



**Sorghum in the 21<sup>st</sup> Century**  
Cape Town, South Africa  
9 – 12 April 2018



# Determinants of Sorghum Producing Households' Expenditure and their Implications for Food Security in Western Kenya and Eastern Uganda

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Sorghum in the 21<sup>st</sup> Century Congress  
9-12 April 2018, Cape Town, South Africa



# Introduction

- ❖ Food and livelihood insecurity is a major problem in Eastern Africa, with a majority deriving their livelihoods from Agriculture
- ❖ In 2010, food hungry globally were 925 m with SSA accounting for 239 m. Out of this 18.5m were traceable to Kenya (FAO 2010).
- ❖ Poverty limits 20 % of Uganda's population of 39 million from accessing nutritious food, especially in the north and east of the country (WFP, 2018).
- ❖ Kenya and Uganda host more refugees than any other country in Africa, from South Sudan, DRC, Somalia and Congo, Burundi and Ethiopia worsening poverty



# Introduction

- ❖ Poverty is perpetuated and development is hampered where food insecurity exists.
- ❖ Poverty reduces capacity of households to access farm inputs & food and exposes households to poor health reducing their ability to engage in food production activities.
- ❖ Household expenditure is a good indicator of resource constraints households face in their endeavor to meet their needs.
- ❖ Most households spend their budgets on food, education, medicare, clothing and social events.



## Problem Statement

- ❖ Sorghum growing households in western Kenya and Eastern Uganda allocate their budgets to different needs, but budgetary constraints are common among them.
- ❖ To improve understanding of household budgetary allocation it is crucial to unpack key determinants of the allocation
- ❖ Even though previous efforts have examined, determinants of household expenditure, no effort has been made to evaluate such factors among sorghum producing households in western Kenya and Eastern Uganda



