

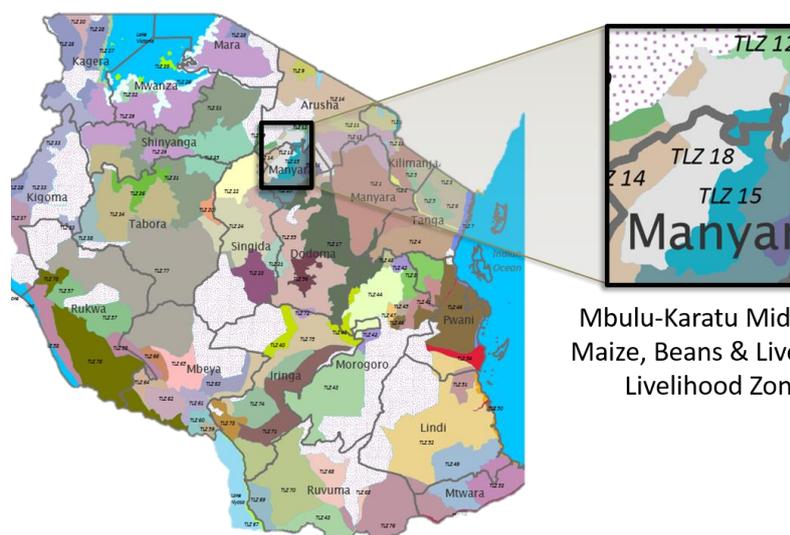
# Tanzania Livelihood Baseline Profile

## Mbulu-Karatu Midlands Maize, Beans & Livestock Livelihood Zone (TLZ 18)

April, 2016<sup>1</sup>

### Zone Description

The *Mbulu-Karatu Midlands Maize, Beans and Livestock Livelihood Zone* encompasses parts of Mbulu and Hanang districts in Manyara Region and part of Karatu District in Arusha Region<sup>2</sup>. This mid-altitude zone is relatively cool, with flat plains broken up by hills and valleys, extending from 1,000 to 2,400 metres above sea level. Most of the zone is covered by agricultural land, which has taken over much of the previously forested areas. The Kilimapunda and Endamaksi mountains are the highest points in the zone. The lowest points are found along the Endagikot River and the Yaeda River valley, which extends from Lake Eyasi. These waterways provide seasonal access to water for people living in close proximity to them. The zone has a relatively well-developed network of roads, although only one is paved. The main arteries connect Mbulu to Babati, Singida and Arusha; and Karatu to Mang'ola and the Serengeti. The main ethnic group residing here is the Iraqw. The population density is 32-45 people per square kilometre<sup>3</sup>, with higher densities found in Arusha Region and lower densities found in Manyara.



Mbulu-Karatu Midlands Maize, Beans & Livestock Livelihood Zone

There is one long rainy season, from November through April, although this is typically interrupted in February by a stoppage in the rains. Annual precipitation ranges from 700-1,200 mm, and temperatures are cool, averaging 15 - 24°C, dropping as you move up in elevation. Fertile, silt clays and sandy soils are the norm, and the combination of relatively high rainfall and good soils makes this a moderately productive zone.

The household economy is built around crop and livestock production. Maize, beans and pigeon peas are the main food crops. A few households grow sunflower as a cash crop. All production is rain-fed. Households use oxen to plough the earth; some households on the upper end of the wealth spectrum also use tractors. The use of improved seeds is common here, and people fertilize their fields with manure from their own livestock. The use of industrial fertilizers is not customary. Weeding is one of the most labour-intensive activities and middle and better off households hire men and women from poorer households during

<sup>1</sup> Fieldwork for the current profile was undertaken in February of 2016. The information presented in this profile refers to the reference year, which was the consumption year that started in April 2014 and ended in March 2015. Provided there are no fundamental and rapid shifts in the economy, the information in this profile is expected to remain valid for approximately five to ten years (i.e. until 2020-2025). All prices referred to in the document are for the reference year.

<sup>2</sup> The wards in Mbulu District are: Maretadu, Haydom, Maghang, Dongobesh, Bashay, Tlawi, Mbulu Mjini, Bargish, Sanu and Masieda. The wards in Karatu District are Baray, Daa, Endabash, Kansay, Endamarariiek, Qurus and Karatu.

<sup>3</sup> Based on the 2012 national census.

weeding periods, and to a lesser extent for harvesting. Some people also migrate seasonally to coffee estates in Karatu District.

Livestock provide a source of food and cash for all households. Cattle are the most valuable livestock, providing milk for consumption and sale and acting as a bank account, drawn down on every year to provide cash for a range of basic necessities. Bulls also get converted into plough oxen, providing a critical source of agricultural labour. Goats and sheep are also kept, eaten especially during festivals and sold for cash income. Chickens are used for eggs, eaten throughout the year, and sold whenever cash is needed, especially by poorer households. Pigs are kept by some households as well. The larger livestock migrate during the dry season, taken to areas within 20 or 30 kilometres from the villages, where better access to pasture and water can be found, such as Yaeda Chini or the Eyasi Basin. Rainy season water sources for livestock include charcoal dams, the perennial rivers, seasonal rivers, shallow wells and seasonal ponds. In the dry season, livestock use reservoirs and dams, the perennial rivers and wells. Men manage the cattle, goats and sheep; women are responsible for the chickens and pigs.

In addition to crop and livestock production, brick sales and firewood and charcoal sales bring income to poorer households. These sources of cash, along with seasonal agricultural labour, are of critical importance to households who do not have enough land and livestock to make ends meet.

