INNSPUB

International Journal of Biosciences | IJB |
ISSN: 2220-6655 (Print), 2222-5234 (Online)
http://www.innspub.net
Vol. 23, No. 1, p. 55-67, 2023

RESEARCH PAPER OPEN ACCESS

# Socio-economic valuation of donkey ownership in Ethiopia: in the case of Hossana town and Lemo woreda of Hadiya zone, Southern Ethiopia

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**Key words:** Donkey, Socio-economic Values, Contingent Valuation Technique, Ethiopia

http://dx.doi.org/10.12692/ijb/23.1.55-67 Article published on July 07, 2023

## Abstract

Despite the fact that it is widely acknowledged that donkeys are an important part of people's livelihoods in Ethiopia, there is very little quantitative data on the specific socio-economic value of donkey ownership. The objective of this study was to examine socio-economic contributions of donkey ownership. To this end, primary data were collected from 267 respondents, out of which 147 were from rural areas and 120 were from urban areas. Social and marketable economic contributions of donkey ownership and use were analyzed using descriptive statistics. The non-market socio-economic contributions of the donkey were measured by employing the contingent valuation (CV) method. Furthermore, the factors that affect the probability and share of the non-market value of donkeys were analyzed using the Tobit model. The study found that donkey owners earn a net income of 18943.6 birr annually in Hossana town and 10,393.1 birr annually in Lemo Woreda from their donkeys. Similarly, the result of contingent valuation indicated that the non-market socio-economic value of a donkey was 778.54birrs and 936.64birrs for urban and rural donkey owners, respectively. It was found that also the share of the non-market value of donkeys was approximately 20% and 23% of the total perceived value of donkeys for urban and rural donkey owners, respectively. Alternative use of the donkey as an insurance and source of finance though useful, is associated with risks. Therefore, those households have to be included in modern insurance and financial markets so as to improve their welfare.

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## Introduction

Ethiopia has the second largest population of donkeys in the world, after China. There are 9.9 million donkeys (CSA, 2021). Donkeys are the driving force behind both urban and rural economic development. They fulfill a range of purposes that go beyond economic ones to also include social and cultural ones. Donkeys are essential in rural areas for transporting water, working on farms, bringing goods such as firewood, grain, and charcoal and construction materials like timber, bricks, sand and cement (Berhanu and Yosef, 2011). In Ethiopia, the main means of animal transportation is the use of donkeys, mules and horses for pulling carts, riding, and carrying loads. According to Alemu *et al.* (2003), donkeys are used to carry a wide variety of loads, including people, crops, food and water, as well as construction materials like stone, timber bricks and even girders and iron sheets. Donkeys are frequently adorned with makeshift pack saddles with little or no padding or protection causing painful wounds and injuries. They are the family car but don't always receive the regular care they need (The Donkey Sanctuary, 2015).

In less developed countries, financial markets are often inadequate and there is a lack of access to formal insurance services, particularly in rural areas, which limits the ability to manage risk. To handle this, livestock in general and donkeys specifically have often taken non-market, socio-economic roles(Moll *et al., 2001*).The roles they have in smallholder systems are varied and numerous. They can be used as living savings, providing an alternative form of saving that can be converted into cash when necessary, and also acting as collateral to help secure informal loans and credits (Slingerland, 2000). According to Emily *et al.*(2000),donkeys are deeply intertwined with the social and cultural norms of countless resource-poor farmers. These norms differ from place to place and often dictate the approaches, interventions, and supply and growth prospects for livestock. Owning them gives social status (leadership) and economic status (access to informal credits and loans) to the households. They are frequently regarded as a sign of wealth, used as bride price payments to cement bonds with partners, and even as a crucial social support system in difficult times. However, because of society's negative attitude toward animals, they do not receive the social value they are worth.

The value of donkeys` socio-economic contribution is often overlooked when assessing the total contribution of donkeys. As these functions are difficult to quantify, the focus is typically placed on the tangible production they can provide, yet they could be used to gain a better insight into donkey ownership. The studies conducted so far under the discipline of veterinary medicine have said many things about donkeys' welfare. However, little is said about their socio-economic contributions. Even the studies that were concerned with the estimation of total donkeys' contribution did not give much attention to non-marketable socio-economic contribution. This study was mainly initiated to understand and quantify the socio-economic contributions of donkeys, mainly focusing on measuring and comparing (urban and rural) the non-marketable socio-economic contributions of donkeys working in Hossana town (urban) and Lemo Woreda (rural) of Hadiya Zone, Southern Ethiopia.

