

A note on the potential profitability of animal traction in Nakuru District, Kenya

by

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Abstract

Since Kenyan independence, farm sizes in Nakuru District have been gradually reduced, first as African land buying companies bought farms from white, large-scale farmers and split them into smallholdings, and later as parts of the smallholdings were passed on to family members or sold. The average smallholding in most parts of the district is now less than 1 ha.

How to make the most economic and efficient use of their land, in order to maximise production, is the problem now facing small-scale farmers. The use of tractors is not cost-effective on such small farms, and so many farmers are having to resort to using hand hoes. Hand hoeing is time-consuming, produces a poor seedbed, and cannot control weeds adequately, so crop yields are low. Animal traction could provide the answer to these problems, but this technology is not common in Nakuru. Donkeys may be the most suitable draft animals in this area, but their successful introduction will require socioeconomic studies, training of both the donkeys and the farmers and the design of efficient implements.

Introduction

At independence Nakuru District of Kenya was inhabited mainly by white, large-scale farmers. After independence the government encouraged Africans to buy farms from the white farmers. Land buying companies were formed, and the government facilitated the buying by providing loans. When the loans had been repaid, the companies subdivided the farms into smallholdings ranging in size from 0.2 to 4 ha depending on the size of the farm, the number of shareholders and the number of shares owned.

Over the past 10 years the farms have been further divided as parts of smallholdings have been passed on to family members or sold. In most areas of the district, the average holding is now below 1 ha.

The problem that the small-scale farmers are now facing is how to make the most economic and efficient use of their land in order to maximise agricultural production. Farming systems research and extension practitioners are working towards easing the situation by carrying out detailed socioeconomic surveys aimed at influencing land use patterns and agricultural policies.

Farm size and use

The population of Kenya is predominantly (85%) rural, and the country's economy is based on agriculture: the agricultural sector contributes 30% of Gross Domestic Product, and about 70% of the working population is employed directly or indirectly in agriculture.

An important challenge facing the agricultural sector is sustainability of production: major constraints include the unprecedented subdivision of the already small holdings, the high cost of farm inputs, marketing problems and high labour costs. The major concerns of most development agents are the training of farmers, provision of credit, better management of farmers' resources and the timeliness of agricultural operations, particularly land preparation because the quality of the seedbed largely determines crop yields.

A recent survey conducted by the Ministry of Agriculture in conjunction with Farming Systems Kenya Ltd revealed that the average farm size in Nakuru District is 0.8 ha, while the average family has eight children. Most farm families have subdivided their farms among one or two sons who are married and living on the farm. Buildings occupy about 12.5% of the farm; the rest is used for food production. Major food crops include maize, beans, potatoes, tomatoes and a variety of vegetables. Some farmers grow tea and coffee.

Mechanisation

On large farms (4 ha or more) tractors are commonly used for land preparation and other field operations. Use of tractors is not cost-effective on smaller farms: tractors are expensive to hire and work is slow (and a lot of time is wasted) because, on small areas, tractors are constantly having to make turns. In fact, most farmers with only 0.8 ha cannot afford to hire tractors unless they have off-farm income, and even then the high costs of other farm inputs inhibits this option. Small farmers are therefore having to revert to using hand hoes.

This, combined with less use of fertiliser, is resulting in declining crop yields per unit of land.

Attempts have been made to introduce small tractors, and testing has been going on for more than 10 years at the Ministry of Agriculture's Central Workshop in Nakuru and at other centres. As yet no small tractor has made any significant entry onto the market. The work at Nakuru has shown that the cost of buying a so-called small tractor is not within reach of most small-scale farmers; even if they could afford the tractor, they probably would not be able to buy the necessary implements. Thorough research is needed to justify the costs of mechanisation of small farms, particularly in the light of the continued subdivision of farm land.

Traditional farming

The reversion of small-scale farmers to the use of hand hoes can be attributed to a number of factors, such as the high cost of tractor operations and the fact that tractors are not readily available when needed. Hand hoeing has many disadvantages: it is time consuming; the quality of the seedbed is poor; and it encourages regrowth of weeds which are often not properly buried. However, animal traction is not a common practice in Nakuru, and so farmers feel they have no alternative at present.

Low crop yields resulting from poor land preparation are a major concern. Thus what is needed is an alternative technology, and animal traction could certainly make an important contribution to solving these problems.

Animal traction

Farmers' priorities in farming are first to grow food for themselves and their families, and second to generate some income to take care of their other basic needs. Farmers are very careful not to engage in activities that may put their farms—their livelihood—at risk; for example, they will resist any assistance that presupposes the loss of their farms if they cannot pay back the loan. They are therefore very business conscious.

Hence, in considering the best option for mechanisation thorough socioeconomic studies will need to be undertaken. For instance, while ox plowing is the most common form of animal traction in Kenya, farmers in high potential areas opt to keep dairy cows for milk production, the immediate benefit being income accruing from the sale of milk. But land cannot be used for both food crops and grazing at the same time. As feed requirements for oxen and dairy cows can be broadly similar (FAO, 1972), the implication is that

dairy cows have a comparative advantage over the oxen. It is therefore imperative that the decision on the species of animal to be used for draft be based on maximum economic returns per hour.

Donkeys have gained acceptance in Kenya as a means of transport and are particularly common in high potential regions. Our observation in Farming Systems Kenya Ltd is that the donkeys are grazed on the roadside and very little attention is paid to them, unlike the cows and oxen. If a donkey is to be used for traction work it must be well fed, although donkeys require less feed than horses or oxen (FAO, 1972). Baseline surveys and socioeconomic studies need to be carried out to determine the acceptability of the species. This is crucial in Nakuru District where land holdings are becoming smaller because of subdivision of the land.

At the same time implements will need to be assessed and redesigned so that, hopefully, single animals could be used. The Agricultural Engineering Department of Egerton University has initiated student projects to redesign animal traction implements, an area that will need serious follow-up.

Conclusion

The potential role of work animals, particularly donkeys, in Nakuru District, appears very great. One major challenge is training of both the donkeys and farmers, but economic analyses should also be carried out as the profitability of animal traction is of major concern. It is recommended that more studies be carried out in the following areas:

- selection of the most economical species
- acceptance of the selected species
- design of efficient and economical implements
- utilisation of different species and their opportunity cost compared with other species, tractors and hand hoes
- labour-saving aspects
- sources of feeds and the requirements for the number of animals to be deployed based on available land
- possibility of communal management and use of the animals.

Farm size is certainly dictating that alternative methods be sought because the current trend of using either hand hoes or tractors has drawbacks that are reflected in the profit margins of the farms.

Reference

- FAO, 1972. *Manual on the employment of draught animals in agriculture*. Food and Agriculture Organization of the United Nations (FAO), Rome, Italy. 249p.