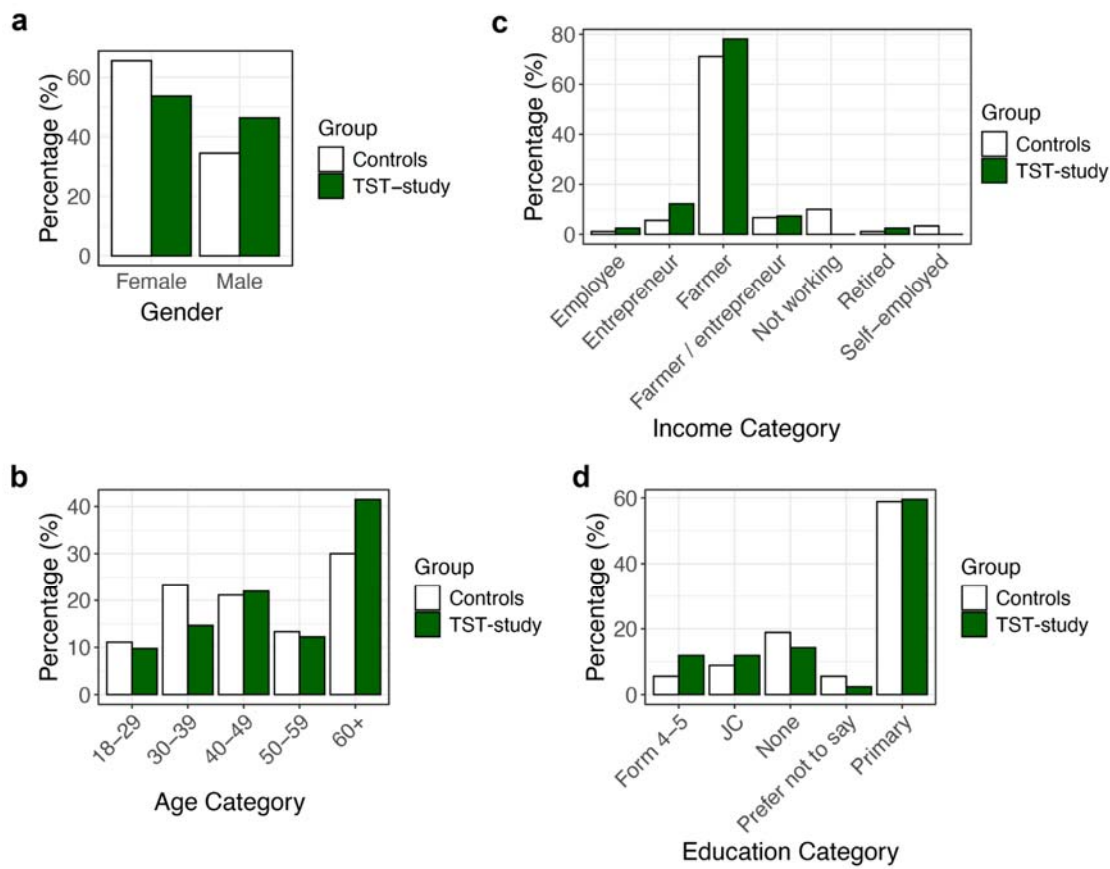


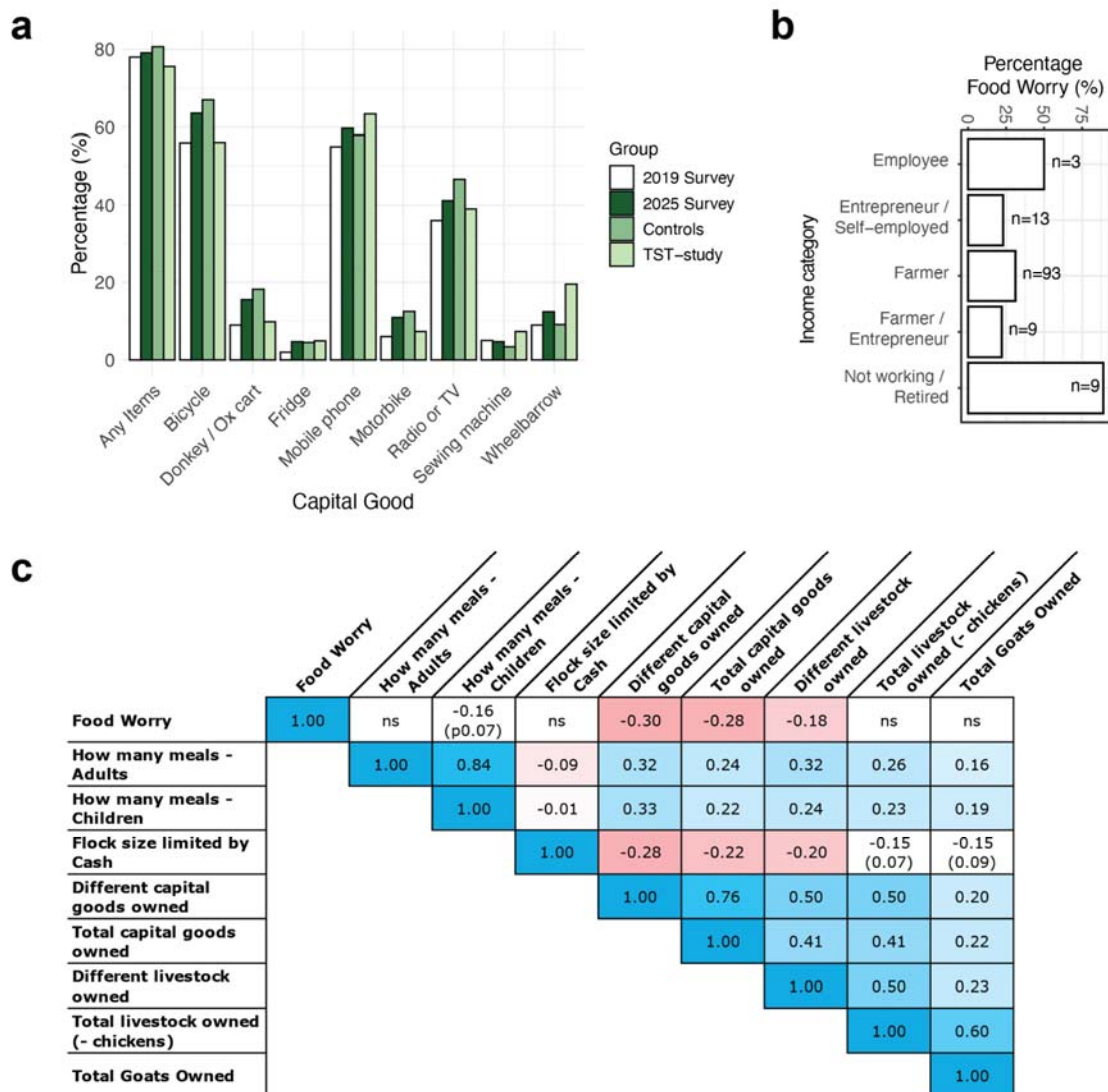
Supplemental Materials

Supplemental Tables and Figures



Supplemental Figure 1: Basic demographics of survey respondents.

Respondents from the 2020 TST-study as well as Controls ranged in (a) gender, (b) age, (c) income, and (d) education level but were representative of the area (Airs et al., 2023a). Plots are shown as proportion of responses received minus blank answers for TST-study respondents ($n = 42$) and Controls ($n = 90$). Chi-square and Fisher's exact tests are reported in the main text.



Supplemental Figure 2: Demographics and livelihood interactions.

(a) Proportional ownership of different capital goods (at least 1 item per household). Data include results from a 2019 pre-study survey in the same area (Airs et al., 2023a), the 2025 survey in total, and groups from the 2025 survey including TST-study participants and Controls. (b) Proportion of respondents with food worry (“yes”) per different income categories. (c) Correlation analyses of different livelihood indicators (as per S1 File) with significant results shown and marginal values shown alongside respective p-values. Ns = not significant.

Supplemental Table 1: Capital goods ownership of TST-study households

Item	Ownership (%)	> 1 of item owned (%)	Maximum owned (n)
Bicycle	56.1	9.8	5
Donkey / Ox cart	9.8	0.0	1
Fridge	4.9	0.0	1
Mobile phone	63.4	4.9	2
Motorbike	7.3	0.0	1
Radio	36.6	0.0	1
TV	14.6	0.0	1
Sewing machine	7.3	0.0	1
Wheelbarrow	19.5	0.0	1
Any Items*	75.6	56.1	13
Different Items**	56.1	4.9	8/9

* Ownership of any of the items listed in the table. ** Number of different items owned within the same household