## Methodology

*Description of the study area*

The study was conducted in Hossana town and Lemoworeda of Hadiya Zone in Southern Nations Nationalities and Peoples` Region of Ethiopia. Hossana is the principal town of Hadiya zone, which is 232KM away from Addis Ababaand Astronomically, the town is situated at 70 15'00" North latitude and 370 50'30" East Longitude. Lemoworeda is also one of the eleven woredas in Hadiya zone located near its capital town Hossana surrounding the town. It has thirty-six *kebeles*.

*Sampling technique and sample size*

To draw sample from the Lemo woreda, two stages random sampling technique was applied. In the first stage, six *Kebeles* were selected randomly out of

thirty-six*Kebeles* and in the second stage, 147 households were selected proportionally from each sample *Kebeles*. Following the same procedure, 120 respondents who owned donkeys were selected from Hossana town.

*Data sources and methods of data collection*

The study addressed those households who owned donkeys in urban as well as in rural areas. Both primary and secondary data sources were used. Primary data mainly used questionnaires and interview methods where, as secondary data sources focused on reports, magazines and journals from governmental and nongovernmental bureaus, agricultural and rural development bureaus, social affairs offices, finance and economic development and financial institutions. Moreover, the Participatory method (Catley, 2005), such as focus group discussions (FGDs), were used to generate information at the household and community level. Focus group discussions were to discover demographic characteristics, livestock holdings, other equine acquisition, donkey acquisition and reasons for keeping them (including their social contributions), income from livestock activities other than donkeys, income from donkeys services and use, frequency of donkey use and purposes translated into cash income, in relation to livestock and specifically donkey and constraints on the use of them.

*Data analysis*

After the collected data was entered into STATA 13, the analysis was done using different descriptive statistical techniques and econometric models. In the descriptive analysis part, statistical tools like averages, sums and percentages were used. To analyze the non-market socio-economic value of donkeys' contribution to the household, econometric models such as contingent valuation (CV) and the Tobit model were employed.

*Contingent valuation method (CV)*

The main purpose of contingent valuation (CV), a survey technique, is to assign monetary values to goods and services for which there are no market prices or whose prices do not adequately reflect their social value. It was created in the environmental field to determine the worth of "intangible" assets. Initially, the CV approach was used in developing nations for tourism, sanitation, water supply, national parks, and recreation. As a result, it has been used in many different contexts to provide a concept for figuring out how much to charge for intangible goods. In the contingent valuation method, respondents are presented with a plausible but hypothetical scenario and asked to indicate the minimum amount they would accept in a situation in which the status quo worsened or the maximum amount they would be willing to pay in the case that the situation improved. Eliciting the values might be done in an open-ended or closed-ended way. The evaluation of WTP by CV has a solid theoretical foundation in welfare economics (Mitchell and Carson, 1989).

The welfare economics hypothesis is predicated on two key tenets. The first presumption is that humans are self-interested and logical. The capacity of humans to maximize their welfare is the second presumption. The contingency valuation (CV) approach is significantly impacted by the two underlying assumptions. In discrete choice CV questions, the respondent is given the option to select between the status quo (the current circumstance) and a change in the status quo. The likelihood that the respondent would select option 1 (utility with the proposed change) over option 0 (utility without the proposed change) is known as the likelihood that the respondent will select option 1. Thus;

$$P_{1i} = Pr\,[\bar{U}_{i1} + e_{i1} \geq \bar{U}_{io} + e_{io}]$$
$$= Pr\,[e_{io} - e_{i1} \leq \bar{U}_{i1} - \bar{U}_{io}] \quad (1)$$

Where $P_{1i}$ is the probability that the $i^{th}$ respondent will answer, "yes" to an offered price, $u_{io}$ is the respondent's total utility in the *status quo*; $u_{i1}$ is the utility with the change.

*Willingness to Pay (WTP) question*

The respondents were asked to outline the objectives or reasons for keeping donkeys in the first of the

questionnaire to introduce the willingness to pay questions. Then, they were asked to give their perceived value of the donkey; this is not necessarily its market price. Subsequently, a hypothetical scenario was posed whereby they were to suppose that a new government policy was in place restricting the movement and sale of the donkeys. As a result, the household loses control of the disposal of the donkey through sales and dowry payment.

