



Do lock-ins reinforce a socio-ecological trap? Evidence from Ethiopian *Enset* farming systems

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CONTEXT

- In Ethiopia's enset (*Ensete ventricosum*) based farming system, the enset biomass from the same plant is allocated among household food, livestock feed, and sale.
- These competing uses create trade-offs.
- Whether allocation patterns persist, what lock-ins shape them, and whether they exhibit features of a socio-ecological trap (SET) remain unclear.

Data Collected

- Household survey n = 100 (51 intervention, 49 control)
- Focus group discussions (n=7) + Key Informant Interview (n=21)
- District feed balance, market prices, climate data (2014-2024).

What Analysed

- Biomass allocation pattern, Monetary return comparison (ETB kg⁻¹ DM), Behavioral–structural–technological lock-ins via the SET framework (interpretive lens), Intervention effect using non-parametric tests and rank correlations

OBJECTIVE

- Quantify monetary return difference across competing biomass uses
- Assess whether behavioral, structural, and technological lock-ins shape allocation

METHODOLOGY

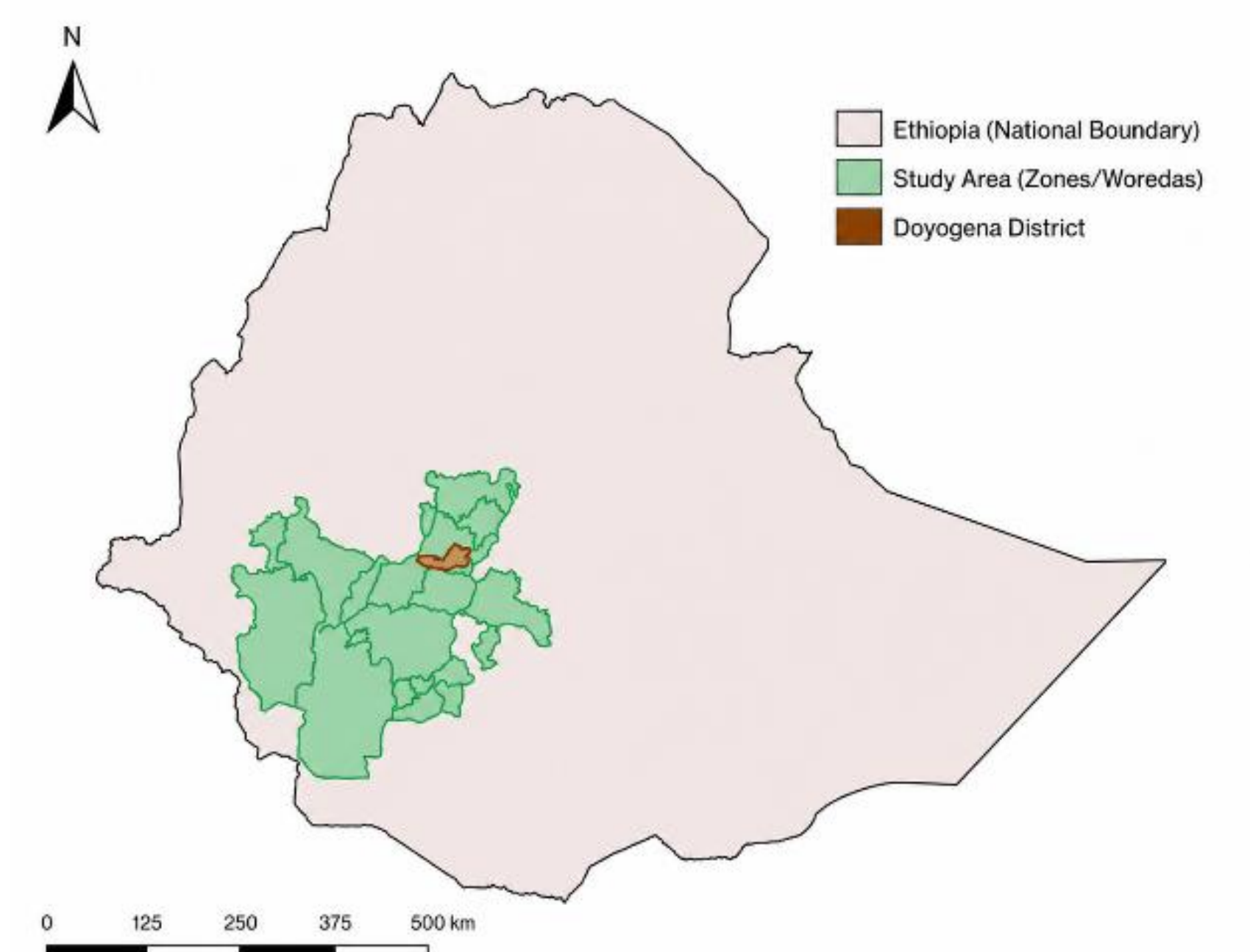


