

Supplementary Materials

Below are results from analyses to assess multicollinearity of regression model independent variables.

Table S1. Correlation matrix

	conflict with neighbors	conflict within home	1	2	3	4	5	6	7	8	9	10	11	12	13
Female head of household -															
1	0.0596	0.1430													
<i>p-value</i>	0.0055	<0.001													
Number kids -			-												
2	0.0233	0.1053	0.1262												
<i>p-value</i>	0.2780	<0.001	<0.001												
Relative socioeconomic position - 3	-0.1632	-0.3311	0.2378	0.0454											
<i>p-value</i>	<0.001	<0.001	<0.001	0.0334											
Monthly income z- score (USD) -			-												
4	-0.0144	0.0037	0.0994	0.0180	0.1906										
<i>p-value</i>	0.5024	0.8635	<0.001	0.3981	<0.001										
Age - 5	0.0500	0.0742	0.1483	0.0468	0.1402	0.0368									
<i>p-value</i>	0.0198	0.0005	<0.001	0.0283	<0.001	0.0849									
Dry season - 6	-0.1018	0.1519	0.0350	0.2304	0.1675	0.0101	0.0238								
<i>p-value</i>	<0.001	<0.001	0.1009	<0.001	<0.001	0.6355	0.2654								
Food insecurity - 7	0.212	0.3913	0.1264	0.1663	0.4867	0.1219	0.1421	0.1782							
<i>p-value</i>	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001							
Quantity: Worried about	0.2055	0.3577	0.0535	0.0812	0.3039	0.0049	0.1097	0.0262	0.4779						

not having enough water - 8															
<i>p-value</i>	<0.001	<0.001	0.0122	0.0001	<0.001	0.8181	<0.001	0.2196							<0.001
Quality: Drank water you thought was unsafe - 9	0.2399	0.4155	0.1316	0.0934	-0.274	0.0096	0.0401	0.1296	0.3914	0.3759					
<i>p-value</i>	<0.001	<0.001	<0.001	<0.001	<0.001	0.6532	0.0602	<0.001	<0.001	<0.001					
Reliability: Day been interrupted due to water - 10	0.3354	0.5105	0.1856	0.0523	0.3944	0.0044	0.0900	0.0833	0.4592	0.4200	0.4911				
<i>p-value</i>	<0.001	<0.001	<0.001	0.0143	<0.001	0.8360	<0.001	0.0001	<0.001	<0.001	<0.001				
Accessibility: Minutes return trip to collect water - 11	0.0990	0.4315	0.0639	0.1904	0.2356	0.0096	0.0410	0.4133	0.4979	0.3675	0.4029	0.4083			
<i>p-value</i>	<0.001	<0.001	0.0028	<0.001	<0.001	0.6536	0.0546	<0.001	<0.001	<0.001	<0.001	<0.001			
Cost: % hh income spent on water/month - 12	0.0677	0.0606	0.0745	0.0278	0.1881	0.1603	0.0503	0.1621	0.1019	0.1275	0.0448	0.0744	0.0452		
<i>p-value</i>	0.0016	0.0047	0.0005	0.1928	<0.001	<0.001	0.0185	<0.001	<0.001	<0.001	0.0358	0.0005	0.0341		
Mean population density of site - 13	-0.0651	-0.177	0.022	0.1669	0.0284	0.0003	0.0777	0.2256	0.2379	0.1712	0.1935	0.1609	0.3213	0.0691	
<i>p-value</i>	0.0024	<0.001	0.3022	<0.001	0.1840	0.9869	0.0003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.0012
Regional conflict 2016-	0.1088	-0.0876	0.1124	0.1024	0.1002	0.0002	0.0556	0.1861	0.0716	0.0334	0.0555	0.0178	0.3253	0.0057	0.3676

2018 within

500km - 14

p-value **<0.001** **<0.001** **<0.001** **<0.001** **<0.001** 0.9911 **0.0092** **<0.001** **0.0008** 0.1173 **0.0094** 0.4053 **<0.001** 0.7878 **<0.001**

*NOTE: Correlations $r>0.4$ shown in boxes; $p<0.05$ shown in bold font

The strongest, significant correlation detected was 0.5105, between conflict within the household and interruptions in the day due to water issues. There were modest correlations between many of the water insecurity variables. However, none of these correlations appear to be concerning in terms of multicollinearity.

