Supplementary Material

Supplementary Table S1: 15 rainfall indicators by stratum in the Nouna HDSS area from 1981 to 2019

Indicator			Cissé			Kodougou			Nouna			Sono			Toni			Diff. in means
ID (unit)	Indicator name	Definitions	Mean ± SD	Min-Max	Trend[a]	Mean ± SD	Min-Max	Trend[a]	Mean ± SD	Min-Max	Trend[a]	Mean ± SD	Min-Max	Trend[a]	Mean ± SD	Min-Max	Trend[a]	p-value
PRCPTOT (mm)	Annual total precipitation	Annual total PRCP in wet days (RR>=1mm)	724 ± 166	355 - 1087	↑*	778 ± 153	430 - 1113	↑**	730 ± 127	540 - 1019	↑*	730 ± 135	486 - 1062	↑*	744 ± 139	504 - 1115	↑**	0.477
R95p (days)	Very wet days	Annual number of days with RR>95th percentile	5 ± 1	0 - 6	↑*	4 ± 2	0 - 6	↗	5 ± 1	0 - 6	↑	4 ± 2	0 - 6	↑	4 ± 2	0 - 6	↑	0.1091
CDD (days)	Consecutive dry days	Max. no. of consecutive days with RR<1mm	171 ± 34	64 - 222	↑*	164 ± 37	81 - 238	↗	161 ± 33	97 - 238	↑*	164 ± 31	80 - 236	↗	161 ± 34	63 - 211	↗	0.715
R99p (days)	Extremely wet days	Annual number of days with RR>99th percentile	2 ± 2	0 - 6	↑	1 ± 2	0 - 5	→	1 ± 2	0 - 5	↗	4 ± 2	0 - 6	↑	2 ± 2	0 - 5	↗	**0.000****
R20Aug (days)	Days with very heavy rains in Aug	Count of days when PRCP>=20mm	5 ± 2	0 - 9	↗*	5 ± 2	0 - 9	↗*	4 ± 2	1 - 8	↗**	5 ± 2	0 - 9	↗	5 ± 2	2 - 8	↗*	0.787
PRCPAUG (mm)	Total precipitation in Aug	Cumulative rainfall in August (RR>=1mm)	243 ± 106	57 - 561	↗*	227 ± 68	150 - 480	↗**	224 ± 76	87 - 379	↗**	231 ± 82	78 - 378	↗	230 ± 75	124 - 397	↗**	0.869
PRCPJUL (mm)	Total precipitation in July	Cumulative rainfall in July (RR>=1mm)	181 ± 66	63 - 300	↗*	196 ± 63	85 - 359	→	183 ± 51	64 - 298	→	182 ± 59	70 - 367	→	193 ± 67	32 - 316	↗**	0.737
R20Jul (days)	Days with very heavy rains in July	Count of days when PRCP>=20mm	4 ± 2	1 - 8	↗	4 ± 2	1 - 8	→	4 ± 2	1 - 7	→	3 ± 2	1 - 9	→	4 ± 2	0 - 8	↗*	0.793
R10 (days)	Days with heavy precipitation	Annual count of days when PRCP>=10mm	25 ± 5	15 - 37	↗*	27 ± 5	18 - 39	↗**	25 ± 4	17 - 33	↗	25 ± 4	19 - 32	→**	25 ± 4	18 - 38	→*	0.360
SDII (mm/day)	Simple daily intensity index	Annual total precipitation by no. of wet days (PRCP>=1mm)	15 ± 3	9 - 22	↗**	15 ± 2	12 - 20	→	15 ± 2	11 - 20	→	15 ± 2	9 - 20	→	15 ± 2	12 - 19	→*	0.717
R20 (days)	Days with very heavy precipitation	Annual count of days when PRCP>=20mm	13 ± 4	3 - 21	↗	14 ± 3	6 - 21	→*	13 ± 3	7 - 20	→	13 ± 4	4 - 23	→	13 ± 3	8 - 19	→*	0.437
R25 (days)	Days with very heavy precipitation	Annual count of days when PRCP>=25mm	9 ± 4	1 - 17	↗*	10 ± 3	3 - 17	→	9 ± 3	3 - 15	→	9 ± 3	1 - 16	→	10 ± 3	5 - 18	→**	0.325
CWD (days)	Consecutive wet days	Max. no. of consecutive days with RR>=1mm	4 ± 1	2 - 9	→	4 ± 2	3 - 8	→	3 ± 1	2 - 6	→	4 ± 1	3 - 6	→	4 ± 1	2 - 8	→	**0.015***
Lws (days)	Duration wet season	Length of the wet season	132 ± 23	88 - 177	→	142 ± 21	94 - 179	→	136 ± 23	77 - 179	→	138 ± 24	85 - 182	→	135 ± 23	77 - 177	→	0.359
CDDws (days)	Consecutive dry days in wet season (mini-drought)	Max. no. of consecutive dry days (RR<1 mm) during wet season	10 ± 3	3 - 17	→	11 ± 2	7 - 15	→	9 ± 3	4 - 15	↘	11 ± 3	5 - 17	→	10 ± 3	5 - 17	↘*	0.182