Service provision in this zone is basic. Water for all purposes comes from seasonal rivers, ponds, open wells, boreholes and tap water. There is some payment expected for tap water, but the other sources are free. The quality of water is quite poor in most villages, with the exception of villages where tap water is the main source, such as Endagem, Changarawe and Qurus in Karatu. Sanitation facilities consist of pit latrines with no covers. Waste is collected and burned. Health dispensaries are found in many villages, or at the ward centre, although these are often poorly stocked and under-staffed. Better off households have access to private hospitals if they can make their way to Mbulu, Karatu or Arusha. Primary schools are found in the villages and secondary schools are available in the ward centres, which are often too far for children to reach on a daily basis. Poorer households only send their children to primary, or at most secondary school. Better off households usually manage to send their children to at least secondary school and often to college. There is electricity in only a few villages; in most villages households depend on solar lamps and solar panels. Households in all wealth groups have mobile phones, with better off households having multiple phones. Better off households have access to credit through VICOBA, SILC and SACCOS. Savings facilities are provided through VICOBA and SILC. A number of NGOs and government agencies operate here, including TASAF (Tanzania Social Action Fund), which supports poorer households by providing funds to cover food, education and health as well as helping build hospitals, schools and bridges, etc.; the Diocese of Mbulu Development Department, which undertakes the construction of improved toilets and toilet seat covers for schools; the Roman Catholic church, which supports the construction of bore holes; and HELVETORS, which undertakes actions to prevent post-harvest losses.

## Markets

The transportation infrastructure in this zone is variable, with relatively good access in the dry season, but serious problems during the wet season. Mbulu and Karatu are the main intermediate markets and Arusha is a central terminal market. There is only one tarmac road in the zone, connecting Karatu to Arusha and Ngorongoro gate. The others, from Singida to Haydom and Mbulu; and from Babati to Mbulu are not paved. The more remote villages are hard to reach, accessed via rough dirt roads, many with deep eroded gullies. In the dry season these roads are passable, but they become difficult to traverse in the wet season. Most of the bridges are in relatively good condition. Well-worn dirt tracks take people by foot from villages to cultivated fields, pastures and water points, and walking is the most common means of transportation.

Maize, beans, pigeon peas, sunflower, cattle, goats and sheep are the commodities sold by households in this zone. Locally-produced crops are purchased by small traders at the farm gate. August and September are when traders come to villages in order to buy up maize harvests, and any pigeon peas that local

households might want to sell. The traders arrange for crops to be bundled and transported to larger market hubs during the post-harvest dry season months, when trucks can still travel on the dirt roads. Haydom, in Mbulu, is one of these market hubs; Karatu is another. Arusha is the terminal market for maize, but pigeon peas are often exported after being transported to Dar es Salaam via Arusha. Beans are sold in March and April, following the same trade route used for maize. Sunflower, sold mostly by better off households, is collected in Haydom or Karatu, where it is processed into oil for local consumption.

Cattle, goats and sheep are sold at small weekly ward- and sub-ward level markets within the zone throughout the year. Traders generally do not come to the villages for livestock, with the exception of pigs. From the livestock markets, traders collect and transport livestock to Duka Bovu in Arusha, and then on to Weruweru in Kilimanjaro, Korogwe in Tanga and finally the Pugu market in Dar es Salaam. Much of this trade takes place from August to November, just before the rains start in earnest. This is a time when households need extra cash in order to pay for agricultural inputs; and it is also a time when roads throughout the zone are still accessible.

In addition to local commodities that are sold for 'export' from the zone, there is an active importation of food and other basic goods for consumption by local households. Poorer households need to buy maize grain to cover their needs for seven to nine months of the year, especially from November to March, even in relatively good production years. Maize is the cheapest local staple, and all of this is locally sourced, procured from better off households who generally produce a large surplus. Rice, purchased mostly by the upper wealth groups, is sourced from Magugu and Shinyanga, collected in Mbulu and Karatu and distributed via local markets. Non-food essentials, like salt, soap, batteries and kerosene, are sold at local markets.

The labour market is almost entirely local seasonal agricultural labour. Middle and better off households cultivate large tracts of land, requiring additional labour to help them complete the more intensive seasonal tasks, especially weeding and harvesting. It was estimated that in the reference year, 90% of seasonal labour was found within the zone on local farms. An additional 5% of labour demand came from local towns and the other 5% came from outside the livelihood zone, mainly from the Oldeani coffee estates in Karatu District. Both men and women from poorer households take on paid agricultural work. The coffee estates are a primary place for seeking work in bad years, when poor rains reduce local production.

## Timeline and Reference Year

The baseline assessment refers to a very specific time period called the reference year. In the *Mbulu-Karatu Midlands Maize, Beans & Livestock Livelihood Zone* the reference year covered the **consumption** period from April 2014 to March 2015. During community leader interviews, 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 response of the community leaders, shows year quality by *production* year (which starts with the planting season in December and ends with the harvest in June through August of the following calendar year). Thus, the production year of 2013-2014 corresponds to the consumption year of 2014-2015. As shown in the table, the production year corresponding to the reference year of 2014-2015 was average, with average rainfall, a decent harvest, average staple food prices, and average livestock prices. The reference year followed an average year and a below average year. The baseline information presented in this profile, therefore, provides a view into how households in this livelihood zone make ends meet in an average year after a fairly normal sequence of years.

Production Year	Season	Rank	Critical Events
2014-2015	<i>Masika</i>	2	Poorly distributed rains leading to low crop yields; high staple food prices with low livestock prices. As a result, people sold more livestock and poorer households increased the time spent on agricultural labour in the Oldeani coffee estates.
2013-2014	<i>Masika</i>	3	Average rainfall, good crop yields, average staple food and livestock prices.

2012-2013	<i>Masika</i>	3	Average rainfall, good crop yields, average staple food and livestock prices.
2011-2012	<i>Masika</i>	2	Poorly distributed rains leading to low crop yields; high staple food prices with low livestock prices. As a result, people sold more livestock and poorer households increased the time spent on agricultural labour in the Oldeani coffee estates.
2010-2011	<i>Masika</i>	2	Poorly distributed rains leading to low crop yields; high staple food prices with low livestock prices. As a result, people sold more livestock and poorer households increased the time spent on agricultural labour in the Oldeani coffee estates.

