

Supplementary to “Integrated participatory approach reveals perceived local availability of wild edible plants in northwestern Kenya” published in the Journal of Human Ecology and accessible via <https://doi.org/10.1007/s10745-022-00370-0>.

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See the repository with data and R codes for the manuscript at
https://github.com/Wycology/wild_edible_plants_availability

Supplementary Table 1: Variability parameters across the community units in Loima and Turkana South Sub-Counties in Kenya. The three study community units highlighted in green are representative of the different agro-climatic and vegetation zones occurring in the study area. Altitude data were derived from Shuttle Radar Topography Mission (SRTM) (Farr and Kobrick 2000). Agro-Climatic zones data (Kenya Soil Survey 1980): VI = Arid and VII = Very Arid. Annual rainfall data from Climate Hazards Group InfraRed Precipitation with Station data (CHIRPS) (Funk *et al.* 2014). For vegetation types: SH = Sparse Herbaceous, B = Barren, DB = Deciduous Broadleaf, and SS = Sparse Shrublands (Friedl and Sulla-Menashe 2019). For Potential Natural Vegetation of East Africa: Bd = Somalia-Masai Acacia-Commiphora deciduous bushland and thicket, Bds = Acacia-Commiphora stunted bushland, and R = Riverine wooded vegetation (van Breugel *et al.* 2015). For population density (Kenya Population and Housing 2019). For livelihood zone: TBP = Turkana Border Pastoral, TCP = Turkana Central Pastoral, and TAP = Turkwel Riverine Agro-Pastoral (Food Economy Group 2016). For livestock kept: Cam = Camels, S/G = sheep and goats, and Catl = Cattle.

Community Unit	Altitude (masl)	Agro-Climatic Zones	Annual Rainfall (mm)	Vegetation types	Potential Natural Vegetation of	Population Density	Livelihood Zone	Livestock kept
Atala Kimusio	889	VI-2	670.15	SH	Bd	7	TBP	Cam, S/G, Catl
Kawalathe	815	VII-1	314.92	B	Bd	12	TCP	Cam, S/G
Lokwatuba	797	VI-1	595.12	SH	Bd	-	TBP	Cam, S/G, Catl
Kamarese	794	VII-1	401.49	B	Bd	-	TCP	Cam, S/G
Lokichar	770	VII-1	401.49	B	Bd	73	TCP	Cam, S/G
Kalemngorok	741	VI-1	555.01	DB	Bds	33	TAP	Cam, S/G, Catl
Lochwa	739	VII-1	344.72	B	Bd	8	TCP	Cam, S/G
Namoruputh	729	VI-1	533.85	DB	R	22	TBP	Cam, S/G, Catl
Lopur	696	VI-1	557.04	DB	R	322	TAP	Cam, S/G, Catl
Lokapel	667	VI-1	489.97	DB	R	96	TAP	Cam, S/G, Catl
Nameyana	643	VII-1	425.03	SS	Bds	-	TCP	Cam, S/G
Lorugum	624	VII-1	316.76	SS	R	11	TCP	Cam, S/G
Napeikar	570	VII-1	273.91	B	R	35	TAP	Cam, S/G, Catl
Kablokor	565	VII-1	292.16	B	R	-	TAP	Cam, S/G, Catl
Nasiger	559	VII-1	290.13	B	Bds	7	TCP	Cam, S/G
Kaapus	557	VII-1	343.33	SS	R	12	TAP	Cam, S/G, Catl
Napusmoru	547	VII-1	288.24	B	Bds	6	TCP	Cam, S/G

