

## Supplementary tables

Table S1: Plant species according to land-use systems at the study site<sup>c</sup>

Cut-use fodder grasses				
<i>Andropogon gabonensis</i>	<i>Cenchrus setigerus</i>	<i>Eragrostis curvula</i>	<i>Paspalum conjugatum</i>	<i>Stenotaphrum dimidiatum</i>
<i>Andropogon gayanus</i>	<i>Chloris gayana</i>	<i>Eragrostis turgida</i>	<i>Paspalum dilatatum</i>	<i>Tripsacum laxum</i>
<i>Andropogon tectorum</i>	<i>Chrysopogon aciculatus</i>	<i>Heteropogon contortus</i>	<i>Paspalum notatum</i>	<i>Urochloa bolbodes</i>
<i>Brachiaria brizantha</i>	<i>Cymbopogon giganteus</i>	<i>Hydropogon canaliculata</i>	<i>Paspalum virgatum</i>	<i>Urochloa pullulans</i>
<i>Brachiaria mutica</i>	<i>Cynodon dactylon</i>	<i>Hyperthelia dissoluta</i>	<i>Pennisetum purpureum</i>	<i>Vetiveria fulvivanus</i>
<i>Brachiaria ruziziensis</i>	<i>Cynodon plectostachyus</i>	<i>Panicum maximum</i> (Guinea fine)	<i>Pennisetum ruppelii</i>	<i>Vetiveria zizanioides</i>
<i>Buchloe dactyloides</i>	<i>Digitaria decumbens</i>	<i>Panicum maximum</i> (ILCA)	<i>Seteria sp.</i>	
<i>Cenchrus ciliaris</i>	<i>Digitaria swanzilandensis</i>	<i>Panicum maximum</i> (local)	<i>Seteria sphacelata</i>	
<i>Cenchrus setigerus</i>	<i>Digitaria valida</i>	<i>Panicum maximum</i> (South Africa)	<i>Sporobolus pyramidalis</i>	
Cut-use fodder herbs				
<i>Calopogonium mucunoides</i>	<i>Clitoria ternatea</i>	<i>Macroptilium atropurpureum</i> (Siratro)	<i>Mucuna pruriens</i> (Bunso)	<i>Stylosanthes guianensis</i>
<i>Centrosema pubescens</i>	<i>Desmodium distortum</i>	<i>Macroptilium lathyroides</i>	<i>Pueraria phaseoloides</i>	<i>Stylosanthes hamata</i>
<i>Centrosema pubescens</i> (ILCA)	<i>Lablab purpureus</i>	<i>Mucuna pruriens</i>	<i>Sesbania grandiflora</i>	
Fodder trees and shrubs				
<i>Baphia nitida</i>	<i>Desmanthus virgatus</i>	<i>Leucaena leucocephala</i> (Peru)	<i>Leucaena leucocephala</i> (local)	<i>Pithecelobium dulce</i>
<i>Cajanus cajan</i>	<i>Gliricidia sepium</i>	<i>Leucaena leucocephala</i> (Langerham)	<i>Moringa oleifera</i>	<i>Spondias mombin</i>
<i>Cratylia argentea</i>				
Native grassland				
<i>Acacia spp.</i>	<i>Azadirachta indica</i>	<i>Cyperus rotundata</i>	<i>Elaeis guineensis</i>	<i>Panicum maximum</i>
<i>Panicum decumbens</i>	<i>Talinum triangulare</i>			
Seeded grazing fields				
<i>Brachiaria brizantha</i>	<i>Brachiaria ruziziensis</i>	<i>Digitaria decumbens</i>		
Food crop fields				
<i>Manihot esculenta</i>	<i>Zea mays</i>	<i>Vigna unguiculata</i>	<i>Arachis hypogaea</i>	

<sup>c</sup>Names in parenthesis indicate cultivar name

Table S2. One-way analyses of variance (fixed effect = land-use type) Test of homogeneity, normality and non-parametric

Parameters	Homogeneity of variances (Levene Test)	Normality (Shapiro-Wilk test)	Kruskal-Wallis test	SEM <sup>a</sup>
Soil pH	0.2074	<0.001	<0.001	0.052
C- N ratio	0.8231	<0.001	0.0350	0.223
Available phosphorus	0.1824	<0.001	0.0002	8.227
Total nitrogen	0.1432	0.0038	0.0040	0.088
Potassium	0.3681	<0.0002	0.0297	0.517
Soil organic carbon	0.1700	0.0048	0.0021	1.133
Changes in soil organic carbon	0.1979	0.0072	0.0014	23.49

<sup>a</sup>Standard error of the mean

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Table S3. Mixed-effect modelling to analyse condensed tannins (CT)<sup>b</sup>

