

Tanzania Livelihood Baseline Profile

Iramba Midland Maize, Sorghum and Sunflower Livelihood Zone (TLZ 22)

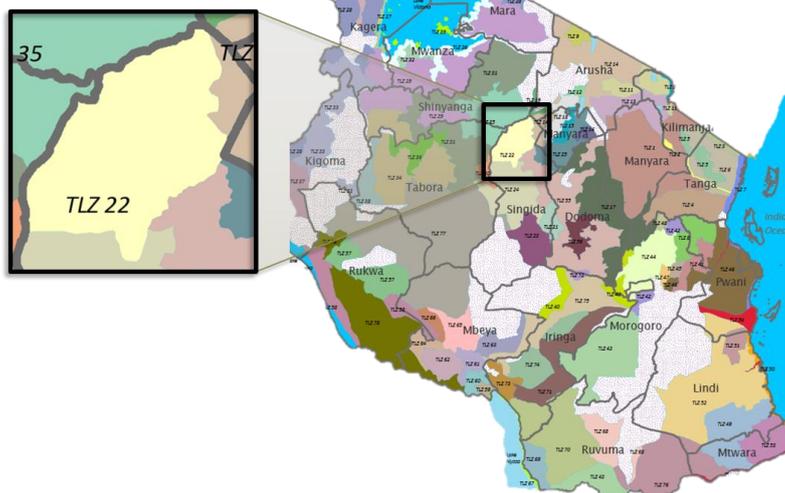
December, 2015¹

Zone Description

This agro-pastoral zone is located on the semi-arid central plateau of Tanzania. Rainfall is often erratic and dry spells and drought are quite frequent. Nonetheless, the local population produces a range of crops on relatively small plots of land (typically 1-8 acres). Maize, sorghum and sunflowers are the staple crops grown by all wealth groups both for food and for cash sale. Middle and better-off households produce various other cash crops as well (such as lentils and vegetables). Livestock production (milk, cattle and goat sales) is the second pillar of the local economy except for the very poor who rely on paid agricultural labor for most of their income. This zone is considered food surplus most years.

However, poor and very poor households purchased about 45% of their food even in a relatively good year. Moreover, households face a number of production challenges both chronic and periodic. Crop and livestock diseases, and the high price of inputs are a few of the chronic problems. Drought is the main periodic hazard and occurs as often as once every 5 years. The boundaries of the zone were recently adjusted to exclude the area in the southwest (Mtoa Ward) where some cotton and paddy are grown in the lowlands. In addition, the area in the northeast (Mwanga Ward) was also shifted to a neighbouring zone where onions are grown in relatively high quantities. The revised boundaries now cover a total of 37 wards in parts of 2 districts, namely Iramba (20 wards) and Mkalama (17 wards).² The zone is densely populated (54 people per km²) and is settled by 3 main groups: the Nyiramba, the Nyaturu and the Nyisanzu.

Iramba Midland Maize & Sunflower Livelihood Zone



The *Midland Maize, Sorghum and Sunflower Livelihood Zone* is situated on the great central plateau of Tanzania at an elevation of 1,000-1,500 metres above sea level. There are no mountains in this zone nor permanent rivers. The main feature of note is Lake Kitanguri on the northwest border of Singida Region, as well as Urughu Dam. The savannah vegetation and warm tropical climate as well as the mixed soils allow for reasonably good conditions for crop and livestock production. In this area of the central plateau, there are both fertile black soils, sandy, laterite and clay soils, and infertile red soil. Rainfall in this zone is generally in the range of 500-850 mm per year with notable variation from year to year. The climate is shaped by the monsoon winds which blow from the northeast from December-March/April during the short rainy season and then blow from the southwest during the long dry

¹Fieldwork for the current profile was undertaken from 2-16 October 2015. The information presented in this profile refers to the reference year, which started April 2014 and 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 5-10 years (i.e. until March 2025). All prices referred to in the document are for the reference year.

Iramba District: Total wards 20, namely: Kiomboi, Old Kiomboi, Kisiriri, Kidaru, Tulya, Ntwike, Mgongo, Mtoa, Shelui, Mtekente, Urughu, Ndago, Mbelekese, Kaselya, Ndulungu, Mukulu, Kinampanda, Ulemo, Kyengege and Maluga.

