



# Report on a pilot study in Mukono District, Uganda, using the Household Economy Approach (HEA)

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August 2016





## Acknowledgements

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This study was conducted by Evidence for Development with partners from the HyCRISTAL rural livelihoods team, including:

Walker Institute, University of Reading

Gulu University, Uganda

Maseno University, Kenya

The HyCRISTAL project is funded by the UK Foreign, Commonwealth and Development Office (FCDO) and the UK Natural Environment Research Council (NERC), under the Future Climate for Africa (FCFA) programme.

We would like to thank all who generously gave their time to contribute to community discussions, workshops and planning sessions.

We would also like to thank funders for their generous support.

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*DOI 10.5281/zenodo.5113323*

## Introduction

This report gives an initial summary of the findings of a survey of household economy conducted in part of Mukono District Uganda<sup>1</sup>. The study is part of the HyCRISTAL (Integrating Hydro-Climate Science Into Policy Decisions for Climate-Resilient Infrastructure And Livelihoods In East Africa) project. HyCRISTAL is a multi-disciplinary and multi-agency FCDO (Foreign, Commonwealth and Development Office) and the UK Natural Environment Research Council (NERC) funded project under the Future Climate for Africa (FCFA) Programme. HyCRISTAL's main objective is to improve knowledge of East African climate change and its impacts to inform long-term decision-making in East Africa.

Mukono district is located approximately 30 km to the East of Kampala (Figure 1) on the route between Kampala and Jinja and was selected because of its proximity to Lake Victoria and to the location of a recently completed household economy village level survey, conducted using the Individual Household Method (IHM) (Petty, C. et al., 2016).

## Methodology

### The Household Economy Approach

The survey used the 'Household Economy Approach' (HEA). HEA is designed to allow short run predictions to be made of the impact of production, price and other year to year changes on the income and welfare of rural households. Data is collected for 'livelihood zones' (LZ), defined as areas in which the population have similar access to sources of income. Sampling is purposive, locations being selected to maximise expected variation in household economy within the LZ, e.g. proximity to urban areas which might provide additional work, water sources. Interviews are conducted in groups at community level to establish the wealth distribution, and with each 'wealth group' recognised by the community e.g., poor, middle etc, for a defined 'reference year' (usually the agricultural year immediately preceding the survey). Wealth group interviews collect data for a household 'typical' of the wealth group and include household asset holdings, a household budget and necessary supporting data (household membership, prices, additional source of income which households might exploit under conditions of economic stress, seasonality and the price of food and non-food goods). This data set can be used to model the expected impact of changed conditions on household income (Seaman, J.A., et al., 2014).

### Data collection

An HEA survey is usually preceded by a detailed field investigation of the livelihood zones (LZ), to confirm the LZ borders and to establish likely sources of economic variability within the zone (e.g. proximity to urban areas). Interview locations are selected to maximise the likely variation in

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<sup>1</sup> The survey was led by EFD associates James Acidri, Stella Ngoleka, Hosea Machuki, with support from Duncan Ongeng, Stephen Kalule and Eunice Achiro, of Gulu University. The work was directed by John Seaman and was also used to test new software designed by John Seaman for the analysis of HEA livelihood data.

livelihoods within the zone (e.g. locations close to rivers, urban areas). In this case time did not allow a preliminary survey of the area or field investigation. Livelihood zoning was conducted at a meeting of District officials with specialist knowledge of the area, including the District Agricultural Officer, the District Entomologist, the District Commercial Officer, the District Veterinary Officer and the Senior Fisheries Officer specialised knowledge of the area. Data was collected from 7 locations selected with the assistance of sub-county workers, to get as good a ‘spread’ as possible within the LZ (Figure 1).

Mukono District was divided into 6 zones (Figure 1) 1. A fishing zone, bordering the Lake 2. An adjacent area dominated by the production of Bananas/plantain, coffee and pigs. 3. An industrial zone, including Mukono Town and the corridor along the Jinja road. 4, 5 and 6, zones dominated by commercial fruit production, sugar cane and tea, and cassava and livestock.

