

# Donkey traction in north central Namibia

by

Nestor Haufiku<sup>1</sup>, Sylvanus Naunyang<sup>2</sup> and Christophe Rigourd<sup>2</sup>

<sup>1</sup> Ministry of Agriculture, Water and Rural Development

Directorate of Engineering and Extension Services, P/Bag 5556, Oshakati, Namibia

<sup>2</sup> Ministry of Agriculture, Water and Rural Development,

Northern Namibian Rural Development Project, PO Box 498 Oshakati, Namibia

## Abstract

*This paper reviews donkey use in the farming systems of northern Namibia and discusses the experiences of the Northern Namibian Rural Development Project.*

*Donkeys are increasingly popular in northern Namibia due to the harsh conditions and the decrease in available pasture. They are particularly used by women who usually do not work with oxen. However, they remain under-utilised due to economic, social and technical constraints. Unlike in other regions of Namibia where donkeys are only used for transport, in the north central regions it is common to find donkeys plowing. Realising the potential for further use of donkeys, the Ministry of Agriculture, Water and Rural Development initiated an animal draft power development programme.*

*Animal-drawn cultivators for weeding were tested including the BS 41 from Zimbabwe and the lighter Western Hoe (Houe occidentale) from Senegal and the Ebra cultivator from France. The Western Hoe proved the most suitable for use with donkeys and women found it convenient. Other trials have focused on the use of animal power for dry sowing, animal training methods and better ways of feeding draft animals.*

## Introduction

The Northern Namibian Rural Development Project (NNRDP) is a joint initiative of the Namibian Ministry of Agriculture, Water and Rural Development and the French Ministry for Co-operation. Since 1994, it has supported the Namibian extension services and local investment initiatives. The method in use, 'action-oriented research' involves farming system research and extension and adaptive research and extension. With the aim of improving the existing farming systems it emphasises:

- the importance of an holistic approach
- sustainability
- replicability
- action.

Within a pilot area, a first external diagnosis of the farming system is carried out (technicians' point of view). The comparison of this diagnosis with farmers' points of view leads to negotiations, the outputs of which are the proposed activities. These are tested within the pilot areas, by farmers, in real conditions.

If proven successful (ie, sustainable and replicable), they are developed into extension messages. Ongoing monitoring may highlight further constraints, leading to new questions and investigations. 'Action-oriented research' is an iterative process that requires general meetings with farmers and establishing interest groups, as well as on-farm visits.

## Historical background

The history of Namibia, involving the end of German colonialism and South-African guardianship has left some "after-ills" in Namibian rural society. Today, the rural society is divided into that in the North and that in the South.

In the north of the country, alongside the Angolan and Zambian borders, in the former 'homelands', 60% of the population shares 27% of the total land. In this area the farmers are often described as 'communal farmers'. The south of the country is separated from the North by the veterinary cordon fence (the former 'red line'). This cordon fence used to have two roles. From a political point of view it was separating the 'White Namibia' in the South from northern homelands. From a veterinary and economic point of view, it was preventing cattle diseases spreading into the commercial areas whose animal products are exported.

Following independence only the veterinary argument remains valid though it is subject to intense and sensitive discussions. South of the veterinary cordon fence, around 3000 commercial farmers (0.35% of the whole population, almost

exclusively white) occupy the remaining 67% of the country's agricultural land where they carry out extensive cattle and sheep farming on farms of on average 7000 hectares. These farmers are described as 'commercial farmers'.

### Physical environment and farming systems

This paper deals mainly with the Oshana, Omusati and Ohangwena regions. These form, together with the Oshikoto region, what is usually referred to as the '4Os' or the north central regions (NCR). The 4Os cover roughly the former Ovamboland. For comparison with the 4Os references are made as well to other regions of northern Namibia such as Kunene, Kavango and Caprivi.

The physical environment is rather harsh in the NCR. Rainfall is low and erratic fluctuating between 300 and 500 mm per annum, usually spread over a short period of 3-4 months. Potential evaporation is very high, averaging 2500 mm per annum which induces a high water deficit. The mean temperature is 26°C in December and 17.5°C in July. The soils are sandy to sandy clay or sandy silt, very poor in nutrients and relatively saline. They are light and suitable for soil preparation with donkeys. Most of the region is a broad plain approximately 1100 m above sea level.