Mkalama District: Total wards 17, namely: Msingi, Tumuli, Iguguno, Kinyangiri, Kikhonda, Kinampundu, Nduguti, Miganga, Mwanga, Nkalakala, Nkinto, Matongo, Mwangeza, Ibaga, Mpambala, Ilunda and Gumanga.

season from April/May-November. Daytime temperatures are relatively hot throughout the year with the hottest period falling in October (29-32°C) and the coolest month falling in July. Water is sourced from seasonal rivers such as the Ndurumo, Sekenke and Misgiri Rivers in the wet season and from shallow wells in the dry season. These sources are shared by people and livestock alike. There are some natural resources, such as various minerals (gold, sodium carbonate, calcium salt and silicon), as well as woodland (timber) and fish but these resources do not play a large role in the local economy.

The semi-arid agro-ecology of Tanzania's central plateau supports a fairly mixed agricultural base. Maize and sorghum are central but in addition to these staple grains, farmers also grow sunflowers, groundnuts, beans, and sweet potatoes. These are the crops grown mainly for home consumption. Farmers also grow a variety of crops that for the most part are sold. This includes lentils, onions, tomatoes, sugar cane, pumpkin, cowpeas, Bambara nuts and cotton. Onions are more prevalent in the northeast; cotton is more common in the southwest. Farm work is labor intensive, particularly land clearing, weeding and harvesting. For poor and very poor households, these labor-intensive jobs are done manually. Better-off and middle households use an ox and plough for tilling or sometimes hire a tractor to plough the land. Occasionally, poor households rent an ox and plough and in exchange they provide weeding labor. Throughout the zone, agriculture is rain fed only and crops are grown during the single rainy season from November-April. Men and women share farm tasks such as land clearing, sowing, weeding and harvesting. However, livestock care is divided by gender. Men are responsible for cattle and poultry care is women's work. In this zone, the use of inputs (such as fertiliser, pesticides and improved seed) is limited as these inputs are not subsidised but must be purchased through private means from agri-dealers and are considered costly. Cattle owners apply manure to their fields and this is the main type of fertiliser used in the zone. Crop production is affected by certain chronic pests and diseases. Most notable is stalk borer which affects the staple grains, maize and sorghum. Agri-dealers sell a pesticide that can be sprayed on the crops but it is only available privately, purchased by households with sufficient cash income. Birds are also considered a chronic pest and families have to be vigilant with guards staying in the fields to scare away the birds. Fungal diseases are a problem for sunflowers and to avoid fungus developing, the crop has to be planted early.

Livestock production is the second key sector in the local economy. Cattle, goats, sheep and poultry are the principal animals reared in this zone. Livestock are free range, grazing in the open grasslands and on crop residues, and watering in seasonal rivers or from shallow wells when the rivers run dry. Households in this zone are settled in villages near their farmland and hence do not migrate seasonally with their animals. Cows are milked in both the dry season and the wet with peak production falling in the wet season when pasture is plentiful. In this zone, peak yields are about 1.5 L/cow/day (January-mid-April) but drop by half to 0.75 L/cow/day in the dry season (mid-April-August). Livestock are also kept as a source of cash income. There is not a big export market for livestock from this zone but households regularly sell a few animals as the need arises with a normal range being 1-3 goats and 0.5-3 cattle during the year. Sales tend to peak from December-March when households need cash for food purchases, as well as for the poor, post-harvest from July-September when paid agricultural jobs wind down. Very poor households only sell poultry. Most households keep a flock of chickens for meat. They also sell poultry for cash although Newcastle disease is a real problem for poultry owners. Goats and cattle in this zone are also affected by a number of chronic diseases, particularly cattle diseases such as trypanosomiasis, East Coast Fever, anaplasmosis and CBPP (contagious bovine pleuropneumonia). Most of these diseases require treatments (such as preventative vaccinations or dipping) that must be purchased privately. However, in the reference year, the CBPP vaccination was provided free by the Ministry of Livestock and Fisheries Development (MLFD).

