Supplemental Material

Supplementary Information

Weather, Climate, and Society

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Supplementary Figures S1-S5 and Tables S1-S3

Figure S1. Time series of monthly rainfall totals (blue lines) and mean temperature (red lines) at the two research sites, Masindi (top) and Bwindi (bottom), from 1983-2019. Significant increasing trends ($\alpha = 0.05$; one tailed) in temperature and rainfall change are shown as red and blue dotted lines, respectively. There are no significant decreasing trends. Rainfall plots are mean values of CHIRPS v2 (Funk et al. 2015) and TAMSAT v3 (Maidment et al. 2017); temperature plots show data from The Berkeley Earth Land/Ocean Temperature Record (Rohde and Hausfather 2020).

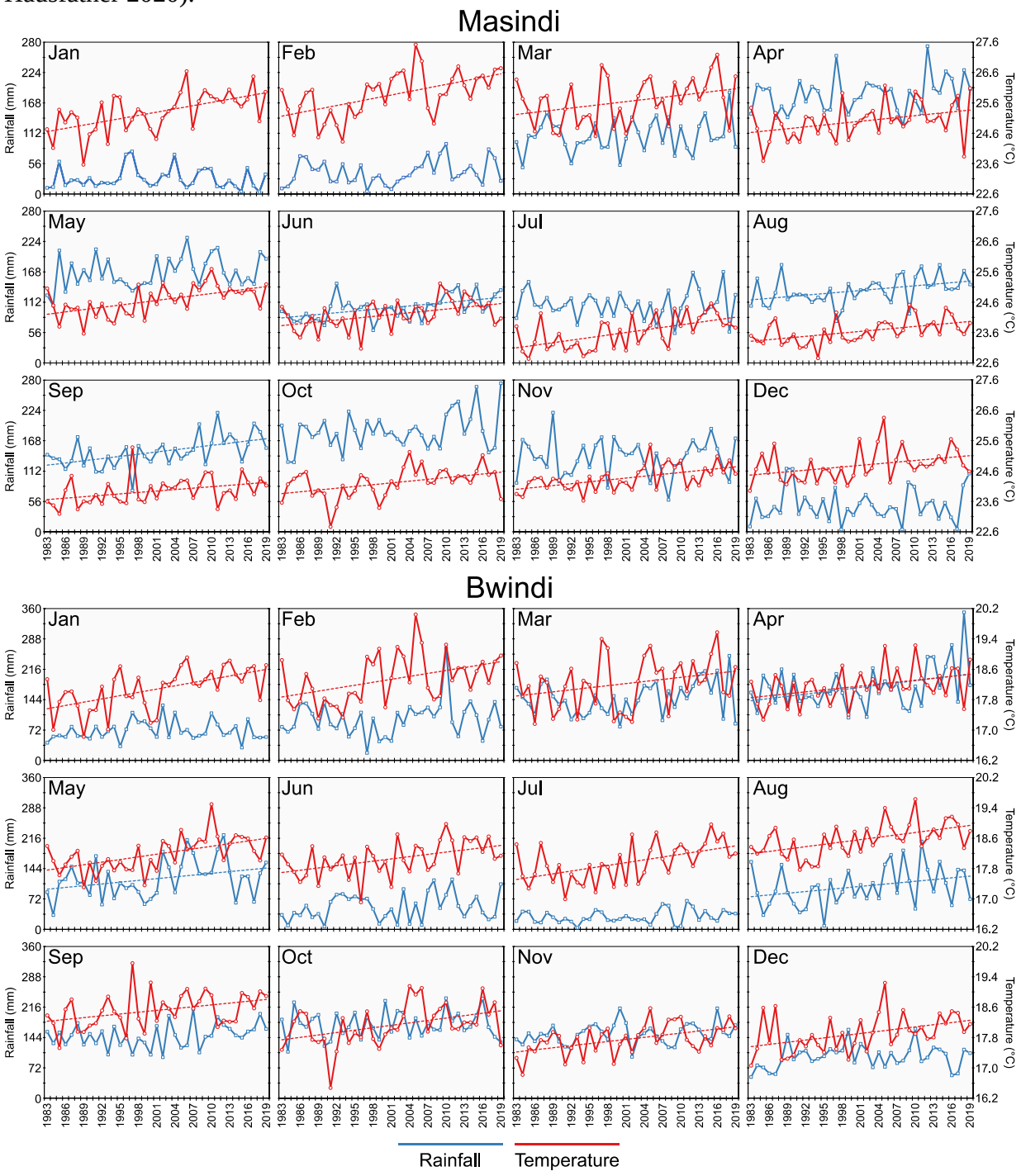

Figure S2. Percentage of farmer respondents (*n*=614) in the (a) Masindi and (b) Bwindi sites observing rainfall presence (1/0) in 36 dekadal annual periods, reported through surveys, corresponding to recent and past periods. Mean total rainfall (mm) in the (c) Masindi and (d) Bwindi sites in 36 dekadal annual periods from satellite-based rainfall products in recent (2014-2018) and past periods (1983-2013).

