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Donkeys, horses and mules - their contribution to people's livelihoods in Ethiopia

by Berhanu Admassu and Yoseph Shiferaw



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Acronyms

AHS	African horse sickness
DFID	Department for International Development
ETB	Ethiopian birr
FGD	Focus group discussion
GLM	General Linear Model
HH	Household
MASL	Metres above sea level
PSNP	Productive Safety Net Project
SNNPR	Southern Nations and Nationalities People's Region
SPSS	Statistical Package for Social Sciences
SSI	Semi-structured interview
USD	United States dollar



Foal grazing in its compound .

Executive Summary

Although it is widely recognised that donkeys, mules and horses play a crucial role in the livelihoods of people in Ethiopia, very limited quantitative information is available on the specific economic or social value of equine ownership. This study examined the contributions of donkeys, horses and mules to human livelihoods in three woredas in the Southern Nations and Nationalities People's Region of Ethiopia. The analytical approach used for the study was the sustainable livelihoods framework, and the study aimed to assess the value and costs of equine ownership by wealth group in the selected woredas.

Study findings

a) Wealth groups in the study woredas and livestock ownership

In the three study woredas the mean proportion of households in each wealth group was as follows: 'poor' 41.3%; 'medium' 42.2%; and 'rich' 16.5%. Livestock were the main productive asset owned by households. Overall, households owned on average 3.2 sheep, 2.2 goats, 6.5 cattle, 7.1 chickens, 1.5 donkeys, 0.5 horses, 0.2 mules and 0.7 beehives, with livestock ownership varying by wealth group. It was noted that very poor households did not own equines.

b) Uses of equines

The main uses of equines were as follows:

- Donkeys – 56% of households kept donkeys mainly for pack services (to generate income and homestead use), 26% for cart use (to generate income), and 14% for pack use but exclusively for homestead use and 4% exclusively for renting, breeding or petty trade.
- Horses – 38% of households kept horses mainly for riding, 41% for gharry¹ use, 18% for pack services (to generate income and homestead use), 2% exclusively for breeding and 1% exclusively for renting out.
- Mules – 78.3% of households kept mules mainly for riding, 13% for pack services (to generate income and homestead use), 4.3% exclusively for renting out, and 4.3% for gharry use.

However, many households used equines for a number of different uses. For example, in Lemmo woreda, 21% of households rented out their equines alongside other uses. This figure was 25% in Meskan and 15% in Shashego. It was rare for equines to be kept exclusively for a single purpose, such as renting out.

The social values and contributions of equines across the study areas were enormous, ranging from festivals and entertainment to ceremonial decoration during funeral services. The social contribution of donkeys across the woredas in reducing the work burden of women was higher than for mules and horses – 40% of households identified the main social contribution of donkeys as reducing women's work burden. This compared to 30% of households for mules and 9% of households for horses. Equines were also used to provide ambulance services for both animals and humans, and to establish good relationships

¹ A gharry is a horse-drawn taxi carriage.

with neighbours and local societies through lending them whenever people were in need, e.g. for threshing crops and private and societal works.

c) Income from equines

Equines were an important source of cash:

- Income from sales of equines per household – on average per year, households generated 961 ETB (72 USD)² from selling donkeys, 1180 ETB (88 USD) from selling horses and 1698 ETB (127 USD) from selling mules. Rich, medium and poor households generated similar incomes from the sale of equines.
- Income from renting out equines per household – on average per year, households generated 2522 ETB (188 USD) from renting out donkeys, 3507 ETB (262 USD) from renting out horses and 3322 ETB (248 USD) from renting out mules. Rich households generated significantly more income from renting out equines compared to medium or poor households.
- Income from cart and gharry use per household – on average per year, 37% of households earned an income from equine cart³ and/or gharry use. These households made 10,077 ETB (752 USD) per year. Resource-poor households generated more income as compared to medium and wealthier households in this way.
- Savings from homestead use of equines per household – between 96% and 100% of households who owned or made a living from equines used them for homestead purposes. Overall, households saved 3583 ETB (267 USD) per year by using equines for homestead purposes. The savings from own use by wealthier households were the largest.

Overall, income derived from the use of equines accounted for 14% of total income across the three study woredas. The overall income from other livestock accounted for only 13% of total household income. This shows that equines were very important in the livelihoods of equine owners and users.

d) Costs of equine ownership and use

The main costs of equine ownership and use were as follows:

- Purchase costs per household – in the three woredas the average annual cost for the purchase of donkeys was 984 ETB (73 USD), 1376 ETB (103 USD) for horses and 1747 ETB (130 USD) for mules.
- Feed costs per household – across the three woredas, the average annual feed costs varied by rental options and cart or gharry use. For households that neither rented out their animals nor used carts or gharries, the feed cost was 568 ETB (42 USD). In contrast, the feed costs for rented-out equines or those used for carts or gharries was 1338 ETB (100 USD). Poor households spent more on feed than medium households, which may be due to their greater dependence on the income generated from cart and/or gharry use.
- Healthcare cost per household – the annual amount spent on healthcare for equines was extremely low, at only 44 ETB (3 USD) in the three woredas, in contrast to the high prevalence rates of equine infectious and non-infectious diseases.
- Other costs per household – various expenses such as shoes for gharry horses, harnessing materials, saddles, ropes for tethering and gharry, cart and shelter maintenance amounted to 509 ETB (38 USD) per year across the three woredas.

² Exchange rate of 13.3 ETB to 1 USD is used throughout the report.

³ Income is generated from cart use by owners charging a fee for carrying either goods or people.

The labour input for equine management was supplied primarily by household members. The monetary value of family labour was estimated based on the location-specific employment rate, and the value of labour for equine use was calculated on this basis. Accordingly the average per annum expenditure on equine-related management activities across the three woredas was 904 ETB (67 USD).

e) Economic returns from equine use

The average household-level net return from equine ownership and use was 4419 ETB (330 USD) per annum. The benefit-cost ratios for all three woredas were high showing that the use of equines was profitable. Nevertheless, the net return from equines used for income generation (equine rent, pack, gharry and cart services) which was 7836 ETB (585 USD) was highly significantly larger ($P < 0.001$) than the net return from exclusive own use, which was 1031 ETB (77 USD) per annum per household. In both cases the benefit-cost ratio was positive. Across all three woredas equine use outputs were largest for rich followed by poor households, and in Lemmo woreda the benefit-cost ratio was the same for both rich and poor households. These results show the importance of equines in the smallholder rural and urban communities for all wealth groups.

f) Constraints on the use of equines

The shortage of fodder and grazing areas, and the rising costs of feed were identified as important limiting factors for equine production and use in the surveyed woredas. The major animal feed sources in each woreda were fodder from grazing lands and crop residues. Other feed sources, such as industrial by-products and fodder from improved forage, were insignificant. Grazing land was less available in the urban/peri-urban areas, and so more feed had to be purchased to support working animals, especially equines. Poor health was reported as another major constraint. Among the health problems identified by informants, the most frequently encountered were respiratory problems (with common clinical signs such as cough and nasal discharge), colic, back sores and the epizootic form of lymphangitis. These constraints were reported to reduce equine work output substantially, and limited the contribution of equines to rural livelihoods.



Mules laden with grain heading to market in Lemmo.

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Brooke vet in SNNPR.

Conclusions and recommendations

This study demonstrates that donkeys, mules and horses play a central role in the livelihoods of people in Lemmo, Meskan and Shashego woredas of the Southern Nations and Nationalities People's Region of Ethiopia. The economic and social contributions of equines to the livelihoods of the poor in terms of income, creation of employment opportunities and transportation were enormous. The net return from equine use over total costs was significantly larger showing that equines in the smallholder communities were very useful whether employed for exclusive own use or for income generation. Equines assisted poor households with income-generating opportunities and made a contribution to improving access to cash.

Improved management practices and feeding regimes and the delivery of accessible, sustainable and affordable equine health services are required to enhance equine performance and welfare. Strengthening the ongoing community-based animal health system through the existing public animal health service system and creating links with private drug vendors should be prioritised to realise accessible, sustainable and affordable equine health services. There is a need to provide equine users with better knowledge about the management and use of their equines. Moreover, an awareness-creation and training agenda is required for those people involved in decision making, policy formulation, research, training and education to disseminate better positive images of the value of equine contributions towards food security, improved livelihoods and the national economy.

1 Background and Justification

Agriculture is an important economic activity in Ethiopia and is known to dominate the economy in terms of its contribution to gross domestic product and supporting livelihoods.

In Ethiopia about 83% of the human population live in rural areas, and are primarily engaged in agriculture and related activities (CSA, 2010). Thus agriculture, directly or indirectly, forms an important component of the livelihoods of more than 80% of the human population in the country. The varied and extensive agro-ecological zones and the importance of livestock in livelihood strategies make Ethiopia home to large numbers of livestock. Indeed, Ethiopia has the largest livestock inventory in Africa, including more than 51 million cattle, 48 million small ruminants, 2 million camels, 8 million equines, 42 million chickens and 5 million beehives (CSA, 2010). Livestock are kept for various reasons but primarily to achieve household food security, to reduce poverty through generation of employment, and for transportation of both people and materials. Livestock contribute to economic development through trade in livestock and livestock products, by supplying raw materials to industry, and as a means of earning income. The livestock sector interacts with other sectors of the economy such as crop cultivation, manufacturing and transportation, thereby producing additional economic benefits.

In the livestock sector equines play an important role in the economy of the nation. They are the engines that power rural as well as urban economic development. The most important feature of animal transport in Ethiopia is the use of donkeys, horses and mules as pack animals, for pulling carts and for riding (especially horses and mules). They transport a huge diversity of loads ranging from people, agricultural produce, food and water to building materials, such as timber, stone, bricks and even iron sheets and girders. They have multiple functions, which are not limited to economic aspects, but are also related to socio-cultural issues. Practically all of the equines kept in Ethiopia are used for transportation of both humans and materials/goods at some point in their lives, and so make a significant contribution to the livelihoods of most of its citizens. Equines have reduced the domestic transport burden of rural people, especially women, and have created employment and income-generation opportunities for many people. Studies have shown that transport constitutes one of the necessary inputs for rural development and has a positive stimulus for growth in food production, poverty alleviation and overall communication (Pearson, 2000; Pearson et al., 1999).

The important role of horses, donkeys and mules in Ethiopia is often unrecognised or under-rated by the individuals, organisations and institutions that allocate resources and make policies, laws and practices. The Brooke is working to increase national and international recognition of the role of working equines in poverty alleviation, maintaining sustainable livelihoods and the national economy. A sustainable livelihood, as defined by the UK Department for International Development (DFID), comprises the capabilities, assets (including both material and social resources) and activities required for means of living (DFID, 2000). The sustainable livelihoods framework encompasses household assets (human, natural, physical, financial and social) and their use in farming, non-farming activities and other strategies used by a household to make a living (DFID, 2000). Since the late 1980s, the sustainable livelihoods approach has become a well-established methodology for examining the dynamics of household resources, livelihood strategies and outcomes, and their vulnerabilities to shocks and changes (Carney, 1998).



Donkeys: Regarded as close family members in rural Ethiopia.

Equines are a lifeline for the rural and urban people in Ethiopia. In the Southern Nations and Nationalities People's Region (SNNPR) in Ethiopia, equines provide the only affordable means of transport and traction for most rural and urban communities. Despite the importance of equines in the livelihoods of rural and urban communities, there is little information about their economic and livelihood contributions, which is very important in assessing the different factors involved in improving their welfare and use. The contribution of equines to household income and expenditure and to the local economy has not been well established. In this study the sustainable livelihoods framework was used to assess the contribution of equines to the livelihoods of households in Lemmo, Shashego and Meskan woredas of the SNNPR.

The objectives of the study were as follows:

Overall objective

To quantify the level of equine contribution to the household and local economy in Lemmo, Shashego and Meskan woredas of Hadiya and Gurage zones of SNNPR.

Specific objectives

1. To quantify the income generated by equines out of the total household income.
2. To quantify expenditure related to equines compared to other livestock.
3. To quantify in monetary terms the labour contributions of equines at the household level.
4. To document the socio-cultural contributions of equines.

2 The Study Areas

Ethiopia is divided into nine regional states and two special city administrations, Addis Ababa and Dire Dawa. Each region is subdivided into zones, and zones into woredas (roughly equivalent to a 'county' in the United Kingdom). Woredas in turn are divided into kebeles, small administrative units consisting of a number of villages. This study was conducted in SNNPR in the south-west of Ethiopia. The Hadiya and Gurage zones were selected for the study because they are areas where the Brooke is operating. The Hadiya zone is divided into 10 woredas and the Gurage zone into 13 woredas.

2.1 Study woredas

The study was undertaken in Lemmo and Shashego woredas in Hadiya zone, and Meskan woreda in Gurage zone (see Figure 1). Detailed basic information such as land area, population, land use and topographic and climatic data are presented in Annex 1.

All the study woredas were characterised by smallholder mixed agriculture, dominated by crop production in Lemmo, and crop and horticultural crops (especially enset, or false banana, and red pepper) in Meskan and Shashego. In Shashego and Meskan, wheat, teff (*Eragrotis teff*) and red pepper, and in Lemmo, wheat, teff and vegetables were cash crops. In all areas, maize, sorghum and haricot beans were grown mainly for household consumption, but livestock production was an integral part of crop production. The common technology to cultivate land was animal-drawn implements and hand hoes (Robert et al., 2007).



Owner giving concentrate feed to his donkeys in SNNPR.



Donkeys helping women in SNNPR.

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Figure 1. The location of SNNPR and the three study woredas

In rural areas, livestock have a critical role in the agricultural intensification process through provision of draught power and manure for fertiliser and fuel, and cash income. Work for which cattle and equines are used includes soil preparation (ploughing, hoeing, harrowing), crop processing (threshing) and on-and off-farm transport of agricultural products and people. At farm level the importance of livestock as an income source and for other outputs varies between woredas and between kebeles. Cash can be generated from regular or sporadic sales of livestock and livestock products (live animals, meat, milk and milk products, eggs, hides and skins, manure and manure product) or from services, especially using equines (draft or transport), petty trade and other off-farm activities such as casual employment. The opportunities for casual employment include local agricultural work for better-off households particularly during planting and harvesting seasons, and local urban work. In rural and urban areas of each of the woredas studied livestock production reduces the risk of income fluctuation through diversification of production.

Livestock resources in the study areas are summarised in Table 1.

Table 1. Livestock numbers in Lemmo, Shashego and Meskan woredas, 2010

Livestock type	Livestock numbers		
	Lemmo	Shashego	Meskan
Cattle	126,786	101,230	112,399
Goats	27,488	30,384	14,864
Sheep	24,395	31,210	36,178
Horses	7839	1870	2728
Mules	5820	1147	130
Donkeys	15,926	10,516	8594
Poultry	78,563	78,208	87,455
Beehives	-	3040	10265

Sources: Woreda Bureaus of Agriculture, 2010

3 Study Design and Methodology

3.1 Study design

The sustainable livelihoods framework was used as the guiding framework for the study, with a focus on household assets, and particularly financial and social assets. The overall study design aimed to measure the contribution of equines to livelihoods relative to other sources of income. The study also aimed to assess the value of equine ownership by wealth group and assessed whether or not equines were of particular importance for poorer or wealthier households. A cross-sectional design was used and data were collected between March and July 2010.

Participatory methods were used to give a detailed insight into the ways equine users in Lemmo, Shashego and Meskan woredas generated and managed their income from different sources. The study included the main sources of income, the amount of income generated from each household activity, the level of income from equine activities as compared to other direct and indirect income, and the expenditure of poor, medium and rich households.

Research into the socio-economic importance of equines requires assessing the socio-economic position of the households in the study. The wealth status of households in a given community were identified by the participants of focus group discussions, based on their own indicators which included ownership of productive and non-productive assets, including livestock holdings, land ownership and size, own resident house, waged labour, having a permanent business such as a kiosk and being a recipient of the Productive Safety Net Project (PSNP)⁴. This allowed poor, medium and rich households to then be selected for the study (Table 2).

The basic sampling units for the study were household interviews and focused group discussions. Households which owned equines, or accessed and used equines were the target.