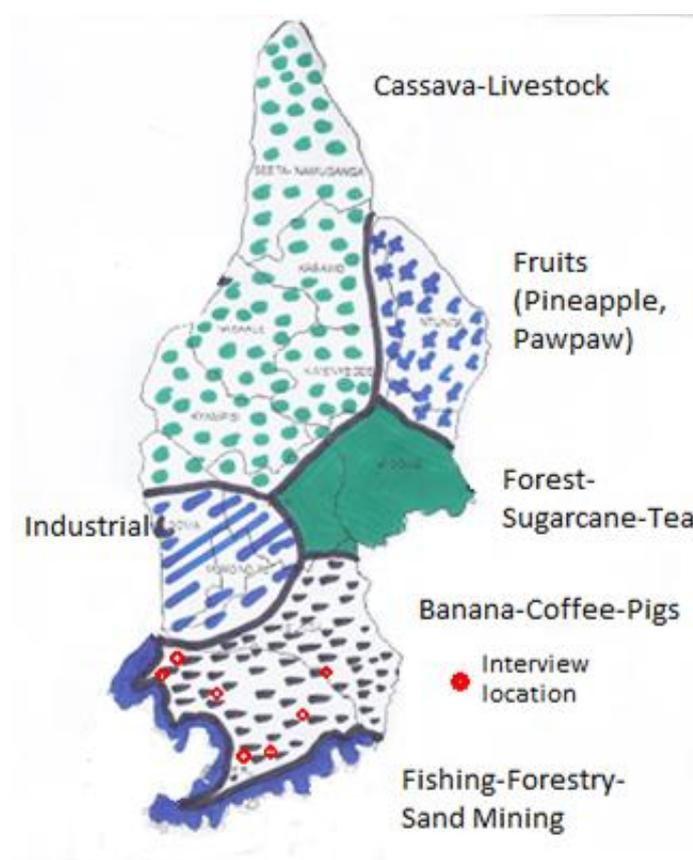
The ‘Banana-Coffee-Pigs’ Zone was selected for the survey as more detailed IHM data (Petty et al., 2016) had already been collected in the fisheries zone, and the zone is reasonably close to the Lake and although chiefly an agricultural area, might be expected to be influenced by the fishing economy.

**Figure 1.** Mukono District location (A) and zones (B)

A



B



The simplified dataset used for HEA was designed specifically for use in rural areas, and is based on the assumption that most households within a wealth group have access to the same potential

income sources (e.g. for the poor usually farming, agricultural labour, seasonal off-farm work). In urban and peri-urban areas where opportunities for work are more varied this assumption does not hold and HEA cannot be used e.g. at a given income level households may obtain income from a wide variety of occupations and it is impossible to establish a 'typical' household<sup>2</sup>.

Communities categorize 'wealth' as a function of productive capital, i.e. ownership of land, livestock and other productive assets, rather than the income obtained from these in any year. In the present study it was found in two wealth group interviews that a group that had been classified as 'Poor' by the community, on the basis of their assets, were achieving high returns from tomato and cassava sales. On this basis, one wealth group interview was reclassified from 'Poor' to 'Better – off'. Additionally, in two wealth group interviews substantial amounts of income were obtained from fishing, which is not typical of the zone and indicates that one sample point strayed into the margins of the fishing zone.

### Livelihoods in Mukono

The Banana-Coffee-Pigs (BCP) Zone is densely settled. There are two agricultural seasons of which the first (March to July Fig. 2.) is the most productive. Feeder roads within the zone are in poor condition.

The main crops cultivated are Plantain (Matooke), Bananas, Sweet Potatoes, Cassava, Coffee, Maize and Beans. Tomatoes are a high value crop for which there is a large urban demand. Vanilla, yam, cocoa, leafy vegetables (Amaranthus, dodo) and fruit (Jackfruit, Guava, Mango, Papaya, Avocado) are also cultivated. Cattle, pigs, goats and chickens are kept. Manure is used as fertiliser. No use of artificial fertiliser was recorded although pesticides/ fungicides are used for tomatoes and other commercial vegetable crops. Crops are affected by a variety of plant diseases (Coffee and Banana wilt, cassava mosaic, bean bacterial wilt, bean yellow mosaic virus).

### *Temperature and rainfall in Mukono*

In **Mukono**, the average annual temperature is 21.1 °C. In a year, the rainfall is 2015 mm (Climate Data.org)

## Results

The results of the survey have been presented by wealth group. This format is usually used as it minimises variation in the results within a livelihood Zone and is sufficient for most operational applications. The availability of software may allow more sophisticated analysis in due course.

### The wealth distribution

Three wealth groups were identified in community interviews, Poor, Middle and Better-off.

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<sup>2</sup> In these circumstances, household economy analysis should be conducted using the Individual Household Method (see Seaman J.A. et al., 2014, additional data).