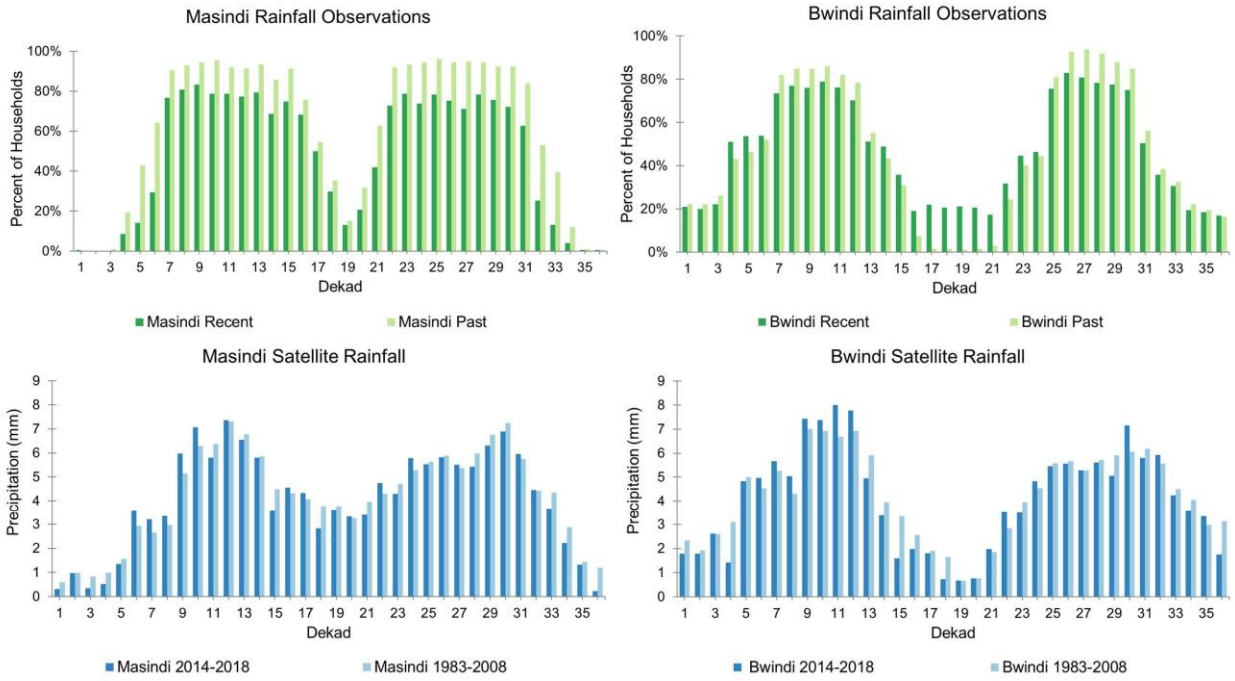

Figure S3. Violin plots showing the distributions of farmer-specific climate tracking values (recent and past) in the two sites. Inlaid boxplots show the median value (black bar) within the inner quartile range (1st to 3rd; white bar); whiskers extend up to 1.5 times beyond the inner quartile range. Model estimation and reported values use these point-biserial coefficients, calculated from farmer recall of rainfall dekads and satellite-based dekadal totals (2014-2018, 1998-2008).