Below are results from the sensitivity analyses, evaluating associations between conflict within the home or with neighbors with conflict at different scales and by type, followed by descriptive statistics for the conflict variables.

Table S2. Regression modeling results for associations with conflict within the home (Model S1) and with neighbors (Model S2) – regional conflict within 100km

	Model S1: Frequency of conflict within the home					Model S2: Frequency of conflict with neighbors				
	β	se	p-value	[95%]		β	se	p-value	[95%]	
				Conf.	Interval				Conf.	Interval
Female head of household	0.14	0.12	0.248	-0.10	0.37	-0.14	0.14	0.318	-0.42	0.14
Number kids	0.07	0.03	0.010	0.02	0.12	0.04	0.03	0.235	-0.02	0.10
Relative socioeconomic position	-0.11	0.03	<0.001	-0.17	-0.05	0.03	0.03	0.306	-0.03	0.10
Monthly income z-score (USD)	0.09	0.05	0.080	-0.01	0.20	-0.04	0.06	0.585	-0.16	0.09
Age	0.00	0.00	0.425	-0.01	0.00	0.00	0.00	0.821	-0.01	0.01
Dry season	0.43	0.43	0.313	-0.41	1.28	-0.55	0.34	0.106	-1.21	0.12
Food insecurity	0.03	0.01	0.008	0.01	0.05	0.05	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.14	0.05	0.005	0.04	0.23	0.10	0.06	0.080	-0.01	0.21
Quality: Drank water you thought was unsafe	0.18	0.05	<0.001	0.08	0.27	0.20	0.06	<0.001	0.09	0.31
Reliability: Day been interrupted due to water	0.64	0.06	<0.001	0.52	0.76	0.55	0.07	<0.001	0.42	0.68
Accessibility: Minutes return trip to collect water	0.01	0.00	0.001	0.00	0.01	0.00	0.00	0.108	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.062	0.00	0.01	0.00	0.00	0.280	-0.01	0.00
Mean population density of cluster	0.00	0.00	0.077	0.00	0.00	0.00	0.00	0.094	0.00	0.00
Regional conflict 2016-2018 within 100km of cluster	0.00	0.00	0.392	0.00	0.00	0.00	0.00	0.001	0.00	0.01

Table S3. Regression modeling results for associations with conflict within the home (Model S3) and with neighbors (Model S4) – regional conflict within 1000km

	Model S3: Frequency of conflict within the home					Model S4: Frequency of conflict with neighbors				
	β	se	p-value	[95%]		β	se	p-value	[95%]	
				Conf.	Interval				Conf.	Interval
Female head of household	0.14	0.12	0.241	-0.09	0.37	-0.14	0.14	0.338	-0.41	0.14
Number kids	0.07	0.03	0.011	0.02	0.12	0.03	0.03	0.260	-0.03	0.09
Relative socioeconomic position	-0.12	0.03	<0.001	-0.18	-0.06	0.02	0.03	0.447	-0.04	0.09
Monthly income z-score (USD)	0.09	0.05	0.097	-0.02	0.19	-0.03	0.06	0.613	-0.16	0.09
Age	0.00	0.00	0.442	-0.01	0.00	0.00	0.00	0.833	-0.01	0.01
Dry season	0.41	0.37	0.270	-0.32	1.13	-0.80	0.34	0.018	-1.47	-0.14
Food insecurity	0.03	0.01	0.010	0.01	0.05	0.05	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.14	0.05	0.004	0.05	0.24	0.11	0.06	0.050	0.00	0.22
Quality: Drank water you thought was unsafe	0.18	0.05	<0.001	0.09	0.27	0.21	0.06	<0.001	0.09	0.32
Reliability: Day been interrupted due to water	0.63	0.06	<0.001	0.51	0.75	0.55	0.07	<0.001	0.42	0.69
Accessibility: Minutes return trip to collect water	0.01	0.00	0.001	0.00	0.01	0.00	0.00	0.113	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.058	0.00	0.01	0.00	0.00	0.349	-0.01	0.00
Mean population density of cluster	0.00	0.00	0.117	0.00	0.00	0.00	0.00	0.799	0.00	0.00
Regional conflict 2016-2018 within 1000km of cluster	0.00	0.00	0.844	0.00	0.00	0.00	0.00	0.009	0.00	0.00

Table S4. Regression modeling results for associations with conflict within the home (Model S5) and with neighbors (Model S6) – battles

