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DETERMINANTS OF FOOD SECURITY AMONG SMALLHOLDER FARMERS IN KENYA.

Patrick K Rono, Shaikh Rahman, and Stephen Devadoss

INTRODUCTION

- Food security exists when all people, at all times, have physical and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life (FAO, 2006).
- In 2016 Chronically undernourished people in the world was estimated to be 815 million (FAO, 2017).
- Many countries has failed to achieve millennium development goal of halving extreme poverty and hunger by 2015.

INTRODUCTION

- Sub Saharan Africa especially horn of Africa leads with number of people suffering from hunger (Sasson et al., 2012)
- The global population is expected to reach at least 9 billion by the year 2050, requiring up to 70 percent more food, and demanding food production systems and the food chain to become fully sustainable (King et al., 2017).

FOOD SECURITY IN KENYA

- As of 2017 the number of people that were acutely food insecure in Kenya was 3.4 million
- Kenya faces the same problems of hunger and poverty like any other developing country in sub-Saharan Africa.
- Poor agriculture performance is at the heart of the problem- Misallocation and underinvestment in the sector, disengagement of government support to agriculture, poor infrastructure, limited access to credit, the high cost of farm inputs, and the lack of a land policy and framework
- Determinants of food security has been investigated in in many countries .In Kenya (Kassie et al., 2014) studied determinants of food security from gender perspective, however a study examining determinants of food security missing, therefore this study aim to fill this gap.

LITERATURE REVIEW

- (Abdullah et al., 2017)

Factors affecting household food security in rural northern hinterland of Pakistan using a binary logistic regression technique

- Results
- Age, gender, education, remittances, unemployment, inflation, assets, and disease are important factors determining household food insecurity.

LITERATURE REVIEW CONT.

- (Magaña-Lemus et al., 2016)
- Determinants of household food insecurity in Mexico using a ordered probit
- Results
- Households more likely to be food insecure include those with younger, less-educated household heads
- Households headed by single, widowed or divorced women,
- household with lower-income.

LITERATURE REVIEW CONT.

- (Tefera & Tefera, 2014)
- Determinants of Households Food Security and Coping Strategies for Food Shortfall in Mareko District, Guraghe Zone Southern Ethiopia using Logistic regression model
- Results
- Age of household head, level of education, household size, size of cultivated land, use of improved seed, number of contact with development agents, size of credit received, size of livestock owned, and off-farm income per adult equivalent were found to be significant and influence food security.

OBJECTIVES

The overall objective;

- Evaluate the impact of socio-economic factors on food security in Kenya.

The specific objective:

- Examine the socio-economic factors that influence food security in Kenya.

DATA

- The Tegemeo Agricultural Policy Research Analysis (TAPRA) rural household survey data 2014 was used
- It included assessment of food security during the 30 days
- Sample size 6512 households.

EMPIRICAL MODEL

- Food security was categorised into three categories: High food security, Low food security and very low food security
- Ordered probit was used to examine the probability of a household falling into one of the above identified categories of food security.
- $y^* = X'\beta + \varepsilon$ 1
- Where y^* is the latent variable that can take on three values corresponding to three levels of food security.
- x is a vector of socio-economic characteristics entering the equation
- ε refer to error term which is assumed to be normally distributed across observations

EMPIRICAL MODEL CONT.

- Highfoodsecurity $y = 1$ if $y \leq \alpha_1$
  Lowfoodsecurity $y = 2$ if $\alpha_1 < y \leq \alpha_2$
  Very lowfood security $y = 3$ if $\alpha_2 < y$

(2)

- The α's indicate the cut-points or thresholds to be projected for each level
- The formulas for the probabilities with the three observed outcomes for the ordered probit will be;

EMPIRICAL MODEL CONT.

$$Prob(y = 1|\, X) \;= 1 - \Phi(X'\beta)$$

- $Prob(y = 2|\, X) = \Phi(\alpha_1 - X'\beta) - \; \Phi(-X'\beta)$ 4

$$Prob(y = 3|\, X) = 1 - \Phi(\alpha_2 - X'\beta)$$

- **Marginal effects**
- $\frac{\partial Pr[y=1|x\,]}{\partial X} = -\Phi(X'\beta)\beta$
- $\frac{\partial Pr[y=2|x\,]}{\partial X} = [\Phi(\alpha_1 - X'\beta) - \; \Phi(-X'\beta)\,]\beta$
- $\frac{\partial Pr[y=3|x\,]}{\partial X} = \Phi(\alpha_2 - X'\beta)\beta$ 5

RESULTS

DESCRIPTIVE STATISTICS

Variable	Frequency	Percentage
Food secure	5,110	78.47
Low food secure	972	14.93
Very Low food secure	430	6.60
Household Gender		
Male HH	4,996	76.72
Female HH	1,516	23.28
Land tenure		
Own land	6,115	94.29
Doesn’t own land	370	5.71
Livestock ownership		
Own	6,000	92.14
DO not own	512	7.86

		Marginal Effects		
Variable	Parameters est	High food security	Low food security	Food insecure
Age	0.0078***	-0.0021***	0.0014***	0.0007***
Gender HH Head	-0.1761*	0 .0500*	-0.0331*	-0.0166*
Land size	-0.0061**	0.0016**	- 0.0011**	- 0.0005**
Group Member	-0.0010	0.00020	- 0.0002	- 0.0001
Saving account	-0.2616***	0.0700***	-0.0477***	-0.0222***
Distance to Mkt	0.0053	- 0.0015	0.0010	0 .0005
LnAsset value	-0.2159***	0.0581***	-0.0400***	-0.0185***
Lnoff farminc	-0.0711***	0.0191***	-0.0131***	-0.0061***
Primeducation	-0.2056***	0.0564***	-0.0381***	-0.0183***
Seceducation	-0.3563***	0.0872***	-0.0615***	-0.0247***
Colleguniversity	-0.4580***	0.1006***	-0.0733***	-0.0273***
Land tenure	-0.0941	0 .0263	- 0.0176	-0.0087
Household size	0.0912***	-0.0246***	0.0168***	0.0080***
Livestock own	-0.1467*	0.0416*	-0.0276*	-0.0140*
Seed subsidy	0.2511***	-0. 0737***	0.0479***	0.0258***
Fert subsidy	-0.3950***	0 .0903***	-0.0651***	-0.0252***
Soilmgtprac	-0.1380*	0.0381*	-0.0256*	-0.0125*

DISCUSSION

- Increase in income increases likelihood of being food secure- consistent with (Magaña-Lemus et al., 2016)
- Increase in asset value increases likelihood of household being food secure, reduces like hood of household being low food secure and likelihood to be very low food secure
  - Consistent with Abdullah et al., 2017 and Gezimu Gebre, 2012.
- Increase in age of household head reduces likelihood of household being food secure
- Consistent with Bashir et al., 2012 but Magaña-Lemus et al., 2016 and Abdullah et al., 2017 reported a positive relationship.
- Increase in household size reduces likelihood of household being food secure.
  - Consistent with most studies reviewed.

CONCLUSION AND POLICY IMPLICATIONS

- Income, assets, age, gender, and household size significantly influenced food security status of households.
- Government and all stakeholders should address gender parity so that women headed household can access resources.
- Interventions should target women, the elderly, adolescence, and children under five.
- Therefore, interventions focused on these factors need to get priority in order to improve food security status in Kenya.

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