3.2 Data collection

Participatory methods (Catley, 2005), such as focus group discussions (FGDs), semi-structured interviews (SSI) and proportional piling techniques, were used to generate information at household and community level.

SSIs were developed to discover demographic characteristics, livestock holdings, equine acquisition and reasons for keeping them (including their social contributions), income from livestock activities other than equines, income from equine services and use, frequency of equine use and purposes translated into cash income, a labour inventory in relation to livestock and specifically equines, expenditure on equine inputs, feed and labour, and constraints on the use of equines. Table 3 presents a summary of research methodologies.

⁴ The Productive Safety Net Project (PSNP) was started in 2005 by the government in response to the chronic food insecurity experienced by a section of the population. The aim of the project is to provide insecure households with enough food and create income generating conditions for asset accumulation to meet the household food gap and improve livelihoods. It is now also supported by international donors and development organisations.

The field methodology was developed during a workshop held in April 2010, attended by eight Brooke Ethiopia staff and one government staff member from each woreda. Prior to conducting the field work, meetings were held with local government officials, agriculture bureau staff and leaders of the community to explain the purpose of the study.

A variety of primary and secondary information sources was also used to generate information on the role of agriculture in the local and national economy and on the characteristics of the study areas.

3.3 Sampling framework

In this study the two main methods to collect information were the individual household interviews and focus group discussions.

3.3.1 Household interviews

A stratified purposive sampling method was used to select woredas, kebeles and households. Two woredas, namely Lemmo and Shashego, were selected from the Hadiya zone, and Meskan woreda was selected from the Gurage zone: these were the areas where the Brooke was operational and were therefore of particular interest to the organisation. Kebeles were selected based on equine population and use. Households were selected based on ownership of equines and use, taking into consideration the wealth status and gender of the household head. Out of 33, 36 and 40 kebeles in Lemmo, Shashego and Meskan respectively, 22 were considered in this study per woreda, making 66 kebeles in total. The selection of kebeles was made in collaboration with the woreda bureaus of agriculture and the selection of households was made in collaboration with the kebele administrative bodies and local elders.

In each woreda 176 households⁵ (eight households per kebele) were selected based on equine ownership considering wealth and gender, giving a total of 528 households in the study.

Table 2. Number of households studied by wealth group and gender

Woreda	Household heads	Wealth group			Total
		Rich	Medium	Poor	
Lemmo	Male	14	84	48	146
	Female	2	12	16	30
Meskan	Male	10	41	97	148
	Female	1	4	23	28
Shashego	Male	59	77	33	169
	Female	1	5	1	7
Total		87	223	218	528

⁵ A household was defined as a group of persons, irrespective of whether related or not, who normally lived together in the same housing unit and who shared the same head and cooking and dining arrangements.

3.3.2 Focus group discussions

Ten randomly selected kebeles from each woreda were considered for FGDs, making a total 30. FGDs. The composition of each focus group was two persons from the kebele administration, two knowledgeable elders, one traditional healer, one community animal health worker, two cart and/or gharry owners, and two women household heads. As previously mentioned, the FGD groups were responsible for setting the wealth group criteria for rich, medium and poor households which allowed households to be selected for the study.

Table 3. Summary of research methodology

Type of information	Methods	Type of informants	Number of repetitions
Demographic characteristics; sources of household income and amount generated from each activity; the level of income from equine activities as compared to other direct and indirect incomes; the expenditure of households	FGD, proportional piling	FGD members, average of 10 people per site	10 sites per woreda
Acquisition, use and ownership of equines; the main sources of equines; how their purchase, use and ownership differs between men and women	SSI, probing for more information	8 households (head) per site considering wealth and gender	22 sites per woreda (176 hh/ woreda)
Reasons for keeping equines, including their social contributions; income from equine services and frequency of use; income from other livestock activities; labour inventory in relation to livestock and equines; expenditure on equine inputs and labour; constraints on the use of equines	SSI, probing for more information	8 households (head) per site considering wealth and gender	22 sites per woreda (176 hh/ woreda)
Information on the constraints of equine ownership and use	Proportional piling of the key factors and disease ranking	Average of 10 people per site	10 sites (10 FGDs) per woreda
General information	SSI, probing for more information	Ad hoc	N/A

hh=households

3.4 Statistical analysis

The data analysis was conducted using the Statistical Package for Social Science (SPSS) software, version 17. All continuous variables were examined for normality of distribution. The methods used for quantitative analysis of household characteristics including income and expenditure were descriptive statistics, univariate and multivariate analysis. Differences between woredas and wealth status in normally distributed variables with homogeneity of variance were assessed using the General Linear Model (GLM). Descriptive statistics were used to analyse proportions, and differences between groups in normally distributed variables were assessed using the Pearson chi-square test. Details about the statistical analysis can be found in Annex 2.



A farrier working with Alebachew, the horse and its owner at Butajira.

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4 Study Findings

4.1 Study Households: size, gender of household head and levels of education

All the study households owned equines. The basic demographic characteristics of the study households represent the situation at the time of the study period: March–July 2010. Mean household sizes in the study woredas and the number of household heads by gender are presented in Table 4.

Table 4. Study household family size and gender of household heads

Woreda	Mean household family size, (95% CI)	Number of household heads by gender	
		Female	Male
Lemmo (n=176)	8.2 (7.7, 8.7)	30 (17%)	146 (83%)
Meskan (n=176)	7.1 (6.7, 7.6)	28 (16%)	148 (84%)
Shashego (n=176)	8.7 (8.2, 9.2)	7 (4%)	169 (96%)
All woredas (n=528)	7.9 (7.7, 8.3)	65 (12%)	463 (88%)

CI=confidence interval; n=number of households

The number of female household heads who owned equines was very small as compared to male household heads (Table 4). The mean age of interviewed male household heads was 40.5 years while for females it was 36.9; there was no significant difference between the woredas. Information on literacy among sampled households is presented in Annex 3. The proportion of educated household heads in Meskan woreda was significantly lower compared to Lemmo and Shashego. The number of literate female household heads was significantly lower as compared to male household heads.

4.2 Wealth status of households studied

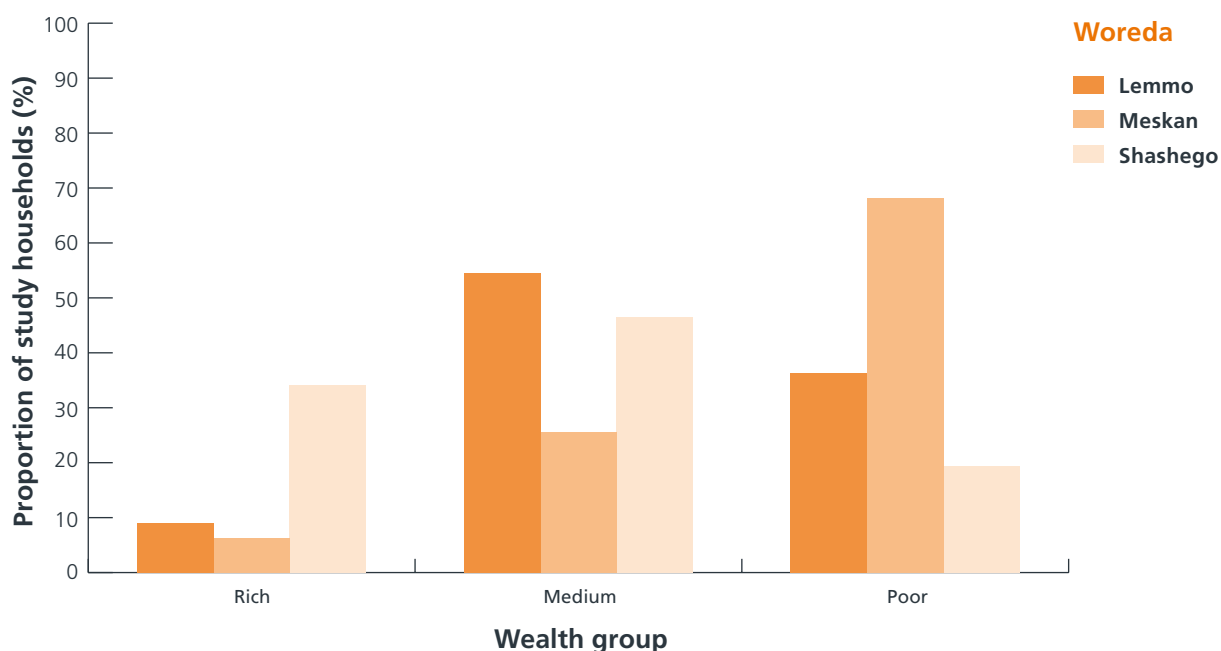


Figure 2. The wealth status of households studied

For the three woredas, 16.5% of households studied were categorised as rich, 42.2% as medium and 41.3% as poor. The medium wealth group was larger in Lemmo and Shashego woredas as compared to Meskan, whereas the poor wealth group was larger in Meskan woreda (Figure 2). The variations could be due to the differences in the means of livelihoods indicating there could be a difference in the use and contribution of equines. During the focus group discussion, it was noted that the very poor households did not own equines.

4.3 Livestock holdings and values

Livestock are one of the main productive assets available to smallholder households. Most (96.4%) of households kept different species of livestock, including equines. The number of households that kept cattle was highest, followed by donkeys and chickens. Livestock holdings in Shashego woreda were significantly larger as compared to Lemmo and Meskan woredas (Table 5).

Table 5. Household livestock holdings including chickens and beehives in study woredas

Livestock type	Mean livestock holdings, 95% CI			
	Lemmo (n=176)	Meskan (n=176)	Shashego (n=176)	Overall (n=528)
Cattle	5.9 (5.1, 6.6)	3.9 (3.1, 4.6)	9.9 (9.1, 10.7)	6.5 (6.1, 7.0)
Sheep	2.4 (1.9, 2.9)	2.1 (1.6, 2.6)	5.2 (4.7, 5.7)	3.2 (2.9, 3.5)
Goats	1.8 (1.3, 2.3)	1.2 (0.7, 1.7)	3.6 (3.1, 4.1)	2.2 (1.9, 2.5)
Donkeys	1.4 (1.2, 1.6)	0.9 (0.7, 1.1)	2.2 (2.0, 2.4)	1.5 (1.4, 1.6)
Horses	0.4 (0.2, 0.6)	0.6 (0.5, 0.8)	0.6 (0.4, 0.7)	0.5 (0.4, 0.6)
Mules	0.13 (0.03, 0.23)	0.1 (-0.02, 0.2)	0.3 (0.2, 0.4)	0.2 (0.1, 0.2)
Chickens	8.5 (7.4, 9.7)	4.1 (2.9, 5.3)	8.7 (7.5, 9.9)	7.1 (6.4, 7.8)
Beehives	0.8 (0.6, 1.1)	0.4 (0.1, 0.6)	1.0 (0.7, 1.2)	0.7 (0.6, 0.9)

n=number of households

The numbers of chickens, cattle, sheep and goats per household in all three woredas were higher as compared to donkeys, horses and mules. Across the woredas, more donkeys were kept compared to horses and mules. The numbers of donkeys and mules per household in Shashego were the highest followed by Lemmo woreda. The number of horses per household was higher in Meskan followed by Shashego woreda.

The livestock and chicken holding values were estimated based on the location-specific market price. The average market price of animals was estimated from the household livestock sale and purchase prices. The value of cattle holdings in the wealthier households was larger as compared to medium and poor households. The estimated values of holdings of donkeys, horses and mules were comparable with those of sheep and goats with small variations between the wealth groups.

In Lemmo Woreda (Table 6), the value of cattle holdings was the highest, followed by mules and horses. The value of cattle holdings in the wealthier households was larger as compared to medium and poor households. The value of donkey holdings was larger for wealthier households as compared to medium and poor households, but the value of horse holdings was greater for poorer families, followed by medium and then rich households.

Table 6. Estimated value per household of livestock and chickens in Lemmo woreda by wealth group

Livestock type	Mean livestock estimated value ETB (USD)							
	n	Rich	n	Medium	n	Poor	n	Total
Cattle	16	23988 (1790)	96	12793 (955)	59	6245 (466)	171	14,342 (1070)
Sheep	10	1792 (134)	60	1401 (105)	33	824 (61)	103	1339 (100)
Goats	8	1467 (109)	42	1653 (123)	20	1141 (85)	70	1420 (106)
Donkeys	16	1872 (140)	91	1444 (108)	61	1235 (92)	168	1517 (113)
Horses	7	1480 (110)	40	1651 (123)	8	1781 (133)	55	1637 (122)
Mules	8	1818 (136)	10	2000 (149)	4	1818 (136)	22	1879 (140)
Chickens	15	437 (33)	87	376 (28)	56	211 (16)	158	341 (25)

n=number of households

Similarly, in Meskan woreda across the wealth groups the value of cattle holdings as compared to other livestock was larger (Table 7). The value of cattle holdings in the wealthier households was larger as compared to medium and poor households. The values of holdings of donkeys and horses were larger for wealthier households as compared to medium and poor households and were second to cattle. On the other hand the value of mules was comparable across the wealth groups. The values of holdings of sheep, goats and chickens were larger for wealthier households as compared to medium and poor households.

Table 7. Estimated value per household of livestock and chickens in Meskan woreda by wealth group

Livestock type	Mean livestock estimated value ETB (USD)							
	n	Rich	n	Medium	n	Poor	n	Total
Cattle	11	26,343 (1966)	45	12,239 (913)	100	4644 (347)	156	14,409 (1075)
Sheep	7	1589 (119)	32	1477 (110)	58	943 (70)	97	1337 (100)
Goats	6	2173 (162)	19	1458 (109)	27	942 (70)	52	1525 (114)
Donkeys	11	3425 (256)	34	1222 (91)	68	1108 (83)	113	1918 (143)
Horses	5	5698 (425)	16	1862 (139)	53	1613 (120)	74	3057 (228)
Mules	1	1818 (136)	3	1818 (136)	1	1818 (136)	5	1818 (136)
Chickens	10	435 (32)	27	285 (21)	77	162 (12)	114	294 (22)

n=number of households

Table 8 presents estimated values per household of livestock and chickens in Shashego woreda by wealth group. In this woreda, livestock holdings per households, including chickens, were larger than in the other two woredas; almost all study households own cattle followed by donkeys and chickens. The value of cattle holdings was larger across the wealth group as compared to other livestock. The value of cattle in the wealthier households was larger than for medium and poor households. The values of holdings of horses and donkeys across the wealth groups were second to cattle. Again the values of horses and donkeys were larger for resource-rich compared to medium and poor households. Similarly, the values of holdings of sheep, goats and chickens were larger for wealthier households.

Table 8. Estimated value per household of livestock and chickens in Shashego woreda by wealth group

Livestock type	Mean livestock estimated value ETB (USD)							
	n	Rich	n	Medium	n	Poor	n	Total
Cattle	60	33,774 (2520)	82	13,807 (1030)	34	5418 (404)	176	17,667 (1318)
Sheep	50	2800 (209)	68	1559 (116)	27	1373 (102)	145	1911 (143)
Goats	46	2388 (178)	55	1494 (111)	18	924 (69)	119	1602 (120)
Donkeys	60	3027 (226)	79	1797 (134)	32	1570 (117)	171	2131 (159)
Horses	20	3432 (256)	24	2050 (153)	8	1781 (133)	52	2421 (181)
Mules	23	1897 (142)	17	1925 (144)	2	1818 (136)	42	1880 (140)
Chickens	53	435 (32)	73	316 (24)	27	227 (17)	153	326 (24)

n=number of households

The values of cattle, donkey, sheep and goat holdings in Shashego woreda across the wealth group were larger as compared to Lemmo and Meskan woredas. However, the value of horses was larger in Meskan as compared to Shashego and Lemmo woredas.

4.4 Reasons for keeping equines

The main reasons for keeping donkeys and horses are presented in Tables 9 and 10. Relatively few mules were kept compared to donkeys and horses and therefore the data was not tabulated.

