and doubtful economics from the beginning.

### **Agricultural Engineering Training Centre, Zimbabwe**

The Agricultural Engineering Training Centre (AETC) in Harare (Photo 1) is mainly an in-service training centre for the agricultural extension service Agritex. Its training manuals on topics such as ox training and plowing are now used in several other countries (AETC, 1986a; AETC, 1986b; AETC, 1987).

Animal draft power has been well introduced on smaller farms in Zimbabwe for a long time. General agricultural extension workers, who are working in areas where draft animals are used, go to the AETC for one-week courses to upgrade their knowledge and skills in mechanisation. Five one-week courses

on subjects related to animal draft power are on offer.

Apart from giving solid basic knowledge and skills in the use of oxen and their implements, special emphasis is given to easier control of oxen through the use of reins, to conservation plowing and to inter-row cultivation.

Considerable time and effort was spent on curriculum development, training of trainers and production of training aids and materials. The centre is well equipped with competent instructors and all the necessary training facilities. Courses are general and not too specific with regard to soils or climate. Once a year, animal traction courses are also run for participants from neighbouring countries.

When the author's four-years assignment with AETC ended, the centre had only just started to assess the impact of the training courses in the field. Some feedback was obtained from participants when they returned for another course, but there was no direct and immediate link to farmers.

### **Tanga Draft Animal Project, Tanzania**

The Tanga Draft Animal Project in the north-east corner of Tanzania is introducing the use of draft animals to an area where this technology had practically no tradition. On the smallholder farms in the area, almost all operations are carried out manually.

Although cattle and donkeys are kept in Tanga Region they were never used for work, apart from using donkeys as pack animals and some short-lived

*Ox cart in front of the mural on the workshop of the Agricultural Engineering Training Centre, Zimbabwe*

