

Tanzania Livelihood Baseline Profile

Chalinze-Ngerengere Maize, Sesame & Cattle¹ Livelihood Zone (TLZ 41)

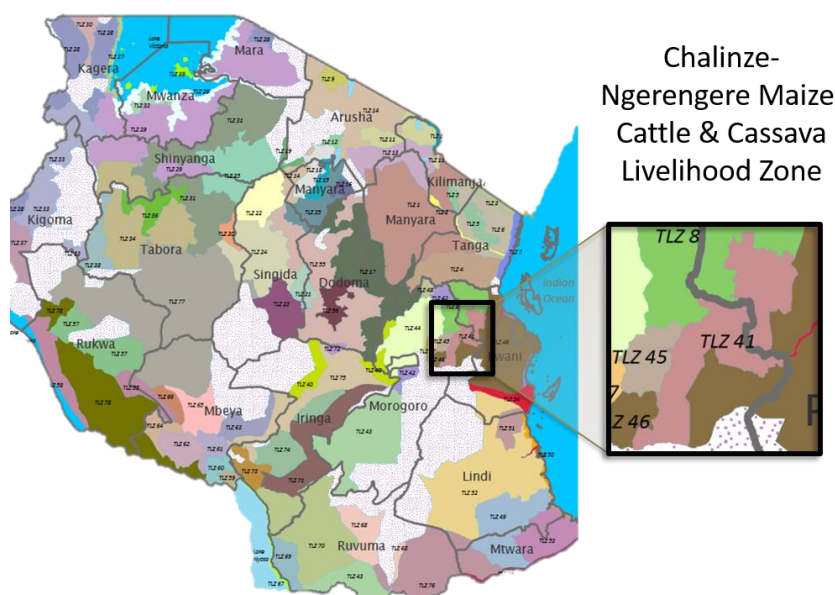
February, 2016²

Zone Description

The *Chalinze-Ngerengere Maize, Cattle & Cassava Livelihood Zone* is a warm lowland to midland zone found in parts of Pwani and Morogoro regions. In Morogoro District, the wards included in this zone are Bwakila, Chini, Ngerengere and Kidugalo; in Kibaha District, the wards included are Gwata and Magindu; and in Bagamoyo District, the wards included are Lugoba, Msoga, Talawanda, Pera and Bwilingu.³ The main ethnic groups living here are the Kwere in Bagamoyo, Chalinze and Kibaha; and the Luguru and Kutu in Morogoro District.

The Uluguru Mountains border the zone to the southwest, and major rivers, like the Ruvu, Ngerengere, Mvuha and Bwakila provide a source of water for local residents. The main towns found here include Chalinze, Ngerengere, Lugoba and Mvuha, and the zone is well connected to Dar es Salaam via a major tarmac road between Morogoro and the coastal capital as well as the central railway. This is a low-to mid-altitude area, ranging from 100 to 480 metres above sea level, with undulating plains and forested areas interspersed with agricultural land. The forests are an important source of charcoal, firewood and timber. The Selous Game Reserve also borders this zone, stretching southwards to cover an expanse larger than the country of Switzerland. The population density is approximately 23 people per km².

This zone has two rainy seasons – the *masika* rains, from March to June, and the short *vuli* rains, from November to December. The long *masika* rains are the most reliable and the most important for crop production. Total precipitation ranges from 800 to 1,000 mm, and the temperatures are hot and humid, typically hovering around 30⁰C from October to March, the summer months. Winter is cooler, with temperatures dropping to around 25⁰ C between May and August. The soils are sandy loams, moderately fertile and suitable for cultivation.



Chalinze-Ngerengere Maize, Cattle & Cassava Livelihood Zone

¹ The previous name of this zone was Chalinze-Tununguo Maize, Cassava & Cattle, but after the current field work, team members proposed a new name that reflects livelihood patterns in the zone. It should be noted that within the same geographical area there are households practicing pastoralism, agro-pastoralism and cropping. This profile covers the livelihood patterns of the agro-pastoralists and cropping households.

² Fieldwork for the current profile was undertaken in November and December of 2015. The information presented in this profile refers to the reference year, which was the consumption year that started in May 2014 and ended in April 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.

³ The southern part of the zone shown on the map should be separated from the current zone because it has a different economic base, dependent on irrigated crops along the rivers, including paddy, water melons, tomatoes and bananas. The three wards that should be separated from this zone are Tununguo, Mvuha and Bwakila in Morogoro District. The information contained in this profile does not apply to these wards.

This zone is considered self-sufficient in the sense that rarely do people need external assistance. This does not mean that households grow all of their own food; they do not, relying heavily on the market to meet food needs every year, especially on the poorer end of the wealth spectrum. The foundation of the household economy in this livelihood zone is two-fold: people grow crops for consumption and sale; but just as importantly they raise livestock. Livestock are more important in cash terms than crops, and milk is consumed by those in the top two wealth groups. Maize, sorghum and cassava - all of which are rain-fed - are the main food crops grown, along with some pulses; households sell part of these food crops for cash. Sesame is grown as a cash crop, sold to markets as far away as India. Cassava used to be more important in this zone, but in recent years a number of factors have led to its diminished role; wild pigs, for one, root up cassava, creating a year-round requirement to scare them off. Also, cattle numbers have increased, which has elevated the labour requirements around livestock and reduced the time available for households to manage cassava throughout the year. An additional factor is the growth in importance of sesame; households prefer to focus on this high-value crop over cassava. Hand hoes are the dominant form of cultivation; ox ploughs are not used, although a few better off households hire tractors. Land clearing/preparation and weeding are the most labour-intensive activities and for these tasks middle and better off households hire members from poor and very poor households to help them. It is mostly the men from poorer households who work as seasonal labourers, helping provide their families with an important source of cash.