[a] Slope = steep increase (↑), when > 1.0; light increase (↗), when < 1.00 and > 0.10; no change (→), when > -0.10 and < 0.10; light decrease (↘), when < -0.10; * p-value < 0.05, ** p-value < 0.01

Supplementary table S2: Means (SDs) and z-scores of the rainfall indicators

ID (unit)	Indicator name	Mean (SD)	Z-score
PRCPTOT (mm)	Annual total precipitation	852 (150)	0.79
SDII (mm/day)	Simple daily intensity index	17 (2)	0.66
R10 (days)	Days with heavy precipitation	28 (5)	0.70
R20 (days)	Days with very heavy precipitation	15 (3)	0.48
R25 (days)	Days with very heavy precipitation	12 (3)	0.68
CDD (days)	Consecutive dry days	162 (41)	-0.02
CWD (days)	Consecutive wet days	4 (1)	0.16
R95p (mm)	Very wet days	5 (1)	0.43
R99p (mm)	Extremely wet days	3 (2)	0.52
Lws (days)	Duration wet season	128 (14)	-0.33
CDDws (days)	Consecutive dry days in wet season (mini-drought)	10 (3)	-0.14
R20Jul (days)	Days with "big rains" in July	4 (1)	0.31
R20Aug (days)	Days with "big rains" in August	6 (2)	0.61
PRCPJUL (mm)	Total precipitation in July	227 (49)	0.59
PRCPAUG (mm)	Total precipitation in August	300 (82)	0.90

Supplementary table S3: Associations of the three DPSs with HAZ of 1,439 children and WHZ of 1,434 children aged 7-60 months