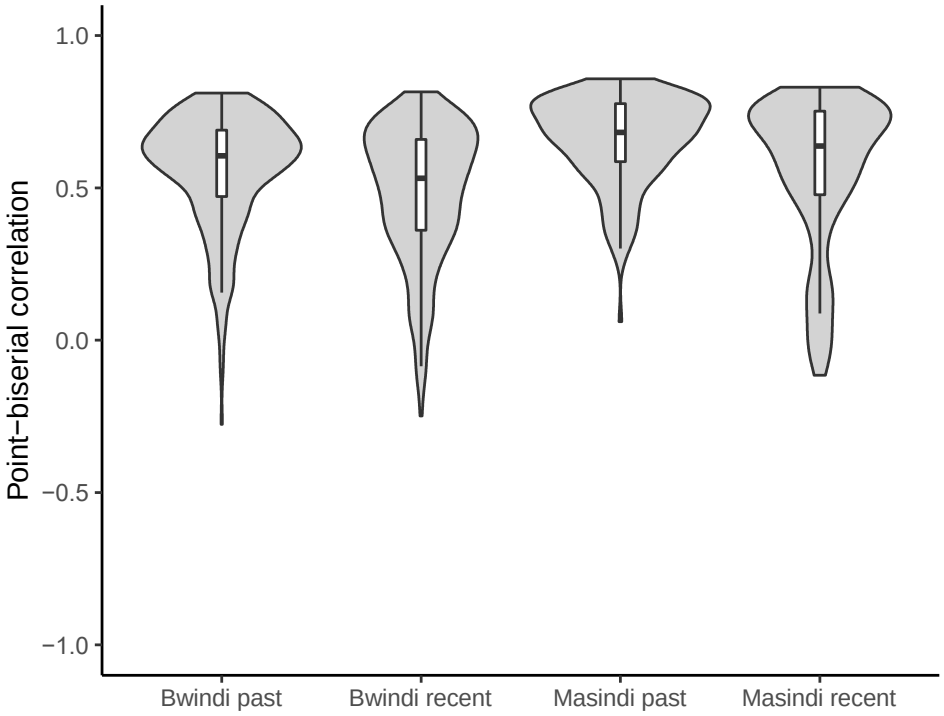

Figure S4. Sensitivity analysis of statistical model estimates using climate tracking values derived from a range of satellite-based rainfall estimates. Paired coefficient estimates (and 95% credibility intervals) for recent (top of pair) and past (bottom of pair) tracking from 30 models are plotted to assess the sensitivity of our derivation of tracking values. Models are specified and estimated identically to the main model presented in the main text, including control covariates and varying effects (not plotted).

