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1 Introduction

Rural areas in SSA

- High population growth
- Declining farm sizes
- Agriculture main source of income
- Rising rural business activities
- Multiple income sources



Objective

- To provide insights on who should diversify and move out of agriculture

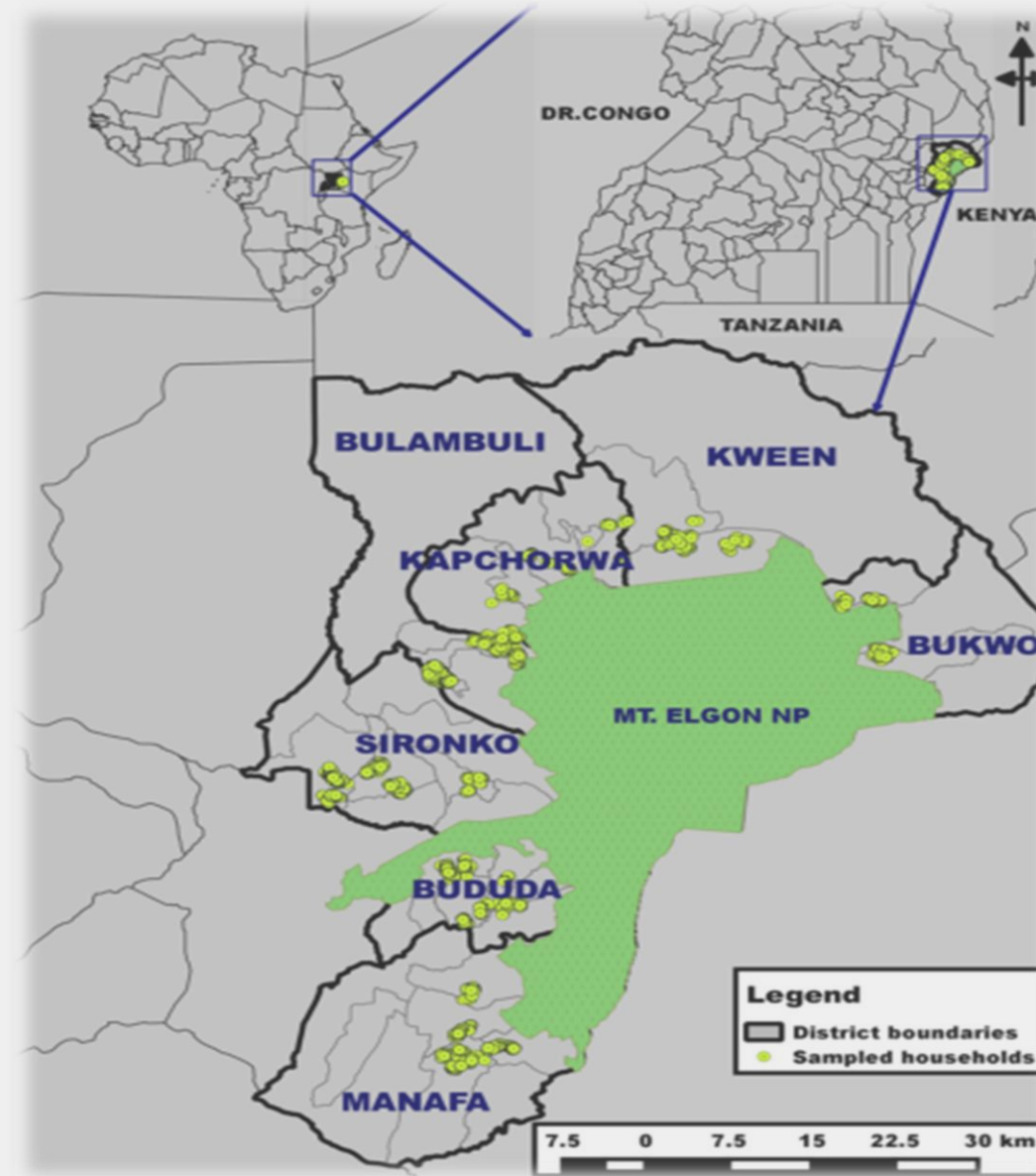
2 Data and Methods

Research area

- The Mount Elgon region

Data collection

- Survey data from two panel rounds
- Baseline survey: April-May 2014
- Follow up survey: Sept-Oct 2016
- Balanced panel of 458 households



Econometric models

- Average welfare effects: Fixed effects (FE) and Random effects (RE)

$$Y_{i,t} = \alpha + \beta I_{i,t} + \gamma X_{i,t} + \delta Z_j + d_t + u_i + \varepsilon_{i,t}$$

