

Transfer of animal traction technology in Mbozi District, Tanzania

by

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Abstract

Transfer of animal traction technology by the Agricultural Development Programme in Mbozi, Tanzania, started immediately after farming systems research showed that poor soil fertility and labour shortages were the main constraints to food production in the working area. The project has operated by organising farmers into voluntary groups, at village level, and providing training in improved agricultural techniques, particularly the use of animal draft power for weeding, transport, incorporation of organic matter under ridges, etc. Organising farmers into groups enables the limited number of extension staff to provide a more efficient service, and also enables the farmers to build up their own organisations which can "pull down" the provided services as required.

Introduction

The Agricultural Development Programme, which started in Mbozi District, Mbeya Region, Tanzania in 1986, is an integrated agricultural project currently covering some 90 villages. Its aim is to increase food production of Mbozi smallholder farmers in a sustainable way. To this end, the smallholder farming system was analysed, and farmers were organised into groups and trained in various improved agricultural techniques. In order to achieve sustainability, strong emphasis was given to resource efficient agricultural methods (sometimes called low external input agriculture).

In order to help the farmers become more efficient, a mixed farming system is advocated, whereby the produce of the land is used to support the farmers' animals (through feeding crop residues and eventually through growing fodder crops), manure is used to improve soil fertility and animal draft power is used for various agricultural production activities.

The integrated approach means not only providing agricultural extension services but also supplying inputs, implements and other services at both village and divisional levels. At divisional level a so-called Farm Service Centre is available, where extension services are coordinated, training and demonstrations are held (in the training centre and at the trial and demonstration farm) and other services

(such as building ox carts, wheelbarrows, etc, and sales of implements) are provided.

Organising farmers into groups enables the limited number of extension staff to reach them more efficiently, and also encourages them to build up their own farmers' organisations to a level where they can "pull down" the provided services and eventually take over the running of the Farm Service Centres.

Farming systems research

Farming systems research carried out in 1986/87 identified two main constraints to agricultural production in Mbozi District:

- decreasing soil fertility
- seasonal labour shortages (at planting and weeding times and during harvesting) because most farmers grow maize, beans (twice each season) and some coffee.

Use of draft animal power could alleviate these constraints, but although about 50% of farming households in Vwawa Division own cattle, only 15% use them for primary soil preparation and transport (using locally constructed sledges). The research identified several factors which limit the application of animal traction.

First, it appeared that the risks of owning cattle were quite high. There was a high death rate (about half of the calves died) attributable to several factors. Common diseases were East Coast Fever, Lumpy Skin Disease and Black Quarter. Veterinary services were relatively poor and medicines were either not available or were felt to be too expensive. The use of local medicines was limited. Witchcraft was also mentioned as a regular cause of death of animals. And poor housing and feeding of the animals also contributed to the high death rate.

Second, although cattle did have a high social and cultural value—for example, they were seen as a form of security for times of unexpected expenditure (serious illness in the family, a funeral, etc)—cows were preferred over oxen. Owning oxen was not seen as very economically attractive as they were

mainly used for plowing and pulling sledges, whereas cows provide milk and offspring. Dowries had to be paid in cattle, but oxen could make up only a small part of the number of cattle requested. Also farmers had great respect for their cows and so were unwilling to use them for draft purposes because of the rough methods generally used in training.

Third, there was only limited cooperation among farmers in the use of their animals. Sharing animals was not very common. And animals from different families could not be brought together at one place for training because farmers feared negative influences from witchcraft which may kill their animals. However, farmers did frequently lend animals to other family members, and sometimes hired out their animals after they had plowed their own fields.

Finally, cattle were owned by men, and so it was the men who took care of the animals and worked with them. However, the culture is changing slowly and women are not completely excluded from handling oxen.

All the villages surveyed had some local ox trainers. The training offered was usually very basic (mainly getting animals accustomed to pulling a log and to obeying commands) and was carried out at the farm of the trainer. The actual plowing was done by the owner when he received his animals back.

Draft animal power policy

These findings, together with experience gained by the project in the working area, led to the formulation of an ox-mechanisation policy. The main elements of this policy are discussed below.

