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Transport constraints and the roles of mules and donkeys in Kaffecho Zone, Ethiopia

by

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Abstract

This paper examines the importance of donkey and mule transport in a remote region of Ethiopia (Kaffecho Zone). Households are highly dependent on pack animals in trying to develop an exchange economy above mere subsistence, with climatic conditions and payload considerations favouring the use of mules. However, ownership levels are low relative to national averages. The main cause of low ownership is thought to be poverty, although supply constraints, including the availability of credit, may also be important. Policies to encourage wider ownership require a better understanding of both supply and demand constraints which are identified and are currently being researched.

Introduction

Kaffecho Zone lies in the south western corner of Ethiopia and covers an area of some 11,000 km between the Gojeb River in the north and the Omo River in the south-south-east. Approximately 96% of the 1994 population of between 650,000 and 700,000 people is rural and depends directly on agriculture for its livelihood. The remaining inhabitants are mainly involved in trading and in government services. Kaffecho Zone (subsequently referred to simply as Kaffecho) contains most of the remnants of the original forest cover of the country—a unique and valuable reservoir of biodiversity. Indeed, the word coffee is a corruption of the area's traditional name 'Keffa'. The zone is also home to Ethiopia's growing tea industry. Despite this valuable cash crop, and both wild and cultivated coffee, Kaffecho remains one of the country's poorest regions.

Part of the explanation for this lies in the inadequacy of its transport system. There are few roads and motor vehicle transport services. Most farm households are dependent on traditional forms of transport—walking with goods carried on the shoulder, head or back, and the use of pack animals. However, the climate and topography places limitations on the use of animals and ownership levels are well below the national average. This paper discusses the characteristics of the transport system, the role of animal transport, apparent barriers to the wider use animals, and measures which might be taken to improve farm-level transport. Without these improvements it is difficult to envisage how the present low quality of life can be significantly improved.

Climate and geomorphology

Some 85% of Kaffecho is situated at altitudes between 1500–2200 m and, consequently, enjoys a favourable and moderate climate. Average annual temperatures vary from 16–20°C, while rainfall ranges between 1600–2200 mm, with one long rainy season lasting on average from 7–9 months in March–October (Abate, 1994).

Geomorphology and climate, in combination, are responsible for a landscape that is characterised by hundreds of rivers (most of them perennial), steep valleys and gorges, hills and thick heterogeneous forests. The long rainy season favours the cultivation of perennial crops like coffee, tea and ensette (false banana). Besides maize as the main cereal crop, the people cultivate teff (staple grain in much of Ethiopia), sorghum, wheat, barley and several root crops.

Vegetation and land use

Kaffecho is endowed with natural forests (270,000 ha, some 26.6% of the total land area) which are reported to be under pressure as a result of uncontrolled firewood-cutting and slow but steady extension of the area under cultivation. It is estimated that over 62% of the total land area is, or has been, under agricultural cultivation. Some 10.2% of Kaffecho's total land area is reported to be grazing land.

Economy

There is virtually no industrial sector in Kaffecho. Crop production is estimated to be just above the level of food self-sufficiency in a normal year. There are, however, a considerable number of families that go without their minimum daily food requirements. The prevalence of malnutrition, especially in its chronic forms, is almost as high as elsewhere in Ethiopia (Argaw, 1994).

Transport system

Route Infrastructure

In the hilly and forested terrain which characterises much of the settled part of Kaffecho the influence area of an all-weather road probably does not exceed 4–8 km, or 1–2 hours walk. Thus the combined road length of 281 km does not serve more than 11–22% of the total, or 18–35% of the potentially cultivable, area. The proportions of the population served are likely to be of a similar order since it is widely scattered throughout the cultivated areas, in spite of the Dergue's policy of villagisation (Abate, 1994). But, reaching an all-weather road does not guarantee either the availability or affordability of modern means of transport. Under the proposed Road Sector Development Programme, Kaffecho can only expect about 140 km of road to be added in the next 10–15 years, increasing the proportion of the total area served to perhaps 15–30%, or 26–52% of the potentially cultivable area.

Maps indicate a number of other existing and disused roads. However, inspection shows that due to lack of maintenance most have deteriorated to the point that it is not possible to use them at all, or only with great difficulty in the dry season and with 4-wheel drive vehicles. Thus, reliable road communication currently serves only a limited area and there are considerable areas and population centres located a long way from a motorable road.

