

Land Tenure Insecurity and the Adoption of Sustainable Practices in Rice Production Systems in Ghana

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Rice production in Ghana

- Unpredictable extreme weather events
- High vulnerability of rice production → Need: enhance climate resilience
- Sustainable practices like integrated fertilization practices (IFP): often overlooked
- IFP: combine organic & inorganic fertilizer
- Adoption barrier: land tenure (in)security (Besley, 1995)



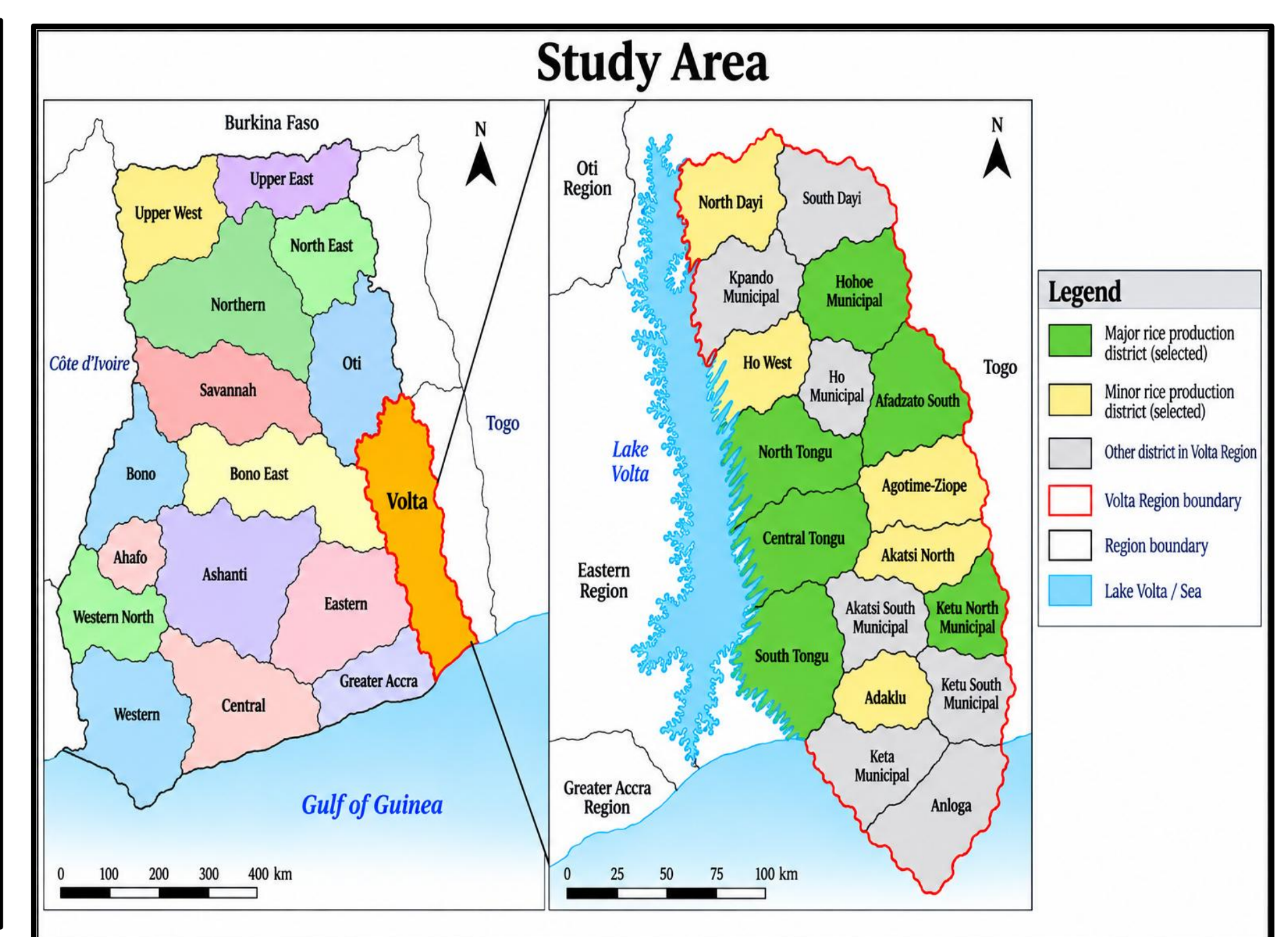
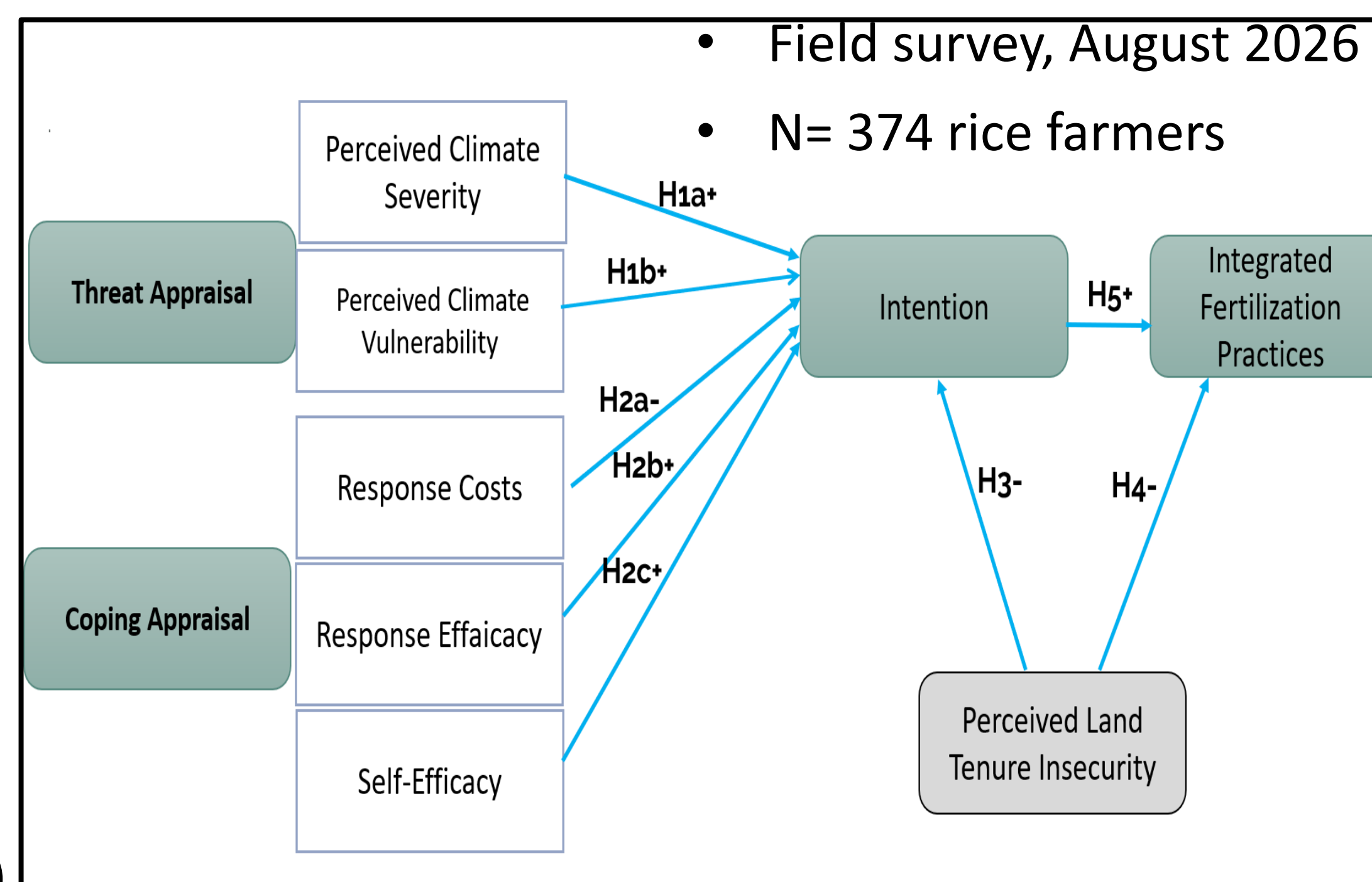
Rice farm affected by drought and part has been switched to okra farming

