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Supplementary Materials to

Climate Shocks, Vulnerability, Resilience and Livelihoods in Rural Zambia

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This report contains additional descriptive and econometric outputs for the paper 'climate shocks, vulnerability, resilience and livelihoods in rural Zambia. To some extent, some narration is given where this is not provided in the main paper.

Do smallholder farmers' perceptions of changes in weather patterns align with changes observed in weather data?

The 2019 RALS asked retrospective questions on whether there have been any changes observed in rainfall and temperature patterns between the 2015/2016 and 2017/2018 agricultural seasons. At national level, about 23% of smallholder farmers felt that rainfall had increased between the two seasons, whereas 65% reported a decrease in precipitation (Table S1). Overall, Figure S1 shows that a larger proportion of rural farmers perceived a decline in rainfall at the national level. The perceived decline in rainfall is more pronounced in Southern, Western, North-Western, Lusaka, Central and Copperbelt Provinces (Table S1 and Figure S1).

Between the 2015/2016 and 2017/2018 seasons, 53% of smallholder farmers perceived temperature to have increased while only 19% reported temperature to have decreased (Table S1 and Figure S1). With regards to gender, 52% of female-headed households indicated that temperature had increased, whereas 20% suggested a drop in temperature. Furthermore, the majority of farmers in Lusaka Province (43.1%) reported a decline in temperature (Figure S2). In sum, a larger proportion of smallholder farmers in Zambia perceive reductions in seasonal rainfall and increased temperatures between the 2015/2016

and 2017/2018 agricultural seasons. These findings are in line with Mulenga et al. (2017) who found that smallholder farmers in Zambia perceived a short and less predictable rainy season and rising average temperature.

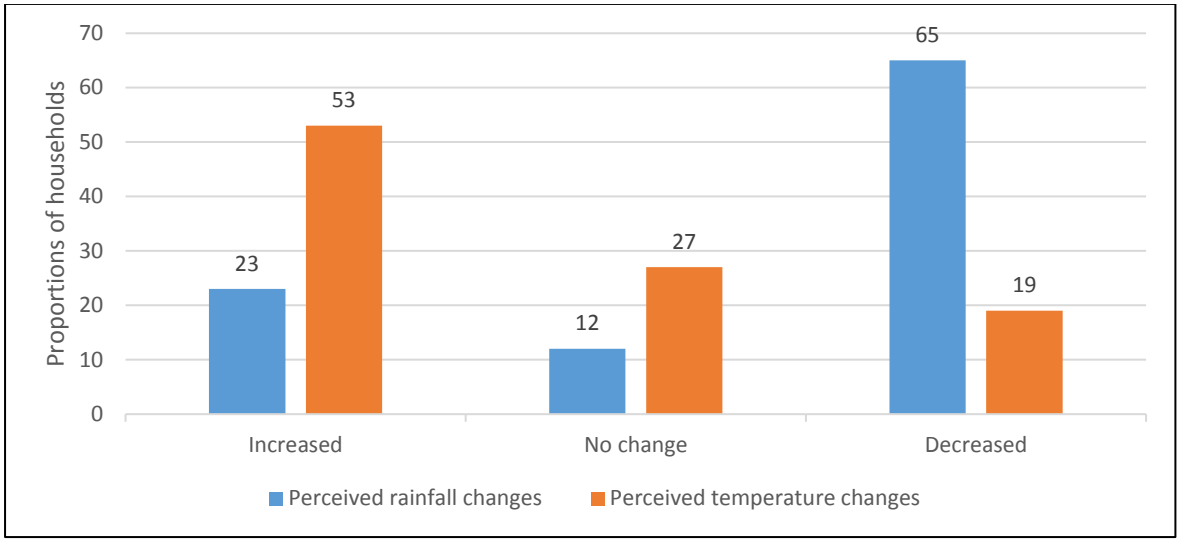

Figure S1: Proportions of smallholder who perceived changes in rainfall and temperature at national level between 2015/16 and 2018/19

Source: RALS (2019)

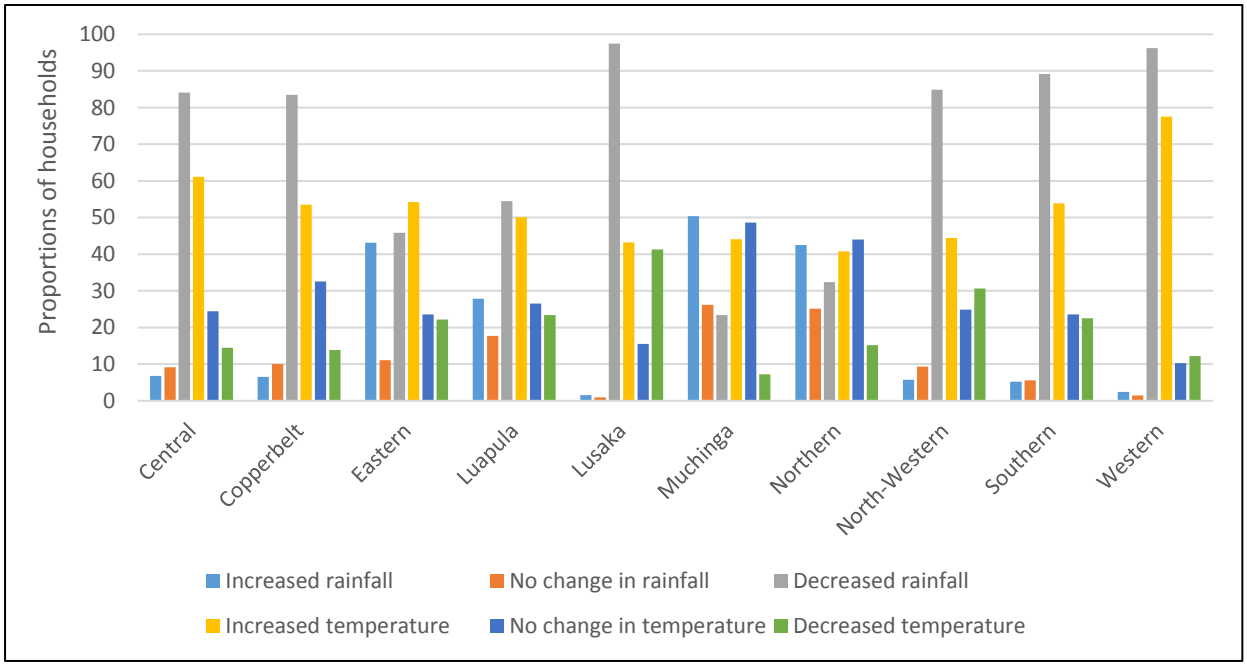

Figure S2: Proportions of smallholder who perceived changes in rainfall and temperature at provincial level between 2015/16 and 2018/19

Source: RALS (2019)

Figure S3 reports provincial-level mean differences in rainfall between the 2015/2016 and the 2018/2019 seasons computed from the CHIRPS data. To a large extent, results in Figure S3 are in line with farmer's perceptions that rainfall has reduced at national level and more so in Southern, Western and North-Western Provinces between the 2015/2016 and 2018/2019 agricultural seasons. However, the correlations between the exogenous climate risk measures and the self-reported exposure variables are very low at less than 10%, as are the correlations between exogenous climate shocks and the outcomes variables. This calls for caution in the use of exogenous measures of climate shocks.

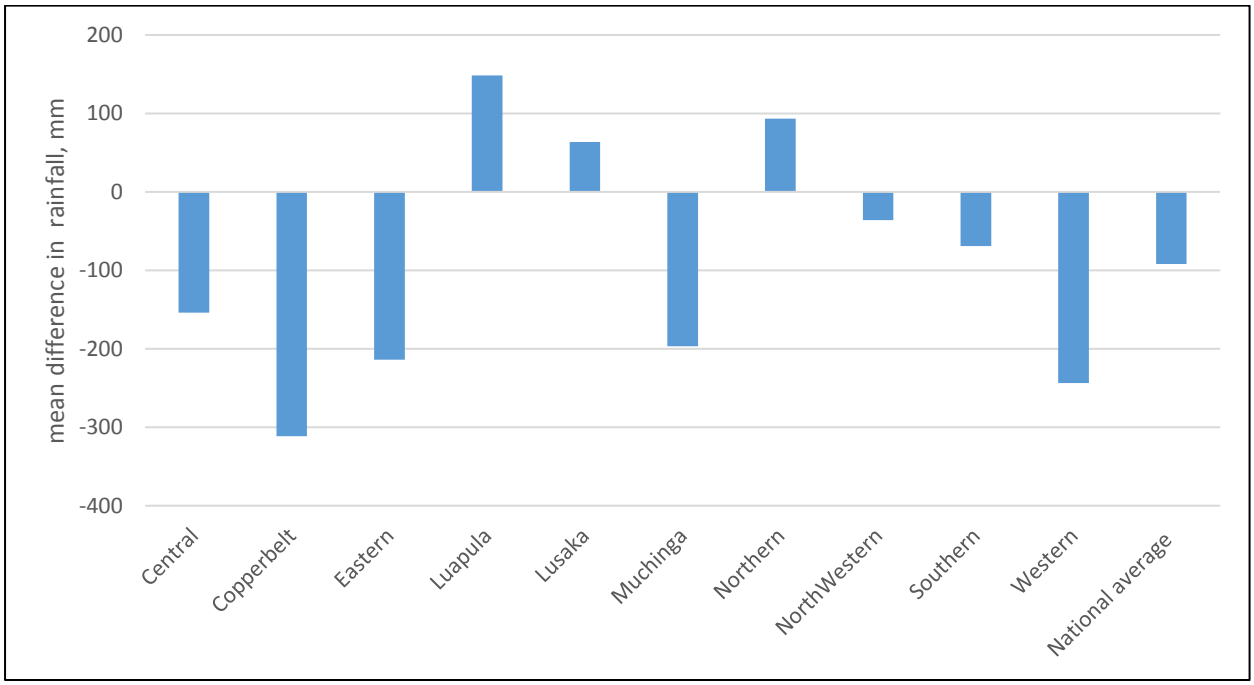

Figure S3: Provincial level mean differences in rainfall amount between the 2015/2016 and 2018/2019 agricultural seasons

Source: CHIRPS data

A declining trend in rainfall at national level is confirmed by looking at the average standard precipitation indices between 2019 and 1982 displayed in Figures S4.[1]

[1] Recall that a negative SPI suggests rainfall deficits in time *t* relative to the long term average

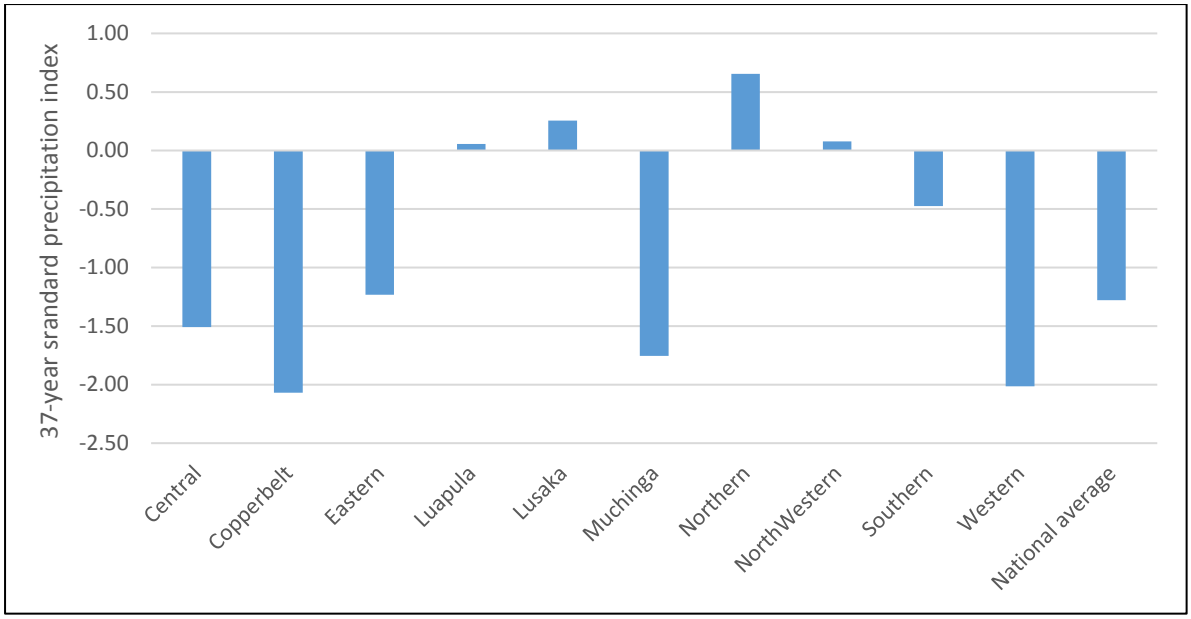

Figure S4: Provincial level average standard precipitation indices between 1982 and 2019.
Source: CHIRPS data

Main copings strategies used by rural households in Zambia

While these coping strategies are not specific to climate risks, they can contribute to building resilience among households. The five most commonly used coping mechanisms at the national level are spending household savings used by 22.2% of households, followed by purchasing food on credit (20.0%), borrowing money to buy food (18.2%), reducing on essential non-food expenditures such as education, health and clothes (7.96%), and depending on food rations or support from neighbors and relatives as their food and income source (7.56%) (Figure S5). Similar top five coping strategies are used at province level, by farm size categories, gender and agro-ecological zone (Figure S6).

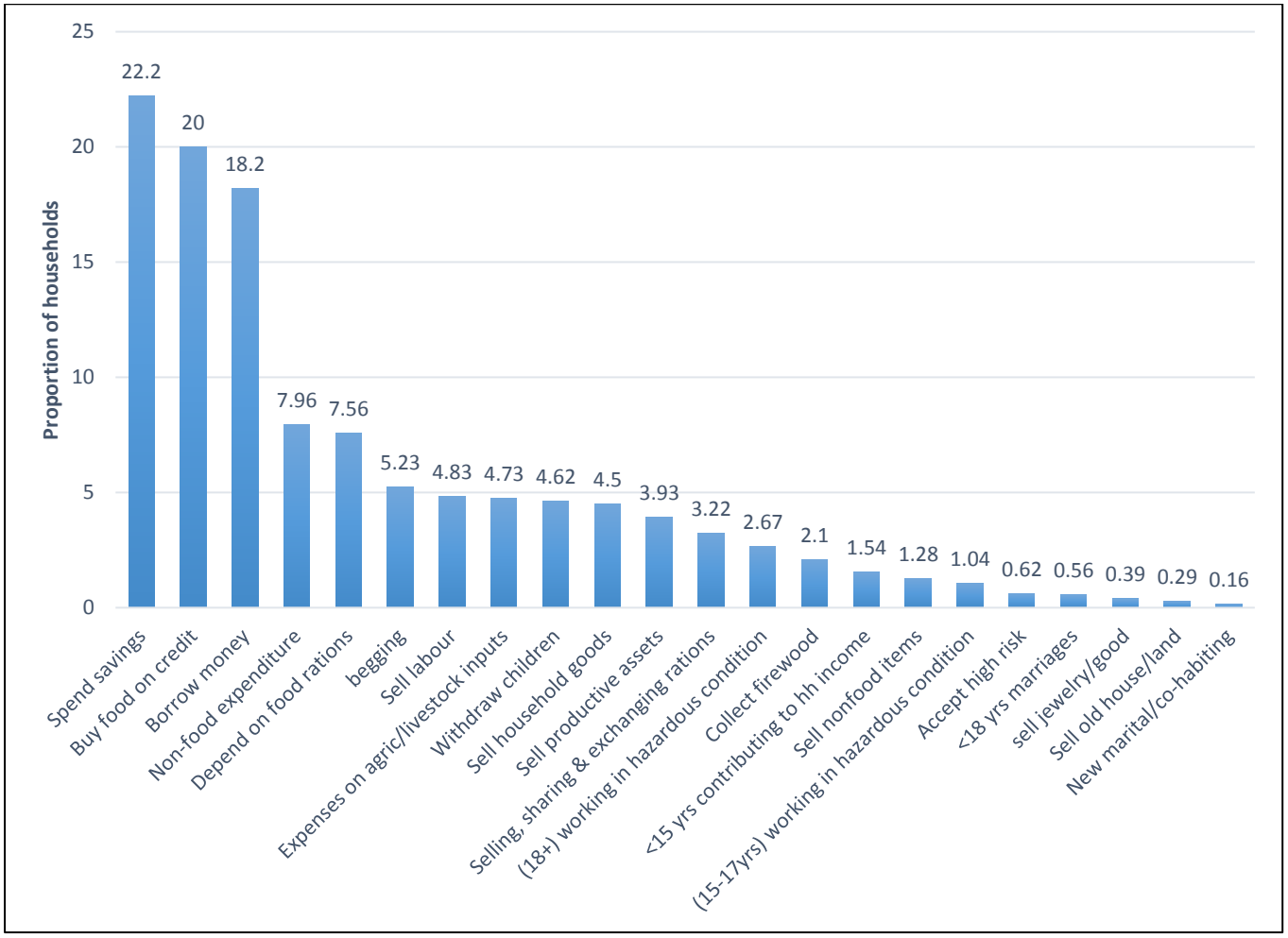

Figure S5: Coping strategies used by rural households in response to food shortages or lack of money to buy food at national level

Source: RALS (2019)

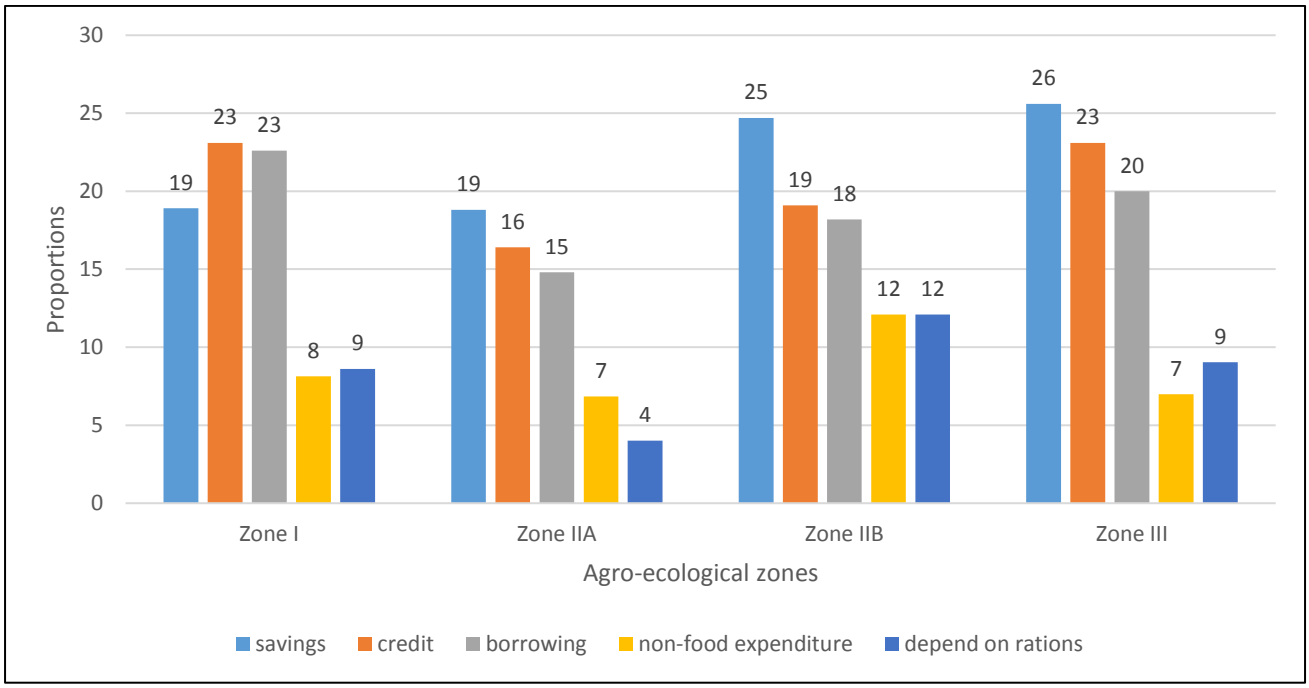

Figure S6: Top five coping strategies used by rural households in response to food shortages or lack of money to buy food by agro-ecological zone

Source: RALS 2019

Table S1: Population of people affected by floods in different agricultural season

Province	2018/2019 season	2017/2018 season	2016/2017 season	2015/2016 season
Central	10125.50	19396.84	29315.68	24921.87
Copperbelt	1271.54	1498.55	1961.30	2560.33
Eastern	100403.22	29310.49	28455.24	21423.82
Luapula	9052.67	14020.68	9884.64	5564.84
Lusaka	1292.33	3737.55	5923.09	3354.70
Muchinga	29136.16	17682.83	11217.10	8338.46
Northern	34560.56	26294.65	11435.91	13078.00
Northwestern	5364.56	8943.68	8542.79	4211.61
Southern	786.74	18437.52	28103.94	38025.40
Western	5625.51	62934.60	49152.12	36203.40
National	197618.78	202257.38	183991.81	157682.43

Table S2: Population of people affected by drought in different agricultural season

Province	2018/2019 season	2017/2018 season	2016/2017 season	2015/2016 season
Central	149280.74	96667.55	15868.48	9508.28
Copperbelt	53009.46	40867.42	17088.55	12840.32
Eastern	139893.96	202718.84	104321.10	72544.82
Luapula	66399.82	33048.29	14236.78	12076.96
Lusaka	47706.13	14886.78	3662.87	3408.51
Muchinga	46359.33	45726.64	22208.53	16881.26
Northern	87431.96	71626.43	60552.84	42084.99
Northwestern	65362.13	16798.38	4465.62	1810.74
Southern	233311.31	98538.16	26726.89	24171.33
Western	152462.27	31858.16	13426.08	13925.01
National	1041217.10	652736.66	282557.74	209252.22

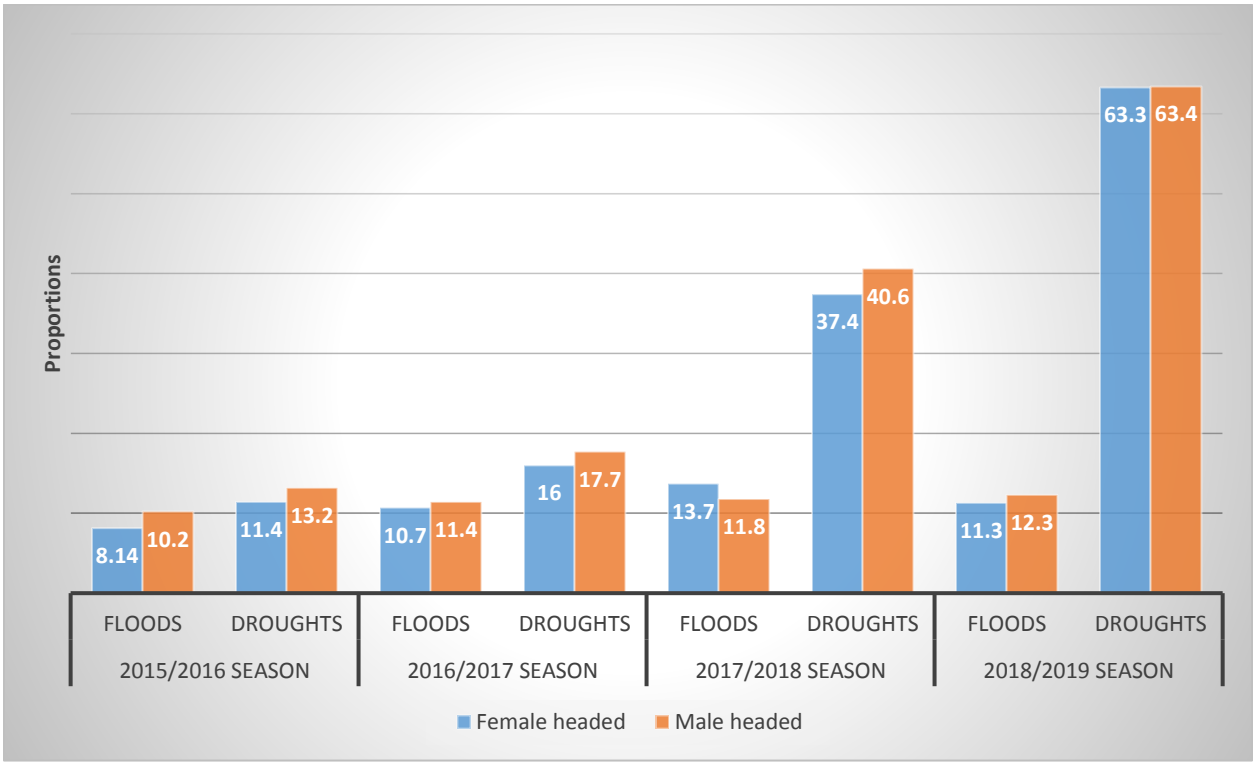

Figure S7:Proportion of gender that experienced floods and droughts across agricultural seasons

Table S3: Proportion of resilient and vulnerable households by gender of household head and gendered household type.

	Resilient	Vulnerable
Gender of household head		
Female headed households	19.05	80.95
headed households	25.06	74.94
Gendered household type		
Female adults only	20.44	79.56
Male adults only	52.86	47.14
Male and Female adults	23.35	76.65
Children only	0.00	100.00

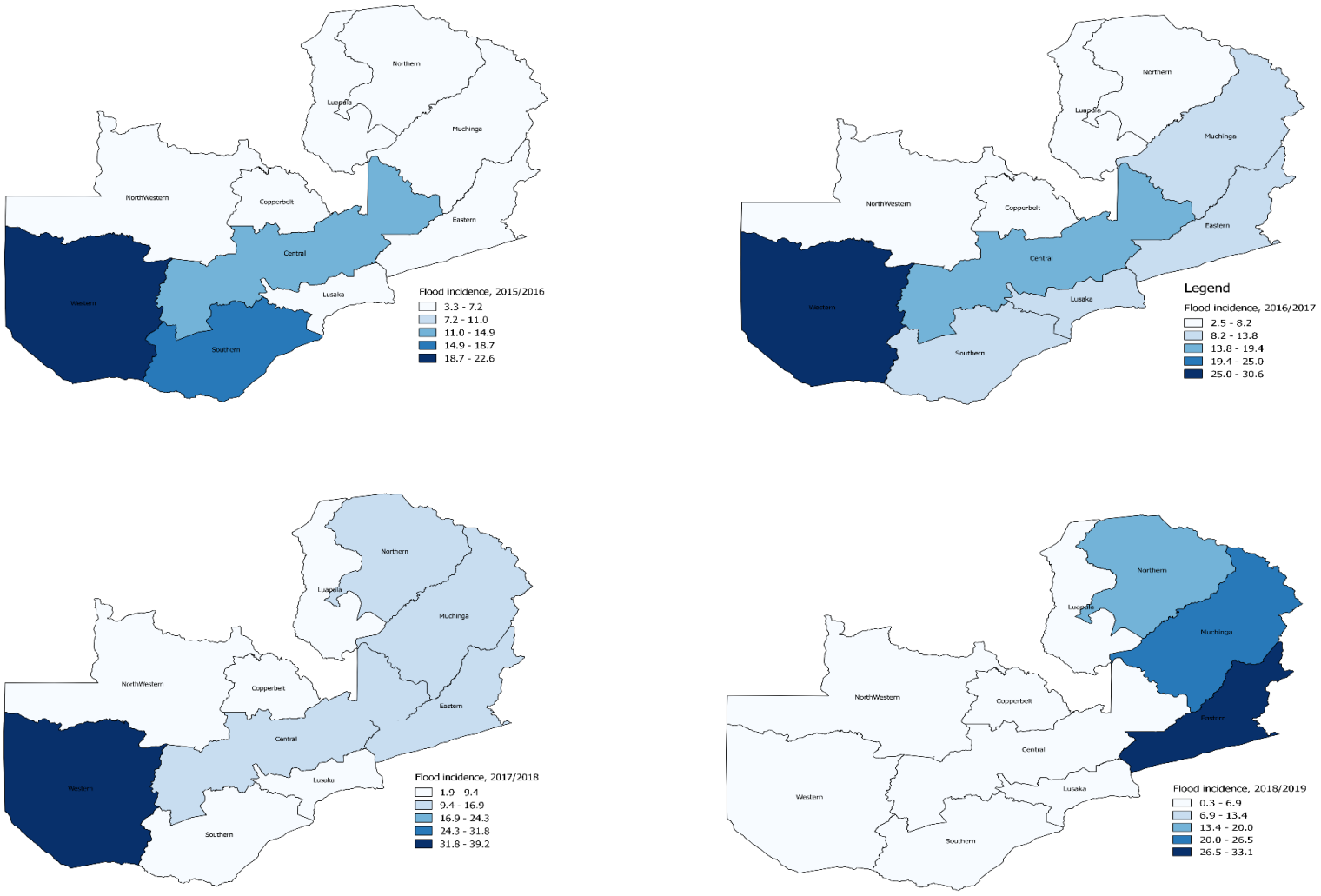

Figure S8: Provincial level spatial distribution of farm households that experienced floods in any part of their fields during the 2015/2016 season (top left), the 2016/2017 season (top right), the 2017/2018 season (bottom left) and 2018/2019 season (bottom right).

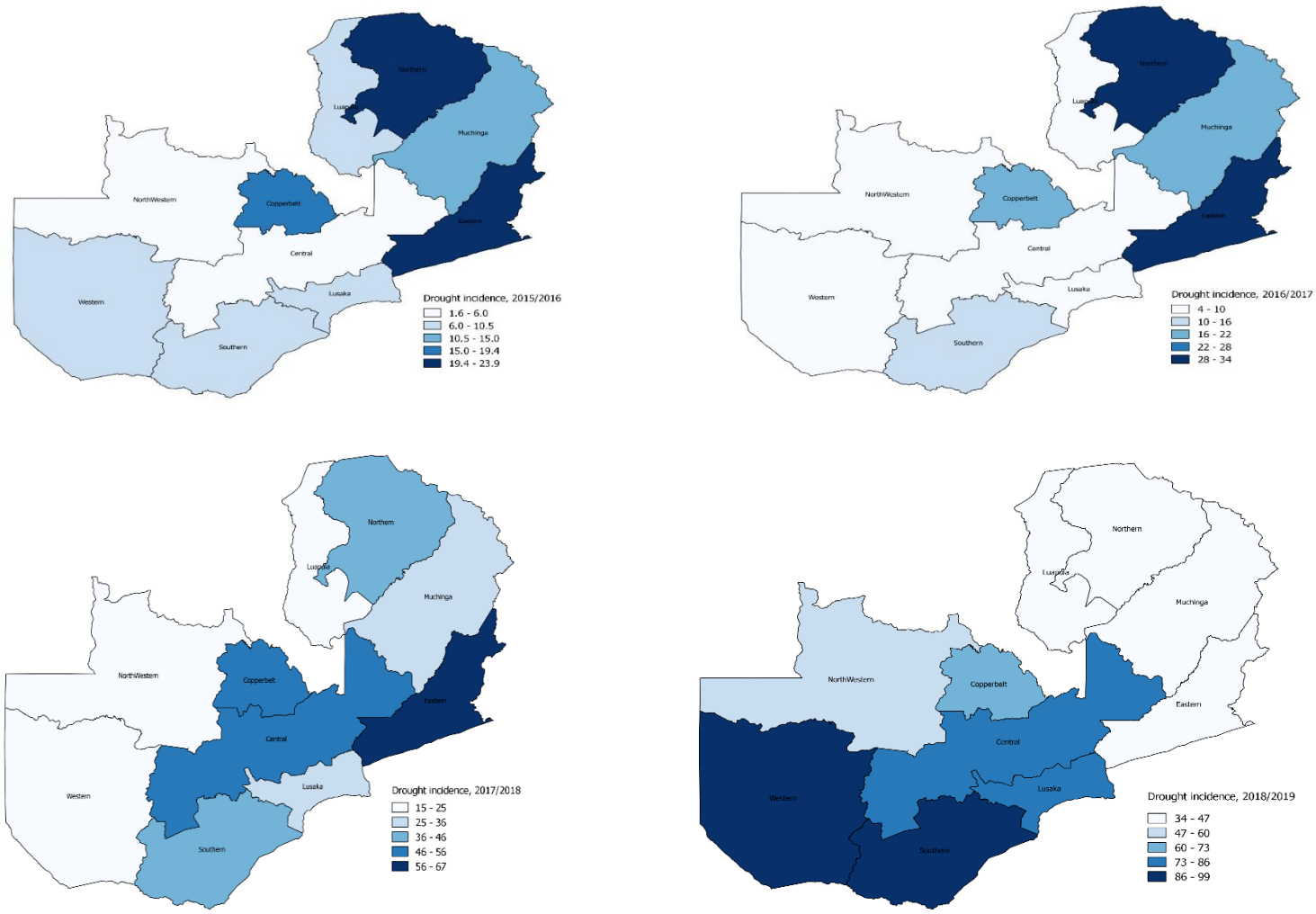

Figure S9: Provincial level spatial distribution of households that experienced droughts in any part of their fields during the 2015/2016 season (top left), the 2016/2017 season (top right), the 2017/2018 season (bottom left) and 2018/2019 season (bottom right). Source: RALS (2019)

Table S3: Average partial estimates of the first stage results showing relevance of the chosen instrumental variables for each endogenous variable (model)

	Model 1: Used MT	Model 2: Access to loans	Model 3: Crop diversity
Received CSA advice at *t-1*	**0.031****		
	(2.081)		
Member loan group		**0.201*****	
		(11.288)	
Received advice on crop diversity			**0.068*****
			(3.840)
Drought risk (yes =1)	-0.066**	-0.011	0.017
	(-2.137)	(-0.477)	(0.506)
Flood risk (yes =1)	0.001	-0.011	0.009
	(0.031)	(-0.604)	(0.334)
Growing seasonal rainfall/100	-0.008	0.015**	0.001
	(-0.984)	(2.234)	(0.078)
30-year rainfall coeff. variation	-0.469	0.999***	-1.216***
	(-1.102)	(3.185)	(-2.589)
Number of rainfall stress days	0.041*	-0.058***	0.047
	(1.799)	(-2.817)	(1.455)
Standard precipitation index	-0.088**	-0.022	-0.046
	(-2.176)	(-0.765)	(-1.136)
Asset index	0.004	0.011***	-0.016***
	(1.262)	(4.177)	(-4.008)
Female, hh head (yes =1)	-0.041***	-0.016	-0.023
	(-3.108)	(-1.188)	(-1.451)
Age, household head	-0.004	-0.028***	-0.009
	(-1.027)	(-6.534)	(-1.571)
Education, household head	-0.001	-0.006***	-0.003
	(-0.388)	(-4.087)	(-1.437)
Dependency ratio	0.001	-0.005	-0.009
	(0.188)	(-0.754)	(-0.978)
Members 0 – 5 years	-0.009	-0.002	0.015
	(-1.231)	(-0.333)	(1.614)
Members 5– 10 years	0.007	-0.009	-0.002
	(1.063)	(-1.504)	(-0.302)
Members 10 – 15 years	-0.010*	0.002	-0.010
	(-1.857)	(0.402)	(-1.462)
Members 15 – 64 years	-0.000	0.000	-0.005
	(-0.086)	(0.102)	(-0.996)
Members >65 years	0.001	0.003	-0.003
	(0.250)	(0.959)	(-0.773)
Farm size/100	0.058	-0.079*	0.126**
	(1.298)	(-1.903)	(2.338)
Distance market/100	-0.044	-0.013	-0.034
	(-1.403)	(-0.582)	(-1.069)
Observations	6,302	6,303	6,303

Notes: Models 1 – 3 were estimated as separate probit regressions since with a binary endogenous variable as the dependent variable. IVs for each model are shown in bold as the first three independent variables. Robust t-statistics in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table S4: Average partial estimates of the effects of climate exposure on vulnerability and resilience among smallholders in Zambia, instrumented Probit

	Vulnerability		Resilience	
	(1)	(2)	(3)	(4)
Drought risk (yes =1)	0.024	0.023	-0.022	-0.022
	(0.025)	(0.025)	(0.019)	(0.019)
Flood risk (yes =1)	0.007	0.006	-0.006	-0.006
	(0.016)	(0.016)	(0.016)	(0.016)
Growing seasonal rainfall/100	0.015**		-0.018**	
	(0.008)		(0.008)	
30-year average rainfall/100		0.018		-0.019**
		(0.073)		(0.008)
30-year rainfall coeff. variation	0.579	0.683	-0.099	-0.145
	(0.392)	(0.433)	(0.406)	(0.404)
Number of rainfall stress days	0.007	0.003	-0.017	-0.017
	(0.024)	(0.024)	(0.022)	(0.022)
Standard precipitation index	-0.030	-0.007	0.040	0.015
	(0.037)	(0.099)	(0.026)	(0.023)
Used CSA in 2019 (yes =1)$^{+}$	0.083	0.068	0.217***	0.217***
	(0.324)	(0.319)	(0.056)	(0.056)
Accessed loan (yes =1)	-0.076	-0.118	0.087	0.087
	(0.073)	(0.075)	(0.075)	(0.075)
Crop diversity (yes =1)	-0.011	-0.012	0.008	0.008
	(0.011)	(0.011)	(0.011)	(0.011)
Asset index	-0.038***	-0.037***	0.042***	0.042***
	(0.003)	(0.003)	(0.003)	(0.003)
Female, hh head (yes =1)	0.033**	0.032*	-0.024*	-0.024*
	(0.017)	(0.017)	(0.013)	(0.013)
Age, household head	0.020***	0.019***	-0.020***	-0.020***
	(0.005)	(0.005)	(0.005)	(0.005)
Education, household head	-0.014***	-0.014***	0.013***	0.013***
	(0.002)	(0.002)	(0.002)	(0.002)
Dependency ratio	0.000	-0.000	-0.001	-0.001
	(0.006)	(0.006)	(0.006)	(0.006)
Members 0 – 5 years	0.038***	0.038***	-0.035***	-0.035***
	(0.008)	(0.008)	(0.008)	(0.008)
Members 5– 10 years	0.054***	0.054***	-0.059***	-0.059***
	(0.007)	(0.007)	(0.007)	(0.007)
Members 10 – 15 years	0.034***	0.034***	-0.033***	-0.033***
	(0.007)	(0.006)	(0.006)	(0.006)
Members 15 – 64 years	0.034***	0.034***	-0.036***	-0.036***
	(0.004)	(0.004)	(0.004)	(0.004)
Members >65 years	-0.001	-0.001	-0.000	-0.000

	(0.004)	(0.003)	(0.004)	(0.004)
Farm size/100	-0.010	-0.012	0.007	0.007
	(0.033)	(0.032)	(0.032)	(0.032)
Distance market/100	0.016	0.012	-0.018	-0.018
	(0.024)	(0.024)	(0.021)	(0.021)
Credit residuals	0.020	0.041	-0.028	-0.028
	(0.037)	(0.037)	(0.038)	(0.038)
MT residuals	-0.053	-0.046	-0.158**	-0.158**
	(0.161)	(0.161)	(0.071)	(0.071)
Crop diversity residuals	-0.024**	-0.024**	0.018**	0.018**
	(0.009)	(0.009)	(0.009)	(0.009)
*Used CSA * weather shock*	*yes*	*yes*	*yes*	*yes*
District FE	*yes*	*yes*	*yes*	*yes*
	6,274	6,302	5,885	5,885

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Dependent variables are dummies = 1 if a household is vulnerable or resilient. A household is vulnerable if poor in all the three survey waves or fell into poverty by the third wave in 2019. This corresponds to PPP, PNP, NPP and NNP in Table 1. A resilient household is one that was never poor over the three survey waves or one that escaped poverty by the third survey wave in 2019. This corresponds to NNN, PPN, PNN and NPN in Table 1. The estimation is done using a pooled probit for the 2019 panel wave. $^{+}$ defined as use of either minimum tillage or hybrid maize seed or inorganic fertilizer. Columns 1 and 2 differ in the sense that one includes the current season rainfall and the other includes the 30-year average rainfall. There is a similar difference between columns 3 and 4.

Table S5: Average partial estimates of the effects of climate exposure on vulnerability and resilience among smallholders in Zambia, non- instrumented Probit

	Vulnerability		Resilience	
	(1)	(2)	(3)	(4)
Drought risk (yes =1)	0.019	0.020	-0.019	-0.020
	(0.019)	(0.019)	(0.019)	(0.019)
Flood risk (yes =1)	0.008	0.008	-0.008	-0.008
	(0.016)	(0.016)	(0.016)	(0.016)
Growing seasonal rainfall/100	0.014*		-0.014*	
	(0.007)		(0.007)	
30-year average rainfall/100		0.019		-0.015*
		(0.073)		(0.008)
30-year rainfall coeff. variation	0.483	0.534	-0.483	-0.523
	(0.372)	(0.416)	(0.372)	(0.370)
Number of rainfall stress days	0.012	0.012	-0.012	-0.012
	(0.022)	(0.022)	(0.022)	(0.022)
Standard precipitation index	-0.037	-0.013	0.037	0.019
	(0.025)	(0.096)	(0.025)	(0.022)
Used CSA in 2019 (yes =1)$^{+}$	-0.018	-0.018	0.018	0.018
	(0.015)	(0.015)	(0.015)	(0.015)
Accessed loan (yes =1)	-0.040***	-0.040***	0.040***	0.040***

	(0.014)	(0.014)	(0.014)	(0.014)
Crop diversity (yes =1)	-0.012	-0.012	0.012	0.012
	(0.011)	(0.011)	(0.011)	(0.011)
Asset index	-0.039***	-0.039***	0.039***	0.039***
	(0.003)	(0.003)	(0.003)	(0.003)
Female, hh head (yes =1)	0.029**	0.029**	-0.029**	-0.029**
	(0.012)	(0.012)	(0.012)	(0.012)
Age, household head	0.020***	0.020***	-0.020***	-0.020***
	(0.004)	(0.004)	(0.004)	(0.004)
Education, household head	-0.014***	-0.014***	0.014***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)
Dependency ratio	-0.000	-0.000	0.000	0.000
	(0.006)	(0.006)	(0.006)	(0.006)
Members 0 – 5 years	0.038***	0.038***	-0.038***	-0.038***
	(0.008)	(0.008)	(0.008)	(0.008)
Members 5– 10 years	0.055***	0.055***	-0.055***	-0.055***
	(0.007)	(0.007)	(0.007)	(0.007)
Members 10 – 15 years	0.033***	0.033***	-0.033***	-0.033***
	(0.006)	(0.006)	(0.006)	(0.006)
Members 15 – 64 years	0.034***	0.034***	-0.034***	-0.034***
	(0.004)	(0.004)	(0.004)	(0.004)
Members >65 years	-0.001	-0.001	0.001	0.001
	(0.003)	(0.003)	(0.003)	(0.003)
Farm size/100	-0.002	-0.002	0.002	0.002
	(0.031)	(0.031)	(0.031)	(0.031)
Distance market/100	0.009	0.010	-0.009	-0.010
	(0.020)	(0.020)	(0.020)	(0.020)
*Used CSA * weather shock*	*yes*	*yes*	*yes*	*yes*
District FE	*yes*	*yes*	*yes*	*yes*
	6,303	6,303	6,303	6,303

Notes: Standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1. Dependent variables are dummies = 1 if a household is vulnerable or resilient. A household is vulnerable if poor in all the three survey waves or fell into poverty by the third wave in 2019. This corresponds to PPP, PNP, NPP and NNP in Table 1. A resilient household is one that was never poor over the three survey waves or one that escaped poverty by the third survey wave in 2019. This corresponds to NNN, PPN, PNN and NPN in Table 1. The estimation is done using a pooled probit for the 2019 panel wave. $^{+}$ defined as use of either minimum tillage or hybrid maize seed or inorganic fertilizer. Columns 1 and 2 differ in the sense that one includes the current season rainfall and the other includes the 30-year average rainfall. There is a similar difference between columns 3 and 4.

Table S6: Average partial estimates of the effects of climate exposure on vulnerability among smallholders in Zambia, instrumented Probit – separate CSA practices

	(1)	(2)	(3)	(4)	(5)	(6)
Used MT (yes =1)	-0.031			-0.030		
	(0.019)			(0.019)		
Used fertilizer (yes =1)		0.019			0.018	
		(0.014)			(0.014)	
Used hybrid seed (yes =1)			-0.000			-0.001
			(0.012)			(0.012)
Drought risk (yes =1)	0.021	0.022	0.024	0.020	0.021	0.023
	(0.019)	(0.019)	(0.019)	(0.019)	(0.018)	(0.019)
Flood risk (yes =1)	0.006	0.010	0.006	0.005	0.010	0.005
	(0.015)	(0.016)	(0.016)	(0.015)	(0.016)	(0.016)
Growing seasonal rainfall/100	0.016**	0.015**	0.015**			
	(0.007)	(0.007)	(0.008)			
30-year average rainfall/100				0.017**	0.016**	0.017**
				(0.008)	(0.008)	(0.008)
30-year rainfall coeff. variation	0.452	0.442	0.453	0.557	0.547	0.581
	(0.373)	(0.372)	(0.395)	(0.376)	(0.374)	(0.396)
Number of rainfall stress days	0.011	0.013	0.013	0.007	0.009	0.007
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Standard precipitation index	-0.040	-0.037	-0.038	-0.016	-0.015	-0.012
	(0.026)	(0.026)	(0.026)	(0.022)	(0.023)	(0.023)
Accessed loan (yes =1)	-0.074	-0.072	-0.119	-0.116	-0.113	-0.162**
	(0.073)	(0.072)	(0.077)	(0.075)	(0.074)	(0.078)
Crop diversity (yes =1)	-0.011	-0.012	-0.010	-0.011	-0.012	-0.010
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Asset index	-0.038***	-0.038***	-0.037***	-0.037***	-0.037***	-0.037***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Female, hh head (yes =1)	0.030**	0.030**	0.029**	0.030**	0.030**	0.028**
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Age, household head	0.020***	0.020***	0.019***	0.019***	0.019***	0.018***
	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)
Education, household head	-0.014***	-0.014***	-0.014***	-0.014***	-0.014***	-0.015***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Dependency ratio	0.000	0.001	0.001	-0.000	-0.000	-0.000
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Members 0 – 5 years	0.037***	0.038***	0.038***	0.036***	0.038***	0.038***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)

Members 5– 10 years	0.055***	0.055***	0.053***	0.054***	0.054***	0.052***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Members 10 – 15 years	0.033***	0.033***	0.035***	0.034***	0.034***	0.035***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Members 15 – 64 years	0.034***	0.034***	0.035***	0.034***	0.034***	0.035***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Members >65 years	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
Farm size/100	-0.008	-0.008	-0.007	-0.011	-0.010	-0.011
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Distance market/100	0.012	0.013	0.011	0.009	0.010	0.006
	(0.020)	(0.020)	(0.021)	(0.020)	(0.020)	(0.021)
Credit residuals	0.019	0.018	0.043	0.041	0.039	0.064*
	(0.038)	(0.038)	(0.038)	(0.037)	(0.037)	(0.038)
MT residuals	-0.011	-0.019*	-0.012	-0.011	-0.019*	-0.012
	(0.009)	(0.010)	(0.010)	(0.009)	(0.010)	(0.009)
Crop diversity residuals	-0.024**	-0.023**	-0.026***	-0.024**	-0.024**	-0.026***
	(0.009)	(0.009)	(0.010)	(0.009)	(0.009)	(0.010)
*Used CSA * weather shock*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
District FE	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	6,274	6,274	6,050	6,302	6,302	6,078

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Table S7: Average partial estimates of the effects of climate exposure on resilience among smallholders in Zambia, instrumented Probit – separate CSA practices

	(1)	(2)	(3)	(4)	(5)	(6)
Used MT (yes =1)	0.038**			0.038**		
	(0.019)			(0.019)		
Used fertilizer (yes =1)		-0.015			-0.015	
		(0.014)			(0.014)	
Used hybrid seed (yes =1)			0.004			0.004
			(0.012)			(0.012)
Drought risk (yes =1)	-0.025	-0.026	-0.026	-0.025	-0.026	-0.026
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Flood risk (yes =1)	-0.008	-0.013	-0.007	-0.008	-0.013	-0.007
	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Growing seasonal rainfall/100	-0.016**	-0.015**	-0.014*			
	(0.007)	(0.008)	(0.008)			
30-year average rainfall/100				-0.017**	-0.016**	-0.016**
				(0.008)	(0.008)	(0.008)

30-year rainfall coeff. variation	-0.303	-0.239	-0.288	-0.335	-0.276	-0.323
	(0.399)	(0.397)	(0.400)	(0.397)	(0.395)	(0.398)
Number of rainfall stress days	-0.015	-0.015	-0.016	-0.016	-0.015	-0.017
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Standard precipitation index	0.037	0.037	0.033	0.016	0.017	0.013
	(0.026)	(0.026)	(0.027)	(0.023)	(0.023)	(0.024)
Accessed loan (yes =1)	0.082	0.081	0.103	0.082	0.081	0.103
	(0.075)	(0.075)	(0.078)	(0.075)	(0.075)	(0.078)
Crop diversity (yes =1)	0.007	0.008	0.008	0.007	0.008	0.008
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)
Asset index	0.042***	0.042***	0.042***	0.042***	0.042***	0.042***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Female, hh head (yes =1)	-0.032***	-0.032***	-0.033***	-0.032***	-0.032***	-0.033***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Age, household head	-0.019***	-0.019***	-0.019***	-0.019***	-0.019***	-0.019***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Education, household head	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Dependency ratio	-0.002	-0.002	-0.001	-0.002	-0.002	-0.001
	(0.006)	(0.006)	(0.007)	(0.006)	(0.006)	(0.007)
Members 0 – 5 years	-0.035***	-0.036***	-0.038***	-0.035***	-0.036***	-0.038***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Members 5– 10 years	-0.057***	-0.057***	-0.055***	-0.057***	-0.057***	-0.055***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Members 10 – 15 years	-0.035***	-0.034***	-0.036***	-0.035***	-0.034***	-0.036***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Members 15 – 64 years	-0.036***	-0.037***	-0.037***	-0.036***	-0.037***	-0.037***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Members >65 years	0.001	0.001	0.001	0.001	0.001	0.001
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Farm size/100	0.011	0.010	0.012	0.011	0.010	0.012
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)
Distance market/100	-0.010	-0.010	-0.012	-0.011	-0.011	-0.013
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Credit residuals	-0.026	-0.025	-0.037	-0.026	-0.025	-0.037
	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)	(0.039)
MT residuals	0.007	0.015	0.008	0.007	0.015	0.008
	(0.008)	(0.010)	(0.009)	(0.008)	(0.010)	(0.009)
Crop diversity residuals	0.018**	0.018**	0.020**	0.018**	0.018**	0.020**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
*Used CSA * weather shock*	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
District FE	*yes*	*yes*	*yes*	*yes*	*yes*	*yes*
Observations	5,948	5,948	5,841	5,948	5,948	5,841

Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1