Condensed tannins	Homogeneity of variances (Levene Test)	Normality (Shapiro-Wilk test)	Transformation	Random effect Significance level
Extractable CT	0.05692	0.9631	logx	<0.0001
Protein-bound BCT	0.1481	0.6546	1/x	<0.0001
Fibre-bound CT	0.9501	0.6108	logx	<0.0001
Total CT	0.8814	0.203	logx	<0.0001

<sup>b</sup> Fixed effects = plant functional group, part of plant used; random effect = species

Table S4: Model selection results of the four best models in the meta-analysis, based on Akaike's Information Criterion with small-sample bias adjustment (AIC<sub>c</sub>) and AIC weights (*w<sub>i</sub>*)

Model	K <sup>a</sup>	SSE <sup>b</sup>	AIC <sub>c</sub> <sup>c</sup>	Δ <sub>i</sub> <sup>d</sup>	w <sub>i</sub> <sup>e</sup>	Adjusted R <sup>2</sup>
Soil variables only (N= 81)						
s-4 N <sup>f</sup> , P <sup>g</sup> , K <sup>h</sup> , pH, PxK <sup>j</sup> , NxpH, PxpH	8	0.542	-387.52	0.000	0.691	0.82
s-3 N, P, K, pH, PxK, NxpH, PxpH, KxpH	9	0.540	-385.28	2.234	0.226	0.82
s-2 N, P, K, pH, NxP, PxK, NxpH, PxpH, KxpH	10	0.540	-382.78	4.739	0.065	0.82
s-1 N, P, K, pH, NxP, NxK, PxK, NxpH, PxpH, KxpH	11	0.540	-380.11	7.407	0.017	0.81
s-8 N, P, K	4	0.744	-371.39	16.13	2.17x10 <sup>-4</sup>	0.77
s-6 N, P, pH, PxpH	5	0.729	-370.77	16.75	1.60x10 <sup>-4</sup>	0.77
s-5 N, P, pH, NxpH, PxpH	6	0.712	-370.29	17.23	1.26x10 <sup>-4</sup>	0.77
s-7 N, P	3	0.788	-368.96	18.56	6.46x10 <sup>-5</sup>	0.76
s-9 P, K, pH	4	1.790	-300.26	87.26	7.81x10 <sup>-20</sup>	0.44
Soil variables and plant CT (N=54)						
st-6 TCT <sup>k</sup> , N, P, K, pH, NxpH, KxpH, NxP, TCTxN, TCTxP	11	0.138	-294.12	0.000	0.588	0.92
st-5 TCT, N, P, K, pH, NxpH, KxpH, NxP, TCTxN, TCTxP, TCTxpH	12	0.133	-292.82	1.294	0.308	0.92
TCT, N, P, K, pH, NxpH, KxpH, NxP, TCTxN, TCTxP, TCTxK,						0.92
st-4 TCTxpH	13	0.133	-289.43	4.692	0.056	
st-8 TCT, N, P, NxP, TCTxN, TCTxP	7	0.193	-287.81	6.305	0.025	0.90
TCT, N, P, K, pH, NxpH, KxpH, NxP, PxK, TCTxN, TCTxP, TCTxK,						0.92
st-3 TCTxpH	14	0.131	-286.29	7.826	0.012	
st-7 TCT, N, P, K, NxP, TCTxN, TCTxP	8	0.191	-285.71	8.406	8.79x10 <sup>-3</sup>	0.90
TCT, N, P, K, pH, NxpH, KxpH, PxpH, NxP, PxK, TCTxN, TCTxP,						0.92
st-2 TCTxK, TCTxpH	15	0.131	-282.67	11.44	1.93x10 <sup>-3</sup>	
TCT, N, P, K, pH, NxpH, KxpH, PxpH, NxP, NxK, PxK, TCTxN,						0.92
st-1 TCTxP, TCTxK, TCTxpH	16	0.130	-278.71	15.41	2.65x10 <sup>-4</sup>	

a = Number of parameters in the model, including intercept; b= Sum of squares error in the model; c= Akaike's Information Criterion (AIC) (Akaike, 1985; Burnham et al., 2011) with the small-sample bias adjustment, (AIC<sub>c</sub> = n\*[ln (SSE/n)] + 2K + [(2K\*(K + 1))/(n-K-1)]), (Akaike, 1985; Burnham et al., 2011); d=Difference between best model and each model in set, AIC<sub>i</sub> - AIC<sub>min.</sub>; e=AIC weight,  $w_i = \exp(-0.5 * \Delta_i) / \sum_{i=1}^n \exp(-0.5 * \Delta_i)$  (Akaike, 1985; Burnham et al., 2011); f= Total soil nitrogen; g= Plant available phosphorus; h= exchangeable potassium, j= interaction terms; k= Total condensed tannins