Table 1 shows the average percentage of households in each wealth group, the range of estimates between interview locations and average household size. Local estimates of the proportion of the population in each wealth group varied widely between villages.<sup>3</sup>

*Table 1. Average household size and percentage in each wealth group*

Wealth Group	Poor	Middle	Better-Off
Average household size	4.2	6.3	6.3
Average % in wealth group	33	53	14
Range	10-47	32-62	7-23

### Asset holdings

Land holdings vary from 0- 8 acres per household. Livestock holdings are shown in Table 2.

*Table 2. Asset holdings by wealth group*

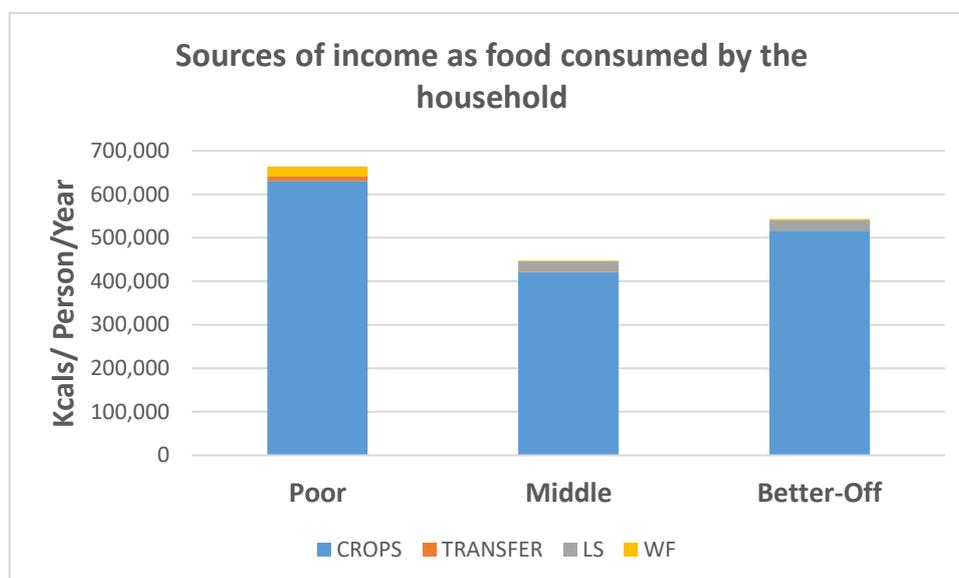
		Poor	Middle	Better-Off
		Number/ area per Person in wealth group		
LAND	Upland	0.01	0.20	0.44
	Upland-rented in	0.00	0.02	0.00
LIVESTOCK	Chicken	1.11	2.87	20.57
	Cattle	0.00	0.27	0.27
	Goats	0.08	0.39	2.86
	Pigs & piglets	0.96	1.44	1.47
OTHER	Hand tools (axe, panga, hoe)	0.00	0.00	0.17
	Bicycle	0.00	0.00	0.02
	Motorcycle	0.00	0.00	0.02
	Rental houses	0.00	0.00	0.04
	Spray pump	0.00	0.00	0.02

### Income

Note that food income (Figure 2, Table 3) is income in the form of food (from crop and livestock production, payment in food, transfers of food, wild foods) consumed by the household. A household may also sell food to obtain additional income (e.g. exchanging high value products such as meat, to meet school fees or other expenses) and purchase food when its own food income is insufficient, or to obtain preferred items, e.g. rice.

<sup>3</sup> For example in one location it was reported that some years ago many people had sold their land and moved to Kampala. Many of these returned having been unsuccessful and are now landless and reduced to working for and often living with better off households.

**Figure 2. Sources of food income: Crops, Transfers, Livestock (LS) and Wild Foods (WF)**



All wealth groups produce and consume most of the food needed to meet their energy requirement, assuming an average requirement of 2,100Kcal/ person/ day (WHO 1985)<sup>4</sup>. The poor, middle and Better-Off wealth groups meet 87%, 58% and 71% of their requirement respectively.

**Table 3. Sources of food income by wealth group**

	Poor	Middle	Better-Off	Poor	Middle	Better-Off
CROPS	Kcal/ Person			Percent of food requirement @ 2,100Kcal/ person/day		
Banana	25,778	12,997	47,673	3.36	1.70	6.22
Beans	11,611	26,248	43,388	1.51	3.42	5.66
Cassava	257,454	68,213	92,662	33.59	8.90	12.09
Dark green vegetables	0	713	0	0.00	0.09	0.00
Ground nut dry	2,316	13,372	0	0.30	1.74	0.00
Ground nuts green	0	610	0	0.00	0.08	0.00
Green beans	156	0	0	0.02	0.00	0.00
Maize	103,522	101,992	173,484	13.51	13.31	22.63
Green maize	13,995	3,440	4,906	1.83	0.45	0.64
Matoke	121,993	71,257	35,598	15.92	9.30	4.64
Sweet Potato	64,940	118,943	113,750	8.47	15.52	14.84
Tomato	0	2,236	2,183	0.00	0.29	0.28
Yams	28,824	850	2,468	3.76	0.11	0.32

<sup>4</sup> 2,100Kcal per person per day is an average of the individual energy requirements (men, women, children) of a population 'typical of a developing country' i.e. with a large proportion of young individuals.