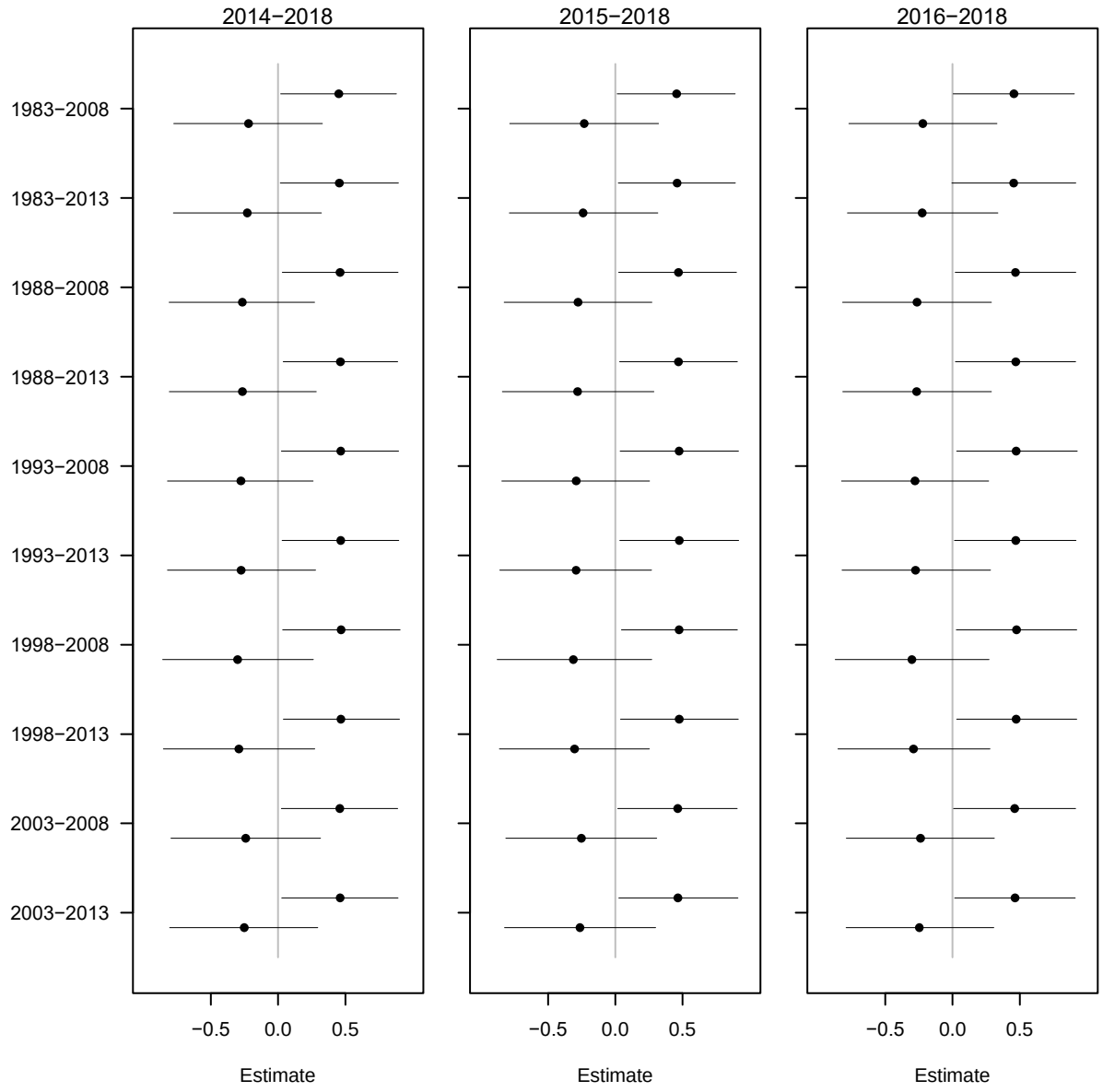

Figure S5. Different derivations of farmer-level climate tracking values based on varied periods of satellite-based rainfall estimates. Derivations are based on point-biserial correlation coefficients between farmer recall of rainfall dekads and satellite-based dekadal totals from both Masindi and Masindi sites. Satellite-based dekadal totals are varied as specified in the x-axis labels. Boxplots show the median value (horizontal black bar) within the inner quartile range (1st to 3rd; white box; whiskers extend up to 1.5 times beyond the inner quartile range. The main text results use tracking values corresponding to the 2014-2018 (recent) and 1998-2008 (past) periods based on survey questions.

