The economic impact of pack donkeys in Makete, Tanzania

by

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Abstract

This paper reviews the economic effects of the introduction of donkeys and compares their cost efficiency with other transport interventions undertaken in the region. The use of donkeys generated larger economic benefits than the construction of a feeder road. Regarding cost efficiency donkeys were comparable with road investments. The donkeys in Makete were only used for production-related transport tasks on the farm. The benefits would be higher if the donkeys were also used for domestic transport purposes. Domestic transport is traditionally a female task, but the animals were owned exclusively by men. The study showed that lack of cash was the main constraint to the purchase of donkeys. It is stressed that investment in donkeys may be as efficient as investment in roads.

Introduction

This paper is based on a field study (Sieber, 1996) to assess the economic effects of the Makete Integrated Rural Transport Project (MIRTP). The project was conducted by the International Labour Organisation from 1986 to 1995 to improve the transport capacity of rural households. The principal aim was to reduce the transport burden of rural households by improving footpaths, tracks and roads with labour-based technologies, by transport-avoiding measures and by making donkeys available for the local population.

At the start of the project, a survey was undertaken to investigate household wealth, expenditure, transport behaviour, agricultural production and marketing (Barwell and Malmberg 1989). In 1994, another survey was carried out to identify the socio-economic changes that had taken place. This paper is based on the second survey. In eight villages, 248 households were interviewed. Of these, 171 households were a 10% random sample of all households in the villages. Another 77 households were interviewed because they possessed a donkey, bicycle or wheelbarrow. The databases made it possible to compare the economic effects of the transport interventions.

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The study concentrated on the Matamba Ward, in the northern part of the Makete District, which is located in southwest Tanzania, 900 km from the capital Dar es Salaam. The ward stretches over fertile highland surrounded by mountains, hills, ridges, valleys and a steep escarpment to the lowland. The population density is relatively low (18 people/km^2), and growth figures are far below the national average because of strong out-migration. Matamba has a moderate tropical climate which allows the rain-fed cultivation of temperate crops such as potatoes and wheat, which are traded with the people of the lowlands. Nevertheless, the economy relies on subsistence agriculture. The annual cash income, earned by an average five-person household, from selling agricultural produce amounts to US$ 120.

The growth of the donkey population

In Makete three donkey centres were set-up to promote the dissemination of donkeys, animals that were rare in the district before the project started. Even though the animals were promoted all over the district, most were sold in Matamba. This is due to the stronger market orientation of the Matamba farmers compared to the remainder of the district.

Before the project started there were three donkeys kept in the surveyed villages of Matamba. By 1994 this number had increased to 56. At first, few animals were bought from the MIRTP donkey centre, later, breeding activity and barter with the lowland population was the main factor of growth. Today, two thirds of the donkeys are female and often used for breeding. The population growth rate would have been much higher if the mortality rate of the donkeys had not been so high. The Makete climate could be one of the reasons for this. In Tanzania donkeys are mainly used in hot and dry areas, while the climatic conditions in the mountainous Makete District are wet and cold.

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The high mortality rates were compensated for by the high levels of reproduction which probably increased the number of donkeys in Matamba more than the importing of animals from outside.

Donkey-owning households are better off

The most obvious observation in Matamba is that households that own a donkey are much more prosperous than comparable households without donkeys (Figure 1). The donkeys enable their owners to cultivate bigger plots. On top of this the farmers use more fertiliser because it can be carried to the plots with less effort. Bigger fields and higher inputs enable farmers to double harvests and sales and thus the revenue received from marketing activities. The increased income results in higher spending and a better endowment of the 'donkey households' with kerosene lamps, radios, sewing machines and tin roofs.