Durand (1994) and Delarue (1996) have described the existing farming methods. Traditional farming systems on communal land are based on subsistence crops and livestock. They involve little or no investment in production except for labour. These are 'input extensive' systems. The major crop is pearl millet. It is rarely sold in the market. Other crops include sorghum, cow peas, bambara nuts, groundnuts and pumpkins.

Cattle are kept on communal pastures (though wealthier farmers have tended to appropriate communal land through enclosure of pastures). The management strategy is aimed at accumulating wealth through having large numbers of cattle, risk aversion and social recognition. Cattle are sent during the dry season to less populated communal pastures since fodder resources are normally insufficient during this period. These are the cattle posts. Due to recent droughts and the degradation of pastures in the central Oshana area, cattle are now staying longer at the cattle posts. The distances to the cattle posts are increasing and cattle may not come back to the

farms at the end of the dry season. The cattle posts are thus developing into secondary farms. As a result of these changes cattle are better fed, but on the other hand, draft oxen may not be available for early land preparation. The transfer of fertility through manure has decreased. Consequently the already low fertility in central Oshana is declining.

So far, donkeys can still feed on the degraded pastures around the farms when rain is sufficient. They are not sent to the cattle posts and are replacing draft oxen either permanently or temporarily. Donkeys may only replace oxen for early field preparation at the beginning of the cropping season, when the grazing resources are insufficient for cattle. However, donkeys may accelerate the soil degradation. Although an increase in the use of donkeys as draft animals answers the needs of densely populated areas as well as of certain segments of the farming community, it is leading to a rise in the whole donkey population, resulting in further overgrazing. Straying donkeys also make it difficult for some donkey owners to control their donkey herd.

Overstocking and pasture degradation further obliges farmers to keep their cattle longer at the cattle posts. The competition for grazing resources reduces the availability of oxen as draft animal as well as the supply of milk. Furthermore, donkeys are not properly fed when there is overstocking and may be too weak to work during the dry season and at the beginning of the rainy season.

A general feature of livestock keeping is the little attention given to animal health. Farmers may either not have the necessary cash for medicines, or medicines may not be available in remote rural areas, or due to little support from veterinary services they may not be aware of the possible treatments. In the NCR, donkeys are even more neglected than cattle. Injuries in the field and external and internal parasites are often not treated though farmers may have to deal with the consequences.

Given the low and erratic rainfall conditions, it is of paramount importance for farmers to take advantage of the first rains, the earlier the sowing, the higher the expected yields. Hence the importance of having draft animals in good condition at the beginning of the season for early field preparation/dry sowing.

Extension Services are new in northern Namibia though they were well developed in southern



Photo: Paul Starkey

*Photo 1: Young people loading water onto a cart pulled by two yoked donkeys in Oshana, Namibia*

Namibia before independence. Immediately after independence the Extension Service managed the government subsidised plowing services. They are now being reorganised to improve their effectiveness in meeting farmers' needs.

Very few farmers derive their livelihood solely from farming and they mostly rely on off-farm income. Nearly every household receives remittances from a family member having a job. Others may receive pensions from the government. This dependency on off-farm incomes is typical. If the contribution of subsistence farming to the rural economy is limited in terms of income it nevertheless provides basic foodstuffs for the farming community, employs the vast majority of the rural population and supports social cohesion.

At present less than 5% of farmers have the means to use the government or private tractor services for land preparation. It may be estimated that half of the farmers own draft animals and implements for land preparation and these farmers can provide a plowing service to non-owners of animal power.

## **Traditional uses of donkeys**

### ***Transport***

In North Central, donkeys are under-utilised. In the 4Os, the use of donkeys for pulling carts is limited compared to the potential. The following factors may explain this situation:

- a high number of cars and taxis owned by people employed in the South are present in North Central

- the cost of carts made by professional welders (artisans) in towns is very high as most of the carts are made with new materials and not with scrap as in other regions of Namibia.

Farmers in the North tend to overvalue the merits of car ownership that is also a factor in social recognition. As a result, appropriate technologies are often ignored. Driving a car is much more valued than sitting on a donkey's back. Similarly, carts should be made from brand new material to be valued by people.

