
**Impact of land tenure security on the adoption of sustainable land
management practices: evidence from farm households in Togo**

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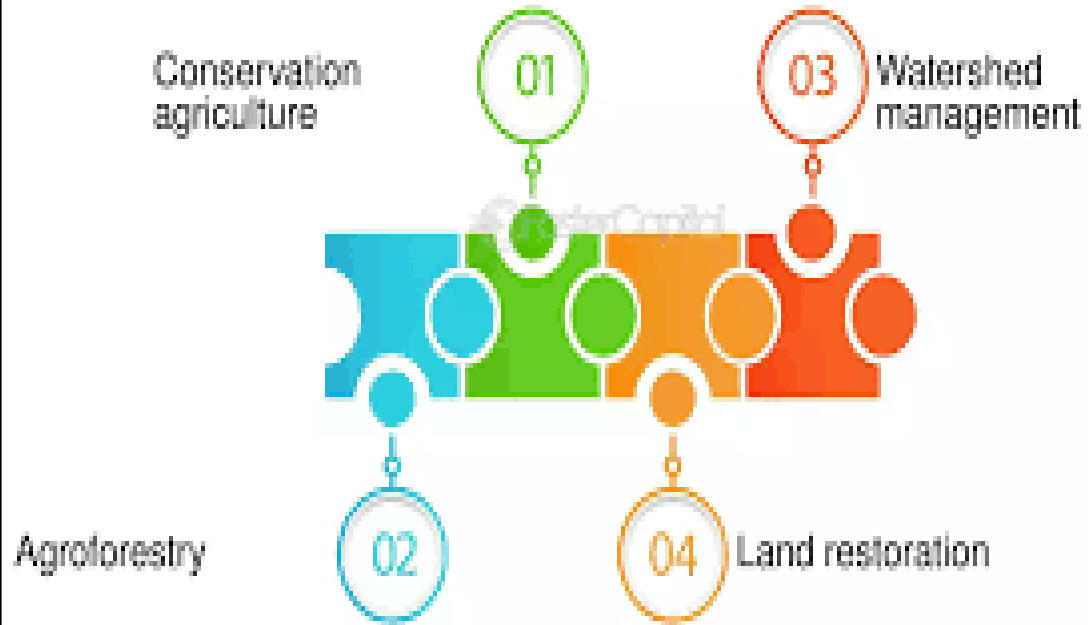
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Outlines

- Background
- Methodology
- Results and discussion
- Conclusion

Background

Sustainable Land Management Practices



Numerous advantages:

- food security.
- improved local water and energy access.
- enhanced productivity for farmers.
- like biodiversity conservation.
- resilience to climate change.
- reduced greenhouse gas emissions

This calls for the move towards a sustainable land management world

Background

However, the adoption of sustainable land management practices remains challenging



Background

Land tenure security can help to boost sustainable land management practices but the debate in the relevant literature is contradictory

❑ Some authors find positive impact of land tenure security on long-term investment in the adoption of sustainable land management practices (Kabubo-Mariara and Linderhof. 2015; Shittu et al.. 2018; Abid et al.. 2019; Diendéré and Wadio. 2023)

❑ Others affirm that land tenure security has no impact on the adoption of sustainable land management practices (de Bekker-Grob et al.. 2015; Nyanga et al.. 2016; Nkomoki et al.. 2018; Shittu et al.. 2018)

Background

What is the impact of land tenure security on the adoption of sustainable land management practices by farming households in Togo?

□ Thus, security of tenure is the legitimate and legal recognition of an individual's rights to a parcel of land (*Coase. 1960; Platteau. 1996*) ; (permanent versus temporary land rights)

□ Sustainable land management is defined as the use of land resources such as soil, water, animals and plants for the production of goods to meet changing human needs, while ensuring the long-term productive potential of these resources and the maintenance of their environmental functions (*Alemu et al.. 2016*) ;

□ Endogenous Switching Regression Probit Model (ESR Probit Model)

- This method controls for potential problems of selection and unobserved heterogeneity linked to the treatment variable :

$$z_{1i}^* = \theta_i V_i + u_i \text{ with } \begin{cases} z_i = 1 \text{ if } z_{1i}^* > 0 \\ z_i = 0 \text{ if } z_{1i}^* \leq 0 \end{cases} \quad (1)$$