Benefits of increased agricultural production

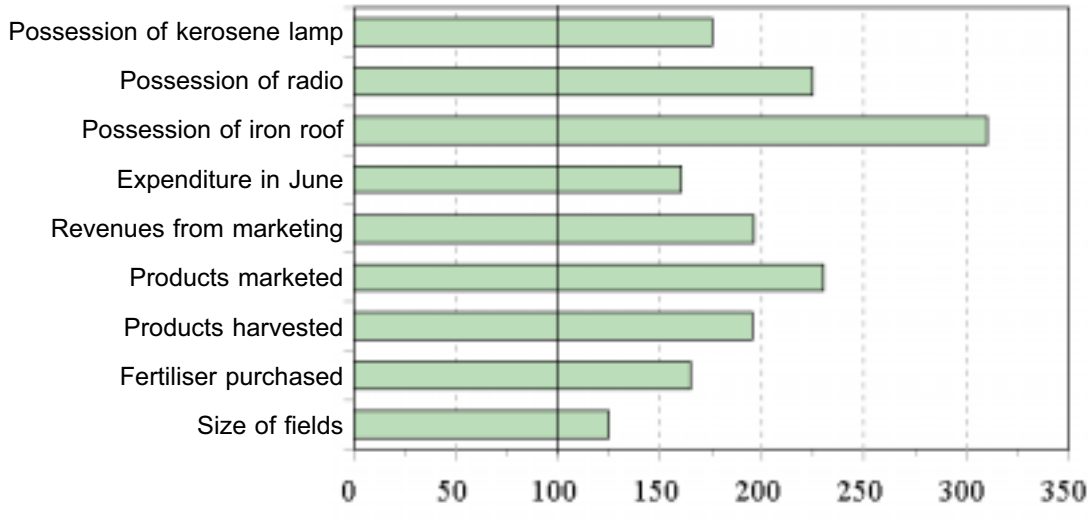
The greatest economic effects can be seen in agricultural production. While 'non-donkey households' marketed on average only 2.1 tonnes of agricultural products per year (worth US$ 120), the 'donkey households' marketed 5.1 tonnes (US$ 240). This increase in production was only possible with the growing use of agricultural inputs. A much higher proportion (90%) of 'donkey-households' used fertiliser, compared to 'non-donkey households' (67%). The donkeys carried 87% of all the fertiliser purchased by 'donkey households'.

It is important to consider the incomes of households before and after the purchase of a donkey. Frieling and Mchoavu (1991) stated that the donkey owners were already relatively wealthy when they purchased their animals. Nevertheless, this study concluded that buying a donkey generated an estimated net benefit to households of US$ 40–110 per year by increased marketing.

Case study: a donkey owner in Mpangala

A farmer from the village of Mpangala bought a donkey in 1990 from the MIRTP Donkey Centre. Although this died quite soon, he obtained replacements and eventually owned three donkeys, which he used for transport purposes. They carried 4.2 tonnes of crops home from the field and another four tonnes to the collection points. The owner did not use the donkeys for transport to the grinding mill or the water point because both were located close to the house. He also used the donkeys to transport produce to the nearby market in Matamba, which he visited weekly. The donkeys transported 18 tonne-kilometres annually, and saved about 285 hours of arduous work and drudgery. This enabled the farmer to cultivate more plots that are further away from the homestead and collection points. He doubled his cultivation area and increased his annual income

Figure 1: Comparison of donkey-owning and non-donkey-owning households in 1994. Index: non-donkey owners = 100%



to US$ 168. His children can now attend secondary school.

Donkeys were mainly used for production-related transport

The donkeys in Matamba were used only as pack animals. Each animal made nearly 100 trips a year and carried a total of 8 tonne-km. Even though the donkeys generated an increase in market activity, only 3% of their trips were to markets, while 77% were undertaken to carry crops from the fields and 7% were for carrying grain to the mill (Figure 2). Thirteen per cent of the trips were transport services for other farmers or members of the family. The main effect of the donkeys seems to be that crops were quickly transported from the fields to the collection points. Not a single household used donkeys to collect water or firewood. People claimed there were no suitable containers to transport water and firewood was transported in long pieces, which could not easily be loaded on a donkey.

Donkeys were used to carry 15% of the household's total transport burden measured in tonne-kilometres. They reduced the amount of work and drudgery, especially for women. These economic benefits could be assessed by estimating the amount of time saved. Assuming that the average load of a donkey was three times that of a human being, a donkey could reduce the annual transport burden by 93 trips which amounts to