Table 9. Main reasons (purpose) for keeping donkeys

Reason/purpose	Number of households (%) in each woreda			
	Lemmo	Meskan	Shashego	Overall
Pack services ⁶	103 (61.3)	51 (45.1)	101 (59.1)	255 (56.4)
Cart services ⁷	38 (22.6)	52 (46.0)	27 (15.8)	117 (25.9)
Renting out	3 (1.8)	5 (4.4)	5 (2.9)	13 (2.9)
Exclusive homestead use ⁸	24 (14.3)	4 (3.5)	36 (21.1)	64 (14.2)
Breeding	0	1 (0.9)	2 (1.2)	3 (0.7)
Total	168 (100)	113 (100)	171 (100)	452 (100)

⁶ Pack services are services provided using equines to generate income by carrying materials, goods or supplies on their backs.

⁷ Cart services are services provided using equines (mostly donkeys and in some places mules) to generate income from two- or four-wheel carts by transporting people and/or goods and supplies.

⁸ Homestead use is the use of equines to provide pack, cart or gharry services exclusively for transportation of household members and/or their goods.

Across the three woredas donkeys were mainly kept for pack and cart services to generate income followed by exclusive homestead use. Though these were pointed out as the main reasons for keeping donkeys, households in the study areas kept them for multipurpose use. In Shashego, 100% of equine owners and nearly 98% in Lemmo and Meskan used donkeys for homestead purposes alongside other uses. Services provided by donkeys included transporting water, firewood and charcoal for household use; firewood and charcoal for sale; grain and harvested crops from farm to household; grain to or from market; feed/straw from farm to household; sugarcane and chat⁹ from farm to market; qocho¹⁰ and vegetables from household to market; timber from field to household and from household to market; petty trade items from household to market; agricultural inputs such as seeds and fertiliser, from town to household and to the farm field; and food aid from the distribution site to household. Donkeys were also used to thresh crops and provided ambulance services for both animals and people.

Across the three woredas horses were kept mainly for riding, gharry and pack services. The extent of these three uses varied between woredas. In Shashego, nearly 69% of study households kept horses for riding; in Meskan, 76% of study households kept horses for gharry services; in Lemmo, the most common use (44%) for horses was pack services (Table 10).

Table 10. Main reasons (purpose) for keeping horses

Reason/purpose	Number of households (%) in each woreda			
	Lemmo	Meskan	Shashego	Overall
Pack services	24 (43.6)	2 (2.4)	6 (11.8)	32 (17.0)
Riding	20 (36.4)	17 (20.7)	35 (68.6)	72 (38.3)
Gharry services	6 (10.9)	62 (75.6)	9 (17.6)	77 (41.0)
Renting out	0 (0)	1 (1.2)	1 (2.0)	2 (1.1)
Breeding	5 (9.1)	0	0	5 (2.7)
Total	55 (100)	82 (100)	51 (100)	188 (100)

The main reasons given for keeping mules was for pack services and riding. In Meskan 40% of households kept mules for pack services and 40% for riding, whilst in Lemmo the figures were 27% for pack services and 59% for riding. In Shashego 3% of households kept mules for pack services whilst 93% kept them for riding. Though these were reported as the main reasons, both horses and mules were kept for multiple uses, including riding, ambulance services for people, festivals, sports, funeral ceremonies, pack services to transport all sorts of household produce and goods to and from the household or market, and also for breeding and threshing crops (barley and wheat).

⁹ Chat is a plant whose leaf is commonly chewed in Ethiopia as a stimulant with appetite-suppressing properties.

¹⁰ Qocho is a staple food made from the stem and root of the plant enset (*E. ventricosum*), commonly known as 'false banana' for its close resemblance to the domesticated banana plant.

4.5 Household income from equines

4.5.1 Relative contribution of equines to total household income

Data on household income sources and their proportions are summarised in Figure 3.

Household income included income in kind, from net sales of crops and livestock, and from equine services. Local non-farm income included income earned by household members working for wages (including on someone else's farm) and local sales of goods and services. Overall, households were able to generate 26.6% of their income from crop farming, 13.4% from livestock farming (not including equines), 13.6% from equine use and services, 11.6% from labour, 27.3% from off-farm activities such as petty trade, food and beverage sales, timber sales, rental income, and the PSNP; while 6.3% of household income came from remittances both from abroad and within the country.

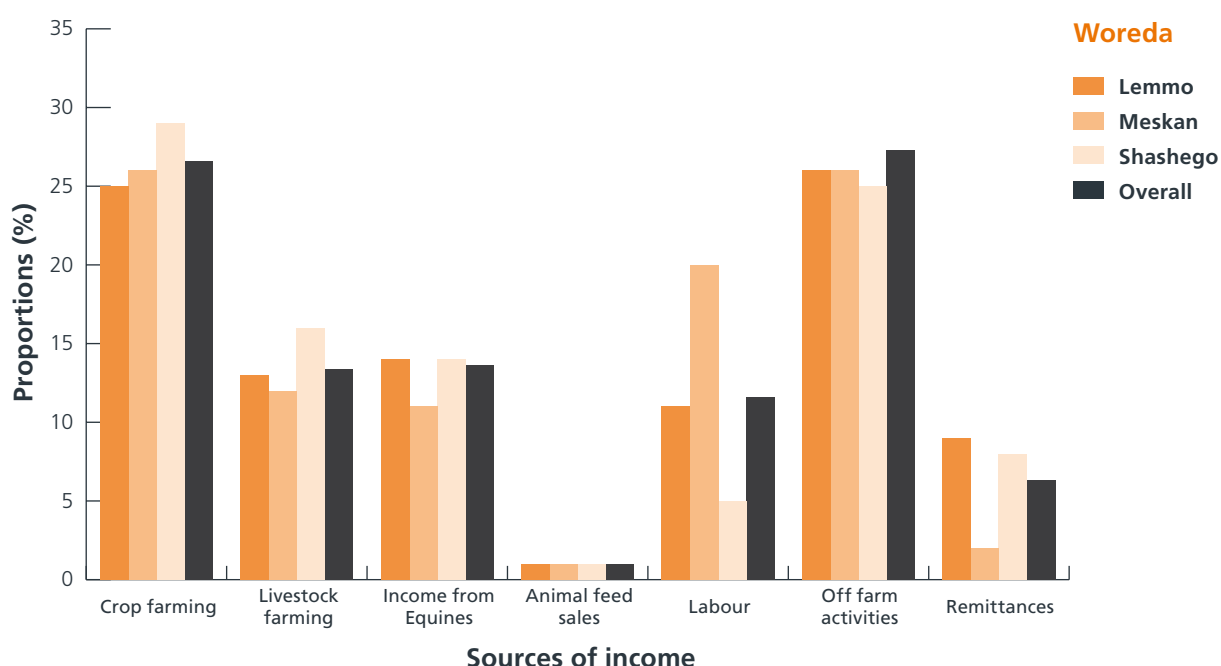


Figure 3. Sources of household income in each woreda (median proportions)

More details of the sources and median proportions of household income are presented in Annex 4.

Table 11 summarises the sources of equine income, and the median proportions of each source. In the three woredas, income from equines (such as renting out carts, gharry use and equine sales) was proportional to the combined income from the rest of livestock farming. The estimate of income from equine use did not include equine use on homesteads; if this were taken into consideration, the income from equine use could be more than that reported.

Table 11. Sources of equine income and median proportions (%) of each source

Income source	Median proportions of income (%)		
	Meskan (n=10 FGD)	Lemmo (n=10 FGD)	Shashego (n=10 FGD)
Total income from equines	11	14	14
Sales	2 (1,4)	5 (4,8)	8 (4,18)
Renting out equines and carts	4 (1,5)	5 (3,8)	3 (2,6)
Gharry services	5 (2,5)	4 (2,8)	3 (0,5)

note: (range)

4.5.2 Income from sales of equines

Information on income from equine sales in each woreda by wealth group is presented in Tables 12 and 13. Nearly 27% of households in Lemmo, 34% in Meskan and 43% in Shashego generated income from sales of equines. Across the woredas, there was no statistical difference in the overall income generated from the sales of equines. However, in Shashego woreda a difference was detected between wealth groups; rich households generated a relatively higher income as compared to poor and medium households, whilst poor families generated more than the medium households.

Table 12. Mean annual household income from sales of equines in each woreda by wealth group

Woreda	Wealth group	Mean annual income ETB (USD)
Lemmo	Rich (n=7)	925.7 (69.1)
	Medium (n=27)	970.6 (72.4)
	Poor (n=13)	959.2 (71.6)
	Total (n=47)	951.8 (71.0)
Meskan	Rich (n=5)	1390.0 (103.7)
	Medium (n=14)	1146.4 (85.6)
	Poor (n=38)	919.5 (68.6)
	Total (n=57)	1151.9 (86.0)
Shashego	Rich (n=29)	1586.9 (118.4)
	Medium (n=40)	996.3 (74.4)
	Poor (n=6)	1008.3 (75.2)
	Total (n=75)	1197.2 (89.3)
All woredas	Rich (n=41)	1300.8 (97.1)
	Medium (n=81)	1037.7 (77.4)
	Poor (n=57)	962.3 (71.8)
	Total (n=179)	1100.3 (82.1)

n=number of households

The study households generated on average 961 ETB (72 USD) from sales of donkeys, 1181 ETB (88 USD) from horses and 1699 ETB (127 USD) from sales of mules per year (Table 13). Again looking at each species of equine, across the wealth groups there was no statistical difference in the income generated from sales of donkey, horses and mules nor was there any difference between the wealth groups in income from sales. However, across the species of equines, the income generated from sales of mules was larger as compared to horses and donkeys.

Table 13. Mean annual household income from sales of donkeys, horses and mules by wealth group

Wealth group	Mean annual income from sales ETB (USD)					
	n	Donkeys	n	Horses	n	Mules
Rich	32	1072.7 (80.1)	10	1330.6 (99.3)	4	2275.0 (169.8)
Medium	54	964.8 (72.0)	24	984.2 (73.4)	6	1705.6 (127.3)
Poor	39	847.6 (63.3)	18	1250.6 (93.3)	2	1400.0 (104.5)
Total	125	961.7 (71.8)	52	1180.7 (88.1)	12	1698.6 (126.8)

n=number of households

4.5.3 Income from renting out equines

Close to 21% of households in Lemmo, 25% in Meskan and 15% of households in Shashego rented out their equines to generate income. Across the three woredas, rich households rented out on average 1.4 donkeys, 4.6 horses and 1 mule while poor and medium households rented out 1.1 donkeys and horses, and 1 mule at a time. Medium and poor households usually generated income by using their equines for their own business or transporting goods for a fee. Across the three woredas relatively resource-rich households generated a larger income from renting out equines as compared to resource-poor and medium households (Table 14). However, unlike Lemmo woreda where medium households generated a higher income as compared to resource-poor households, in Meskan and Shashego resource-poor households generated a better income from renting out equines as compared to medium households. Average annual income from renting out equines was lowest in Shashego woreda: this may be because Shashego is more reliant on its agriculture base and does not have such large towns as Lemmo and Meskan with opportunities to rent out animals.

Table 14. Mean annual household income from renting out equines in each woreda by wealth group

Woreda	Wealth group	Mean annual income ETB (USD)
Lemmo	Rich (n=6)	6413.3 (478.6)
	Medium (n=18)	3264.4 (243.6)
	Poor (n=12)	1885.0 (140.7)
	Total (n=36)	3854.3 (287.6)
Meskan	Rich (n=4)	7443.8 (555.5)
	Medium (n=12)	1499.3 (111.9)
	Poor (n=31)	2222.9 (165.9)
	Total (n=47)	3722.0 (277.8)
Shashego	Rich (n=9)	3326.7 (248.3)
	Medium (n=12)	2253.3 (168.2)
	Poor (n=5)	2600.0 (194.0)
	Total (n=26)	2726.7 (203.5)
Overall	Rich (n=19)	5727.9 (427.5)
	Medium (n=42)	2339.0 (174.6)
	Poor (n=48)	2236.0 (166.9)
	Total (n=109)	3434.3 (256.3)

n=number of households

Average annual rental income from each species of equine by wealth group is summarised in Table 15. Resource-rich households generated a larger income from renting out donkeys and horses as compared to medium and poor households. However, there was no significant difference in income from renting out mules between wealth groups.

Table 15. Mean annual household income from renting out donkeys, horses and mules by wealth group

Wealth group	Mean annual income from sales ETB (USD)					
	n	Donkeys	n	Horses	n	Mules
Rich	16	3722.2 (277.8)	3	6698.8 (499.9)	4	3640.0 (271.6)
Medium	35	1894.0 (141.3)	8	2374.7 (177.2)	3	3640.0 (271.6)
Poor	36	1950.9 (145.6)	11	2012.5 (150.2)	3	2686.7 (200.5)
Total	87	2522.4 (188.2)	22	3506.6 (261.7)	10	3322.2 (247.9)

n=number of households

4.5.4 Income from equine cart and gharry services

The percentage of households that used equine cart or gharry services to transport people or goods in Meskan was 59%, larger as compared to Lemmo (31%) and Shashego (22%). The income generated from equine cart and gharry services is presented in Table 16. The income generated by resource-poor households was larger as compared to resource-rich and medium households. The income generated from equine cart and gharry services in Lemmo was significantly larger as compared to Meskan and Shashego woredas.

Table 16. Mean annual household income from equine cart and gharry services in each woreda by wealth group

Woreda	Wealth group	Mean annual income ETB (USD)
Lemmo	Rich (n=7)	7651.4 (571.0)
	Medium (n=25)	15,184.0 (1133.1)
	Poor (n=23)	16,933.9 (1263.7)
	Total (n=55)	13,256.4 (989.3)
Meskan	Rich (n=8)	6474.0 (483.1)
	Medium (n=21)	6255.4 (466.8)
	Poor (n=75)	8103.3 (604.7)
	Total (n=104)	6944.2 (518.2)
Shashego	Rich (n=16)	13,094.2 (977.2)
	Medium (n=14)	8865.9 (661.6)
	Poor (n=8)	8131.3 (606.8)
	Total (n=38)	10,030.5 (748.5)
Overall	Rich (n=31)	9073.2 (677.1)
	Medium (n=60)	10,101.8 (753.9)
	Poor (n=106)	11,056.2 (825.1)
	Total (n=197)	10,077.1 (752.0)

n=number of households

The income generated from donkey carts and horse gharries for each wealth group is presented in Table 17. The number of donkeys and horses used per cart and gharry was on average 1.5 and 1.4, respectively. Only a few households used mules for pulling carts and it was therefore not possible to categorise such income by wealth group. Resource-poor households generated a larger income from the use of donkey carts and horse gharry services as compared to medium and wealthier households.

Table 17. Mean annual household income from donkey cart and horse gharry services by wealth group

Wealth group	Mean annual income ETB (USD)			
	n	Donkeys	n	Horses
Rich	30	7036.9 (525.1)	7	10,725.0 (800.4)
Medium	51	8838.7 (659.6)	12	8706.2 (649.7)
Poor	74	9856.6 (735.6)	36	11,327.9 (845.4)
Total	155	8577.4 (640.1)	55	10,038.1(749.1)

n=number of households

4.5.5 Equine own use and estimated economic value

Equine own use included homestead services provided by equines such as water collection, firewood and charcoal collection for household purposes; transportation of firewood/charcoal, grain/crops, feed/straw, sugar cane, chat, qocho, vegetables, timber from household to market and agricultural inputs from market to households. It also included the use of equines for off-farm activities such as petty trade. Nearly 98% of households in Lemmo, 96% of households in Meskan and 100% of households in Shashego which owned or made a living from equines used them for homestead purposes or own use, alongside other uses. Estimates of the value of such homestead use were based on the cost of paying for transportation of materials or people. Estimates of the value of own use of equines by wealth status in each woreda are summarised in Table 18.

The estimated average monetary value of own use of equines was larger for Lemmo as compared to Meskan and Shashego woredas. The annual monetary value of own use of study households in Meskan woreda was the lowest of the three woredas. The average value of own use by resource-rich households was larger as compared to the medium and the poor households. A detailed statistical analysis of each source of income from equine use (sales, renting out, cart and gharry services including monetary value of own use) is presented in Annex 5.

