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**IMPROVED LEGUME SEED DEMAND SYSTEMS IN CENTRAL MALAWI:  
WHAT DO FARMERS' SEED EXPENDITURES SAY ABOUT THEIR  
PREFERENCES?**

[Henry Kankwamba](#)<sup>1</sup>, Julius Mangisoni<sup>1</sup>, Franklin Simtowe<sup>2</sup>, Kai Mausch<sup>2</sup> and Moses Siambi<sup>2</sup>

1) Department of Agricultural and Applied Economics,

Bunda College of Agriculture

P.O. Box 219

Lilongwe

[hkankwamba@gmail.com](mailto:hkankwamba@gmail.com)

+265 999 338 042

2) Institutions, Markets, Policy & Impacts

International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)

Lilongwe,

Malawi

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Henry Kankwamba<sup>1</sup>, Julius Mangisoni<sup>1</sup>, Franklin Simtowe<sup>2</sup>, Kai Mausuch<sup>2</sup> and Moses Siambi<sup>2</sup>,

1) Bunda College of Agriculture, Lilongwe, Malawi, 2) International Crops Research Institute for the Semi-Arid Tropics



**Research Objective**

- ◆ To assess factors that affect the decision to participate in improved legume farming and the extent to which they affect purchases.
- ◆ To analyze improved legume seed expenditure patterns of smallholder farmers.
- ◆ To examine how smallholder farmers' seed purchases respond to changes in market prices of improved legume seed and income.

**Hypotheses**

- ◆ Socio-economic and demographic factors do not affect the decision to participate in improved legume seed purchases.
- ◆ Farmers' improved seed expenditure patterns are not responsive to changes in economic determinants of demand i.e. prices and income.

**Theoretical Framework**

**Multivariate Probit**

$$y_{im}^* = \beta_m' X_{im} + \epsilon_{im}, m = 1, \dots, M$$

$$y_{im}^* = 1 \text{ if } y_{im}^* > 0 \text{ and } 0 \text{ otherwise}$$

**AIDS model**

$$w_i = \alpha_i + \beta_i \ln\left(\frac{x}{p}\right) + \sum_j \gamma_{ij} \ln p_j$$

$$\ln P = \alpha_0 + \sum \alpha_k \ln p_k + \frac{1}{2} \sum_k \sum_m \gamma_{km}^* \ln p_k \ln p_m$$

**Results**

Marginal Effects after Multivariate Probit

VARIABLES	(1) Aggregate	(3) Groundnut	(4) Beans	(5) Maize	(6) Soybean
Household size	0.1019** (0.0598)	0.0291 (0.0638)	-0.0145 (0.0668)	-0.0094 (0.0675)	-0.0436 (0.0674)
Education of the head	0.0580*** (0.0170)	0.0385** (0.0175)	0.0429** (0.0184)	0.0105 (0.0170)	0.0148 (0.0172)
Land cultivated	0.0103** (0.0042)	0.0086** (0.0041)	0.0083** (0.0039)	0.0039 (0.0036)	0.0023 (0.0034)
Distance to main market	-0.0054 (0.0223)	-0.0426* (0.0247)	-0.0419* (0.0247)	0.0085 (0.0254)	0.0449* (0.0250)

Parameter estimates of the LA/AIDS model

Regressors	Groundnut	Beans	Soy bean	Maize
Price Groundnut	-0.340*** (0.036)			
Price Beans	0.252*** (0.032)	-0.687*** (0.044)		
Price Soy bean	0.017** (0.007)	0.104*** (0.014)	-0.132*** (0.009)	
Price Maize	0.071*** (0.012)	0.330*** (0.031)	0.011 (0.012)	-0.592*** (0.036)
Expenditure	0.169*** (0.019)	-0.073*** (0.017)	-0.036*** (0.004)	-0.073*** (0.008)
lnmills1	-0.0861*** (0.0210)	-0.155*** (0.0296)	-0.0356*** (0.00663)	0.0828*** (0.0150)
Constant	-1.387*** (0.185)	1.184*** (0.162)	0.416*** (0.036)	0.900*** (0.072)
R <sup>2</sup>	0.64	0.52	0.67	0.75
Chi-square	314.78***	316.29***	325.60***	694.66***

Uncompensated (Marshallian) elasticities

	Groundnut	Beans	Soy bean	Maize
Groundnut	-11.714	3.013	5.818	4.711
Beans	0.997	-4.55	5.329	5.471
Soy bean	0.581	0.771	-5.523	0.563
Maize	-0.82	2.253	1.61	-8.249
Expenditure	2.862	0.583	-0.379	0.001

Note: \*\*\*p<0.01 \*\*p<0.05 \*p<0.1

**Conclusions & Policy Implications**

1. Farmers' socioeconomic circumstances affect the decision to purchase improved seed.
2. Farmers are highly sensitive to seed price changes.
3. Farmers have several options to choose from when improved seed prices rise on the market.

Therefore, any intervention to improve farmers' seed purchases should take into account efforts to increase farmers' purchasing power.

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**Contact Information**

Henry Kankwamba  
Bunda College  
hkankwamba@gmail.com