**Hunting and trading bushmeat in the Kilombero Valley, Tanzania**: **motivations, cost-benefit ratios and meat prices**

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## APPENDIX 1

**Questionnaire**

*Introduction*

This study is conducted by a Danish student and before we start you should know that your name will be kept secret and not be provided to anyone here in Tanzania or elsewhere….

Identification

|  |  |
| --- | --- |
| Date |  |
| Village |  |
| Name of interviewee  |  |

**1. Socioeconomic questionnaire**

*1.1 Interviewee information*

|  |  |
| --- | --- |
| Age/year borne |  |
| Ethnic group |  |
| Religion |  |
| Born in the village | Yes/no: |
| If no, when did you move to this village | Year: |
| If no, why did you move to this village |  |
| Married | Yes/no: |
| Education level (number of years completed) |  |
| Main source of income | Code: |

*Code: 1 = cultivation/farming; 2 = domestic animal rearing; 3 = trading/shop/small business; 4 = casual labor; 5 = formal employment; 6 = non-timber natural resource harvesting and trade; 7 = timber and logging, 8 = remittances and pension; 99 = other (specify)*

*1.2 Household and demographic information*

|  |  |
| --- | --- |
| Number of household members | Adults: Children below 12: |
| When was this household formed | Year: |
| Metres from house to village centre | Code: |
| Average years of education of household members above 15 years |  |

*Code: 1 = less than 100 m, 2 = less than 500 m, 3 = less than 1000, 4 = less than 2000, 5 = less than 4000, 6 = more than 5 km.*

*1.3 How much land does your household own and cultivate?*

|  |  |  |  |
| --- | --- | --- | --- |
| Land | Acres owned | Acres cultivated | Crop: |
| Crop land |  |  | Code: |
| Crop land |  | Code: |
| Crop land |  | Code: |
| Woodlot/orchard |  |  | Code: |
| Woodlot/orchard |  | Code: |
| Woodlot/orchard |  | Code: |
| Other (specify) |  |  |  |
| Other (specify) |  |  |  |
| Land fallow |  |
| Land rented out |  |

*1 = maize, 2 = beans, 3 = cassava, 4 = paddy, 5 = sunflower, 6 = onions, 7 = millet, 8 = simsim, 9 = grounnuts, 10 = cashews, 11 = tobacco, 12 = sweet potato, 13 = tomatoes 14 = sugarcane, 15 = coconut, 16 = bananas, 17 = mangoes, 18 = papaya, 19 = sorghum, 20 = coffee, 21 = tea, 22 = cotton, 23 = black wattle, 24 = pine, 25 = Cyprus, 26 = eucalyptus, 97 = other vegetable (specify), 98 = other trees and fruits (specify) , 99 = other (specify).*

*1.4 How many domestic animals do your household own?*

|  |  |
| --- | --- |
| Domestic animals (read list of options out loud) | Number |
| Normal cow |  |
| Dairy cow |  |
| Horse |  |
| Donkey |  |
| Goat |  |
| Sheep |  |
| Chicken |  |
| Pigs |  |
| Rabits |  |
| Simblisi |  |
| Ducks |  |
| Dogs |  |
| Other (specify) |  |

*1.5 Description of main house*

|  |  |
| --- | --- |
| Do you own the house you live in | Yes/no:  |
| What is the type of material of (most of) the walls | Code A: |
| What is the type of material of (most of) the roof  | Code B: |
| How many rooms are there in the house |  |

*Code A: 1 = reeds/straw/grass/fibres; 2 = mud/soil; 3 = wood (boards, timber remains); 4 = bricks no cement; 5 = burnt bricks no cement; 6 = burnt bricks plastered; 99 = other, specify.*

*Code B: 1 = thatch; 2 = wooden (boards); 3 = iron or other metal sheets; 4 = tiles; 99 = other, specify.*