The household consequently loses the dowry payment, financial benefits, insurance, and the ability to sell the animal to cover both anticipated and unforeseen expenses. The household was then asked, using predetermined values and the original perceived value as a base, what their "new" perceived value was following this loss. The value of these socio-economic gains is determined by the difference between the "new" perceived value and the old perceived value. The percentage of the household total perceived value of the donkey (WTPSHARE) above the socio-economic value of the donkey (WTP amount) is the dependent variable in the Tobit model, whereas institutional and socio-economic variables are the independent variables.

**Results and discussion**

*Sex of the respondents*

Table1belowshowsthat of the total sampled respondents, 96.9% of them were male and 3.1%of them were female. With regard to the location of the respondents, it was foundthat99.2%ofurban donkey owners were male, while only 0.8%ofthem were female. Males take the lion's share in owning donkeys and working with them more than females. This may indicate that the culture of female engagement in such business done by donkeys is relatively lower than males. Similarly, 95.2% of rural donkey owners were male, while 4.8% were female. This result was similar to the findings of Kathy and Zahra (2000).

**Table 1.** Demographic characteristics of the respondents.

| Donkey Owners, N= 267 | | | | | | | |
|---|---|---|---|---|---|---|---|
| | Urban, N= 120 | | Rural, N=147 | | Total | | χ2 |
| Sex | N | % | N | % | N | % | |
| Male | 119 | 99.2 | 140 | 95.2 | 259 | 97 | 0.47 |
| Female | 1 | 0.8 | 7 | 4.8 | 8 | 3 | |
| Total | 120 | 100 | 147 | 100 | 267 | 100 | |
| Level of education | N | % | N | % | N | % | t value |
| No formal education | 14 | 11.7 | 46 | 31.3 | 60 | 22.5 | |
| 1 – 4 | 38 | 31.6 | 40 | 27.2 | 78 | 29.2 | |
| 5 – 8 | 47 | 39.2 | 49 | 33.3 | 96 | 36.0 | |
| 9 – 10 | 17 | 14.2 | 9 | 6.1 | 26 | 9.7 | |
| 11 – 12 | 3 | 2.5 | 1 | 0.7 | 4 | 1.5 | |
| Diploma &above | 1 | 0.8 | 2 | 1.4 | 3 | 1.1 | 0.54 |
| Total | 120 | 100 | 147 | 100 | 267 | 100 | |

Source: Own survey result (2020).

For the purpose of this study, respondents were categorized in to six groups with respect to their educational level, including those who haven formal education, completed grade1-4, completed grade 5-8, completed grade9-10, completed grade11-12 and those who attained diploma and above as shown in table 1thatmajority (77.5%) of the respondents in the study are ahad obtained formal education where as 22.5% of them had no formal education. Of urban donkey owners, 88.3% of them have obtained formal education, whereas the rest, 11.3% of them, have no formal education. Out of 147 rural donkey owners, it was found that 68.7% of them had attained formal education, while31.3% of the mhadno formal education.

*Social value of donkeys*

The social value of donkeys is categorized into; reducing women's workload, ambulance service, helping social workers, and establishing good

relations with society through lending. Out of the total sampled donkey owner respondents, 44.2% have responded that donkeys are most important for social work. The remaining 37.8%, 15.7% and 2.3% of the respondents said that reducing women's workload establishes good relations with society through lending and ambulance services, respectively. Donkeys mostly contributed to social work in the urban area. Reducing the women's workload was the most important service in the rural area of Lemo Woreda. As we noted in the focus group discussion, activities such as preparing household food and taking care of children and animals are usually women's responsibilities in the rural study area. Household women used donkeys to fetch water, collect firewood for home consumption and sale, take grain to the mill house, and transport goods bought at the 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.

Donkeys also assisted women with income-generating opportunities and contributed to changing gender power relations. Besides this, women were found to use donkeys more frequently than other equines. This result was similar to the findings of the study conducted by Berhanu and Yosef (2011).

