Extension typologies and sustainable intensification: Evidence from West Africa

Supplementary Material (Full model tables and robustness check)

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Table SM1: Extension access and SI practices

	(1)		(2)		(3)		(4)	
variables	Intercropping	Intercropping	Crop rotation	Crop rotation	Improved seeds	Improved seeds	Organic fertilisers	Organic fertilisers
Extension access (dummy, Yes=1)	0.130***	0.092***	0.069***	0.115***	0.126***	0.126***	0.017	-0.029**
	(0.016)	(0.015)	(0.013)	(0.013)	(0.013)	(0.014)	(0.012)	(0.013)
Age of household head (years)	0.021***	0.018***	0.003	0.004	0.005	0.006	0.002	0.001
,	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)
Sex of household head (dummy, male=1)	-0.026	-0.021	0.039	-0.109***	0.055**	0.110***	-0.001	0.249***
	(0.030)	(0.030)	(0.024)	(0.030)	(0.022)	(0.029)	(0.021)	(0.027)
Education level (Number of years)	-0.003	0.002	-0.001	-0.013***	0.003*	0.011***	-0.001	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Household size (number of persons)	0.007***	0.007***	0.002*	0.002*	-0.002	-0.002*	-0.006***	-0.005***
, ,	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Distance to the nearest urban market (km)	-0.000	-0.001*	0.002***	0.001***	-0.002***	-0.003***	0.001***	0.001***
,	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Distance the nearest village market (km)	-0.007***	-0.008***	-0.007***	-0.004***	0.004***	0.000	-0.004***	-0.007***
, ,	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cooperative membership (dummy)	-0.004	-0.004	0.031**	0.049***	0.012	0.063***	0.030***	0.023*
	(0.017)	(0.017)	(0.014)	(0.015)	(0.013)	(0.014)	(0.011)	(0.012)
Labor cost (USD/ha)	-0.000	0.000**	0.000	-0.000	0.001***	0.001***	0.001***	0.002***
, , ,	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Groundnut area (ha)	0.019***	0.023***	0.040***	0.038***	0.017***	0.017***	0.048***	0.050***
, ,	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Off-farm income (dummy)	0.001	-0.005	0.009	0.012	0.051*	0.045	-0.070***	-0.073***
	(0.032)	(0.032)	(0.026)	(0.026)	(0.031)	(0.031)	(0.023)	(0.023)
Dependency ratio	0.018***	0.019***	-0.001	-0.001	-0.003	-0.003	0.018***	0.019***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
Clay soil (dummy)	0.014	0.009	0.034*	0.052***	-0.000	-0.003	0.012	-0.004
	(0.021)	(0.022)	(0.017)	(0.020)	(0.017)	(0.019)	(0.015)	(0.017)
Sandy-clay soil (dummy)	0.017	0.020	0.024*	0.035**	-0.004	-0.010	0.025**	0.022
	(0.017)	(0.018)	(0.014)	(0.016)	(0.014)	(0.015)	(0.012)	(0.014)
Silty soil (dummy)	0.009	0.013	0.035**	0.051***	-0.004	-0.008	0.010	-0.000
· · · · · · · · · · · · · · · · · · ·	(0.021)	(0.022)	(0.017)	(0.020)	(0.017)	(0.019)	(0.015)	(0.017)
Constant	0.360***	0.266***	-0.018	0.342***	0.454***	0.039	0.875***	0.100**
	(0.068)	(0.049)	(0.047)	(0.047)	(0.049)	(0.045)	(0.038)	(0.045)
Observations	8,604	8,604	8,604	8,604	8,604	8,604	8,604	8,604
Number of id	2,868	2,868	2,868	2,868	2,868	2,868	2,868	2,868
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	No	Yes	No	Yes	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table SM2: Extension system and SI practices