*1.6 What working number of these household items does your household own?*

|  |  |
| --- | --- |
| Item (read list of options out loud) | Number |
| Car/truck |  |
| Tractor |  |
| Motorcycle |  |
| Bicycle |  |
| Mobile phone |  |
| Television |  |
| TV antenna or satellite dish |  |
| Radio |  |
| DVD/VHS/CD/cassette player |  |
| Stove for cooking |  |
| Refrigerator/freezer |  |
| Chainsaw or machine saw |  |
| Shotgun/rifle |  |
| Sewing machine |  |
| Generator |  |
| Other items worth more than 100 000 TSh (specify) |  |

*1.7* *What are your household’s main sources and amount of income?*

|  |  |  |  |
| --- | --- | --- | --- |
| Source(read list of options out loud) | Past 30 days (TSh) | Past 12 months(TSh) | Was the income increasing (↑) or decreasing (↓) compared to previous year |
| Agricultural products |  |  |  |
| Livestock products  |  |  |  |
| Trade/shop/small business  |  |  |  |
| Collecting and selling NTFP\* |  |  |  |
| Timber |  |  |  |
| Salary (casual and formal labour) |  |  |  |
| Remittances and pension |  |  |  |
| Rent of land, buildings etc. |  |  |  |
| Other sources of income (specify) |  |  |  |
| Overall total |  |  |  |

*\*NTFP = non-timber forest/environmental products incl. all types of products collected from the bush, forest, river etc. (i.e. fish, bushmeat, fruits, grasses, fuel wood, medicine plants etc.).*

*1.8 What is the minimum amount of income that your household need per day to live at your current level of livelihood?*

|  |  |
| --- | --- |
| Daily needed cash: | TSh |

*1.9 How much money did you spend for your households living expenses the past 30 days? (Specify if calculated per year etc.)*

|  |  |
| --- | --- |
| (read list of options out loud) | Cash need past 30 days to cover the following expenses |
|
| Food (excl. meat and fish) |  |
| Meat and fish |  |
| Wood or fuel for cooking |  |
| Other products (etc. matches) |  |
| House rent |  |
| Land rent |  |
| School fees and expenses |  |
| Taxes and development contributions |  |
| Cash assistance to relatives |  |
| Transportation  |  |
| Medicine and medical treatment |  |
| Alcohol, soda and cigarettes |  |
| Other (specify) |  |
| Total |  |

*1.10 Do you prefer to eat domestic animal meat or bushmeat?*

|  |  |
| --- | --- |
| Prefer |  |
| Primary reason for preference: | Code: |

*Code: 1 = price, 2 = availability, 3 = taste, 4 = meat quality, 5 = tradition/culture, 6 = local beliefs\*, 7 = others (specify). \*Has special powers, makes you stronger, etc.*

*1.11 Have your household experienced any income shocks the past 12 months*

|  |  |
| --- | --- |
| Number of severe shocks\* |  |
| Describe these shocks |  |
| Deaths of close family members\*\* | Number:When (number of months ago): |
| Combined months where working household members have been unable to work due either to own or others disease/sickness | Number of months: |

*\*A severe shock could include the theft or death of a major part of the household’s domestic animals, loss of a major part of the household’s crops, or a major part of the household’s property due to fire, flood, draught, etc. \*\*A close family member refers to someone that contributes to the households income or where the household members are expected to assist the relatives substantially financially incl. with the funeral.*

1. **Questions about hunting and the bushmeat trade**

*2.1 What is your primary involvement in bushmeat hunting and trading?*

|  |  |
| --- | --- |
| Actor group |  |

*IF ONLY A RETAILER (i.e. selling meat in the streets) OR ONLY OWNING A STORAGE HOUSE, THEN GO TO QUESTION 2.14.*

*2.2 [For hunters only] Are you primarily hunting for meat for your own consumption or for generating income through selling the meat?*

|  |  |
| --- | --- |
| Consumption/subsistence | Income/trade |
|  |  |

2.3 [for those that go on trips only – i.e. hunters and porter/traders]. Describe the nature of your ‘job’ in terms of being a hunter and/or a porter/trader?