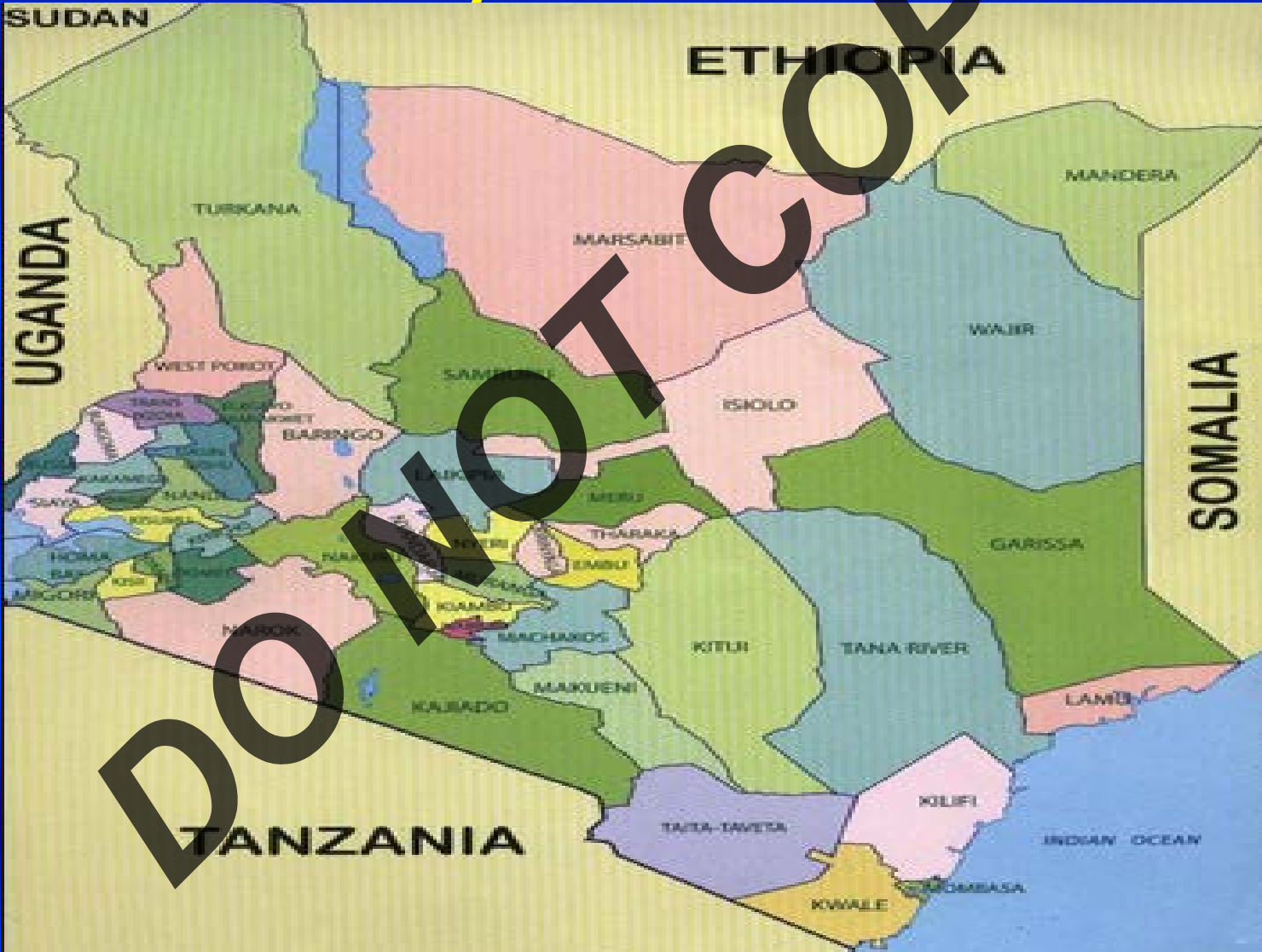


## Research Questions

- ❖ What is the socioeconomic profile of sorghum farmers in western Kenya and Eastern Uganda?
- ❖ what is the expenditure pattern of sorghum producing households in western Kenya and Eastern Uganda?
- ❖ What drives their expenditure pattern?
- ❖ What are their policy implications for food security among sorghum producing households in western Kenya and Eastern Uganda?