Supplemental Table 2: Capital goods ownership of Control households

Item	Ownership (%)	> 1 of item owned (%)	Maximum owned (n)
Bicycle	67.0	12.5	10
Donkey / Ox cart	18.2	1.1	20
Fridge	4.5	1.1	2
Mobile phone	58.0	2.3	6
Motorbike	12.5	0.0	1
Radio	43.2	0.0	1
TV	12.5	1.1	1

Sewing machine	3.4	0.0	1
Wheelbarrow	9.1	0.0	1
Any Items*	80.7	65.9	21
Different Items**	65.9	2.3	7/9

* Ownership of any of the items listed in the table. ** Number of different items owned within the same household

Supplemental Table 3: Question “In the past 7 days, did you worry that your household would not have enough food?”

	Food Worry?		Proportion (%)
	Yes	No	
TST-study groups	16	25	39.02
Control groups	27	60	31.03
2019 Survey	41	59	41

Supplemental Table 4: Question “How many meals are taken per day in your household per adult?”

	Adult meals per day				Proportion (%)		
	1	2	3	Sum	1	2	3
TST-study groups	0	22	19	41	0.00	53.7	46.3
<i>Plant-TST group</i>	0	11	10	21	0.00	52.3	47.6
<i>TST group</i>	0	11	9	20	0.00	55.0	45.0
Control groups	4	43	42	89	4.49	48.3	47.2

Supplemental Table 5: Question “How many meals are taken per day in your household per child?”

	Child meals per day					Proportion (%)			
	1	2	3	4	Sum	1	2	3	4
TST-study groups	0	17	21	2	40	0.00	42.5	52.5	5.0
<i>Plant-TST group</i>	0	7	13	0	20	0.00	35.0	65.0	0.0
<i>TST group</i>	0	10	8	2	18	0.00	55.6	44.4	11.1
Control groups	2	37	49	0	88	2.27	42.1	55.7	0.0

Supplemental Table 6: Question “Are you better off now compared to in 2019?”

	Better or Worse since 2019?				Proportion (%)		
	Better 2019	Same	Better Now	Sum	Better 2019	Same	Better Now
TST-study groups	13	7	21	41	31.7	17.1	51.2
<i>Plant-TST group</i>	5	6	10	21	23.8	28.6	47.6
<i>TST group</i>	8	1	11	20	40.0	5.00	55.0
Control groups	24	15	47	86	27.9	17.4	54.7

Supplemental Table 7: Reasons why TST-study farmers will use the Five Point Check in the future

Category*	Sub-category*	Count**	Proportion of farmers (%)
Disease or Health		36	85.7
	<i>Disease diagnosis / treatment</i>	23	54.8
	<i>Health status / keeping goats healthy</i>	17	40.5
Production		15	35.7
	<i>Flock size / breeding / productivity</i>	8	19.0

<i>Market profit / setting value / help selling goats</i>	5	11.9
<i>Goat management knowledge / skills</i>	3	7.1
Generally helpful	2	4.8

* Full responses available as part of the raw dataset.

** Responses contained 1 ($n = 26$), 2 ($n = 14$), or 3 ($n = 1$) sub-categories.

Supplemental Table 8: Farmers knowledge sharing

		Share knowledge?		
Group	Group	Yes	No	Sometimes
TST-study	<i>Plant-TST</i>	16	4	2
	<i>TST</i>	13	5	2
	<i>Total</i>	29	9	4
Controls	Control - TST	7	12	0
	Control – Plant-TST	9	10	2
	Control - Out of village	26	19	0
	<i>Total</i>	42	41	2

Supplemental Table 9: Responses to the open-ended question “How did you learn about using trees and plants to treat sick or struggling goats?”

Category	Controls	TST-study	Plant-TST	TST
Personal experience / Observation of goat preferences	14 (16%)	2 (5%)	0 (0%)	2 (10%)
Indigenous knowledge / Family	4 (4%)	1 (2%)	1 (5%)	0 (0%)
Training (including veterinary and extension officers)	4 (4%)	27 (64%)	15 (68%)	12 (60%)
Other Farmers & TST-study participants	6 (7%)	4 (10%)	2 (9%)	2 (10%)

Supplemental Table 10: Seasonal feeding management of survey respondents.