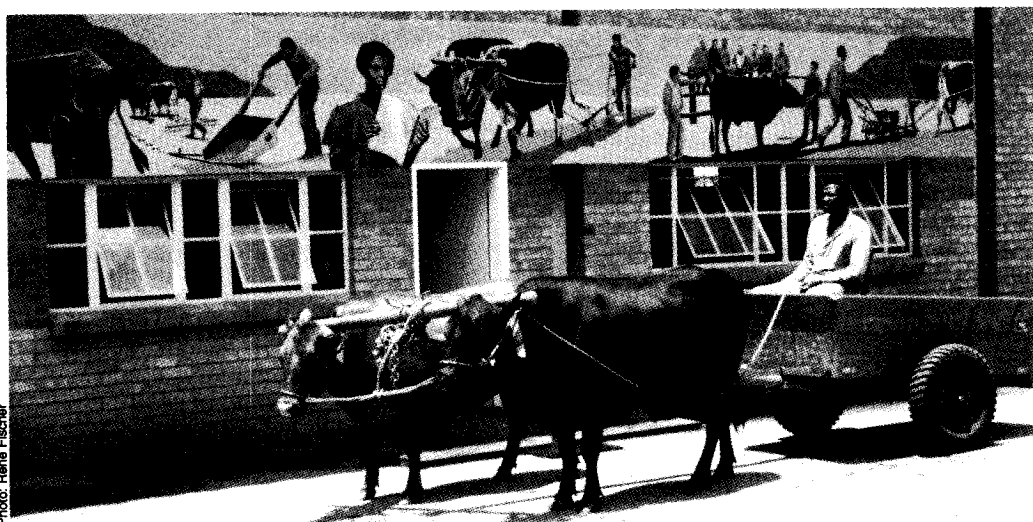


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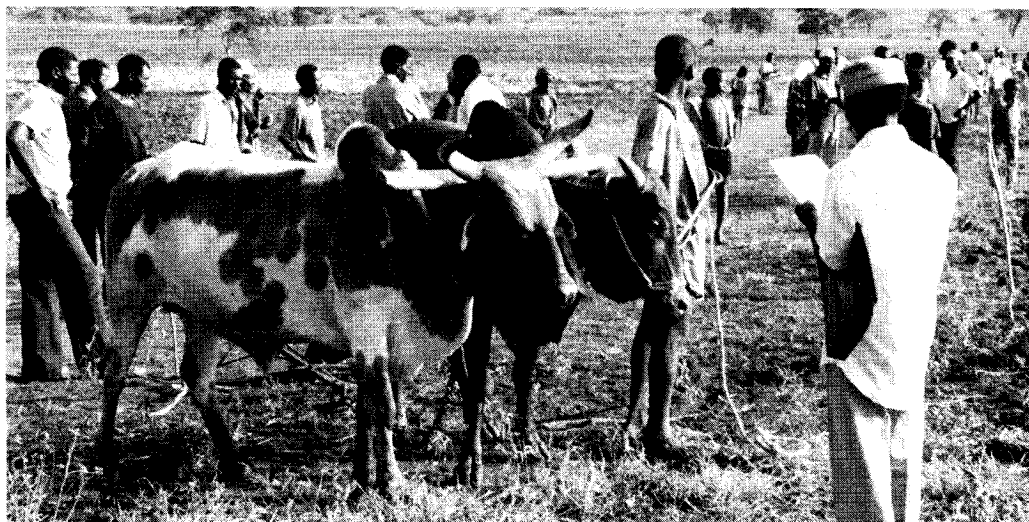


Photo: René Fischer

*Plowing competition organised by the Tanga Draft Animal Project, Tanzania*

attempts to introduce oxenisation in the 1970s. Reasons for the absence of draft animals may be:

- prevalence of many cattle diseases
- traditional and religious taboos
- advances in agromechanisation mainly took place on the big sisal, tea and coconut estates
- investments for annual crops are considered risky due to unreliable rains.

There is need to promote the use of draft animals in the region because:

- infrastructure and size of land holdings allow only limited economical use of tractors
- labour is not sufficient to cultivate all land
- suitable animals are kept in Tanga Region anyway
- promotion of draft animal use is a national policy.

#### ***Project organisation and activities***

The Draft Animal Project is run by the Tanzanian Ministry of Agriculture, supported by the German aid agency, GTZ. The project has one regional coordinator, six zonal extension coordinators, subject matter specialists (one of whom is a woman), 12 ox trainers (two women), one technician and three administrative staff, plus helpers and one expatriate adviser. These provide the following services to the farming community:

- selection of suitable implements and animals, and recommendations for their use and maintenance
- publicity campaigns to attract and select new farmers

- assistance in procuring oxen, donkeys, implements and, where necessary, credit
- training courses for extension and veterinary staff and farmers
- follow-up services for active draft animal farmers: regular visits, demonstrations, field days, competitions (Photo 2)
- maintenance of the Korogwe Animal Draft Centre: animals, implements and crops for training and demonstrations.

#### ***New project approach***

The agro-ecological environment is very delicate, both where animal health and agricultural production are concerned. Since the beginning, when the project was promoting oxen, adoption has been slow. Diseases and animal losses were the major problems at that stage. Considerable improvements in adoption rates by farmers were achieved by making changes in the project's approach, namely:

- switching to using local oxen
- including donkeys as draft animals
- introducing a suitable donkey cart
- using animal-drawn carts for gravel haulage on a contract basis.

Substantial animal losses caused by various diseases (East Coast Fever, anaplasmosis, trypanosomiasis) seriously threatened the viability of the new technology. The exclusive use of farmers' own animals or cattle purchased in the farmers' villages reduced animal losses to an acceptable level and improved the viability of the technology. Previously, animals had been bought from ranches and then

distributed to farmers living in a very different environment, and the rapid change of environment and management was often too much for an animal's delicate health. Further, by selecting cattle keepers, use could be made of farmers' existing experience in animal husbandry.

Donkeys became a very interesting alternative to cattle, particularly for farmers who did not have cattle or experience in cattle keeping and where animal draft was exclusively used for transport. Donkeys are more hardy than cattle and seem to be able to withstand local conditions with less intensive care. Adoption rates for donkeys did not increase substantially before a suitable design of donkey cart was found and produced locally.