Figure 1. Location of the study area. Doyogena district

RESULT

Monetary difference in biomass allocation

Livestock fattening returned tenfold more per kg enset dry matter

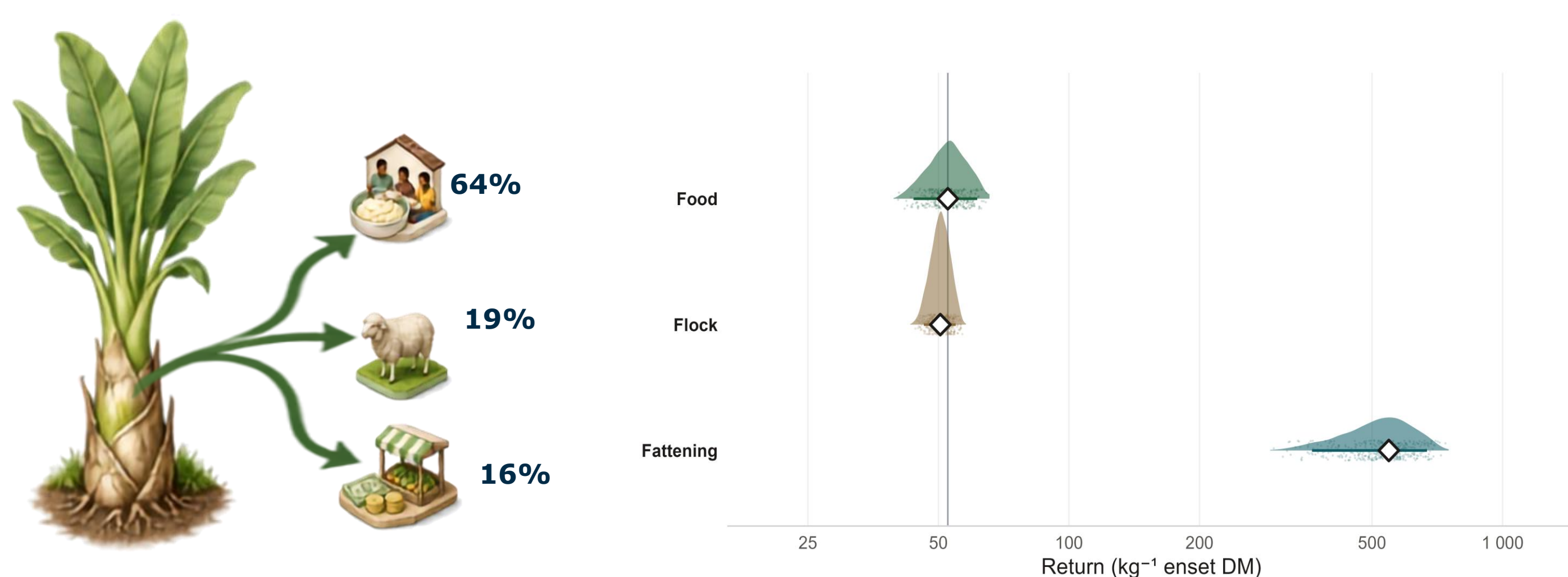


Figure 2. Biomass allocation and monetary return

Lock-ins and trap

- Behavioral: 95% revert to food-first under shocks (drought, harvest loss, price rise). 85% would reorient to feed if sheep prices rose 50%.
- Structural: 58% farmed ≤ 0.5 ha; 57% enset food-deficient (FSR < 1.0); 42% district feed deficit. Land and feed shortages occurred together
- Technological: 73% faced ≥ 3 of 6 gaps (disease, machinery, breeds, vet, knowledge)
- Reinforcing feedback: tightness $\rightarrow$ food-first $\rightarrow$ small flocks $\rightarrow$ gaps unrepaired $\rightarrow$ tightness remains

CONCLUSION

The intervention households had greater livestock assets, but the food–feed allocation pattern remained largely unchanged. Behavioral, structural, and technological lock-ins co-occurred, exhibiting features of a socio-ecological trap. Hence, system transition therefore requires addressing interacting lock-ins across multiple domains.