|  |
| --- |
|  |

*i.e. does the hunters primarily shoot and then sell directly on the spot to the porter/trader or is the porters just paid by the hunter and the animal then sold to a wholesaler or to consumers in the village by the hunter; do the porter/traders primarily sell to a wholesaler in the village or distribute themselves etc.*

2.4 [for hunters only]. What is your primary method of hunting?

|  |  |  |  |
| --- | --- | --- | --- |
| Rifle/shotgun etc. | Traps | Dogs | Other |
|  |  |  |  |

2.5 [for those that go on trips only – i.e. hunters and porter/traders]. What is the primary location of the hunt/origin of the meat?

|  |  |
| --- | --- |
| Bush (i.e. Kilombero game controlled area) | Forest (i.e. Udzungwa mountains) |
|  |  |

2.6 [for those that go on trips only – i.e. hunters and porter/traders]. How many trips do you on average make per month in the dry season and wet season?

|  |  |  |
| --- | --- | --- |
|  | Dry season | Wet season |
| Trips (per month) |  |  |

2.7 [for those that go on trips only – i.e. hunters and porter/traders]. How many trips did you make the past 30 days?

|  |  |
| --- | --- |
| Number of trips |  |

2.8 [for those that go on trips only – i.e. hunters and porter/traders]. How long time do you on average use per trip?

|  |  |  |
| --- | --- | --- |
|  | Dry season | Wet season |
| Time per trip (hours/days) |  |  |

2.9 [for those that go on trips only – i.e. hunters and porter/traders]. How long did you spend on your last trip?

|  |  |
| --- | --- |
| **Duration of last trip** |  |

2.10 [for those that go on trips only – i.e. hunters and porter/traders]. What is your average profit per trip in the dry and wet season?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Income\* | Costs\*\* | Profit after selling |
| Dry season |  |  |  |
| Wet season |  |  |  |

*\*For hunters the income is the price obtained from selling the animal – so start here. Then ask for costs and then calculate profit. \*\*For porter/traders the costs include buying the meat from the hunter - so start her. Then ask for income obtained from selling the meat and then calculate profit. Remember cost is only directly related to hunting (i.e. buying meat, bullets, paying fines, renting boat, bicycle and riffle) – not food etc.*

2.11[for those that go on trips only – i.e. hunters and porter/traders]. What was your profit from your last trip?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Number and species killed (if hunter)Species and amount bought (if porter/trader) | Income\* | Costs\*\* | Profit after selling |
| Last trip |  |  |  |  |

*\*For hunters the income is the price obtained from selling the animal – so start here. Then ask for costs and then calculate profit. \*\*For porter/traders the costs include buying the meat from the hunter - so start her. Then ask for income obtained from selling the meat and then calculate profit. Remember cost is only those directly related to hunting and trading (i.e. buying meat, fines, bullets, transport, plastic bags, renting boats, fuel etc.) – Not food etc.*

2.12 [for those that go on trips only – i.e. hunters and porter/traders]. Out of ten trips, how many times do you make dry meat?

|  |  |
| --- | --- |
| Number of times |  |

2.13 [Hunters only]. Do you sometimes use a faked (without end date etc.) permit obtained from employees at the Wildlife Division through a bribe?

|  |  |
| --- | --- |
| Faked permit | Yes/no |

**IF NOT A RETAILER (selling bushmeat on the street only) OR OWNER OF A STORAGE HOUSE ONLY THEN GO TO QUESTION 2.19.**

* 1. [for those that does not go on trips – i.e. only retailers and storage house owners]. Describe the nature of your engagement in terms of distributing bushmeat and/or owning a house for storing bushmeat?

|  |
| --- |
|  |

*I.e. do the retailers primarily buy from the hunters, porters or the owners of houses where it is stored or are they primarily distributing for a share of the sales prices etc.*

* 1. [for those that does not go on trips – i.e. only retailer and storage house owners]. How many days per month do you on average spend selling bushmeat in the dry season and wet season?