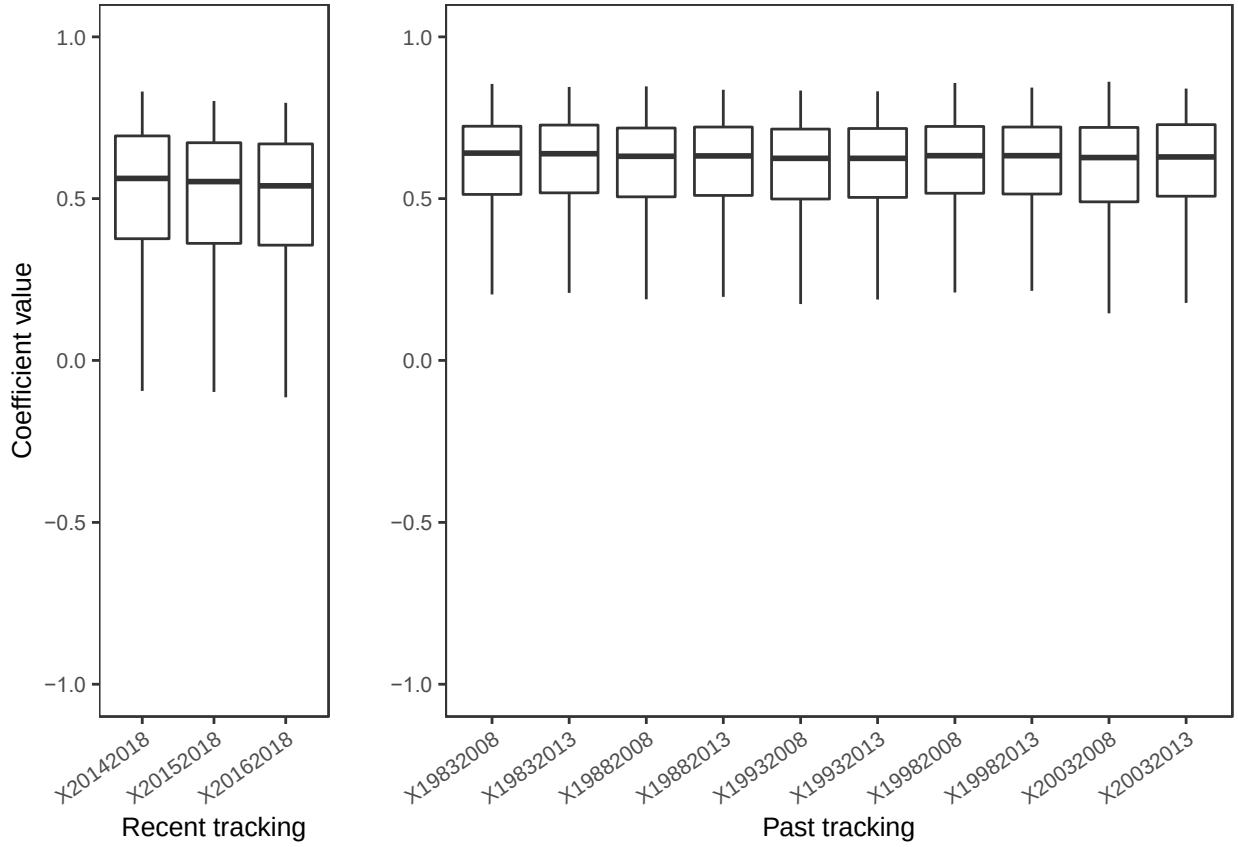

Table S1. Descriptive mean summary values of household data included in the model.

Yield[a]	Recent tracking[b]	Past tracking[b]	Age	Education[c]	Years resident[d]	Household size
3223.37	0.51	0.60	47.08	0.20	0.74	5.56

Farm size (ha)	Rent land[e]	Fallow land[e]	Use fertilizer[e]	Use mulch[e]	Own cattle[e]	Own med. livestock[e]
1.72	0.44	0.42	0.45	0.72	0.15	0.73

a. Yields are estimated as market value in 1000 Ugandan shillings (UGX) per hectare at the time of harvest for farmers stated most important crop; see Supplementary Methods.
b. Tracking values are calculated as point-biserial correlations between farmer observations of dekadal rainfall and satellite-based dekadal rainfall totals; see Supplementary Methods.
c. Proportion of the sample who completed secondary school
d. Proportion of the sample resident for 10 or more years
e. Values are proportions of the sample who implemented the practice or owned livestock in the previous year.

Table S2. Correlation matrix of household-level predictor variables included in the model. Check for multicollinearity reveals that no variables exhibit a problematic linear association.

	Recent	Past	Age	Education	Resident	HH size	Land own	Fallow	Rent	Fertilizer	Soil amend	Own cattle	Own med. stock
Recent	1												
Past	0.36	1											
Age	-0.02	0.04	1										
Education	0.01	0	-0.22	1									
Resident	-0.03	0.03	0.49	-0.17	1								
HH size	0.02	0.06	-0.02	0.01	0.08	1							
Land own	-0.04	-0.05	0.32	0.01	0.23	0.06	1						
Fallow	-0.07	-0.06	0.21	0.06	0.08	0.03	0.22	1					
Rent	0.04	-0.1	0.12	0.03	-0.02	0.03	0.14	0.22	1				
Fertilizer	-0.04	-0.11	0.09	0.05	-0.04	0.06	0.13	0.16	0.17	1			
Soil amend	0.02	0.03	0.03	0.03	-0.04	0.03	0.02	0.04	0.01	0.05	1		
Own cattle	-0.08	-0.04	0.16	0.08	0.12	0.07	0.3	0.23	0.11	0.27	-0.05	1	
Med. stock	-0.06	-0.07	0.08	0.08	0.06	0.14	0.17	0.16	0.02	0.22	0.06	0.15	1

Table S3. Farmer-level coefficient estimates from the main statistical model predicting crop yields. Mean estimates and lower and upper 95% credibility intervals (CIs) are drawn from the joint-posterior density.

Coefficient	Mean	Lower CI	Upper CI
Recent tracking	0.48	0.05	0.91
Past tracking	-0.30	-0.84	0.26
Age	-0.19	-0.52	0.15
Education	0.00	-0.24	0.24
Years resident	-0.11	-0.35	0.13
Household size	0.29	0.09	0.50
Farm size	0.33	0.19	0.47
Fallow land	0.21	0.01	0.42
Rent land	0.04	-0.19	0.26
Fertilizer use	0.32	0.08	0.55
Soil amendments	0.05	-0.32	0.41
Cattle	0.25	-0.04	0.53
Medium stock	0.21	0.00	0.43