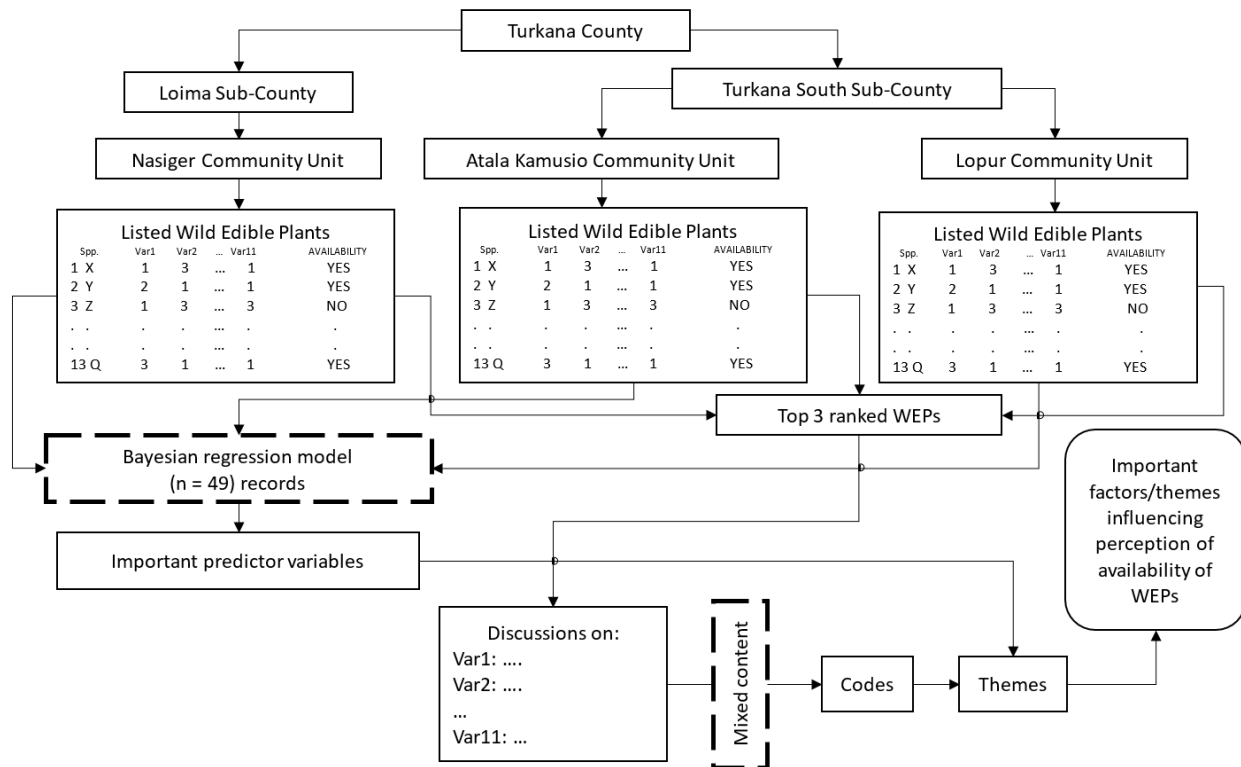
Supplementary Table 2: Focus Group Discussion data for assessment of Wild Edible Plants against 11 predictor parameters and a response parameter in Turkana County, Kenya. Listed wild edible fruit plants per community unit (Nasiger (n = 13), Atala Kamusio (n = 23), and Lopur (n = 13)), their scientific (validated using (Sarfo 2018) and checked for accepted name using World Flora Online (<http://www.worldfloraonline.org/>)) and local names (Turkana language). Several WEPs were cited across all or more than one community unit resulting into citations of 49 plants of 24 unique WEPs.