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 seasonal calendar below highlights the competing demands of livestock raising and crop production in this agro-pastoral zone. The rains determine the timing of productive activities here, signalling the start and stop of a range of crop and livestock management tasks. There is one long rainy season, which begins in November and continues through April, although it is common for rains to stop for a while in February. People begin to prepare lands in October and continue this through November, as the new rains help to soften the ground. The November rains also provide a welcome boost to pastures. All crops are planted in December and January, followed by a period of weeding that lasts from mid-January through April. Maize, beans and pigeon peas are inter-cropped; sunflower is planted as a single stand around the edges of fields. The green harvest of maize starts in April, although beans can be harvested green as early as March. June marks the start of the main maize harvest, which lasts through August. This coincides with the sunflower harvest, which is relevant mainly for better off households. Pigeon peas are harvested as late as September and October.

As planting activities are in full swing, in January, milk production begins to increase as a result of fresh pastures and renewed sources of water that come with the rains. The rains also bring livestock diseases. Contagious Bovine Pleura-pneumonia (CBPP), Contagious Caprine Pleura-pneumonia (CCPP) and Black Quarter occur with higher frequency during the rains. Thus, as people are busy in their fields, they also must contend with more work related to milking and caring for livestock. Livestock sales are highest from July to October, a time when households are putting together the cash they need for the coming agricultural season.

The peak agricultural labour period is during weeding time. Land preparation is not as arduous here as in many areas because ploughing is done with ox ploughs, not hand hoes. Poorer households who do not own oxen themselves obtain access to oxen and ploughs by exchanging their labour for it. This reduces the effort involved in land preparation and ploughing, and it means that poorer households are generally not paid in cash for any work related to land preparation. Weeding, however, is done entirely by hand, and poorer households are hired throughout the weeding period to work on the larger farms of middle and better off households. At the same time, poorer households need to weed their own fields, which leads them to split their labour pool, sending some members to work for cash, while others work in their own fields. The ultimate result is that poorer households have lower yields due to less-intensive management on their own fields during critical periods. They often also miss the best times for ploughing and planting because they must wait for plough oxen to finish cultivating the farms of the oxen's owners before being deployed to their farms.

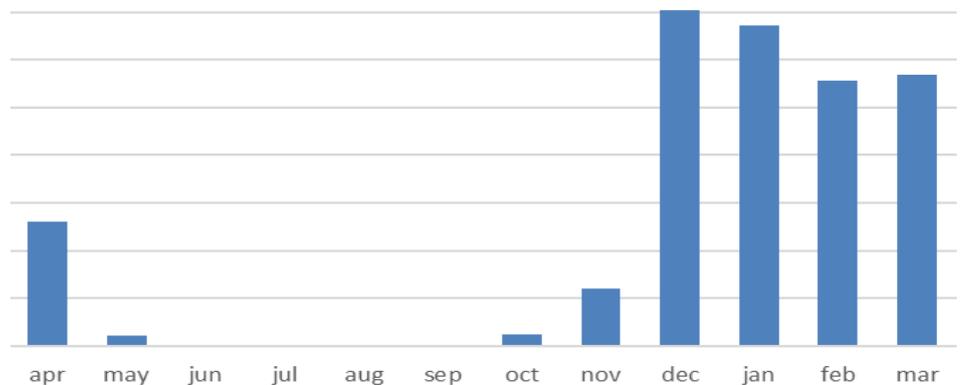
The weeding period coincides with a time when poorer households have run out of their stocks from the previous year's harvest. Some, in fact, run out as early as September or October, but by November none of the poorer households have their own food stocks left at home. These households need to purchase all of their staple foods

just when the price of staple foods is highest (from December through March). Thus, the paid work offered up by middle and better off households helps provide needed cash to poorer households, allowing them to bridge the gap until April, when the green harvest of maize begins.

The rainy season is also when most human illnesses occur. Malaria is a serious problem here, and the rains bring about a new influx of mosquitoes and a greater incidence of sickness. This increases the expenditure requirements for medical treatment at a time of year when other outlays (on staple food and education – in January) are already high. Remittances from relatives living outside the zone are most commonly sent in January and February to help cover school fees and also to help cover the costs of staple foods.