Table 18. Mean monetary value of equine own use per household by wealth status in each woreda

Woreda	Wealth group	Mean annual monetary value ETB (USD)
Lemmo	Rich (n=16)	6241.6 (465.8)
	Medium (n=96)	4253.8 (317.4)
	Poor (n=60)	3959.4 (295.5)
	Total (n=172)	4818.2 (359.6)
Meskan	Rich (n=11)	5186.3 (387.0)
	Medium (n=45)	1979.8 (147.7)
	Poor (n=113)	1316.8 (98.3)
	Total (n=169)	2827.6 (211.0)
Shashego	Rich (n=60)	4222.8 (315.1)
	Medium (n=82)	2598.5 (193.9)
	Poor (n=34)	2489.4 (185.8)
	Total (n=176)	3103.5 (231.6)
Overall	Rich (n=87)	5216.9 (389.3)
	Medium (n=223)	2944.0 (219.7)
	Poor (n=207)	2588.5 (193.2)
	Total (n=517)	3583.1 (267.4)

n=number of households

Estimates of the average monetary value of own use of each species of equine are summarised in Table 19.

Table 19. Mean monetary value of own use of donkeys, horses and mules per household by wealth group

Wealth group	Mean annual monetary value ETB (USD)					
	n	Donkeys	n	Horses	n	Mules
Rich	87	4411.6 (329.2)	33	1461.1 (109.0)	10	810.0 (60.4)
Medium	204	2663.5 (198.8)	80	911.3 (68.0)	23	1506.3 (112.4)
Poor	161	2591.6 (193.4)	65	994.1 (74.2)	7	1647.5 (122.9)
Total	452	3222.2 (240.5)	178	1122.2 (83.7)	40	1321.3 (98.6)

n=number of households

The value of own use of donkeys (or the costs saved by households using their own donkeys for homestead purposes) was larger as compared to horses and mules, showing that donkeys were used more for homestead purposes than horses and mules. The estimated monetary value of own use of donkeys and horses by resource-rich households was larger as compared to medium and poor households. On the other hand, the estimated monetary value of own use of mules by poor households was larger as compared to medium and rich households.

4.6 Income generated from sales of livestock (including poultry), other than equine sales

Livestock production is a major component of the agricultural economy of the Southern Nations and Nationalities People's Region and goes well beyond direct food production. Livestock production is an integral part of crop agriculture in the mixed crop and livestock production system of the region, which predominates in Hadiya and Gurage zones. Nearly 84% of study households in Shashego, 74% in Lemmo and 61% in Meskan generated income from selling livestock (other than equines) and poultry in 2009.

At farm level the importance of livestock as an income source varied across the woredas. The overall income from sales of livestock (other than equines) and poultry was larger in Meskan as compared to Shashego and Lemmo woredas (Table 20).

Table 20. Mean annual household income from sales of livestock and chickens (not including equines) in each woreda by wealth group

Woreda	Wealth group	Mean annual income ETB (USD)
Lemmo	Rich (n=14)	3475.7 (259.4)
	Medium (n=79)	2298.5 (171.5)
	Poor (n= 38)	2608.7 (194.7)
	Total (n=131)	2794.3 (208.5)
Meskan	Rich (n=9)	6457.8 (481.9)
	Medium (n=28)	2668.4 (199.1)
	Poor (n= 70)	1800.4 (134.4)
	Total (n=107)	3642.2 (271.8)
Shashego	Rich (n=52)	4107.0 (306.5)
	Medium (n=67)	2374.1 (177.2)
	Poor (n= 29)	1577.2 (117.7)
	Total (n=148)	2686.1 (200.5)
Total	Rich (n=75)	4680.2 (349.3)
	Medium (n=174)	2447.0 (182.6)
	Poor (n= 137)	1995.5 (148.9)
	Total (n=386)	3040.9 (226.9)

n=number of households

Across the woredas wealthier households followed by medium households generated a higher cash income from sales of livestock as compared to poor households except in Lemmo woreda. Here poor households earned a higher income from this source than medium households.

The income generated from livestock and chicken sales across the woredas and wealth groups was larger as compared to income generated from sales of equines (see Table 12). Cash was also generated from sales of animal products (milk and milk products, eggs, hides and skins). Across the three woredas 53% of study households (67% in Shashego, 59% in Lemmo and 34% in Meskan) generated income from sales of animal products. The income generated from animal products is summarised in Table 21. Overall, the income generated per annum per household from selling animal products was significantly higher in Lemmo woreda than Shashego and Meskan woredas. In all the woredas resource-rich households generated more income as compared to medium and poor households. A detailed statistical analysis of income generated from sales of livestock and animal products is presented in Annex 6.

Table 21. Mean annual household income from sales of animal products in each woreda by wealth group

Woreda	Wealth group	Mean annual income ETB (USD)
Lemmo	Rich (n=9)	2268.9 (169.3)
	Medium (n=59)	1298.4 (96.9)
	Poor (n=36)	1103.1 (82.3)
	Total (n=104)	1556.8 (116.2)
Meskan	Rich (n=8)	475.8 (35.5)
	Medium (n=17)	348.1 (26.0)
	Poor (n=34)	264.3 (19.7)
	Total (n=59)	362.7 (27.1)
Shashego	Rich (n=42)	1079.5 (80.6)
	Medium (n=60)	588.7 (43.9)
	Poor (n=15)	438.7 (32.7)
	Total (n=117)	702.3 (52.4)
Total	Rich (n=59)	1274.7 (95.1)
	Medium (n=136)	745.1 (55.6)
	Poor (n=85)	602.0 (44.9)
	Total (n=280)	873.9 (65.2)

n=number of households

4.7 Costs of keeping equines

4.7.1 Equine purchases

Households across all the woredas acquired their donkeys, horses and mules mainly through purchase, followed by home-breeding (Table 22). Only a few households kept donkeys and horses mainly for breeding purposes, and only a few households rented donkeys and horses from their owners on a long-term basis. Renting out equines for income generation was a common practice across the woredas, but the terms of rent were mostly on a daily basis.

Table 22. Household equine acquisition

Woreda	Equines Species	Number of households and their proportions (%)				
		Purchased	Born at home	Purchased and born**	Rented	Others*
Lemmo	Donkey	129 (77.7)	17 (10.2)	20 (12)	-	-
	Horse	29 (56.9)	14 (27.5)	7 (13.7)	-	1 (2.0)
	Mule	17 (85)	3 (15)	-	-	-
Meskan	Donkey	87 (70.2)	6 (4.8)	24 (19.4)	3 (2.4)	4 (3.2)
	Horse	72 (87.8)	5 (6.1)	-	3 (3.7)	2 (2.4)
	Mule	9 (100)	-	-	-	-
Shashego	Donkey	67 (39.2)	19 (11.1)	84 (49.1)	-	1 (0.6)
	Horse	27 (54.0)	6 (12.0)	15 (30.0)	-	2 (4.0)
	Mule	40 (100)	-	-	-	-
Overall	Donkey	283 (61.4)	42 (9.1)	128 (27.8)	3 (0.7)	5 (1.1)
	Horse	128 (69.9)	25 (13.7)	22 (12.0)	3 (1.6)	5 (2.7)
	Mule	66 (95.7)	3 (4.3)	-	-	-

*Others=inherited, gift, shared

**Households using both home-born and purchased equines

The average household expenditure on the purchase of different equine species is summarised in Table 23. A detailed statistical analysis of the costs of keeping and using equines is presented in Annex 7.

Table 23. Mean annual household expenditure on purchase of equines in each woreda by wealth group

Woreda	Wealth group	Mean annual expenditure ETB (USD)
Lemmo	Rich (n=3)	1220.0 (91.0)
	Medium (n=17)	1064.7 (79.5)
	Poor (n=16)	955.6 (71.3)
	Total (n=36)	1080.1 (80.6)
Meskan	Rich (n=2)	1150.0 (85.8)
	Medium (n=17)	1297.6 (96.6)
	Poor (n=59)	1163.2 (86.8)
	Total (n=78)	1203.6 (89.8)
Shashego	Rich (n=24)	1237.2 (92.3)
	Medium (n=21)	1051.9 (78.5)
	Poor (n=7)	1110.0 (82.8)
	Total (n=52)	1133.0 (84.6)
Overall	Rich (n=29)	1202.3 (89.7)
	Medium (n=55)	1138.1 (84.9)
	Poor (n=82)	1076.3 (80.3)
	Total (n=166)	1138.9 (85.0)

n=number of households

There were no significant differences in the expenditure on acquiring equine species between households across the three woredas. Similarly, differences were not detected between different wealth groups. This shows that equines were equally important to all households irrespective of wealth and income.

On examining the different species of equines by wealth group, it was found that the average expenditure on the purchase of mules was highly significantly larger as compared to horses and donkeys. This higher price for mules is related to their strength and endurance as working animals, and also because they are seen as a symbol of wealth status in many communities. However, differences between the wealth groups were not detected (Table 24).

Table 24. Mean annual household expenditure on purchase of donkeys, horses and mules by wealth group

Wealth group	Mean annual expenditure ETB (USD)					
	n	Donkeys	n	Horses	n	Mules
Rich	14	991.3 (74.0)	11	1467.5 (109.5)	4	2100.0 (156.7)
Medium	34	1031.0 (76.9)	17	1193.8 (89.1)	4	1766.7 (131.8)
Poor	47	929.4 (69.4)	32	1556.6 (116.2)	3	1550.0 (115.7)
Total	95	983.9 (73.4)	60	1375.6 (102.7)	11	1746.7 (130.4)

n=number of households

4.7.2 Expenditure on equine feed

One of the major costs of keeping equines was feed, especially for those households residing in urban areas. It was reported that equines were usually released onto their owners' or communal grazing areas after work. In urban areas equines were released to graze on open public fields or at the roadside. Supplementary feeding for cart donkeys and gharry horses in the evening was reported to be common. The costs of supplementary feeding (e.g. wheat bran, cereals, grass hay, green grass and rented grazing land) are summarised in Table 25.

The average annual supplementary feed costs per household in Lemmo and Meskan woredas were significantly higher than in Shashego woreda. However, though statistically not significant, the feed costs of the poor households across the three woredas were larger as compared to medium households.

Table 25. Mean annual household expenditure on supplementary feed in each woreda by wealth group

Woreda	Wealth group	Mean annual expenditure ETB (USD)
Lemmo	Rich (n=16)	1217.6 (90.9)
	Medium (n=96)	876.8 (65.4)
	Poor (n=64)	985.4 (73.5)
	Total (n=176)	1026.6 (76.6)
Meskan	Rich (n=11)	1215.5 (90.7)
	Medium (n=45)	1038.8 (77.5)
	Poor (n=120)	1109.1 (82.8)
	Total (n=176)	1121.1 (83.7)
Shashego	Rich (n=60)	857.5 (64.0)
	Medium (n=82)	744.3 (55.5)
	Poor (n=34)	778.1 (58.1)
	Total (n=176)	793.3 (59.2)
Overall	Rich (n=87)	1096.9 (81.9)
	Medium (n=223)	886.6 (66.2)
	Poor (n=218)	957.5 (71.5)
	Total (n=528)	980.3 (73.2)

n=number of households

Across the three woredas the average annual costs incurred for feed by study households that used their equines for income generation through renting them out or cart and gharry services were significantly larger than for those households that used equines exclusively for their own use (Table 26).

Table 26. Mean annual household expenditure on supplementary feed based on equine use by wealth group

Equine use	Wealth group	Mean annual expenditure ETB (USD)
Income generation and own use	Rich (n=43)	1367.3 (102.0)
	Medium (n=86)	1338.5 (99.9)
	Poor (n=134)	1308.4 (97.6)
	Total (n=263)	1338.0 (99.9)
Exclusive own use	Rich (n=44)	579.8 (43.3)
	Medium (n=137)	560.9 (41.9)
	Poor (n=84)	563.0 (42.0)
	Total (n=265)	567.9 (42.4)
Total	Rich (n=87)	973.5 (72.6)
	Medium (n=223)	949.7 (70.9)
	Poor (n=218)	935.7 (69.8)
	Total (n=528)	953.0 (71.1)

n=number of households

4.7.3 Expenditure on material inputs

Mean annual expenditure on items such as shoes for gharry horses, harnessing materials, saddles, ropes for tethering, gharry and cart maintenance, and shelter maintenance were estimated per household by wealth group for each woreda (Table 27). The overall mean expenditure on the different material inputs for Shashego woreda was significantly lower as compared to Meskan and Lemmo woredas. However, within the woredas no statistical difference was detected between wealth groups.

Table 27. Mean annual household expenditure on material inputs by wealth group in each woreda

Woreda	Wealth group	Mean annual expenditure ETB (USD)
Lemmo	Rich (n=16)	570.8 (42.6)
	Medium (n=96)	505.7 (37.7)
	Poor (n=64)	516.4 (38.5)
	Total (n=176)	530.9 (39.6)
Meskan	Rich (n=11)	579.6 (43.3)
	Medium (n=45)	509.2 (38.0)
	Poor (n=120)	554.0 (41.3)
	Total (n=176)	547.6 (40.9)
Shashego	Rich (n=60)	479.8 (35.8)
	Medium (n=82)	440.1 (32.8)
	Poor (n=34)	422.6 (31.5)
	Total (n=176)	447.5 (33.4)
Overall	Rich (n=87)	543.4 (40.6)
	Medium (n=223)	485.0 (36.2)
	Poor (n=216)	497.6 (37.1)
	Total (n=528)	508.6 (38.0)

n=number of households

4.7.4 Expenditure on treatment of equines

Across the three woredas 58% of households owning or using equines had their equines treated for different health problems in 2009. Expenditure on modern treatment in public or private animal health clinics or posts was calculated; the figures do not include expenditure on the services of traditional healers. Expenditure in Lemmo and Meskan woredas was higher for the richer households, whereas in Shashego treatment expenses were higher for the poor households. Overall treatment expenditure was higher in Lemmo woreda compared to Meskan and Shashego woreda (Table 28).

Table 28. Mean annual household expenditure on equine treatment in each woreda

Woreda	Wealth group	Mean annual expenditure ETB (USD)
Lemmo	Rich (n=15)	88.6 (6.6)
	Medium (n=69)	36.2 (2.7)
	Poor (n=51)	39.0 (2.9)
	Total (n=135)	54.6 (4.1)
Meskan	Rich (n=2)	47.5 (3.5)
	Medium (n=20)	29.2 (2.2)
	Poor (n=55)	39.0 (2.9)
	Total (n=77)	38.6 (2.9)
Shashego	Rich (n=36)	44.2 (3.3)
	Medium (n=44)	34.3 (2.6)
	Poor (n=16)	45.2 (3.4)
	Total (n=96)	41.2 (3.1)
Overall	Rich (n=53)	60.1 (4.5)
	Medium (n=133)	33.2 (2.5)
	Poor (n=122)	41.1 (3.1)
	Total (n=308)	44.8 (3.3)

n=number of households

4.7.5 Labour costs for equine management

The labour needed to look after equines was supplied primarily by household members. Wealthier households might hire permanent workers for their farms or sometimes, especially in peak season, they might hire temporary workers for specified periods. These workers undertake a range of farm work, including equine management. Across the three woredas, the use of family labour for the care of equines was common. Tasks included night-time shelter cleaning, followed by releasing the equines in the morning, and then bringing them back in the evening; tethering and feeding were also important tasks.

Shelter cleaning was done by wives, assisted by mature girls where available, in 84% of households in Shashego, 75% in Lemmo and 86% in Meskan. Releasing equines early in the morning and bringing them back in the evening was mostly the responsibility of boys and husbands. Feeding and watering duties were mostly handled by family members, and by labourers in households where there was employed labour.

The monetary value of family labour was calculated based on the location-specific employment rate, and the value of labour for equine own use was estimated on this basis. (Table 29). The estimated annual expenditure per household on labour expenses in Shashego woreda was lower than in Lemmo and Meskan woredas. Nevertheless, in all the woredas expenses were not statistically different between wealth groups.