<b>TOTAL</b>				82.27	54.91	67.33
<b>TRANSFERS</b>						
Banana from relative	2,578	0	0	0.34	0.00	0.00
Cassava from relative	4,080	0	0	0.53	0.00	0.00
Gifts from kin, bread	0	360	0	0.00	0.05	0.00
Rice	393	607	0	0.05	0.08	0.00
Sugar	444	686	0	0.06	0.09	0.00
Sweet potato from relative	3,040	0	0	0.40	0.00	0.00
<b>TOTAL</b>				1.37	0.22	0.00
<b>LIVESTOCK PRODUCTS</b>						
Chicken eggs	56	0	89	0.01	0.00	0.01
Cow milk	0	22,322	24,965	0.00	2.91	3.26
Pork	0	663	0	0.00	0.09	0.00
<b>TOTAL</b>				0.01	3.00	3.27
<b>WILD FOODS</b>						
Amaranthus	64	0	0	0.01	0.00	0.00
Avocado	4,840	0	0	0.63	0.00	0.00
Dark green leaves	907	0	120	0.12	0.00	0.02
Guava	0	0	480	0.00	0.00	0.06
Jackfruit	10,194	1,074	1,354	1.33	0.14	0.18
Mangoes	6,804	0	0	0.89	0.00	0.00
Nile Perch	0	0	521	0.00	0.00	0.07
Silver fish	0	408	0	0.00	0.05	0.00
Pawpaw	0	381	0	0.00	0.05	0.00
<b>TOTAL</b>				2.98	0.24	0.32

Transfers of food (Sweet potatoes, Cassava, rice, beans, meat, bread) are mostly received by the poor from relatives and neighbours. No employment was paid in food. 'Wild plant foods' include chiefly fruits from cultivated trees (Jackfruit, mango, avocado) and plants, the distinction from cultivated crops appears to be that these are common property, or the owner permitted collection (i.e. they are really transfers). Fish makes up only a very small proportion of food income.

### Sources of cash income

Crop sales account for about one third of all cash income among the better off wealth group with a large proportion of this accounted for by tomato, cassava and coffee sales (Figure 3 & Table 4). Paid employment is largely in agricultural and casual labour and brick making, a source of income chiefly for the poor. Off-farm work is largely found in brick making, charcoal burning, brewing, motorcycle taxis ('Boda boda'), retail and other trade and other small self-employment (Table 4). Surprisingly, given the proximity of the zone to urban areas no remittances from outside the area were recorded. Most crop sales are conducted with traders who visit the village or in local markets.