Community Unit	Wild Edible Plant	Local name (Turkana)	Abundance	Distance	Harvesting	Portability	Processing	Seasonality	Market	Affordability	Access	Adequacy	Regeneration	AVAILABILITY
Nasiger	<i>Ziziphus mauritiana</i> Lam.	Ekalale	1	1	1	1	1	2	3	1	1	3	3	1
Nasiger	<i>Salvadora persica</i> L.	Esekon	1	1	1	1	1	2	3	1	1	3	3	1
Nasiger	<i>Balanites rotundifolia</i> (Tiegh.) Blatt.	Ebei	2	1	1	3	3	1	3	1	1	3	1	1
Nasiger	<i>Dobera glabra</i> Juss. ex Poir.	Edapal	1	2	1	3	1	1	3	1	1	3	3	1
Nasiger	<i>Cordia sinensis</i> Lam.	Edome	1	1	1	1	1	1	1	1	1	1	1	1
Nasiger	<i>Hyphaene compressa</i> H.Wendl.	Eng'ol	2	2	3	3	2	1	2	2	1	3	3	1
Nasiger	<i>Boscia coriacea</i> Pax	Edung	3	3	2	2	3	3	1	3	1	1	1	0
Nasiger	<i>Balanites pedicellaris</i> Mildbr. & Schltr.	Elamach	3	3	3	3	1	3	1	3	1	3	1	0
Nasiger	<i>Vachellia tortilis</i> (Forssk.) Galasso & Banfi	Ewoi	1	1	2	1	1	2	3	1	1	3	3	1
Nasiger	<i>Grewia tenax</i> (Forssk.) Fiori	Eng'omo	3	3	3	2	2	3	1	3	1	1	1	0
Nasiger	<i>Vatovaea pseudolablab</i> (Harms) J.B.Gillett	Egilae	2	3	3	3	2	3	1	3	1	2	3	0
Nasiger	<i>Berchemia discolor</i> Hemsl.	Emeyen	3	3	2	3	3	3	2	2	1	1	3	0
Nasiger	<i>Sterculia stenocarpa</i> H.J.P.Winkl.	Etete	3	3	3	1	3	3	1	3	1	1	1	0
Atala Kamusio	<i>Ziziphus mauritiana</i> Lam.	Ekalale	1	1	1	1	1	2	3	1	1	3	3	1
Atala Kamusio	<i>Salvadora persica</i> L.	Esekon	2	3	1	1	1	2	3	1	1	3	3	1
Atala Kamusio	<i>Balanites rotundifolia</i> (Tiegh.) Blatt.	Ebei	1	1	1	3	3	2	3	1	1	3	1	1
Atala Kamusio	<i>Balanites pedicellaris</i> Mildbr. & Schltr.	Elamach	1	1	1	3	1	2	3	1	1	3	3	1
Atala Kamusio	<i>Boscia coriacea</i> Pax	Edung'	3	3	1	2	3	3	1	3	1	1	3	0
Atala Kamusio	<i>Dobera glabra</i> Juss. ex Poir.	Edapal	1	1	1	2	1	1	1	3	1	2	2	1
Atala Kamusio	<i>Grewia tenax</i> (Forssk.) Fiori	Eng'omo	3	2	3	3	3	2	1	3	1	1	1	0
Atala Kamusio	<i>Vachellia tortilis</i> (Forssk.) Galasso & Banfi	Ewoi	1	1	2	1	1	2	3	1	1	3	3	1
Atala Kamusio	<i>Grewia rothii</i> DC.	Ekali	3	2	3	3	3	1	1	2	1	1	1	1
Atala Kamusio	<i>Senegalia senegal</i> (L.) Britton	Ekunoit	3	3	3	3	3	3	1	2	1	1	1	0
Atala Kamusio	<i>Vachellia oerfota</i> (Forssk.) Kyal. & Boatwr.	Epetet	3	3	3	3	2	1	1	2	1	1	1	0