**Table 2.** Social contributions of Donkeys.

| | Donkey Owners, N=267 | | | | | |
|---|---|---|---|---|---|---|
| | Urban, N=120 | | Rural, N=147 | | Total | |
| Social contributions | N | % | N | % | N | % |
| Reducing women's work load | 32 | 26.7 | 69 | 46.9 | 101 | 37.8 |
| Ambulance service | - | - | 6 | 4.1 | 6 | 2.3 |
| Societal work | 76 | 63.3 | 42 | 28.6 | 118 | 44.2 |
| Establish good relation with | 12 | 10 | 30 | 20.4 | 42 | 15.7 |
| society by lending | | | | | | |
| Total | 120 | 100 | 147 | 100 | 267 | 100 |

Source: Own survey result (2020).

*Economic benefits and costs of donkey*

Benefits from Donkey

The direct and main benefits of donkeys are using them for income-generating activity on the one hand and for homestead services on the other hand. In Table 3 benefits of donkeys were measured by the amount of income from cart and gharry services, sale of donkeys, renting out and own uses. The mean annual income from cart and gharry services of urban donkey owners is by far greater than rural donkey owners. This is because; almost all donkey owners in urban areas were those who were engaged in income-generating activity in the cart and gharry services. Income from the sale of donkeys for rural donkey owners was also greater than urban owners. This is an indication that the role of a donkey as a source of finance and saving is greater for rural households than urban ones.

**Table 3.** Mean annual income from different activities.

| | Donkey Owners, N= 267 | | |
|---|---|---|---|
| Activities | Urban, N=120 | Rural, N=147 | Total |
| Cart and gharry services | 33140.25 | 5110.89 | 38251.14 |
| Sale of donkey | 191.67 | 714.28 | 905.95 |
| Renting out | 501.67 | 1217.69 | 1719.36 |
| Own use | 2159.33 | 10051.7 | 12211.03 |
| Total | 35992.92 | 17094.56 | 53087.48 |

Source: Own survey result (2020).

The rural donkey owners generated higher income by renting out their donkeys than urban donkey owners. This shows that the practice of renting donkeys is higher in rural areas than in urban areas. Estimated economic values of own donkey use are higher for rural donkey owners than urban donkey owners. Since the donkey is mainly used for business activity in urban areas, the own use value of the donkey is expected to be less than rural donkey owners.

The income generated from cart and gharry service is larger than other activities showing that donkeys were used more for business activity than exclusive homestead uses.

**Table 4.** Mean annual costs related to donkey usage.

| | Donkey Owners, N =267 | | |
|---|---|---|---|
| Expenditures | Urban, N=120 | Rural, N=147 | Total |
| Purchase of donkey | 2142.92 | 2309.18 | 4452.1 |
| Donkey feed | 7993.42 | 689.18 | 8682.6 |
| Material inputs | 3165.69 | 1489.03 | 4654.72 |
| Treatment | 40.4 | 43.13 | 83.53 |
| Cost of labor | 2364.33 | 935.71 | 3300.04 |
| Total | 15706.76 | 5466.23 | 21172.99 |

Source: Own survey result (2020).

*Costs of keeping and working with a donkey*

Estimated annual costs per respondent related to donkey ownership and use are summarized in Table 4. The mean annual cost for donkey purchases is similar for both urban and rural owners. However, urban donkey owners incurred higher costs for donkey feed than rural donkey owners. This was because; since there was no grazing land in urban areas, they had to buy food for their donkey every time. Material input cost is higher for urban donkey owners than for rural donkey owners. The material input includes harnessing materials, saddles, ropes for tethering, maintenance for cart and costs for shelter maintenance (rent for urban owners).

Urban donkey owner respondents who were engaged in business have to buy all material inputs, which are expected to incur higher costs than rural donkey owners. The treatment cost of donkeys, which was relatively very low than other costs, was similar for both urban donkey owner respondents and rural donkey respondents.

**Table 5.** Net economic benefits of donkey.

| Area | Total Benefits | Variable cost | Fixed cost | Total cost | Net benefit |
|---|---|---|---|---|---|
| Urban | 35992.92 | 15706.7 | 1342.5 | 17049.2 | 18943.7 |
| Rural | 17094.5 | 5466.2 | 1235.2 | 6701.4 | 10393.1 |
| Total | 51087.4 | 21172.9 | 2577.7 | 23750.6 | 29336.8 |

Source: Own survey result (2020).

Labor is needed to work with donkeys and to look after donkeys (especially in urban areas). This expenditure was larger for urban donkey owner respondents than for rural donkey owners. The respondents' mean expenditure for donkey feed was larger than other costs. With regard to total cost related to donkey ownership and use, urban donkey owner respondents incurred higher costs than rural donkey owners.

