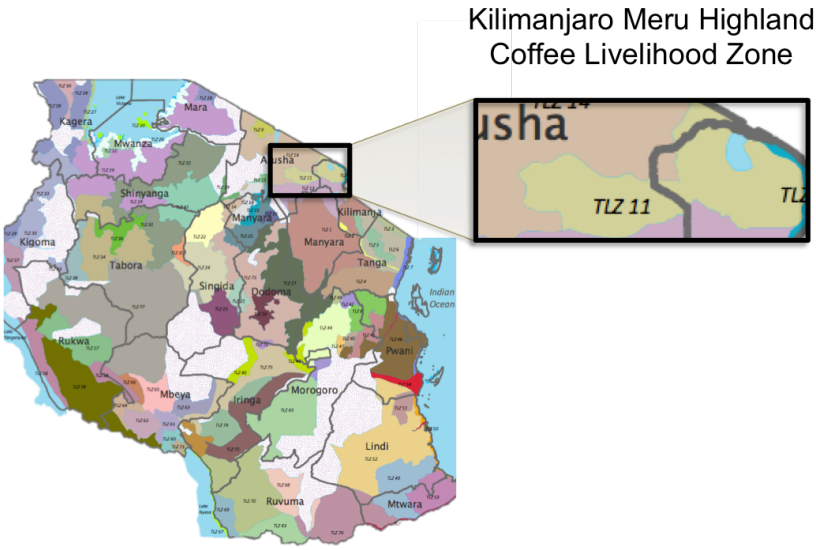
Tanzania Livelihood Baseline Profile

Kilimanjaro Meru Highland Coffee Livelihood Zone (TLZ 11)

October, 2014[1]

Zone Description

The *Kilimanjaro Meru Highland Coffee Zone* takes its name from the two famous mountains found here: Mount Kilimanjaro and Mount Meru. The zone is located in Kilimanjaro and Arusha regions and covers 7 districts, namely: Mwanga, Rombo, Moshi, Hai, Siha, and Same (Kilimanjaro Region), and Arumeru (Arusha Region). This is a highland area characterised by forest, bush and undulating plains. Rivers and mountain springs feed into Lake Kisanjuni. The volcanic soils are fertile for agriculture; the plains provide pasture and browse for livestock; the forests provide timber for sale; and the lakes and rivers provide fish. There is also some gypsum quarrying in the region.



Overall, this is a relatively fertile zone that supports a range of crops. The principal food and cash crops include maize, beans, bananas, avocados and coffee. The zone is densely populated with an estimated 124.2 people per square kilometre[2]. Consequently, land sizes are relatively small. The economy of the zone is based principally on mixed farming. Soils are relatively fertile and total annual rainfall ranges from 1,000 mm to 2,000 mm. Temperatures vary from a low of 15°C for the months of April to August to a high of 30°C in January and February. There are two distinct rainy seasons: the long rainy season (*Masika*) from March to May followed by the short rainy season (*Vuli*) from October to January. This bimodal pattern of rainfall yields two important cultivation seasons. Maize and beans are the staple food crops grown during both seasons and supplemented by fruit, yam, vegetables and sunflowers. Farmers also grow cash crops, namely, coffee, bananas and avocados. In the highlands, crops are sown and weeded by hand using hoe cultivation. Tractors are used in the lowlands outside of the zone by those wealthier households who have the capital to rent in additional land. To increase cash crop yields, there are improved seed varieties of coffee as well as improved varieties of banana seedlings. However, households must pay cash or take on the risk of credit in order to access them. Similarly, households with some cash savings use chemical fertiliser and/or manure to boost crop production. Wealthier households also hire additional local labour (both male and female workers) to weed maize and harvest coffee. Several pests and diseases are chronic problems for local farmers. Coffee leaf rust and coffee berry disease reduce coffee output. Banana plants also frequently suffer from leaf rust. The main disease affecting maize crops is leaf necrosis.