|  |  |  |
| --- | --- | --- |
|  | Dry season | Wet season |
| Days spend per month\* |  |  |

*\* Distinguish between full or half days*

* 1. [for those that does not go on trips – i.e. only retailers and storage house owners]. How many days did you spend selling bushmeat the past 30 days?

|  |  |
| --- | --- |
| Days spend last month\* |  |

*\* Distinguish between full or half days*

* 1. [for those that does not go on trips – i.e. only retailers and storage house owners]. What is your average profit per day spend selling or storing bushmeat in the dry and wet season?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Income | Costs\* | Profit |
| Dry season |  |  |  |
| Wet season |  |  |  |

*\* Income is the amount obtained from selling the meat. Some of this amount may have to be paid to the porter/trader if getting the meat on credit. \*Costs include the price paid when buying the meat from the porter/trader. If getting the meat on credit then this cost is zero. \*\*Profit is the amount earned after paying the costs determined by whether the meat is bought or received on credit. Remember cost is only those directly related to trading (i.e. buying meat, transport, plastic bags etc). – not food etc.*

* 1. [for those that does not go on trips only – i.e. only retailers and storage house owners]. What was your profit from the last full day you spend selling or storing bushmeat?

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Species and number of packages | Income\* | Costs\*\* | Profit\*\*\* |
| Last day |  |  |  |  |

*\*Income is the amount obtained from selling the meat. Some of this amount may have to be paid to the porter/trader if getting the meat on credit. \*\*Costs include the price paid when buying the meat from the porter/trader. If getting the meat on credit then this cost is zero. \*\*\*Profit is the amount earned after paying the costs determined by whether the meat is bought or received on credit. Remember cost is only those directly related to trading (i.e. buying meat, transport, plastic bags etc). – not food etc.*

**ALL HUNTERS, PORTER/TRADERS, RETAILERS ETC.**

* 1. [All]. How many times have you been caught hunting or trading bushmeat without a permit?

|  |  |
| --- | --- |
| Number of times caught: |  |

* 1. [All]. How many times have you been caught hunting or trading bushmeat the past year without a permit?

|  |  |
| --- | --- |
| Number of times caught: |  |

* 1. [only for those having been caught]. What happened when you were caught hunting or trading bushmeat?

(do not read options out loud) (write for each time if caught more than once).

|  |  |  |  |
| --- | --- | --- | --- |
|  | First time | Second time | Third time |
| I was taken to the village office: |  |  |  |
| I was send to court |  |  |  |
| I was fined an amount of: | TSh | TSh | TSh |
| I went to jail for a number of months/years: |  |  |  |
| I was beaten or otherwise humiliated |  |  |  |
| I had to pay a bribe of: | TSh | TSh | TSh |
| Other (specify: |  |  |  |

## APPENDIX 2

**Deterrence model and Monte-Carlo simulation**

Cost-benefit ratios were calculated using the deterrence model (Kuperan & Sutinen 1998; Charles *et al.* 1999) as a theoretical basis. The model was developed to explain criminal activity and focus on the probability and severity of sanctions as key determinants of compliance arguing that individuals will disregard regulations if the expected benefit or utility exceeds the benefits of legal alternatives. Subsequent work recognizes that moral and social considerations also influence compliance (Sutinen & Kuperan 1999). Based on this a formal model can be developed according to which the objective of an individual is to maximize potential expected gain (net benefit) from hunting or trading bushmeat moderated by moral and social considerations. Net benefits can be defined as:

 (1)

where the first term [*ph*(*A,e,x*) –*T*(*e,A*)] represents the total revenue of hunting or trading in terms of the unit price of bushmeat *p*, the amount of meat produced by the hunter or bought by the trader *h*, influenced by *A* the avoidance activity undertaken, *e* the inputs required and *x* the biomass of wildlife available minus the costs *T* determined by *e* and *A*. The second term [*θ*(*e,A,R*)*F*–*m(e)* –*s*(*e*)] represents the expected total costs of hunting or trading. This includes the expected penalty under the set of regulations *R* in place determined by the probability of being apprehended multiplied by the penalty *F* the offender faces when caught and the individual’s moral *m* and social *s* standing, which are both assumed to be inversely related to hunting and trading inputs *e*.