	(1)	(2)		(3)		(4)	
variables	Intercropping	Intercropping	Crop rotation	Crop rotation	Improved seeds	Improved seeds	Organic fertilisers	Organic fertiliser
Private extension (dummy)	0.009	-0.018	0.055***	0.059***	0.164***	0.138***	0.021*	0.028**
	(0.017)	(0.016)	(0.014)	(0.015)	(0.012)	(0.013)	(0.011)	(0.013)
Public extension (dummy)	0.108***	0.098***	0.046***	0.097***	0.045***	0.079***	0.024**	-0.022*
	(0.019)	(0.017)	(0.015)	(0.015)	(0.015)	(0.014)	(0.012)	(0.013)
Age of household head (years)	0.021***	0.018***	0.000	-0.000	-0.001	-0.000	0.000	-0.000
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)
Sex of household head (dummy, male=1)	-0.034	-0.023	0.038	-0.107***	0.059***	0.113***	-0.002	0.252***
	(0.029)	(0.030)	(0.024)	(0.030)	(0.022)	(0.029)	(0.021)	(0.027)
Education level (Number of years)	-0.003	0.002	-0.001	-0.013***	0.003*	0.011***	-0.001	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)
Household size (number of persons)	0.007***	0.008***	0.002*	0.002	-0.002**	-0.003**	-0.006***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Distance to the nearest urban market (km)	-0.000	-0.001**	0.002***	0.002***	-0.002***	-0.002***	0.001***	0.002***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Distance the nearest village market (km)	-0.007***	-0.008***	-0.007***	-0.004***	0.003***	-0.001	-0.004***	-0.007***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cooperative membership (dummy)	-0.004	-0.008	0.030**	0.043***	0.011	0.058***	0.027***	0.022*
	(0.017)	(0.017)	(0.014)	(0.015)	(0.013)	(0.014)	(0.010)	(0.012)
Labor cost (USD/ha)	-0.000	0.000*	0.000	-0.000*	0.001***	0.001***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Groundnut area (ha)	0.019***	0.022***	0.039***	0.036***	0.015***	0.015***	0.047***	0.049***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Off-farm income (dummy)	-0.003	-0.009	0.012	0.016	0.059*	0.055*	-0.067***	-0.068***
	(0.032)	(0.032)	(0.026)	(0.025)	(0.031)	(0.031)	(0.023)	(0.023)
Dependency ratio	0.018***	0.018***	-0.001	-0.002	-0.003	-0.004	0.018***	0.018***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
Clay soil (dummy)	0.013	0.007	0.032*	0.048**	-0.003	-0.008	0.012	-0.004
	(0.021)	(0.022)	(0.017)	(0.020)	(0.016)	(0.019)	(0.015)	(0.017)
Sandy-clay soil (dummy)	0.017	0.020	0.024*	0.034**	-0.004	-0.010	0.025**	0.023
	(0.017)	(0.018)	(0.014)	(0.016)	(0.013)	(0.015)	(0.012)	(0.014)
Silty soil (dummy)	0.010	0.012	0.036**	0.052***	-0.001	-0.006	0.010	0.001
	(0.021)	(0.022)	(0.017)	(0.020)	(0.017)	(0.018)	(0.015)	(0.017)
Constant	0.379*** (0.068)	0.283*** (0.048)	-0.033 (0.048)	0.333*** (0.047)	0.412*** (0.048)	0.006 (0.044)	0.858*** (0.037)	0.077* (0.044)
Observations	8,604	8,604	8,604	8,604	8,604	8,604	8,604	8,604
		*	*	,	,	*	•	
Number of id	2,868	2,868	2,868	2,868	2,868	2,868	2,868	2,868 V
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	No	Yes	No	Yes	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