	Dambo / Herding		Grain		Crop residue		Cut/Carry Forage	
	Rainy		Dry	Rainy	Dry	Rainy	Dry	Rainy
TST-study groups	90.5	28.6	66.7	42.9	26.2	50.0	40.5	85.7
Control groups	92.1	34.1	51.7	50.0	19.1	51.1	13.5	86.4

*Proportion (%) of total responses utilising each feeding strategy per group.

Supplemental Table 11: Proportion of respondents who use feed or plants to supplement sick or struggling goats.

	Any feed*	<i>Commiphora africana</i>	<i>Ficus ingens</i>	<i>Gmelina arborea</i>
Plant-TST group	15 (71%)	17 (77%)	15 (68%)	19 (86%)
TST group	17 (89%)	7 (35%)	8 (40%)	6 (30%)
Control groups	49 (60%)	17 (19%)	26 (29%)	40 (44%)

* Not specified, includes 'yes' and 'sometimes' responses.

Supplemental Table 12: Goat holding size and stock change (gains and losses) over the last 12 months.

Status	Item	TST-Study (n=39)				Controls (n=86)			
		%	Min	Media n	Max	%	Min	Media n	Max
Current Flock	Adult F	92.3	0	4	11	91.9	0	3	15
	Adult M	56.4	0	1	5	65.1	0	1	4
	Castrated M	15.4	0	0	4	3.5	0	0	2

	Kid <1 yr	25.6	0	0	6	22.1	0	0	4
	Kid suckling	28.2	0	0	4	24.4	0	0	13
	Purchased/Traded	15.4	0	0	8	9.3	0	0	4
	Total Owned	100.0	1	7	16	100.0	1	5	23
Used	Sold/Traded	71.8	0	1	7	51.2	0	1	15
	Consumed at ceremonies	23.1	0	0	4	23.3	0	0	3
	Consumed domestically	2.6	0	0	1	2.3	0	0	1
	Total Used	76.9	0	2	7	57.0	0	1	17
Lost	Stolen	35.9	0	0	4	23.3	0	0	5
	Died (adults)	51.3	0	1	3	36.0	0	0	7
	Died (kids)	12.8	0	0	4	8.1	0	0	10
	Died (predators)	7.7	0	0	1	8.1	0	0	6
	Total Losses	71.8	0	2	5	59.3	0	1	15
Farm Size*		100.0	1	10	23	100.0	1	8	39

*Sum of all goats owned, used, and lost

Supplemental Table 12b: Goat holding size and stock change over the last 12 months - in village comparisons.

Status	Item	Plant-TST				Control-PlantTST				TST				Control-TST				Out of village controls			
		%	Min	Med	Max	%	Min	Med	Max	%	Min	Med	Max	%	Min	Med	Max	%	Min	Med	Max
Current Flock	Adult F	100.0	1	3	8	81.8	0	2	6	85.0	0	4	11	100.0	1	4	9	93.5	0	3	15
	Adult M	52.6	0	1	5	63.6	0	1	4	60.0	0	1	5	66.7	0	1	4	65.2	0	1	4
	Castrated M	15.8	0	0	4	9.1	0	0	1	15.0	0	0	3	5.6	0	0	2	0.0	0	0	0
	Kid <1 yr	21.1	0	0	6	13.6	0	0	2	30.0	0	0	4	22.2	0	0	3	26.1	0	0	4
	Kid suckling	21.1	0	0	3	36.4	0	0	2	35.0	0	0	4	27.8	0	0	6	17.4	0	0	13
	Purchased/ Traded	5.3	0	0	1	22.7	0	0	4	25.0	0	0	8	0.0	0	0	0	6.5	0	0	1
	Total Owned	100.0	1	6	12	100.0	1	4	10	100.0	1	8	16	100.0	1	5	14	100.0	1	5	23
Used	Sold/Traded	78.9	0	2	7	50.0	0	0.5	4	65.0	0	1	5	50.0	0	0.5	3	52.2	0	1	15
	Consumed at ceremonies	26.3	0	0	2	9.1	0	0	1	20.0	0	0	4	16.7	0	0	1	32.6	0	0	3
	Consumed domestically	0.0	0	0	0	0.0	0	0	0	5.0	0	0	1	5.6	0	0	1	2.2	0	0	1
	Total Used	84.2	0	2	7	50.0	0	0.5	4	70.0	0	2	6	55.6	0	1	4	60.9	0	1.5	17
Lost	Stolen	36.8	0	0	4	22.7	0	0	5	35.0	0	0	3	22.2	0	0	3	23.9	0	0	5
	Died (adults)	42.1	0	0	3	18.2	0	0	2	60.0	0	1	3	27.8	0	0	4	47.8	0	0	7
	Died (kids)	21.1	0	0	4	9.1	0	0	1	5.0	0	0	1	5.6	0	0	1	8.7	0	0	10
	Died (predators)	10.5	0	0	1	4.5	0	0	1	5.0	0	0	1	5.6	0	0	1	10.9	0	0	6
	Total Losses	73.7	0	2	4	45.5	0	0	5	70.0	0	1.5	5	50.0	0	0.5	5	69.6	0	1	15
Farm size*		100.0	5	10	23	100.0	1	6	14	100.0	1	12.5	22	100.0	1	8.5	19	100.0	1	9.5	39
	Net change		-5	0	3		-2	0.5	4		-8	2	11		-2	1	8		-17	1	12