Basic services and infrastructure are found in the zone. Most feeder roads are dirt or gravel. However, the main tarmac road from Dar-es-Salaam on the coast, to Mwanza on Lake Victoria in the northwest passes through the zone. Moreover, there is mobile communication service throughout most of the zone although the network is considered poor. Living conditions at the household level are fairly basic. Most households live in a traditional house with a mud roof (*tembe*), use kerosene and torches for lighting in the evening, and have outdoor pit latrines. Wealthier households typically install improved toilets as well as solar panels for lighting. Services are similar to other infrastructure: basic but accessible. For instance, villagers contribute to a community health care fund which gives them access to village-based health care services. Moreover, there are primary schools in most villages and secondary schools are available at the ward level. Water is accessed from seasonal streams and open wells. For the most part, water is fairly clean but there are clear health risks with open wells. Two NGOs are active in this zone:

HAPA (Health and Sanitation) and TASAF (Tanzania Social Action Fund). Humanitarian aid is rarely distributed. The exception was in 2012-2013 when households affected by a prolonged drought received food aid. There are no micro-finance institutions or any other credit-facilities at the village level.

Markets

Throughout this mixed agricultural zone, large, sprawling open-air markets (called *gوليو*) are found in all ward towns. In the *gوليو* markets, farmers and traders buy and sell their goods. Most of the main crops that are sold in the zone – including maize, sunflowers, lentils and onions – follow a similar trade route from local *gوليو* markets to nearby district centres (such as Kahama town). From there, the produce may be sold in Singida, the regional market hub serving this zone, or sent to Dar-es-Salaam, an important destination market for much of the produce from the central plateau. Singida town also has a processing plant where oil is extracted from sunflower seeds. The processed oil is then sold to major city markets (such as Dar-es-Salaam). Onions and lentils are sold in city markets such as Dar and Arusha but are also exported out of the country. Kenya is an important export market for onions; and India is the destination market for lentils (including lentils from this zone). Crops are sold at various times of the year depending when they are harvested. Onions are ready the earliest as post-harvest sales begin in April and continue until June. Sunflowers are usually harvested from May and sales continue until September. Post-harvest sales of maize begin in June but last until January. Lentils are sold mainly in July-August.

Staple grains are not just sold but are also bought during the year. The peak period for staple grain purchases is during the wet season from December through to March. At this time of year, the maize that is sold in the local markets is typically imported from northwestern Tanzania from Kagera Region near Lake Victoria. Bukoba is the regional market hub that serves as the transit market for produce from the Lake Victoria area to markets throughout central Tanzania. Rice is another preferred grain that is purchased by some households. Rice is usually imported from Shinyanga Region, northwest of Iramba District, through Singida regional market to local markets within the zone.

Cattle, goats, sheep and poultry are all sold by local villagers during the year. As a general rule of thumb, older oxen are sold as cash needs arise and young bullocks are purchased to re-stock the herd. Milk cows, however, are replaced from within the herd. The goats and cattle that are sold from this zone are not usually exported but are traded from local market to major urban centres (i.e., Dar-es-Salaam and Arusha) where demand for meat is high.

The need for hired labor on local farms is relatively high in this zone. Consequently, during years of decent rainfall, there is very little labor migration out of the zone. In the reference year itself, an estimated 90% of casual labor was found locally on the farms of better-off households.

The road network within the zone is considered fair. One issue is that most of the roads are gravel or dirt and hence they become impassable after heavy rain. Only the main Dar to Mwanza road is tarmac and is passable all year round. Bridges are in particular poor state of repair in this zone which affects market access for some villages.

Timeline and Reference Year

In the *Midland Maize, Sorghum and Sunflower Livelihood Zone*, the reference year is April 2014 to March 2015. Overall, the reference year was considered a good year due to the positive outcome of the 2013-2014 rains. As a result, livestock were healthy, the harvest was good and prices for both crops and livestock were average.

However, the last six years have seen a number of different outcomes. The most recent production year based on the 2014-2015 rains was very poor due to very low total rainfall and dry spells during critical times of the crop growing season. High staple food prices have hurt consumers and poor pasture meant livestock health declined. Likewise, conditions in 2011, 2012 and early 2013 were poor due to low rainfall and poor crop and livestock outcomes. Prior to this drought, conditions were reasonably good. However, in 2009-2010 there was heavy rainfall

and flooding led to pest outbreaks (namely arm worm). Despite this problem, overall production and price outcomes were reasonably good that year.

Production Year	Rank	Critical Events
2014-2015	1	Low rainfall and dry spells between February and March. This resulted into poor crop production and poor pasture together with high prices of staple food. Households sold more livestock and firewood as well as looked for additional agricultural labour. The government provided support through Tanzania Social Action Fund (TASAF).
2013-2014	4	Good rains, good pasture, healthy livestock, good harvest and average crop and livestock prices.
2012-2013	2	Poor rains and drought resulted to low crop production and high staple good prices. To cope, households sold livestock, looked for additional casual labour jobs, made and sold bricks and received some food aid from the Government.
2011-2012	2	Widespread rain failure led to very low harvests and to very high maize prices. Households' main strategy was to sell livestock. There was also social support between households as well as crisis responses such as renting out land for a bag of maize.
2010-2011	3	A year of good rainfall. Good harvest outcomes led to a fall in prices which hurt producers.
2009-2010	3	High rainfall led to some flooding which swamped some maize fields. Heavy rains also led to an army work outbreak. Overall, production was average and staple food prices were also average. .

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

Production Year – November to October

Consumption Year – April to March

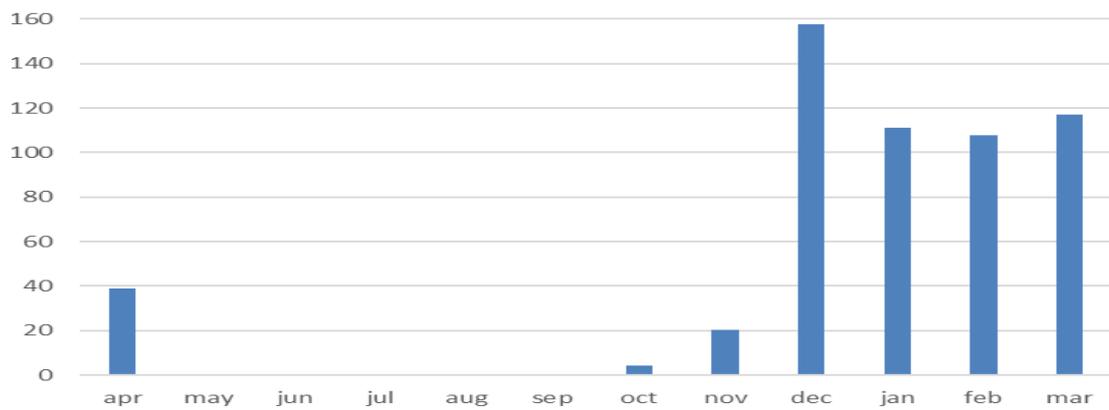
Seasonal Calendar for Reference Year

In this central midland zone, there is just a single rainy season which starts in November and carries through until April of the following year. This results in a single cropping cycle as agriculture is rain fed throughout the zone. The cropping cycle begins in November with land clearing and ploughing. Once the rains are established, farmers plant their crops. Maize is planted first and it is intercropped with the farmer's choice of beans, cowpeas, groundnuts and Bambara nuts. Sorghum, sunflowers and vegetables are grown in single stands and are planted once maize and beans are in the ground, usually in January. Weeding takes place as the crops grow and by April, the lean season comes to an end with some consumption of fresh maize and beans. The main harvest takes place in June-July, first maize, then sorghum and sunflowers. Maize sales peak during a four-month period from August-November. By contrast, maize purchases – and maize prices – peak from January-March when crops are still growing and poor households are juggling tending their own crops with earning a cash income.

Livestock production also has a defined seasonal cycle that is shaped by rainfall patterns. Cattle births are highest during the rainy season when pasture and water are plentiful which ensures the best survival outcome for young calves. Conception takes place about 9 months earlier. The calving season marks the start of the milking season which for cows lasts about 8 months. The milking season is divided into a wet season (January-May), when yields are highest, and a dry season (December and June-August), when milk yields decline by half. Livestock sales are most common in July-September/October as households who need income cannot find paid agricultural jobs at this time. A second peak occurs from January-March due to the need to buy staple grains. Other types of non-agricultural work are also carried out during the 3-month dry season (July-September) including brick making, construction work and petty trade.

Month	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Mar	
Rainy/dry season	wet	dry season							wet season				
Land preparation								land preparation					
Planting										planting			
Weeding											weeding		
Green consumption	maize											beans	
Harvest	sunflower		maize & sorghum										
Crop sales						peak crop sales							
Cattle births										cattle births			
Cow milk peak	milk								milk				
Livestock sales				peak livestock sales									
Agricultural labour				ag labour							ag labour		
Firewood sales					firewood/charcoal								
Brick sales				brick sales									
Construction labour				non-ag labour									
Festivals						festivals							
Hunger season										hunger season			
Peak staple prices										peak staple prices			

The graph to the right shows average monthly rainfall (mm) in Dodoma Region based on a recent 10-year period (2005 – 2014)
Source: TZ Meteorology Department



Wealth Breakdown

		Wealth Groups Characteristics				
		HH size	Land area cultivated (acres)	Livestock	Poultry	Other
Very poor		4 - 8	1 - 2	none	0-10 chickens	1 cell phone; 0 bicycles
Poor		6 - 10	2 - 3	0 - 4 cattle; 3-5 goats; 0-2 sheep	4-8 chickens	1 cell phone; 1 bicycle
Middle		6 - 10	4 - 8	2 - 6 oxen; 4 - 10 cattle; 8-12 goats; 0-8 sheep; 0-2 donkeys	10 - 15 chickens	2 cell phones; 1 bicycle; 1 ox plow
Better off		8 - 12	10 - 20	6 - 10 oxen; 15 - 30 cattle; 10-18 goats; 4-10 sheep; 1-2 donkeys	10-20 chickens	3 cell phones; 1 bicycle; 2 ox plows

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

In this zone, about half (52%) of households are considered very poor and poor. The other half of households are middle to better-off. However, the largest wealth groups are the poor (30%) and the middle (34%) which means that the majority of households do not fall in either of the more extreme wealth groups but somewhere in the lower to middle range.

For agro-pastoral households, their most important assets are land and livestock (including plough oxen). Very poor households have very few of these assets which is the reason for their poverty. In practice this means that they own no animals except poultry and they own very little land (1-2 acres). For those who do not own land at all, they usually rent in some farm land. Production is generally low as they farm with the use of hand hoes only and do not use other inputs. As a result, the very poor have to buy about 50% of their food during the year as their own-crop production only meets about 6 months of their annual food needs. Thus for at least half the year, the very poor are laborers either on construction sites, or on others' farms, or self-employed making and selling bricks. Typically they have relatively small households of 4-8 people.

Poor households are in a similar situation as the very poor. The key difference is that poor households typically own some sheep and goats (*shoats*) and some poor households even own cattle as well (0-4). This provides the poor with some back-up income when and as needed. The poor do not own plough oxen but at times they may rent oxen in exchange for weeding the crop of the ox-owner. Poor households typically own farms that are about twice the size of the very poor (2-4 acres) which in general they farm with hand hoes and limited inputs. In the reference year, their crops provided them with about 6.5-7 months of food as despite farming more land, they have more family members to feed (6-10 people on average).

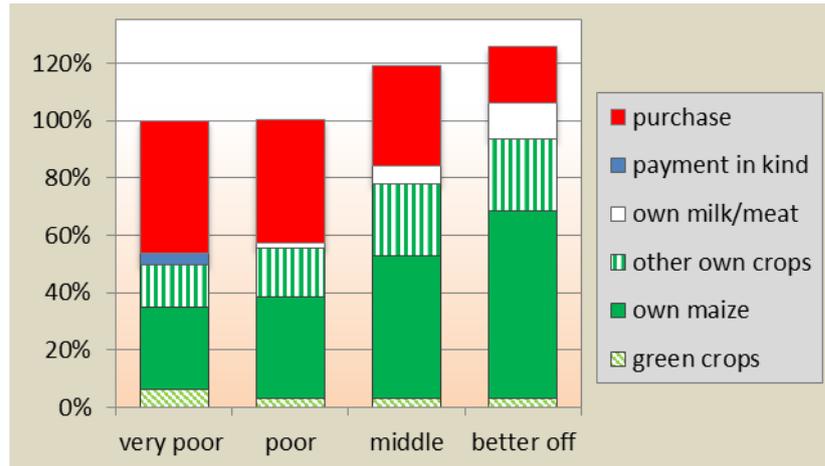
Middle households are not completely self-sufficient off their land but they produced enough food in the reference year to meet their food needs for about 9 months of the year. Middle households (who are typically 6-10 people in size) own and cultivate farms of 4-8 acres. Most importantly, they are cattle-owners and hence they cultivate with plough oxen, use manure from their 4-10 other cattle to fertilise the soil; have milk cows; and sell livestock for cash income, including cattle and, for some households, a fattened ox. However, middle households still require supplementary income to meet all their cash needs, and this income is mainly secured through petty trade.

Better-off households are those with the most land and livestock in their community. Typically, they own 12-20 acres which is more land than they cultivate in an average year (i.e., 15 acres). They produced sufficient staple food for the full 12 months of the reference year and also produced cash crops, such as onions and lentils as well as other vegetables for sale. The better-off plough with their own oxen and also hire labor for labor-intensive farm work. The defining characteristic of the better-off is that in a relatively average year, they can live off agriculture and livestock production alone without other supplementary food or income sources. Their household size is fairly large and 8-12 family members are the norm.

Wealth groups are also distinguished by other types of assets, including transportation and communication assets. Bicycles are an important resource for rural villagers and in this zone most households – except the very poor – have at least one bicycle. Similarly, ownership of a mobile phone is widespread. However, the number of cell phones owned by household increases by wealth group and in the reference year, better-off households typically owned 3 phones and poor and very poor households typically owned only 1.

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-March 2015. April 2014 represents the start of the consumption year because it is when people begin to consume green crops and marks the end of the hunger period. Food is presented as a percentage of 2100 kcal per person per day for the 12-month period.



In 2014-2015, most households secured food from their own-crops for at least half of the year. Middle and better-off households (with

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.

more land, labor and inputs) secured 9-12 months of food from their own-crops. All households in this zone focused on producing maize (29-65% of food needs) which they supplemented with sorghum, sunflower, beans, sweet potato and groundnuts. Due to poverty and chronic food shortages, it was mainly the very poor who began eating their maize fresh (or "green") in April/May while it was still in the field.

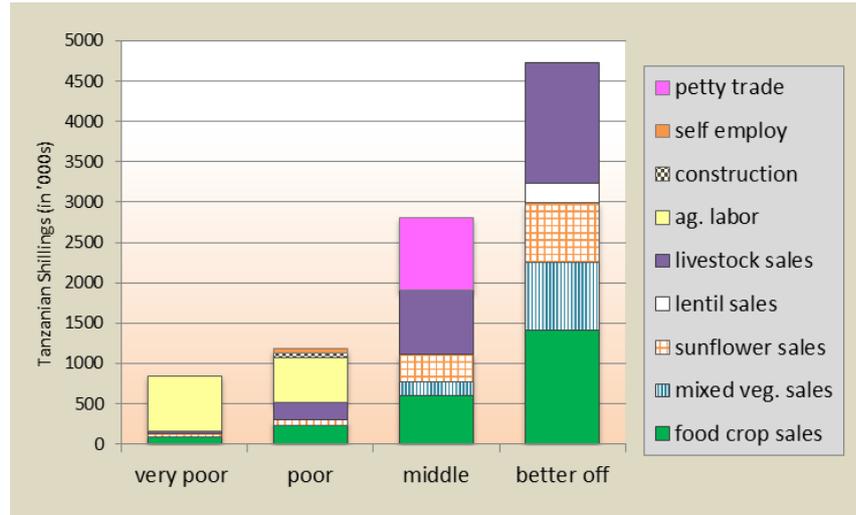
Purchased food was the other main food source for middle, poor and very poor households. The poor and very poor principally bought maize (28-33% of annual food needs) supplemented with sorghum. They also bought small amounts of sugar, cooking oil, beans and rice. The pattern was similar for middle households although they purchased less food over fewer months as they grew more staple crops. Middle households, like better-off households, could also afford to buy a greater diversity of food. These items included wheat flour, meat and dried fish. They also purchased more rice than poorer families.

Better-off households produced enough food from their farms to meet their annual food needs. In their case, they bought items that they did not produce directly in order to have dietary diversity. Moreover, they had milk from their cows (11% of annual food needs) as well as a little of their own meat during the year.

Very poor households worked for other farmers during the reference year which brought in some food in the form of a food payment. The typical payment rate in 2013-2014 was a *debe* of maize or sorghum for one day's work (*Nngwa* or one-third of an acre). Food payments are not as common as cash payments. Nonetheless, it is one way that very poor households can access food, especially in January-February.

