The effect of early life rainfall fluctuations on ECD - Appendix

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IDELA domains

Appendix Table 1 shows the skills tested within each IDELA domain.

Table 1: The IDELA domains

Domain	Feature	
Gross and fine motor skills	Hopping on one foot	Drawing a human figure
	Copying a shape	Folding a piece of paper
Emergent literacy and language	Print awareness	Expressive vocabulary
	Letter identification	Emergent writing
	Phonemic awareness	Listening
Emergent numeracy	Measurement and comparison	Classification and sorting
	Number identification	Shape identification
	One to one correspondence	Simple arithmetic
	Simple problem solving	
Social - Emotional development	Peer relationships	Emotional awareness and regulation
	Empathy	Self-awareness
	Conflict resolutions	

Balance and other considerations

Appendix Table 2 presents a reasonable balance between the characteristics of households that never faced a rainfall shock and households that did using a 10% threshold to construct a "rainfall shock" indicator. The exception is that households that are never shocked have younger children whose cognitive and non-cognitive development are evaluated.

Table 2: Balance table using an indicator for rainfall shocks

	(1) Never shocked	(2) Atleast one shock	(3) Difference
Sex	0.502	0.507	0.005
	(0.501)	(0.500)	(0.026)
Age	3.814	3.936	0.122***
	(0.764)	(0.792)	(0.040)
Number of siblings	2.372	2.437	0.064
	(1.716)	(1.803)	(0.091)
hh.size	6.130	6.284	0.155
	(2.864)	(2.943)	(0.153)
Owns land	0.697	0.669	-0.028
	(0.460)	(0.471)	(0.024)
Owns business	0.415	0.438	0.023
	(0.493)	(0.496)	(0.026)
Owns livestock	0.500	0.457	-0.043*
	(0.501)	(0.498)	(0.026)
Observations	446	1,890	2,336

Figure 1 shows the spatial distribution of rainfall shocks within a single district to illustrate the spatial variation of the rainfall shock variables used in the model.

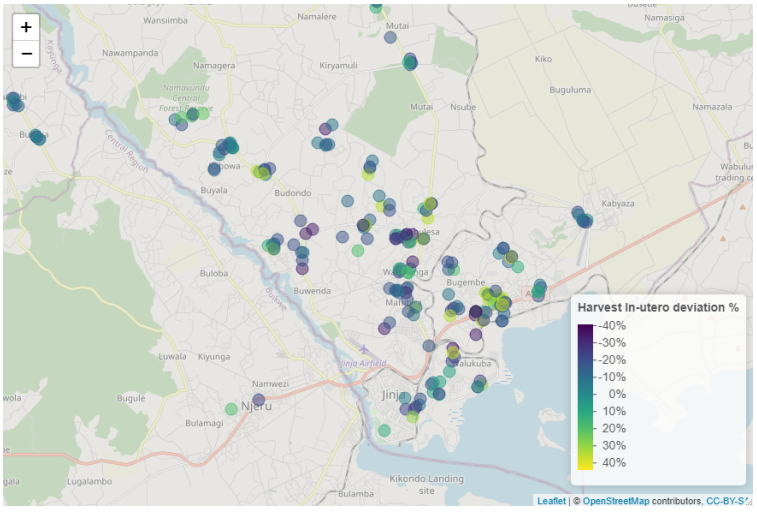

Figure 1: Spatial rainfall variation in-utero - households in Jinja district

Figure 2 shows the variation in harvest and plant season rainfall shocks faced by households in each district during the *in-utero* year. Districts appear to have different average levels of rainfall and there is variation in the rainfall shock faced by households within a district as well.

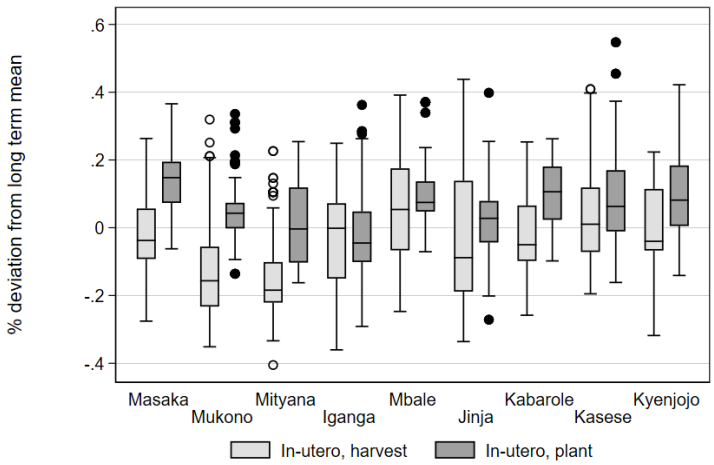

Figure 2: Seasonal rainfall variation in-utero across districts

P-value comparisons for Table 2

Appendix table 3 below shows p-values using different procedures. Column (1) shows the p-values using the Romano-Wolf step down procedure with 1000 replications and 6 hypotheses (testing the family wise error rate for the six seasonal rainfall shock variables). Column (2) contains p-values using the Romano-Wolf procedure, testing the family wise error rate for both the seasonal and the yearly rainfall shock variables. These p-values are used in Table 2 in the main text, and are used to interpret the results. Column (3) contains p-values adjusted using the Bonferroni correction considering 6 hypotheses in the seasonal estimates (3 in the yearly model, not reported here). Column (4) shows the p-values using 9 hypotheses and the Bonferroni correction.

Appendix Table 3: Seasonal regressions - p-value comparison

	Romano-Wolf (6)	Romano-Wolf (9)	Bonferroni (6)	Bonferroni (9)
	(1)	(2)	(3)	(4)
With controls				
Harvest In-utero	0.001	0.001	0.000	0.000
Harvest Year 1	0.001	0.002	0.001	0.002
Harvest Year 2	0.126	0.273	0.761	1
Plant In-utero	0.49	0.532	1	1
Plant Year 1	0.865	0.826	1	1
Plant Year 2	0.141	0.273	0.707	1
Without controls				
Harvest In-utero	0.003	0.001	0.002	0.002
Harvest Year 1	0.001	0.001	0.002	0.002
Harvest Year 2	0.090	0.140	0.564	0.846
Plant In-utero	0.661	0.768	1	1
Plant Year 1	0.873	0.853	1	1
Plant Year 2	0.154	0.166	0.781	1

Each column contains adjusted P-values using the seasonal rainfall variables (6) or both yearly and seasonal rainfall variables (9). (1) - Romano-Wolf procedure with 6 hypotheses , (2) - Romano-Wolf procedure with 9 hypotheses, (3) - Bonferroni correction with 6 hypotheses, (4) - Bonferroni correction with 9 hypotheses. Results in the main text use p-values adjusted using the Romano-Wolf hypotheses considering both the seasonal and the yearly rainfall variables.

IDELA components

Table 4 below presents estimates of seasonal rainfall shocks on the individual IDELA score components.

Appendix Table 4: Seasonal Rainfall shocks and ECD

	(1) IDELA Total	(2) Motor	(3) Literacy	(4) Numeracy	(5) Socio-emotional
Harvest In-utero (HU)	0.828***	0.854***	0.915***	0.579***	0.324*
	(0.189)	(0.194)	(0.199)	(0.177)	(0.184)
Harvest Year 1 (HY1)	0.955***	0.920***	1.139***	0.569**	0.454**
	(0.248)	(0.235)	(0.250)	(0.229)	(0.210)
Harvest Year 2 (HY2)	0.347	0.167	0.438	0.327	0.288
	(0.225)	(0.239)	(0.230)	(0.195)	(0.190)
Plant In-utero (PU)	-0.225	-0.082	-0.202	-0.251	-0.280
	(0.285)	(0.319)	(0.226)	(0.283)	(0.269)
Plant Year 1 (PY1)	-0.050	-0.316	-0.094	0.154	0.099
	(0.270)	(0.255)	(0.260)	(0.275)	(0.248)
Plant Year 2 (PY2)	0.341	0.229	0.392	0.272	0.215
	(0.216)	(0.221)	(0.204)	(0.220)	(0.232)
Constant	0.148	0.032	0.337*	0.048	0.190
	(0.191)	(0.220)	(0.160)	(0.169)	(0.199)
Observations	2,007	2,007	2,007	2,007	2,007
R-squared	0.155	0.101	0.207	0.113	0.121
p-value (test: HU = HP)	0.004	0.012	0.001	0.017	0.063
p-value (test: HY1 = PY1)	0.006	0.001	0.001	0.208	0.303
p-value (test: HY2 = PY2)	0.986	0.865	0.894	0.874	0.837

Column (1) is the total IDELA score, columns (2)-(5) are the IDELA component scores. Harvest season is Jun-Aug and Dec-Feb. The rainfall variables are percentage deviations from the long-term means for a season in a particular year. Asterisks denote significance: *** $p \leq .01$, ** $p \leq .05$, * $p \leq .1$. SE's are clustered at the sub-district level and p-values are corrected for 6 multiple hypotheses using the Romano-Wolf step-down procedure. The p-values listed at the bottom indicate whether harvest and plant season effects differ.