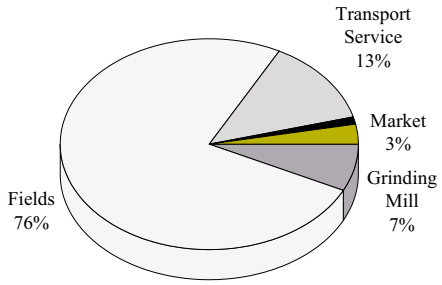


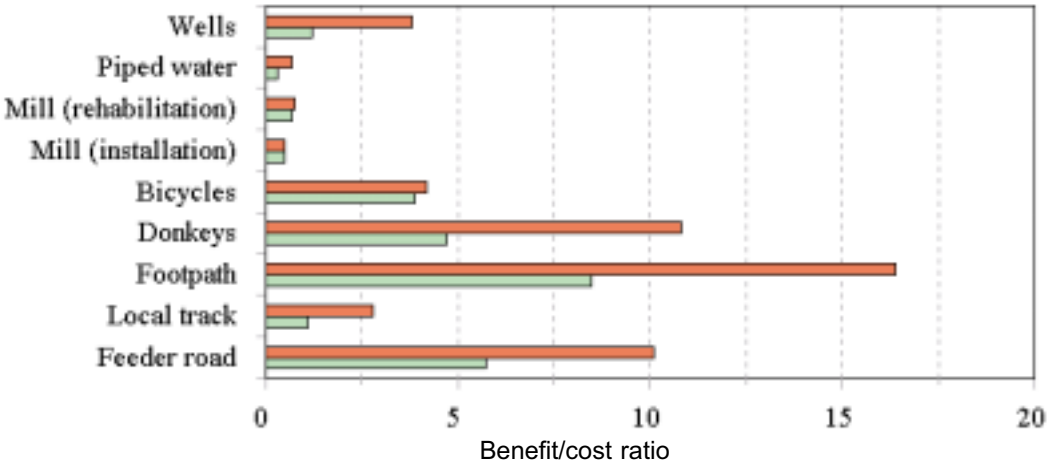
Figure 2: Trips undertaken with donkeys (total of 98 trips per year)

133 hours per year. A monetary value of the time savings could be attributed by using the opportunity costs of time, that was represented by the income increase generated by working the saved time in their fields. The annual monetary benefits for time savings amounted to US$ 10 per household. More time could be saved if donkeys were used for water and firewood collection: but men own the animals, while women have the tasks of carrying most of the domestic transport volume.

Economic benefits from donkeys were comparable to roads

The total annual benefit generated by donkeys ranged between US$ 55 and US$ 124 per household. This can be compared to a low cost

Figure 3: Range of benefit/cost ratio of transport interventions in Makete: optimistic (upper) and pessimistic (lower) views



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feeder road in Matamba, whose rehabilitation generated annual benefits of only US$ 17–20 per household. Absolute benefits only tell half the truth if they are not compared to their costs: the benefit/cost ratio of donkeys and of feeder roads were mainly in the range 5 to 10 (Figure 3). Most of the other transport interventions examined in Makete had lower ratios. Only the construction of footpaths generated a higher cost efficiency.

Reasons for donkey purchase and possible price constraints

People in Matamba bought donkeys because of the burden they faced transporting heavy crops, (especially potatoes) from the fields to the collection points. Donkeys were bought only if their use resulted in increase in revenues, which quickly compensated for the big investment costs. The purchase of a donkey was rational behaviour only in regions with a strong market orientation such as Matamba.

Another restriction was the low cash income in many parts of the district. At the beginning of the project, the price for the donkeys was subsidised to accelerate their adoption. After the cessation of the subsidies very few donkeys were bought.

Without subsidies a donkey cost US$ 88. In a survey of households half of them said that they could not pay more than US$ 10, a quarter said they could pay US$ 20, and less than 10% said they could afford US$ 40. Without access to credit none of the households would be able to buy a donkey at current prices. A credit scheme could increase the number of donkeys sold. If 80% of the price for a donkey was financed by a credit scheme then more than 40% of the said households would be able to purchase an animal.

Conclusions

Donkeys in Matamba were mainly purchased for production-related transport tasks and they considerably reduced the transport burden of rural households. However, donkeys were only bought if they enabled farmers to increase revenues, which quickly compensated for the high investment costs. Benefits could be much higher if donkeys were used as well for water and firewood collection. The poverty of the households was the main constraint to purchase and without subsidised credit the demand for donkeys could be zero.

The conventional focus of transport planners on farm-to-market roads overlooks farm transport constraints. This study demonstrates that the use of donkeys on the farm may generate greater economic benefits than the construction of a feeder road. With regard to cost efficiency, donkeys were comparable with road investments. There is no economic reason therefore, why donors and governments should spend large sums for feeder roads and do very little to promote donkeys. The experience of Matamba shows that bottlenecks in production-related transports can be reduced efficiently by the introduction of donkeys as pack animals.

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