^{***} p<0.01, ** p<0.05, * p<0.1

Table SM3: Joint public-private extension and SI practices

	(1)	((2)		(3)		(4)	
variables	Intercropping	Intercropping	Crop rotation	Crop rotation	Improved seeds	Improved seeds	Organic fertilisers	Organic fertilisers	
Public-private extension (dummy)	0.041**	0.029*	0.084***	0.123***	0.198***	0.209***	0.049***	0.037***	
	(0.016)	(0.015)	(0.014)	(0.014)	(0.013)	(0.013)	(0.010)	(0.011)	
Age of household head (years)	0.025***	0.021***	0.001	0.001	-0.002	-0.002	-0.000	-0.003	
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)	
Sex of household head (dummy, male=1)	-0.028	-0.029	0.036	-0.113***	0.048**	0.109***	-0.002	0.254***	
	(0.029)	(0.030)	(0.024)	(0.030)	(0.022)	(0.029)	(0.021)	(0.027)	
Education level (Number of years)	-0.002	0.002	-0.000	-0.013***	0.003**	0.011***	-0.000	0.016***	
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)	(0.001)	(0.002)	
Household size (number of persons)	0.008***	0.008***	0.002*	0.002*	-0.002*	-0.002**	-0.006***	-0.006***	
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Distance to the nearest urban market (km)	-0.000	-0.001**	0.002***	0.002***	-0.002***	-0.002***	0.002***	0.002***	
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Distance the nearest village market (km)	-0.007***	-0.008***	-0.007***	-0.005***	0.003***	-0.001	-0.004***	-0.007***	
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	
Cooperative membership (dummy)	0.009	0.008	0.034**	0.053***	0.012	0.061***	0.028***	0.015	
	(0.017)	(0.016)	(0.014)	(0.014)	(0.013)	(0.013)	(0.011)	(0.012)	
Labor cost (USD/ha)	-0.000	0.000*	0.000	-0.000*	0.001***	0.001***	0.001***	0.002***	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	
Groundnut area (ha)	0.021***	0.024***	0.039***	0.037***	0.015***	0.015***	0.047***	0.048***	
	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)	
Off-farm income (dummy)	-0.015	-0.018	0.008	0.008	0.054*	0.049	-0.067***	-0.064***	
	(0.032)	(0.032)	(0.026)	(0.025)	(0.031)	(0.031)	(0.022)	(0.022)	
Dependency ratio	0.021***	0.021***	-0.001	-0.000	-0.003	-0.003	0.018***	0.017***	
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)	
Clay soil (dummy)	0.013	0.008	0.031*	0.046**	-0.005	-0.011	0.011	-0.005	
	(0.021)	(0.022)	(0.017)	(0.020)	(0.016)	(0.018)	(0.015)	(0.017)	
Sandy-clay soil (dummy)	0.016	0.020	0.024*	0.034**	-0.003	-0.011	0.025**	0.023	
	(0.017)	(0.018)	(0.014)	(0.016)	(0.013)	(0.015)	(0.012)	(0.014)	
Silty soil (dummy)	0.011	0.014	0.037**	0.053***	0.000	-0.005	0.011	0.000	
	(0.021)	(0.022)	(0.017)	(0.020)	(0.017)	(0.018)	(0.015)	(0.017)	
Constant	0.437***	0.323***	-0.014	0.375***	0.433***	0.042	0.860***	0.062	
	(0.068)	(0.048)	(0.048)	(0.047)	(0.047)	(0.043)	(0.036)	(0.044)	
Observations	8,604	8,604	8,604	8,604	8,604	8,604	8,604	8,604	
Number of id	2,868	2,868	2,868	2,868	2,868	2,868	2,868	2,868	
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
District FE	Yes	No	Yes	No	Yes	No	Yes	No	
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	