	Model S5: Frequency of conflict within the home					Model S6: Frequency of conflict with neighbors				
	β	se	p-value	[95%]		β	se	p-value	[95%]	
				Conf.	Interval				Conf.	Interval
Female head of household	0.13	0.12	0.262	-0.10	0.37	-0.14	0.14	0.338	-0.41	0.14
Number kids	0.07	0.03	0.010	0.02	0.12	0.04	0.03	0.241	-0.02	0.10
Relative socioeconomic position	-0.11	0.03	<0.001	-0.17	-0.05	0.03	0.03	0.391	-0.04	0.09
Monthly income z-score (USD)	0.09	0.05	0.086	-0.01	0.20	-0.04	0.06	0.577	-0.16	0.09
Age	0.00	0.00	0.428	-0.01	0.00	0.00	0.00	0.870	-0.01	0.01
Dry season	0.31	0.42	0.451	-0.50	1.13	-0.85	0.39	0.028	-1.61	-0.09
Food insecurity	0.03	0.01	0.009	0.01	0.05	0.05	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.14	0.05	0.004	0.05	0.24	0.11	0.06	0.051	0.00	0.22
Quality: Drank water you thought was unsafe	0.17	0.05	<0.001	0.08	0.27	0.21	0.06	<0.001	0.10	0.32
Reliability: Day been interrupted due to water	0.64	0.06	<0.001	0.52	0.76	0.55	0.07	<0.001	0.41	0.68
Accessibility: Minutes return trip to collect water	0.01	0.00	0.001	0.00	0.01	0.00	0.00	0.119	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.053	0.00	0.01	0.00	0.00	0.314	-0.01	0.00
Mean population density of cluster	0.00	0.00	0.097	0.00	0.00	0.00	0.00	0.884	0.00	0.00
Regional conflict 2016-2018 within 500km of cluster - battles	0.00	0.00	0.400	0.00	0.00	0.00	0.00	0.099	0.00	0.00

Table S5. Regression modeling results for associations with conflict within the home (Model S7) and with neighbors (Model S8) – riots

	Model S7: Frequency of conflict within the home					Model S8: Frequency of conflict with neighbors				
	β	se	p-value	[95%]		β	se	p-value	[95%]	
				Conf.	Interval]				Conf.	Interval]
Female head of household	0.13	0.12	0.260	-0.10	0.37	-0.154	0.14	0.278	-0.43	0.12
Number kids	0.07	0.03	0.010	0.02	0.12	0.037	0.03	0.227	-0.02	0.10
Relative socioeconomic position	-0.11	0.03	<0.001	-0.17	-0.05	0.027	0.03	0.416	-0.04	0.09
Monthly income z-score (USD)	0.09	0.05	0.083	-0.01	0.20	-0.037	0.06	0.560	-0.16	0.09
Age	0.00	0.00	0.421	-0.01	0.00	-0.001	0.00	0.795	-0.01	0.01
Dry season	0.35	0.43	0.412	-0.49	1.19	-0.890	0.30	0.003	-1.48	-0.30
Food insecurity	0.03	0.01	0.008	0.01	0.05	0.046	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.14	0.05	0.004	0.05	0.24	0.105	0.06	0.057	0.00	0.21
Quality: Drank water you thought was unsafe	0.18	0.05	<0.001	0.08	0.27	0.204	0.06	<0.001	0.09	0.32
Reliability: Day been interrupted due to water	0.64	0.06	<0.001	0.52	0.76	0.558	0.07	<0.001	0.42	0.69
Accessibility: Minutes return trip to collect water	0.01	0.00	0.001	0.00	0.01	0.003	0.00	0.065	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.055	0.00	0.01	-0.004	0.00	0.278	-0.01	0.00
Mean population density of cluster	0.00	0.00	0.139	0.00	0.00	0.000	0.00	0.308	0.00	0.00
Regional conflict 2016-2018 within 500km of cluster - riots	0.00	0.00	0.888	0.00	0.00	0.002	0.00	0.001	0.00	0.00

Table S6. Regression modeling results for associations with conflict within the home (Model S9) and with neighbors (Model S10) – protests