*Net economic benefits of donkey*

The average benefits of the donkey were calculated from the sum of income generated from donkey use in each area divided by the number of respondents.

Similarly, the total cost was calculated from the sum of all expenditures (Cost for purchase of donkey, Cost of donkey feed, Cost for Material inputs,Cost of Treatment and Cost of labor) in each area divided by the number of respondents. The total benefit for urban donkey owner respondents was larger than for rural donkey owners. The variable cost is also larger for urban donkey owners than for rural donkey owners. The fixed cost is the cost of materials that can be used over a number of years and shared by a number of enterprises and include depreciation of carts and gharry and costs of labor, including an estimate of all value of unpaid labor. It was similar for both urban and rural donkey owners. The net benefit of donkey ownership and use for urban donkey owners was significantly larger than for rural donkey owners. As presented in the table, the average annual marketable economic contribution of donkeys for urban was 35,992.9 birr, while it was 17,094.5 birr for rural donkey owners. Similarly, urban donkey owners netted 18,943.7 per year, whereas the rural owners netted 10,393.1 birrs per year. Total donkey owner respondents in our study netted 29336.8 birrs per year.

**Table 6.** Willingness to pay for urban donkey owner respondents.

| WTP | Frequency, N=120 | Percentage |
|---|---|---|
| 0 -200 | 6 | 5 |
| 201 – 400 | 7 | 5.8 |
| 401 – 600 | 44 | 36.7 |
| 601 – 800 | 42 | 35 |
| 801 – 1000 | 12 | 10 |
| 1001 – 1200 | 4 | 3.3 |
| 1200 – 1400 | 3 | 2.5 |
| 1401 – 1600 | 2 | 1.7 |
| | | |
| Total | 120 | 100 |
| Mean | 778.54 | |
| Maximum | 1600 | |
| Minimum | 0 | |

Source: Own survey result (2020).

*Econometric results*

*Contingent valuation model*

The objective of this section was to value the non-marketable socio-economic contributions of donkeys based on the willingness to pay that the respondents were asked to elicit in different scenarios. First, the respondents were asked about the value of their donkey, keeping all its contributions and the market price in mind. Secondly, we asked them their value for their donkey after the introduction of the hypothetical scenario.

Therefore, the WTP here is the difference between the respondent's value in both scenarios. In this study, two valuation questions were set: valuation questions for urban donkey owners and rural donkey owners. Since the WTP responses are different in the respective cases, we treated each of them separately.

*Willingness to pay for urban donkey owner respondents*

The mean willingness to pay was 778.54birr. The minimum willingness to pay was 0, while the maximum was 1600 birr. As indicated in Table 5, 36.7% of them have a willingness to pay in the range of 401 up to 600 birrs.

*Willingness to pay for rural donkey owner households*

The mean willingness to pay was 936.64. The minimum was 0, where the maximum willingness to pay was 2750 birr. The willingness to pay for the majority of the respondents lay between 701 – 1050 birr. The mean was higher for rural donkey owners than urban donkey owner respondents. The possible explanation for this is that rural households are more likely to demand donkeys for their non-marketable

contributions than urban donkey owners. This is because, in urban areas, modern means of insurance, savings and other financial facilities are available. Due to this, their demand for donkeys for its non-market socio-economic contributions is relatively low.

*Regression results*

Before estimation is done, data exploration is an important step. To start with, to check whether multicollinearity is present or not, a simple correlation coefficient matrix was conveyed. Gujarati (1995) establishes a rule of thumb that says thatmulticollinearity is a serious problem when the correlation coefficient is 0.8 or above.Thus though correlation is present, multicollinearity is not a serious problem in these data.

*Determinants of non-marketable socio-economic contributions of donkeys in urban*

Table 7 shows the results of Tobit's estimation. The statistical significance of the model is examined by using a Wald test of the null hypothesis that all slope coefficients (H0 = βj = 0) are zero except the intercept term. The χ2 statistic of70.03 is statistically significant ($p$<0.01), indicating a rejection of the null hypothesis.