In addition to the formal road network there is an extensive network of trails and footpaths used by pack animals and pedestrians, primarily for access to markets and essential services. There is no official categorisation of these routes, but it is clear that for the majority of the population this is the effective transport system. One survey on one of the main trails from Felega Selam to Bonga indicated a mule traffic on the day preceding market of 150–200 animals. Field surveys indicated that due to the terrain, climate and soils, the condition of most trails provides only an arduous means of communication. It is not possible to use motorcycles on them due to the steep, rocky and often slippery surfaces, absence of drainage, and the poor quality of bridges which offer only a precarious form of passage for pedestrians. Bridging of large rivers, such as the Gojeb (35–40 m) which divides the northern part of Kaffecho, is a major problem and most bridges do not survive the summer (wet) season and have to be rebuilt. In the hilly parts of Kaffecho, which comprise the main settled and cultivated areas, rainfall can be expected to exceed 100 mm about 7–8 months a year. Thus, for many months of the year parts of Kaffecho are cut off even from their woreda (district) headquarters.

Transport services

The Transport and Communications Department of Kaffecho reports that there has been a recent surge in the number of goods vehicles operating in the area, but only 7 are registered locally as freight carriers. There are an additional 24 privately registered motor vehicles, 21 owned by government, although not all are in working order, and 26 government-owned motor cycles. This is a tiny fleet for a population approaching 700,000 and the majority depend on animal transport and walking. Moreover it is noteworthy that the national fleet has been static at about 60,000 vehicles for more than a decade (Howe, 1992). The majority are located in the major urban areas and only a few thousand are available for hire and reward services in rural areas, mostly along the major trunk routes.

Animal ownership and use

There are estimated to be 63,700 oxen, 12,800 horses and 5100 mules and donkeys in Kaffecho, or one pair of oxen per 4.1 households and one equid for every 7.3 households (MOA, 1984; Abdelle 1994). In 1984 a Ministry of Agriculture survey indicated that in the old Keffa Region there were 1.7 mules for every donkey (MOA, 1984). In practice few oxen are used for transport and there seems to be considerable reluctance among many farmers to use them for this purpose. At 275–300 kg the Ethiopian ox is a comparatively light animal (Pathak, 1987). Because of their low speed, seldom exceeding 0.6 m/s, as against the normal working speed of 0.9–1.0 m/s of similar animals in Asia, a pair of Ethiopian oxen is able to produce a draft of about 1 kN, sufficient to pull the *traditional* maresha plow. Bryceson and Howe (1989) considered that this was insufficient to pull

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a cart with a significant payload. Not a single animal-drawn cart was observed in Kaffecho and indeed the terrain would limit their use to relatively few areas.

There were only a few other forms of non-motorised transport such as bicycles, wheelbarrows and handcarts. Most of the latter were crudely constructed, giving low capacity and making them difficult to use. Pack animal transport by equids—mainly mules and donkeys—is the norm. In this respect Kaffecho is poorly endowed since its ownership level is well below the national average which in 1983 was estimated at about one pack animal for every household. At that time there was a declining trend in national ownership with the per household equid population having fallen by 18% between 1978–83 (Admassi, Abebe, Ezra and Gay, 1983).

There are many possible reasons for the low level of pack animal ownership. The old southern regions of Gamo Goffa, Keffa (Kaffecho) and Wolega shared the lowest levels of all regions in Ethiopia suggesting environmental conditions may be a significant factor (Bryceson and Howe, 1989). A more likely reason, however, is income. The local cost of a mule is Birr 1000–1400, a horse Birr 500–700 and donkey Birr 150–250 (US$ 1 = Birr 6.3). In comparison the local purchase price for an ox is Birr 600–800. It is noteworthy that in Kaffecho donkeys command only 15–20% of the price of a mule because in the damp conditions which prevail they are reported to have poor disease resistance and low life expectancy. At 45 kg their average load capacity is also only about two thirds of the average reported for a mule in Ethiopia (Tesfahunegan, 1986).

Surveys in the 1980s confirmed the exceptionally low cash incomes achieved by the rural people (FAO, 1986). There was remarkably little wealth differentiation within regions, since land reform had had a levelling effect on household output and income. Extremely few households had off-farm, non-agricultural sources of income. For zones typical of the land use in most of Kaffecho annual total farm income would have been in the range Birr 300–540, with net cash income at about 10–20% of this sum (FAO, 1986). A negligible amount is spent on transport (ECSA, 1988). Given the negative economic growth of Ethiopia's economy during the 1980s, in real terms, it is doubtful if household income is presently significantly different from these levels (World Bank, 1992).