□ Endogenous Switching Regression Probit Model (ESR Probit Model)

□ Next, the two conditional results equations (**Lokshin and Sajaia 2004**) can be expressed as follows :

$$\text{Régime 1 : } y_{1i}^* = \varphi_{1i}x_{1i} + \delta_{1i} \text{ with } y_{1i} = \begin{cases} 1 & \text{if } y_{1i}^* > 0 \\ 0 & \text{if } y_{1i}^* \leq 0 \end{cases} \text{ if } z_i = 1 \quad (2a)$$

$$\text{Régime 2 : } y_{0i}^* = \varphi_{0i}x_{0i} + \delta_{0i} \text{ with } y_{0i} = \begin{cases} 1 & \text{if } y_{0i}^* > 0 \\ 0 & \text{if } y_{0i}^* \leq 0 \end{cases} \text{ if } z_i = 0 \quad (2b)$$

$$ATT = \frac{1}{n} \sum_{i=1}^n \{\Pr(y_{1i} = 1 | z_i = 1) - \Pr(y_{0i} = 1 | z_i = 0)\} \quad (3)$$

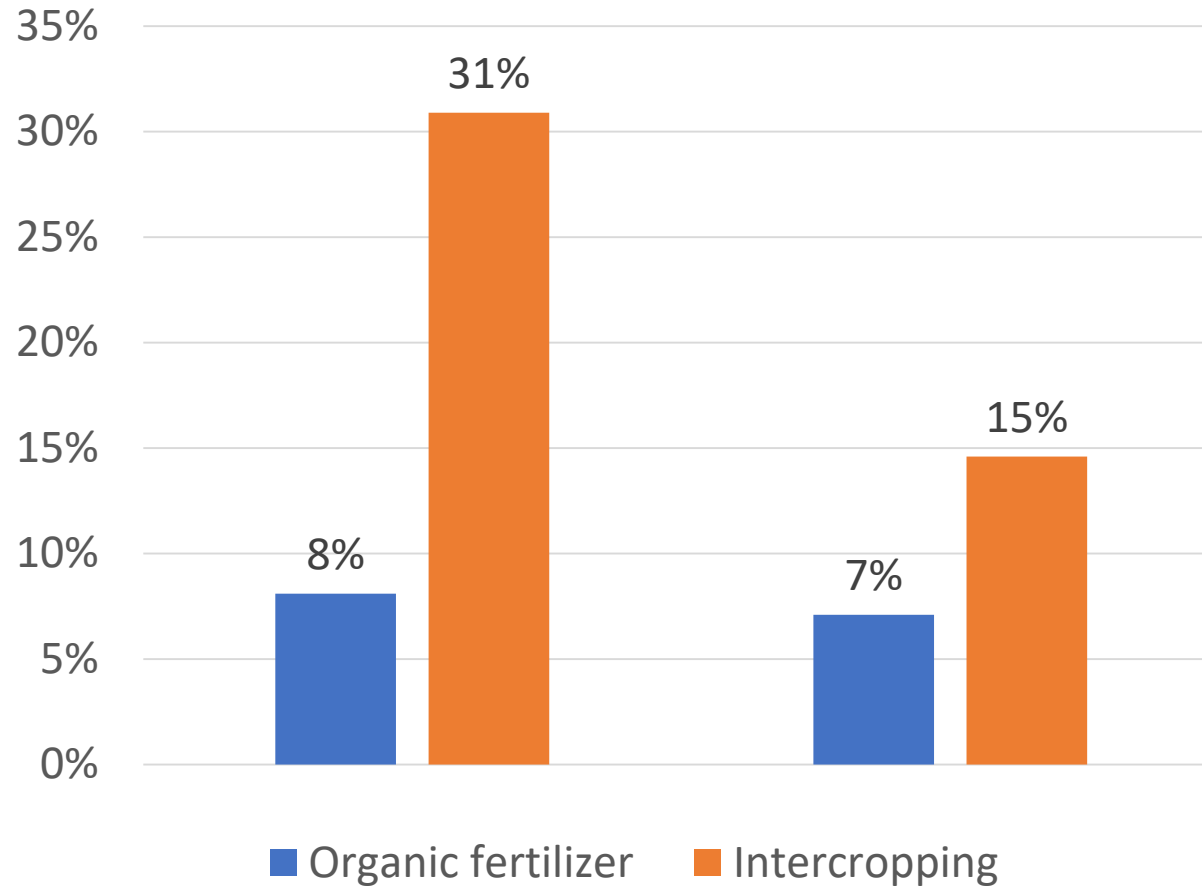
$$ATT = E(y_{1i} - y_{0i} | z_i = 1) = E(y_{1i} | z_i = 1) - E(y_{0i} | z_i = 0) \quad (4)$$