- Heterogeneous welfare effects: RE with interaction terms

$$Y_{i,t} = \alpha''' + \beta''' I_{i,t} + \gamma''' X_{i,t} + \delta''' Z_j + \eta''' I_{i,t} X_{i,t} + d_t + u_i + \varepsilon_{i,t}'''$$

- Welfare effects at different quantiles of per capita income and vulnerability: quantile fixed effects estimation

$$q_\tau(Y_{i,t} | I_{i,t} X_{i,t} Z_j) = \beta_\tau I_{i,t} + \gamma_\tau X_{i,t} + \delta_\tau Z_j + d_t + u_i + \varepsilon_{i,t}$$

Dependent variables

- Per capita income (log)
- Poverty (dummy)
- Vulnerability

Main independent variables

- Simpson index
- Share of off-farm income

4 Conclusions

- Income diversification and off-farm income generation **improve household welfare**
 - Income diversification serves both income growth & income smoothing
 - Off-farm income generation mainly serves income growth
- Research implications
 - Distinction needed between income diversification & moving out of agriculture
 - Vulnerability as an important welfare indicator
 - Analysis beyond average effects

3 Results

Average welfare effects

	Per capita income		Poverty		Vulnerability	
	FE	RE	FE	RE	FE	RE
Simpson index	1.323*** (0.160)	1.364*** (0.129)	-0.507*** (0.088)	-0.496*** (0.070)	-0.073*** (0.025)	-0.099*** (0.022)
Share of off-farm income	1.576*** (0.123)	1.232*** (0.091)	-0.491*** (0.072)	-0.424*** (0.050)	-0.013 (0.022)	-0.001 (0.017)

Summary of regression results. Standard errors are reported in parentheses. Significant effects are indicated with * p<0.1, ** p<0.05 or *** p<0.01.

- Income diversification increases per capita income & reduces poverty and vulnerability
- Off-farm income generation increases per capita income & reduces poverty but has no impact on vulnerability

Heterogeneous welfare effects

	Per capita income		Poverty	
	I = Simpson index	I = share of off-farm income	I = Simpson index	I = share of off-farm income
Diversification (I)	1.199*** (0.248)	1.019*** (0.181)	-0.480*** (0.135)	-0.337*** (0.100)
I * Education HH head	0.021 (0.027)	0.045*** (0.017)	0.002 (0.014)	-0.013* (0.007)
Education HH head	0.021* (0.012)	0.019** (0.009)	-0.015** (0.006)	-0.012** (0.005)
Diversification (I)	1.605*** (0.161)	1.290*** (0.108)	-0.610*** (0.087)	-0.473*** (0.060)
I * Land size	-0.148** (0.059)	-0.038 (0.037)	0.070** (0.032)	0.032 (0.021)
Land size	0.084*** (0.030)	0.031** (0.015)	-0.040** (0.016)	-0.019** (0.008)
Diversification (I)	1.295*** (0.265)	1.489*** (0.169)	-0.495*** (0.144)	-0.545*** (0.095)
I * Number of adults	0.017 (0.058)	0.065* (0.036)	-0.0002 (0.032)	0.031 (0.020)
Number of adults	-0.113*** (0.027)	-0.081*** (0.018)	0.044*** (0.015)	0.032*** (0.010)

Summary of regression results. Standard errors are reported in parentheses. Significant effects are indicated with * p<0.1, ** p<0.05 or *** p<0.01.

- Income diversification benefits households with less land most
- Off-farm income generation benefits larger & more educated households most

Welfare effects at different income & vulnerability quantiles

Per capita income	Q10	Q25	Q50	Q75	Q90
	Simpson index	2.081*** (0.117)	1.320*** (0.182)	1.307*** (0.205)	1.153*** (0.151)
Share of off-farm income	1.406*** (0.104)	1.394*** (0.212)	1.371*** (0.170)	1.215*** (0.126)	1.174*** (0.154)
Vulnerability	Q10	Q25	Q50	Q75	Q90
	Simpson index	-0.104* (0.058)	-0.096*** (0.033)	-0.085*** (0.027)	-0.071** (0.035)
Share of off-farm income	-0.064** (0.026)	-0.058** (0.025)	-0.055** (0.027)	-0.028 (0.019)	-0.028 (0.072)

Summary of regression results. Standard errors are reported in parentheses. Significant effects are indicated with * p<0.1, ** p<0.05 or *** p<0.01.

- Income diversification and off-farm income generation increase income at all income levels but relatively more for poorer households
- Off-farm income generation reduces vulnerability only at low levels of vulnerability