



Effects of land tenure security-driven afforestation on household food security in Ghana



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Introduction

- ❖ In the Global South, including Ghana, the interplay between land tenure, afforestation efforts, and household food security remains a critical concern.
- ❖ The right to sufficient food is seen as a fundamental human entitlement, but food insecurity persists due to low investment in agriculture as result unsecured land rights (Long et al., 2020; Glauber & Laborde, 2023).
- ❖ While studies have explored the individual effects of tenure security and afforestation on welfare outcomes (Alban & Willem, 2020; Asaaga et al., 2020), limited research exists on their combined impact on household food security.
- ❖ Examining the linkages between tenure security, investment in planting trees, and food security through food expenditure share could become the ultimate evidence for policymakers for decision-making.

Materials and Methods

Study area: Ghana

Source: GLSS7 data

Sample size: 5776 farm households.

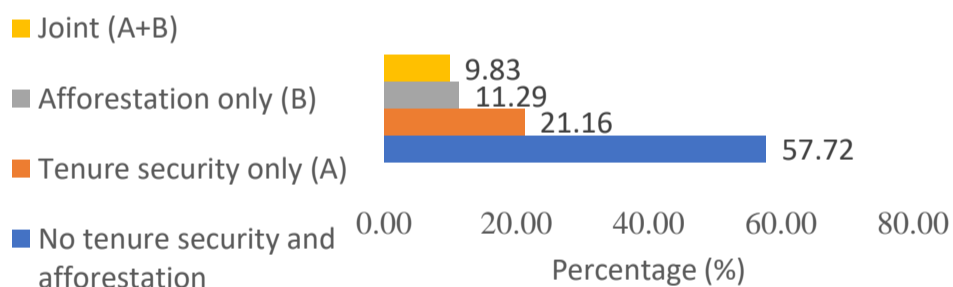


Multinomial Endogenous Switching Regression (MESR)

- ❖ This model was employed to estimate the land tenure security-afforestation effects on food security using household food consumption share as proxy.
- ❖ The MESR has the ability to handle the selectivity bias emerging from both observable and unobservable factors.

Results & Discussion

Land tenure and afforestation status in Ghana



- ❖ 21% of farm households have secure lands;
- ❖ 11% engaged in investment in afforestation (tree planting); and
- ❖ 10% of the households simultaneously have secured-land-afforestation.

Socioeconomic drivers of individual and joint tenure security and afforestation

Drivers of individual and joint tenure security-afforestation

| Variables | PT only | | TS only | | Joint | |
|----------------|-----------|-----------|-----------|-----------|-----------|-----------|
| | dy/dx | Std. Err. | dy/dx | Std. Err. | dy/dx | Std. Err. |
| Education | 0.016 | 0.011 | 0.010 | 0.013 | 0.011 | 0.010 |
| Gender | 0.017* | 0.009 | 0.026** | 0.013 | -0.015* | 0.009 |
| Age | 0.023* | 0.014 | 0.068*** | 0.018 | 0.016 | 0.013 |
| Off-farm | -0.002 | 0.008 | -0.002 | 0.012 | 0.015** | 0.008 |
| Phone | 0.003 | 0.010 | 0.008 | 0.012 | 0.001 | 0.009 |
| Sharecropped | 0.013 | 0.015 | 0.053** | 0.027 | 0.023* | 0.013 |
| Purchased land | -0.098*** | 0.028 | 0.317*** | 0.034 | 0.118*** | 0.015 |
| Inherited land | -0.023*** | 0.007 | 0.163*** | 0.010 | 0.064*** | 0.007 |
| Livestock | -0.000 | 0.009 | 0.019** | 0.011 | 0.011 | 0.008 |
| Credit | -0.033** | 0.014 | -0.009 | 0.017 | 0.005 | 0.011 |
| Remittance | 0.002* | 0.001 | -0.009*** | 0.002 | 0.005*** | 0.001 |
| Family size | -0.004*** | 0.001 | 0.002 | 0.002 | -0.000 | 0.001 |
| Farm capital | 0.007*** | 0.002 | 0.016*** | 0.003 | 0.016*** | 0.002 |
| C. diversity | -0.003 | 0.005 | 0.011** | 0.005 | -0.020*** | 0.005 |
| Farm distance | -0.026*** | 0.006 | -0.007 | 0.008 | -0.030*** | 0.006 |
| Mkt | -0.012 | 0.017 | 0.060*** | 0.021 | 0.025* | 0.014 |
| Regions | Yes | | Yes | | Yes | |

Effects of tenure security-afforestation on food security

| Outcome | Decision stage | | ATT | T-value | % change in outcome |
|----------|-----------------------------------|--|----------------------|---------|---------------------|
| | Not secure afforestation (j=1) | Secured land-afforestation (j=2, 3,4) | | | |
| Scenario | (1) | (2) | 3 = (2-1) | | 4 = (3/1) |
| PT only | 1.800 (0.003) | 1.760 (0.005) | -0.035*** (0.003) | -5.4710 | -1.94 |
| TS only | 1.798 (0.004) | 1.761 (0.006) | -0.037*** (0.008) | -4.7424 | -2.06 |
| Joint | 1.804 (0.003) | 1.762 (0.006) | -0.043*** (0.007) | -6.3165 | -2.38 |

- ❖ Invest in afforestation only reduces household food insecurity by 3.50%.
- ❖ Tenure security only reduces household food insecurity by 3.70%.
- ❖ Tenure security-afforestation (joint effect) reduces household food insecurity by 4.30%.

Discussion

- ❖ Male households were found to have a positive association with tenure security only and afforestation investment only but a negative association with tenure security and afforestation jointly.
- ❖ Households with outright land purchase and inherited lands had a negative correlation with afforestation investment only but a positive correlation with tenure security only and secured land-afforestation jointly.
- ❖ Households who received remittance were more likely to invest in afforestation only and joint tenure security-afforestation investment.
- ❖ The amount a household spends on farm production had a positive and significant association with individual and joint land tenure security and afforestation investment.
- ❖ The study further revealed that households with land tenure and propensity to invest in afforestation enhance food security.

Conclusions and policy implications

- ❖ Land tenure security incentivizes investment in sustainable land management- This helps minimize household susceptibility to food insecurity.
- ❖ Male households are more likely to have secure land and investment in afforestation compared to female households.
- ❖ Land ownership right enhance tenure security and land tenure-driven afforestation investment.
- ❖ Secure land tenure and afforestation initiatives should be jointly implemented to enhance household food security.
- ❖ Future research should consider land tenure security as a bundle of rights by developing a composite index to measure tenure security and rural agricultural development.

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DecLaRe: Decision Support for Strengthening Land Resilience in the Face of Global Challenges;
www.uni-kassel.de/forschung/declare/home



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