Livestock herds are relatively small in this highland zone. High population density as well as the hilly terrain create

[1] Fieldwork for the current profile was undertaken in August 2014. The information presented in this profile refers to the reference

[2] Population density (number of people per square km) in the zone is highly variable as the following data show: (i) Moshi District – 272.5; (ii) Mwanga District: 49.8; (iii) Hai – 208.2; (iv) Rombo District – 181.0; (v) Siha District – 100.4. It should be noted that only parts of these districts fall in the *Kilimanjaro Meru Highland Coffee Zone* (conversely, there is more than 1 livelihood zone in each district).

grazing shortages and inhibit large cattle herd sizes. Hence free grazing is somewhat restricted and many livestock are stall fed. Households provide supplementary feed such as sunflower cakes and crop residues to their stock in addition to the local pasture and browse. This results in relatively high milk yields for wealthier households. During the reference year, their cows produced 4 litres per day per cow. Water is usually sourced freely from mountain springs and rivers. Only in Lambo (Mwanga) do households pay for water for their livestock. Cattle are mainly kept for dairy whereas shoats, chicken and pigs are slaughtered for meat at festivals. All livestock are sold for cash income, as are hides, skins, eggs and milk. Ticks (and tick borne diseases such as Rift Valley Fever) chronically affect cattle in the area. Poultry and pigs also affected with diseases such as swine fever and fowl pox. There are vaccinations available for these diseases as well as cattle sprays against ticks. However, access requires sufficient capital.

The zone has reasonably good availability of essential services. On the whole, households have access to safe and clean water for domestic use and livestock use from natural canals or from other sources. The exception is some parts of Mwanga District where households face problems of water access. Sanitation control in the villages is through permanent latrines. Moreover, health dispensaries are for the most part available at village level. Children from all wealth groups go to local schools and in general complete both a primary and secondary education. Electricity is provided to villages in this zone. Wealthier households also have back-up generators in case of power outages. The mobile phone network coverage in this part of the country is reasonably good. Consequently, most households, including poorer households, own 1-2 mobile phones. Credit and savings facilities are provided to villagers through Village Community Banks (VICOBA) as well as through SACCOS. There are several international organisations working in this zone, including: Children Care; CARE International; World Vision; FAIDIKA; FINCA; and BRAC.

Markets

The transport network in this zone is considered relatively good. Most roads are all season tarmac which encourages year round trade. As the zone is located relatively close to larger urban centres such as Moshi, Arusha and Boma Ng'ombe, this proximity helps to ensure that the road infrastructure is kept in fairly good condition. There is an important road artery crossing through the zone, namely the Arusha-Dar es Salaam all season road that runs via the Moshi-Taveta Road (which is also an all-season road). In addition, the Moshi-Arusha railway provides further transport opportunities. Currently, the other railway line, the Moshi-Tanga Railway, is not operational.

Coffee, fruit and labour are the key commodities sold and exchanged in the zone. Of these, coffee is the principal export crop. Coffee is first collected and sorted at local or regional cooperative societies. Coffee that meets export grade is sold internationally through the Tanzania Coffee Board. Coffee is typically brought from the cooperative societies to Dar es Salaam where it is packaged and exported to Europe. The season for coffee marketing is May to December.

Bananas and avocados are mainly destined for local markets within the zone or to major urban centres outside the zone. Both men and women engage in selling fruit. Bananas are typically sold throughout the year either at weekly local markets or at a stall just outside of the trader`s hut. Bananas and avocados are also sold in nearby urban centres such as Moshi, Arusha and Boma Ng'ombe. In addition, large quantities of fruit are taken by truck by large-scale traders to Dar es Salaam where the city market offers higher prices and greater demand. Avocados have a more defined season running from April to August.

Households also sell sheep, goats and poultry. Local farmers sell small stock at weekly markets. Traders buy and sell sheep and goats at primary and secondary auctions. Typically, the final destination for shoats are major urban centres, such as Arusha, Moshi or Dar es Salaam. Trade is highest during the months of December/January, April and July (i.e., the festival season) when demand for meat is high. Poultry are sold more locally where there is demand year-round for chicken in the food outlets in the townships and service centres.