	Model S9: Frequency of conflict within the home					Model S10: Frequency of conflict with neighbors				
	β	se	p-value	[95% Conf.	Interval]	β	se	p-value	[95% Conf.	Interval]
Female head of household	0.13	0.12	0.264	-0.10	0.37	-0.14	0.14	0.338	-0.41	0.14
Number kids	0.07	0.03	0.009	0.02	0.12	0.04	0.03	0.214	-0.02	0.10
Relative socioeconomic position	-0.13	0.03	<0.001	-0.19	-0.07	0.02	0.03	0.455	-0.04	0.09
Monthly income z-score (USD)	0.10	0.05	0.067	-0.01	0.20	-0.04	0.06	0.583	-0.16	0.09
Age	0.00	0.00	0.403	-0.01	0.00	0.00	0.00	0.855	-0.01	0.01
Dry season	0.79	0.26	0.002	0.29	1.30	-0.92	0.46	0.043	-1.82	-0.03
Food insecurity	0.03	0.01	0.004	0.01	0.05	0.05	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.15	0.05	0.003	0.05	0.24	0.11	0.06	0.053	0.00	0.22
Quality: Drank water you thought was unsafe	0.18	0.05	<0.001	0.09	0.27	0.22	0.06	<0.001	0.11	0.33
Reliability: Day been interrupted due to water	0.64	0.06	<0.001	0.52	0.76	0.55	0.07	<0.001	0.42	0.68
Accessibility: Minutes return trip to collect water	0.01	0.00	<0.001	0.00	0.01	0.00	0.00	0.092	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.043	0.00	0.01	0.00	0.00	0.253	-0.01	0.00
Mean population density of cluster	0.00	0.00	<0.001	0.00	0.00	0.00	0.00	0.908	0.00	0.00
Regional conflict 2016-2018 within 500km of cluster - protests	0.00	0.00	<0.001	0.00	0.00	0.00	0.00	0.839	0.00	0.00

Table S7. Regression modeling results for associations with conflict within the home (Model S11) and with neighbors (Model S12) – strategic development

	Model S11: Frequency of conflict within the home					Model S12: Frequency of conflict with neighbors				
	β	se	p-value	[95% Conf.	[95% Interval]	β	se	p-value	[95% Conf.	[95% Interval]
Female head of household	0.13	0.12	0.263	-0.10	0.37	-0.14	0.14	0.335	-0.41	0.14
Number kids	0.07	0.03	0.010	0.02	0.12	0.04	0.03	0.243	-0.02	0.09
Relative socioeconomic position	-0.11	0.03	<0.001	-0.17	-0.05	0.03	0.03	0.386	-0.04	0.09
Monthly income z-score (USD)	0.09	0.05	0.085	-0.01	0.20	-0.04	0.06	0.577	-0.16	0.09
Age	0.00	0.00	0.427	-0.01	0.00	0.00	0.00	0.870	-0.01	0.01
Dry season	0.33	0.42	0.427	-0.48	1.15	-0.83	0.38	0.031	-1.58	-0.08
Food insecurity	0.03	0.01	0.009	0.01	0.05	0.05	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.14	0.05	0.004	0.05	0.24	0.11	0.06	0.051	0.00	0.22
Quality: Drank water you thought was unsafe	0.17	0.05	<0.001	0.08	0.27	0.21	0.06	<0.001	0.10	0.32
Reliability: Day been interrupted due to water	0.64	0.06	<0.001	0.52	0.76	0.55	0.07	<0.001	0.41	0.68
Accessibility: Minutes return trip to collect water	0.01	0.00	0.001	0.00	0.01	0.00	0.00	0.120	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.053	0.00	0.01	0.00	0.00	0.320	-0.01	0.00
Mean population density of cluster	0.00	0.00	0.111	0.00	0.00	0.00	0.00	0.783	0.00	0.00
Regional conflict 2016-2018 within 500km of cluster - stratdev	0.00	0.00	0.412	0.00	0.00	0.00	0.00	0.075	0.00	0.00

Table S8. Regression modeling results for associations with conflict within the home (Model S13) and with neighbors (Model S14) – remote violence

