

# Household Agricultural Production Diversity & Food Security in Malawi

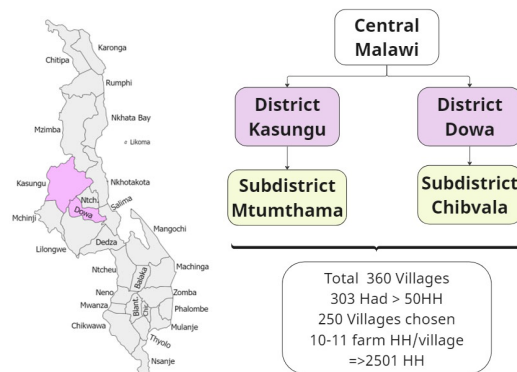
Mrignyani Sehgal



## Introduction

- 33% population experiencing moderate to severe food insecurity
- Smallholder farm HHs significant share of this undernourished population
- Smallholder farm HHs consume considerable share of their produce; increasing on-farm diversity can improve dietary diversity
- Alternatively, HHs can produce profit maximizing crops; use income earned to purchase food from market
- **“Best path” to improve food security?**

## Data: CS primary survey data



## Research Questions



Using **Instrumental Variable Approach** we answer:



Does higher farm **production diversity** (PD) lead to higher food security?



Does better **market access** (M) lead to higher food security?



Does the **relative importance of production and market pathway** depend upon food security indicator used?

## Method: OLS and 2SLS IV

**OLS:**  $FS_i = \beta_0 + \beta_1 PD_i + \beta_2 M_v + \beta_3 TLU_i + \beta_4 X_i + \varepsilon_i$

**IV:**  $PD_i = \gamma_0 + \gamma_1 PD_{v-i} + \gamma_2 M_v + \gamma_3 TLU_i + \gamma_4 X_i + \xi_i$

**Instrument for HH Production Diversity:** Average village level production diversity of neighbors in community excluding HH under consideration

**Relevance:** Households farming decision correlated with neighbor's farming decision due to similar agro-ecological conditions & socio-economic characteristics.

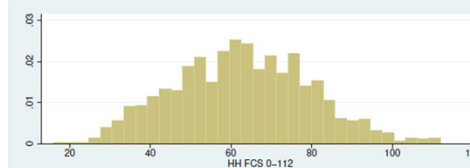
F- stat 18.57, effective F- stat 55.76

**Exclusion restriction:** Violated if neighbor's production diversity impacts HH's food security via barter of food. Percentage of foods obtained via gifts and other sources < 2% for IHS 2016-2017 and 2019-2020.

## Food Security Indicators

### 1. Food Consumption Score (FCS 0-112)

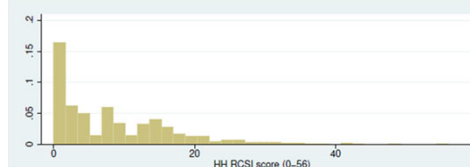
- Measures diversity of food groups in consumption (not actual quantity)
- Aggregates frequency of consumption (over past week) using food group weights



0-21 poor | 21.5-35 borderline | >35 acceptable

### 2. Reduced Coping Strategy Index (rCSI 0-56)

- Measures how people behave when they do not have enough food
- rCSI combines (i) the frequency of each strategy and (ii) their severity
- Higher rCSI => worse food security



0-3 low | 4-18 medium | 19-56 high

Weak and significant correlation (-0.20) establishes that these dimensions capture two different dimensions of food security.

## Results

PD does not increase overall FCS, reduces reporting of more serious food insecurity strategies (rCSI). Market access increases FCS but has limited role for improving rCSI.

	FCS (0-112)		rCSI (0-56)	
	OLS	2SLS	OLS	2SLS
Food Groups Grown	0.35 (0.39)	2.43 (2.46)	-0.91*** (0.22)	-2.72** (1.37)
Distance (sell harvest)	-0.09** (0.03)	-0.09*** (0.03)	-0.04** (0.02)	-0.03** (0.02)
Distance (buy produce)	-0.17** (0.08)	-0.16** (0.08)	-0.06 (0.04)	-0.06 (0.04)
Livestock	0.39** (0.18)	0.38** (0.18)	-0.04 (0.13)	-0.03 (0.13)
Observations	2291	2291	2291	2291
Demographic variables	Yes	Yes	Yes	Yes
Land and Asset	Yes	Yes	Yes	Yes

**Pulses vs meat:** Farm diversity increases pulse consumption (driven by own production than market access) & reduces meat consumption

	FCS (pulses)		FCS (meat)	
	OLS	2SLS	OLS	2SLS
Food Groups Grown	0.34*** (0.06)	1.52*** (0.39)	-0.15*** (0.05)	-0.58* (0.35)
Distance (sell harvest)	-0.01* (0.01)	-0.02*** (0.01)	-0.01** (0.00)	-0.01** (0.01)
Distance (buy produce)	-0.02 (0.01)	-0.01 (0.01)	-0.02 (0.01)	-0.02 (0.01)
Livestock	0.05* (0.03)	0.03 (0.03)	0.07*** (0.02)	0.07*** (0.02)
Observations	2291	2291	2291	2291
Demographic variables	Yes	Yes	Yes	Yes
Land and Asset	Yes	Yes	Yes	Yes

**Conclusion:** Choice of food security indicator affects relative importance the of market and own production pathways. Production diversity impacts sub-components of FCS differently.