Livestock are the second important pillar of the economy. Cattle, goats, sheep and chickens are raised, relying on free grazing/browsing and some crop residues. During the wet season, livestock find water in rivers and seasonal streams. In the dry season they turn also to shallow wells and dams, and cattle are moved to rivers within the zone towards the end of the dry season. Cattle are the most important livestock from an economic viewpoint; they provide significant amounts of milk for consumption and sale and those who have them are able to sell young steers or other unproductive animals to generate cash when needed. Goats and sheep are used for meat, slaughtered especially during the festival season, and also sold when needed. Very poor households own only chickens, also sold throughout the year when cash is required. Men are responsible for taking care of the cattle, goats and sheep; women and children manage the chicken flocks.

To earn additional cash, poorer households depend heavily on seasonal agricultural labour - all of it local - and on selling charcoal. Charcoal is produced by cutting down and burning trees from local forests. The charcoal then gets bundled and sold to local urban areas. This practice, carried out especially during the hunger season (February to April) and in the dry season (July to October) is having a devastating effect on the local environment. Middle and better off households earn extra cash from petty trade and running small kiosks.

Services in this zone are on a par with much of rural Tanzania. Drinking water is obtained from government-run taps, which require payment of around 50-100 Tsh per household per day. Water for washing comes from rivers and wells (both shallow and deep). Sanitation facilities consist of pit latrines, most of which are constructed with brick and mud and covered with aluminium sheets. Better off households may have improved concrete floors instead of mud floors. Most villages have a health dispensary, although these may not be well-stocked. Better off households typically travel to health facilities in the ward centre, or hospitals in regional centres when necessary. Primary schools also available in villages, with secondary schools found at the ward level. Most poorer households send their children through primary school but not to secondary school. Middle and better off households, on the other hand, can afford to send their children to secondary school and vocational college. There is no electricity in this zone so households depend on battery-operated torches and kerosene lanterns for light; most better off households use solar lanterns. In general, all households have at least one mobile phone and better off households have multiple phones. People do not have access to credit here; VICOBA offers an opportunity to save money, but this is done only by better off households. A few NGOs operate here, including the Tanzania Social Action Fund (TASAF), which provides grants to poor households to start income generating projects or to access social services; CAMFED, which supports girls' education; MUVI, which helps support sesame production.

Markets

The transportation infrastructure in this zone is relatively good. There is a tarmac road from Dar es Salaam to Morogoro and Tanga which passes along the zone; and feeder roads extend throughout the zone, from Chalinze to Ngerengere, Chalinze to Magindu, and Chalinze to Talawanda. For the most part roads are accessible throughout the year and bridges are all in good condition, although some of the more remote areas can be difficult to traverse in the peak of the rainy season. The zone is close to urban centres, which provide a steady demand for local commodities. Morogoro is the main intermediary market, providing ready access to Dar es Salaam, the main terminal market for most goods.

Maize, sorghum and cassava are the main food crops sold by households in this livelihood zone. Sesame, however, is the most important cash crop. Food crops are sold from August through October. Traders come to the farm gate, traveling from village to village to buy up local commodities. They transport crops to Morogoro, where they are sold at retail; or on to Dar es Salaam. Sesame is also purchased by traders directly from local households in June and July; the terminal market for sesame is India. It transported by traders to Morogoro and then on to Dar es Salaam, from where it is shipped on freighters headed east.

Livestock and milk are a more important commodity (in terms of cash earned per household) than crops. Cattle – the biggest earner – and goats and sheep are sold at local markets called *mnada* or *gulio* twice a month. The urban population in Dar es Salaam ensures a relatively constant demand for livestock; traders purchase the animals locally and then truck them on to the city. Chickens are also sold at local markets throughout the year, but consumed within the region.

Households in all wealth groups also buy some maize grain during the year, especially from October through April, when local stocks are low and the new harvest has not yet come in. Maize is the cheapest local staple, and most of this is sourced from Ruvuma and distributed via local markets. Non-food essentials, like salt, soap, batteries and kerosene, are sold in local kiosks owned by better off households.

The labour market is entirely local seasonal agricultural work. It was estimated that in the reference year, 100% of seasonal labour was found within the zone on local farms, with middle and better off households hiring poorer household members to work on their land.

Timeline and Reference Year

The baseline assessment refers to a very specific time period called the reference year. In the *Chalinze-Ngerengere Maize, Cattle & Cassava Livelihood Zone* the reference year covered the **consumption** period from May 2014 to April 2015. During community leader interviews, informants were asked to rank the last four years (eight seasons) 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 *vuli* rains in October/November and ends with the May through July harvest 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 was relatively good, with good rainfall, good harvests and average food prices. In the past nine seasons, including the recent *vuli* season, five were below average, three were average and one was slightly above average.