Although the zone is typically viewed as a food surplus area due to the year round export of fruit, staple grains are

imported into the zone throughout the year due to constant demand. The areas supplying the *Kilimanjaro Meru Highland Coffee Livelihood Zone* are the neighbouring lowlands.

Labour markets are found both inside and outside the zone. Labourers typically look for work on the maize and bean farms in the neighbouring lowland zone. There is also some work to be found on larger farms within the zone. Urban centres such as Moshi Municipality, Arusha City, Mwanga town, Boma Ng'ombe, Dar es salaam, Himo/NjiaPanda, and Same, which all fall outside of the zone, are also important places to find casual employment in the construction or the service sector. Other labour markets include the tourism industry. Local men find work as porters or tour guides for tourists climbing Mt. Kilimanjaro. Construction work or hotel jobs are other types of employment offered in the tourist sector.

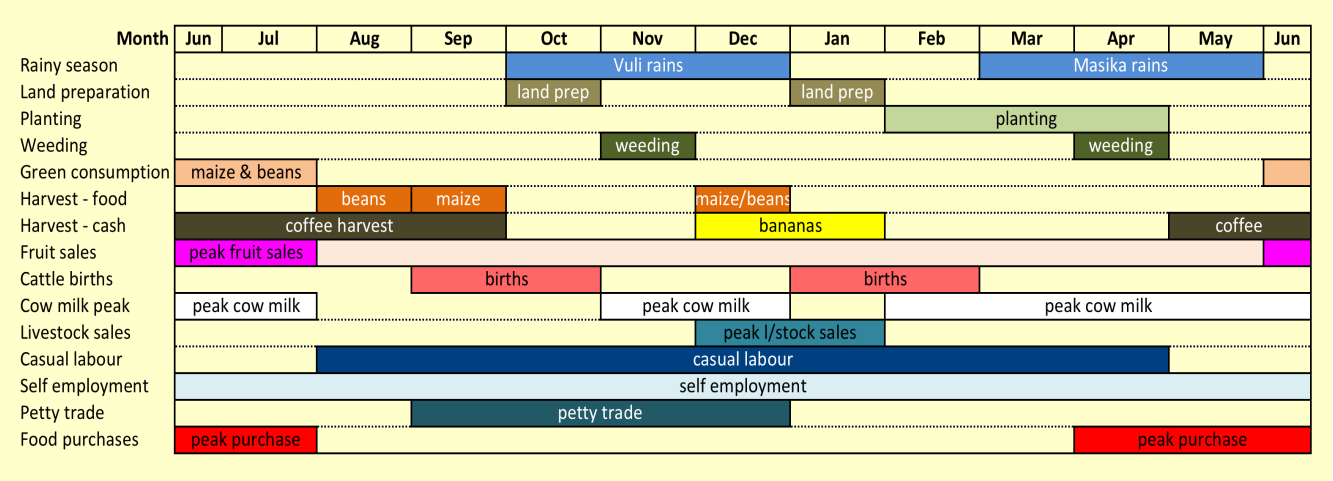
Timeline and Reference Year

The baseline assessment refers to a very specific time period called the reference year. In the *Kilimanjaro Meru Highland Coffee Livelihood Zone* the reference year covered the period from July 2013 to June 2014. During community leader interviews, key informants were asked to rank the last five years in terms of seasonal performance with '1' indicating a poor season and '5' an excellent season. The table below, which summarizes the responses of the community leaders, shows that the reference year was ranked as a relatively good year for rainfall and harvest outcomes. In addition, there were no unusual outbreaks of livestock diseases nor crop pests.

