WORKING PAPER: 10

Livelihood Zones & Household Economy Approach (HEA) Survey Report, Homa Bay County, Kenya

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Acknowledgements

The Livelihood Zoning (LZ) Workshop and Household Economy Approach (HEA) survey was led by Dr. John Seaman from Evidence for Development (EfD) and EfD Associates,, James Acidri and Hosea Machuki. The survey was conducted in collaboration with the main partners, the Homa Bay County Government (Government of Kenya (GoK)), and Practical Action/Maseno University , as part of the HyCRISTAL (Integrating Hydro-Climate Science Into Policy Decisions for Climate-Resilient Infrastructure And Livelihoods In East Africa**)** project.

Special thanks are extended to staff of the County Government and Maseno University, especially Mr. John Owor and students who helped with translation during field work data collection process. We hope this report will provide part of the information required for monitoring climate conditions and household food and livelihood security in Homa-Bay County.

This document is an output from the HyCRISTAL rural pilot study.

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Introduction

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..[1]

This study was conducted in one rural part of Homa Bay County with the aim of gaining a better understanding of the potential impact of changed climatic conditions on people's livelihoods and the policy decisions required to mitigate these.

Methodology

The methodology used for the survey is the Household Economy Approach (HEA), a well-established operational method designed to rapidly obtain a quantitative description of an economy in a defined area (a 'livelihood zone', LZ), to allow modelling of the vulnerability (and resilience) of household income to exogenous shocks. The method involves four steps: Step 1. The livelihood zones within the area county are established. A LZ is defined as an area in which households have access to similar economic opportunities. In this context, where agriculture is the dominant economic activity an LZ is similar to an agroeconomic zone. Step 2. For each LZ, additional Information is obtained on probable variation in economy within the LZ e.g. better access to paid work, water etc. Step 3. A sample is drawn from each LZ. Samples are purposive and are selected to maximise the expected variation between sample sites (e.g. by selecting areas close to water, towns where work may be available). Step 4. At each sample site, two interviews are conducted: (i) a 'community interview' to establish the wealth groups recognised at each location, the approximate proportion of population in each wealth group, and the productive assets and main economic activities of each group; and (ii) an interview with each identified wealth group to establish the income obtained from different sources by a typical household of defined household membership in that group.

Livelihood zones for Homa Bay County

Homa Bay County covers an area of 4,267.1 Km^2 including 16 islands in South Western Kenya adjacent to Lake Victoria. It borders Kisumu and Siaya Counties to the North, Kisii and Nyamira Counties to the East, Migori County to the South and the Republic of Uganda to the West. Fishing and agriculture are the main economic activities in the county with sand mining on parts of the lake shore and brick making in some local areas.

The livelihood zones in the County were established in the following way:

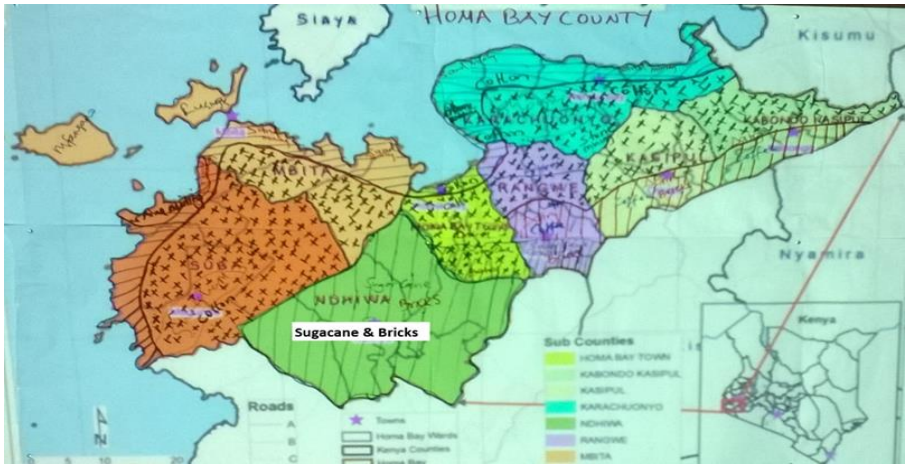
1) Some basic information on the geography, climatology, demographics, agriculture, livestock, markets, etc. was obtained from secondary sources.

[1] http://www.walker.ac.uk/projects/hycristal-integrating-hydro-climate-science-into-policy-decisions-for-climate-resilient-infrastructure-and-livelihoods-in-east-africa/

2) A workshop was organized with Homa Bay County representatives (Annex 1) with specialized knowledge e.g. on agriculture, livestock, markets, at which the livelihood zones were established.

Four livelihood zones were identified (Figure 1). Three of these ('Lake Shore Fishing', the 'Sand Mining and Stone Quarry Zone', the 'Central Cotton and Sorghum Zone' and the 'Eastern Plateau Coffee and Dairy Farming Zone') are described in ANNEX 4. The fourth zone, the 'Southern Valley Sugar Cane and Brick Making Zone' was selected for the survey, chiefly because this was the only zone which was accessible in the short time available.

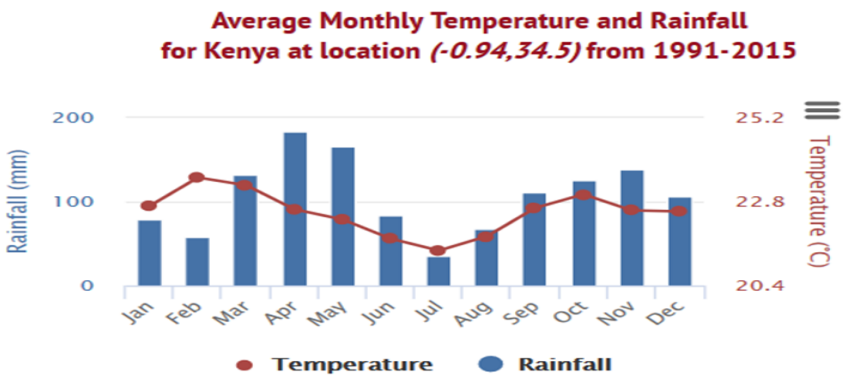
Figure 1. Livelihood zones in Homa Bay County. Sugar Cane and Bricks LZ highlighted



The 'Southern Valley Sugar Cane and Brick Making Zone'

This zone mainly lies within Ndhiwa Sub County and upper parts of Homa bay and Rangwe sub counties. The zone is an agricultural rainfed area receiving 1,200 mm of rainfall per annum and is characterized by hills and valleys. The soils are fertile clay loam. A main tarmac road connects Ndhiwa sub country with Homa Bay town and Kisumu. Feeder roads are unsurfaced which creates difficulties with access in the rainy season. Rainfall is bimodal with peaks in April/May and October/ November (Figure 2).