## Area of Study

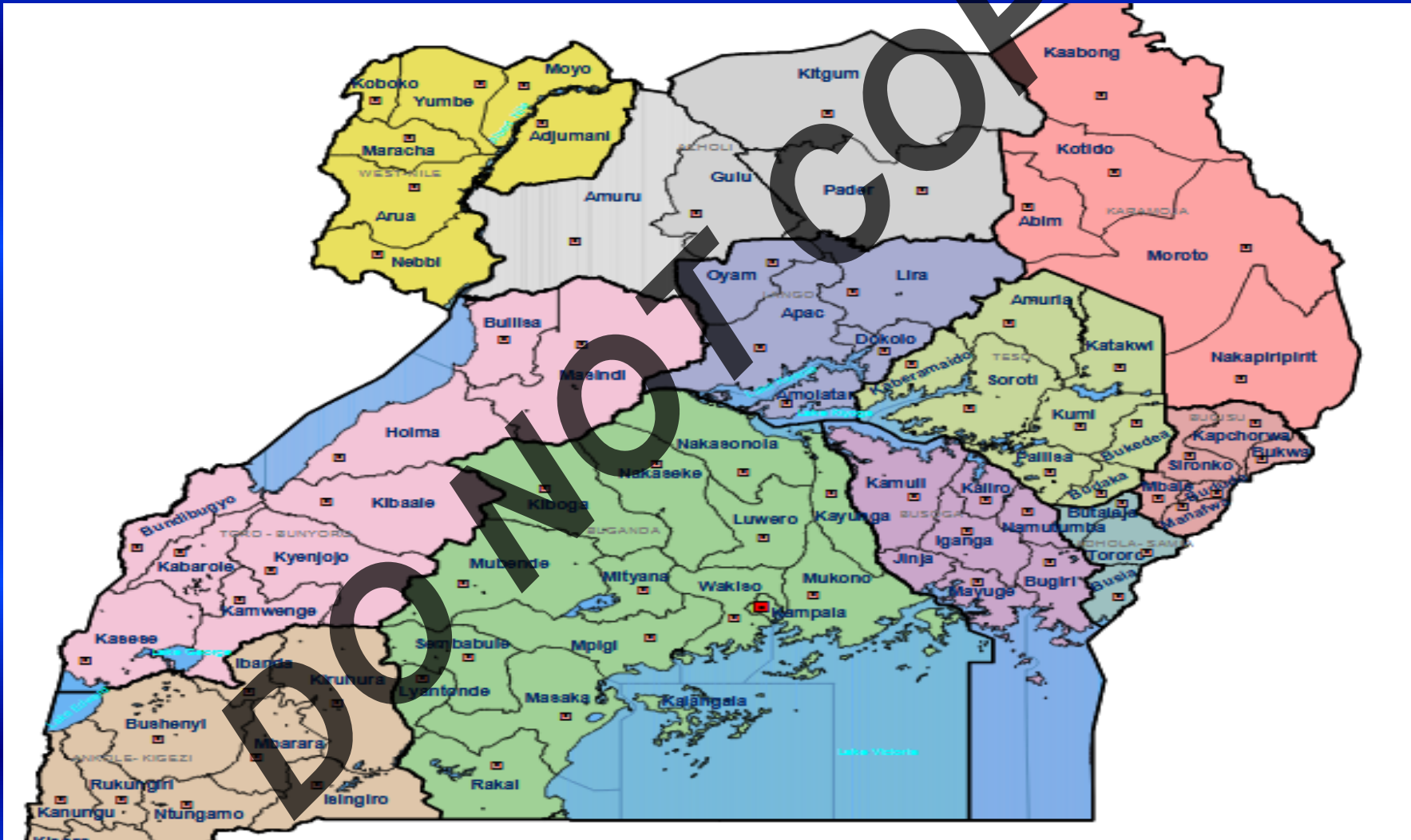




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## Area of Study



The boundaries and names shown on this map are liable for changes. OCHA disclaims liability for any inaccuracy. Uganda now has 81 districts as of July 2006.





## Methodology

- ❖ The study had 6 experimental sites located in 5 counties of western Kenya and 4 experimental sites located in 4 counties of Uganda
- ❖ Homabay, Migori, Busia, Kakamega and Siaya counties were selected from Kenya while Amuria, Kumi, Bukedea and Kanyum were selected in Uganda.
- ❖ Two sites were selected from Homabay County and one site each from the rest of the counties in western Kenya and eastern Uganda.
- ❖ Data included general demographics of respondents such as age, gender, education, marital status, household expenditure pattern.





## Methodology

- ❖ Cluster sampling used with sites being criterion for clustering.
- ❖ In each cluster a sample was selected proportional to pop. of sorghum farmers in selected sites.
- ❖ Farmers systematically selected
- ❖ Due to non-response and poor responses analyzable responses reduced to 210 in western Kenya and 152 in Eastern Uganda.
- ❖ Questionnaires, observation, and focused group discussions used to collect information from farmers.
- ❖ filled questionnaires uploaded to McKnight server.