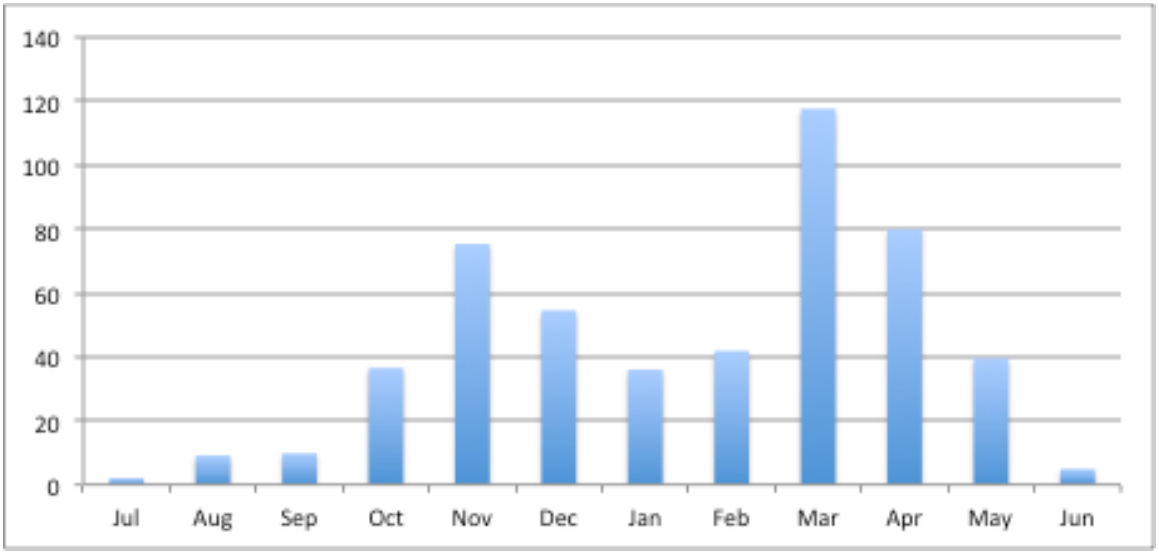
Year	Rank	Critical Events
2014	**4**	Good rains and harvest
2013	**4**	Good rains and harvest
2012	**3**	Average rains and harvest
2011	**3**	Average rains and harvest
2010	**1**	Drought, poor harvest and food shortages

5 = an excellent season for household food security (e.g. due to good rains, good prices, good crop yields, etc)
4 = a good season or above average season for household food security
3 = an average season in terms of household food security
2 = a below average season for household food security
1 = a poor season (e.g. due to drought, flooding, livestock disease, pest attack) for household food security

Seasonal Calendar for Reference Year



The graph to the right shows the 10-year (2003 - 2012) average monthly rainfall (mm) for Same District Source: TZ Met. Dept



The *Kilimanjaro Meru Highland Coffee Zone* has two distinct rainy seasons. The short rainy season - or *Vuli* - occurs from October to December. The long rainy season - *Masika* – takes place from March to May. The staple food crops in the zone, namely maize and beans, mature relatively quickly and hence are typically planted during both rainy seasons. For beans in particular, there can often be two harvests during the year. The February-March planting yields a harvest in August and September. Another planting in October sometimes produces a second harvest in December.

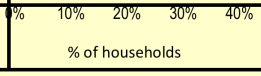
The main cash crops – coffee, bananas and avocados – are planted just before the long rainy season begins in March. Once the trees have matured, coffee is harvested between May and September. The banana harvest typically falls at the end of the year in November and December.

The main crops in the *Kilimanjaro Meru Highland Coffee Zone* are all intercropped. This intensive style of farming makes the maximum use of small plots of land. Moreover, intercropping means that there is typically some farm work throughout the year. The quietest period on the farm is January although land preparation for the upcoming season may begin that month.

For the poor, the peak period for food purchases is April to June. This is the time just before maize and beans can be eaten green from the fields. Moreover, family labour is needed on the farm to harvest coffee and to weed the growing crops so any supplementary income is typically earned through fruit sales. The period when poor labourers typically seek casual work is from January to April, and then again from August to December.

Livestock births usually occur just before the rains. Farmers practice controlled breeding to ensure the optimal time for the birth of young calves. Hence the peak period is in January and February (prior to the March rains), and then in September and October (prior to the October rains). With the birth of young calves and kids comes the milking season. This typically lasts from February to July. There may also be a shorter milking season in November and December.