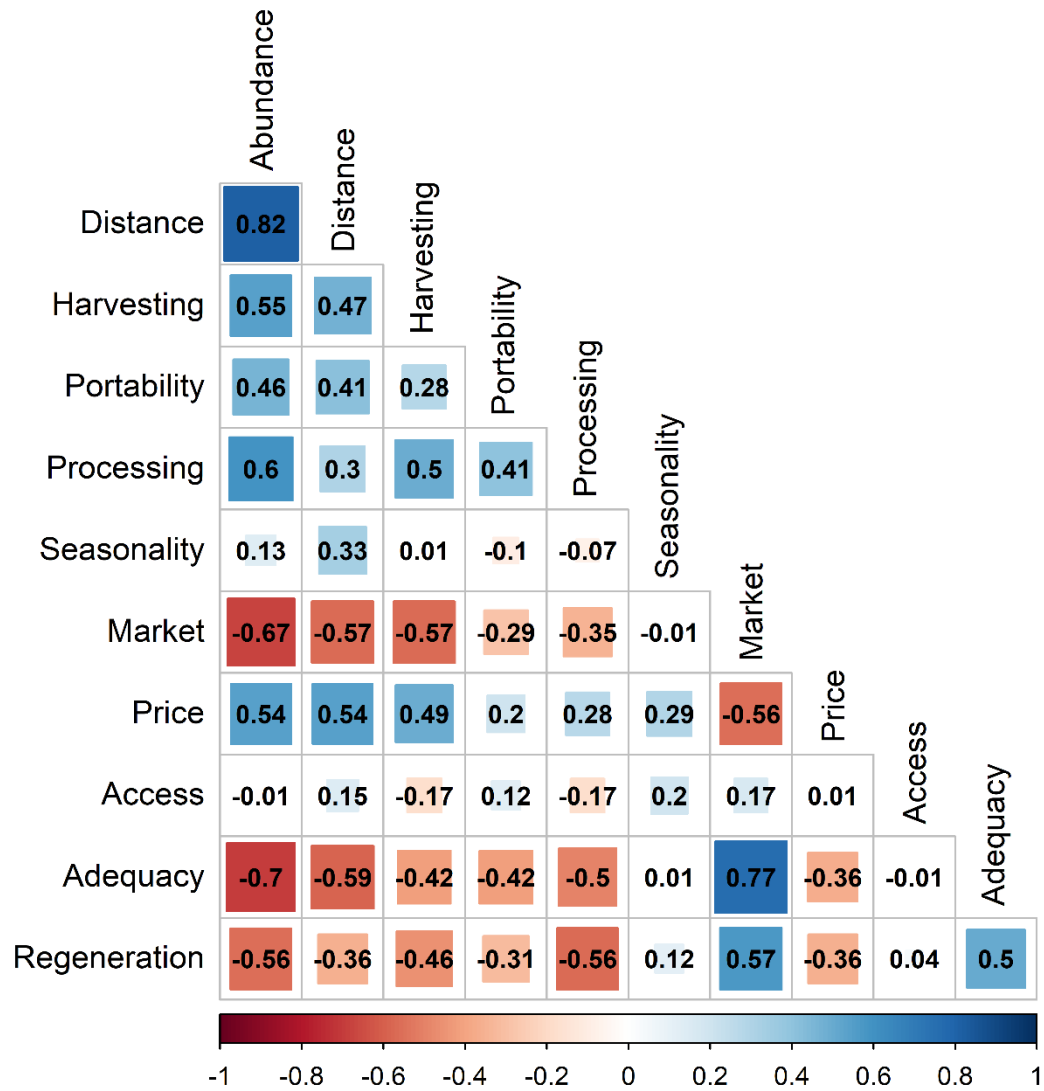
Atala Kamusio	<i>Sterculia stenocarpa</i> H.J.P.Winkl.	Etete	2	3	3	3	3	2	3	3	1	2	1	1
Atala Kamusio	<i>Grewia villosa</i> Willd.	Epong'ai	3	3	3	3	3	3	1	1	1	1	1	0
Atala Kamusio	<i>Ficus sycomorus</i> L.	Echoke	3	2	3	3	3	1	1	2	1	1	1	0
Atala Kamusio	<i>Berchemia discolor</i> Hemsl.	Emeyen	1	1	3	2	3	1	2	2	1	2	1	1
Atala Kamusio	<i>Cenchrus ciliaris</i> L.	Ejamaruka	3	3	1	3	3	1	1	1	1	1	1	0
Atala Kamusio	<i>Lannea triphylla</i> Engl.	Etopojo	3	3	3	3	3	1	1	3	1	1	1	0
Atala Kamusio	<i>Balanites aegyptiaca</i> (L.) Delile	Eroronyit	3	3	3	3	3	1	2	1	1	1	1	0
Atala Kamusio	<i>Maerua subcordata</i> (Gilg) DeWolf	Eerut	3	2	3	3	3	1	1	3	1	1	1	0
Atala Kamusio	<i>Grewia mollis</i> Juss.	Epat	1	1	3	1	3	2	2	1	1	3	1	1
Atala Kamusio	<i>Vatovaea pseudolablab</i> (Harms) J.B.Gillett	Egilae	3	3	3	3	3	1	1	1	1	1	1	0
Atala Kamusio	<i>Tamarindus indica</i> L.	Epedur	2	2	3	3	3	1	1	2	1	1	1	0
Atala Kamusio	<i>Cordia sinensis</i> Lam.	Edome	2	2	3	3	3	2	3	3	1	3	3	1
Lopur	<i>Ziziphus mauritiana</i> Lam.	Ekalale	1	1	1	1	1	2	3	1	1	3	3	1
Lopur	<i>Salvadora persica</i> L.	Esekon	1	1	1	1	1	2	3	1	1	3	3	1
Lopur	<i>Balanites rotundifolia</i> (Tiegh.) Blatt.	Ebei	2	1	1	3	3	2	3	1	1	3	1	1
Lopur	<i>Dobera glabra</i> Juss. ex Poir.	Edapal	1	1	1	3	1	2	3	1	1	3	3	1
Lopur	<i>Maerua subcordata</i> (Gilg) DeWolf	Eerut	3	3	3	1	3	2	2	3	1	3	1	0