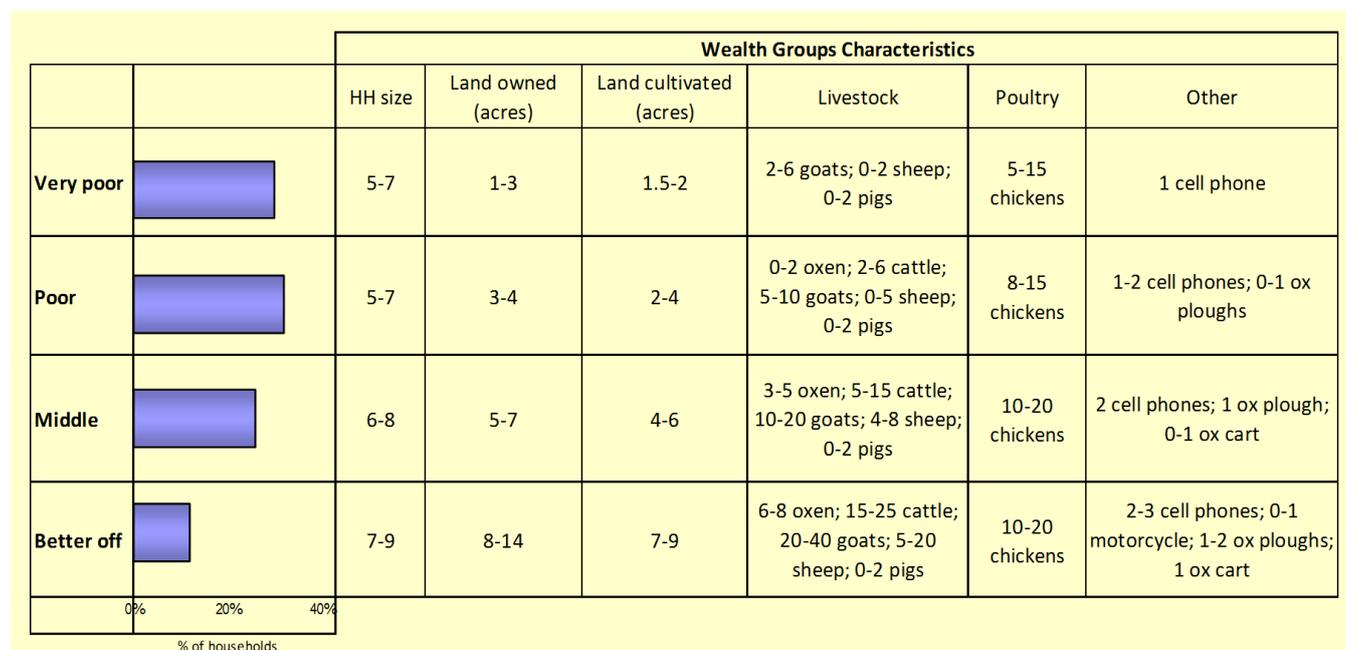
	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
<b>Rainy season</b>	Blue							Blue	Blue	Blue	Blue	Blue
<b>Crops</b>												
Maize	Green Cons.	Green Cons.	Harvest/Thresh.	Harvest/Thresh.	Harvest/Thresh.		Land prep	Land prep	Land prep	Land prep	Land prep	Land prep
Pigeon peas	Land prep					Harvest/Thresh.	Harvest/Thresh.	Land prep				
Beans							Land prep	Land prep	Land prep	Land prep	Land prep	Harvest/Thresh.
Sunflower			Harvest/Thresh.	Harvest/Thresh.			Land prep	Land prep	Land prep	Land prep	Land prep	Land prep
<b>Livestock</b>												
Cattle milk peak	Peak	Peak								Peak	Peak	Peak
Livestock diseases	Peak								Peak	Peak	Peak	Peak
Livestock migration								Peak	Peak	Peak	Peak	
Livestock sales peak				Peak	Peak	Peak	Peak					
<b>Other</b>												
Agricultural labor peak	Peak								Peak	Peak	Peak	Peak
Off farm labour peak				Peak	Peak	Peak				Peak	Peak	
Remittances										Peak	Peak	
Brewing income peaks				Peak	Peak	Peak						
Firewood sales peak					Peak	Peak						
<b>Stress &amp; High Expenditure Periods</b>												
High staple prices									Peak	Peak	Peak	Peak
Human diseases	Peak									Peak	Peak	Peak
Festival season					Peak	Peak	Peak					
Lean season								Peak	Peak	Peak	Peak	Peak
<b>Legend</b>												
		Land prep	Sowing	Weeding	Green Cons.	Harvest/Thresh.						

The graph to the right shows average monthly rainfall (mm) in Dodoma District based on a 35-year period (1980-2014). Source: TZ Meteorology Department



May through October is the dry season. At this time, poorer household members earn extra cash by collecting and selling firewood, or making charcoal. Brick making also peaks at this time. It is often women and children who collect the firewood; men are involved in charcoal and brick production. People need to set aside money at this time to prepare for the costs associated with the coming agricultural season and to pay back any loans accrued in the past year.

## Wealth Breakdown



Note: The percentage of household figures represent the mid-point of a range.

The main determinants of wealth in this zone are, first, the amount of land a household cultivates and, second, the number of livestock, particularly cattle, a household owns. In important ways these two things are inter-related: bigger herds generate more cash, which enables people to buy or rent tractors and hire labourers to expand the area they have under cultivation. On the other side, the more land a household has under cultivation, the larger its harvests; and with more crop production, a household is able to reduce the money it spends on food for survival, and – with the proceeds from crop sales - invest more in the health and growth of its livestock herd.

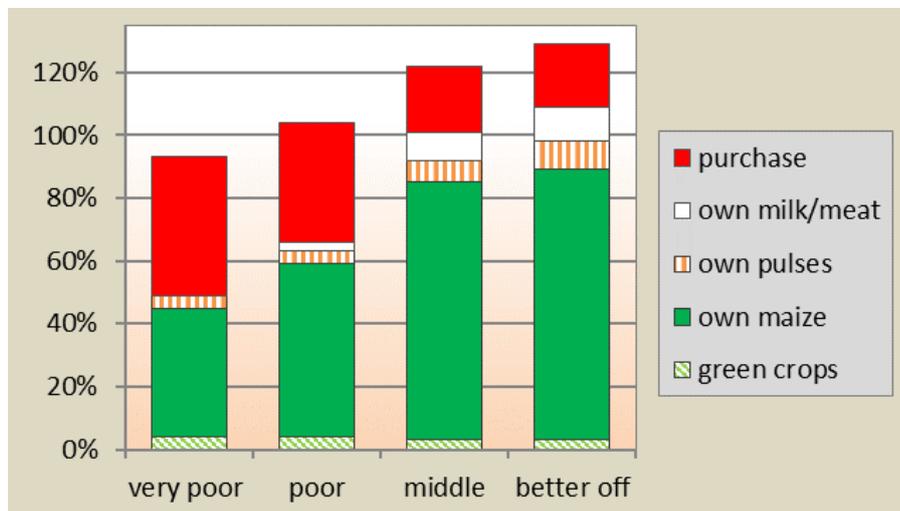
A typical better off household, therefore, cultivates around 7-9 acres and owns 15-25 cattle, 20-40 goats, 5-20 sheep and 6-8 oxen. These are slightly bigger households, with around 7-9 members. In addition to land and livestock, other assets, like ploughs, ox carts and cell phones are commonly owned. Of all the households, these are the most likely to have a motorcycle as well, which can provide additional cash through *boda boda* (motorcycle taxi or transport hire). Better off households benefit from surplus crop production and sizeable supplies of milk. These households hire very poor and poor household members to help with weeding and harvesting activities, because they do not have enough intra-household labour to manage their fields on their own.

A typical very poor household, on the other hand, cultivates only 1.5-2 acres of land, working in exchange for access to plough oxen. These households have no cattle, and small numbers of goats (2-6), sheep (0-2) and pigs (0-2). They have 5-15 chickens which are, relatively speaking, significant to them as a source of cash. Very poor households tend to be smaller in size, with only 5-7 members. This means that they have a difficult time managing the many competing labour requirements associated with the cropping season, especially since they need to work on both their own fields and the fields of better off households, where they earn cash that is critical to their survival.