## Data processing and analyses

- ❖ Coding of responses automatically generated by ODK software
- ❖ Data for six sites downloaded from McKnight server as excel spreadsheets, cleaned and imported into STATA software
- ❖ Further cleaning done in Stata to remove outliers, create consistency and test the integrity of the data
- ❖ Measures of central tendencies, dispersion, bar charts and cross tabulations used to analyze data
- ❖ Regression analysis was done to isolate determinants of expend. pattern of sorghum producing households



## Empirical Model Specification

- ❖ Considering a consumer whose expenditure function is  $e(u, p, z)$ , with targeted utility  $u$ ,  $p$  a vector of commodity prices and  $z$  a vector of individual characteristics, consumer's objective function is to minimize expenditure w.r.t to quantity,  $x$ , s.t. a targeted utility constraint  $u(x) = u$ .
- ❖ Following Deaton and Muellbauer (1986), income is expressed per capita using a simple headcount of household members and intercept augmented to allow for influence of household composition.

$$w = \alpha + \beta \ln \left( \frac{x}{n} \right) + \gamma z + \varepsilon$$



## Results and Discussion

**Table 1: Age of household heads**

Variable	Western Kenya				Eastern Uganda			
	N	Mean	Min	Max	N	Mean	Min	Max
Age(years)	210	49	20	100	149	44	18	84
Household size	210	6	1	17	146	8	2	23

**Tab 2: Education of respondents across sites**

Education	Western Kenya							Eastern Uganda				Total %
	Homabay %	Karungu %	Koyonzo %	Matayos %	Migori %	Sega %	Total %	Amuria %	Bukedea %	Kanyum %	Kumi %	
Pre-primary	2	22	0	22	18	23	16	3	9	1	7	21
Primary	72	59	71	42	62	60	60	21	19	5	13	58
Secondary	20	19	29	29	18	15	21	7	4	0	5	16
Post-secondary	7	0	0	7	2	3	4	1	1	0	3	5
<b>n</b>	<b>46</b>	<b>27</b>	<b>7</b>	<b>45</b>	<b>45</b>	<b>40</b>	<b>210</b>	<b>50</b>	<b>49</b>	<b>9</b>	<b>41</b>	<b>149</b>





## Results and Discussion

**Table 4: Gender Distribution across Sites**

Gender	Western Kenya							Eastern Uganda				
	Hbay %	karungu %	Koyonzo %	matayos %	Migori %	Sega %	Total %	Amuria %	Bukedea %	Kanyum %	Kumi %	Total %
Male	47.8	81.5	100	44.4	68.9	37.5	55.7	68	75	67	83	74
Female	52.2	18.5	0	55.6	31.1	62.5	44.3	32	25	33	17	26
<b>n</b>	<b>46</b>	<b>27</b>	<b>7</b>	<b>45</b>	<b>45</b>	<b>40</b>	<b>210</b>	<b>50</b>	<b>51</b>	<b>9</b>	<b>41</b>	<b>151</b>

**Table 5: Expenditure pattern among sorghum farmers**

Item	Western Kenya		Eastern Uganda	
	n	Annual expenditure(US\$)	n	Annual Expenditure (US\$ )
Food	210	523	147	346.62
Education	210	379	145	374.45
Medicare	210	85	144	280.57
Clothing	210	54	145	111.94
Social events	210	48	142	126.56
<b>Total</b>	<b>210</b>	<b>1,090</b>	<b>130</b>	<b>1,273.85</b>

## Results and Discussion

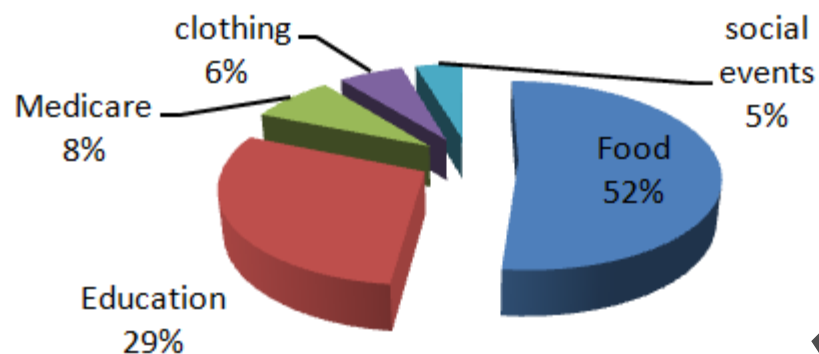


Fig 1a: Expenditure shares(W/Kenya)