Figure 2. Rainfall and temperature by month.

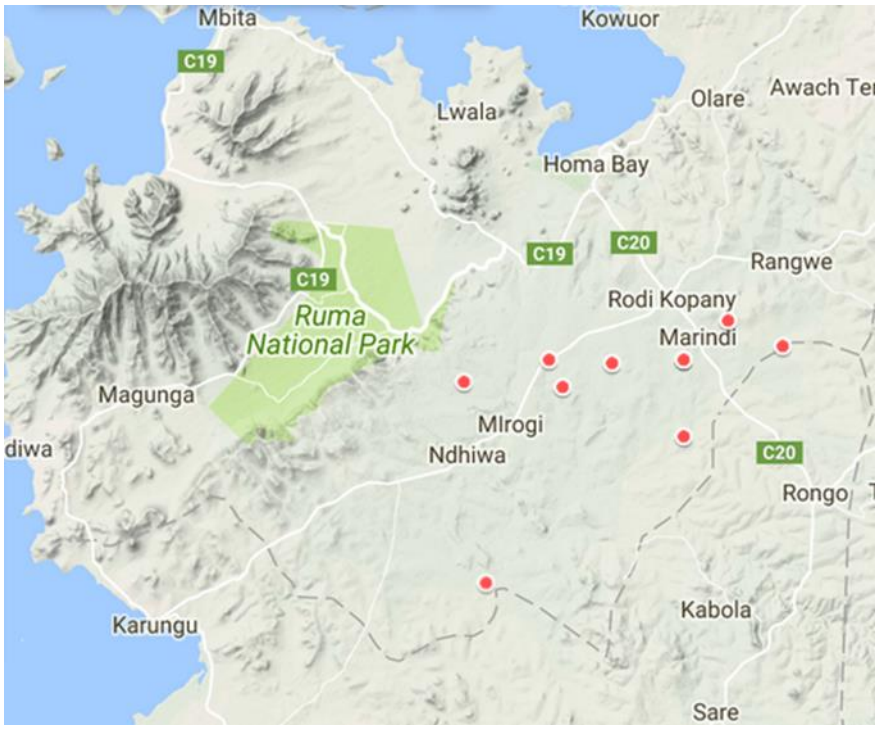


Source: World Bank Climate Change Portal

9 locations were selected for Community and Household interviews (Figure 3).

The survey was conducted during the rainy season which created difficulties with access. The settlement pattern is dispersed, rather than in villages and most interviews were conducted at primary schools. Figure 3 shows the location of interview sites.

Figure 3. Location of survey sites



Description of the rural economy

The economy of the Southern Valley Sugarcane and Brick Making Zone is primarily based on agriculture. The crops grown include maize, beans, sugarcane, millet, groundnuts, cowpeas, sweet potatoes, cassava, sorghum, and a variety of vegetables (chiefly kale and onions grown on domestic plots) and occasional other crops e.g. pumpkins. Trees, mainly Eucalyptus, are cultivated in field margins and are a cash crop. Napier grass is grown as a fodder crop by some households. Two maize crops are cultivated each year. The seasonality of crop and wild food harvests, livestock products and employment income are given in Annex 3.

Sugarcane offers three advantages. Once established (which taKsh 18 months) it is resistant to climate variability, has low requirements for labour and fertiliser and it can be harvested at any time of the year when cash is required. Sugarcane is processed into raw sugar cones in smaller quantities in village crushers, can be sold as stalks to local traders, or for large quantities to contractors who will harvest and transport cane to the sugar factory in Ndhiwa Sub County for onward transportation to Rodi and Homa Bay

Most households use animal manure for fertiliser. Artificial fertiliser is used by a minority of households. In general crop yields are 2-3 times higher with artificial inputs than without fertilizer

application (Annex 2). Subsidised fertiliser is available although the process of acquiring this is said to be complicated and few farmers apply.

Army worm infestation of maize is endemic and in the survey year (2018) is projected to lead to substantial (estimated at 40%) maize losses.

Cattle (mostly local breeds), goats, sheep and poultry (chiefly chickens) are kept by most households. Chicken losses to disease are high as poorer households do not vaccinate their birds, mainly because of the cost of obtaining vaccines.

Most off-farm employment is agricultural work on larger local landholdings, although in some areas better paid unskilled and semi-skilled work is available, e.g. in sugar cane processing, trade (in maize and other food crops, livestock and clothes), retail shops, skilled occupations including teaching, hairdressing, and medical work and formal employment e.g. Government work, the police and army. Most agricultural and other unskilled employment is found within the zone, with a minority of people finding work outside the area e.g. in Kisumu, Nairobi and beyond. The availability of agricultural work and to some extent rates of pay appear to vary significantly within the area, with in some areas migrant workers entering the LZ from Kisii.

Wild plant foods are scarcely available as little wild land remains. Guavas, which self-seed, are abundant in May and June and are consumed in large quantities.

In bad/crisis years poor households compensate for lost income by livestock sales, migrating to find work in the sugarcane plantations and factory within Ndhiwa, to work in stone quarries and fishing within the county, to the tea estates in Kericho, or to Homabay, Kisumu, Nairobi and other urban areas to work as security guards, in construction or in providing "boda, boda" (motorcycle) transport.