Figure 3. Sources of cash income

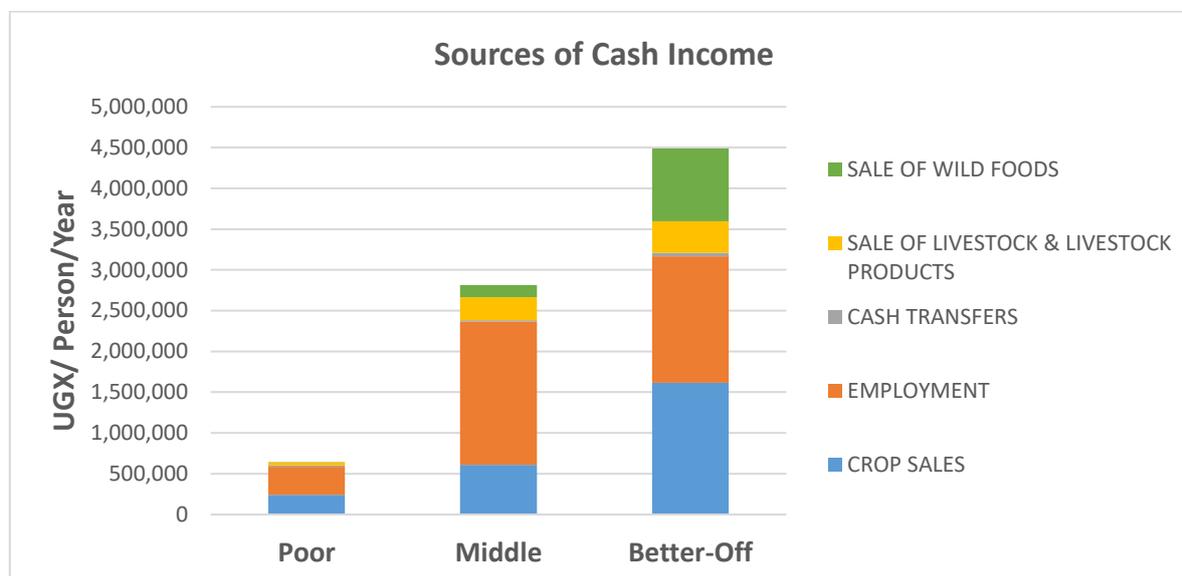


Table 4. Sources of cash income

	Poor	Middle	Better-Off	Poor	Middle	Better-Off
	Cash Income UGX/ Person			Percent of cash income		
<b>CROP SALES</b>						
Banana	0	20,204	39,000	0.0	0.7	0.9
Beans	4,000	14,612	33,968	0.6	0.5	0.8
Beans-Fresh	0	429	185	0.0	0.0	0.0
Cassava	43,944	33,882	114,014	6.8	1.2	2.5
Cocoa	5,333	0	0	0.8	0.0	0.0
Coconut	0	0	13,333	0.0	0.0	0.3
Coffee	61,001	127,436	75,331	9.5	4.5	1.7
Green maize	0	0	1,111	0.0	0.0	0.0
Ground nut dry	0	4,898	0	0.0	0.2	0.0
Maize	8,039	55,674	72,917	1.2	2.0	1.6
Matoke	55,333	32,286	112,381	8.6	1.1	2.5
Sweet Potato	30,556	29,924	52,262	4.7	1.1	1.2
Tomato	33,328	290,762	1,095,364	5.2	10.3	24.4
Yams	0	0	7,422	0.0	0.0	0.2
<b>TOTAL</b>	<b>241,535</b>	<b>610,106</b>	<b>1,617,289</b>	<b>37.5</b>	<b>21.7</b>	<b>36.0</b>
<b>EMPLOYMENT</b>						

Agricultural labour (harvesting, land clearing, slashing, weeding)	185,667	31,143	0	28.9	1.1	0.0
Alcohol selling	21,926	0	0	3.4	0.0	0.0
Boda Boda	0	387,010	148,919	0.0	13.8	3.3
Brick Laying	16,778	0	0	2.6	0.0	0.0
Brick Making	33,889	217,143	77,778	5.3	7.7	1.7
Brick sales	0	0	105,278	0.0	0.0	2.3
Cake/chapati sales	16,178	349,762	0	2.5	12.4	0.0
Causal labour	7,667	0	0	1.2	0.0	0.0
Charcoal sales	889	1,810	167,659	0.1	0.1	3.7
Craft material sales	7,111	0	0	1.1	0.0	0.0
Firewood sales	3,259	0	33,333	0.5	0.0	0.7
fishing	16,833	61,905	470,476	2.6	2.2	10.5
House rental	0	19,592	63,889	0.0	0.7	1.4
Mat making and other crafts	28,000	0	20,000	4.4	0.0	0.4
Pretty Trade	0	0	26,667	0.0	0.0	0.6
Retail shop	0	276,408	113,333	0.0	9.8	2.5
Sand mining	0	0	10,000	0.0	0.0	0.2
Stone quarrying	6,667	21,429	46,667	1.0	0.8	1.0
Teacher	0	177,143	0	0.0	6.3	0.0
Trade in fish, crops, livestock	0	215,211	266,667	0.0	7.7	5.9
<b>TOTAL</b>	<b>344,863</b>	<b>1,758,554</b>	<b>1,550,665</b>	<b>53.6</b>	<b>62.5</b>	<b>34.5</b>
<b>TRANSFERS</b>						
Cash from relative	9,315	14,898	41,976	1.4	0.5	0.9
Remittance from husband	5,556	0	0	0.9	0.0	0.0
<b>TOTAL</b>	<b>14,870</b>	<b>14,898</b>	<b>41,976</b>	<b>2.3</b>	<b>0.5</b>	<b>0.9</b>
<b>SALE OF LIVESTOCK &amp; LIVESTOCK PRODUCTS</b>						
Bull livesale	0	23,810	0	0.0	0.8	0.0
Sale of chicken eggs	0	0	338	0.0	0.0	0.0
Chicken livesale	4,096	23,510	53,672	0.6	0.8	1.2
Chicken meat	0	714	0	0.0	0.0	0.0
Cow livesale	0	23,810	46,032	0.0	0.8	1.0
Sale of cow milk	0	52,864	73,595	0.0	1.9	1.6
Goat livesale	370	11,964	87,269	0.1	0.4	1.9
Pig livesale	35,556	139,497	126,614	5.5	5.0	2.8
Sale of pig meat	0	7,143	0	0.0	0.3	0.0
<b>TOTAL</b>	<b>40,022</b>	<b>283,312</b>	<b>387,520</b>	<b>6.2</b>	<b>10.1</b>	<b>8.6</b>
<b>SALE OF WILD FOODS</b>						
Avocado	533	0	0	0.1	0.0	0.0
Egg Plants	440	0	0	0.1	0.0	0.0
Jackfruit	1,067	0	0	0.2	0.0	0.0
Nile Perch	0	117,551	843,333	0.0	4.2	18.8

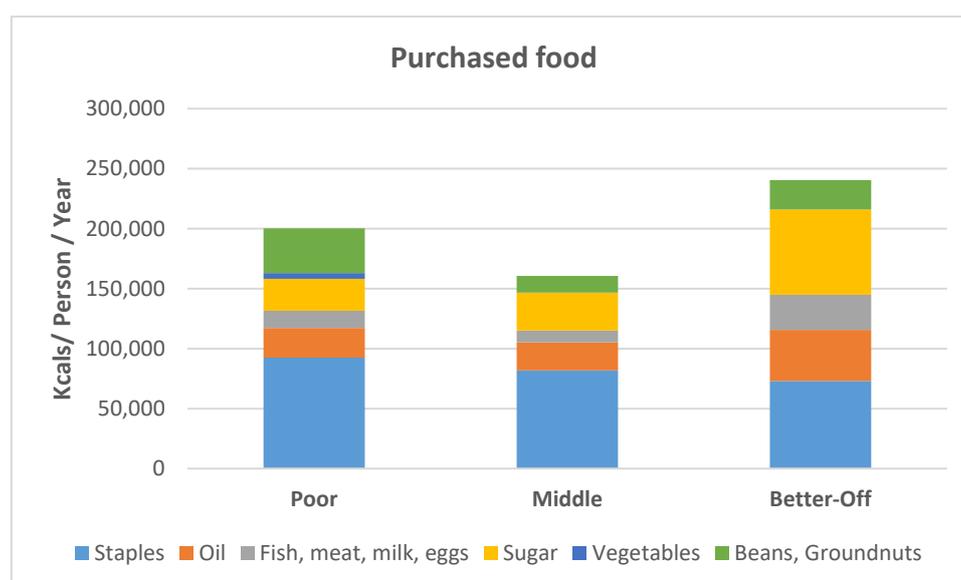
Silver fish	0	22,857	0	0.0	0.8	0.0
Tilapia	0	5,000	49,875	0.0	0.2	1.1
<b>TOTAL</b>	2,040	145,408	893,208	0.3	5.2	19.9

The sale of fish is accounted for by two fishing households with very large income from this source. No other wealth group had fishing income.

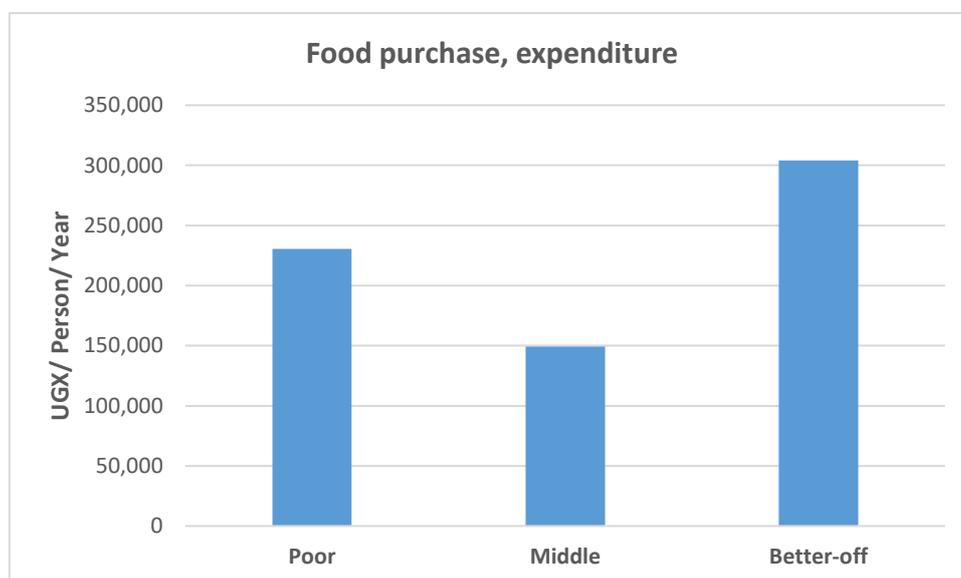
### Expenditure

Average food purchase (kcal) is shown in Figures 4 and 5. Staples include maize, banana, cassava, bread, macaroni, Irish potatoes and rice.