	Tertile 1	Tertile 2		Tertile 3		Per 1 score-point increase		
		ß-coef.	95% CI	ß-coef.	95% CI	ß-coef.	95% CI	p-value trend
Height-for-Age zscore (HAZ)								
DPS1: Market-based diet								
Unadjusted model	Ref.	-0.02	-0.20, 0.15	0.07	-0.10, 0.24	0.01	0.00, 0.02	0.222
Adj. model 1a	Ref.	0.07	-0.11, 0.23	0.19	0.02, 0.36	0.02	0.00, 0.03	**0.010***
Adj. model 2b	Ref.	0.03	-0.13, 0.20	0.19	0.02, 0.35	0.02	0.00, 0.03	**0.012***
DPS2: Legume-based diet								
Unadjusted model	Ref.	-0.02	-0.19, 0.16	-0.13	-0.29, 0.03	-0.01	-0.02, 0.00	0.115
Adj. model 1a	Ref.	0.12	-0.05, 0.30	0.06	-0.10, 0.23	0.00	-0.01, 0.01	0.383
Adj. model 2b	Ref.	0.19	0.01, 0.37	0.17	0.00, 0.34	0.01	0.00, 0.02	**0.045***
DPS3: Vegetable-based diet								
Unadjusted model	Ref.	-0.03	-0.20, 0.14	0.04	-0.14, 0.21	0.00	-0.01, 0.01	0.991
Adj. model 1a	Ref.	0.03	-0.14, 0.20	0.09	-0.08, 0.26	0.01	-0.01, 0.02	0.353
Adj. model 2b	Ref.	-0.07	-0.23, 0.10	0.00	-0.18, 0.17	0.00	-0.01, 0.01	0.818
Weight-for-Height zscore (WHZ)								
DPS1: Market-based diet								
Unadjusted model	Ref.	0.03	-0.10, 0.16	0.00	-0.13, 0.13	0.00	-0.01, 0.01	0.444
Adj. model 1a	Ref.	-0.02	-0.15, 0.11	-0.06	-0.19, 0.07	0.00	-0.01, 0.01	0.995
Adj. model 2b	Ref.	-0.04	-0.17, 0.09	-0.09	-0.23, 0.04	0.00	-0.01, 0.01	0.573
DPS2: Legume-based diet								
Unadjusted model	Ref.	0.06	-0.07, 0.19	0.05	-0.08, 0.18	0.01	0.00, 0.01	0.084
Adj. model 1a	Ref.	-0.04	-0.17, 0.09	-0.07	-0.20, 0.07	0.00	-0.01, 0.01	0.754
Adj. model 2b	Ref.	-0.04	-0.18, 0.10	-0.04	-0.19, 0.10	0.00	-0.01, 0.01	0.936
DPS3: Vegetable-based diet								
Unadjusted model	Ref.	0.06	-0.07, 0.19	0.08	-0.05, 0.22	0.01	0.00, 0.02	**0.047***
Adj. model 1a	Ref.	-0.01	-0.14, 0.12	0.05	-0.09, 0.18	0.01	0.00, 0.02	0.166
Adj. model 2b	Ref.	-0.04	-0.17, 0.09	0.03	-0.11, 0.16	0.00	-0.01, 0.01	0.435

a Adjusted for child's age and sex, and stratum; b Adjusted for all variables included in adj. model 1 and mother's and household head's education and ethnicity, household wealth,

siblings aged <5 years, child's fever and diarrhea the previous two weeks, and breastfeeding status, and year of data collection; * p-value < 0.05

Supplementary table S4: RRR-derived explained variation and rotated factor loadings of

rainfall indicators with the three DPSs

Extracted factors			Explained variation (%)	Factor loadings	Factor weights
Predictor variables					
CDDws	Mini-droughts	Max. number of consecutive dry days (RR<1 mm) during wet season	49.06	**0.41**	0.80
PRCPJUL	Dry spell July	Monthly total PRCP in wet days (RR>=1mm)	29.96	**0.32**	0.81
R99p	Extremely wet days	Annual total PRCP when RR>99th percentile	30.42	**0.32**	-0.27
R20Jul	Number of "big rains" in July	Count of days when PRCP>=20mm	4.57	0.12	-0.49
Lws	Duration wet season	Length of the wet season	2.59	0.09	-0.34
R95p	Very wet days	Annual total PRCP when RR>95th percentile	0.00	0.00	-0.27
SDII	Simple daily intensity index	Annual total precipitation by number of wet days (PRCP>=10mm)	7.89	-0.16	-0.41
R20	Number of very heavy precipitation days	Annual count of days when PRCP>=20mm	11.64	-0.20	0.18
R25	Number of very heavy precipitation days	Annual count of days when PRCP>=25mm	11.23	-0.19	0.84
CWD	Consecutive wet days	Maximum number of consecutive days with RR>=1mm	15.24	-0.23	0.07
PRCPTOT	Annual total wet-day precipitation	Annual total PRCP in wet days (RR>=1mm)	15.66	-0.23	-0.41
CDD	Consecutive dry days	Maximum number of consecutive days with RR<1mm	19.77	**-0.26**	-0.31
R20Aug	Number of "big rains" in August	Count of days when PRCP>=20mm	29.48	**-0.32**	0.14
R10	Number of heavy precipitation days	Annual count of days when PRCP>=10mm	32.63	**-0.33**	0.11
PRCPAUG	Dry spell August	Monthly total PRCP in wet days (RR>=1mm)	36.48	**-0.35**	0.00
Explained variance (%)			**19.77**		
Response variables					
DP 1	Market-based diet		10.11		0.49
DP 2	Legume-based diet		7.71		0.41
DP 3	Vegetable-based diet		24.51		0.77
Explained variance (%)			**14.11**		