People over 70 years of age qualify for an old age pension. Few people actually receive this as the process of application is complicated and costly, e.g. in one interview participants were aware of 2 recipients in the entire village.

Wealth Groups

Communities identified three wealth groups, Poor, Middle and Better-off, making up (averaged between community interviews) 44%, 42%, and 14% of the households in each wealth group respectively. In addition, there is a ‘super rich’ category, a very small number of households who are clearly very well off, e.g. with substantial modern houses and large landholdings. No attempt was made to interview this group as they derive their income largely from different sources (e.g. a senior official in the national Government) although as larger landholders they play a significant role in the economy in providing employment to poorer households.

The reference period identified and applied during fieldwork data collection was May 2016 – June 2017. The month of May is when majority of households normally start green maize consumption.

Asset holdings

Figures 4 and 5, show average land holdings and other productive assets such as livestock for the three wealth groups recorded from each wealth group and community interviews respectively.

Figure 4. Average land holdings per person, for each wealth group

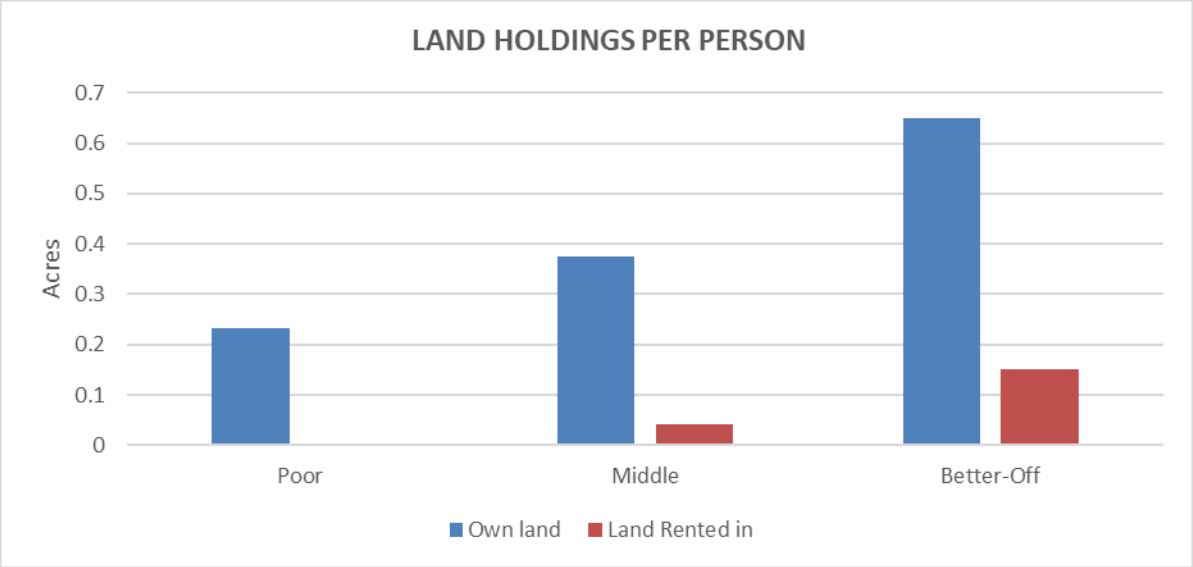
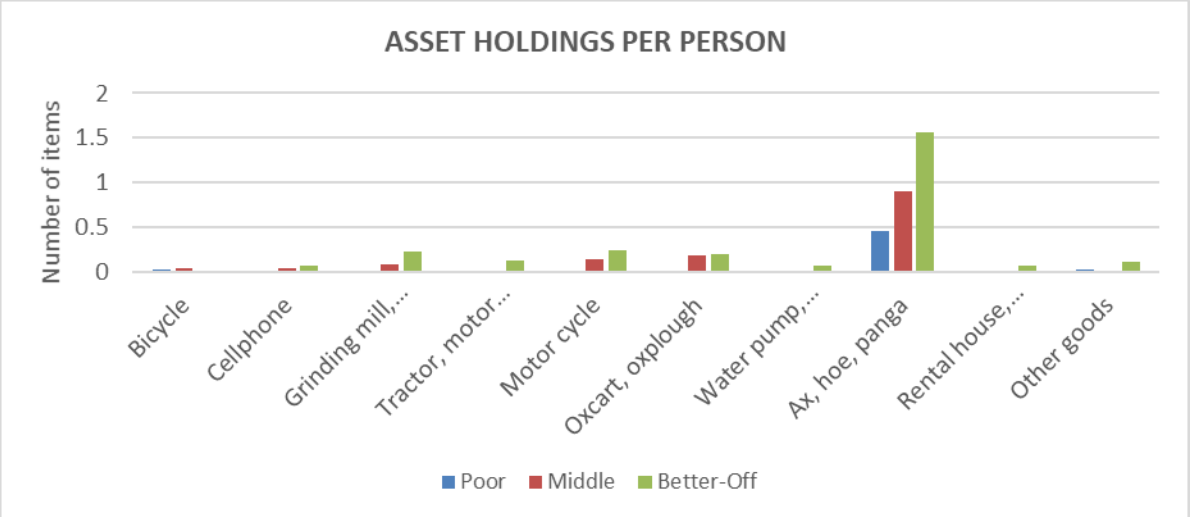


Figure 5. Average asset holdings per person, for each wealth group



Household income

Results from the wealth group interviews are presented as (i) income obtained in the form of food and retained for consumption by the household (Figures 6 and 7); (ii) income as cash (Figures 8 and 9) and (iii) 'Disposable income', discussed below.

The results are averaged for each wealth group.

Most food income is obtained from crops produced by the household. Only the Better-off group meet the set requirement (approximately 766,500 kcals per person per year @ 2,100Kcals/person /day) from their food income. Poor households cover around a 40% of their requirements from food income and middle households around 70% of their requirements.