Wealth Breakdown

		Wealth Groups Characteristics				
		HH size	Land area cultivated (acres)	Large stock holdings	Small stock holdings	Other
Very poor		5-7 (6)	< 1	0 - 2 cattle	0 - 4 goats; 0 - 3 sheep	1 - 10 chickens
Poor		5-7 (6)	1 - 1.5	1 - 2 cattle	2 - 6 goats; 0 - 5 sheep	2 - 12 chickens
Middle		5-7 (6)	1.5 - 2.5	2 - 3 cattle	3 - 7 goats; 0 - 6 sheep	5 - 15 chickens; 1 motorcycle; 0 - 1 kiosks
Better off		4-6 (5)	2 - 4	3 - 5 cattle	4 - 8 goats; 0 - 10 sheep	10 - 20 chickens; 2 motorcycles; 0 - 1 shops
						

Note: The wealth breakdown percentages represent the mid-point of a range

Wealth in this agricultural zone is determined by farm size and livestock holdings. Farmers typically grow the same mix of crops. What differs between wealth groups is how much is grown and sold, reflecting the size of a farmer's land and the inputs used.

Very poor households make up around 25%-45% of households in the zone. Together with poor households, these two wealth groups comprise 45%-85% of all households. The very poor are characterised by small land holdings, specifically farms of less than an acre, and few livestock (i.e., around 5 shoats and less than 10 chickens). Many of the very poor own neither cattle nor any other assets.

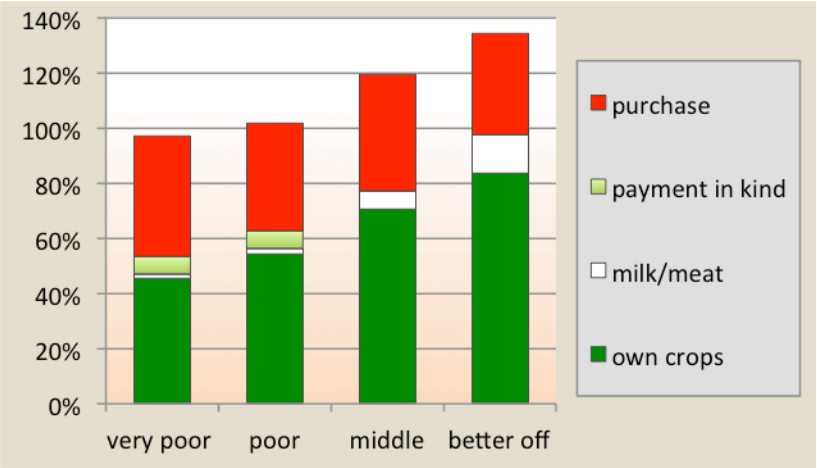
Poor households are typically those who farm between 1 - 1.5 acres. Most poor households have at least 1 - 2 cattle, about 2 - 6 goats and 0 - 5 sheep, as well as 12 or fewer chickens. They do not usually have other assets.

Middle and better off households are distinguished from the very poor and poor by larger farm sizes, for example, 2 - 3 hectares per household. They also own more livestock, notably around 2 – 5 cattle per household. Nonetheless, although wealthier households own more land than poorer neighbours, the highland topography prevents them from using mechanised methods to boost output significantly. Consequently, some better off farmers rent in land in lowland areas where mechanised farming is possible. On their highland farms, better off farmers hire additional manual labour to improve production. Some farmers have also introduced horticultural crops into their crop mix in order to benefit from the higher prices obtained from these high value crops. Typically, the main crops of the zone (maize, beans, coffee, bananas and avocados) do not command a high market price. Importantly, better off and middle households also own assets such as motorcycles. Motorcycles are used extensively for trade. Hence, this asset allows wealthier households to travel to larger urban markets where their goods command a higher price. Middle households comprise 15% - 35% of households in the zone. Better off households are the smallest group making up around 10% - 15% of households.

There is no great difference in household size between the wealth groups. Most households have between 5 - 7 people.

Sources of Food

The graph to the right presents the sources of food for households in different wealth groups in the livelihood zone for the reference year, which spans the period of July 2013 to June 2014. July represents the start of the consumption year because it is when people begin to consume green crops and marks the end of the hunger period. Food is presented as a percentage of 2100 kcal per person per day for the 12-month period.



