

# From beast of burden to multi-purpose power source: challenges for the use of donkeys in Bolivia

by

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## Abstract

*For many years, donkeys, together with horses and llamas, provided the only source of non-human transport in the Andean regions of Bolivia. This was mainly in their capacity as pack animals. Because of the nature of the terrain, carts were rarely an option. Even today, with an ever extending network of all-weather roads, the principal use of carts in Bolivia remains localised in a few immigrant colonies in the eastern lowlands. The extensive road building projects, combined with increasing crop yields and overall development have had a dramatic impact on the use of equids. The bulk of the transport is currently provided by trucks.*

*Donkeys are mainly used to carry cut fodder to the farms and agricultural produce to the road heads. In areas where roads are absent or impassable during the rainy season, donkeys and other pack animals still provide an important means of communication. But, with the continuing progress of road building projects, these areas are becoming rare. In this changing environment possibilities exist for the alternative employment of donkeys. Opportunities exist not only in the development of low-cost carts, but also in the use of donkeys for low draft tasks such as seeding and inter-row weeding and other agricultural tasks that are currently carried out by hand.*

## Introduction

The picture of long trails of pack animals winding their way down treacherous mountain paths still features strongly in tourist literature advertising dream-holidays in the Andean region of Latin America. In reality, such sights are now rare. A combination of extensive road development, which has opened up previously isolated areas to motorised traffic, and increasing crop yields, especially of potatoes, has significantly increased transport needs and possibilities in the region.

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This paper presents part of the results of a Participatory Rural Appraisal (PRA) on the 'availability, use and management of work animals in the middle Andean hills of Bolivia', which was carried out between May and October 1996 in six communities in three provinces of Cochabamba Department in Bolivia (see Map 1). These provinces were selected as they represent the broad spectrum of agro-ecological zones, socio-economic circumstances and work animal usage within the region. During the PRA exercise, a variety of methods such as historical transects, community mapping, seasonal calendars, mobility maps, resource flow diagrams and matrix and problem ranking were used. These resulted in basic information on communities, past events, farming and livelihood patterns and livestock and animal traction sub-systems. Using the information obtained this paper discusses the changes that have occurred in the use of donkeys in the region and analyses the new possibilities that exist for the diversification of their use.

## Background

The communities in which the PRAs were carried out were, Sarcobamba and Sarco Kucho in Capinota, San Isidro and Puisilla in Morochata, and Kolque Joya and Boqueron K'asa in Tiraque.

Map 1: Location of Cochabamba and position of Bolivia in South America



They are situated between 2300 and 3800 m above sea level with a mean annual rainfall of 500–650 mm and a mean daily temperature between 11–15°C. Size of landholding ranges from 0.5 to 5 ha. Whilst the differences in topography and micro-climate have obvious implications for agricultural practices within the communities, potatoes are the major cash and subsistence crop in the whole region. Cereals (maize, barley, oats or wheat, depending on the altitude) form another main component of the cropping calendar which is further complemented with crops such as broad beans, carrots and onions. Livestock forms an integral part of all farming activities and is mainly used for the provision of traction (oxen) and household food and income (pigs, chickens, sheep and dairy cattle). In addition, most households own donkeys, a horse, and at the highest elevations, llamas.

### Donkeys: past and present

There is little information available on past and current numbers of donkeys in the country. Equids are not listed in the chapter on animal production of the Secretaría Nacional de Agricultura y Ganadería (SNAG, 1994), which reports on animals used for commercial meat production only. The FAO Production Yearbook (1996) has entries for horses, donkeys and mules, but these are at best rough guesstimates (Table 1). Moreover, hardly any attention is paid to this animal resource by Bolivian institutes or NGOs.

In the past donkeys and other pack animals used to be the only means of transport available in the area both for people and goods. Hence donkeys not only formed part of the essential lifeline with the outside world, but they also constituted an integral part of many on and off-farm activities involving the need for transport.