The distribution of wealth in this zone is weighted towards poorer households, with very poor (30%) and poor (32%) households together comprising over 60% of households in the zone. Middle (26%) and better off (12%) households combined represent just over a third of the population. However, as middle and better off households are slightly larger, it is important to remember that the percent of the *population* (as opposed to the percent of *households*) represented by the upper wealth groups is larger than this.

## 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 period April 2014 to March 2015. April represents the start of the consumption year because it is when people begin to consume green crops and it 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. This was considered an average year, with average rains, crop yields and prices.



*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.*

Own crops, own milk and meat, and purchased food are the three

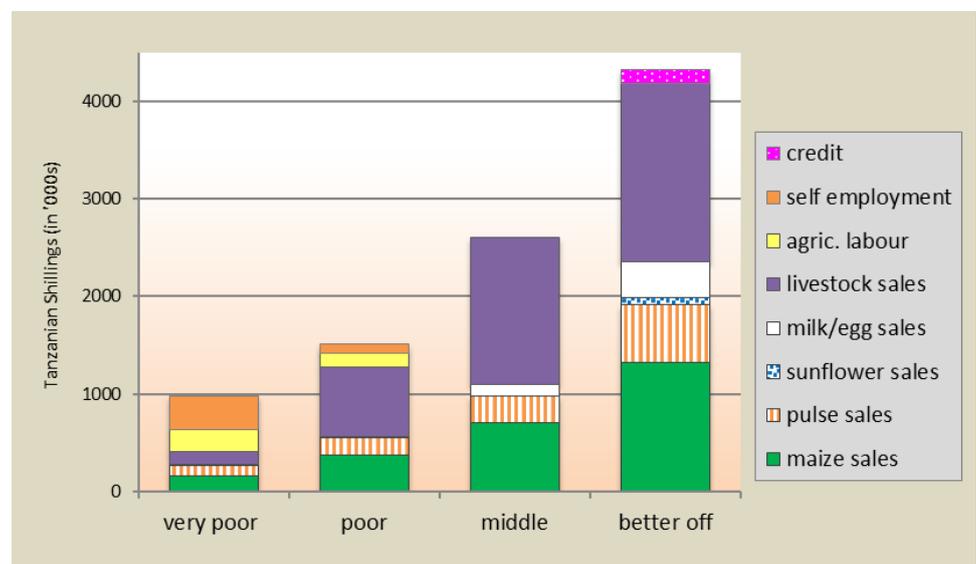
sources of food in this livelihood zone. Households' own crop production made up 45-65% of minimum calorie requirements for very poor and poor households in the reference year, with maize, beans and pigeon peas the only food crops grown. This means that even in an average year, poorer households do not depend on their own crop production to cover all of their own food needs. Middle and better off households produced considerably more, meeting the vast majority (90-98%) of their minimum calorie needs with their own crops; in addition, what they consume is only a portion of the total they grow, since a good deal of their crops are sold in a year like the reference year. In fact, if households did not sell any of the crops they produced, consuming them instead, all except for the very poor would well exceed their minimum calorie requirements. The reference year production of maize for typical very poor, poor, middle and better off households was 970 kg, 1,800 kg, 3,200 kg, and 5,050 kg, respectively. For beans and pigeon peas combined it was 210 kg, 315 kg, 495 kg, and 910 kg, respectively. In calorie terms, the total production of maize and beans together represented 90%, 150%, 230% and 330% of minimum calorie requirements, respectively. All households, however, sold at least half of their production for cash (with sales as a proportion of production increasing as you move up with wealth scale) to meet a range of expenditure requirements throughout the year, which means that their own crop production covered less of their food needs than it could have.

Milk, and to a much lesser degree meat, provided additional calories in the reference year, but only for the top three wealth groups. Very poor households own neither cattle nor substantial numbers of goats, and do not benefit from this source of food. A typical poor household had around 1 cow milking throughout much of the year, middle households had around 3 cows milking, and better off households had 5 cows milking. Milk yields are not very high in this livelihood zone due to limitations on pasture, but the 1.25 litres per cow per day during the rainy season, and 0.5 litres a day in the dry season accumulated over the year to total around 220 litres for poor households, 660 litres for middle and 1,100 litres for better off households. The upper two wealth groups sold 15-30% of this in the reference year, leaving them with enough milk to cover around 6% of their annual calorie needs; poor households did not sell any of their milk, using it all for home consumption. For them, milk covered around 3% of their food needs. There was also a small contribution (only around 1% of calorie needs) from goat meat for middle and better off households.

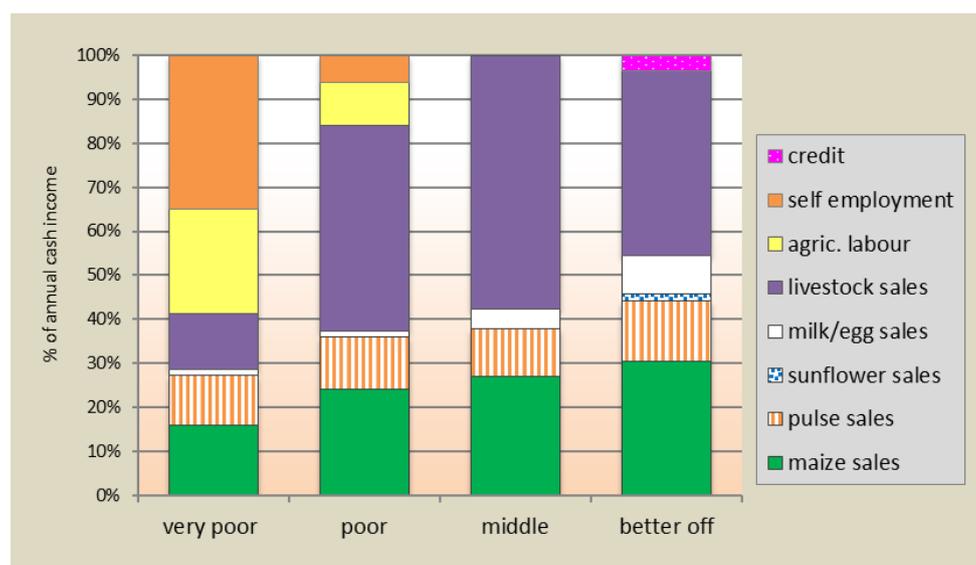
Food purchased from the market made up all of the remaining food needs for all wealth groups, comprising around 20-45% of minimum calorie requirements. Those in the upper two wealth groups bought less (20-21% of minimum calories) and those in the bottom two wealth groups bought more (35-45% of minimum calories). This is because, as explained above, poorer households produced less of their own food in the reference year and needed to buy food to make up for the gap. What poorer households purchased supports this argument: 28-36% of their minimum calories were comprised of purchased maize grain, the cheapest staple. Middle households bought only 5% of their calories in the form of maize grain, and better off households purchased no maize grain at all. The 'purchase' component for better off households was comprised of high-value, preferred foods, such as rice, wheat, sweet potatoes, meat, oil, sugar, Irish potatoes and dried fish. Thus, the 20% of minimum calories purchased by these households diversified their diets and added nutrients and protein they otherwise could not produce themselves. Poorer households, on the other hand, purchased only around 8-9% of their minimum calories for the sake of diversity, and most of this was oil. The largest portion of their 'purchase' component was devoted to filling a real calorie gap and meeting their minimum food needs for the year.