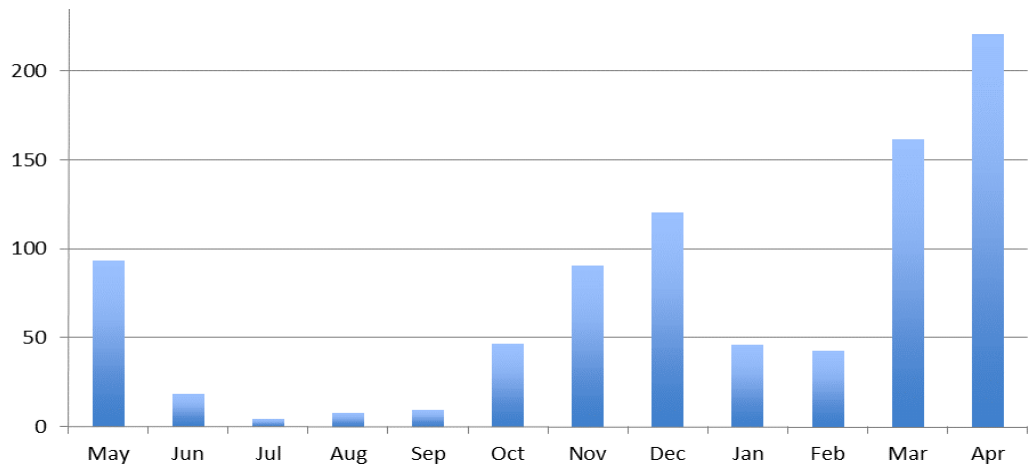
Production Year	Season	Rank	Critical Events
2015-2016	<i>Vuli</i>	3	Fairly good <i>vuli</i> rains; farmers have planted
2014-2015	<i>Masika (2015)</i>	1.5	Inadequate rainfall, high food prices; normal livestock migration; increased livestock sales and charcoal sales
	<i>Vuli</i>	1	No <i>vuli</i> rains

2013-2014	Masika (2014)	3.5	Good rainfall, good harvest and average food prices
	Vuli	1	No vuli rains
2012-2013	Masika (2013)	3	Average rainfall; average crop production average prices
	Vuli	2	Below average rains
2011-2012	Masika (2012)	3	Mixed picture by village – some average and some inadequate rainfall, poor harvest with high food prices; normal livestock migration; people increased livestock sales and charcoal sales
	Vuli	1.5	Poor rains
<p>5 = an excellent season for household food security (e.g. due to good rains, good prices, good crop yields, etc.)</p> <p>4 = a good season or above average season for household food security</p> <p>3 = an average season in terms of household food security</p> <p>2 = a below average season for household food security</p> <p>1 = a poor season (e.g. due to drought, flooding, livestock disease, pest attack) for household food security</p>			

Seasonal Calendar for Reference Year

	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr
Rainy season												
Crops												
Maize												
Sorghum												
Sesame												
Cassava												
Livestock												
Cattle milk peak												
Cattle sales peak												
Goat sales peak												
Livestock diseases												
Other												
Agricultural labor peak												
Charcoal sales												
Stress & High Expenditure Periods												
High staple prices												
Human diseases												
Festival season												
Lean season												
Legend												

The graph to the right shows average monthly rainfall (mm) in Kibaha for a 50-year period from 1964 to 2013. Source: TZ Meteorology Department



This livelihood zone benefits from two rainy seasons. The first, called the *vuli*, is short, starting in October and lasting until the end of December; the second, called the *masika*, occurs from March through May. *Masika* rains are when the main planting takes place here because *vuli* rains do not provide enough precipitation and they are not as reliable. Nevertheless, as shown on the calendar above, most households attempt to plant a *vuli* crop of maize, taking what comes from it if it succeeds. Most maize, however, is planted in March, when the *masika* rains are fully established. Sorghum, sesame and cassava are also planted at this time, following a month of land preparation in February.