Table 29. Mean annual household estimated value of household labour to manage equines in each woreda by wealth group

Woreda	Wealth group	Mean annual estimated labour value ETB (USD)
Lemmo	Rich (n=16)	930.0 (69.4)
	Medium (n=96)	924.5 (69.0)
	Poor (n=64)	873.8 (65.2)
	Total (n=176)	909.4 (67.9)
Meskan	Rich (n=11)	1036.4 (77.3)
	Medium (n=45)	1012.3 (75.5)
	Poor (n=120)	987.0 (73.7)
	Total (n=176)	1011.9 (75.5)
Shashego	Rich (n=60)	801.5 (59.8)
	Medium (n=82)	784.4 (58.5)
	Poor (n=34)	789.7 (58.9)
	Total (n=176)	791.9 (59.1)
Overall	Rich (n=87)	922.6 (68.9)
	Medium (n=223)	907.1 (67.7)
	Poor (n=218)	883.5 (65.9)
	Total (n=528)	904.4 (67.5)

n=number of households

4.8 Net economic benefits of equine use

4.8.1 Net profits and benefit-cost ratios

The average output of equine use is calculated from the sum of all income generated from equine use in each woreda divided by the number of study households. The total income includes the monetary value of own household use. Outputs include income from sales of equines, renting out, cart or gharry use and own use translated into a monetary value. The average variable cost of equine use is calculated from the sum of all expenses in each woreda, including purchase of equines, feed, treatment and labour and variable inputs such as maintenance of gharries, carts and harnesses divided by the number of study households.

Table 30 shows the benefits and costs of equine use and demonstrates that benefits from equines were much greater than the costs of keeping and managing them. The average output from the sum of all income generated from equine use, including own use, was lowest in Shashego woreda as compared to Lemmo and Meskan woredas. Across all three woredas equine use outputs were larger for rich followed by poor households.

Table 30. Mean annual benefits and costs per household of equine use in each woreda by wealth group

Woreda	Wealth group	Mean annual benefits, costs and returns ETB (USD)					Benefit-cost ratio
		Equine use outputs	Variable costs	Gross returns	Fixed costs ¹¹	Net returns over total costs	
Lemmo	Rich (n=16)	12,399.1 (925.3)	2100.2 (156.7)	10,298.9 (768.6)	1640.9 (122.5)	8657.9 (646.1)	6:1
	Medium (n=96)	9054.1 (675.7)	1598.0 (119.3)	7456.1 (556.4)	1474.5 (110.0)	5981.6 (446.4)	5:1
	Poor (n= 64)	10,333.8 (771.2)	1771.7 (132.2)	8562.1 (639.0)	1437.5 (107.3)	7124.6 (531.7)	6:1
	Total (n=176)	10,595.7 (790.7)	1823.3 (136.1)	8772.4 (654.7)	1517.6 (113.3)	7254.7 (541.4)	5:1
Meskan	Rich (n=11)	13,233.3 (987.6)	2194.6 (163.8)	11,038.6 (823.8)	1772.4 (132.3)	9266.3 (691.5)	5:1
	Medium (n=45)	5524.9 (412.3)	2050.2 (153.0)	3474.7 (259.3)	1675.1 (125.0)	1799.6 (134.3)	3:1
	Poor (n=120)	7169.9 (535.1)	2252.1 (168.1)	4917.8 (367.0)	1718.4 (128.2)	3199.5 (238.8)	3:1
	Total (n=176)	8642.7 (645.0)	2165.7 (161.6)	6477.1 (483.4)	1721.9 (128.5)	4755.1 (354.9)	3:1
Shashego	Rich (n=60)	8980.6 (670.2)	1858.6 (138.7)	7122.1 (531.5)	1355.5 (101.2)	5766.6 (430.3)	5:1
	Medium (n=82)	4932.8 (368.1)	1472.1 (109.9)	3460.7 (258.3)	1305.3 (97.4)	2155.4 (160.9)	3:1
	Poor (n=34)	4962.8 (370.4)	1450.4 (108.2)	3512.3 (262.1)	1287.2 (96.1)	2225.1 (166.1)	3:1
	Total (n=176)	6292.1 (469.6)	1593.7 (118.9)	4698.4 (350.6)	1316.0 (98.2)	3382.4 (252.4)	4:1
Total	Rich (n=87)	11537.6 (861.0)	2051.1 (153.1)	9486.5 (707.9)	1589.6 (118.6)	7896.9 (589.3)	5:1
	Medium (n=223)	6504.0 (485.4)	1706.8 (127.4)	4797.2 (358.0)	1485.0 (110.8)	3312.2 (247.2)	4:1
	Poor (n=218)	7488.8 (558.9)	1824.7 (136.2)	5664.1 (422.7)	1481.0 (110.5)	4183.1 (312.2)	4:1
	Total (n=528)	8510.1 (635.1)	1860.9 (138.9)	6649.3 (496.2)	1518.5 (113.3)	5130.7 (382.9)	4:1

n=number of households

Average annual variable costs of equine use per household, that is the average sum of all expenses, were different between woredas. Average variable costs were larger in Meskan woreda followed by Lemmo woreda. However, across the three woredas there was no difference in average variable costs between wealth groups.

Average gross returns, calculated from the differences between equine use outputs and variable costs per household, were significantly larger in Lemmo woreda as compared to Meskan and Shashego woredas. In Lemmo and Shashego woredas, average gross returns were not statistically different between the wealth groups, but in Meskan gross returns were larger for wealthier households as compared to medium and poor households.

¹¹ Fixed costs are the costs of those materials that can be used over a number of years and shared by a number of enterprises; fixed cost figures include depreciation of carts and gharries, and the cost of labour, including an estimate of the value of all unpaid labour.

The annual net returns over total costs per household were significantly larger for Lemmo woreda as compared to Meskan and Shashego woredas. The annual net returns over total costs per household were larger for wealthier households as compared to medium and poor households, and larger for poor households compared to medium households. The annual average benefit-cost ratio per household was higher in Lemmo woreda as compared to Meskan and Shashego woredas but there was no difference between the wealth groups across the woredas.

Further analysis comparing the economic returns of equine 'own use' with renting out or cart or gharry use is presented in Table 31.

Table 31. Benefits and costs of different uses of equines

	Mean annual benefits, costs and returns ETB (USD)		
	Equine exclusive own use (n=263)	Equine rent or cart and/or gharry use (n=265)	Overall (n=528)
Equine use outputs	3595 (268)	11,951 (892)	7773 (580)
Variable costs	1273 (95)	2399 (179)	1837 (137)
Gross returns	2321 (173)	9551 (713)	5936 (443)
Fixed costs	1290 (96)	1715 (128)	1503 (112)
Net returns over total costs	1031 (77)	7836 (585)	4433 (331)
Benefit-cost ratio	3:1	5:1	4:1

n=number of households

The average annual benefits per household were much greater for households that used equines for income generation (equine rent, pack, gharry and cart services) than households that used them exclusively for their own purpose. Nevertheless, in both cases the annual benefit-cost ratio was positive showing that equines were very useful, whether it was for exclusive own use or for income generation.

4.8.2 Uses of income

Table 32 summarises household expenditure in Lemmo, Meskan and Shashego woredas. The income derived from equines, as presented in section 4.5, contributed to these expenses. The major proportion of expenses went on agricultural inputs such as tools and grain, followed by family clothing and shoes, followed by school fees and social affairs. The proportion of expenditure on equine inputs was moderate. The proportion of equine-related expenditure compared to overall expenditure was largest in Shashego.

Table 32. Household expenditure by item

Household expense	Median proportion in % (range) (n=10 FGD/woreda)		
	Lemmo	Meskan	Shashego
Grain	15 (4,18)	9 (5,20)	16 (12,20)
Family clothing and shoes	8 (5,9)	5 (4,7)	7 (6,9)
Transport	3 (0,6)	3 (4,13)	6 (5,7)
Utilities	1 (0,8)	2 (0,8)	2 (2,2)
Religious ceremonies	1 (0,1)	2 (1,3)	1 (1,2)
Weddings and circumcision	1 (0,1)	5 (3,11)	2 (1,2)
Agricultural inputs (e.g. tools, grain, fertiliser)	9 (6,15)	10 (5,19)	8 (3,15)
Human medical treatment	7 (3,11)	6 (1,9)	7 (5,12)
Livestock treatment (other than equines)	4 (2,6)	2 (1,3)	6 (5,13)
Animal feed (other than equines)	3 (1,4)	2 (1,3)	4 (4,8)
Equine-related feed, health, etc.	6 (4,8)	5 (3,12)	8 (5,16)
Gharry purchase and maintenance	3 (1,4)	6 (8,10)	1 (1,2)
Food additives (e.g. salt, spices, oil, onions)	3 (0,15)	4 (2,9)	3 (1,6)
Furniture and utensils	5 (0,9)	4 (2,8)	3 (1,12)
Cosmetics and healthcare	2 (1,3)	3 (0,8)	2 (1,2)
Entertainment (drinks, chat, etc.)	3 (1,4)	3 (2,5)	2 (1,3)
Schooling	10 (6,14)	5(1,10)	9 (5,15)
Tax and other government contributions	5 (5,8)	4 (3,6)	5 (3,9)
Social affairs	6 (2,11)	8 (5,11)	5 (2,15)
Labour hire	2 (2,9)	4 (2,6)	1 (1,2)
Construction maintenance	1 (1,9)	2 (0,5)	1 (0,6)
Housing	2 (1,8)	2 (0,13)	0 (0,0)
Others	1 (0,5)	4 (0,5)	1 (0,3)

4.9 Social value of equines

The social value of equines across all the study areas was enormous, ranging from festivals, sports and entertainment to ceremonial decoration during funeral services. The indicators of social contributions of equines in each woreda were similar. However, the level of social contribution varied by woreda, mainly due to differences in livelihoods, access to social services and proximity to the main administrative town where most of the infrastructure and institutions are available. The social contributions of donkeys are summarised in Table 33. In all three woredas the donkey was considered as an animal that reduces the work burden of women.

In the central highlands of Ethiopia, especially in the study areas, there are cultural delineations of household activity responsibilities. Activities such as preparing and serving food; taking care of children and animals; fetching water and firewood for home consumption and sale; getting grain to the mill house; purchasing food and transporting it from market to household are usually the responsibility of women. In those households with a donkey the work burden for women is reduced.

Table 33. The social contributions of donkeys by household

Social contribution	Percentage of households (no. of HH)			
	Lemmo	Meskan	Shashego	Overall
Reducing women's work burden	31.5% (53)	67.3% (76)	31.0% (53)	40.3% (182)
Festivals	-	0.9% (1)	3.5% (6)	1.5% (7)
Societal work	24.4% (41)	9.7% (11)	2.9% (5)	12.6% (57)
Establishing good relations with society through lending	18.5% (31)	16.8% (19)	46.2% (79)	28.5% (129)
Ambulance services	18.5% (31)	1.8% (2)	14.0% (24)	12.6% (57)
Services during funeral	7.1% (12)	3.5% (4)	2.3% (4)	4.5% (20)

HH=households

Across the three woredas, the most common social contribution of donkeys was reducing women's work burden. Donkeys were also used to establish good relationships with neighbours and local societies through lending them whenever people were in need of them. Lending donkeys was most common in Shashego, especially during harvesting to transport agricultural produce from farm to household and also for threshing. The social value of donkeys in giving ambulance services for both people and animals was also high in Lemmo and Shashego woredas.

The most common social contributions of horses in Lemmo and Shashego woredas were festivals, ambulance services for people and societal work. In Meskan woreda the most common social contributions were ambulance services for people and societal works, followed by lending to establish good relations with neighbours and local society. The social contributions of horses are presented in Table 34.

Table 34. The social contributions of horses by household

Social contribution	Percentage of households (no. of HH)			
	Lemmo	Meskan	Shashego	Overall
Reducing women's work burden	7.3% (4)	15.9% (13)	0	9.0% (17)
Festivals	32.7% (18)	1.2% (1)	27.5% (14)	17.6% (33)
Societal work	20.0% (11)	25.6% (21)	17.6% (9)	21.8% (41)
Establishing good relations with society through lending	12.7% (7)	13.4% (11)	11.8% (6)	12.8% (24)
Ambulance services	14.5% (8)	25.6% (21)	29.4% (15)	23.4% (44)
Decoration of funeral ceremony	7.3% (4)	11.0% (9)	5.9% (3)	8.5% (16)
Wedding ceremony	5.5% (3)	7.3% (6)	7.8% (4)	6.9% (13)

HH=households

The most common social contributions of mules in Lemmo and Shashego were reducing women's work burden followed by ambulance services for people (Table 35). In Meskan woreda societal works, reducing women's work burden and ambulance services were important.

Table 35. The social contributions of mules by household

Social contribution	Percentage of households (no. of HH)			
	Lemmo	Meskan	Shashego	Overall
Reducing women's work burden	36.4% (8)	20.0% (1)	28.6% (12)	30.4% (21)
Societal work	22.7% (5)	40.0% (2)	9.5% (4)	15.9% (11)
Establishing good relations with society through lending	4.5% (1)	0	19.0% (8)	13.0% (9)
Ambulance services	27.3% (6)	20.0% (1)	26.2% (11)	26.1% (18)
Decoration of funeral ceremony	4.5% (1)	20.0% (1)	9.5% (4)	8.7% (6)
Wedding ceremony	4.5% (1)	0	7.1% (3)	5.8% (4)

HH=households

4.10 Association between household and individual demographic characteristics and benefits from equine use

Details of the relationship between benefit-cost ratios of equine related activities and household and individual demographic characteristics can be found in Annex 8. As the number of equine holdings and education level (number of years in school) of the household head increased the benefits to the household from equines and related activities grew. Owning larger numbers of equine holdings significantly increased the income and benefits from equine-related activities. In contrast to our expectation, though not significant, male-headed households showed a negative correlation with the benefit-cost ratio showing that the female-headed households benefited more from equines as compared to male-headed households. Similarly, the household head's age was negatively associated with benefit, showing that the younger the household head's age, the larger the benefits from equine use and related activities. Though not significant, household family size had a positive association with benefits from equine-related activities.

4.11 Constraints to equine ownership and use

The constraints to equine ownership and use are summarised in Table 36. The major constraints were the shortage of fodder and grazing areas, health problems, poor shelter, lack of roads and roads in poor condition, and overloading, though the extent varied between woredas.

Table 36. Constraints to equine ownership and use

Constraint	Median score from 10 FGD/woreda		
	Meskan	Shashego	Lemmo
Feed and grazing area shortage	26.5 (14,45)	18.5 (8,36)	23 (13,42)
Overloading	15.5 (10,45)	15 (8,17)	10 (5,19)
Poor shelter and lack of roads	16 (15,21)	20 (18,26)	19 (5,29)
Health problems	15 (3,19)	34 (16,49)	28 (12,45)
Lack of rest	12.5 (5,23)	6 (0,8)	3 (1,10)
Poor knowledge and practice in cart usage	16 (5,25)	10.5 (0,17)	6 (4,15)
Harmful traditional practices	3 (0,10)	6 (3,7)	3.5 (1,6)
Poor harnessing, saddle and lack of spare parts	1 (1,2)	11 (6,20)	6.5 (5,15)
Others	1 (2,5)	1.5 (1,5)	2 (1,4)

note: data in brackets represents the range in %

4.11.1 Shortage of fodder and grazing land and rising costs of feed

The major animal feed sources in each woreda were fodder from grazing land and crop residues. Other sources such as industrial by-products and fodder from improved forage were insignificant. Grazing land was scarcer in the urban/peri-urban areas and so more feed had to be purchased to support working animals. In the surveyed woredas insufficient grazing was a problem in all kebeles and in all agro-ecologies. During the interviews and focused group discussions it was clear that the size of land holdings for small-scale farmers is decreasing as human populations increase. The size of communal grazing land varies from kebele to kebele. Traditionally certain grazing areas are only used during the dry season as means of preserving grazing for when grass is in short supply. The utilisation of these grazing areas varies from area to area. In some places the grazing areas are divided among farmers and utilised privately, whilst in other areas the land is used communally. The practice of private use of grazing land by individuals has an advantage in that the land might be more productive because the farmer is encouraged to manage it properly and would likely match his or her livestock holding to the amount of feed he/she can obtain. The survey team observed that farmers commonly used standing hay, which is dried out and dominated by coarse grasses especially during the ploughing season.