In addition, few artisans in the rural areas are able to supply carts and suitable harnesses, and draft animals are often not properly trained.

Comparatively, the use of carts for transport is more developed in the Omaheke and Erongo

regions. In these areas, carts are made locally from scrap metal and hence at a low cost. Every household in Erongo region has on average 7-10 donkeys for transport (Pitois and Naunyango, 1996). Donkeys, if well cared for, are able to pull carts during the dry season, for water collection, etc. In Kavango Region, donkeys are used to pull sledges in order to transport water and goods from one place to another. In remote parts of Kunene, Ohangwena, Oshikoto and Omusati, people use pack donkeys for transporting water and other materials.

Many benefits could be derived from the development of the use of donkeys for transport. Donkeys are flexible sources of power. If continuously used, donkeys would become stronger and better trained, hence they would be able to work at the beginning of the cropping season, thus enabling farmers to take full advantage of early rains. Through making more effective use of their donkeys, farmers would become more aware of the importance of animal health and animal feeding. These are matters in which improvements are strongly required.

#### **Plowing**

In NCR and Kunene, pairs of donkeys are commonly used for plowing with the same plow as used with oxen. The 1992 drought affected so severely the densely populated and overstocked parts of Omusati and Oshana regions that farmers had to plow by hand or to wait for government or private tractors. The same situation developed during the 1996/97 season. Plowing was delayed in Omusati and Oshana due to the very poor condition of the animals at the beginning of the growing season. Besides transport, donkeys are also used for meat, and for cash generation through selling. Castration is practised and this serves to restrict the growth of numbers.

Conversely, in the 4Os regions, donkey meat is hardly consumed and no formal markets for donkeys exist. The informal market is very limited. There is little use of castration and the donkey population is out of control.

#### **Rationale for developing donkey use**

The donkey population has been increasing since the early 1980s due to an influx from the South and the natural increase in the existing population. The donkey's ability to cope with harsh climatic conditions is greater than that of oxen and the recent droughts have highlighted this comparative advantage.

Donkeys have tended to replace oxen as draft animals in the highly populated-overgrazed areas of North Central. Donkeys can graze where cattle would have starved and have hence been sent to the cattle posts. Donkeys are not taken to the cattle posts. If properly fed they can pull carts throughout the dry season, and plow at the beginning of the cropping season.

A significant proportion of rural households are headed by women because they are widows and because many men work in the cities. There is a gender bias in that men are normally regarded as the ones that should look after cattle. Such a social barrier does not exist for donkeys. Also, donkeys are more steady than oxen and are more easily trained by women. Oxen are usually seen by women as more dangerous than donkeys. The use of donkeys as draft animals would reduce the work load of women and also of many children, thus allowing them to go to school.

#### **Tests and trials**

##### ***The 'BS 41 Master Farmer' cultivator***

Farming systems research carried out in 1993/94 identified weeding as a major constraint. The NNRDP started to tackle this issue during the 1994/95 cropping season by testing, with farmers, a cultivator pulled by draft animals, the BS 41, made by Bulawayo Steel in Zimbabwe.

The BS 41 appears to be heavy and more suited for oxen than for donkeys. Its advantages are that it is very stable, can be adjusted while working and the risk of jamming is fairly low in case of late weeding, as compared to the *Western Hoe*.

##### ***The 'Western Hoe' and 'Ebra' cultivators***

To overcome the constraints identified with the BS 41, and to address more specifically the needs of owners of donkeys, the NNRDP purchased other cultivators for testing. These were the *Western Hoe (Houe occidentale)*, made by Sismar in Senegal, and a cultivator made Ebra in France. These light cultivators were assumed to be suitable for donkeys. The Senegalese *Western Hoe* was preferred. The French Ebra was not better than the Senegalese cultivator, but cost twice as much.

The *Western Hoe* can be pulled by a single donkey and meets the needs of many farmers. Being light it can be easily handled by women who are normally disadvantaged by the heaviness of the BS 41. Furthermore, this cultivator is easy to maintain and can be produced locally. Problems

with the *Western Hoe* include clogging if the weeding is done late and width adjustments must be done when the cultivator is at a standstill.