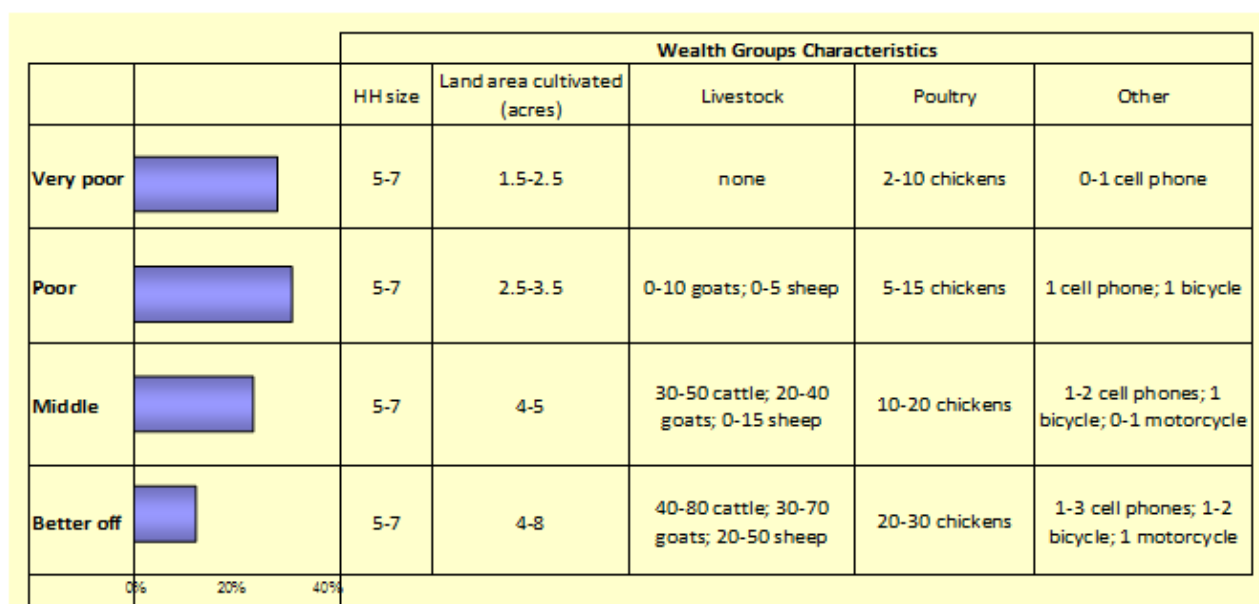
January through April is when seasonal agricultural labour is most intense. Within that period, April is an especially challenging month, with weeding the main focus of agricultural activities. Poorer households need to buy food at this time of year as they tend to have none of their own food stocks left from February through April. This is the worst month of the lean period, when prices are high and food stocks are low; human and livestock diseases (especially malaria for people and East Coast Fever and Blackquarter – both highest in the rainy season) are starting to peak at this time too, imposing additional expenditure requirements on already-stretched households. Poorer households, in need of extra cash to buy food, medicines and possibly livestock drugs, find work on the farms of middle and better off households, paid to weed their larger fields. They also burn and sell charcoal or collect and sell firewood at this time to shore up their cash income.

Middle and better off households, who own cattle, see their milk production peak from April through June, as the condition of cows improves with replenished pastures from the recent rains, and with plentiful supplies of water. Milk helps boost the nutritional content of the diet for these households, and especially for children, while at the same time improving the income flows, since households sell at least half of their milk. Cattle and goat sales peak from August through October. Body condition is highest at this time, which brings in the best prices. There is also higher demand locally since people have extra money from crop sales, and the dry season facilitates the movement of trucks which are deployed to transport livestock to Dar es Salaam. Goats are also sold in higher quantities in the lean season – but mainly by poorer households.

May marks the beginning of the consumption year as households begin to eat maize from the *masika* harvest. At first, maize is eaten green – especially by poorer households, who cannot afford to wait the additional month or two for the dried harvest. In July and August the main maize harvest is taken in from the fields and August and September are when sales of maize are highest. Cassava and sesame can be harvested starting in June. Sales of sesame – the main cash crop - are highest in July. People sell cassava for months afterwards, with peak sales occurring from October through December.

The festival season occurs from September through December, when harvests are in, cash flow is a bit higher and people have a chance to rest before delving into the next production year. Meat consumption is highest during these months as goats are slaughtered; and expenditures on weddings or other celebrations is highest at this time as well.

Wealth Breakdown



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

Both crop and livestock production are central in this zone, and so it follows that the area of land cultivated by a household along with the number of livestock it owns are the two key determinants of wealth. Households with smaller areas of land and fewer livestock are generally poorer, whereas those with larger plots also have more livestock and are considered better off. In addition, ownership of productive assets, like motorcycles (which enable households to make money *from trading activities*), contributes to the basis on which differences of wealth are determined.

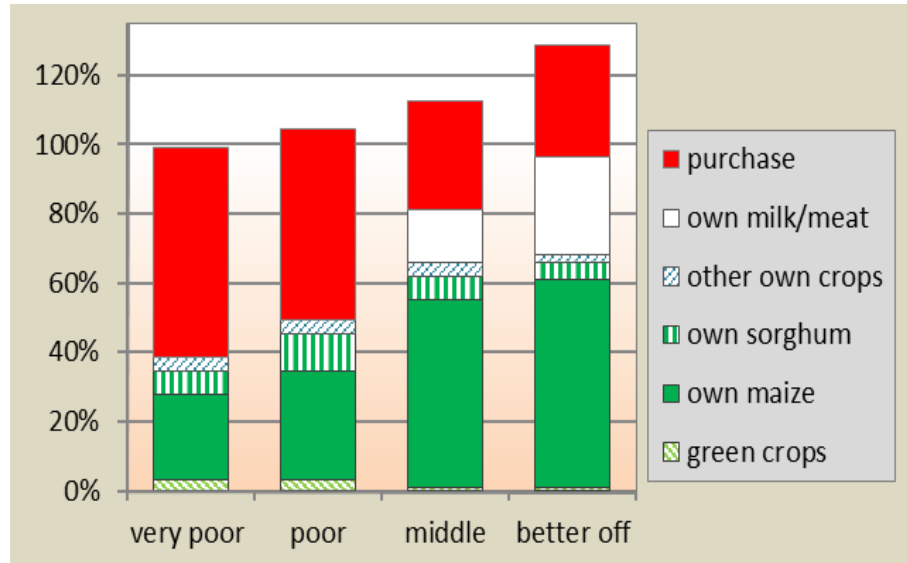
Very poor households plant on 1.5-2.5 acres and have no livestock other than chickens. Poor households cultivate 2.5-3.5 acres and own 0-10 goats and 0-5 sheep along with a few chickens. A jump occurs between poor and middle households, with middle households typically cultivating 4-5 acres and owning 30-50 cattle, 20-40 goats, possibly some sheep and 10-20 chickens. The difference between these two wealth groups is seen more in the livestock than in the land. Middle households cultivate just an acre or two more than poor households, but they own twenty to thirty times more cattle. Better off households cultivate 4-8 acres (not much different from middle households) and own 40-80 cattle, 30-70 goats and 20-50 sheep. Cattle are critical because they bring in significant amounts of cash income from live animal and milk sales; and they provide extra nutrition and calories in the form of milk. The other critical divide between poor and middle households is that poor and very poor households need to work for others to earn enough cash to live on and middle households do not. Thus, middle and better off households hire labour to work for them; very poor and poor households *are* the labour that gets hired.

Middle and better off households are engaged in trade activities, providing them with another source of cash. This trade is enabled by their ownership of motorcycles. Almost all better off households own at least one motorcycle and some middle households do as well. Bicycles are another common means of transport, and all wealth groups except for the very poor own at least one bicycle. Almost all households also own at least one cell phone. Over the last decade, cell phone ownership has become ubiquitous throughout rural Africa.

There are more households falling into the very poor and poor categories than into the middle and better off categories. Very poor (30%) and poor (33%) households together comprise just under two-thirds of the households in the zone. Middle (25%) and better off (13%) households combined represent just over a third of the population.

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 May 2014 to April 2015. May 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.



Households in this livelihood zone depended on three main sources of food in the reference

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.

year: their own crop production; their own milk and meat production; and the market. A range of crops are grown here, including maize, sorghum, cassava, pulses (like pigeon peas and cowpeas) and sesame. Only the top two wealth groups are able to produce enough from their own fields to come close to meeting all of their own food needs, even in a good year like the reference year. Better off households harvested around 1,200 kg of maize, 250 kg of sorghum and 320 kg of cassava in the reference year along with small amounts of pulses for consumption. Very poor households, on the other end of the wealth spectrum, produced only around 390 kg of maize, 390 kg of sorghum, and 100 kg of cassava along with small amounts of pulses. If these poorer households had consumed all the maize, sorghum and cassava they produced, they could have covered around 65-70% of their minimum calorie needs, leaving a fairly sizeable gap. Better off households could have covered closer to 125% of their minimum calorie needs. However, all households here sell some of their crops for cash, which means that even better off households are left with a staple grain gap that needs to be filled with purchased food. When combined, the contribution of own crops (after sales and seed) accounted for around 40-68% of households' annual food needs in the reference year, increasing with wealth.

The upper two wealth groups fill in a good portion of the remaining gap with milk and meat. Middle households typically had around 12 cows milking during much of the reference year, and better off households had, on average, 15 cows milking. Very poor and poor households did not own any cattle and were not able to benefit from this source of food. Yields are relatively low, at 1.5 litres a day in the first rainy season (lasting around four months) and 0.75 litres a day in the second rainy season (lasting around two months). When added together, the milk from both seasons amounted to around 2,700 litres for middle households, and 3,375 litres for better off households during the reference year. Around 50-70% of this was sold, providing some cash income (shown in the section below) for these two wealth groups. The remainder was consumed, providing 8-18% of the minimum calories for these households. Meat from cattle and goats consumed throughout the year contributed an additional 4% of minimum food needs for the upper two wealth groups. Goats are the main livestock slaughtered, usually in April, June, July and December during festivals; but cattle that die from natural causes are also eaten.

Given the remaining gap, all households needed to purchase staple grain to cover a production gap – even better off households. In the reference year, an average year, very poor households bought almost 600 kg of maize grain, the cheapest staple, which is equivalent to 45-50% of their minimum calories; poor, middle and better off households bought around 40%, 12%, 6% of their calories in the form of maize grain, respectively. All households also bought some rice, with middle and better off households buying more of this expensive grain

than poorer households. Beans, sugar, meat, oil, Irish potatoes, and dried fish also contributed to the purchased food basket. Combining both staple grain and non-staple food purchases, households here relied on the market to cover 30-60% of their minimum calorie requirements in the reference year.