Soil fertility

The role of ox mechanisation should be defined in relation to all aspects of soil fertility:

- transport of organic matter to the fields
- incorporation of organic matter under ridges
- use of improved farmyard manure (stored in a pit or a heap) and compost.

Labour constraints

The role of ox mechanisation should be defined in relation to labour constraints, land availability and improvement of crop husbandry. The policy stresses three main aspects of this:

- timely and proper soil preparation, which includes plowing before the rains (either after the harvest or just before the onset of the rains), harrowing twice (the second time to kill

germinated weeds and prepare the seedbed for the maize), and planting with a plow or a cultivator

- the advantage of planting on ridges which, combined with the incorporation of organic matter, leads to higher yields
- the importance of weeding, as poor weeding is the biggest constraint to increased maize yields in the southern highlands of Tanzania. Because of labour shortages, only mechanised weeding can provide a solution to this problem.

Role of women

The role of women should be taken into account at all stages of the ox-mechanisation process. Women are the main actors in the food production cycle, and so would benefit most from the eventual reduction in workload.

Animal health care

Ox mechanisation and animal health care are topics in the general agricultural courses for link farmers and extension workers at the Farm Service Centre training centre. The fully ox-mechanised trial farm is used as a demonstration and training place during these courses.

Village organisation

The ox-mechanisation policy should be part of the general project village extension and organisation policy.

First, over a period of a year, link farmers attend three different seminars at which they are trained in general agricultural methods and resource-efficient agricultural techniques. The third seminar is devoted solely to ox mechanisation. Thereafter villages can enrol for on-site training, whereby five local ox trainers or ox users are selected for further training: at least one of these should be a woman. This further training covers the more advanced techniques of steering, weeding, planting, one-ox traction and the making of different types of yokes. The farmers who receive this further training then form an ox-mechanisation committee in their village, and are at the disposal of other farmers for demonstrations and training.

The village has to provide a training and demonstration plot as many people do not yet believe that it is possible to plant and weed with oxen. The training activities at the village are supported by an upgraded trainer from another village, and the village can borrow the necessary equipment from the project for a certain period.

After mastering all the techniques, the trained committee members also act as trainers in other villages, thereby reducing the role of the project to that of an intermediary, linking the people with the needs with those having the knowledge, and strengthening the links between villages.

Promotion and distribution of equipment

Equipment and implements are promoted and distributed through existing sales points and project shops, which are available in 48 villages at present. At the sales points equipment can only be ordered, while in the shops the different tools are available and specific promotion meetings are undertaken. As the availability of ox carts has been problematic in the past, these are now built at one Farm Service Centre workshop in collaboration with the Mbeya Oxenization Project which provides the axles.

Availability of equipment in the country is a bottleneck which the project cannot tackle. For example, appropriate cultivators and ridgers are still not available.

Results

The draft animal power component of the Mbozi Agricultural Development Programme was developed over a period of four to five years and was designed to fit within the general approach of the project using, as much as possible, existing local institutions and services such as the district agricultural extension staff and the Mbeya Oxenization Project.

In the initial years ox mechanisation was not given priority, as it was clear that only the larger farms

could benefit from it. A farmer needs a herd of at least five cattle (because sharing of animals is not common in the area), as well as cash to purchase implements.

Even so, between 1987 and 1991 the project managed to sell about 100 ox carts, 250 plows and a few cultivators and ridgers, despite the fact that in the first years availability of the implements was a major bottleneck.

In the past three years, three-day ox-mechanisation seminars have been held at the Farm Service Centre for 18 villages, and 450 link farmers have been trained in the basic skills of this technology. In the past two years ox-mechanisation committees have been trained in more advanced skills in 11 villages (about 55 people).

Expansion of these efforts is constrained by the number of staff available, and they are still only a limited activity within the general agricultural approach.

It is also clear that after all potential villages have had training, expansion can only come if the risk of cattle disease is reduced. The project has not entered this still difficult field—difficult because the supply of medicines in the country is insufficient, dipping is extremely difficult to organise, etc.

At the end of 1991, the project started an experiment with a women's group, in a very isolated area, engaged in maize grinding using an ox-driven maize mill. The mill has just been installed, so results are not yet available.