Figure 6. Main sources of income as food

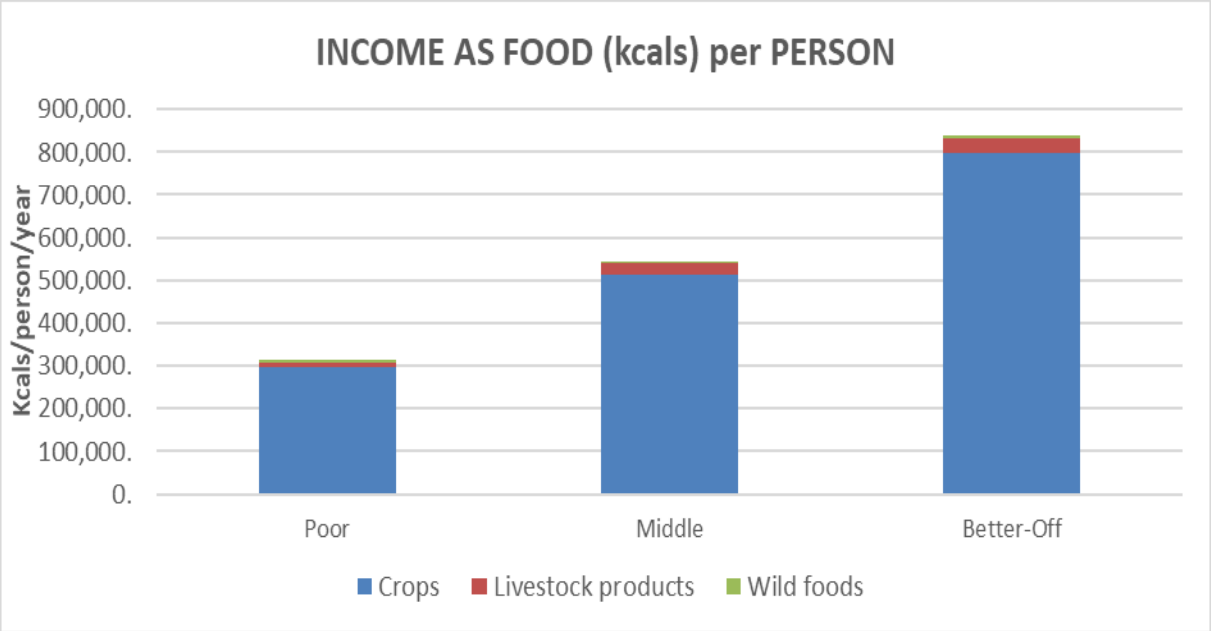
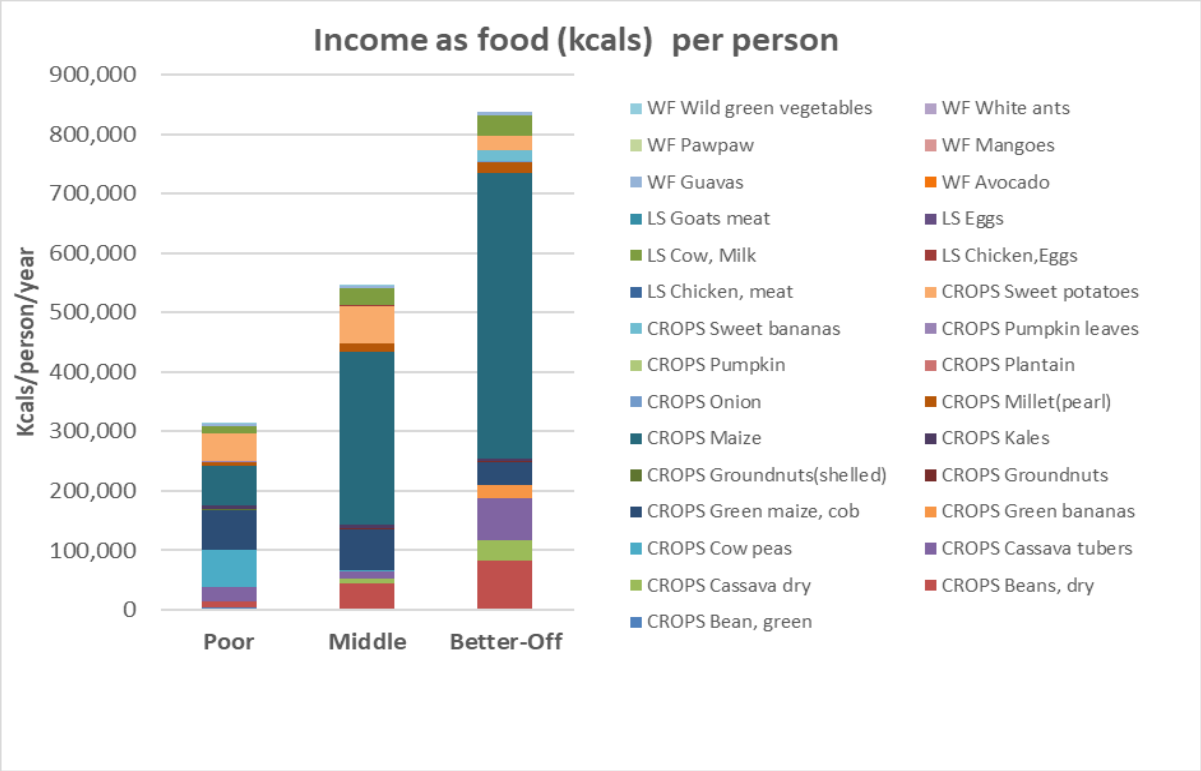
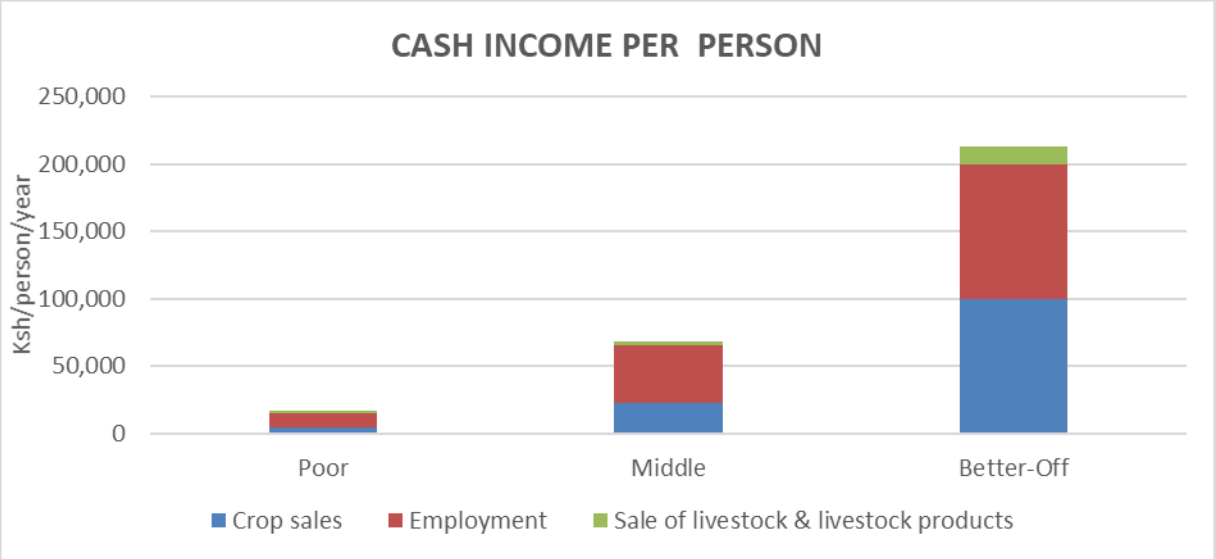


Figure 7. Income as food, detailed



Figures 8 and 9 show the main sources of household cash income. Employment is a major source of income for all wealth groups. Income from the sale of crops and livestock products is mainly from better off households.

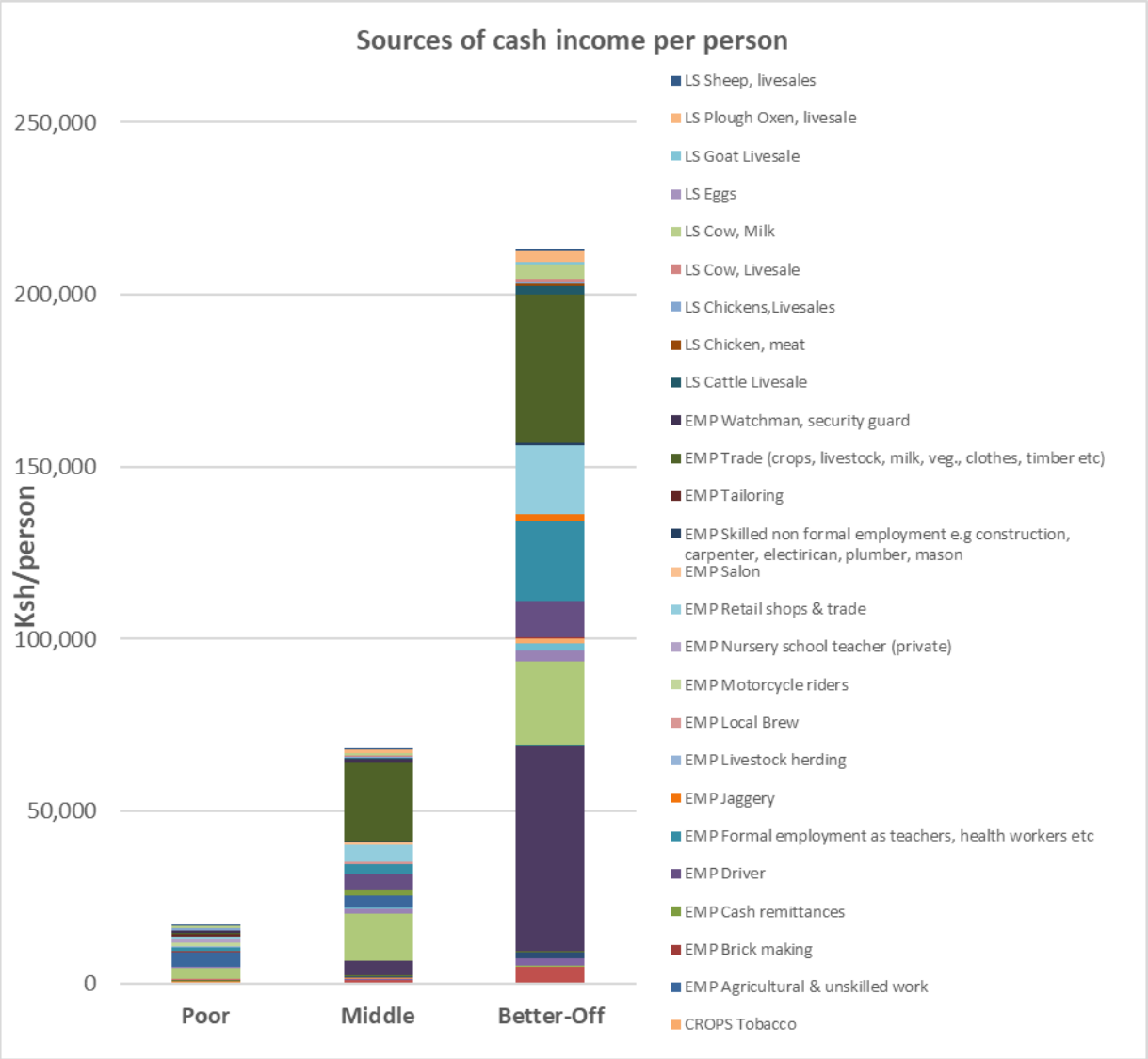
Figure 8: Main sources of income as cash



Cash income sources are further disaggregated in Figure 9. Poorer households rely mainly on agricultural work for their cash income. Trade and more highly skilled employment Middle and

better off households gain income from trade, more highly skilled employment and sale of crops and livestock products.