In the graph, food access is expressed as a percentage of minimum food requirements, taken as an average food energy intake of 2100 kcals per person per day.

The graph visually shows the importance of agriculture in the zone.

Households' own crops, namely maize, beans and plantains, cover 45%-55% of the annual food energy needs of the very poor and poor households. Maize is the most important of these crops, making up (on its own) 30% of very poor household annual food energy needs. This 30% is divided equally between the two seasons. The remaining 12% comes from green maize which is consumed for about 2 months prior to the season's main harvest in both seasons covering about 4 months in total. Maize is supplemented by beans, plantains and bananas.

The pattern is similar for middle and better off wealth groups. Maize is the principal food crop comprising about 50%-60% of their annual food energy needs (including green maize). An additional 25% of their annual food energy needs comes from other crops, namely beans, plantains, bananas and yams.

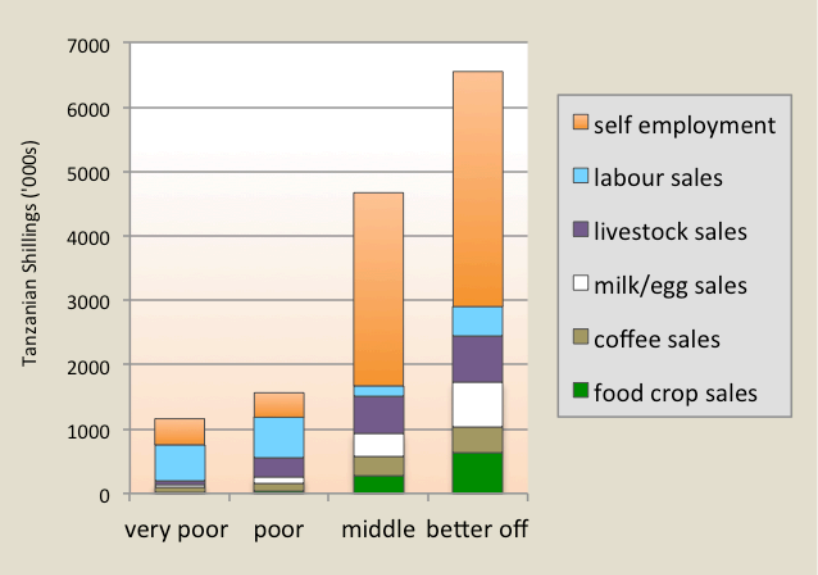
The other principal food source for all households in the zone is purchase. Households from all wealth groups purchase about 35% - 45% of their annual food energy needs from the market. However, there are two very different patterns of purchase depending on the wealth group. Very poor, poor and middle households buy mainly maize (10% - 25% of their food annual food energy needs). Maize purchases are supplemented with a number of other food items such as: beans, rice, oil and sugar as well as a little dried fish. By contrast, better-off households purchase no maize, preferring instead to buy rice.

Milk from the household herd is an important source of food for better off households as well as, to a lesser extent, for middle households. Very poor and poor households only access small amounts of milk (2% of food energy needs) during the year.

To cover the balance of their food energy needs, very poor and poor households take on casual work in exchange for a food payment. Typically these jobs are on local farms. Labourers mainly find work preparing land for planting for a 4-month period during both planting seasons. Other types of casual work are weeding and harvesting.

Sources of Cash Income

Crop sales make up only a very small proportion of household annual income in the *Kilimanjaro Meru Highland Coffee Zone*. Overall, poorer households secure proportionately less income from crop sales than wealthier households and most of this income is from coffee. Specifically, crop sales comprise about 10% of the annual income of the poorest wealth groups of which 75%-85% comes from coffee. By contrast, wealthier households secure more crop income from crop sales but less comes from coffee. For example, for better off and middle wealth groups, crop sales comprised about 15% of their annual cash income of which 35% - 45% comes from coffee. The remainder of crop income comes from the sale of maize, beans, plantains, bananas and avocados.



The graph provides a breakdown of total annual cash income in Tanzania Shillings according to income source.

