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

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### Abstract

Economic theory suggests that land tenure security is crucial for promoting agricultural investment and productivity to reduce household vulnerability to food insecurity. Securing land tenure through formalisation and protection of land rights is essential for sustainable rural development. This can be accomplished through land reform measures like land titling programs. The connection between tenure security, investment in planting trees, and food security through food expenditure is not well explored in the existing literature. We used a multinomial endogenous switching treatment effect model and the Seemingly Unrelated Bivariate probit framework to analyse the relationship between tenure security, investment in tree planting, and food security while considering selectivity bias from both observable and unobservable factors. The analysis was based on national household data at plot level data from 2016/2017. We found that farm households have low levels of land tenure security (21%) and investment in tree planting (11%). Land tenure security is positively correlated with investment in tree planting. Additionally, land tenure security decreases households' vulnerability to food insecurity by 3.5%, while investment in tree planting reduces vulnerability by 3.7%. Tenure security and tree planting have a greater impact (4.3%) on reducing families' vulnerability to food insecurity when households possess secure land and engage in tree planting. In terms of the determinants, gender, age, mode of land acquisition, remittance, and farm capital jointly influenced land tenure security-driven afforestation among farm households. Socioeconomic factors that are found to reduce household vulnerability to food insecurity include formal education, digital technology, production credit, remittance, family size, subscription to an insurance policy, and membership in an association. Therefore, we conclude that land tenure security among farm households is not enough but it must be accompanied by investment in long-term sustainable land management practices. Thus, tenure security incentivizes investment in sustainable land management, which helps minimise household susceptibility to food insecurity. Tree investment-incentivized policies should be introduced to enhance tenure security.

**Keywords:** Food expenditure share, land title deed