Lopur	<i>Balanites pedicellaris</i> Mildbr. & Schltr.	Elamach	2	1	2	1	3	2	2	3	1	3	1	1
Lopur	<i>Boscia coriacea</i> Pax	Edung'	3	3	2	3	3	3	2	3	1	1	1	0
Lopur	<i>Tamarindus indica</i> L.	Epedur	2	3	1	3	1	3	3	2	2	2	2	0
Lopur	<i>Vachellia tortilis</i> (Forssk.) Galasso & Banfi	Ewoi	1	1	2	1	1	2	3	1	1	3	3	1
Lopur	<i>Cordia sinensis</i> Lam.	Edome	2	2	1	2	2	2	3	2	1	3	1	1
Lopur	<i>Grewia tenax</i> (Forssk.) Fiori	Eng'omo	3	3	2	2	1	1	1	3	1	2	1	0
Lopur	<i>Grewia villosa</i> Willd.	Epong'ai	2	3	2	3	1	3	1	3	1	1	1	0
Lopur	<i>Vatovaea pseudolablab</i> (Harms) J.B.Gillett	Egilae	2	3	3	2	1	3	1	3	1	3	1	0
Key	<i>Abundance (How plenty is the WEP in the community unit?)</i>	1. Plenty 2. Average 3. Little	Distance (How far do you travel to get the WEP?)									1. Near 2. Average 3. Far		
	<i>Harvesting (How easy it is to pick fruit from the WEP?)</i>	1. Easy 2. Average 3. Hard	Portability (How easy is it to carry the harvested fruits of the WEP?)									1. Light 2. Average 3. Heavy		
	<i>Processing (How easy is it to prepare harvested WEP for consumption?)</i>	1. Easy 2. Average 3. Hard	Seasonality (In which seasons are fruits of the WEP plenty?)									1. Both 2. Dry 3. Wet		
	<i>Market (How much of the WEP is sold in the market?)</i>	1. Plenty 2. Average 3. Little	Price (How do you rate the price of the WEP in the market?)									1. Cheap 2. Average 3. Expensive		