## Sources of Cash Income

The graphs to the right present the sources of cash income in the reference year by wealth group, first in terms of absolute values, and next as a proportion of annual cash income. They reveal a number of points about the local household economy. First, livestock-related income is clearly important for the top three wealth groups. Thus, even in a year of decent crop production, cash income depends more on livestock than on crops. Second, there is a noticeable difference between the sources of cash income for those in the upper three wealth groups and those in the bottom wealth group. Very poor households derived more than half of their annual cash income from **off** their own farms, working for others, or generating income from self-employment activities. The top three wealth groups, on the other hand, obtained 80-100% of their cash income from their own farms – both from crops and from livestock – in the reference year.



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



The graph provides a breakdown of total annual cash income as a percent of annual cash income.

There were five main sources of cash income in the reference year: own crop sales, own milk/egg sales, livestock sales, seasonal agricultural labour, and self-employment. On average, better off households' annual cash income was over four times higher than very poor households'.

In the reference year, crop sales accounted for 27-46% of cash income for households. Maize, beans, pigeon peas and sunflower are sold, although sunflower is only sold by better off households. Maize provides the majority of crop-based cash income, accounting for over two-thirds of the cash earnings from crop sales. Beans and pigeon peas garner a higher price than maize, sold at an average of 2 ½ times more per kilogramme, but far larger quantities of maize are sold. In the reference year, beans brought in 30-40% of the crop-sale income for local households. In years when rains are inconsistent, beans become even more important, as they have a higher tolerance to drought than maize, and their price tends to increase in bad years. Better off households grow and sell a small amount of sunflower as well, although this is not crucial income when viewed on an annual basis. In absolute terms, better off households generated over 7 times more from their crop sales than very poor households, which is proportionally more than the difference in land they cultivate. Better off households cultivate, on average, 4.5 times more land than very poor households, but are able to derive more per acre from their efforts, investing more in terms of labour and inputs, and able to time their ploughing, labour and inputs applications for more effective outcomes.

Sales of live animals (fattened oxen, cattle, goats, sheep, chickens, and pigs), milk and eggs provided an additional source of earnings in the reference year, making up around 15% of very poor household annual cash income, and 45-65% of middle and better off cash income. Poor, middle and better off households sold, on average, 0-1, 1-2, and 2-3 oxen (at 500,000-600,000 TZS per head), respectively, in the reference year; along with 1-2 heads of cattle (at around 300,000 TZS per head); 2-5 goats (at 35,000 TZS each) and 1-3 sheep (at 25,000-30,000 TZS each). Of these, very poor households sold only goats and sheep, 0-2 in total. All households also sold chickens, averaging around 8 hen sales per year at 8,000 each. Although households sell a number of livestock species, cattle are the most important, and the cash that better off households generated with their cattle and oxen sales alone exceeded the average annual cash income (all sources combined) of both very poor and poor households. Cattle are also important because of the milk they provide, and the upper two wealth groups both benefitted from milk income, accounting for around 4-8% of their total cash earnings. In addition, egg sales contributed a small amount of cash for all four wealth groups.

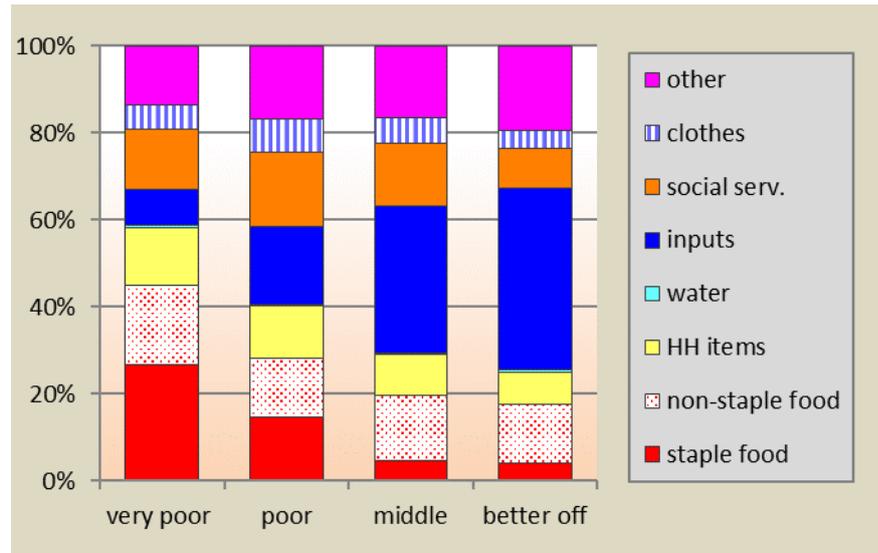
While better off households obtained almost all of their cash income from livestock- and crop-based sources, poorer households needed to supplement their farm-based cash income with other options. Seasonal agricultural labour and self-employment both provided additional cash for poorer households, and these are especially important sources for very poor households. Weeding is a busy time, and very poor and poor households split their efforts between their own farms and the farms of middle and better off households, where they work for a daily fee. As mentioned previously, because middle and better off households use ox ploughs and tractors, land preparation activities are not as labour-intensive, and people are not usually hired for land preparation and planting. But weeding is done entirely by hand and occupies people's time for three months of the year. People also get hired for harvesting work, but this lasts only for around a month. Seasonal agricultural labour provided very poor households with around a quarter of their cash income in the reference year, and it provided poor households with around 10% of their cash income. In the dry season, after the harvest ends but before the next agricultural season begins (July to December), poorer households rely on making and selling bricks as a source of earnings. Very poor households also gather and sell firewood and make charcoal. These self-employment activities account for around 35% of annual cash income for very poor households and around 5% of poor households' cash income.