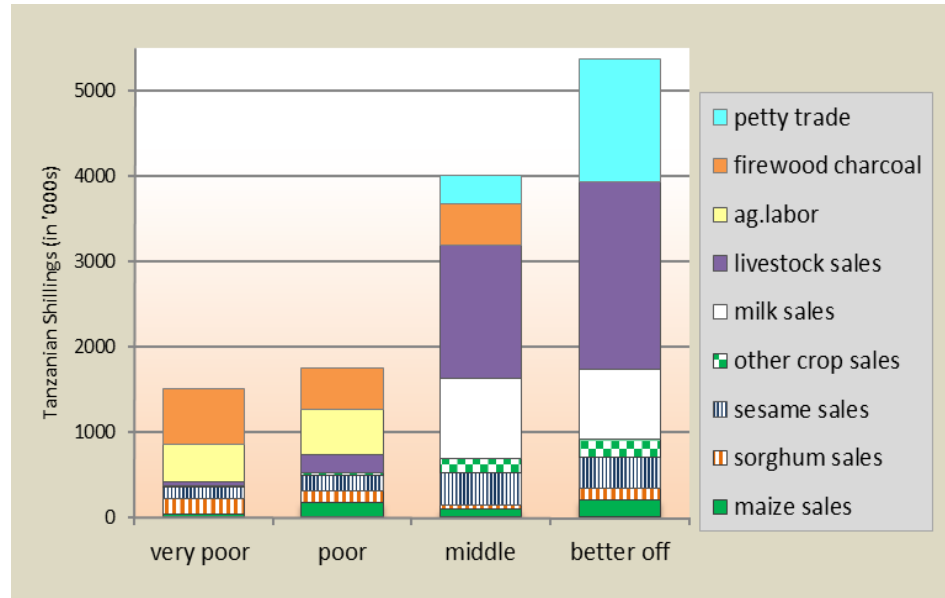
Sources of Cash Income

The graph to the right highlights six main sources of cash income in this livelihood zone: own crop sales, milk/egg sales, livestock sales, agricultural labour, petty trade and firewood/charcoal sales. The majority of cash income for middle and better off households is generated on the farm (from crop and livestock-related sales.) The bottom two groups rely heavily on agricultural labour and firewood and charcoal sales to supplement their crop and livestock-related cash income. Their on-farm production meets less than half of their annual cash needs.

The importance of livestock sales and milk sales is striking

for the upper two wealth groups. Combined, these two sources of income account for around 55-65% of annual cash for middle and better off households; for very poor and poor households, on the other hand, they only make up 3-12% of annual cash income. The difference is due almost entirely to cattle, owned by the upper two groups but not by the lower two. Cattle are worth 300,000 – 350,000 Tsh per head. Typical middle and better off households each sold 4-5 head of cattle in the reference year, bringing in 1,200,000-1,750,000 Tsh. This stream of income alone is more than the total annual income of some poor households. In addition, these households also sold goats, sheep and chickens. Their total income from livestock sales ranged from 1,565,000 Tsh to 2,207,000 Tsh. Poor households sold only goats, sheep and chickens in the reference year, averaging around 200,000 Tsh from livestock sales; very poor households had only chickens to sell, which brought them around 40,000 Tsh. Cattle also afforded middle and better off households with cash income from milk sales, adding another 825,000 – 950,000 Tsh. Comparing livestock-based cash income (including both the sale of live animals and milk) across wealth groups we see that better off households had a total that 75 times higher than very poor households' and 15 times higher than poor households'. Without cattle this difference would have been only 11 times higher (better off vs very poor) and 2 times higher (better off vs poor) respectively.

Crop sales generated 15-30% of cash income for households in this zone in the reference year. It is worth remembering that the reference year was a good year, so the contribution from crop sales is as high as it would ever be. In a bad year the share will decrease. This suggests that crops are more important as a source of food than cash here. Maize, sorghum, cassava and sesame were the main crops sold; sesame generated 34-56% of crop-based cash income, with middle households making the most of this crop. Sorghum sales were most



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

INCOME SUMMARY TABLE (in Tanzanian Shillings)				
Wealth group	Very poor	Poor	Middle	Better off
Annual income per household ⁴	1,140,000 – 1,640,000	1,640,000 – 2,10,000	3,000,000 – 5,000,000	5,000,000 – 6,000,000

⁴ The average exchange rate from May 2014-April 2015 was 1 USD = 1,810 TZS

important for very poor households who generated around half of their crop-based cash income from this crop alone. Better off households generated around 2 ½ times as much cash from crop sales as very poor households. Although crops contribute to the local economy, they are not as important as livestock.

Poorer households depend on two main sources of cash other than crop and livestock sales: agricultural labour and charcoal/firewood sales. Middle and better off households hire men and women from poorer households to help with land preparation and weeding activities. January and February are especially busy months for agricultural labour, when land preparation occurs, as well as April, when weeding takes place. The wage rate for land preparation is higher than for weeding, but weeding generates more revenue for very poor households, who may send additional people to work during this time and/or spend more days working. Agricultural labour accounts for around a third of annual cash income for the bottom two wealth groups. Selling charcoal and/or firewood brought in even more money for very poor households in the reference year, making up around 45% of their cash income. Middle households may also be engaged in charcoal sales. Men are responsible for charcoal production and sales; women gather and sell firewood. Local towns are the main source of demand. Wood for both is found in the forests within the zone and environmental degradation is clearly a serious problem given the high reliance on this income source.