	<i>Access (Do you need any permission to access the WEP?)</i>	1. Free 2. With permission 3. No access	Adequacy (How adequate are fruits of the WEP from single harvest?)	1. Plenty 2. Average 3. Little
	<i>Regeneration (How plenty are young ones of the WEP?)</i>	1. Plenty 2. Average 3. Little	Availability (Do you consider the WEP available or not?)	1. YES 2. NO

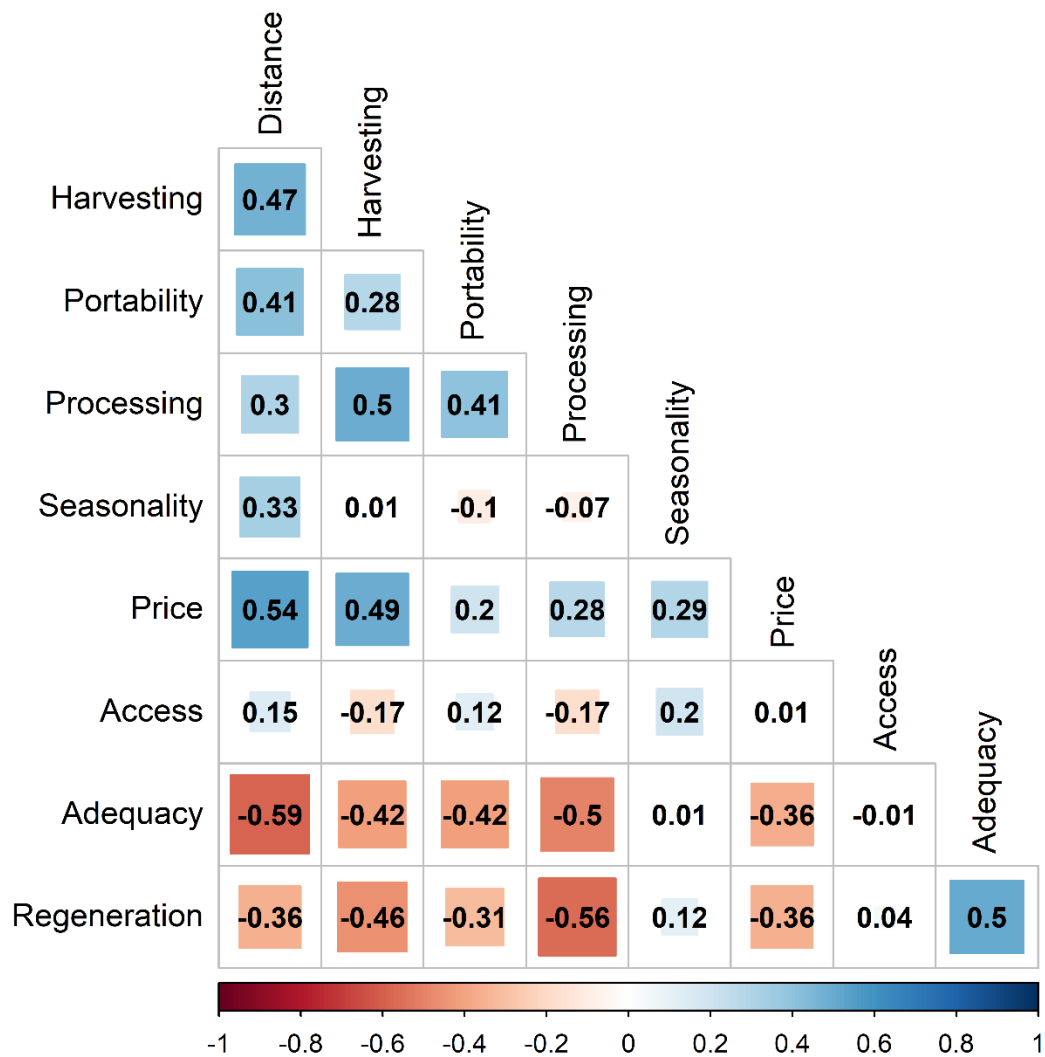
Supplementary Figure 1: Conceptual structure of the study on Wild Edible Plants in Turkana County, Kenya. Var1 to Var11 are the parameters used as predictor parameters. Spp X, Y, Z to Q denote names of WEPs cited at every community unit. Arrows denote flow of data and information while thick-bordered broken boxes enclose method of data analysis.