Since the Agricultural Reform Bill of 1954, when Bolivian peasants, who previously worked the land belonging to large landowners under a feudal system, acquired ownership rights to the land they were cultivating, the agricultural landscape has changed significantly (Bentley, 1996). Not only did peasant farmers enter into the market economy, but also the agricultural development in the country now focused on the millions of subsistence farmers that had to provide the country with food. The opening up of the Andean hinterland by an expanding network of roads has also meant that development organisations can

**Table 1: Animal population (1000s) for selected species in Bolivia**

	1979/81	1992	1993	1994
Cattle	4570	5779	5794	6012
Donkeys	680	631 <sup>1</sup>	631 <sup>1</sup>	636 <sup>1</sup>
Horses	330	322	322	324
Mules	86	81 <sup>1</sup>	81 <sup>1</sup>	81 <sup>1</sup>
Llamas	na	1516 <sup>2</sup>	1552 <sup>2</sup>	na

na = not available

<sup>1</sup> FAO estimates; <sup>2</sup> SNAG (1994)

Source: Adapted from FAO (1996)

now easily access communities that were previously virtually beyond reach.

Through this improved accessibility and availability of information farming communities were able to obtain technologies such as chemical fertilisers, phyto-sanitary chemicals and improved potato varieties. These technologies have had a major impact on the production of this crop with yields, in some cases, increasing more than tenfold. As a result, families that previously produced around 1000 kg of potatoes, mainly for home consumption, now often have several tonnes to sell. Marketing these amounts using pack animals would be a long and tedious process and, as the extension of the road network also opened up the communities to motorised transport, most of this type of transport is currently done by trucks and pick-ups. Furthermore, the adoption of more sophisticated attitudes in the larger cities of Bolivia has deemed the presence of large animals and the accompanying manure unacceptable, and equine transport is currently all but banned from urban areas such as Cochabamba.

In spite of all these changes the majority of the rural households still own one or two donkeys. Whilst they can be seen tied-up near the homesteads or grazing for the majority of the day, they are still employed for operations such as the transport of firewood, fodder and agricultural produce. In addition, and importantly, they still provide a means of emergency transport when no vehicles are available or when weather conditions make roads impassable to motorised transport.

### Donkey husbandry and use

The majority of the donkeys employed in the communities are bought at one to three years old at weekly local livestock markets. Prices range



*Photo 1: Old man with a pack donkey and foal on a rural road in Bolivia*

from US\$ 30 to US\$ 50 and, whilst most animals are sold untrained, premiums are paid for trained animals. The working life of donkeys is reported to vary between five and ten years, which suggests that life span varies from 6–13 years. Any foals that are produced are normally sold unless household needs dictate otherwise.

The management of work animals was reported to be the responsibility of the men. Animals are trained over a period of one week to a month, during which time they are usually worked with more experienced animals. Feeding was not considered to be a problem during the wet season (November to March). Donkeys are mainly grazed on natural pasture on communal or fallow land and during the drier periods of the year they also receive cereal straw or maize or bean stover which is stored in sheaves or heaps near the homesteads. No supplementary foods are bought for the animals.

Although health problems are not common, cases of angina and colic do occur occasionally, especially during the change from the dry to the wet season. Foot rot and excessive hoof growth are also reported, but as with the other health problems mentioned, these could be avoided through improved management practices. Veterinary care, as is the case for all other livestock, is virtually non-existent due to a lack of

knowledge of drugs and treatments together with its low availability and the high costs. The few traditional treatments that are practised within the communities are reported to have variable success rates. Housing is not provided for the animals and overnight they are normally tied-up outside the house to a stake or a tree.

Pack saddles are not commonly used in the area. Usually, only a blanket or a fertiliser bag is thrown over the animal's back for protection before the load is put on. Loads are carried over the back rather than over the withers and either hang loose or are tied up with a rope under the animal's belly. The animals are used, on occasion, to transport firewood to the house or manure from the livestock corrals to the fields. Another common use is the transport of alfalfa or other fodder to the farm to feed the dairy animals and oxen. On fields which cannot be reached by motorised transport, donkeys are often employed to transport agricultural inputs and harvested materials the short distance from the field to the road.

