



Resource use efficiency under sustainable intensification practices among maize farmers in rural Ghana

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Introduction	Methods (study area)
•Context: Significant investments in sustainable food systems have drawn attention to smallholder sustainable intensification's (SI) impact on livelihoods.	Northern Ghana. Population: ~6 million (83% farm households). Area: ~93,000 km ² . Arid regions, characterised by poor soil condition, low and unpredictable rainfall patterns, and high temperature (up 40 °C). Effects of climate change is pronounced. Some SITs: row
•Research Gap: Efficiency in production among smallholders employing	planting, drill fertiliser, maize-legume intercrop, manure, crop rotation, cover cropping
sustainable intensification technologies (SIT) remains underexplored (Pretty et al,	<u>3°0'0"W</u> <u>2°0'0"W</u> <u>0°0'0"</u> MAP LOCATION

2018; Grassman and Grassini, 2020; Jain et al., 2023).

Objectives

- Examine the technical efficiency of smallholder maize farmers in Northern Ghana, focusing on the impact of adopting SIT.
- Examine the factors influencing farmers technical efficiency (TE)



Results

Tab.1.T-test results of differences in characteristics.

	Pooled	Adopters	Non-adopters	t-test
	Mean	Mean	Mean	
Ψ E	46.45	49.54	43.23	-4.75
Age				
	0.12	0.13	0.11	-0.68
Gender				
5	0.78	0.84	0.73	-2.76
Education				
	0.61	0.93	0.29	-18.96
Social				
group				
	0.28	0.39	0.16	-5.72
Credit				
1	0.72	0.87	0.57	-7.63
Extension				



Fig 1. Data collection sites in Northern Ghana

Methods (Analytical framework)				
-test	Stochastic Frontier Analysis			
Results				
	Maize yield (Kg/acre)			







Fig 4. Significant determinants of technical efficiency among adopters and non-adopters.

- The adoption of sustainable intensification technologies offers a pathway to improved maize yields; however, inefficiencies in their adoption persist due to various factors.
- Adopters displayed higher underutilisation in labour and capital, whereas nonadopters demonstrated underutilisation in seed and herbicides usage.
- Geographical differences, along with household and institutional factors such as age, access to extension services, credit, and household size, contributed to TE and/or inefficiencies among the farmers
- Adopters were observed to have potential of improving TE by 0.28 percentage point
- Lower initial technical efficiency among adopters may be expected, as farmers typically improve efficiency over time when adopting new practices.

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