* Precipitation indicators with factor loadings of ≥ |0.20| indicate relevant contributions to the precipitation

pattern score

Supplementary table S5: Pearson correlation coefficients (N=1,364) for precipitation indicators (predictor variables), the RRR-derived precipitation pattern score (PVS), and dietary pattern scores (response variables)

Predictor variables		PVS		Market-based diet (DP 1)		Legume-based diet (DP 2)		Vegetable-based diet (DP 3)	
		Unadj. model	Adj. model[a]	Unadj. model	Adj. model[a]	Unadj. model	Adj. model[a]	Unadj. model	Adj. model[a]
CDDws (days)	Consecutive dry days in wet season	0.70***	0.71***	0.20***	0.21***	0.12***	0.14***	0.40***	0.41***
R10 (days)	Days with heavy precipitation	-0.57***	-0.59***	-0.10***	-0.12***	-0.07*	-0.10***	-0.39***	-0.40***
CDD (days)	Consecutive dry days	-0.44***	-0.58***	-0.11***	-0.19***	-0.12**	-0.16***	-0.26***	-0.26***
PRCPAUG (mm)	Cumulative rainfall in August	-0.60***	-0.58***	-0.21***	-0.17***	-0.12***	-0.12***	-0.31***	-0.34***
R99p (mm)	Extremely wet days	0.55***	0.55***	0.19***	0.19***	0	0.01	0.35***	0.35***
R20Aug (days)	Days with "big rains" in August	-0.54***	-0.53***	-0.18***	-0.17***	-0.04	-0.05*	-0.33***	-0.34***
CDD (days)	Consecutive dry days	-0.40***	-0.52***	0.01	-0.07**	-0.07*	-0.13***	-0.31***	-0.34***
PRCPJUL (mm)	Total wet-day precipitation in July	0.55***	0.52***	0.18***	0.13***	0.06*	0.05	0.32***	0.35***
CWD (days)	Consecutive wet days	-0.39***	-0.40***	-0.06*	-0.07**	-0.05	-0.06*	-0.27***	-0.27***
PRCPTOT (mm)	Annual total wet-day precipitation	-0.40***	-0.37***	-0.09***	-0.07*	-0.11***	-0.12***	-0.22***	-0.23***
R20 (days)	Days with very heavy precipitation	-0.34***	-0.36***	-0.02	-0.05	-0.05	-0.09**	-0.25***	-0.26***
R25 (days)	Days with very heavy precipitation	-0.34***	-0.33***	-0.06*	-0.05*	-0.11***	-0.13***	-0.18***	-0.19***
SDII (mm/day)	Simple daily intensity index	-0.28***	-0.32***	-0.07**	-0.10***	-0.19***	-0.22***	-0.09**	-0.09**
R20Jul (days)	Days with "big rains" in July	0.21***	0.18***	0.11***	0.08**	0.06*	0.04	0.08**	0.08**
Lws (days)	Duration wet season	0.16***	0.16***	0.08**	0.08**	0.01	0.01	0.08**	0.08**
R95p (mm)	Very wet days	0	0.09***	-0.07**	0.02	-0.05	0.01	0.07**	0.07**
Total				**0.32***	**0.29***	**0.28***	**0.28***	**0.50***	**0.51***

[a] Adjusted for child's age and sex, and stratum; Note: Correlations are considered weak 0 to 0.30, moderate 0.31 to 0.50, and strong 0.51 to 1.00

* p-value < 0.05; ** p-value < 0.01; *** p-value < 0.001