### **Options and challenges for the future**

It is apparent that major changes have occurred in the utilisation of donkeys in the Andean region of Bolivia and that, given the current pace of developments in the region, this trend is likely to

Photo: Paul Starkey

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continue. Although the use of appropriate pack-saddles and the correct placement of loads over the withers could have some impact, there are relatively few realistic options to improve the animals' pack capacity. In the end, an animal is only able to carry so much. Nevertheless, several low-cost possibilities and options are thought to exist to optimise the use of this currently chronically under-utilised resource.

### **Cultivation**

Apart from the primary cultivation which is done with oxen, all other field operations are presently carried out by hand. There are various possibilities to employ donkeys in low-draft tasks, for example, inter-row weeding. Such activities have been successfully carried out by donkeys in other farming systems (eg, Betker, 1993; Emhardt, 1994) and their introduction warrants serious consideration in the current context.

Unfortunately, appropriate implements for these types of operations are not available in Bolivia at present. However, with the continued increase in the establishment of small blacksmith workshops in many communities and the collaboration of more traditional farm-machinery manufacturers, there are distinct possibilities to adapt, manufacture and evaluate low-cost implements that have proved successful in other areas. One of the main stumbling blocks, though, is the established cultural prejudice against the employment of donkeys for any other kind of activity than the transport of goods. Nevertheless, attitudes are changing and in two of the communities in which the PRA was carried out, donkeys and horses are already occasionally employed for the threshing of cereals and broad beans.

### **Soil and water conservation**

In the semi-arid conditions of Cochabamba Department, the conservation of water is of vital interest to farmers. Given that steep, fragile hillsides are widely cultivated for annual crops, soil conservation is also a priority concern with farmers. Reduced tillage techniques that are relevant answers to these concerns include contour and strip tillage to promote rain-water infiltration and to reduce the risk of soil loss through water and wind erosion. Equipment developed for these techniques has normally had a high draft requirement, but efforts have been made to design equipment suitable for low draft animals such as donkeys (Sims, Ellis-Jones, Uresti and Francisco,

1996) which merit evaluation under the conditions of the Bolivian valleys.

### **Carts**

The improvement in the road infrastructure has made possible the introduction of animal-drawn carts. The use of carts would not only significantly increase the transport capacity and efficiency of donkeys, but it could also provide a low cost alternative to motorised transport. Whereas the introduction of animal-drawn carts has frequently proved to be prohibitively expensive, recent publications suggest that a variety of good low-cost alternatives are now available. The introduction of animal-drawn carts could also benefit from the technology and experience of the Mennonite communities settled in the Bolivian lowlands—these have been using horse-drawn carts for centuries. Any design adopted will need adaptation to the specific conditions of the region. Particular attention will have to be paid to the braking systems which are very important in hilly environments (Chadborn, 1991; Dennis and Anderson, 1994).

### **Harvest and post-harvest equipment**

During the study farmers expressed a desire for a reduction in the drudgery of harvest and post-harvest operations such as the selection of potatoes and the threshing or milling of cereal crops. The machines for these types of operations currently available on the Bolivian market are in many cases either too expensive or inappropriate. There are various examples of these types of implements that have been specifically designed or adapted to be driven by animal-energy (eg, Starkey, Astatke and Goe, 1989; Dippon, 1993). Unfortunately most of these constructions and machines are rather intricate and relatively expensive. Although their investigation would seem sensible it is not an immediate priority, nor is their adoption thought likely in the current climate.

### **Proposed follow-up**

Whereas all the above options are worthy of investigation, this does not imply that improvements in the general husbandry and management of donkeys *per se* should be overlooked. A proposal has been formulated and submitted for funding. This addresses the identified opportunities as well as the general husbandry constraints in an integrated manner, based on the results of the PRAs together with a confirmatory workshop, attended by community

representatives, intermediate users and scientists. The project proposes using participatory methodologies to select and evaluate appropriate technologies and aims to improve the efficiency of use and to diversify the utilisation of work animals by smallholder hillside farmers. The project is planned to develop improved animal management strategies through activities in animal health, fodder production and conservation, utilisation and housing. It also plans to develop improved equipment for use by work animals and through this to address the wider problem of degradation of natural resources, principally land, soil and water, through unsuitable agricultural practices. These activities will be carried out in a three-year period, commencing in 1997, and they should have a significant impact on the utilisation and management of donkeys.

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