*Figure 4. Purchased food, Kcals/ Person/Year*



**Figure 5. Purchased food, UGX/ Person/Year**



### Disposable Income

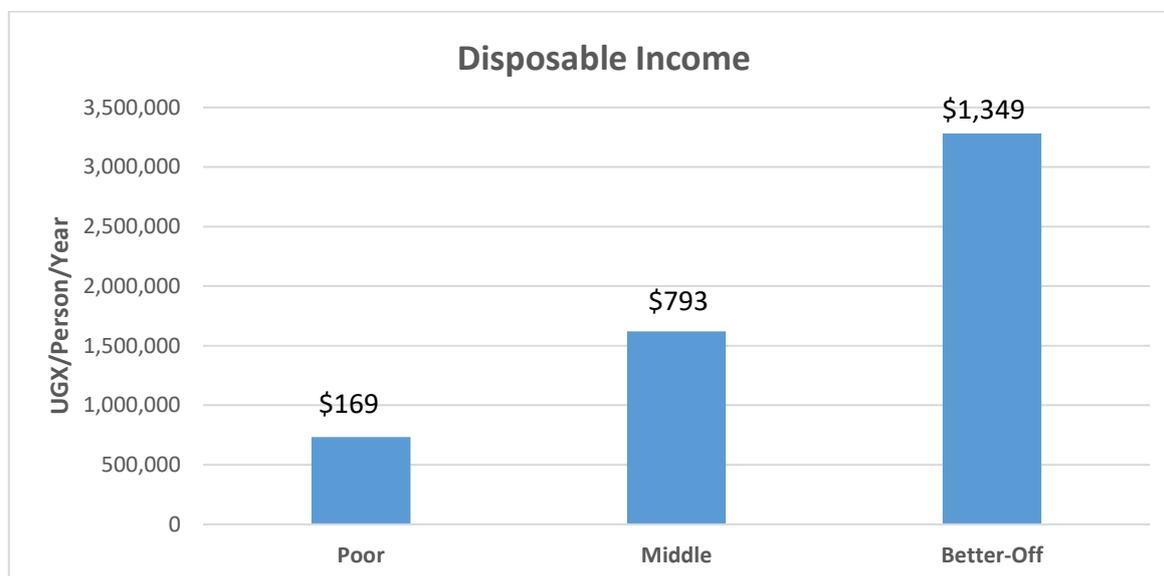
Figure 6 shows ‘disposable income’ by wealth group. This measure provides an estimate of the purchasing power of a wealth group and is defined as the money remaining to the wealth group after this has satisfied its food energy requirement from its own food income (Fig. 2) and where this is insufficient by purchasing food at a set price.

In this case purchased food has been set using the foods shown in Table 5 at the average prices recorded on the survey. This approximates the pattern of food expenditure of the poor wealth group.

**Table 5. Food purchase**

Table 5.	
Food purchased	% of expenditure
Maize Meal	24
Cooking oil	17
Sugar	17
Groundnuts	13
Rice	13
Cassava flour	7
Irish potatoes	5
Beans	4

**Figure 6. Disposable income by wealth group**



For scale, these values approximate to an average per person per year of US\$169 for the poor, UD\$793 for the middle, US\$1,349 for the better-off after food energy requirements have been met.