ATT. the average difference of the probability of adopting sustainable land management practices of farm households that actually enjoy land rights versus those that do not.

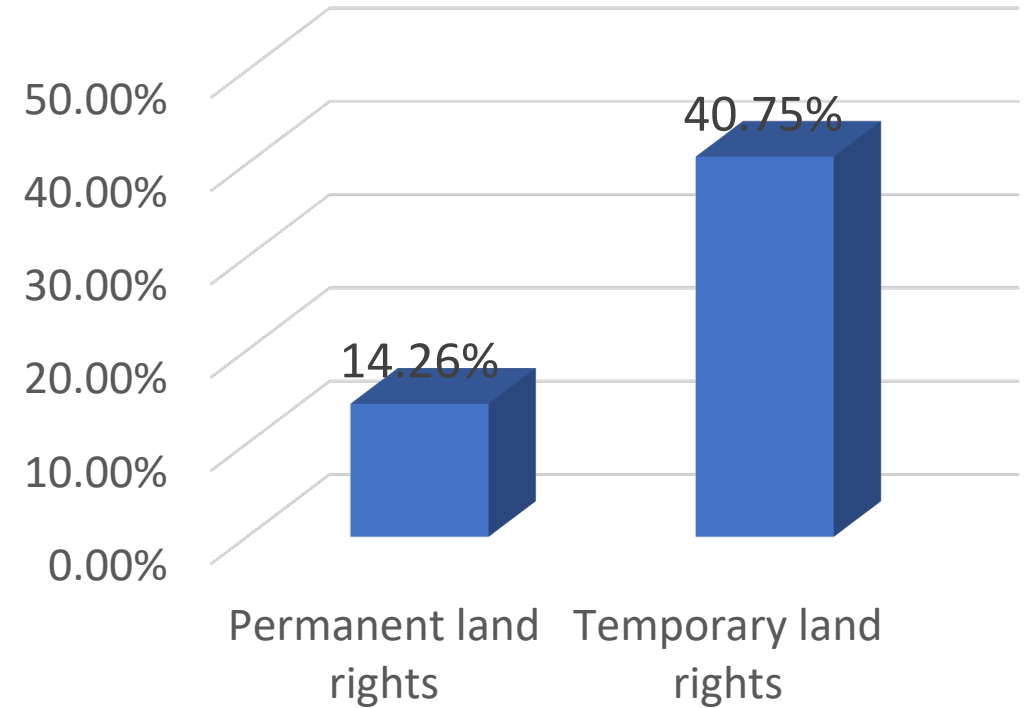
- ❑ Living Standards Measurement Study – Integrated Surveys on Agriculture (LSMS-ISA, 2021). The EHCVM - World Bank & INSEED, <https://microdata.worldbank.org/index.php/catalog/6279>
- ❑ It covers 6462 households in 2021 throughout the country