Sources of Cash Income

In 2014-2015, only better-off households in the *Midland Maize, Sorghum and Sunflower Livelihood Zone* were able to make their living from crop and livestock production alone. For the better-off, crop sales and livestock sales together generated enough income to meet their spending needs. Sales of maize, sunflowers and mixed vegetables (including onions, tomatoes, sugar cane, cotton and pumpkin) brought in the most income. In addition, lentils and sorghum were important, secondary sources of crop income. Better-off households also sold livestock during the year. Some sold a fattened ox for TSh 500,000/ox which compared to TSh 300,000, for cattle and TSh 40,000 for a goat.



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

INCOME SUMMARY TABLE (in Tanzania Shillings)

Wealth group	Very poor	Poor	Middle	Better off
Annual income per household ³	658,000 - 1,385, 000	666,000 – 1,695,000	1,316,000- 4,724,000	2,294,000 - 6,834,000

Middle households earned just over two-thirds of their annual cash income from crop and livestock sales. For the most part, maize and sunflower sales were their greatest source of cash although they sold sorghum, beans and vegetables too. Lentil sales were not common. Some middle households sold a fattened ox in the year but most middle households sold 1-2 cattle as well as a couple of goats. The income earned from these sales was supplemented by petty trade. Middle households traded a number of goods common in the zone such as maize or vegetables or even fish. Other middle households ran small kiosks or had a *bodaboda* (motorcycle taxi) service.

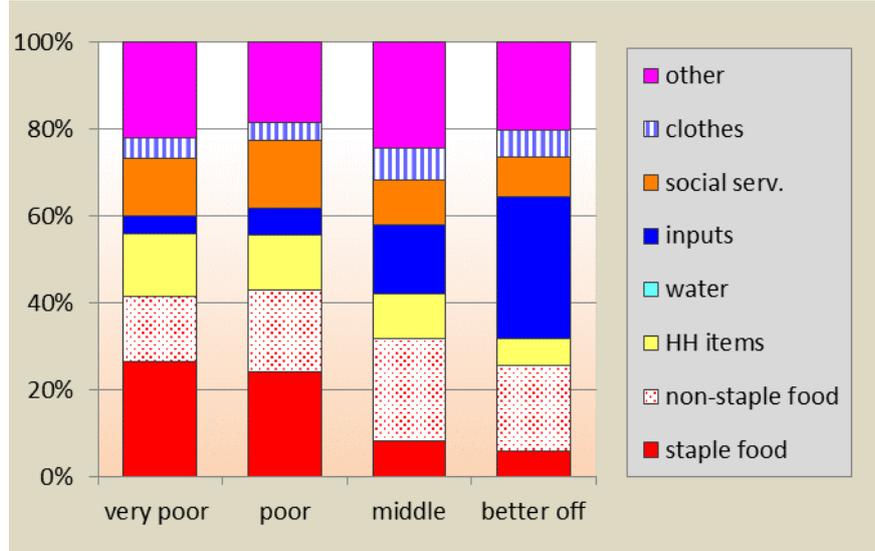
Poor and very poor households earned less than half (20-43%) of their annual cash income from crop and livestock sales. They sold maize, sorghum and sunflowers as well as chickens. Many of the poor also sold a goat or two, and although not as common, some of the poor sold a cow. However, their major source of income was agricultural labour. Poor and very poor labourers were hired for various local farm jobs including land clearing, ploughing, weeding, harvesting and threshing. This provided intermittent work for much of the year (October through to July) and comprised 80% of the very poor's total cash income. Poor households did not rely solely on agricultural labour to earn money but boosted their annual cash earnings with additional activities such as brick making and firewood/charcoal sales.

³ The average exchange rate during the reference year from April 2014-March 2015 was 1 USD = 1,675 TZS

Expenditure Patterns

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

Food spending is an important part of the budget for all wealth groups. In 2014-2015, for example, for the very poor and poor, just over 40% of their annual expenditures was on food, particularly staple food. Maize alone comprised 25-27% of their annual spending. The remaining 60% of expenditures covered a range of goods and services, with an estimated 15% going to basic household items; 15% going to education and health; and a small amount going to clothes, seeds and animal drugs. The remaining 20% of expenditures was for phone credit, transportation, social events, beer, tobacco, hair products and cosmetics



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

Better-off and middle households spent much less on staple food. Total food costs were only about 25-30% of their annual expenditures, of which staple food costs were less than 10%. Middle and better-off households purchased non-staple items such as rice, wheat flour, beans, sugar, cooking oil, meat and dried fish. Aside from these non-staple food items, their largest expenses were on productive inputs such as hired labor, improved seeds, livestock purchase and animal drugs. Their other major category of expenses was on “other”. In large part, this comprised spending on transport as well as machine servicing. It also included phone credit, social support and festivals, and non-essentials such as beer, tobacco, hair products and cosmetics.

