How do multidimensional relational networks affect large-scale grain producers' adoption of low-carbon fertilization technology?

Supplementary Materials

Table S1. Endogeneity test.

	ivprobit	
	First stage	Second stage
	(1)	(2)
rc		0.519***
		(0.163)
iv	0.442***	
	(0.028)	
Control variables	YES	YES
Wald test of exogeneity chi2(1)	0.28	
Prob > chi2	0.597	

* * *, **, * respectively indicate significance at the statistical levels of 1%, 5%, and 10%. The parentheses represent the robust standard errors. The meaning of the abbreviation of variables: rc - multidimensional relational network; *iv* - instrumental variable.

Table S2. Robustness test.

	(1)	(2)	(3)	(4)
	cdecision	taccept	cdecision	taccept
rc	0.164***	0.206***		
	(0.041)	(0.065)		
lnscexpense			0.102**	0.080*
			(0.042)	(0.042)
Control variables	Yes	Yes	Yes	Yes
N	239	239	239	239
R^2	0.133	0.143		
pseudo R^2			0.076	0.059

* * *, **, * respectively indicate significance at the statistical levels of 1%, 5%, and 10%. The parentheses represent the robust standard errors. The meaning of the abbreviation of variables: rc - multidimensional relational network; lnscexpense - the logarithm of the amount of human expenses; cdecision - adoption choice of LCFTs; taccept - adoption intensity of LCFTs.

Table S3. Mechanism analysis of the integrated relational network.

	(1) cdecision	(2) Inform	(3) cdecision	(4) demon	(5) cdecision	(6) loan	(7) cdecision
rc	0.162***	0.340***	0.146***	0.255**	0.132***	0.277**	0.150***
	(0.0394)	(0.098)	(0.0402)	(0.124)	(0.0373)	(0.121)	(0.0398)
inform			0.0470*				
			(0.0254)				
demon					0.427***		
					(0.0613)		
loan							0.123*
							(0.0644)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	239	239	239	239	239	239	239
pseudo R^2	0.104	0.085	0.114	0.137	0.214	0.133	0.115
Log likelihood	-147.4	-319.9	-145.8	-111.3	-129.3	-138.9	-145.6
LR chi2	35.77	75.64	39.01	37.73	66.85	34.05	39.07
Prob>chi2	0.0002	0.0000	0.0001	0.0001	0.0000	0.0004	0.0001

* * *, **, * respectively indicate significance at the statistical levels of 1%, 5%, and 10%. The estimated parameters are marginal effect coefficients in Column (1), (3), (5), and (7) . The parentheses represent the robust standard errors. Column (1) displays the total effect of the multidimensional relational network on LCFT adoption; Columns (2), (4), and (6) demonstrate the impact of relational networks on the mediators in terms of information sharing, demonstration effects, and resource guarantees; Columns (3), (5), and (7) show the mediation effects of the three corresponding mediators on LCFT adoption. The meaning of the abbreviation of variables: rc - multidimensional relational network; inform-information sharing; demon - demonstration effect; loan - resource guarantee; cdecision - adoption choice of LCFTs.

Table S4. Mechanism analysis of three dimensions of relational networks.

	(1) cdecision	(2) Inform	(3) cdecision	(4) demon	(5) cdecision	(6) loan	(7) cdecision
marrc	0.0856**	-0.0132	0.0855**	0.253**	0.0565*	0.168*	0.0794**
	(0.033)	(0.081)	(0.032)	(0.107)	(0.030)	(0.099)	(0.033)
govrc	0.0161	0.184**	0.0077	0.0432	0.0100	-0.0087	0.0162
	(0.029)	(0.073)	(0.030)	(0.092)	(0.026)	(0.084)	(0.029)
socrc	0.0674**	0.135**	0.0605**	0.0198	0.066***	0.135*	0.0613**
	(0.025)	(0.063)	(0.026)	(0.081)	(0.024)	(0.077)	(0.026)
inform			0.0500**				
			(0.025)				
demon					0.427***		
					(0.061)		
loan							0.116*
							(0.064)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	239	239	239	239	239	239	239
pseudo R^2	0.111	0.089	0.122	0.147	0.220	0.138	0.120
Log likelihood	-146.4	-318.4	-144.6	-110.0	-128.3	-138.1	-144.8
LR chi2	37.47	73.05	40.89	41.77	71.79	36.81	39.96
Prob >chi2	0.0003	0.0000	0.0002	0.0001	0.0000	0.0004	0.0003

* * *, **, * respectively indicate significance at the statistical levels of 1%, 5%, and 10%. The estimated parameters are marginal effect coefficients in Column (1), (3), (5), and (7) . The parentheses represent robust standard errors. Column (1) displays the total effect of various relational network on LCFT adoption; Columns (2), (4), and (6) demonstrate the impact of various relational networks on the meditators in terms of information sharing, demonstration effects, and resource guarantees; Columns (3), (5), and (7) show the mediation effects of the three corresponding mediators on LCFT adoption. The meaning of the abbreviation of variables: marrc - market network; govrc - government network; socrc - social network; inform-information sharing; demon - demonstration effect; loan - resource guarantee; cdecision - adoption choice of LCFTs.