INCOME SUMMARY TABLE in Tanzania Shillings ('000s)				
Wealth group	**Very poor**	**Poor**	**Middle**	**Better off**
Annual income per household[3]	742,000 - 1,923,000	749,000 - 2,800,000	2,900,000 - 7,849,000	5,789,000 - 10,794,000

About 40% - 50% of the annual cash income of very poor and poor households is earned through casual labour, notably farm work but also some construction work. A second major income source, comprising 25% - 35% of annual cash income, is self-employment, particularly petty trade.

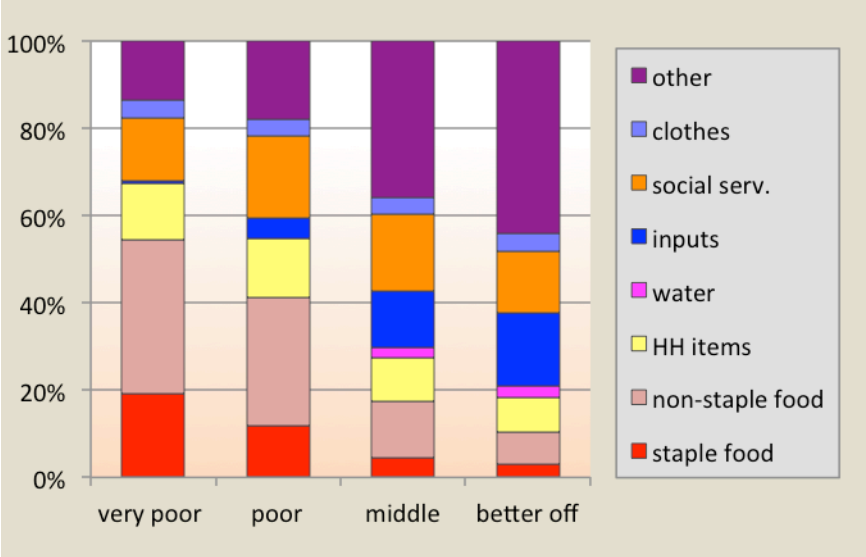
One difference between very poor and poor household income is how much comes from livestock and milk sales. Only around 10% of very poor household cash income derives from the sale of milk, poultry, eggs and livestock whereas poor households earn about 25% from this source.

Better off and middle households earn the majority of their cash income from trading activities (about 50% - 60%). These households have the capital to invest in the purchase of motorcycles, facilitating access to bigger urban markets. The rest of their cash income came from crop sales (15%), livestock sales (10%-12%), milk sales (5%-10%) and labour (5%).

[3] The average exchange rate during the reference year (July 2013- June 2014) was US$1 = Tsh 1,640

Expenditure Patterns

The graph presents expenditure patterns for the reference year July 2013-June 2014. While total expenditure increases with wealth, the expenditure breakdown by percent in this graph demonstrates the relative amount of income spent on different categories.



The graph provides a breakdown of total annual cash expenditure according to category of expenditure.

During the reference year, food purchases comprised almost half (42% - 55%) of the annual expenditures of very poor and poor households. Food items such as oil, sugar, beans and rice are a more costly form of food energy than maize. Hence, these non-staple food items typically make up about 65% - 70% of food spending, or about a third of total annual expenditures. By contrast, about 10% - 15% of the annual expenditures of wealthier households go towards non-staple food and only 3% - 5% of annual expenditures is on staple food.

Livelihood inputs are proportionately one of the main expenditure categories for better off and middle households. Along with greater assets comes more spending on maintaining these livelihood assets. About 15% - 20% of the annual expenditure of wealthier households is comprised of spending on inputs such as seeds, tools, fertiliser, pesticides, land rental, ploughing, farm labour hire, business tax and animal drugs. By contrast, only 1% - 5% of the annual expenditure of very poor and poor households is on livelihood inputs (mainly seeds and tools).

In relation to annual expenditures, all wealth groups spend about 15% - 20% on social services (education and medical costs), with higher amounts spent on education than on medicine. Another major expenditure for the better off and middle groups is on loan repayments. In the graph, this forms part of the "other" category. This category also includes spending on beer, tobacco, cigarettes, phone credit, gifts, festivals, and social ceremonies.