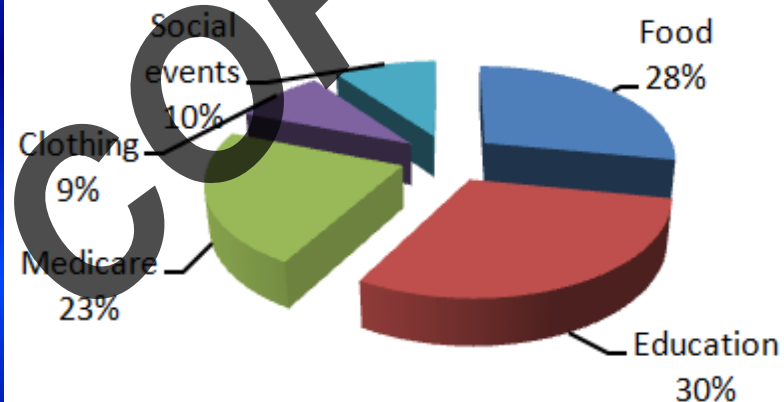


Fig 1b: Expenditure shares(E/Uganda)



## Results and Discussion

Table 6: Regression results of determinants of Expenditure share of sorghum producing households

item		Constant	$\ln w$	Age	Marital status	Education	Religion	gender	HHsize
		$\alpha_i$	$\beta_i$	$\gamma_{i1}$	$\gamma_{i2}$	$\gamma_{i3}$	$\gamma_{i4}$	$\gamma_{i5}$	$\gamma_{i6}$
Food	W/Kenya	1.0928 <sup>a</sup> (-0.2739)	<b>-0.0390<sup>b</sup></b> (-0.0209)	-0.0011 (-0.0011)	0.0240 (-0.0204)	-0.0283 (0.0230)	0.0077 (0.1457)	<b>-0.0645<sup>a</sup></b> (0.0323)	-0.0064 (0.0058)
	E/Uganda	0.8491 <sup>a</sup> (0.255)	-0.0249 (0.0183)	<b>-0.003<sup>a</sup></b> (0.0011)	0.0230 (0.0277)	0.0007 (-0.0217)	-0.0364 (0.0377)	-0.00127 (-0.0035)	<b>-0.0119<sup>a</sup></b> (0.00293)
Education	W/Kenya	-0.8130 <sup>a</sup> (0.2784)	<b>0.0876<sup>a</sup></b> (0.0212)	0.0012 (0.0011)	-0.0187 (0.0207)	0.0022 (0.0234)	-0.0346 (0.1481)	0.0294 (0.0328)	<b>0.0178<sup>a</sup></b> (0.0059)
	E/Uganda	-1.229 <sup>a</sup> (0.317)	<b>0.0788<sup>a</sup></b> (0.0228)	<b>0.00274<sup>b</sup></b> (0.00135)	-0.0346 (0.00437)	0.0298 (0.0269)	0.0856 (0.0344)	<b>0.0175<sup>a</sup></b> (0.0469)	<b>0.0154<sup>a</sup></b> (0.0036)
Medicare	W/Kenya	0.2736 <sup>a</sup> (0.1074)	<b>-0.0211<sup>a</sup></b> (0.0082)	-0.0002 (0.0004)	0.0061 (0.0080)	0.0087 (0.0090)	0.0258 (0.0571)	<b>0.0338<sup>a</sup></b> (0.0127)	-0.0020 (0.0023)
	E/Uganda	0.6654 <sup>b</sup> (0.287)	-0.0201 (0.0206)	<b>0.000919<sup>a</sup></b> (0.001222)	-0.0182 (0.0311)	<b>-0.0454<sup>b</sup></b> (0.0244)	-0.0047 (0.0424)	<b>-0.0107<sup>a</sup></b> (0.00395)	0.0004 (0.00329)
Clothing	W/Kenya	0.3127 <sup>a</sup> (0.0892)	<b>-0.0245<sup>a</sup></b> (0.0068)	-0.0001 (0.0003)	-0.0085 (0.0066)	<b>0.0157<sup>a</sup></b> (0.0075)	0.0249 (0.0475)	0.0054 (0.0105)	<b>-0.0032<sup>a</sup></b> (0.0019)
	E/Uganda	0.5553 <sup>a</sup> (0.1488)	<b>-0.0322<sup>a</sup></b> (0.0107)	-0.0005 (0.00063)	0.0005 (0.0161)	0.0147 (0.0126)	-0.0058 (0.0219)	-0.0031 (0.0021)	-0.00144 (0.00170)
Social events	W/Kenya	0.1339 (0.1057)	-0.0030 (0.0080)	0.0002 (0.00041)	-0.0029 (0.0079)	0.0017 (0.0089)	-0.0238 (0.0562)	-0.0042 (0.0125)	<b>-0.0062<sup>a</sup></b> (0.0023)
	E/Uganda	0.1593 (0.2053)	-0.00165 (0.0147)	-0.000109 (0.000874)	0.0294 (0.0223)	<b>0.000179<sup>a</sup></b> (0.01743)	-0.0386 (0.0303)	-0.00245 (0.0028)	-0.00249 (0.00235)
Total		1.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