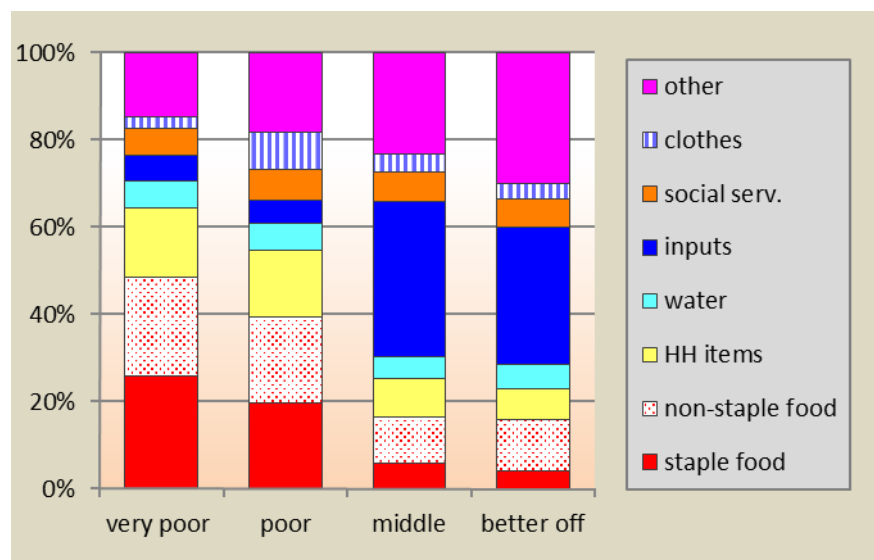
Petty trade is very important for better off households, and also for middle households. This trade is done mainly by middle and better off households who have motorcycles and extra money and can buy up local produce, selling in more profitable markets to make a small margin. Better off or middle households may also have small kiosks where they sell salt, soap, kerosene or other household goods. Better off households relied on petty trade to make up around a third of their cash income in the reference year.

Those at the upper end of the wealth spectrum generated, on average, three and a half times more than those at the bottom. Owning cattle is the critical differentiator in this zone, affording the two upper wealth groups with cash income from the sales of cattle as well as milk. Having the means to trade provides a further advantage, with petty trade bringing in – for better off households – almost as much on its own as very poor households made from all of their sources combined.

Expenditure Patterns

The graph presents expenditure patterns for the reference year May 2014 to April 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 range of essential goods and services that households here need to spend money on, including: staple and non-staple food, household items, productive inputs, social services, clothing and other miscellaneous items. There are four main points to make about the information displayed in the graph.



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

First, both absolute and relative expenditure on staple foods decreases as we move up the wealth spectrum, but the opposite is true for non-staple foods. Very poor households spent, on average, around 390,000 Tsh on

staple foods⁵ in the reference year; better off households spent around 220,000 Tsh. But if we look just at spending on maize grain it becomes clear that poorer households spent far more on ensuring they had sufficient calories and better off households spent more on diversifying their diet: very poor households spent around 360,000 Tsh (of the 390,000 Tsh) on just maize grain, whereas better off households spent 62,400 Tsh (of the 220,000 Tsh) on maize grain. The rest of the staple expenditure was on beans, oil and dried fish. All households also spent money on other foods, such as rice, sugar, meat, and potatoes. These are all included in the non-staple food basket. Better off households spent almost twice as much on non-staple foods as very poor households, again using the market to help diversify their diets.

Second, expenditure on basic household goods ('hh items'), including all of the items bought by households over the year – often in small incremental amounts - to meet basic needs, such as tea, salt, soap, kerosene, grinding services and utensils, ate up a large amount of the cash earned by the two poorer groups. Within this category, the highest expenditure was on grinding; very poor households devoted 45-50% of their 'hh items' budget to grinding in the reference year; no wealth group devoted less than 30% of their 'hh items' budget on grinding. Soap took up the next largest chunk. On an annual basis, spending on basic household goods comprised 7-16% of total expenditure, generally decreasing in proportional terms (although increasing in absolute terms) with increasing wealth. Finding ways to reduce the relatively high costs of grinding for poorer households could help them free up some money for other productive uses.

Third, productive inputs accounts for a much larger portion of the budget for middle and better off households than for the poorer two wealth groups. 'Inputs' on the expenditure graph above includes the following: livestock drugs, house repair, seeds and tools, labour, livestock purchase and phone credit. Very poor households spent all of their inputs budget on phone credit. Poor households, in addition to phone credit, spent a small amount on seeds and tools. Middle and better off households spent the majority of their inputs budget (58-68%) on two items: labour and livestock purchase. Livestock drugs took up almost all of the rest of their budget. On the whole, middle and better off households devoted 30 - 40% of their annual cash income to productive inputs whereas very poor and poor households devoted only 5-6% of their annual budget to productive inputs in the reference year. In absolute terms, better off households spent almost 20 times more than very poor households on productive inputs.

Fourth, this is one of the livelihood zones where households need to spend a noticeable proportion of their budget on water. An average household buys 80-100 buckets of water from village taps every month throughout the year, spending 100-250 Tsh per bucket. In annual terms this adds up to around 5-6% of total expenditure. Water can also be obtained from local rivers and streams, but this is not safe for drinking and is used only for washing.