For the relatively small number of owners of well-trained cattle the BS 41 appears most efficient. The *Western Hoe* is more flexible and better suited for farmers not familiar with the use of a cultivator for weeding, where crop rows are not properly spaced and where the animals are poorly trained. Donkey owners and women should opt for the *Western Hoe*.

### **Dry planting**

The most important constraint of weeding can now be alleviated by the use of the cultivator. The second farming systems constraint is inadequate land preparation. This is due to the unavailability of draft power, caused by cattle being kept at the cattle posts or being too weak to provide the necessary power for plowing. As a result farmers cannot take full advantage of the first rains. It is assumed that a quicker and lighter land preparation would reduce this constraint. This could be achieved through minimum tillage. Moreover, minimum tillage may present some advantages as regards soil structure. Too frequent plowing may destroy the soil structure of sandy soils and induce hard pans. Minimum tillage would allow both dry and early sowing.

Two types of ripper were tested in 1996/97, using donkeys and oxen. These were the *Magoye Ripper*, imported from Zambia, and a chisel tine adapted to the *Western Hoe*. These two rippers were tested against the traditional method of dry planting with a hoe. In all cases, planting was done in lines. Ongoing assessments show that dry sowing and early sowing have no disadvantages compared to late sowing, even if the rainfall pattern is not favourable for dry sowing.

### **Fodder for donkeys**

The first constraint to a quick adoption of animal power was the feeding of draft animals, especially of donkeys that are not taken to the cattle posts during the dry season. Pearl millet straws, which are normally kept for dry season feeding, have a low digestibility and a low nutrient content. Urea treatment to increase digestibility and palatability as well as nitrogenous content has been tested, but unfortunately is only suited for ruminants.

To overcome the feeding problem of donkeys, NNRDP is testing the delayed planting of fodder-producing cow-peas. Cow-pea leaves will be collected at the end of the cropping season,

stored and given to donkeys as a supplement to pearl millet straws during the dry season. Since stored fodder is usually not preferentially given to draft animals, farmers may need sensitisation on the importance of draft animal feeding.

### **Training of draft animals**

Training is the second main constraint that farmers experience in adopting the use of animal power. Our experience is that if some farmers have got their animals to a tractable stage, very few have reached the point where animals are able to walk in straight lines between rows and to respond to voice commands. Furthermore, three to four people are usually required to handle donkeys when they are working, which is very labour demanding. A 21-day training session in 1995 when farmers were shown how to train draft animals confirmed farmers' interest in that matter. The training was carried out by experts from Palabana Programme in Zambia.

### **Donkey harnessing**

Leather donkey harnesses are available in the market but are quite expensive. There are some other harnesses made from rubber or conveyor belts, but they are still a bit expensive. In Erongo Region, a few farmers are specialised in making breast-band harnesses, steering ropes, bits and blinkers from leather or rubber. Local production seems more developed and hence harnesses are cheaper, although they are sometimes poorly made, and may harm the donkeys. The extension services trained some farmers to make harnesses. Small improvements such as wrapping a cloth around protrusions are required in many instances.

### **Conclusions**

The potential for further development of donkey use is high. The NNRDP, through action-oriented research, has been testing different innovations related to donkeys. One of them, the cultivator, has been quickly accepted by farmers since it alleviates some constraints in the farming system. Further tests on animal feeding and training methods are needed.

Being a low-cost draft animals, donkeys can answer the needs of poor farmers who cannot afford cattle. Donkeys could decrease the painfulness of their work, free some labour (more children could go to school), increase the yields, and in less populated areas, would enable farmers to increase their cultivated areas. If donkeys are used for transport it may facilitate farmers' access to markets. Being more drought resistant than

oxen, donkeys may also address the needs of cattle owners as a complementary animal.

Care should be taken not to promote excessive capitalisation. Further development of donkey use may not be easy. Much has still to be done to facilitate the use of donkeys in the north central region. The outstanding problems to be tackled through farming systems research are those of overstocking and donkey health care.

Animal power developments may make farmers more aware of the importance of animal feeding and care. They may turn to a more productive strategy. In other words, the development of donkey use in the 4Os might be a good entry point for further agricultural development regarding animal keeping in general.

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