**Table 7.** Willingness to pay for rural donkey owners.

| WTP | Frequency, N=147 | Percentage |
|---|---|---|
| 0 – 350 | 6 | 4.1 |
| 351 – 700 | 57 | 38.8 |
| 701 – 1050 | 58 | 39.4 |
| 1051 – 1400 | 19 | 12.9 |
| 1401 – 1750 | 5 | 3.4 |
| Above 1750 | 2 | 1.4 |
| Total | 147 | 100 |
| Mean | 936.64 | |
| Maximum | 2750 | |
| Minimum | 0 | |

Source: Own survey result (2020).

The analysis indicates that the sex of the respondent, age of the respondent, marital status, family size, total income, other income, and ownership of livestock have a significant influence on the probability of demand and the magnitude of the proportion of the socio-economic value ofthe donkey.

The coefficients on the sex of the respondent and ownership of livestock have a negative and significant ($p$<0.01) influence on the probability of demand and the magnitude of the share of the socio-economic value of donkey ownership. This has the implication that females are more risk-averse than males and demand donkeys for their non- marketable socio-economic contributions than males. This can be attributed to their limited alternative sources of income to buffer risks compared to their male counterparts(*Emily et al.,2000*).That is,the non-marketable value of donkeys is lower for males than females. Similarly, respondents who have other livestock are less likely to demand a donkey for its non-marketable socio-economic contributions than those who have not. This is because those households who own other livestock may at the same time demand them for their non-marketable value and due to this, the share of non-marketable value of donkey could be lower.

Moreover, the sign on total income and income from other sources is negative and significant ($p$<0.05) in explaining the probability and the level of demand. This implies that households with higher income levels may have other means of risk aversion, sources of finance, and savings. Due to this, their demand for

donkeys for their non-marketable contribution will be low. Similarly, households who have other sources of income rather than their main occupation may be able to diversify their risk and their demand for donkeys for its non- marketable contributions will be low. Therefore, for those households who have other sources of income, the non-marketable value of a donkey is low compared to those who have not.

**Table 8.** Parameter estimates for factors influencing the non-market value of donkey.

| | | Elasticity | |
|---|---|---|---|
| Variable | Coefficient | Probability of demand | Expected level of demand intensity |
| SEXR | -0.3256888 ***(0.1042404) | -0.0018121 | -0.3250849 |
| AGER | 0.0033975**(0.0015217) | 0.000188 | 0.0033429 |
| MRTST | 0.0860851 ***(0.0296957) | 0.0047644 | 0.0847017 |
| FAMSZ | 0.0233874**(0.0103396) | 0.0012944 | 0.0230115 |
| EDUC | -0.0042856 (0.0031374) | -0.0002372 | -0.0042167 |
| TOTIN | -1.37e-06 **(6.63e-07) | -7.56e-08 | -1.34e-06 |
| OTHIN | -0.0484436**(0.0200329) | -0.0033583 | - 0.047503 |
| OWLIV | -0.1475281***(0.0257945) | -0.0441404 | -0.1379953 |
| AGED | -0.0038082 (.0036755) | -0.0002108 | -0.003747 |

Observations = 120, Prob > chi2 = 0.0000

LR chi2 (9) = 70.03 level of significance:

*** =0.01, ** = 0.05

Log –likelihood = - 94.10929 6 right censored, 4 left censored and 110 uncensored

Numbers in parenthesis are robust standard errors.

Source: Own Survey result (2020)

The family size and the age of the respondent have a positive and significant (0.05) influence on the probability of demand and the share of the socio-economic value of the donkey. Similarly, the coefficient on marital status is positive and statistically significant (0.01). This is expected as it was hypothesized that age, marital status and family size have a positive influence on the households' risk probability, financial needs and obligations. The variables such as level of education and age of the donkey have no significant effect in explaining the variation in the share of willingness to pay (WTPSHARE). However, the sign on both is negative, as expected. Educated people have access to modern financial institutions. And their reliance on donkeys for their non-marketable contribution will be low.