	Model S13: Frequency of conflict within the home					Model S14: Frequency of conflict with neighbors				
	β	se	p-value	[95% Conf. Interval]		β	se	p-value	[95% Conf. Interval]	
				Conf.	Interval]				Conf.	Interval]
Female head of household	0.13	0.12	0.259	-0.10	0.37	-0.14	0.14	0.336	-0.41	0.14
Number kids	0.07	0.03	0.009	0.02	0.12	0.04	0.03	0.219	-0.02	0.10
Relative socioeconomic position	-0.12	0.03	<0.001	-0.17	-0.06	0.03	0.03	0.440	-0.04	0.09
Monthly income z-score (USD)	0.09	0.05	0.076	-0.01	0.20	-0.03	0.06	0.590	-0.16	0.09
Age	0.00	0.00	0.438	-0.01	0.00	0.00	0.00	0.860	-0.01	0.01
Dry season	0.33	0.34	0.325	-0.33	1.00	-0.92	0.42	0.029	-1.74	-0.09
Food insecurity	0.03	0.01	0.007	0.01	0.05	0.05	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.14	0.05	0.003	0.05	0.24	0.11	0.06	0.053	0.00	0.22
Quality: Drank water you thought was unsafe	0.18	0.05	<0.001	0.08	0.27	0.22	0.06	<0.001	0.11	0.33
Reliability: Day been interrupted due to water	0.63	0.06	<0.001	0.51	0.75	0.55	0.07	<0.001	0.41	0.68
Accessibility: Minutes return trip to collect water	0.01	0.00	<0.001	0.00	0.01	0.00	0.00	0.093	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.043	0.00	0.01	0.00	0.00	0.281	-0.01	0.00
Mean population density of cluster	0.00	0.00	0.014	0.00	0.00	0.00	0.00	0.871	0.00	0.00
Regional conflict 2016-2018 within 500km of cluster - rv	0.01	0.01	0.018	0.00	0.03	0.01	0.01	0.415	-0.01	0.02

Table S9. Regression modeling results for associations with conflict within the home (Model S15) and with neighbors (Model S16) – violent armed conflict

	Model S15: Frequency of conflict within the home					Model S16: Frequency of conflict with neighbors				
	β	se	p-value	[95% Conf. Interval]		β	se	p-value	[95% Conf. Interval]	
				Conf.	Interval]				Conf.	Interval]
Female head of household	0.13	0.12	0.265	-0.10	0.37	-0.14	0.14	0.329	-0.42	0.14
Number kids	0.07	0.03	0.010	0.02	0.12	0.04	0.03	0.243	-0.02	0.09
Relative socioeconomic position	-0.11	0.03	<0.001	-0.17	-0.05	0.03	0.03	0.370	-0.03	0.09
Monthly income z-score (USD)	0.09	0.05	0.087	-0.01	0.19	-0.04	0.06	0.573	-0.16	0.09
Age	0.00	0.00	0.427	-0.01	0.00	0.00	0.00	0.869	-0.01	0.01
Dry season	0.28	0.42	0.510	-0.55	1.10	-0.92	0.36	0.010	-1.62	-0.22
Food insecurity	0.03	0.01	0.009	0.01	0.05	0.05	0.01	<0.001	0.02	0.07
Quantity: Worried about not having enough water	0.14	0.05	0.004	0.05	0.24	0.11	0.06	0.051	0.00	0.22
Quality: Drank water you thought was unsafe	0.18	0.05	<0.001	0.08	0.27	0.21	0.06	<0.001	0.10	0.32
Reliability: Day been interrupted due to water	0.64	0.06	<0.001	0.52	0.76	0.55	0.07	<0.001	0.41	0.68
Accessibility: Minutes return trip to collect water	0.01	0.00	0.001	0.00	0.01	0.00	0.00	0.115	0.00	0.01
Cost: % hh income spent on water/month	0.01	0.00	0.054	0.00	0.01	0.00	0.00	0.330	-0.01	0.00
Mean population density of cluster	0.00	0.00	0.081	0.00	0.00	0.00	0.00	0.879	0.00	0.00
Regional conflict 2016-2018 within 500km of cluster - vac	0.00	0.00	0.382	0.00	0.00	0.00	0.00	0.030	0.00	0.00

Table S10. Descriptive statistics for the conflict variables used in the above models.

	minimum	mean	sd	max
Regional conflict within 500km of cluster	341	1674	1526	5266
Regional conflict within 100km of cluster	0	137	151	434
Regional conflict within 1000km of cluster	994	6567	4117	12754
Battles within 500km of cluster	23	354	478	1479
Riots within 500km of cluster	17	314	233	776
Protests within 500km of cluster	45	409	330	1025
Strategic development within 500km of cluster	26	117	140	451
Remote violence within 500km of cluster	0	24	27	77
Violence against civilians within 500km of cluster	89	457	573	1951