Supplementary Figure 2: Correlation matrix plot of the 11 categorical predictor parameters before removing collinear parameters from three focus group discussions held at Nasiger, Atala Kamusio, and Lopur community units in Turkana County, Kenya.



Supplementary Figure 3: Correlation matrix plot of the retained 9 categorical predictor parameters after removing collinear parameters (Abundance and Market) from three focus group discussions held at Nasiger, Atala Kamusio, and Lopur community units in Turkana County, Kenya.



Supplementary Table 4: Bayesian logistic regression model output showing contribution of studied predictor variables (n = 6) on the availability of studied listed wild edible plants (n = 13) to Nasiger community unit in Turkana County, Kenya. CI means credible interval, pd means probability direction, ROPE means region of practical equivalence, Rhat is the scale reduction factor, and ESS means effective sample size factor, and ESS means effective sample size.

[illegible]

Supplementary Table 5: Bayesian regression model output showing contribution of studied predictor variables (n = 7) on the availability of studied listed wild edible plants (n = 23) to Atala Kamusio community unit in Turkana County, Kenya. CI means credible interval, pd means probability direction, ROPE means region of practical equivalence, Rhat is the scale reduction.

Parameter	Median	95% CI	pd	ROPE	% ROPE	Rhat	ESS	Prior	Fit
(Intercept)	4.28	[-5.88, 15.02]	79.67%	[-0.18, 0.18]	2.16%	1.000	3830.00	Normal (0 +- 2.50)	
Distance_ave	-2.04	[-9.73, 5.37]	70.93%	[-0.18, 0.18]	2.74%	1.000	3242.00	Normal (0 +- 5.57)	
Distance_far	-4.64	[-11.34, 2.36]	91.45%	[-0.18, 0.18]	1.58%	1.000	3127.00	Normal (0 +- 4.93)	
Harvesting_ave	1.21	[-16.49, 21.84]	54.62%	[-0.18, 0.18]	1.50%	1.000	4526.00	Normal (0 +- 11.99)	
Harvesting_hard	-0.46	[-7.40, 7.27]	55.25%	[-0.18, 0.18]	4.05%	0.999	3341.00	Normal (0 +- 5.13)	
Portability_ave	2.77	[-7.03, 12.92]	70.50%	[-0.18, 0.18]	2.76%	1.000	3580.00	Normal (0 +- 7.26)	
Portability_heavy	-4.33	[-12.05, 3.71]	85.92%	[-0.18, 0.18]	2.34%	1.002	3427.00	Normal (0 +- 5.31)	
Processing_ave	-7.92	[-26.68, 5.92]	85.60%	[-0.18, 0.18]	1.03%	1.000	3120.00	Normal (0 +- 11.99)	
Processing_hard	-2.15	[-10.84, 5.58]	71.38%	[-0.18, 0.18]	3.37%	1.000	3555.00	Normal (0 +- 5.57)	
Seasonality_dry	3.49	[-2.78, 10.17]	85.82%	[-0.18, 0.18]	2.34%	1.000	3430.00	Normal (0 +- 5.01)	
Seasonality_wet	-5.75	[-16.91, 3.33]	89.60%	[-0.18, 0.18]	1.92%	1.001	3679.00	Normal (0 +- 7.26)	
Market_ave	1.15	[-7.52, 9.93]	60.77%	[-0.18, 0.18]	3.05%	1.000	3312.00	Normal (0 +- 7.26)	
Market_little	8.15	[1.41, 14.95]	99.65%	[-0.18, 0.18]	0.00%	1.000	3380.00	Normal (0 +- 5.31)	
Price_ave	3.26	[-3.94, 10.18]	81.50%	[-0.18, 0.18]	3.03%	1.000	2982.00	Normal (0 +- 5.57)	
Price_expensive	-1.27	[-7.96, 5.30]	64.42%	[-0.18, 0.18]	4.00%	1.000	3145.00	Normal (0 +- 5.31)	
ELPD									-9.37
LOOIC									18.73
WAIC									14.21
R2									0.82
Sigma									1.00
Log_loss									0.10