Results and discussion

Sustainable land management practices



Type of land rights



	PLR			TLR		
	(1)	(2)	(3)	(4)	(5)	(6)
VARIABLES	Selection	Regime 1	Regime 2	Selection	Regime 1	Regime 2
Age group of household head (Ref: <30 30-50 year	0.029 *** (0.011)	0.018* (0.010)	-0.003 (0.062)	1.943*** (0.134)	1.071*** (0.243)	-0.156 (0.278)
50 and over	-0.019 (0.040)	0.011 (0.056)	-0.008 (0.050)	-0.273*** (0.075)	0.450*** (0.159)	-0.020 (0.154)
Gender of head of household (Ref: Other) Men	0.030** (0.010)	0.001 (0.045)	0.026 (0.041)	0.901*** (0.078)	-0.481*** (0.134)	-0.160 (0.135)
Education of the head of household	0.045 (0.037)	0.032*** (0.002)	0.089* (0.046)	0.179* (0.096)	1.669*** (0.144)	-0.781*** (0.167)
Marital status of head of household Married	0.015 (0.041)	0.057 (0.057)	-0.021 (0.051)	-0.939*** (0.141)	-0.280 (0.255)	0.097 (0.200)
Main activity of head of household (Ref: Other) Agriculture	-0.002 (0.036)	0.024 (0.050)	-0.030*** (0.045)	-0.432*** (0.117)	-0.087 (0.213)	-0.518*** (0.167)
Ownership of plough animals by head of household	-0.067* (0.041)	0.301*** (0.059)	-0.124** (0.052)	-0.031 (0.051)	0.081 (0.076)	-0.006 (0.075)
Access to credit by the head of household	-0.064 (0.067)	0.115 (0.093)	-0.055 (0.084)	-1.176*** (0.079)	-0.482*** (0.118)	1.170*** (0.098)
Access to health services by head of household	0.012 (0.050)	0.008 (0.070)	-0.127* (0.065)	0.644*** (0.105)	0.224 (0.172)	-1.482*** (0.138)

VARIABLES	PLR			(4)	(5)	(6)
	(1)	(2)	(3)			
	Selection	Regime 1	Regime 2			
Fertility of farmed land	0.101** (0.040)	0.370*** (0.063)	0.115** (0.057)	0.346*** (0.102)	0.039 (0.159)	-*0.252 (0.272)
Membership of an agricultural cooperative	-0.011 (0.037)	-0.650*** (0.061)	0.200*** (0.045)	0.708*** (0.084)	1.349*** (0.157)	-1.588*** (0.133)
Log (farm income)	0.199*** (0.014)	0.040** (0.019)	0.155*** (0.025)	0.227*** (0.035)	0.442*** (0.095)	0.151*** (0.031)
Log (cultivated area of household head)	-0.045*** (0.005)	0.011 (0.010)	-0.056*** (0.006)	1.651*** (0.115)	1.110*** (0.080)	-2.344*** (0.224)
Availability of family labor	0.295*** (0.054)			1.302*** (0.084)		
Availability of non-family labor	0.331*** (0.032)			-1.571*** (0.111)		
Constant	1.758*** (0.175)	-0.893*** (0.174)	0.631** (0.280)	-2.051*** (0.340)	-8.178*** (1.166)	-1.524*** (0.305)
/athrho1		0.737*** (0.143)			0.774*** (0.150)	
/athrho0			-1.636*** (0.142)			-0.382*** (0.119)
rho1		0.627 (0.087)			0.649 (0.087)	
rho0			-0.927 (0.020)			-0.364 (0.103)
Observations	6148	6148	6148	6325	6325	6325
	Wald test of indep. eqns. (rho1=rho0=0):chi2(2) = 146.32Prob > chi2 = 0.0000			Wald test of indep. eqns. (rho1=rho0=0):chi2(2) = 43.05Prob > chi2 = 0.0000		

Impact of Land Tenure Security on the Adoption of Sustainable Land Management Practices

Dependant variable	Type of land tenure rights	Type of land rights status		Average traitement effect
		Adopters	Non adopters	
		(2)	(1)	(3) = (2)-(1)
Use of organic fertilizer	PLR	0.059	0.018	0.042***
	TLR	0.170	0.132	0.038***
Use of intercropping	PLR	0.064	0.002	0.062***
	TLR	0.079	0.077	0.002***

*** P < 0.01

Conclusion

- ❑ Secured land tenure rights enhances sustainable land management practices' adoption.
- ❑ PLR has greater impact on land management practices adoption compare to TLR.
- ❑ Programs and reforms aiming to secure land ownership are relevant pillars to boost sustainable land management.

Thank you for your attention!



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