In this case the cost of avoidance activities cannot be determined explicitly. Instead these costs are included as variable costs. No attempt was made to measure moral deterrence or social costs. Due to the long tradition for hunting and trading bushmeat, resentment towards enforcement staff and perceived lack of legitimacy of wildlife regulations (Nielsen *et al*. 2014) these aspects likely represent no or very low costs. As offenders engaged in negotiations with enforcement staff to avoid formal prosecution, calculations were made using average formal fines and bribes paid separately.Hence average cost-benefit ratios were calculated for each actor group based on the following equation:

 (2)

where  is the average probability of being apprehended, determined for each actor group by dividing total number of times caught with total number of days spent hunting or trading bushmeat in the past year (one outlier in the sample of hunters in USFR was dropped) and then converted to a per trip apprehension probability where relevant.  is the average magnitude of fines or bribes specific for each actor group, calculated from the amount paid, omitting stock confiscated but including materials confiscated.  is the average variable cost and is the average stock value estimated as the average reported income from hunting or trading bushmeat last time the individual engaged in this activity. Fixed costs are not explicitly considered in the deterrence model. Potential fixed costs include costs of firearms and bicycles. Stalls are not used by traders or retailers due to the illegal nature of the trade. Firearms that are not rented from the nearby JKT (Jeshi la Kujenga Taifa – national service) military station (and hence included under variable costs) are typically very old muzzle loaders. Bicycles used by traders and retailers for transport of meat have multiple other uses. Fixed costs are therefore considered minimal and excluded. To reduce recollection bias we used the cost and income from hunting or trading bushmeat last time the individual engaged in this activity.

Monte-Carlo simulation was used to examine the distribution of cost-benefit ratios and to explore potential effects of increased fines or likelihood of apprehension. To make sure that the relationship between variable costs and income was reflected in the Monte-Carlo simulation, variable cost was determined for individual actors using a linear regression of the square root of variable cost on the square root of income. Cost, income and fines/bribes were square root transformed to normalize distributions and to avoid negative values of final, back-transformed incomes, fines/bribes and costs. Simulated average cost-benefit ratio for each actor group was based on random draws of transformed income, fine/bribe and random deviation around the linear regression. Random values were drawn from a normal distribution with mean and standard deviation corresponding to the values estimated for each variable and actor group (see Table S1). Final simulated values of variable cost and income were furthermore bounded by floors of TSh 1000 and TSh 5000, respectively, corresponding to the lowest values observed for any of the actor groups. For each actor group 100 000 Monte-Carlo simulations were carried out in STATA version 11.2 (seed 10101).

For each actor group, *a*, the simulation run proceeds as described in pseudo-code below (symbols and applied parameter estimates are shown in Table S1).

Start: Initialize the case counter,

* Draw a random value of fine or bribe: 
* Draw a random value of stock value (income): 
* Draw a random error term for cost estimation:
* Estimate variable cost using the linear regression model: 
* Calculate the cost-benefit ratio:  ,

where  is the average probability of apprehension per trip, calculated on the basis of average daily apprehension probability, , and the average trip duration, ; 

* If , then drop the simulated value of otherwise keep it and update the case counter: .

Finally, if the case counter, then stop the simulation and estimate average cost benefit ratio otherwise return to start.

The impact of increasing likelihood of apprehension and increasing magnitude of fines was explored to determine the level required to make hunting or trading bushmeat seemingly non-profitable for the various actor groups. This level was assumed to correspond to a cost-benefit ratio *CB* ≥ 1, although there are issues in relation to risk adversity and level of information (see discussion, main manuscript).

**Table S1** Estimated values of daily apprehension probability, mean and standard deviation of transformed fine/bribe and stock value (income), and parameters of the linear regression of cost on stock value.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Actor(*a*) | Daily apprehension probability | Square root of fine(TSh) | Square root of bribe(TSh) | Square root of stock value(TSh) | Regression  |
| Mean  | St.dev. | Mean  | St.dev.  | Mean  | St.dev. | Intercept  | Slope |  |
| Hunter in USFR | 0.00151129 | 186.6025 | 18.94687 | 253.0836 | 86.23156 | 209.8473 | 150.7909 | 8.908261 | 0.268423 | 32.012 |
| Hunter in KGCA | 0.00094777 | 293.2519 | 157.4929 | 260.3916 | 151.8862 | 359.8848 | 161.1279 | 78.14236 | 0.320619 | 64.480 |
| Trader selling | 0.00168489 | 290.1108 | 137.1577 | 195.3484 | 85.89035 | 302.3708 | 108.2308 | 6.868731 | 0.7048200 | 29.422 |
| Trader not selling | 0.00189106 | 331.4227 | 147.8248 | 175.213 | 107.2013 | 322.7612 | 105.2472 | 38.82724 | 0.6232601 | 41.906 |
| Retailer | 0.00238892 | 248.9754 | 391.4896 | 119.3811 | 59.62283 | 273.7878 | 70.64045 | -8.102295 | 0.9623452 | 11.140 |

## APPENDIX 3

**Details in relation to model describing the price of bushmeat**

We examined the assumption of no difference in negotiated price per package between species, considering willingness to pay a price premium an expression of preference. We used panel data models acknowledging that our data is highly unbalanced being based on occasionally repeated observations of individual traders. Village (*v*) was set as a panel data group to accommodate differences in supply and demand between villages. To evaluate general price trends, a day number (*t*) was included, as a consecutive number assigned to each date starting with the first day in the sample period. In addition a binary dummy variable (*A*) reflecting the agricultural period was incorporated to accommodate seasonal variation in the opportunity cost of hunting and changes in market price of domestic animal meat. Basic economic theory furthermore suggests that the market price of bushmeat depends on demand, consumer incomes and the price of substitutes (Milner-Gulland 2001). The price of cow meat was selected as a proxy of domestic animal meat, due to correlations between the price of cow, pig and goat meat, and included in the model to accommodate effects of changes in the price of substitutes on the price of bushmeat.

We tested for autocorrelation by declaring date code a time series variable and by temporarily substituting village with an id number for each trader as a group to avoid repeated time-series values within the panel (individual traders only traded out of their home village). We used Wooldridge’s test for panel data [(F = 5.51; *p* = 0.26, fresh) and (F = 1653.67; *p* < 0.01, dry)] and selected reciprocal transformation of the dependent variable (-1/price per package), based on the ladder command in STATA. This eliminated significant autocorrelation in the model for dried meat. Wald’s modified test for group-wise random effects models indicated significant heteroscedasticity for both fresh (χ2 = 25×1032; *p* < 0.01) and dry meat (χ2 = 25×1034; *p* < 0.01). The model was therefore estimated with the robust option to provide heteroscedasticity robust variance estimates. We used the Hausman test to select between a random and a fixed effects model. Hence, the resulting model is a linear fixed effects panel-data model according to which the price of a package of bushmeat (*Pbvt*) is given by:

 *v* = 1…3 and *t* = 1…365 (3)

where S1-n are dummy variables for selected bushmeat species, *Pc* is the price of beef,   and are fixed model parameters, α*v*is the village specific intercept, and ’s are normally distributed and independent error terms. We use backward elimination to reduce the model until only significant species dummies were retained. Various diagnostic plots were used to examine the distribution of residuals. Determinants of supply were furthermore examined in terms of relations between price and number of packages available in the market. All data analysis was conducted in STATA version 11.2.

## APPENDIX 4

**Additional tables and figures**



Figure S1 Simulated average cost-benefit ratios for the various local actors as a function of daily probability of apprehension.