'Social services' includes the money spent on education and medical services. Education covers school fees, uniforms, stationery and transportation. Absolute spending on school during the reference year increased substantially as you moved up the wealth spectrum. Very poor households spent around 76,000 Tsh on schooling compared to 240,000 Tsh spent by better off households. As you move up, households are spending more on stationery, books, uniforms, school fees and transportation. Very poor households are unlikely to be able to afford to send their children beyond primary school, whereas those at the upper ends of the wealth scale are likely to send them through at least secondary school, and sometimes on to vocational school. Better off and middle households also spend more on medicine and health care, with each wealth group spending on average 20-50% more than the one below it.

Spending on clothes and other miscellaneous items are the last two categories included here. The 'other' category includes things like beer, tobacco, cigarettes, cosmetics, hair braiding, transportation and festivals. There is also some savings included here for the better off wealth group. 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 at the upper end of the wealth spectrum have the most available in this discretionary budget.

⁵ The team included maize grain, beans, oil and dried fish in the staple food basket.

Hazards

There are a number of hazards that affect this zone on a regular basis. The first is **inadequate and erratic rainfall and occasional drought**. All households rely heavily on crop production from one season to at least partially meet their food and cash needs. If rains in this season are poor, if they are interrupted at the growing stage, or if they end early, households are at risk of losing their crops, all of which are rain-fed. Thus the food and cash income of households here is substantially reduced when rains are poor. Pastures and water supplies are also affected when droughts occur, reducing milk yields and leading to a deterioration in livestock body condition and value. Second, **conflict between farmers and pastoralists** is high in this zone. Competition over scarce pasture and cropping lands as well as prime water sources has resulted in contested access to resources crucial for both farmers and livestock keepers. Third, **livestock diseases**, such as Food and Mouth disease (FMD) and East Coast fever – both of which affect cattle - and New Castle Disease, which can wipe out an entire flock of chickens, are serious problems. Fourth, **crop pests and diseases** are a constant threat. Elegant grasshoppers and army worms are especially problematic as well as *quelea quelea*, which threaten the sorghum harvest. Wild animals also cause damage to crops. Finally, poor markets for cash crops are a consistent constraint on the income of households here. With better market infrastructure and ensured access to markets that offer good producer prices, households here would have higher and more assured incomes.

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.
- Poorer households try to **increase the sale of charcoal**, intensifying the burning and selling of wood products. The expandability of this option is limited in bad years because as more people turn to this option, supplies of charcoal on the market increase, thereby reducing the price of each bag. There are also serious environmental downsides to this strategy. More must be done to provide poor households with an alternative to charcoal as an income source, both in normal and bad years.
- Poorer households also try to increase their **production and sale of handicrafts**. Again, this is an option with limited expansion since the market for handicrafts is limited, and the more households pursuing this option, the lower the returns on each sale.
- Poorer households also **sell more chickens**. However, as the number of chickens owned by very poor and poor households does not exceed 10-15, and each chicken is worth only around 8,000 Tsh in a good year, this option will only go so far in terms of raising cash income.
- Middle and better off households try to increase their **livestock sales**. 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. However, middle and better off households have relatively large herds of cattle here, so this option could provide people with a substantial amount of additional cash.
- Middle and better off households try to increase their reliance on petty trade and **small businesses**, buying and selling goods to make as much cash as they can with which to buy food.

- Middle and better off households also use some of their **savings** in bad years, buying food and other necessities with money saved from the previous good year.

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 *Chalinze-Ngerengere Maize, Cattle & Cassava 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
Crops	<ul style="list-style-type: none"> • Maize – masika - amount produced • Sorghum – masika – amount produced • Cassava – amount produced • Sesame – amount produced 	<ul style="list-style-type: none"> • Maize – masika – producer price • Sorghum - masika – producer price • Cassava – producer price • Sesame – producer price
Livestock production	<ul style="list-style-type: none"> • Cow milk – yields • Cattle – herd size • Goats – herd size • Sheep – herd size • Chickens - numbers 	<ul style="list-style-type: none"> • Cow milk – price • Cattle – producer price • Goats – producer price • Sheep – producer price • Chickens – producer price
Other food and cash income	<ul style="list-style-type: none"> • Agricultural labour (land clearing and preparation, weeding) – number of jobs • Petty trade – amount of trade • Firewood/Charcoal – bundles/bags sold 	<ul style="list-style-type: none"> • Agricultural wage rates (land clearing and preparation, weeding) • Petty trade – margins on trade • Firewood/Charcoal – prices
Expenditure		<ul style="list-style-type: none"> • Maize grain – consumer price • Oil – consumer 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.

- 1) Improve health services and increase the availability of medicines
- 2) Provide agricultural extension services
- 3) Provide affordable loans for agriculture
- 4) Improve road infrastructure and invest in maintenance of existing roads
- 5) Resolve conflict between farmers and pastoralists
- 6) Develop market infrastructure
- 7) Improve access to and availability of safe and reliable water supplies for humans
- 8) Provide subsidized and improved agricultural inputs, for example, access to a village tractor for rental
- 9) Provide access to mechanized agriculture
- 10) Improve education services, deploying sufficient numbers of primary and secondary school teachers and adequate school facilities