Finally, better off households obtained a small amount of their cash during the reference year from credit. Technically this is not 'income' in the same sense as other sources, because it must be paid back with interest; but it does provide these upper households with additional financial resources with which to fund their productive activities. None of the other wealth groups had access to credit in the reference year.

## Expenditure Patterns

The graph presents expenditure patterns for the reference year April 2014 to March 2015. While absolute expenditure increases with wealth in line with total cash income, the expenditure breakdown by percent in this graph shows the *relative* amount of income spent on different categories.

There are a number of essential goods and services that households in this zone need to spend their money on each year. These include: staple and non-staple food, household items, productive inputs, social services, like schooling and health, in addition to clothing and other miscellaneous items. The graph illustrates a general trend in rural Tanzania: poorer households spend a larger proportion of their available cash on food, and those in the top two wealth groups spend a larger portion of their money on productive inputs. These trends are discussed in more detail below.



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

poorer households spend a larger proportion of their available cash on food, and those in the top two wealth groups spend a larger portion of their money on productive inputs. These trends are discussed in more detail below.

In an average year, like the reference year, all wealth groups buy staple foods, however the composition of the staple food basket is not the same for all wealth groups. In this zone, staple foods were defined as maize grain, sweet potatoes, wheat flour and rice. Very poor households devoted almost all of their expenditure on staple foods to maize grain, the cheapest staple, spending nothing on sweet potatoes or wheat, and only a very small amount on rice. Better off households, on the other hand, bought no maize grain, but did spend money on sweet potatoes, wheat flour and rice, all of which are preferred higher-priced foods. (For example, rice costs 2,000 TZS per kg on average, whereas maize grain costs around 555 TZS per kg.) Thus, poorer households bought staple foods to fill a calorie gap, whereas better off households bought staple foods to fill a diversity gap. This is an important point, because without the purchase of staple foods, the very poor wealth group would have been facing a food deficit, but the same cannot be said for the two upper wealth groups.

The same motivation extended to non-staple food purchases, a category in which better off households spent over three times more than very poor households. The non-staple foods category includes money spent on beans, sugar, meat, oil, fried fish, vegetables and Irish potatoes. Sugar and oil comprised 50-60% of the non-staple food budget for all wealth groups; sugar is used in relatively high amounts here, with around 1.5-1.75 kg of sugar purchased and consumed by the upper two wealth groups every week, and closer to ½ kg per week consumed by the lower two wealth groups. The lower two wealth groups did not buy vegetables and Irish potatoes, mainly buying sugar, oil and dried fish, along with small amounts of beans. Their spending on meat was quite minimal. Middle and better off households spent substantially more on meat, but tended not to buy beans (since they produced enough of these on their own). They also devoted more cash income to vegetables and Irish potatoes, although the latter was purchased only by better off households.

The dark blue bar on the graph above represents spending on productive inputs, including the following: livestock drugs, spare parts for fixing ploughs, seeds and tools, labour hire, livestock purchase, house repair, phone credit and loan repayment. Of these items, very poor households spent money only on seeds/tools and phone credit, with a roughly equal amount spent on each. Poor households spent most of their money on seeds/tools (30% of their inputs budget), livestock purchase (28% of their inputs budget) and phone credit (26% of their inputs budget). They also spent some cash on livestock drugs and house repairs. Middle and better off households spent the majority of their inputs budget on labour hire and livestock purchases. In absolute terms, better off households

spent more than 20 times the amount spent by very poor households and double the amount spent by middle households. Better off households had to invest large amounts of cash into hiring labour (which took almost a third of their inputs budget in the reference year), and livestock purchase (which took around a quarter their inputs budget). A typical better off household spent around 502,200 TZS on hiring labour in the reference year. When we compare this to the amount of seasonal labour income very poor households obtained in the reference year (around 234,000 TZS) we see that every better off household supported around 2 households in the very poor wealth group. This highlights the particular importance of this intra-community exchange of labour and cash: very poor households could not survive without this income; and better off households need the labour from very poor households to generate their surplus production. One final point is that better off households are the only ones who have to spend money repaying loans: this takes up around 10% of their inputs budget.

The 'hh items' category (in yellow) includes basic household necessities, such as tea, salt, soap, kerosene, grinding services and utensils. These are items that households usually pay for in incremental amounts on a week-by-week basis. Within this category, very poor households spent the most money on payment for grinding, which took up around 40% of their spending in this category, followed by soap. Poor households also spent the most money on these two categories, with the combined spending on these two items alone comprising around 60% of their inputs budget in the reference year. Middle and better off households spent the most on soap followed by grinding and utensils. On an annual basis, spending on basic household goods comprised 7-13% of total expenditure, decreasing as a proportion of annual expenditure as wealth increases (although increasing in absolute terms).