The other reported main source of feed was crop residues, produced from most cereal crops and some legumes. Crop residues are those parts of the crop that remain when primary products or ripe seeds are removed by threshing. Straw from barley, teff and wheat constitute the major component of the equine diet in all districts. Aftermath grazing is another source of dry season feed available immediately after cereal crops are harvested. However, more farmers each year are collecting these crop residues from fields rather than leaving them to be consumed communally. Crop residues from corn and sorghum are more likely to remain in the fields. Equines facilitate transport of crop residues to the homestead but they are not likely to be offered this feed.

4.11.2 Equine health problems

According to the descriptions of the focus group discussions, equines have a range of health problems, not all of which have been thoroughly investigated in this survey. Among the health problems identified, the most frequently encountered were respiratory problems (with common clinical signs such as cough and nasal discharge), colic, back sores and epizootic lymphangitis.

In Shashego woreda, African horse sickness (AHS) and respiratory problems were considered the most important health problems. In Lemmo Woreda, respiratory problems and strangles were ranked as the top two conditions respectively. In Meskan woreda epizootic lymphangitis was reported as the most important health problem (Table 37).

Table 37. Reported common disease conditions in the three woredas

Equine health problem	Median score from 10 FGD/woreda		
	Lemmo	Meskan	Shashego
Respiratory disease	13.5 (5,20)	11 (1,23)	17 (13,24)
Strangles	12.8 (4,18)	-	3 (4,10)
Anthrax	9 (0,17)	-	8 (1,21)
African horse sickness	8.5 (0,16)	-	18 (13,24)
Back sores	9.5 (4,15)	7 (2,14)	8 (2,15)
Internal parasite	8 (2,12)	-	8 (6,11)
Skin disease	8 (2,18)	10 (4,18)	3 (4,11)
Colic	6.5 (0,16)	11 (5,19)	10 (3,24)
Sudden death	-	12 (0,28)	-
Sarcoid/wart	6.5 (0,13)	-	5 (2,11)
Paralysis	5.5 (0,8)	8 (2,15)	6 (2,10)
Epizootic lymphangitis	5.5 (0,13)	17 (3,41)	4 (2,13)
Eye disease	3 (0,8)	-	2 (1,9)
Ulcerative lymphangitis	2 (0,10)	9.5 (0,30)	3 (2,9)
Tail base wound	-	-	2 (1,4)
Leg sores	-	4 (1,10)	-
Mouth lesion	-	3 (0,5)	-
Lameness	1 (0,9)	5.5 (1,15)	-
Others	1 (0,6)	2 (1,3)	3 (1,4)

note: data in brackets is the range in %

Details of equine health problems, including local names for each woreda, are presented in Annex 9.

4.11.3 Overloading and overworking

Across the three woredas overloading and overworking were reported as the major problems after health, poor shelter and roads, and feed and grazing- and shortages. Equines, including cart donkeys and gharry horses, were commonly exposed to overworking; pack equines were usually made to work all day.

5 Discussion

5.1 Demographic characteristics and their effect on benefits from equine use

In all the woredas studied family size was large (average=7.9 members): the area is known for its dense population (CSA, 2010). The majority of interviewed household heads were male and the numbers of female household heads who owned equines were few, especially in Shashego woreda. Much of Shashego woreda is some distance from the main road and the livelihoods of most of its inhabitants are based on farming. Thus, any woman who is divorced or whose husband has died usually migrates to a nearby village or the main town to make a living. The age structure of the interviewed people in all the woredas was statistically similar showing that there is no difference in age-related experiences in management of livestock.

This study examined the extent to which income from equine use and related activities was influenced by demographic factors and equine holdings. Accordingly, equine holdings – that is the numbers of donkeys, horses and mules – had a significant positive association with equine outputs and net returns over total costs. Household family size showed a positive association with net benefits from equine use. The household head's age, education level (number of years in the school) and number of equine holdings had a significant positive association with net benefits from equine use. The younger the age of the household head, the better educated and the large number of equines, the greater the benefits from equine use.

5.2 Livestock holdings and their value

Livestock are one of the main productive assets available to smallholder households. Most (>95%) of households kept different species of livestock, including equines. Subsistence smallholder livestock producers followed broad production objectives that were driven by their immediate subsistence needs with low-input and risk-averting strategies. They preferred to maintain different species of livestock to diversify risk, resource use and labour demands and thus maximise total system outputs. The system outputs included not only marketable yield but also non-marketable functions such as assets, security, power, employment generation, farm integration and socio-cultural reasons.

In this study, the highest numbers of animals kept were cattle followed by donkeys and chicken. Across the woredas more donkeys were kept compared to horses and mules. This could probably be due to ease of management of donkeys, relative income and diverse socioeconomic use of donkeys. Weighing against other livestock, especially cattle, the asset value of equines was found to be very low as compared to their income generation which was 14% of total household income compared to 13% for all other livestock.



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Woman heading to market with charcoal laden donkey in SNNPR.

5.3 The use of equines as a means of transportation

Equines were the major mode of transport, especially in rural areas, and were used as pack animals or for pulling carts and gharries which enabled households and business people to travel and transport different materials/goods. They facilitated participation of the poor in the market economy. The use of equines in transport services also provided rural and urban dwellers with the opportunity of income generation. The Meskan, Lemmo and Shashago communities used equines, especially donkeys, for fetching water and firewood; carrying a variety of goods such as harvested grain and crops from farm to household and to market, and from market to household; transporting feed and straw from farm to household and to market; taking sugar cane, chat, qocho and vegetables from farm to market; and transporting agricultural inputs and food aid from town to household. Equine transportation was used in agricultural production, mainly to transport fertiliser/manure, seed and chemicals to the farm fields and the harvest from the fields to the homestead and to the market. These transport functions were vital in Meskan and Lemmo where land was more intensively cultivated and where, consequently, households were highly dependent on income from marketing cash crops (kocho, coffee, chat, vegetables, fruits, etc).

Equines, especially horses and mules, were used to transport people mainly from their residence to nearby local towns or administrative centres to accomplish different social and economic activities. They were used for carrying the sick to clinics or hospitals; carrying sick animals to veterinary clinics or posts; and transporting shopping and construction materials such as eucalyptus timber, sand, stone, mud and other materials needed for building construction. Equines were also used for collecting and transporting rubbish in the major towns.

5.4 Relative contribution of equines to total household income

Household income includes income in kind and income from net sales of crops and livestock, and equine services. Local non-farm income includes income earned by household people working for wages (including on someone else's farm) and local sales of goods and services. This study indicated that income generated from equine use and services was comparable to the total income from other livestock farming. The three main types of income sources, namely agriculture (both livestock and crop), non-farm and off-farm activities, have different risk profiles for smallholders, who tended to diversify their income portfolios across different combinations of these three sources, depending on local circumstances. The findings indicate that although agriculture continues to play a central role in rural livelihoods, the promotion of complementary areas of rural growth, such as the use of equines, is vital. In the study areas, the same households tended to be involved in both farm and non-farm activities. Equines were a major mode of transportation and were used as pack animals or for pulling carts/gharries which enabled households and business people to participate in the market economy.

The level and intensity of local non-farm and off-farm income including the use of equines as an income source is largely a result of diversifying risks of crop failure especially during drought. The high degree of diversification of smallholder farmers in the study area, both within agriculture and outside it, appears to be closely related to risk-management strategies devised to cope with risky agricultural returns. When cash income from the renting out of equines and gharry and cart use is spent on other rural products it creates employment for any under-employed local resources. It seems likely that such high diversification out of agriculture creates additional employment opportunities where land holdings are small and fragmented. Moreover, for smallholder subsistence agriculture, which is highly susceptible to climatic risk, diversification into non-farm activities could be the most appropriate solution.

In this study it was found that equines, in particular donkeys, have reduced the domestic transport burden of rural women and have created employment and income-generating opportunities for many poor people. Thus, it is of paramount importance that resources are invested by the existing institutions such as the government in supporting non-agriculture income generating opportunities, such as those provided by using equines.



Owners back from threshing teff, a local cereal.

5.5 Household income from equine use

The sample households, especially the poorer ones, used equines to generate a major part of their income. These households include both equine owners and people who hire equines. People who did not own equines had access to them through various local hiring relationships. It was shown that hiring out donkeys, horses and mules was a good source of income. Equines provided employment opportunities for many people who hired out equines or who use equines on a commercial basis for a transport service. Equines assisted both male- and female-headed households with income-generating opportunities and contributed in improving access to cash.

a) Income from sales of equines

Information on income from equine sales showed that there was no difference between woredas. However, wealthier households in Shashego woreda had a higher income from sales as compared to medium and poor households. This could be due to the relatively large number of equine holdings of rich households as compared to medium and poor households. In addition, the income generated from sales of mules was larger as compared to horses and donkeys. This was mainly due to the price difference between mules and other types of equine. Nevertheless, no significant difference was detected between the wealth groups in income generated from sales of equines, which highlights the relative importance of this income for poorer households.

b) Income from renting out equines

Across the three woredas relatively resource-rich households generated larger incomes from renting out equines as compared to resource-poor and medium households. This was mainly due to the number of animals they rented out and the frequency of renting. Medium and poor households usually generated income by using their equines for their own business or transporting someone else's goods. The annual income generated in Lemmo and Meskan by rich households was significantly larger as compared to Shashego woreda. This was mainly due to the fact that Meskan and Lemmo have main towns with a high human population and high relative demand for transportation of goods and other equine services.

c) Income from gharry and cart use

Equine carts and gharries are used to transport people and materials. The income generated by resource-poor households from cart and gharry services was relatively larger as compared to resource-rich and medium households. This was mainly due to the fact that resource-poor households used their own equines mostly to generate income by providing gharry and cart services. Resource-poor households were more likely to use equine gharry and cart services as a means of livelihood compared to the medium and resource-rich households. The income generated from equine cart and gharry use in Lemmo was significantly larger as compared to Meskan and Shashego woredas. This could be due to the high population in the woreda and in Hosanna town which creates a relatively large demand for equine gharry and cart services.

d) Equine own use and estimated economic value

The estimated average monetary value of own use of equines was larger in Lemmo and Shashego woredas as compared to Meskan. This was mainly due to the difference in the main means of livelihood. In Lemmo and Shashego woreda livelihoods are largely based on agriculture, hence the use of equines for own household purpose was larger in these two woredas. As expected, the average value of own use by resource-rich households was larger as compared to the medium and the poor households, possibly due to the large number of economic activities. Moreover, the estimated monetary value of own use of donkeys and horses by resource-rich households was larger as compared to medium and poor households. The value of own use of donkeys or costs saved by using own donkeys for homestead purpose was larger as compared to horses and mules, showing that donkeys are used more for homestead purposes than horses and mules.

5.6 Costs of keeping equines

a) Expenditure on equine purchases

The average expenditure on the purchase of equines in each woreda and wealth group was not statistically different, but expenditure on the purchase of mules was larger as compared to horses and donkeys. This could be due to several factors: the scarcity of mules in the market because their breeding needs human intervention; their hardiness as working animals; and, in some communities, their value as a sign of wealth. Poor households spent more on buying horses than medium and rich families, and tended to buy horses in good condition. This may be because these animals provided a relatively higher income for these households through their use as cart or gharry horses so the investment was considered worthwhile.

b) Expenditure on equine feed

One of the major costs of equines was feed, especially for those households residing in urban areas. It was reported that equines were usually released to communal and the equine owners' grazing areas after work. In urban areas equines were released to graze on open public fields or at the roadside. Supplementary feeding for cart donkeys and gharry horses in the evening was reported to be common. The average annual costs of supplementary feeds (e.g. wheat bran, cereals, grass hay, green grass and rented grazing land) per household in Lemmo and Meskan woredas were significantly higher than in Shashego woreda, where there were fewer equine cart users. The livelihoods of equine users in Shashego were mainly based on agriculture and hence they produced most of the feed themselves or relied on communal grazing. Across the three woredas the average annual cost incurred on feed by study households that use their equines for income generation through renting out or cart and gharry services was significantly larger than those households that used equines exclusively for own purpose. This could be due to the fact that those households that used equines to generate an income from renting out and/or by using cart or gharry services provided additional feed to their equines as the animals were usually working all day with no time to graze. In addition, the feed expenses by the poor households across the three woredas were larger as compared to medium households showing that equines were a major source of income for this wealth group.

c) Expenditure on material inputs

Various expenses on shoes for gharry horses, harnessing materials, saddles, ropes for tethering, gharry and cart maintenance, and shelter maintenance were estimated. The material input expenditure in Shashego woreda was significantly lower as compared to Meskan and Lemmo woredas. This was mainly due to the difference in equine gharry and cart use which was lowest in Shashego.

d) Expenditure on health treatments

Overall expenditure on health treatments was higher in Lemmo woreda as compared to Meskan and Shashego woredas. This could be due to the difference in awareness or prevalence of diseases that require treatments, or cost of the services. It could also be due to over-use of treatments. Treatment expenses by rich households were larger for Lemmo and Meskan woredas, whereas in Shashego treatment expenses by poor households were larger. This may be related to the higher relative value that poor households attributed to their equines as livelihood providers. However, in general, the expenses on equine health were low in contrast to the reported equine health problems and high prevalence rates of equine infectious as well as non-infectious diseases elsewhere in the highlands of Ethiopia (Martin-Curran et al., 2005; Yoseph et al., 2005; Shelima et al., 2006). This shows that there is huge potential for improving the health and welfare of equines in the study areas in SNNPR.

e) Labour costs for equine management

Across the three woredas, utilisation of family labour for the care of equines was common. Tasks included night-time shelter cleaning, followed by releasing the animals in the morning, tethering and feeding and then bringing them back in the evening. Estimates of the monetary value of family labour were calculated using the location-specific employment rate and the share of equine activities. Accordingly, the estimated annual labour expenses per household in Shashego woreda were the lowest as compared to Lemmo and Meskan woredas. This may be due to the long distances of large parts of Shashego woreda from the main road and from the main town such as Butajira and Hosanna, and associated lower labour rates. Nevertheless, in all the woredas expenses were not statistically different between wealth groups. This was mainly due to the collective management of all livestock and collective labour inputs to all sorts of household activities.

5.7 Net economic benefits of equine use

The benefits and costs structure for equine use demonstrated that the benefits from the use of equines were high when compared to the costs of keeping and managing them. The net annual returns over total costs per household were significantly larger for Lemmo woreda as compared to Meskan and Shashego woredas. This could be due to the topography of Lemmo woreda which is relatively mountainous and rugged, resulting in greater demand for equine use and services. The net annual returns over total costs per household were larger for wealthier households as compared to medium and poor households, and larger for poorer households compared to medium ones. Wealthier households utilised equines for their own purposes much more as compared to medium and poor households.

The study clearly indicated that average annual net returns over the total costs per household were much larger for households that utilised equines for income generation than for households that utilised equines exclusively for their own purposes. Despite that, in both cases, the average annual net returns over the total costs per household were large showing that the use of equines whether for income generation or exclusive own use was profitable.

5.8 Uses of income

The income derived from equines contributed to the household expenses. The major proportion of expenses went on agricultural inputs, tools and grain purchase followed by family clothing and shoes, school fees and social affairs. The proportion of household expenditure on equine inputs was moderate. The proportion of equine-related expenses compared to overall expenses was larger in Shashego. This may be due to awareness of the need for better welfare and management of equines created by the Brooke Ethiopia programme.

5.9 Social value of equines

The social contributions of donkeys, horses and mules across the three woredas were enormous. However, there was a variation between woredas, mainly due to differences in livelihoods, access to social services and proximity to the main administrative town where most of the infrastructure and institutions are available. Nevertheless, the social contribution of donkeys across the woredas in reducing the work burden of women was the most common of all social contributions, and was more common than for mules and horses. It was reported that in the study area there was usually a delineation of household responsibilities between men and women household members. Activities such as preparing household food and taking care of children and animals were usually the responsibility of women. Household women used donkeys to fetch water; collect firewood for home consumption and sale; take grain to the mill house; and transport items bought at market back to the household. The use of donkeys has enabled women to overcome the cultural barriers to the use of working animals and to mitigate some of the additional burdens imposed on them. In all woredas it was observed that women found donkeys easy to work with, and that donkeys helped them in their farming and domestic transport duties, such as for petty trade. Donkeys also assisted women with income-generating opportunities and contributed towards changing gender power relations.