Table SM4: Training and SI practices

	(1)		(2)		(3)		4)
variables	Intercropping	Intercropping	Crop rotation	Crop rotation	Improved seeds	Improved seeds	Organic fertilisers	Organic fertilisers
Training (dummy)	0.055***	0.017	0.026*	0.057***	0.100***	0.132***	0.013	-0.031***
	(0.017)	(0.015)	(0.014)	(0.014)	(0.014)	(0.013)	(0.011)	(0.012)
Age of household head (years)	0.027***	0.023***	0.006	0.009	0.010*	0.011*	0.003	0.000
, ,	(0.006)	(0.006)	(0.005)	(0.005)	(0.006)	(0.006)	(0.004)	(0.004)
Sex of household head (dummy, male=1)	-0.026	-0.028	0.039	-0.112***	0.056**	0.114***	-0.001	0.248***
	(0.029)	(0.030)	(0.024)	(0.030)	(0.022)	(0.029)	(0.021)	(0.027)
Education level (Number of years)	-0.002	0.002	-0.000	-0.013***	0.003**	0.012***	-0.000	0.016***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Household size (number of persons)	0.008***	0.008***	0.003**	0.003**	-0.001	-0.001	-0.005***	-0.006***
,	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Distance to the nearest urban market (km)	-0.000	-0.001**	0.002***	0.001***	-0.002***	-0.003***	0.001***	0.002***
	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Distance the nearest village market (km)	-0.006***	-0.008***	-0.007***	-0.003**	0.005***	0.001	-0.003***	-0.007***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cooperative membership (dummy)	0.003	0.008	0.035**	0.056***	0.010	0.056***	0.029***	0.025**
	(0.017)	(0.017)	(0.014)	(0.015)	(0.013)	(0.014)	(0.011)	(0.012)
Labor cost (USD/ha)	-0.000	0.000**	0.000	-0.000	0.001***	0.001***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Groundnut area (ha)	0.022***	0.025***	0.042***	0.041***	0.020***	0.021***	0.048***	0.049***
,	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Off-farm income (dummy)	-0.021	-0.021	-0.003	-0.008	0.029	0.022	-0.073***	-0.068***
	(0.033)	(0.033)	(0.026)	(0.026)	(0.030)	(0.030)	(0.023)	(0.022)
Dependency ratio	0.021***	0.021***	0.001	0.001	-0.001	-0.001	0.019***	0.018***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.005)	(0.005)
Clay soil (dummy)	0.014	0.009	0.034*	0.051***	-0.000	-0.004	0.012	-0.004
	(0.022)	(0.022)	(0.017)	(0.020)	(0.017)	(0.019)	(0.015)	(0.017)
Sandy-clay soil (dummy)	0.016	0.020	0.024*	0.033**	-0.004	-0.012	0.025**	0.023
	(0.017)	(0.018)	(0.014)	(0.016)	(0.014)	(0.015)	(0.012)	(0.014)
Silty soil (dummy)	0.009	0.013	0.035**	0.050**	-0.004	-0.012	0.010	0.001
, , , , , , , , , , , , , , , , , , , ,	(0.021)	(0.022)	(0.017)	(0.020)	(0.017)	(0.019)	(0.015)	(0.017)
Constant	0.426***	0.327***	0.018	0.397***	0.487***	0.063	0.880***	0.095**
	(0.068)	(0.047)	(0.048)	(0.047)	(0.049)	(0.043)	(0.037)	(0.044)
Observations	8,604	8,604	8,604	8,604	8,604	8,604	8,604	8,604
Number of id	2,868	2,868	2,868	2,868	2,868	2,868	2,868	2,868
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	No	Yes	No	Yes	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table SM5: Extension access and training and SI practices