'Social services' includes schooling and health costs. Schooling expenses included school fees, uniforms, stationery and transportation, where relevant. On a per capita basis, holding household size constant, middle and better off households spent around the same amount on education, and these two wealth groups spent around 2 times more than very poor households, although not much more than poor households. Very poor households are not able to send their children beyond primary school, whereas those in the upper wealth groups may send them at least as far as secondary school, and sometimes on to college. Secondary schools are found only at ward level, and this means paying for things like transportation, boarding, higher fees and more expensive uniforms and supplies. In addition, better off households spent three times more on health care than very poor households on a per capita basis, indicating that these households may have had access to better clinics and private hospitals. Very poor households seek medical care at village dispensaries and ward-level health centres, which – although free or very reasonably priced - are often understocked and understaffed.

Spending on clothes and other miscellaneous items are the last two categories included here. The 'other' category includes things like beer, tobacco, cigarettes, transportation and festivals. This is discretionary spending that can be reduced or redirected in bad years to buy more essential items if necessary. In both absolute and relative terms, those in the upper three wealth groups had the most available in this discretionary budget (better off households had 6 times more in this category than very poor households); and because the reference year was a relatively good year, even the very poor wealth group had more in this budget than it would in a bad year.

## Hazards

There are a number of hazards that affect this zone on a regular basis. The first is **livestock disease**, such as Foot and Mouth Disease (FMD), tick-borne diseases and East Coast Fever. Contagious Bovine Pleuropneumonia (CBPP) and Contagious Caprine Pleuropneumonia (CCPP) affect cattle and goats, respectively<sup>4</sup>. Helminthiasis (worms) is a common problem, as well as New Castle Disease, which can wipe out an entire flock of chickens. Livestock diseases can cause significant herd losses, translating into large declines in income. The second is **crop pests and diseases**. Stalk borers, which affect maize; and aphids and rust fungus, which reduce yields for beans, cause losses throughout the zone almost every year. Birds can also ruin crops.

The main, and most devastating, periodic hazard is **inadequate rainfall**, which leads to serious declines in crop production, degradation of pastures, drying up of local water sources and spikes in food prices. This occurs once

<sup>4</sup> <http://www.lrrd.org/lrrd26/8/swai26138.htm>

every three years. **Army worms** devastate local maize harvests once every five years. **Floods** also cause damage to crops once every five years, on average.

## Response Strategies

In response to hazards and years with bad production, households attempt to meet their minimum food needs and cash requirements through a number of strategies. These strategies are detailed for this livelihood zone below:

- All households try to **reduce expenditure** on non-essential or more expensive items first, buying less sugar and rice, for instance, and using that money to buy the cheaper staple – maize – instead, or cutting down on festivals, tobacco and beer.
- All households also try to increase their **livestock sales**. Poorer households sell more goats, sheep and chickens, and some sell pigs. Middle and better off households sell more cattle, oxen, goats, sheep and chickens. This strategy is far more successful for middle and better off households than for poorer households. Poorer households have less protection, because they can afford to sell only a few animals and still maintain viable herds. Also, the value of livestock tends to drop in bad years, both because supplies increase as more people try to earn cash in the same way, and because their body condition deteriorates as grazing and water resources decline.
- Very poor and poor households try to increase cash income through **finding more casual work**, either locally or migrating outside the zone. In particular, people go to the Oldeani coffee estates in Karatu District. The expandability of this option is limited in bad years because of the increase in labour supply as more and more people look for work. This puts a downward pressure on wages so that even if people do find more days of work, they may earn less per day, making it hard to substantially increase cash income above normal year levels.
- Better off households **decrease the amount of money they pay (wage rates)** for agricultural labour. This directly contradicts the attempts made by poorer households to increase their casual labour income.

## 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 *Mbulu-Karatu Midlands Maize, Beans & Livestock Livelihood 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
<b>Crops</b>	<ul style="list-style-type: none"> <li>• Maize – masika – amount produced</li> <li>• Beans – amount produced</li> <li>• Pigeon peas – amount produced</li> </ul>	<ul style="list-style-type: none"> <li>• Maize– producer price</li> <li>• Beans – producer price</li> <li>• Pigeon peas – producer price</li> </ul>
<b>Livestock production</b>	<ul style="list-style-type: none"> <li>• Cow milk – yields</li> <li>• Fattened oxen – numbers per household</li> <li>• Cattle – herd size</li> <li>• Goats – herd size</li> <li>• Sheep – herd size</li> <li>• Pigs – numbers per household</li> </ul>	<ul style="list-style-type: none"> <li>• Cow milk – price</li> <li>• Fattened oxen - price</li> <li>• Cattle – producer price</li> <li>• Goats – producer price</li> <li>• Sheep – producer price</li> <li>• Pigs – producer price</li> </ul>

	<ul style="list-style-type: none"> <li>• Chickens – flock size</li> </ul>	<ul style="list-style-type: none"> <li>• Chickens – producer price</li> </ul>
<b>Other food and cash income</b>	<ul style="list-style-type: none"> <li>• Agricultural labour (weeding) – number of jobs</li> <li>• Agricultural labour (harvesting) – number of jobs</li> <li>• Brick production – numbers produced</li> <li>• Firewood/charcoal – bundles collected</li> <li>• Self-employment – level of activity</li> <li>• Credit – amount of credit issued</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural wage rates (weeding)</li> <li>• Agricultural labour rates (harvesting)</li> <li>• Bricks – prices</li> <li>• Firewood/charcoal – price per bundle</li> <li>• Self-employment – return on activities</li> <li>• Credit – terms/rates of repayment</li> </ul>
<b>Expenditure</b>		<ul style="list-style-type: none"> <li>• Maize grain – consumer price</li> <li>• Sugar – consumer price</li> </ul>

## 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. Other than credit, all of the options were proposed for all wealth groups. All of these suggestions require further detailed feasibility studies.

- Timely and affordable provision of crop and livestock inputs to all households
- Access to affordable and safe sources of water for humans and animals
- Provision of health services at village level, including qualified health professionals and sufficient and affordable supplies of medicines
- Improved maintenance of existing road networks and increased construction of new roads
- Provision of electricity at village level
- Improved livestock health infrastructure, including dip tanks, charcoal dams and crushes
- Targeted capital investments in agricultural activities and entrepreneurship