*Determinants of non-marketable socio-economic contributions of donkeys in rural*

The coefficients on land size, the total income of the household, total livestock owned measured in tropical livestock units, participation in off-farm activity and access to credit have a negative sign and they have a significant(0.05) influence on the probability and the share of non-marketable value of donkey. Land and other livestock might serve as collateral for credit and a source of finance. Similarly, higher income and participation in off-farm activity reduce the risk probability and serve as insurance, which lowers the non-market value of donkeys. Credit is also an alternative way of financing expenditures, so for farmers with access to this capital, the financing and insurance roles of donkeys diminish. Furthermore, the sex and age of the respondent have a significant (0.01) influence on the probability and the share of the non-marketable value of the donkey. The negative sign on the sex of the respondent is an indication that relative to female-headed households, male-headed households are likely to place a lower value on the socio-economic non-market roles of a donkey. This is due to their limited access to alternative sources of income to buffer risks compared to their male counterparts. A study conducted by Taylor and Boubakri (2013) revealed thatthe availability of

financial services is limited in rural areas, and the existing financial services intended for rural communities rarely benefit rural women. As explained earlier, the sign on the age of the respondent is an indication that its influence on probability and share of the non-market value of donkey is positive. Older people are less likely to get modern financial and insurance services. Therefore, the non-market value of donkeys is higher for older people.

**Table 9.** Parameter estimates for factors influencing the non-market value of donkey.

| | | Elasticity of | |
|---|---|---|---|
| Variable | Coefficient | Probability of demand | Expected level of demand intensity |
| SEXR | -0.1262365***(0.0423191) | -0.0013074 | -0.125806 |
| AGER | 0.0043782***(0.0013034) | 0.0001578 | 0.0043296 |
| MRTST | 0.0147975(0.0581858) | 0.0006639 | 0.0145978 |
| FAMSZ | 0.0057469(0.0042151) | 0.0002071 | 0.005683 |
| EDUC | -0.0004391 (0.0029169) | -0.0000158 | -0.0004342 |
| LANDSS | -0.034461**(0.01541) | -0.0012421 | -0.0340783 |
| TOTINC | -1.19e-06**(5.94e-07) | -4.30e-08 | -1.18e-06 |
| OTHINC | -0.0423632**(0.0209397) | -0.0019869 | -0.0417724 |
| TLU | -0.0091309**(0.00038191) | -0.0003291 | -0.0090295 |
| ACCTCR | -0.0405198**(0.0187273) | -0.0017417 | -0.0399967 |
| DISNMR | 0.0067314 ** (0.0032601) | 0.0002426 | 0.0066566 |
| FEMDON | -0.0105797(0.0284451) | -0.0003813 | -0.0104622 |
| MALDON | 0.0539985**(0.0256526) | 0.0019463 | 0.0533989 |
| AGED | -0.0045023(0.0028593) | -0.0001623 | -0.0044523 |

Observations = 147 Prob > chi2 = 0.0000

LR chi2 (14) = 107.23 level of significance:

*** =0.01, ** = 0.05

Log –likelihood = - 119.70548 4 right censored, 6 left censored and 137 uncensored

Numbers in parenthesis are robust standard errors

Source: Own Survey result (2020).

The positive sign on the coefficient of the number of male donkeys indicates that male donkeys have higher non-market value. The possible explanation for this is that male donkeys are preferred to use in most activities like in carts and gharry. Due to this, they have an even higher market price than female donkeys.

***Conclusion***

The study was mainly focused on the valuation of the socio-economic contributions of donkeys. Descriptive statistics indicate that donkey owners in urban were found to earn larger economic benefits than rural donkey owners. The donkey owners in urban were found to earn a net income of 18943.6 birrs annually, while in rural earned a net income of 10393.1 birrs. This is an indication that donkeys in urban are more fully engaged in income-generating activity than rural ones. The result of contingent valuation indicates that the non-market socio-economic value of the donkey was found to be 778.54 birrs for urban donkey owners and 936.64 birr for rural donkey owners. This shows that the rural households` demand for a donkey for its non-market socio-economic services, such as insurance if the crop fails, collateral to borrow from the informal market, finance if the need arises, etc., is greater for rural donkey owners than urban donkey owners. The predicted values of WTPSHARE indicate that the value of non-market socio-economic functions of donkeys comprises approximately 20% of the total donkey's perceived value for urban donkey owners and approximately 23% of the total donkey's perceived value for rural donkey owners. Even though different use of donkeys is useful, is linked with risks

such as theft, market risks, and death in case of animal disease. Therefore, those households have to be included into modern insurance and financial markets so as to improve their welfare.

*Notes*

Urban donkey owners: Owners of the donkey in Hossana town.

Rural donkey owners: Owners of the donkey in Lemo woreda.

*Disclosure statement*

The authors declare no conflict of interest

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