Research Question

How does perceived insecurity in land tenure affect farmers' adoption of integrated fertilization in rice production systems?

Material & Methods

- Protection Motivation Theory (PMT) (Rogers, 1975; revised 1983)
- Core hypotheses:
Perceived land tenure insecurity reduces intention (H3) and use (H4) of IFP
A climate threat appraisal increase intention to use IFP (H1)
Perceived implementation cost reduce intention to use IFP (H2a)
Efficacy increases intention to use IFP (H2b,c)



Tab.1: Descriptive results of PMT Constructs

Constructs ^a	Mean(SD)
Perceived Land Tenure Insecurity	4.25(1.10)
Perceived Climate Severity	5.73(0.68)
Perceived Climate Vulnerability	5.84(0.66)
Response Cost	5.37(0.70)
Self-Efficacy	5.23(0.88)
Response Efficacy	5.60(0.68)
Intention	4.09(1.28)
Current Use ^b	3.89(1.81)

^a) Likert scale with 1=„strongly disagree“ up to 7=„strongly agree“

^b) Likert scale with 1=„never“ up to 7=„always“

Preliminary results

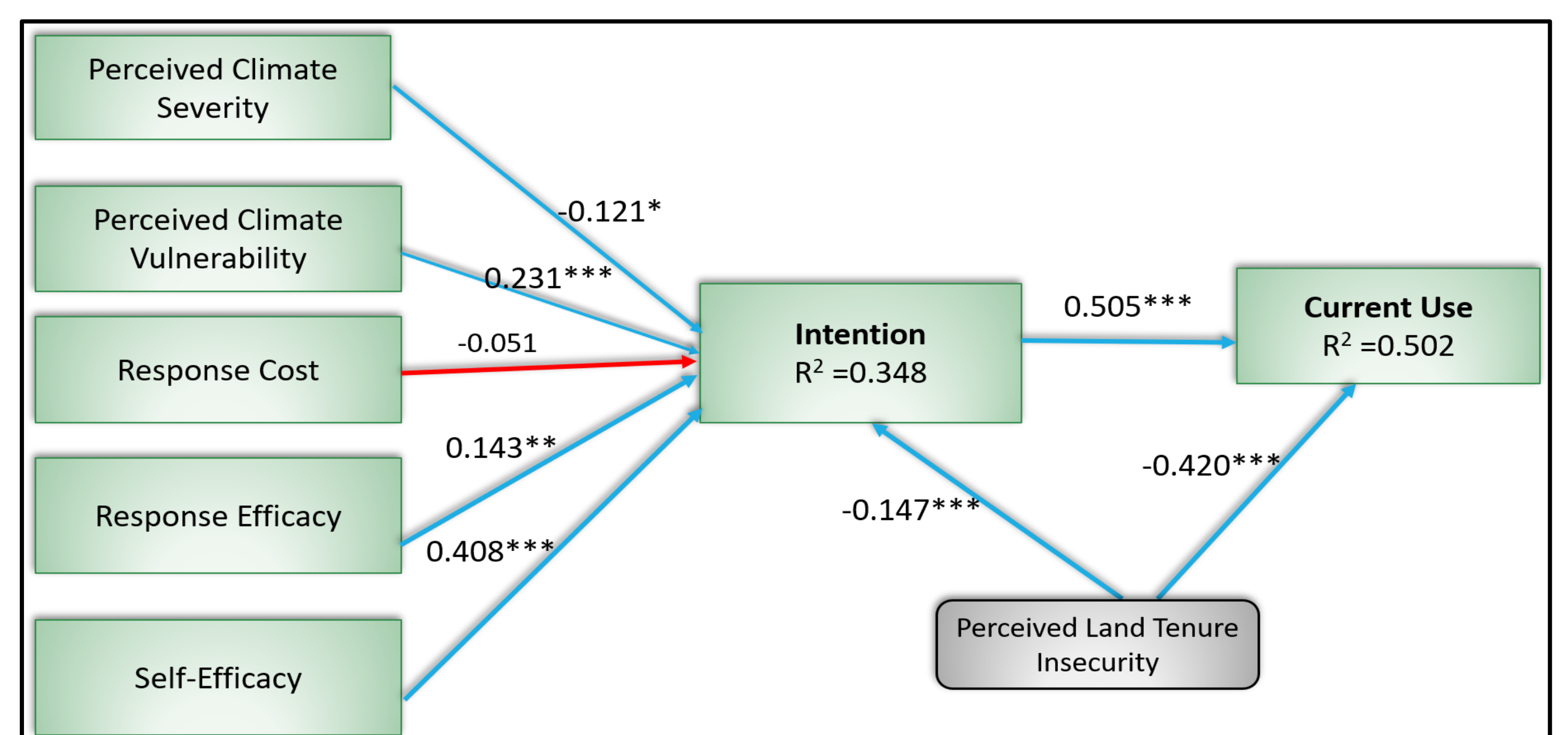


Fig. 1: PLS-SEM results for extended PMT R²:coefficient of determination; *p<0.10; **p<0.05; ***p<0.01