Consequences of reliance on traditional transport

Reliance on traditional forms of transport poses a considerable barrier to the development of an exchange economy and locks the peasant farmer into a subsistence mode of existence and low quality of life from which it is difficult to escape. Pack animals offer a significant payload advantage over human carriage, especially if one person can command the use of several animals. Even with a single animal the potential cost reduction from substitution of pack for human carriage is of the order of 50%, which would significantly improve the efficiency of transport work by farmers (Tesfahunegn, 1986).

Two examples from the field studies illustrate some of these aspects.

Example 1

Mule hire for the journey from Chiri to Bonga—about 20–30 km depending on the point of departure—costs Birr 15–20 for a maximum load of 1 quintal (100 kg). The trip would normally occupy two days necessitating a further Birr 10 for meals and accommodation. The daily opportunity cost of labour in rural areas is estimated at Birr 2.5, giving a total transport cost of Birr 30–35 per quintal. For comparison, urban wages in Bonga Town paid by the municipality are fixed at a minimum of Birr 6 per day, although private sector rates of Birr 3 were quoted for urban areas generally.The average selling prices of

Table 1: The average selling prices of commonly traded commodities in 1993/94

Crop	*Birr/quintal*
Maize	36-65
Sorghum	46-78
Peas	100-160
Beans	90-160
Rapeseed	185-285
Coffee	300-500
Coriander	450-550
Sesame	370-430

Source: Abdelle, 1994

Note: 1 quintal = 100 kg; US$ 1 ≈ Birr 6.3

the most commonly traded commodities in 1993/94 are given in Table 1 (Abdelle, 1994).

Only in the case of the high value seeds, most of which are traded in small quantities, is the transport cost in reasonable proportion to the gross selling price. It may still of course be disproportionate in relation to the net return to the farmer. For the low value food staples, such as maize and sorghum, the transport cost makes a net return unlikely. Moreover, given the low availability of pack animals, head or back loading is even more unattractive because of the limited payload (20 kg maximum for long distances) and transport costs amounting to Birr 15.

Example 2
A mule carrying 60 kg of dried coriander pods (not seeds) was hired for Birr 15 for the 43 km journey to Bonga from Felega Selam. It entails a three day trip so allowing Birr 20 for meals and accommodation and Birr 7.5 for the opportunity cost of labour gives a total cost of Birr 42.5 or Birr 16.7/tonne km (US$ 2.7/tonne km). The transport cost is again high in relation to likely net and gross returns. Equivalent local truck transport rates are Birr 0.6–0.9/tonne km ($ 0.10–0.14/tonne km) for the 115 km trip from Bonga to Mizan Teferi. Even allowing for the tapering off of costs with distance it is clear that traditional forms of transport are very expensive.

Passenger transport by animal is generally more expensive than goods. This is due to a combination of both greater demand and supply constraints.

Discussion

Notwithstanding the foregoing examples it is clear that for a large proportion of Kaffecho's population pack animal transport offers the only realistic way of obtaining returns from agriculture above mere subsistence. Ownership of an animal could significantly reduce total transport costs and increase both the returns to the farmer; and the range of distances over which it is economic to trade different farm goods. This has been underlined by recent research which has emphasised the economic advantage conveyed by all simple forms of transport that offer efficiency improvements over human carriage, although significantly the studies excluded pack animals (Ellis and Hine, 1995; Barwell 1996). There seems little reason to doubt that pack animal transport is an important stage in the transition from inefficient human load carriage—on the head, back or shoulders—to higher capacity, cheaper and faster movement by cart or motor vehicle. For this reason wider ownership and use needs to be encouraged from existing modest levels, but a number of issues need to be better researched if appropriate policies are to be formulated, notably:

> What are the economic advantages of wider equid use and ownership? To what extent does income from hiring supplement direct use?
>
> What are the key constraints on wider farmer ownership of equids: supply of animals, very low incomes, or the absence of affordable credit facilities? Given the (apparent) necessity of using the most expensive equids in Kaffecho (mules), this question is crucial to their wider use.
>
> What are the factors conditioning a farmer's preference for different kinds of equids and the trade-offs between the extra capital cost of a large animal (mule) and its increased load capacity and speed?
>
> What are the main characteristics of equid hire markets and do they need assistance to develop?

It is intended to address some of these issues in the second phase of studies in Kaffecho which are currently in progress.

Notes

The field work for this research was conducted in September–November 1994. Since then Kaffecho Zone has been enlarged by the addition of further territory. All data in this paper refer to the situation at the time of the original studies with the exception that the road length figure has been updated to reflect the completion of the Gimbo–Masha Road (about 130 km), which significantly improves access in two northern woredas (districts), Gawata (Kobech) and Tiliku Gesha (Deka), and for the whole zone. There are approximately 30 major and 52 secondary and tertiary markets in Kaffecho.

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