Hazards

The *Midland Maize, Sorghum and Sunflower Livelihood Zone* is prone to dry spells during the growing season as well as to periodic drought. Drought affects the zone an estimated once every three years leading to poor crop outcomes and low milk yields as well as high consumer prices. The current production year (November 2014- October 2015) has been a particularly dry year in many (although not all) of the zone’s villages. Prior to this current year, the last drought years were 2011-2013. The zone also suffers periodically from heavy rain and flooding. Really wet conditions cause outbreaks of army worms which attack maize in particular (i.e., in 2012-2013 in Makunda).

Pests and diseases are problems that farmers face every year. For instance, *quelea quelea* birds are a common pest that can only be scared away by posting a family member in the field to guard the sorghum crop. Stalk borers (which affect maize and sorghum) are another crop disease prevalent in the zone as is a fungal disease that affects sunflowers. In addition, there are endemic diseases affecting cattle, such as trypanosomiasis, CBPP, East Coast Fever, and anaplasmosis, as well as Newcastle disease affecting poultry. Most of these diseases can be controlled with vaccinations but these must be paid for privately and are out of the price range of many households.

Response Strategies

When poor and very poor households face crop failure their main option is to look for casual labour either on-farm or off-farm. In this area, off-farm work usually involves brick making and selling. Some increased firewood or charcoal sales is also an option – although not actually desirable given the environmental implications. Their last option is to sell more chickens.

Better-off and middle households have more assets to fall back on which helps them cope better with crop losses or poor milk yields. Their main strategy is to sell livestock to generate cash. Otherwise, they can sell more of their high value crops, such as sunflowers, in order to earn cash to buy staple grains. The other strategy is to devote more time and energy to petty trading in order to earn sufficient money to cover their basic needs.

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 *Midland Maize, Sorghum and Sunflower 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 • Sorghum • Sunflower • Lentils • Mixed vegetables (onions, tomatoes, sugar cane, pumpkin) 	<ul style="list-style-type: none"> • Maize • Sorghum • Sunflower • Lentils • Mixed vegetables (onions, tomatoes, sugar cane, pumpkin)
Livestock production	<ul style="list-style-type: none"> • Fattened ox sales • Cattle sales • Goat sales 	<ul style="list-style-type: none"> • Fattened ox prices • Cattle prices • Goat prices
Other food and cash income	<ul style="list-style-type: none"> • On-farm labour (land preparation, weeding) • On-farm labour (harvesting) • Firewood, charcoal sales • Petty trade and small business – volume of trade 	<ul style="list-style-type: none"> • On-farm wage rates in cash (land preparation, weeding) • On-farm labour wage rates (harvesting) • Firewood, charcoal prices • Petty trade and small business profit
Expenditure	<ul style="list-style-type: none"> • Maize (staple grain) • Sorghum 	<ul style="list-style-type: none"> • Maize price • Sorghum prices

Program Implications

The longer-term program implications suggested below are those highlighted by the wealth group interviewees themselves. All of these suggestions require further detailed feasibility studies.

There were several development priorities that were mentioned by all four wealth groups. They can be grouped under the following two headings:

- 1) *Improved livelihood inputs*: This category includes development priorities such as better access to agricultural inputs, micro-credit and loans, construction of dip tanks and irrigation.
- 2) *Improved services and infrastructure*: This category includes improvements in a range of services and basic infrastructure such as health, education, roads, water, electricity, mobile communication and markets.

Very Poor	Poor	Middle-Income	Better-off
Water	Roads	Roads	Education
Health	Water	Provision of electricity	Agricultural Inputs
Agricultural inputs	Education	Markets for crops	Roads
Road improvements	Provision of electricity	Agricultural inputs	Water
Business loans	Health	Dip tanks	Markets for crops
Provision of electricity	Agriculture/Irrigation	Business loans	Electricity
Education	Communication	Water	Health Services