Supplementary Table 6: Bayesian regression model output showing contribution of studied predictor variables (n = 8) on the availability of studied listed wild edible plants (n = 13) to Lopur community unit in Turkana County, Kenya. CI means credible interval,

pd means probability direction, ROPE means region of practical equivalence, Rhat is the scale reduction factor, and ESS means effective sample size.

[illegible]

Supplementary Table 7: Overview of parameters that were retained and dropped in a study of Wild Edible Plants In Turkana County, Kenya. Some parameters were dropped due to multi-collinearity problems ($r \geq 0.7$) with respect to the three communities combined and separately. Dropped parameters are highlighted in gray.

No.	Parameter	All Community Units	Nasiger	Atala Kamusio	Lopur
1	Abundance	Dropped	Dropped	Dropped	Dropped
2	Distance	Retained	Dropped	Retained	Retained
3	Harvesting	Retained	Retained	Retained	Retained
4	Portability	Retained	Retained	Retained	Retained
5	Processing	Retained	Retained	Retained	Retained
6	Seasonality	Retained	Retained	Retained	Retained
7	Market	Dropped	Dropped	Retained	Dropped
8	Price	Retained	Dropped	Retained	Dropped
9	Access	Retained	Dropped	Dropped	Retained
10	Adequacy	Retained	Retained	Dropped	Retained
11	Regeneration	Retained	Retained	Dropped	Retained

Supplementary Table 8: Number of statements (n = 348), codes, and themes from Focus Group Discussions (FGDs) held in three community units (Nasiger, Atala Kamusio, and Lopur) regarding Wild Edible Plants in Turkana County, Kenya that contributed to each of the derived codes (n = 17) and themes (n = 13). The statements are partitioned by gender, where F represents female (n = 158) and M represents male (n = 190).

No	Codes	Theme	Number of contributing statements
1	Cultural livelihood strategy	Culture and traditions	126 (F = 55, M = 71)
2	Lean season	Seasonality	62 (F = 30, M = 32)
	Dry season		
3	Conservation and management	Conservation and management	36 (F = 15, M = 21)
	Overgrazing on seedlings		
	Perishability of the fruits		
4	Distribution of WEPs	Distribution of WEPs	32 (F = 15, M = 17)
5	Climate change	Climate change	26 (F = 8, M = 18)
	Invasive species		
6	Agricultural expansion	Crop farming	15 (F = 9, M = 6)
7	Thorny fruit trees	Price	12 (F = 7, M = 5)
8	Population pressure	Population pressure	11 (F = 5, M = 6)
9	Security considerations	Insecurity and safety	8 (F = 2, M = 6)
10	Declining use of WEPs	Change in lifestyle	7 (F = 5, M = 2)
11	Cutting of WEPs	Selective harvesting	7 (F = 4, M = 3)
12	Competition from wild animals	Competition from wild animals	4 (F = 2, M = 2)
13	Pests and diseases	Pests and diseases	2 (F = 1, M = 1)
	TOTAL		348 (F = 158, M = 190)