### Modelling the Impact of Change

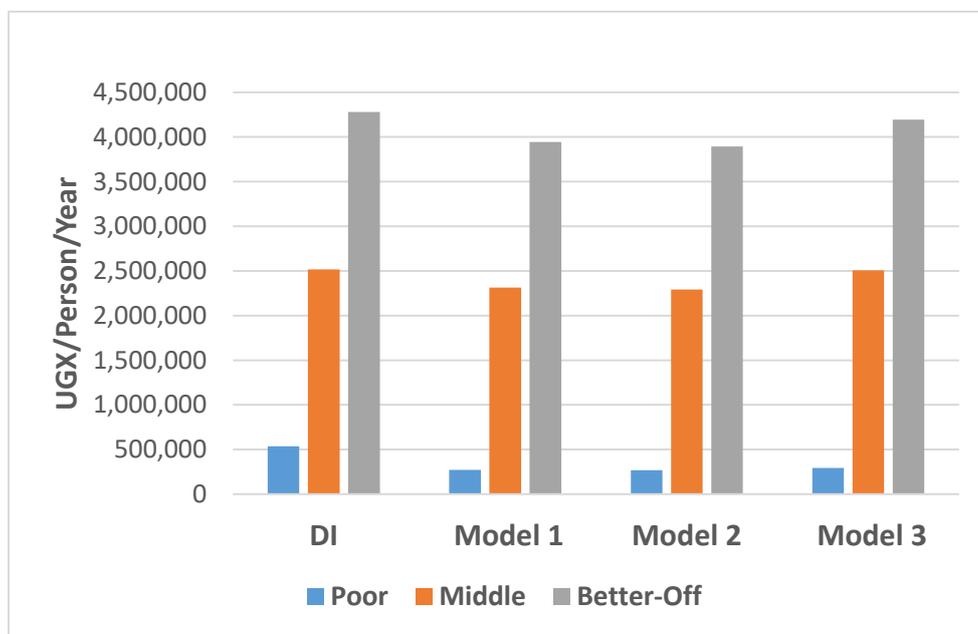
HEA was designed to allow short term predictions of the impact of changed conditions on household income and welfare. Given information on an actual or expected change in a) agricultural or other production, b) off-farm economic activities, and c) the price of all goods sold or purchased by households, an estimate can be made of the impact of this on household income and the ability of the household to meet its food and defined non-food (clothing, health care etc.) requirements. The ability of the household to ‘cope’ with any change can be estimated by factoring in additional income which the household could obtain from livestock sales, transfers, wild foods etc.

The main assumption in this model is that the pattern of income sources in the year in which the prediction is made is the same, or reasonably similar, to those in the reference year. Prediction for longer periods is problematic because under changed conditions, for instance following climate change, households would be expected to change their pattern of economic activity and this assumption will not hold. It is also impossible, given the many variables involved (e.g. changes in international prices, new technologies, population growth) to estimate how economic opportunities will change in future.

For illustration, three simple simulations are shown in Figure 8 and in Table 6. Model 1 shows a 50% reduction in staple crop production (cassava, maize, sweet potato, yam) and sales assuming that prices do not change. Model 2 shows a 50% reduction in the production of all crops assuming an

increase in food crop sale and retail prices of 50%. Model 3. Shows the same simulation as in 2 but assuming that households sell livestock to compensate for lost income and higher food prices

*Figure 7. Three model simulations showing the impact on Disposable Income (DI) by wealth group*



*Table 6. Simulations showing Disposable Income by wealth group, details*

	Disposable Income	Model 1	Model 2	Model 3
<b>Uganda Shillings</b>				
<b>Poor</b>	536,639	272,277	267,258	291,665
<b>Middle</b>	2,518,620	2,313,630	2,293,890	2,506,350
<b>Better-Off</b>	4,282,290	3,944,410	3,892,860	4,196,070

The middle and better-off groups are least affected by the crop failure and price increase and can largely compensate for lost income by livestock sales. The poor are severely affected, losing about half of their income.

## Discussion

Livelihoods in the Banana-Coffee-Pig zone depend mainly on agriculture with some additional income obtained from off-farm work that includes brick making, charcoal burning, brewing, motorcycle taxis ('Boda boda'), retail and other types of trade. Paid employment is largely from agricultural and casual labour and from brick making, which are sources of income chiefly for the poor. Given the proximity of the zone to urban areas it is notable that few remittances from outside the area were recorded.

In relation to income from agriculture, crop sales account for about one third of all cash income for all wealth groups, with a large proportion of this accounted for by tomato, cassava, matoke and coffee sales. Sale of live pigs and chickens accounted for most of the income from the livestock sales, while seasonal brick-making and agricultural labour were the main sources of income from employment.

Despite being adjacent to the lakeshore fishing zone, income from fishing activities accounted for only a very small proportion of food and cash income, as was the case with income from remittances.

Household incomes are primarily dependent on crop sales and employment. The modelling exercise shows how hazards affecting crop price and production would affect different wealth groups and highlights the exposure of the poor to increased market prices. Similarly, climate or other shocks affecting the demand for agricultural labour and/or brick making and construction would have a disproportionate impact on the poor. In the case of a major income shock, little support is available to these households. Government does not currently provide support to households, remittance income is low and whilst churches may provide some assistance, this is limited to church members. The main fall backs, or coping strategies, are the sale of livestock and migration out of the area for work.

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