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Figure S2 Simulated average cost-benefit ratios for the various local actors as a function of the magnitude of the fine if caught.

Table S2 Average price per package in TSh 2011 prices for selected species in village A, B and C. Numbers in brackets are standard errors.

|  |  |  |  |
| --- | --- | --- | --- |
| *Species* | *Village A* | *Village B* | *Village C* |
| *Mean* | *n* | *Mean* | *n* | *Mean* | *n* |
|  1. Crested porcupine (*Hystrix cristata*) | 2000 (-) | 1 |  |  |  |  |
|  2. Cane rat spp. (*Thryonomys spp.*) |  |  | 2021 (144) | 49 |  |  |
|  3. African civet (*Civettictis civetta*) |  |  |  |  | 1000 (-) | 1 |
|  4. Hyrax spp. (*Hyracoidea spp.*) |  |  | 2010 (159) | 50 | 3750 (354) | 2 |
|  5. African elephant (*Loxodonta africana*) | 2200 (274) | 5 |  |  |  |  |
|  6. Hipopotamus (*Hippopotamus amphibius*) | 2007 (59) | 71 | 2650 (412) | 10 | 1667 (250) | 9 |
|  7. Bushpig (*Potamochoerus larvatus*) | 1932 (174) | 44 | 2510 (350) | 52 | 1464 (365) | 14 |
|  8. Warthog (*Pacochoerus africanus*) | 2000 (0) | 4 | 2489 (216) | 19 |  |  |
|  9. African buffalo (*Syncerus caffer*) | 2296 (247) | 108 | 2588 (476) | 17 | 1629 (392) | 105 |
| 10. Bushbuck (*Tragelaphus scriptus*) | 1679 (266) | 42 | 2500 (-) | 1 |  |  |
| 11. Blue duiker (*Cephalophus monticola*) | 1550 (240) | 30 |  |  |  |  |
| 12. Harvey’s duiker (*Cephalophus harveyi*) | 2000 (-) | 1 |  |  | 1000 (0) | 3 |
| 13. Abbott’s duiker (*Cephalophus larvatus*) |  |  | 2000 (-) | 1 |  |  |
| 14. Duiker spp. (*Cephalophus spp.*) | 2500 (-) | 1 | 2357 (280) | 21 |  |  |
| 15. Puku (*Kobus vardonii*) | 2000 (60) | 142 | 2379 (273) | 107 | 1638 (281) | 174 |
| One-way ANOVA | F = 66.8; *p* < 0.01 |  | F = 21.0; *p* < 0.01 |  | F = 17.2; *p* < 0.01 |  |
| Bonferroni | 9 > 6, 7, 8, 11, 155 > 75, 6, 8, 14, 15 > 1114 > 7, 10, 11 |  | 6, 7, 8, 9, 14, 15 > 2, 4 |  | 6, 9, 15 > 124 > 3, 6, 7, 9, 12, 15 |  |

Comparison of price between individual species must be made on a village basis due to significant differences in prices between villages and is constrained by low frequency of occurrence of some species in individual villages. In village A buffalo is significantly more expensive than several of the other species caught in KGCA (including bush pig) and also significantly more expensive than blue duiker caught in USFR. Elephant meat is more expensive than bush pig. Blue duiker meat is significantly cheaper than most large species caught in KGCA as well as duikers spp. caught in USFR. Duikers spp. is also significantly more expensive than bush pig and bushbuck. In village B meat from large species caught in KGCA (including bush pig) and from duikers spp. is significantly more expensive than cane rat and African civet. Finally in village C meat of larger species caught in KGCA is significantly more expensive than that of Harvey’s duiker caught in USFR. Surprisingly hyrax spp. meat is significantly more expensive than that of a number of large species caught in KGCA. However, this likely reflects the low number of observations of hyrax in this village and the possibility that these may have been sold as one large package.



Figure S3 Q-norm plot of the distribution of the residuals from the model predicting price of fresh bushmeat packages against quantiles of the theoretical normal distribution.

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