Supplemental Table 13: Limiting factors impacting the number of goats owned - by proportion of respondents per group.

Limitations	Plant-TST (% yes)	TST (% yes)	Controls (% yes)
Cash	100.0	90.0	88.8
Breeding bucks	22.7	30.0	18.0
Feed	31.8	35.0	12.4
Labour	9.1	25.0	5.6
Theft	54.5	55.0	51.7
Weather	4.5	0.0	11.2
Disease	22.7	65.0	46.1
Health	4.5	30.0	11.2
Dog bites	68.2	60.0	64.0

Supplemental Table 14: Odds ratios for Count Data from Table S13 “Limiting factors impacting the number of goats owned.”

Limitation	Plant-TST vs TST	Plant-TST vs Controls	TST vs Controls
Cash	inf (0.2207)	inf (0.2063)	1.14 (1.0)
Breeding bucks	0.69 (0.7298)	1.34 (0.5603)	1.96 (0.2306)
Feed	0.87 (1.0)	3.31 (0.0473)	3.82 (0.0215)
Labour	0.3 (0.2289)	1.68 (0.6236)	5.6 (0.0175)
Theft	0.98 (1.0)	1.12 (1.0)	1.14 (0.81)
Weather	inf (1.0)	0.38 (0.6897)	0.0 (0.2028)
Disease	0.16 (0.0116)	0.34 (0.0553)	2.17 (0.1444)
Health	0.11 (0.0408)	0.38 (0.6897)	3.39 (0.0726)

Dog bites 1.43 (0.7488) 1.2 (0.8065) 0.84 (0.7996)

* Two-sided Fisher's Exact Test performed in 2x2 contingencies for each occurrence. Shows odds ratios with p values in parentheses. Significant results in **bold**.

Supplemental Table 15: Access to veterinary assistance and medicine for goats across study and control village areas

Village	Group	Help from Veterinary assistant		Access to medicine for goats	
		Yes / Sometimes	No	Yes / Sometimes	No
Mazinga	Plant-TST	10	2	10	2
Mazinga	Control	5	5	7	3
Chinkhowe	Plant-TST	8	2	8	2
Chinkhowe	Control	5	7	8	4
Kamchezera	TST	8	5	10	3
Kamchezera	Control	5	9	4	10
Mkwinda	TST	6	1	6	1
Mkwinda	Control	2	4	3	3
Bauleni	Control	10	4	10	4
Kanyumbu	Control	19	15	20	14
<i>Total</i>		78		85	
<i>Proportion total (%)</i>		59.1		64.4	
<i>Proportion TST-study</i>		76.2		81.0	
<i>Proportion Controls</i>		51.1		57.3	

Supplemental Table 16: Sources of anthelmintics across groups

Group	Vet assistant	Drug Box	Shop
Plant-TST	8 (36%)	11 (50%)	0
TST	11 (55%)	4 (20%)	2 (10%)
Control-PlantTST villages	9 (41%)	4 (18%)	2 (9%)
Control-TST villages	3 (15%)	0	3 (15%)
Control-Out of village	28 (58%)	na*	2 (4%)
<i>Total</i>	<i>59</i>	<i>19</i>	<i>9</i>
<i>Proportion total (%)</i>	<i>67.8</i>	<i>21.8</i>	<i>10.3</i>
<i>Total study area</i>	<i>31</i>	<i>19</i>	<i>7</i>
<i>Proportion study area (%)</i>	<i>54.4</i>	<i>33.3</i>	<i>12.3</i>

* Drug boxes were not provided outside of the study area.