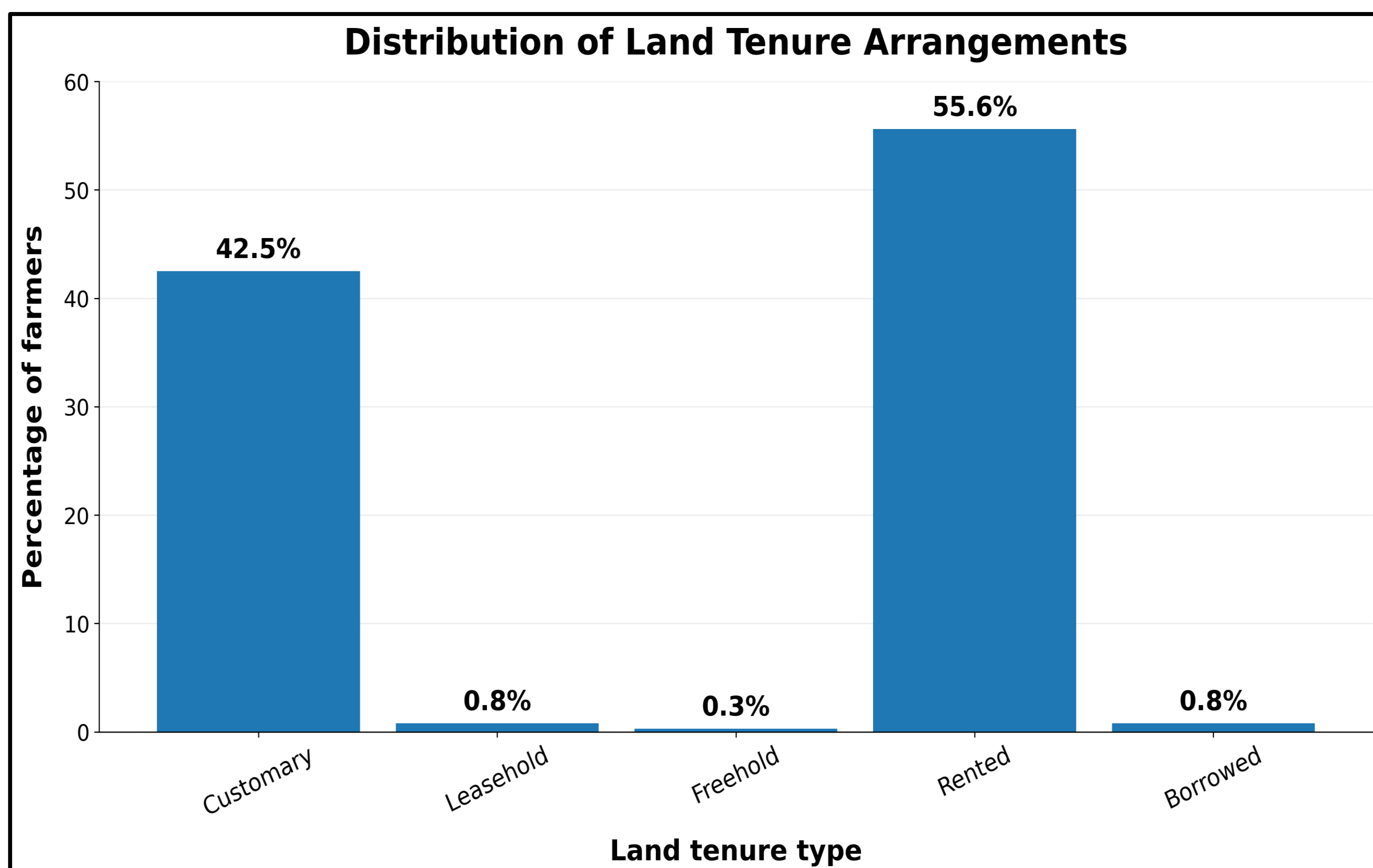


Fig.2: Land Tenure Distribution

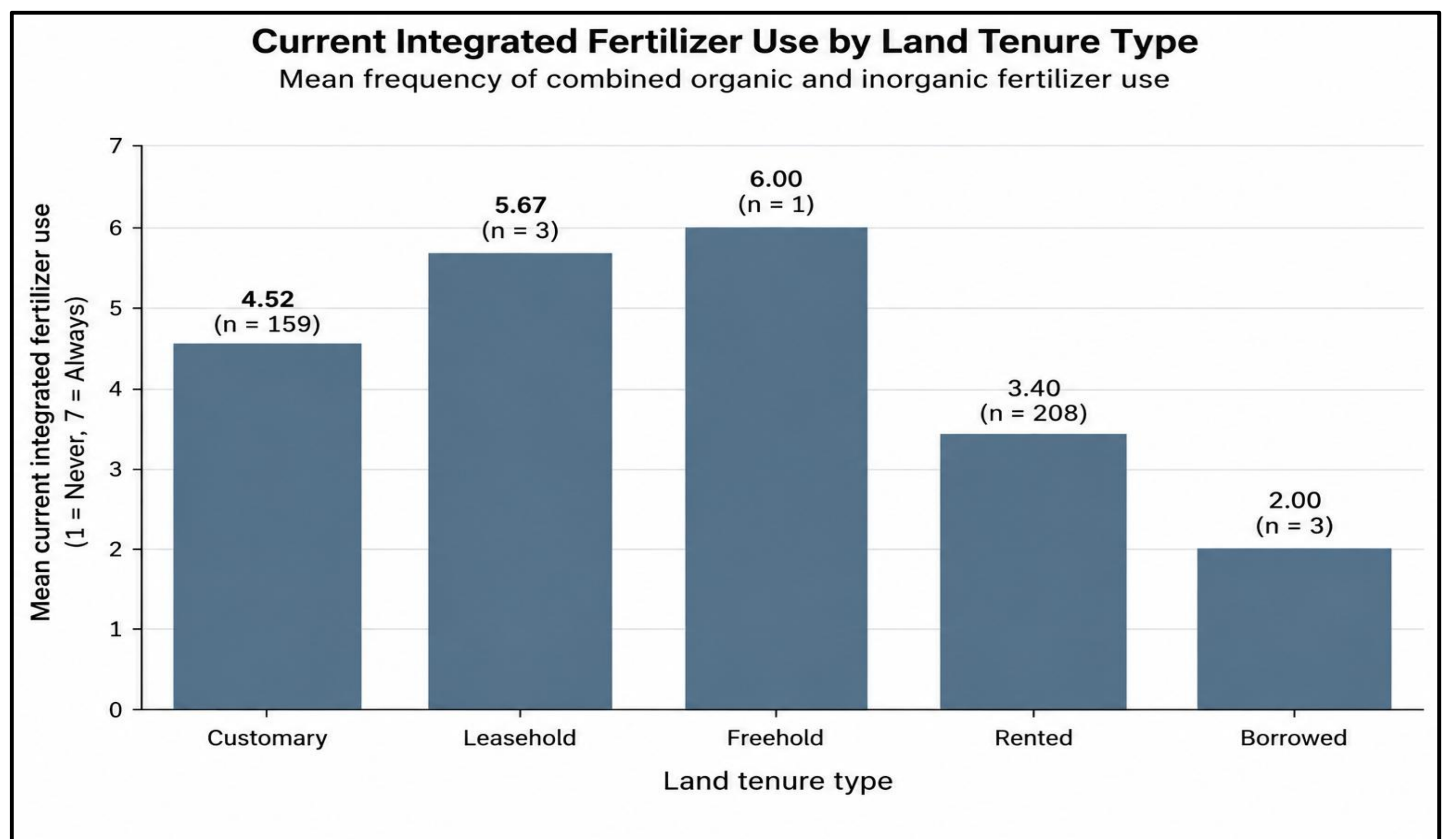


Fig.3 : Land Tenure and current adoption

Summary

- Perceived land tenure insecurity negatively affects farmers' intention and current use of IFP
- Perceived climate severity negatively affects intention
- Intention strongly explains actual use

References:

- Besley, T. (1995). Property rights and investment incentives: Theory and evidence from Ghana. *J of Political Economy*, 103(5), 903-937.
- Maddux, J. E., & Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *J of experimental social psychology*, 19(5), 469-479.
- Purwanti, T. S., Syafrial, S., Huang, W. C., Hartono, B., Rahman, M. S., & Putritamara, J. A. (2023). Understanding farmers' adaptation to climate change: A protection motivation theory application. *Cogent Social Sciences*, 9(2), 2282210.
- Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *The Journal of Psychology*, 91(1), 93-114.
- Xiao, H., Li, S., Chen, X., Yu, B., Gao, M., Yan, H., & Okafor, C. N. (2014). Protection motivation theory in predicting intention to engage in protective behaviors against schistosomiasis among middle school students in rural China. *PLoS*, 8(10), e3246.