S.E are in parentheses <sup>a</sup>-Significant at 5 percent, <sup>b</sup>-significant at 10 percent





## Conclusions

- ❖ Sorghum farmers in E/Uganda were younger and more active than counterparts in W/Kenya
- ❖ Household size was smaller in W/Kenya(6) than Eastern Uganda(8)
- ❖ Literacy levels among sorghum farmers were relatively high in both countries
- ❖ Male gender dominated sorghum farmers with a bigger bias in E/Uganda(74 %) than W/Kenya(56%).
- ❖ sorghum farmer in W/Kenya spend(\$ 1,090) less on basic necessities annually than Ugandan counterpart (US\$ 1,273)
- ❖ Food was most important budgetary item(52%) in W/Kenya, unlike Uganda where it accounted for 28%.
- ❖ income and gender key determinants of food expenditure in W/Kenya while age and site were critical in E/Uganda
- ❖ education expenditure was not only influenced by income and household size in both countries, but was also determined by age in Eastern Uganda.





## Conclusions

- ❖ Income and gender influenced expenditure on medicare in W/Kenya, unlike eastern Uganda where age, education and household size were critical factors
- Income, education and household size determined expenditure on clothing with variation in signs in western Kenya and eastern Uganda
- household size influenced expenditure on social events in W/Kenya, unlike eastern Uganda where education was critical



## Implications for food security

- ❖ Resolution of food insecurity among sorghum producing households requires addressing of both supply side and demand side constraints
- ❖ Boosting household income through alternative sources of livelihoods will reduce poverty and improve access to food
- ❖ Where there are gender responsive households, intra-household consultations are crucial in budgetary allocations to basic necessities
- ❖ Empowerment of sorghum farmers in W/Kenya and E/Uganda crucial for
  - ✓ accessing education which is key not only for addressing literacy levels, but opens new opportunities for cushioning households from food insecurity
  - ✓ Accessing farm inputs thus boosting farm level production of sorghum
- ❖ well endowed households spend less on medicare which is gender responsive, sensitive to household size and level of education and should be factored in medical programmes in the region. Healthy households will contribute more to productive effort
- ❖ Expenditure on social events dwindles as household size increases due to budgetary constraints and desire to meet the more basic necessities first



# Acknowledgement

- ❖ Moi University for permission to attend
- ❖ McKnight Foundation
- ❖ Local organizing committee
- ❖ Century City Conference Center
- ❖ All of you for listening
- ❖ THANK YOU