### **An example of a problem**

A women's group in Kabuku village in Tanga had purchased a pair of donkeys and a cart, were trained, and were seen using their cart frequently on the road, carrying water; the animals and cart were always in good condition. Recently, however, the project received a letter from the Chairman of Kabuku village, stating "... you manager come quickly with medicine to castrate your donkeys because they are eating our goats. Come here, hand in hand with the members of the women group and we will have a meeting to deal with you and your donkeys". When visiting the village project staff found that one male donkey, which was not castrated, had developed an interest in goats, particularly during market days when female donkeys came to the village. There was, however, no evidence to suggest that the donkey had seriously harmed the goats, even less eaten them! The project came to the conclusion that the villagers' allegations were mainly fuelled by jealousy of the women's group who were obviously earning a good income through transport. In order to remedy the situation the notorious male donkey was replaced by a female, and it is hoped that the donkeys will not give any more cause for complaints and that, given time, the villagers will tolerate or even appreciate the new technology.

### **Different project approaches**

The objectives, activities and, particularly, training and extension approaches of the three projects differ considerably. The Draft Animal Project in Tanzania and PAFSAT in Cameroon are similar projects in that they both operate in areas of introduction, where animal traction technology was previously nonexistent. In both these areas animals and experience in animal husbandry are available and from agronomic, economic and sociological points

of view animal traction technology was considered feasible. (Incidentally, it would be interesting to learn of any comparable animal traction feasibility studies which did *not* recommend the start of a project, to compare subsequent experiences.)

The Tanga project in Tanzania differs from the Cameroon project in that it was part of a larger integrated project which allowed a much more comprehensive approach towards improving the living conditions of the rural population.

On the other hand Tanga Region is not exactly an easy area for the introduction of animal traction technology. Oxen are small and plagued by trypanosomiasis and East Coast Fever. The local population is not very business-oriented and has strong traditional beliefs against putting animals to work. Farming systems are very diversified and include permanent crops such as coconuts and cashew nuts. There are very few examples of commercial, well managed field crops in the region, which also means that this concept is not present in the farmers' memory. Farmers cannot get credits from banks or other lending institutions.

To reduce animal losses the project insists that farmers have their own animals or buy them. Animal trainers stay with the farmer family for about four weeks to train animals and people. Extension officers provide follow-up services to help overcome initial problems and the project organises one-week courses for groups of farmers in the villages to complement animal training. Due to lack of credit it is not possible to train groups of farmers with their animals in the same location. Some experienced farmers have also started to help fellow farmers to train their first animals.

Veterinary services are provided by local veterinary assistants. The project is still the sole distributor of implements and spares in the region.

In order to assist the project to establish a permanent infrastructure to support the technology, the project has encouraged the farmers to form clubs.

At the moment the technology is profitable where farmers can combine on-farm use on their crops with contract plowing or carting. The critical question for more widespread use is whether farmers will perceive animal draft power technology as a means to reduce the negative effects of the typically unpredictable rainfall.

### **Factors favouring technology transfer**

To summarise, the following are considered the most important factors influencing the successful transfer of animal draft power technology.

- Farmers must be interested in the topics that the extension workers want to teach them. Farmers must see a realistic chance that the new technology will allow them to earn more money or make their lives easier.
- Farmers must use the new technology when they go home after training, ie, they must have their own animals and implements.
- Farmers must take over training and extension activities themselves (within the family or from farmer to farmer) as soon as possible, because the large number of small farms per unit area makes the use of paid trainers and extensionists very costly and transport-intensive; and because, for employed staff, animal traction technology is less attractive and motivating than other technologies. Without intensive supervision and staff management the quality of extension and training services deteriorates rapidly.
- There is need for continual follow-up because draft animal farmers have limited means of communication and transport.
- Animal traction technology has to be introduced gradually, in a certain sequence, and not all at once.
- There must be an economic basis to run the technology profitably (mechanisation does not develop agriculture!)
- Farmers are firstly interested in power-intensive operations such as plowing and carting. Only later do they adopt control-intensive operations such as planting and weeding, which need specific skills and interact with agronomic practices.
- Training is ideally done with the farmers' own animals and implements and on their own fields. Maintaining a training centre with all the facilities for practical training is very costly.
- Training of staff must always be accompanied by financial and logistic support and supervision when they work in the villages with farmers.
- When introducing animal traction to a new area, training and extension are quite standardised and predictable: the main problems lie in economics, supply of animal and implements and animal health.
- When attempting to improve existing animal traction systems, the choice of training and extension topics, and upgrading and management of staff, pose major difficulties. Trainers and extension workers must be more flexible and highly trained to communicate and cooperate with the farmer. In a well developed system it is not easy to find standard messages which apply to the majority of farmers.

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