	(1)		(2)		(3)		(4)	
variables	Intercropping	Intercropping	Crop rotation	Crop rotation	Improved seeds	Improved seeds	Organic fertilisers	Organic fertilisers
1.extension_access#1.training	0.144***	0.083***	0.073***	0.128***	0.172***	0.187***	0.024*	-0.045***
	(0.020)	(0.018)	(0.017)	(0.017)	(0.017)	(0.016)	(0.014)	(0.015)
Age of household head (years)	0.020***	0.017***	0.003	0.003	0.006	0.007	0.002	0.001
,	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)	(0.004)	(0.004)
Sex of household head (dummy, male=1)	-0.027	-0.023	0.039	-0.107***	0.057**	0.119***	-0.001	0.247***
	(0.029)	(0.030)	(0.024)	(0.030)	(0.022)	(0.029)	(0.021)	(0.027)
Education level (Number of years)	-0.003*	0.002	-0.001	-0.013***	0.003*	0.011***	-0.001	0.016***
,	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.002)
Household size (number of persons)	0.007***	0.007***	0.002*	0.002*	-0.001	-0.001	-0.006***	-0.005***
1	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Distance to the nearest urban market (km)	-0.000	-0.001*	0.002***	0.001***	-0.002***	-0.003***	0.001***	0.002***
,	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Distance the nearest village market (km)	-0.007***	-0.008***	-0.007***	-0.004***	0.004***	0.001	-0.003***	-0.007***
0 ()	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Cooperative membership (dummy)	-0.004	-0.000	0.031**	0.047***	0.002	0.047***	0.029***	0.026**
	(0.017)	(0.017)	(0.014)	(0.015)	(0.013)	(0.014)	(0.011)	(0.012)
Labor cost (USD/ha)	-0.000	0.000**	0.000	-0.000	0.001***	0.001***	0.001***	0.002***
(14)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Groundnut area (ha)	0.019***	0.022***	0.040***	0.038***	0.018***	0.019***	0.048***	0.050***
,	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Off-farm income (dummy)	0.002	-0.003	0.009	0.012	0.045	0.037	-0.071***	-0.072***
	(0.032)	(0.032)	(0.026)	(0.026)	(0.031)	(0.030)	(0.023)	(0.023)
Dependency ratio	0.018***	0.019***	-0.001	-0.001	-0.003	-0.003	0.018***	0.019***
•	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.005)	(0.005)
Clay soil (dummy)	0.014	0.009	0.034*	0.052***	-0.000	-0.004	0.012	-0.004
	(0.021)	(0.022)	(0.017)	(0.020)	(0.017)	(0.019)	(0.015)	(0.017)
Sandy-clay soil (dummy)	0.017	0.020	0.024*	0.034**	-0.004	-0.011	0.025**	0.023
	(0.017)	(0.018)	(0.014)	(0.016)	(0.014)	(0.015)	(0.012)	(0.014)
Silty soil (dummy)	0.009	0.014	0.035**	0.051***	-0.006	-0.012	0.010	0.000
· · · · · · · · · · · · · · · · · · ·	(0.021)	(0.022)	(0.017)	(0.020)	(0.017)	(0.019)	(0.015)	(0.017)
Constant	0.346***	0.262***	-0.021	0.331***	0.430***	0.022	0.870***	0.108**
	(0.068)	(0.049)	(0.048)	(0.048)	(0.049)	(0.044)	(0.038)	(0.045)
Observations	8,604	8,604	8,604	8,604	8,604	8,604	8,604	8,604
Number of id	2,868	2,868	2,868	2,868	2,868	2,868	2,868	2,868
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	No	Yes	No	Yes	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Table SM6: Extension impacts on practices (Household FE Estimator)

	(1)		(2)		(3)		(4)	
variables	Intercropping	Intercropping	Crop rotation	Crop rotation	Improved seeds	Improved seeds	Organic fertilisers	Organic fertilisers
Extension access (dummy, Yes=1)	0.166***	0.165***	0.079***	0.081***	0.119***	0.119***	0.008	0.009
	(0.019)	(0.019)	(0.016)	(0.016)	(0.017)	(0.017)	(0.015)	(0.015)
Age of household head (years)	0.020***	0.022***	0.005	0.004	0.007	0.007	0.004	0.004
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.004)
Household size (number of persons)	0.007***	0.007***	0.002*	0.002*	-0.002	-0.002	-0.006***	-0.006***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Distance to the nearest urban market (km)	-0.001*	-0.001*	0.002***	0.002***	-0.002***	-0.002***	0.002***	0.002***
	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Distance the nearest village market (km)	-0.005**	-0.005**	-0.012***	-0.011***	0.007***	0.006***	-0.003*	-0.003*
	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)
Cooperative membership (dummy)	0.033	0.029	0.046**	0.048***	0.038**	0.036**	0.035**	0.033**
	(0.023)	(0.023)	(0.018)	(0.018)	(0.018)	(0.018)	(0.014)	(0.014)
Labor cost (USD/ha)	-0.000*	-0.000*	0.000	0.000	0.001***	0.001***	0.001***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Groundnut area (ha)	0.018***	0.018***	0.039***	0.040***	0.016***	0.016***	0.047***	0.047***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.005)	(0.005)	(0.005)	(0.005)
Off-farm income (dummy)	-0.003	-0.003	0.004	0.011	0.045	0.045	-0.065***	-0.070***
	(0.032)	(0.031)	(0.026)	(0.026)	(0.031)	(0.030)	(0.023)	(0.023)
Dependency ratio	0.018***	0.018***	-0.002	-0.001	-0.002	-0.002	0.019***	0.018***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
Clay soil (dummy)	0.017	0.021	0.034	0.041*	-0.007	-0.008	0.012	0.008
	(0.028)	(0.028)	(0.024)	(0.024)	(0.023)	(0.023)	(0.020)	(0.020)
Sandy-clay soil (dummy)	0.023	0.026	0.023	0.022	-0.010	-0.009	0.036**	0.036**
	(0.022)	(0.022)	(0.018)	(0.018)	(0.018)	(0.018)	(0.016)	(0.016)
Silty soil (dummy)	0.026	0.029	0.027	0.031	0.002	0.002	0.013	0.012
	(0.027)	(0.027)	(0.024)	(0.024)	(0.023)	(0.023)	(0.020)	(0.020)
Constant	-0.810**	-0.877***	-0.207	0.105	-0.037	-0.065	0.350	0.165
	(0.321)	(0.316)	(0.276)	(0.271)	(0.294)	(0.290)	(0.229)	(0.215)
Observations	8,604	8,604	8,604	8,604	8,604	8,604	8,604	8,604
R-squared	0.066	0.057	0.064	0.055	0.046	0.043	0.088	0.079
Number of id	2,868	2,868	2,868	2,868	2,868	2,868	2,868	2,868
Additional controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
District FE	Yes	No	Yes	No	Yes	No	Yes	No
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Robust standard errors in parentheses