Figure 9: Income as cash, detailed



Disposable income

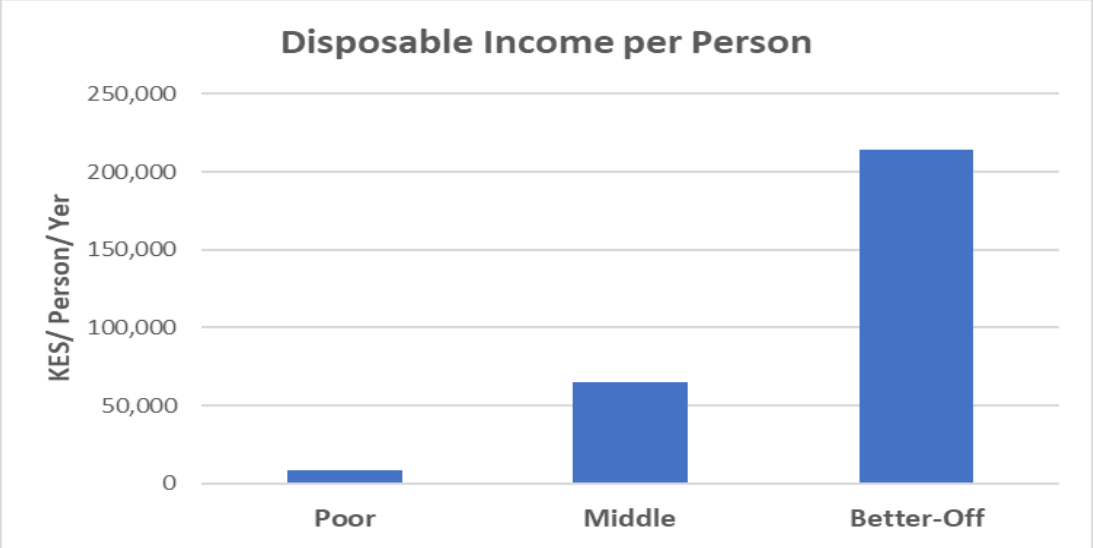
Disposable income is defined as the money remaining to the household after it has met is food requirement from its own food income, and, where this is insufficient to meet its requirement, by food purchase. Average disposable income per person for each wealth group is shown in Figure 10.

In this example:

1. Household requirement is calculated as 2,100Kcal per person per day.
2. Any deficit in household food income relative to requirement is met by purchase of a diet (derived from recorded expenditure per person by poor households) of maize

90% @KSH35, cooking oil 6% @ KSH170, sugar 3% @ KSH120, small fish 1% @KSH 180.

Figure 10: Annual Disposable Income per person



The standard of living

Grouped data has the limitation that it allows only a crude estimate of income poverty, i.e. the ability of a household to afford sufficient food and clothes, fuel, education costs and other necessary non-food goods. In this case we estimated the cost of a basket of goods per person which would allow a household a very basic standard of living. Information was derived from expenditure data recorded in group interviews representative of the 'middle income' household. Items are shown in Table 1

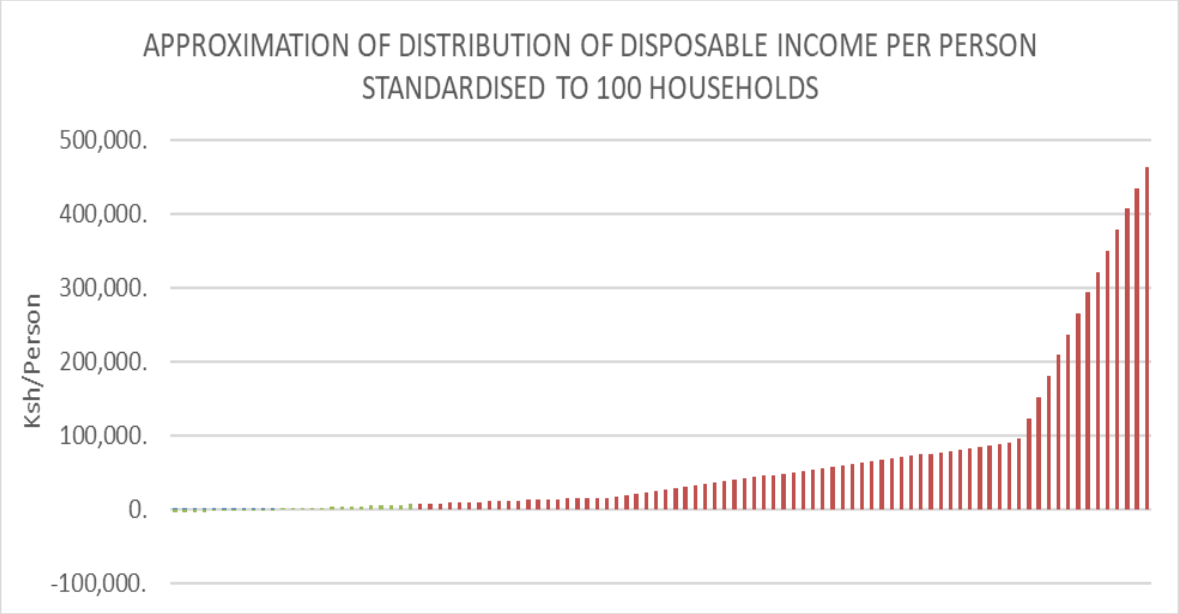
Table 1: Expenditure on minimum 'standard of living' items

Expenditure Items	**Ksh per person/year**
Clothes	900
Community obligations	250
Kerosene	600
Primary education costs	4,000
Salt	100
Soap	1,000
Matches	100
Total	**6,950**

By this measure on average the poor group (DI/person = KSH 8,778) is just above the standard of living threshold.

Figure 11 expands the data using a straight line fit to approximate the wealth distribution. The lower and upper values (Y axis) of each straight line were set using the lowest and highest values for the 9 interviews with the lowest, middle and highest disposable income. The length (x axis) of each line is proportional to the average proportion of households recorded in community interviews (44% poorest, 42% middle and 14% Better-Off). Households in the lowest 25% would be unable to afford the set standard of living threshold.

Fig 11 Approximation of disposable income distribution



Discussion

Livelihoods in this zone depend chiefly on agriculture with some additional income obtained from agricultural and migrant labour, self-employment chiefly in hairdressing and other service occupations and to a much lesser extent salaried employment.

Household incomes are primarily determined by land and livestock holdings, access to veterinary and other agricultural services, fertiliser and other inputs. Poorer households are those with smaller land holdings, the fewest livestock, the least use of vaccines, pesticides and fertilizer, have the least access to markets (sugar is the only commodity with an organised village level market infrastructure) and restricted access to fodder. Absolute poverty (defined by the ability to afford sufficient food and a minimum basket for goods) is estimated by this survey at approximately 25% of the population. However, it was clear from discussion that a larger group struggle to meet expenses, the difficulty in meeting school fees, which are due at set points during the year being a recurrent theme. Households actively manage their cash flow by the sale of sugar, livestock and in some cases the payment of school fees in maize. Sale of food crops. In the case of a major income shock little support is available: with the exception of a small number of recipients of the old age pension, the

Government does not provide support. Churches may provide some limited assistance to church members. The main fall backs, or coping strategies, are the sale of livestock and migrant labour.

Annex 1: PARTICIPANTS

Participants in the HEA survey.

County Officials who participated in the livelihood zoning workshop

S/NO	NAME	DEPARTMENT
1	Zacharia Oluoch	Health
2	Amimo Elizabeth	Social services
3	Pensiano O. Odidi	Forestry
4	Jared O. Apuko	Cooperatives
5	Philips Agwanda	Fisheries
6	Judith Akinyi	Planning
7	Martin Wafula	Water and environment

Students who participated in the fieldwork data collection as translators

1	Wycliff Akello Awuor
2.	Raphael Wanga Ali
3.	Marylyn Apondi Oyieke
4.	Kennedy Otieno Oloo
5.	Brenda Adhiambo Oluoch
6.	Andrew Otieno Aura
7	Joan Akoth Ojijo
8	Ivonne Awuor Mugah

Annex 2: Crop yields/inputs & markets

Yields (with and without Input application)

Crops	Land size	Input Application	No Input Application
Maize	1 acre	15 bags x 90Kg	5 bags x 90Kg
Beans	1 acre	3 bags x 90Kg	20kg
Sugarcane	1 acre	70 Metric Tones	30 Metric Tones
Millet	1 acre	8 bags x 90Kg	3 bags x 90Kg
Green vegetables	1 acre	12 bags x 90Kg	6 bags x 90Kg
Groundnuts	1 acre	Not Applicable	7 bags x 90Kg
Sweet potatoes	1 acre	Not Applicable	12 bags x 90Kg
Cassava	1 acre	Not Applicable	20 bags x 90 Kg

Land rental prices

- 1 acre for maize, beans and groundnuts costs 1,000 KSH per season.
- 1 acre for cassava costs 10,000 KSH per annum.
- 1 acre for sugarcane costs 20,000KSH over 5-year period.

Average month of lactation is about 6 months high yield and another 6 months half milk production per cow. The average daily milk production is 2 litres during peak season and 1 litre towards end of the season.

Commodity prices in the 2016/17 reference year, compared with 2018:

Commodity	***Market***	***Price in 2016***	***Price in 2018***
Crops			
Sugarcane	*Ndhiwa* *Nairobi*	*1.5 Kg @ 80KSH* *90Kg @ 5,000KSH*	*1Kg @ 40 KSH* *90Kg @ 4,000KSH*
Maize	*Local*	*1 Kg @ 25 KSH*	*1Kg @ 30 KSH*
Beans	*Local*	*1 Kg @100 KSH*	*1 Kg @ 100 KSH*
Groundnuts	*Local*		*1Kg @ 350 KSH*
Millet	*Local*		*1Kg @50KSH*

Sweet potatoes	*Local*	*1 Kg @ 40 KSH*	*1Kg @ 50 KSH*
Cassava- tubers	*Local*		*5 pieces @ 50KSH*
Cassava flour	*Local*		*1 Kg @ 40KSH*
Kales	*Local*		*10-12 leaves @ 5KSH*
Livestock			
Cow	*Local*	*20,000-25,000 KSH*	*18,000-20,000 KSH*
Bull	*Local*	*30,000-40,000 KSH*	*22,000-25,000 KSH*
Goat	*Local*	*3,000-4,000 KSH*	*2,000-3,000 KSH*
Sheep	*Local*	*3,500 KSH*	*2,500 KSH*
Chicken (hens)	*Local*	*400 KSH*	*200 KSH*
Chicken (Cocks)	*Local*	*700 KSH*	*500 KSH*

Annex 3: Seasonality

CROPS												
Month	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
	Percent of crop											
Green maize, cob	0	0	0	0	0	25	25	0	0	0	25	25
Maize	15	0	0	0	0	0	25	25	0	0	0	35
Kales	3	3	10	10	10	10	10	10	10	10	10	4
Tomatoes	25	0	0	0	0	0	0	50	0	0	0	25
Pumpkin leaves	0	0	0	25	25	0	0	0	0	0	25	25
Cabbages	25	25	0	0	0	0	25	0	0	0	25	0
Groundnuts	15	0	0	0	0	15	35	0	0	0	15	20
Sweet potatoes	15	10	0	15	15	0	0	0	0	15	15	15
Green beans	0	0	0	0	20	30	0	0	0	0	20	30
Cassava	10	10	8	8	8	8	8	8	8	8	8	8
Cowpeas	3	3	10	10	10	10	10	10	10	10	10	4
Millet	0	0	0	0	0	0	100	0	0	0	0	0
Potatoes	0	0	0	25	25	0	0	0	0	0	25	25
Sugar cane	0	0	0	15	15	15	15	0	0	15	15	10

LIVESTOCK PRODUCTS												
Month	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
	Percent of production											
Eggs	10	10	8	8	8	8	8	8	8	8	8	8
Meat	10	10	8	8	8	8	8	8	8	8	8	8
Cow, Milk	5	5	5	10	10	10	10	5	10	10	10	10
Chicken	8	8	8	8	8	8	8	8	8	8	10	10
EMPLOYMENT												
Month	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**

	Percent of income											
Company Worker	10	8	8	8	8	8	8	8	8	8	8	10
Businessman	10	10	8	8	8	8	8	8	8	8	8	8
Formal employment as teachers, health workers etc	10	10	8	8	8	8	8	8	8	8	8	8
Asset rental income	10	8	8	8	8	8	8	8	8	8	8	10
Salon	10	10	8	8	8	8	8	8	8	8	8	8
Cash remittances	10	10	8	8	8	8	8	8	8	8	8	8
Sugar cane crashing	35	25	0	0	0	0	0	15	0	0	0	25
Brick making	10	10	8	8	8	8	8	8	8	8	8	8
Motorcycle riders	10	10	0	20	20	0	0	0	10	10	10	10
Agricultural Labour	10	10	8	8	8	8	8	8	8	8	8	8
Government Worker	10	10	8	8	8	8	8	8	8	8	8	8
Mechanic	10	8	8	8	8	8	8	8	8	8	8	10
Retail trade	10	8	8	8	8	8	8	8	8	8	8	10
Selling Livestock	20	20	0	0	0	0	20	20	0	0	0	20
Selling Maize	10	10	8	8	8	8	8	8	8	8	8	8
Selling Vegetables	10	10	8	8	8	8	8	8	8	8	8	8
Skilled construction labor	10	10	8	8	8	8	8	8	8	8	8	8
Skilled non-formal employment e.g construction works	10	10	8	8	8	8	8	8	8	8	8	8
Teacher	10	10	8	8	8	8	8	8	8	8	8	8
WILD FOODS												
Month	**J**	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**
	Percent of production											
Guava	0	0	0	0	50	25	0	0	0	0	0	0
Mango	0	0	0	0	75	25	0	0	0	0	0	0
Green vegetables	0	0	25	0	25	25	0	0	0	0	0	0

TRANSFERS												
Month	J	F	M	A	M	J	J	A	S	O	N	D
	Percent of transfers received											
Cash from relative	10	8	8	8	8	8	8	8	8	8	8	10

Annex 4: Livelihood zones

1. Lake Shore Fishing, Sandmining And Stone Quarry Zone

This zone is a commercial fishing area. It covers parts of Suba, Mbita, Homa Bay, Town, Rangwe and Karachuonyo sub counties of Homa Bay County. The area is characterized by rainfed subsistence and irrigated horticulture farming. This zone has mountainous terrain with lake shore and riverine grassland vegetation. The soils are fertile and comprised of sandy soils. The main economic activities in this zone are fishing, commercial sand mining and stone quarries along the lake shoreline. Maize, sorghum, beans, vegetables and fruits are cultivated and cattle, goats, sheep, poultry are kept for consumption and sale.

The main markets in this zone include Kenya Breweries for local sorghum and other local markets for food crops. Household incomes are constrained by bad roads which limit market access. Local off farm employment is chiefly within the area (estimated at) 85% and 15% outside the zone. The main hazards to livelihoods include water hyacinth which affects fishing, strong winds during the rainy season, a high prevalence of HIV/AIDs among the fishing population and crop pests and diseases during peak agricultural seasons.

Coping strategies include migrant labor, cash remittances and the sale of livestock.

2. Central Cotton and Sorghum Zone

This zone is in the central part of Homa Bay County and crosses the entire county including Suba, Mbita, parts of Homa Bay Town, Rangwe and parts of Karachuonyo. This zone is composed of mixed soils (sandy and clay). The average rainfall during peak season is about 500-700mm per annum with two agricultural seasons (February to June and September to October). The economy is based mainly on rainfed agriculture (maize, potatoes, groundnuts, beans, vegetables, cotton, sorghum and sunflower). Livestock sales (local cattle, goats, sheep and poultry are an important source of income). Other economic activities include stone quarries and pit mining sand for construction.

Market access is relatively good compared with neighbouring zones and much production is sold in Kisumu. Livestock and livestock products are mainly sold in the local markets in Homa Bay County. The good access to markets has positive impact on household incomes in the zone with most off farm labour employed within the zone.

The main risks to livelihoods in this zone include dry spells, crops pests, livestock and crop diseases, most of which almost occur every year. The main coping strategies are migration and the sale of livestock.

3. Eastern Plateau Coffee and Dairy Farming Zone

This zone is located in eastern part of Homa Bay County, mainly in Kasipul and Kaboono sub counties and parts of Rangwe Sub County. This zone is composed of mixed soils (sandy and clay), with average rainfall during peak season of about 500-700mm per annum. The soils are fertile with a

peak season from April-September. The population density is high, with an average land holding of 1.5-3 hectares. The most important economic activities are tourism, poultry farming and to some extent brick molding. The main food crops cultivated include maize, sweet potatoes, beans and vegetables. Cash crops include coffee, maize, potatoes and sunflower. Livestock include cattle, goats, sheep and poultry.

Market access is relatively good and most local production (maize, sweet potatoes and pineapples) are sold in Kasipul, Ogugis and Homa Bay. Livestock are traded in Kasipul, Kissi and Nyamura. Off farm work is found mainly (estimated at 70%) within the zone with 30% outside the area.

The main risks to livelihoods in the zone include crop and livestock diseases, HIV/AIDs, hail stones and wild animals.