Bulit- the donkey assists her owner Debritu to do chores while her foal is still at play.

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5.10 Constraints to equine ownership

a) Shortages of fodder and grazing field

Shortage of fodder and grazing areas and rising costs of feeds were identified as important limiting factors for equine production in the surveyed woredas. The most common problems associated with feed and grazing-land shortage were under-nutrition caused by an absolute lack of feed or malnutrition caused by an unbalanced diet. Feed shortage was one of the major constraints to productivity and work performance of equines in these woredas. In the surveyed woredas insufficient grazing was a problem in all kebeles, in all agro-ecologies. According to respondents the shortage of livestock feed was primarily attributed to the small farmland holding per family and the resulting limited crop residues. This was particularly critical in the large, densely populated areas where farmers were forced to cultivate even the steepest slopes in order to provide themselves with subsistence food. In areas where population pressure was high almost all available plots of land were utilised for arable crop production, except a very few fragmented patches of poor-quality land that were left for grazing. It was reported that these grazing areas suffered from high stock density during the dry period of the year, which could subsequently result in an increase in soil erosion and gully formation.

Crop residues were reported as the other vital source of feed but farmers with small land holdings harvested very small amounts of crop residues yearly even in seasons of abundant rain. Though equines facilitated the transportation of crop residues from farm land to the household, they were the last to be offered these residues. Crop residues and grass hay supplements were primarily supplied to oxen followed by other cattle and small ruminants.

b) Health problems

Equine health problems were reported as one of the major constraints to equine management and use. Among the health problems identified, the most frequently encountered were respiratory problems (with common clinical signs such as cough and nasal discharge), colic, back sores and epizootic lymphangitis. During the discussions, it was reported that these equine health problems continued to have major impacts on the equine users' livelihoods, either through direct loss of the animal, reduced production or through reduced capacity to work.

Some of the health problems were reported as epidemics, implying relatively rapid onset and, in some cases, high mortality of equines – one reported example was AHS. The respiratory problems reported were complex and likely to be related to infections, dry season dust and parasites. Across the woredas, colic, defined by rolling and other signs, was reported as an important health problem. This was likely to be due to a number of causes including poor feeding and watering practices, high parasite burdens and eating of rubbish. Wounds, especially on the back, were reported with relatively high frequency across the study woredas. The back and leg sores were presumably associated with inappropriate harness and saddle materials, overloading, overworking and traditional cauterization.

Some of these mentioned endemic and epidemic equine diseases can be prevented by proper management, deworming and vaccination. Vaccines are inexpensive relative to the economic value of equines. The importance of equine diseases as a major constraint to equine ownership and use reflects weak veterinary services and lack of capacity to implement preventive health programmes across the three woredas.

c) Overloading and overworking

Overloading and excessive work were reported as one of the constraints to equine use. Equines, including cart donkeys and gharry horses, were commonly exposed to overworking. Similarly, pack equines were usually made to work all day; in particular, donkeys hired out for work seemed to work very hard. Overloading was the commonest problem exposing the animals to different wounds and back sores. The saddle and harnessing materials were usually not appropriate adding to the chance of equines developing related health and welfare problems. These problems could arise from lack of knowledge or economic pressures.

6 Conclusions and Recommendations

This study confirms that donkeys, horses and mules are economically and socially important in the livelihoods of people in Lemmo, Meskan and Shashego woredas of the Southern Nations and Nationalities People's Region of Ethiopia.

The economic and social contributions of equines to the livelihoods of societies, especially the poor, in terms of creation of employment opportunities, access to finance and local transportation are enormous. The net returns from equine use are significantly higher than the total costs, showing equines in the smallholder communities are very useful whether it is for exclusive own use or for income generation. Donkeys, horses and mules assist poor households with income-generating opportunities and have contributed in improving access to finance. Spending by households of cash income from the renting out of equines and gharry and cart services on other rural services such as crop or livestock agriculture offers realistic ways of obtaining returns from agriculture above mere subsistence. For smallholder subsistence agriculture, which is highly susceptible to climatic risk, diversification into non-farm activities could be the most appropriate solution.

Nevertheless, despite the great contributions made by equines in these three woredas to the daily life and livelihoods of the people who solely or partly depend on them, they suffer the negative impact of feed shortage, poor health, low social status and poor management. These factors were found to significantly reduce their work output and constrain the full contribution that equines could make in supporting rural livelihoods. Improvement of management practices, deliverable, accessible, sustainable and affordable equine health services as well as adequate feed are required to improve the performance of equines. Strengthening the ongoing community-based animal health system, as has been piloted in Shashego woreda, through institutional arrangements with existing public animal health services and creating linkages with private drug vendors should be the priority plan to realise accessible, sustainable and affordable equine health services.

In this study it was found that equines were sources of income, created employment opportunities and reduced domestic transport burdens. With this in mind, it is of paramount importance that resources are invested by the existing institutions such as the government in supporting non-agriculture income generating opportunities, such as those involving use of equines. An awareness creation and training agenda for grassroots users and policy makers at the higher level is of paramount importance. People involved in decision making, policy formulation, research, training and education are required for better positive images of the value of equine contribution towards food security, improved livelihoods and the national economy.

This study did not aim to investigate causes and reasons for certain actions taken by owners and users in relation to their equines. Examples of these include higher expenditure on health care by poor wealth group households in Shashego, and why in particular woredas, certain income-generating uses of equines were more common than in other woredas. The Brooke should plan to undertake additional studies to further research these issues through its continuing work in the area.



A boy using a donkey to fetch water for his family.

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Owner with his working donkey at Hossana timber market.

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8 Annexes

Annex 1. Detailed basic information about Lemmo, Meskan and Shashego study woredas

Basic information	Woredas		
	Lemmo	Meskan	Shashego
Geographical location	7° 22"–7° 45" N latitude 37° 4"–38° 00" E longitude	7° 99"–8° 28" N latitude 38° 26"–38° 58" E longitude	7° 5" - 07° 30" N latitude 37°5"-38°4" E longitude
Total area	343.67km ²	517.7km ²	374.20km ²
Highland	9%	20%	6%
Midland	91%	80%	94%
Lowland	0%	0%	0%
Maximum temperature	23°C	27.5°C	25°C
Minimum temperature	13°C	7.5°C	15°C
Rainfall	950–1200mm	1001–1200mm	900–1100mm
Rainy season	Kiremt (June–September) and Belg (March–April)	Kiremt (June–September) and Belg (March–April)	Kiremt (June–September) and Belg (March–April)
Altitude (metres above sea level – masl)	2100–2340masl	1501–3500masl	1800–2300masl
Annual crop land	22,248ha	17,803ha	24,477ha
Perennial crop land	3278ha	11,195ha	-
Grazing land	1042ha	3646ha	4974ha
Natural forest land	1260 ha	3988ha	2911ha (all forest)
Planted forest land	-	1493 ha	-
Arable land	200ha	883ha	-
Other land	6339ha	1248ha	3826ha
Total population	150,719	172,682	127,717
Rural male	72,925	-	-
Rural female	73,709	-	-
Rural total	146,634	158,391	120,542
Urban male	2900	-	-
Urban female	1185	-	-
Urban total	4085	14,291	7176

Source: Woreda Bureaus of Agriculture. The complete set of data for Shashego was not available.

Annex 2. Statistics

The following General Linear Model equations were used:

Equation 1

$$Y_i = \mu + W_i + E_i$$

Where: Y_i is the i^{th} observation of family size, age of interviewed household head, livestock including poultry and beehive holdings; μ is the overall mean; W_i is the fixed effect of i^{th} woreda (household location, i , representing Lemmo, Shashego and Meskan woredas); E_i is random error (which is assumed $N(0, \sigma^2)$)

Equation 2

$$Y_i = \mu + L_i + E_i$$

Where: Y_i is the i^{th} observation of income from equine use, expenditure on equine inputs including feed, health, labour, variable inputs; μ is the overall mean; L_i is the fixed effect of i^{th} woreda location (household location, i , representing Lemmo, Shashego and Meskan woredas); E_i is random error (which is assumed $N(0, \sigma^2)$)

Equation 3

$$Y_{ij} = \mu + L_i + W_j + LW_{ij} + E_{ij}$$

Where: Y_{ij} is the ij^{th} observation of household income from equine use, expenditure on equine feed, health, labour and other variable inputs such as shoe and harnessing materials; μ is the overall mean; L_i is the fixed effect of i^{th} household location (i , representing Lemmo, Shashego and Meskan woredas); W_j is the fixed effect of j^{th} household wealth status (j , representing rich, medium and poor); LW_{ij} is the effect of interaction between i^{th} household location (Woreda) and j^{th} household wealth status; E_{ij} is random error (which is assumed $N(0, \sigma^2)$)

Regression analysis: Regression analysis was employed to estimate the effects of explanatory variables such as household and individual characteristics and equine holding (Tables 4, 5 and 6) on outcome variables i.e. household benefits from equines and related activities.

Selection of the explanatory variables of the model: Among the set of potential determinants of household income from equine activities, an attempt was made to choose those variables that were arguably explanatory.

Demographic characteristics: Included in this category are household family size and the age and sex of household head. Households with women and young heads are hypothesised to influence income from equine use.

Household assets: Households with more equine holdings and educated head are hypothesised to influence income from equine activities

Equation 4

$$Y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_5 X_5$$

Where: Y_i is the i^{th} household income from equine activity; β_0 is constant, β_j ($j = 1, 2, \dots, 5$) are coefficients of the independent variables; X_j ($j = 1, 2, \dots, 5$) are independent (explanatory) variables specified as determinants.

Explanatory variables and their expected effects:

Characteristic	Expected effects	
	Variable mean	Income equine
X_1 = Household size (head)	7.99	+
X_2 = Household head(1=male and 0 = female)	91.3	+
X_3 = Head's age (in years)	40.15	+
X_4 = Head's education (number of years)	4.56	+
X_5 = Equine holding (number of equines)	2.18	+

Annex 3. Literacy status of household heads by woreda and gender

		Literacy status		Total
		Literate	Illiterate	
Woreda	Lemmo	137 (77.8%)	39 (22.2%)	176(100%)
	Meskan	95 (54.0%)	81(46.0%)	176 (100%)
	Shashego	143 (81.3%)	33 (18.8%)	176 (100%)
Gender	Female	36 (55.4%)	29 (44.6%)	65 (100%)
	Male	339 (73.2%)	124 (26.8%)	463 (100%)
Total		375 (71.0%)	153 (29.0%)	528 (100%)

Annex 4. Detailed sources and median proportion of household income in the study woredas (n=10 FGD)

Income source	Median (Range of income)		
	Meskan	Lemmo	Shashego
Crop farming (%)	26	25	29
Crop production	19 (3,30)	23 (7,36)	26 (7,42)
Fruit and vegetables	7 (2,10)	2 (0,3)	3 (1,4)
Livestock farming (%)	12	13	16
Livestock sales	7 (1,18)	8 (4,14)	11 (4,22)
Animal product sales	5 (1,11)	5 (3,7)	5 (3,13)
Equines (%)	11	14	14
Sales	2 (1,4)	5 (4,8)	8 (4,18)
Renting out	4 (1,5)	5 (3,8)	3 (2,6)
Gharry work	5 (2,5)	4 (2,8)	3 (0,5)
Animal feed sales (%)	1 (1,2)	1 (0,2)	1 (0,3)
Labour (%)	20 (5,30)	11 (4,22)	5 (3,14)
Remittances (%)	2 1,12)	9 (7,11)	8 (5,10)
Off-farm activity (%)	26	26	25
Petty trade	5 (1,30)	5 (3,9)	5 (3,22)
Local employment	2 (1,12)	4 (3,15)	4 (2,6)
Food and beverage sales	3 (1,11)	0 0	2 (0,4)
Timber sales	6 (2,10)	8 (3,14)	6 (4,16)
House rent	1 (0,5)	4 (1,14)	3 (1,12)
Safety net ¹²	2 (0,3)	0 0	2 (0,2)
Brokering	1 (1,5)	0 0	0 0
Farmland rent out	3 (1,11)	0 0	2 (0,3)
Chat sale	3 (2,12)	4 (2,13)	0 0
Others	2 (0,3)	1 (0,3)	2 (0,3)

¹² Safety net: explanation is provided in footnote 10.

Annex 5. Details of statistical analysis of each source of income from equine uses (sales, renting out, cart and gharry services including monetary value of own use)

Annex 5.1. Income from sales of equines in ETB

Average annual income per household from sales of equines in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=7)	925.7	437.4	1414.1
	Medium (n=27)	970.6	721.9	1219.2
	Poor (n=13)	959.2	600.9	1317.6
	Total (n=47)	951.8	733.6	1170.1
Meskan	Rich (n=5)	1390.0	812.2	1967.8
	Medium (n=14)	1146.4	801.1	1491.7
	Poor (n=38)	919.5	709.9	1129.1
	Total (n=57)	1152.0	917.0	1387.0
Shashego	Rich (n=29)	1586.9	1347.0	1826.8
	Medium (n=40)	996.3	792.0	1200.5
	Poor (n=6)	1008.3	480.9	1535.8
	Total (n=75)	1197.2	992.3	1402.0
Overall	Rich (n=41)	1300.9	1036.3	1565.4
	Medium (n=81)	1037.7	880.4	1195.1
	Poor (n=57)	962.3	738.6	1186.1
	Total (n=179)	1100.3	973.5	1227.2

n=number of households

Income per household from sale of donkeys by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	32	1072.7	800.6	1344.8
Medium	54	964.8	773.3	1156.4
Poor	39	847.6	634.4	1060.8
Total	125	961.7	830.0	1093.4

Income per household from sale of horses by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	10	1330.6	884.4	1776.8
Medium	24	984.2	717.5	1250.8
Poor	18	1250.6 ^a	613.0	1888.2
Total	52	1180.7 ^a	928.9	1432.5

a. Based on modified population marginal mean.

Income per household from sale of mules by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	4	2275.0 ^a	1410.0	3140.0
Medium	6	1705.6	924.8	2486.4
Poor	2	1400.0 ^a	176.7	2623.3
Total	12	1698.6^a	1116.0	2281.3

a. Based on modified population marginal mean.

Annex 5.2. Income from renting out equines in ETB

Average annual income per household from renting out equines in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=6)	6413.3	3812.9	9013.8
	Medium (n=18)	3264.4	1763.1	4765.8
	Poor (n=12)	1885.0	46.2	3723.8
	Total (n=36)	3854.3	2680.6	5027.9
Meskan	Rich (n=4)	7443.8	4258.9	10628.6
	Medium (n=12)	1499.3	-339.5	3338.1
	Poor (n=31)	2222.9	1078.8	3366.9
	Total (47)	3722.0	2438.2	5005.8
Shashego	Rich (n=9)	3326.7	1203.4	5449.9
	Medium (n=12)	2253.3	414.5	4092.1
	poor (n=5)	2600.0	-248.7	5448.7
	Total (n=26)	2726.7	1393.2	4060.2
Overall	Rich (n=19)	5727.9	4185.4	7270.4
	Medium (n=42)	2339.0	1338.1	3340.0
	Poor (n=48)	2236.0	1043.2	3428.8
	Total(n=109)	3434.3	2703.7	4164.9

n=number of households

Average annual income per household from renting out donkeys

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	16	3722.2	2502.9	4941.6
Medium	35	1894.0	1147.5	2640.4
Poor	36	1950.9	1043.5	2858.2
Total	87	2522.4	1957.9	3086.8

Average annual income per household from renting out horses

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	3	6698.8 ^a	2457.6	10939.9
Medium	8	2374.7	-635.3	5384.7
Poor	11	2012.5 ^a	-331.9	4356.9
Total	22	3506.6^a	1614.3	5399.0

a. Based on modified population marginal mean.