^{***} p<0.01, ** p<0.05, * p<0.1

Table SM7: Hausman Taylor estimation

variables	Intercropping	Crop rotation	Improved seeds	Organic fertiliser
Age of household head (years)	-0.001	0.001*	0.000	-0.001**
	(0.001)	(0.001)	(0.001)	(0.001)
Household size (number of persons)	0.003***	0.009***	-0.005***	-0.010***
	(0.001)	(0.001)	(0.001)	(0.001)
Distance to the nearest urban market (km)	-0.001**	0.001***	-0.003***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Distance the nearest village market (km)	-0.008***	-0.004***	0.000	-0.007***
	(0.001)	(0.001)	(0.001)	(0.001)
Cooperative membership (dummy)	-0.007	0.048***	0.063***	0.023**
	(0.012)	(0.011)	(0.011)	(0.010)
Labor cost (USD/ha)	0.000***	-0.000***	0.001***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)
Groundnut area (ha)	0.029***	0.028***	0.026***	0.055***
	(0.004)	(0.003)	(0.004)	(0.003)
Off-farm income (dummy)	0.070***	-0.058***	0.144***	0.012
	(0.018)	(0.016)	(0.017)	(0.014)
Dependency ratio	0.019***	-0.004	0.008**	0.023***
	(0.004)	(0.004)	(0.004)	(0.003)
Clay soil (dummy)	0.010	0.048***	-0.005	-0.002
	(0.017)	(0.015)	(0.016)	(0.013)
Sandy-clay soil (dummy)	0.018	0.026**	-0.007	0.029***
	(0.013)	(0.012)	(0.012)	(0.010)
Silty soil (dummy)	0.016	0.046***	-0.006	0.003
	(0.017)	(0.015)	(0.016)	(0.013)
Extension access (dummy, Yes=1)	0.153***	0.097***	0.108***	-0.002
	(0.013)	(0.011)	(0.012)	(0.010)
Sex of household head (dummy, male=1)	-0.035	-0.067**	0.096***	0.216***
	(0.034)	(0.031)	(0.029)	(0.031)
Education level (Number of years)	0.006***	-0.019***	0.015***	0.022***
	(0.002)	(0.002)	(0.002)	(0.002)
Constant	0.237***	0.279***	0.125***	0.179***
	(0.051)	(0.046)	(0.044)	(0.045)
Observations	8,604	8,604	8,604	8,604
Number of id	2,868	2,868	2,868	2,868
Additional controls	Yes	Yes	Yes	Yes
District FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes