

**Table 1** Classification of drought for standardized precipitation evapotranspiration index (SPEI)

Drought level	Categories	SPEI
1	Near normal	$-1.0 < \text{SPEI}$
2	Moderate dryness	$-1.5 < \text{SPEI} \leq -1.0$
3	Severe dryness	$-2.0 < \text{SPEI} \leq -1.5$
4	Extreme dryness	$\text{SPEI} \leq -2.0$

Source: (Zhang et al. 2019)

**Table 2** Descriptions of explanatory variables in this study

Variables	Description	Mean	SD
Demographic characteristics			
Age of household head	Age of household head	46.30	10.117
Gender of household head	0 = female; 1 = male	0.21	0.409
Education level of household head	0 = illiterate; 1 = primary school; 2 = middle school; 3 = secondary school or above	1.66	0.838
Household attributes			
Household size	Number of household members	3.57	1.045
Household labour	Number of labour members	2.17	0.758
Land holding	Area of grassland (ha)	425.94	480.580

Livestock ownership	1 sheep = 1 sheep units; 1 cattle = 5 sheep units; 1 horse = 5 sheep units; 1 camel = 7 sheep units; 1 donkey = 5 sheep units	385.22	310.331
Natural capital			
Land tenure	1 = yes; 0 = no	0.64	0.480
Financial capital			
Credit availability	0 = unavailable; 1 = available	0.44	0.498
Household production facility	Number of items owned, including livestock sheds, drill well, fence and silo	2.57	0.932
Social capital			
Close relatives/friends	Number of relatives/friends living nearby	0.63	0.484
Institutional variable			
Enrolled in cooperation	1 = yes; 0 = no	0.09	0.290

**Table 3** Rotated component matrix

Name	Component				
	Head demographics	Risk-buffering capacity	Household production capacity	Household size	Social network
Head of household age	<b>0.791</b>	-0.183	0.036	-0.078	0.032
Head of household education level	<b>-0.709</b>	-0.195	0.051	0.125	0.030

Land tenure	0.169	<b>0.531</b>	-0.165	0.250	0.367
Credit availability	-0.190	<b>0.712</b>	0.243	-0.022	0.228
Enrolled in cooperation	-0.140	<b>-0.644</b>	0.091	-0.014	0.475
Number of livestock	-0.175	-0.202	<b>0.744</b>	0.083	-0.087
Infrastructure	-0.040	0.079	<b>0.587</b>	-0.015	0.314
Land size	0.170	0.145	<b>0.727</b>	0.070	0.087
Household size	-0.114	0.084	0.037	<b>0.757</b>	0.087
Household labour	0.053	-0.017	0.081	<b>0.827</b>	-0.125
Head of household gender	0.136	-0.025	-0.127	0.033	<b>-0.604</b>
Relatives living nearby	0.178	0.114	0.062	-0.081	<b>0.715</b>
1<Eigenvalues	1.006	1.389	1.923	1.198	1.523
% Explained variance	8.381	11.576	16.022	9.985	12.688
Cumulative% explained variance	8.381	19.957	35.979	45.964	58.652

*Note:* The rotation converged in 7 iterations

Bold values indicate high loading of Head demographics, Risk-buffering capacity, Household production capacity, Household size, and Social network, respectively.

**Table 4** Determinants of adaptations from Multivariate probit model results

Explanatory variables	Purchasing fodder	Reducing livestock	Improving livestock breed	Migrating	Purchasing insurance	Renting pasture	Preventing disease	Off-farm work
Household production capacity	0.007	0.039	<b>-0.229*</b>	0.142	<b>-0.8776***</b>	<b>0.303**</b>	-0.185	-0.215
Social network	<b>-0.212*</b>	0.145	-0.182	<b>0.450***</b>	<b>-0.392**</b>	<b>-0.468***</b>	<b>-0.239**</b>	0.185
Risk-buffering capacity	<b>-0.191*</b>	<b>0.357***</b>	<b>-0.201*</b>	<b>0.379***</b>	<b>-0.244*</b>	<b>-0.709***</b>	-0.107	<b>0.443***</b>
Household size	-0.119	-0.019	0.039	<b>0.219*</b>	0.082	<b>-0.184*</b>	0.009	0.049
Head demographics	-0.145	-0.107	-0.163	0.035	0.131	-0.191*	-0.023	0.028
Constant	<b>0.439***</b>	<b>0.283***</b>	<b>-1.101***</b>	<b>-0.850***</b>	<b>-1.274***</b>	<b>-0.223*</b>	<b>-0.899***</b>	<b>-1.716***</b>
Observations	261							
Log likelihood	-889.09							
Wald $\chi^2$ (40)	226.98							
Prob. > $\chi^2$	0.0000							
	Rho1	Rho2	Rho3	Rho4	Rho5	Rho6	Rho7	
Rho2	0.113							
Rho3	<b>0.263*</b>	0.144						

Rho4	<b>-0.498***</b>	0.057	0.037				
Rho5	<b>0.379***</b>	0.171	0.213	-0.197			
Rho6	<b>0.339**</b>	0.108	0.129	<b>-0.469**</b>	0.190		
Rho7	0.161	0.293	0.417	0.038	0.081	-0.089	
Rho8	<b>-0.648***</b>	0.031	-0.163	<b>-0.178*</b>	<b>-0.301*</b>	-0.054	-0.031

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*Note:* Bold values stand for statistically significant results, \*\*\*, \*\*, \* Significant at 1, 5, and 10% level, respectively

Likelihood ratio test  $Rho_{21} = Rho_{31} = \dots = Rho_{76} = Rho_{86} = Rho_{87} = 0$ :  $\chi^2(28) = 98.1853$ , Prob.  $> \chi^2 = 0.0000$