Average annual income per household from renting out mules

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	4	3640.0	2342.7	4937.3
Medium	3	3640.0	2142.0	5138.0
Poor	3	2686.7	1188.7	4184.6
Total	10	3322.2	2494.2	4150.3

Annex 5.3. Income from equine cart and gharry services in ETB

Average annual income per household from equine cart and gharry services in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=7)	7651.4	728.6	14,574.2
	Medium (n=25)	15,184.0	11,520.8	18,847.2
	Poor (n=23)	16,933.9	13,114.8	20,753.1
	Total (n=55)	13,256.4	10,351.9	16,161.0
Meskan	Rich (n=8)	6474.0	-1.7	12,949.7
	Medium (n=21)	6255.4	2258.6	10,252.3
	Poor (n=75)	8103.3	5988.3	10,218.2
	Total (n=104)	6944.2	4311.5	9577.0
Shashego	Rich (n=16)	13,094.3	8515.3	17,673.2
	Medium (n=14)	8865.9	3970.7	13,761.0
	Poor (n=8)	8131.3	1655.6	14,606.9
	Total (n=38)	10,030.5	6923.8	13,137.2
Overall	Rich (n=31)	9073.2	5564.1	12,582.4
	Medium (n=60)	10,101.8	7666.9	12,536.6
	Poor (n=106)	11,056.2	8452.9	13,659.4
	Total (n=197)	10,077.0	8409.7	11,744.4

n=number of households

Mean annual income per household from donkey cart services by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	30	7036.9	3714.2	10359.6
Medium	51	8838.7	6353.7	11323.6
Poor	74	9856.6	7391.0	12322.2
Total	155	8577.4	6968.6	10186.2

Mean annual income per household from horse gharry services by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	7	10,725.0	4474.8	16975.2
Medium	12	8706.2	2367.4	15045.0
Poor	36	11,328.0a	8600.2	14055.8
Total	55	10,038.1a	6435.7	13640.4

a. Based on modified population marginal mean.

Annex 5.4. Estimate of translated monetary value of own use in ETB

Estimate of translated average monetary value per household of equine own use by wealth status in each woreda

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=16)	6241.6	4933.7	7549.4
	Medium (n=96)	4253.8	3719.9	4787.7
	Poor (n=60)	3959.4	3284.0	4634.7
	Total (n=172)	4818.2	4296.3	5340.1
Meskan	Rich (n=11)	5186.3	3609.0	6763.6
	Medium (n=45)	1979.8	1200.0	2759.6
	Poor (n=113)	1316.8	824.7	1808.9
	Total (n=169)	2827.6	2218.6	3436.6
Shashego	Rich (n=60)	4222.8	3547.4	4898.2
	Medium (n=82)	2598.5	2020.8	3176.2
	Poor (n=34)	2489.2	1592.1	3386.4
	Total (n=176)	3103.5	2682.6	3524.5
Overall	Rich (n=87)	5216.9	4497.7	5936.0
	Medium (n=223)	2944.0	2574.8	3313.3
	Poor (n=207)	2588.5	2179.8	2997.1
	Total (n=517)	3583.1	3281.2	3885.1

n=number of households

Average monetary value per household of donkey own use by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	87	4411.6	3732.4	5090.9
Medium	204	2663.5	2284.1	3042.8
Poor	161	2591.6	2179.3	3004.0
Total	452	3222.2	2928.7	3515.7

Average monetary value per household of horse own use by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	33	1461.1	979.9	1942.4
Medium	80	911.3	616.1	1206.5
Poor	65	994.1	508.7	1479.5
Total	178	1122.2	874.0	1370.4

Average monetary value per household of mule own use by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	10	810.0	-616.8	2236.8
Medium	23	1506.3	808.5	2204.0
Poor	7	1647.5	174.9	3120.1
Total	40	1321.3	599.3	2043.2

Annex 6. Income from sales of livestock and animal products in ETB

Average annual income per household from sales of livestock and chickens (not including equines) in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=14)	3475.7	1993.8	4957.6
	Medium (n=79)	2298.5	1674.6	2922.3
	Poor (n= 38)	2608.7	1709.3	3508.2
	Total (n=131)	2794.3	2180.2	3408.4
Meskan	Rich (n=9)	6457.8	4609.6	8306.0
	Medium (n=28)	2668.4	1620.6	3716.2
	Poor (n= 70)	1800.4	1137.7	2463.1
	Total (n=107)	3642.2	2900.4	4384.1
Shashego	Rich (n=52)	4107.0	3338.1	4875.9
	Medium (n=67)	2374.1	1696.7	3051.4
	Poor (n= 29)	1577.2	547.6	2606.9
	Total (n=148)	2686.1	2201.9	3170.3
Total	Rich (n=75)	4680.2	3850.0	5510.4
	Medium (n=174)	2447.0	1982.0	2912.0
	Poor (n= 137)	1995.5	1489.0	2501.9
	Total (n=386)	3040.9	2681.6	3400.2

n=number of households

Average annual income per household from sales of animal products in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=9)	2268.9	1609.0	2928.8
	Medium (n=59)	1298.4	1040.6	1556.1
	Poor (n= 36)	1103.1	773.1	1433.0
	Total (n=104)	1556.8	1296.3	1817.3
Meskan	Rich (n=8)	475.8	-224.2	1175.7
	Medium (n=17)	348.1	-132.1	828.3
	Poor (n= 34)	264.3	-75.3	603.8
	Total (n=59)	362.7	58.0	667.5
Shashego	Rich (n=42)	1079.5	774.0	1385.0
	Medium (n=60)	588.7	333.1	844.3
	Poor (n= 15)	438.7	-72.5	949.9
	Total (n=117)	702.3	486.3	918.3
Total	Rich (n=59)	1274.7	938.3	1611.2
	Medium (n=136)	745.1	544.4	945.7
	Poor (n= 85)	602.0	369.7	834.2
	Total (n=280)	873.9	722.1	1025.7

n=number of households

Annex 7. Cost of keeping equines in ETB

Annex 7.1. Expenditure on purchase of equines

Average annual household expenditure on purchase of equines in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=3)	1220.0	620.8	1819.2
	Medium (n=17)	1064.7	813.0	1316.4
	Poor (n=16)	955.6	696.2	1215.1
	Total (n=36)	1080.1	846.9	1313.4
Meskan	Rich (n=2)	1150.0	416.2	1883.8
	Medium (n=17)	1297.6	1046.0	1549.3
	Poor (n=59)	1163.2	1028.1	1298.3
	Total (n=78)	1203.6	941.1	1466.1
Shashego	Rich (n=24)	1237.1	1025.2	1448.9
	Medium (n=21)	1051.9	825.4	1278.4
	Poor (n=7)	1110.0	717.8	1502.2
	Total (n=52)	1133.0	966.3	1299.7
Overall	Rich (n=29)	1202.4	878.8	1525.9
	Medium (n=55)	1138.1	997.5	1278.7
	Poor (n=82)	1076.3	913.2	1239.4
	Total (n=166)	1138.9	1009.3	1268.5

n=number of households

Average household expenditure on purchase of donkeys by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	14	991.3	690.4	1292.3
Medium	34	1031.0	876.2	1185.9
Poor	47	929.4	771.9	1086.8
Total	95	983.9	859.5	1108.3

Average household expenditure on purchase of horses by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	11	1467.5a	871.9	2063.1
Medium	17	1193.8	895.9	1491.7
Poor	32	1556.6a	979.6	2133.6
Total	60	1375.7a	1106.5	1644.8

a. Based on modified population marginal mean.

Average household expenditure on purchase of mules by wealth group

Wealth group	n	Mean	95% confidence interval	
			Lower bound	Upper bound
Rich	4	2100.0a	1851.9	2348.1
Medium	4	1766.7	1480.2	2053.1
Poor	3	1550.0	1246.2	1853.8
Total	11	1746.7a	1572.4	1920.9

a. Based on modified population marginal mean.

Annex 7.2 Expenditure on equine feed

Average annual household expenditure on supplementary feed in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=16)	1217.6	1015.9	1419.3
	Medium (n=96)	876.8	794.4	959.1
	Poor (n=64)	985.4	884.6	1086.3
	Total (n=176)	1026.6	946.6	1106.6
Meskan	Rich (n=11)	1215.5	972.2	1458.7
	Medium (n=45)	1038.8	918.5	1159.0
	Poor (n=120)	1109.1	1035.4	1182.7
	Total (n=176)	1121.1	1027.4	1214.8
Shashego	Rich (n=60)	857.5	753.4	961.7
	Medium (n=82)	744.3	655.2	833.4
	Poor (n=34)	778.1	639.7	916.5
	Total (n=176)	793.3	728.4	858.2
Overall	Rich (n=87)	1096.9	986.0	1207.8
	Medium (n=223)	886.6	829.7	943.6
	Poor (n=218)	957.5	895.4	1019.7
	Total (n=528)	980.3	933.9	1026.8

n=number of households

Average annual household expenditure on supplementary feed based on equine use by wealth group

Equine use	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Income generation and own use	Rich (n=43)	1367.3	1306.7	1427.9
	Medium (n=86)	1338.5	1295.6	1381.4
	Poor (n=134)	1308.4	1274.0	1342.7
	Total (n=263)	1338.0	1310.8	1365.3
Exclusive own use	Rich (n=44)	579.8	519.8	639.7
	Medium (n=137)	560.9	526.9	594.8
	Poor (n=84)	563.0	519.6	606.4
	Total (n=265)	567.9	540.7	595.0
Total	Rich (n=87)	973.5	930.9	1016.2
	Medium (n=223)	949.7	922.3	977.0
	Poor (n=218)	935.7	908.0	963.3
	Total (n=528)	953.0	933.7	972.2

n=number of households

Annex 7.3 Expenditure on equine material inputs

Average annual household expenditure on different material inputs in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=16)	570.8	507.1	634.4
	Medium (n=96)	505.7	479.7	531.7
	Poor (n=64)	516.4	484.5	548.2
	Total (n=176)	530.9	505.7	556.2
Meskan	Rich (n=11)	579.6	502.9	656.4
	Medium (n=45)	509.2	471.2	547.1
	Poor (n=120)	554.0	530.8	577.3
	Total (n=176)	547.6	518.0	577.2
Shashego	Rich (n=60)	479.8	447.0	512.7
	Medium (n=82)	440.1	412.0	468.2
	Poor (n=34)	422.6	378.9	466.2
	Total (n=176)	447.5	427.0	468.0
Overall	Rich (n=87)	543.4	508.4	578.4
	Medium (n=223)	485.0	467.0	502.9
	Poor (n=216)	497.6	478.1	517.2
	Total (n=528)	508.7	494.0	523.3

n=number of households

Annex 7.4. Expenditure on equine treatment

Average annual household expenditure on equine treatment in each woreda

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=15)	88.6	67.3	109.9
	Medium (n=69)	36.2	26.3	46.2
	Poor (n=51)	39.0	27.5	50.6
	Total (n=135)	54.6	45.9	63.4
Meskan	Rich (n=2)	47.5	-10.9	105.9
	Medium (n=20)	29.2	10.7	47.6
	Poor (n=55)	39.0	27.9	50.2
	Total (n=77)	38.6	17.8	59.3
Shashego	Rich (n=36)	44.2	30.4	58.0
	Medium (n=44)	34.3	21.9	46.8
	Poor (n=16)	45.2	24.5	65.8
	Total (n=96)	41.2	32.0	50.5
Overall	Rich (n=53)	60.1	38.9	81.3
	Medium (n=133)	33.2	25.1	41.4
	Poor (n=122)	41.1	32.4	49.8
	Total (n=308)	44.8	36.7	52.9

n=number of households

Annex 7.5. Expenditure on labour

Average annual household labour expenditure on the management of equines in each woreda by wealth group

Woreda	Wealth group	Mean	95% confidence interval	
			Lower bound	Upper bound
Lemmo	Rich (n=16)	930.0	792.6	1067.4
	Medium (n=96)	924.5	868.4	980.6
	Poor (n=64)	873.8	805.1	942.4
	Total (n=176)	909.4	854.9	963.9
Meskan	Rich (n=11)	1036.4	870.7	1202.1
	Medium (n=45)	1012.3	930.3	1094.2
	Poor (n=120)	987.0	936.8	1037.2
	Total (n=176)	1011.9	948.0	1075.7
Shashego	Rich (n=60)	801.5	730.6	872.4
	Medium (n=82)	784.4	723.7	845.1
	Poor (n=34)	789.7	695.5	883.9
	Total (n=176)	791.9	747.6	836.1
Overall	Rich (n=87)	922.6	847.1	998.2
	Medium (n=223)	907.1	868.3	945.8
	Poor (n=218)	883.5	841.2	925.8
	Total (n=528)	904.4	872.8	936.0

n=number of households

Annex 8. Predictors of household income from equine-related activities

Explanatory variable	Beta	T-value	Sig.	Correlation part
(Constant)		5.152	0.000	
X_1 = Household family size (head)	0.026	0.533	0.594	0.022
X_2 = Household head(1=male and 0=female)	-0.010	-0.216	0.829	-0.009
X_3 = Head's age (in years)	-0.114	-2.170	0.030	-0.092
X_4 = Head's education (number of years)	0.095	1.977	0.049	0.083
X_5 = Equine holding (number of equines)	0.209	4.742	0.000	0.200

Dependant variable: benefit-cost ratio.

Annex 9. Equine health problems in each woreda

Type of equine health problems in Lemmo woreda

English term	Hadiya term in Lemmo woreda	%	range
Respiratory disease	Salaka / Sal	13.5	(5–20)
Strangles	Tusha / Korosa	12.8	(4–18)
Anthrax	Hitjebo / Tinticho	9	(0–17)
AHS	Ginbot Beshita	8.9	(0–16)
Back sores	Gembeta / Burza	8.5	(4–15)
Internal parasite	Muriea	8	(2–12)
Skin disease	Betera / Kafir	8	(2–18)
Colic	Gemie / Godeb	6.8	(0–16)
Sarcoid/wart	Editicho / Tenterjebo	6.8	(0–13)
Paralysis	Chigena / Chebo	5.8	(0–8)
Epizootic lymphangitis	Chechebsa	5.6	(0–13)
Eye disease	Eltiso	3.1	(0–8)
Ulcerative lymphangitis	Nidift	1.2	(0–10)
Lameness		0.9	(0–9)
Others		1.1	(0–6)

Type of equine health problems in Shashego woreda

English term	Hadiya term in Shashego woreda	%	range
AHS	Ginbot Beshita	18	(13–24)
Respiratory disease	Sal / Salaka	17	(13–24)
Colic	Gemie / Kurtet	10	(3–24)
Anthrax	Tinticho	8	(1–21)
Back sores	Gembeta / Burza	8	(2–15)
Internal parasite	Muriea	8	(6–11)
Paralysis	Chigena	6	(2–10)
Sarcoid/wart	Editicho / Tenterjebo	5	(2–11)
Epizootic lymphangitis	Chebchebsa	4	(2–13)
Skin disease	Kafir	3	(4–11)
Ulcerative lymphangitis	Nidift	3	(2–9)
Strangles	Korosa	3	(4–10)
Eye disease	Eljebo	2	(1–9)
Tail base wound	Sherem Jebo	2	(1–4)
Others		3	(1–4)

Type of equine health problems in Meskan woreda

English term	Guraghe term in Meskan Woreda	%	range
Sudden death	Geregelcha / lakisa	12	(0–28)
Ulcerative lymphangitis	Bochoka	9.5	(0–30)
Skin disease	Kafir	10	(4–18)
Epizootic lymphangitis	Nidift	17	(3–41)
Colic	Gemie / Kurtet	11	(5–19)
Cough/nasal discharge/respiratory disease	Ambik	11	(1–23)
Back partial paralysis	Jibirir	8	(2–15)
Mouth lesion	Afetirs	3	(0–5)
Leg sores	Ametmit / Choq	4	(1–10)
Back sores	Gembet/ Biliz	7	(2–14)
Lameness of fetlock	Tigen	5.5	(1–15)
Others		2	(1–3)
Eye disease	Eljebo	2	(1–9)
Tail base wound	Sherem Jebo	2	(1–4)
Others		3	(1–4)



A boy with his donkey laden with timber in Hosanna.

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