Hazards

In the *Kilimanjaro Meru Highland Coffee Zone*, wild animals pose a considerable threat to crop production. Elephants in particular can destroy a field of crops quickly. The most affected area is Rombo, which is located near Tsavo and Kilimanjaro National Parks. At times, animals stray outside park boundaries and wander into agricultural areas. Army worm is another chronic problem that mainly affects maize. Common problems that affect livestock production year-in year-out are cattle ticks and fowl pox.

About one year in every five years, a severe drought will occur affecting crop and livestock production. Another periodic hazard is swine flu although this mainly affects better-off households who own pigs.

Response Strategies

Households engage in a number of strategies in an attempt to cope with hazards. These include:

Labour migration: The very poor and poor households respond to production and price shocks by seeking additional casual work. Many go in search of available work in neighbouring agricultural lowland areas outside of the zone.

Selling charcoal/firewood/timber: Very poor and poor households sell forest and bush products found locally in order to secure additional income.

Gifts/food aid: Very poor and poor households in particular look for additional support from better off neighbours and relatives, or from the government, to make up food or income deficits from a shock.

Livestock sales: Livestock represent cash savings on the hoof. Hence a common strategy to earn extra income to make up food or income deficits is to sell a cow or goats, sheep or poultry. This strategy pertains to better off, middle and poor households. However, if the market is saturated or if animals are in poor condition, this strategy is not very effective because livestock sale prices will be low compared to staple grain prices.

Petty trade: Middle and better off households may respond to a shock by expanding their trading activities. The strategy of wealthier households is to expand their trade outside of the zone in order to take advantage of more favourable prices. Middle households, who have more limited means, may try to expand their business by selling more commodities in order to secure additional cash in a bad year.

Loans/remittances: Taking out additional credit or asking relatives for more frequent (and greater) remittances are two strategies used by some middle and better off households.

Reduce wages: One strategy that is only an option for wealthier households is to try to reduce their expenditures in response to an economic shock by lowering the wage rate offered to hired labour on their farms. This strategy may be successful if the competition for local work is high and workers have few options.

Key Parameters for Monitoring

The key parameters listed in the table below are food and income sources that make a substantial contribution to the household economy in the *Kilimanjaro Meru Highland Coffee Zone*. These should be monitored to indicate potential losses or gains to local household economies, either through on-going monitoring systems or through periodic assessments.

It is also important to monitor the prices of key items on the **expenditure** side, including staple and non-staple food items.

Item	Key Parameter – Quantity	Key Parameter – Price
Crops	• Green maize (season 1) • Green maize (season 2) • Maize (season 1) • Maize (season 2) • Beans (season 1) • Beans (season 2) • Plantains • Coffee	• Maize (season 1) • Maize (season 2) • Beans (season 1) • Beans (season 2) • Plantains • Coffee

Livestock production	• Cow's milk (season 1) • Cow's milk (season 2) • Cattle sales • Goat sales • Sheep sales • Pig sales • Chicken sales • Egg sales	• Cow's milk (season 1) • Cow's milk (season2) • Cattle prices • Goat prices • Sheep prices • Pig prices • Chicken prices • Egg prices
Other food and cash income	• On-farm labour (land preparation, weeding) • On-farm labour (harvesting) • Construction • Remittances • Beer brewing • Petty trade • Credit	• On-farm wage rates (land preparation, weeding) • On-farm labour (harvesting) • Construction wage rates • Beer brewing prices • Credit
Expenditure		• maize price

Programme Implications

The longer-term programme implications suggested below include those that were highlighted by the wealth group interviewees themselves and those made by the assessment team following detailed discussions and observations in the field. All of these suggestions require further detailed feasibility studies.

Very poor	**Poor**	**Middle**	**Better off**
Provision of water for both humans and livestock			
Provision of agricultural inputs		Establishment of viable marketing opportunities for maize and coffee	
Provision of subsidies for inputs			
Rehabilitation of roads			