

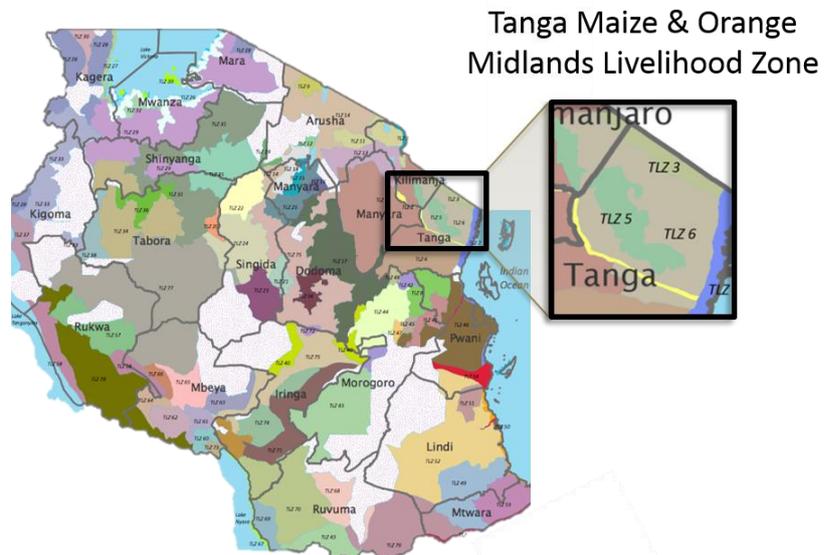
Tanzania Livelihood Baseline Profile

Tanga Maize and Orange Midlands Livelihood Zone (TLZ 06)

March, 2015¹

Zone Description

The *Tanga Maize and Orange Midlands Livelihood Zone* is located in Tanga Region and covers Mkinga, Muheza and Korogwe districts as well as the northeastern edge of Handeni District. The zone lies east and south of the Usambara Mountains and includes both inland plains and coastal forest. Vegetation is diverse and land fragmentation is common. The coastal area is dominated by bushland, dense and open forests, palm gardens, village cultivation plots and estates (mainly sisal). The upland plateaus include bushland and shrub thickets, as well as village plots, palm and sisal plantations. The Wet Plains (covering Muheza and Korogwe districts) and Dry Plains (covering Handeni and parts of Muheza and Korogwe districts) are characterized by open savannah grassland with scattered trees and scrub. While timber was once an important natural resource in the zone, the primary timber trees, *Milicia excelsa* (*Mvule* in Swahili) are a rare species facing extinction and are now under strict government protection, so there is no longer substantial timber harvesting in the zone. The population density averages 65 people per square kilometre, with a range of 40 to 100 people per square kilometre. Handeni District has the lowest population and Muheza has the highest. Water in the zone comes from seasonal rivers, the largest of which are the Pangani and Zigi rivers.



Rainfall in this zone averages 600 – 1200 mm per year, with the coastal and higher elevation areas receiving more rain than the plains. Considered an area with sufficient food production in an average year, drought is not uncommon and the zone has experienced several very dry years since 2011. Most of the rain falls during the long rainy season from March to May. A second season, from October to December, used to have fairly dependable rainfall but in the last decade these short rains have become increasingly unreliable and vary significantly across the zone. Temperatures range from 24 - 30° C.

The zone supports mixed farming, principally the cultivation of maize and cassava, as well as oranges, which are an important cash crop. Paddy, pulses and coconuts are other minor crops. Households rely heavily on crop production to meet their annual food and cash needs. Livestock are less important in this livelihood zone. Most households raise chickens and some keep goats, but only a few keep cattle. Casual agricultural labour, brickmaking, construction, food vending, shop keeping and motorbike transport are other income sources that supplement mixed farming.

¹ Fieldwork for the current profile was undertaken in March 2015. The information presented in this profile refers to the reference year, which started June 2013 and ended May 2014. Provided there are no fundamental and rapid shifts in the economy, the information in this profile is expected to remain valid for approximately five years (i.e. until May 2019). All prices referred to in the document are for the reference year.

The zone has moderate production potential. Along the coastal area, soils for crop production are fertile sandy loams, changing to clay loams inland of the coast. Poorly-drained black clay is also common in the alluvial plains. Crop production is rain-fed, relying on the two seasonal rains, *Vuli* and *Masika*. While soils are relatively fertile throughout the zone, lack of rain during the dry season and flooding during the rainy season decrease production potential for crops. No irrigation is used in the zone and the majority of farmers do not apply chemical or manure fertilizers and do not use improved seed.

The majority of crops are grown during the long rainy season, from March to May. Maize and cassava are the staple crops. Maize is used for green consumption at the end of the lean season in June as well as dry harvest in August and December. Cassava is grown by all wealth groups, but it is the poor who rely on this staple crop to meet food needs in seasons when maize production fails, as cassava is more resistant to drought and pests than maize. Beans, cow peas and mung beans are also grown as food crops in some areas, with beans grown at higher elevations and cow peas grown at lower elevations. Intercropping of maize, pulses and cassava is common, especially by poorer households. Paddy is grown in some areas, both as a food and cash crop. Oranges and coconuts are grown as cash crops, with orange production providing a significant portion of household income across all wealth groups.

Land preparation for seasonal crops is mainly by hand hoe using family labour, or, in the case of the wealthier households, hired labour. In the plains area, a minority of the wealthier households use rented tractors. For orange production, grafting onto lemon rootstock is used throughout the zone, which enables trees to start producing fruit after 3 years, rather than the normal 8 years. Sisal plantations are common on the coast and in the plains. Villages surrounding sisal estates use land owned by the plantations to cultivate seasonal crops. There are land ownership disputes in these areas, as farmers are allowed to use, but not own, the land they cultivate and are not permitted to plant permanent crops, such as oranges, which could significantly increase income. Better off households typically hire labour throughout the cultivation season, paying labourers in cash for tasks such as land preparation, planting, weeding and harvesting. For their part, poor households try to reduce the labour required for weeding on their farms by intercropping maize with minor crops, such as beans and cowpeas—and when acreage is limited, also cassava. Both men and women from the very poor and poor wealth groups perform agricultural labour for better off households in their village. A few labourers also travel to neighbouring villages where oranges are grown to work at harvest time.

Crop pests in the zone include armyworms and stalk borers which affect mainly maize, "*ngeda*", a grasshopper that defoliates all herbaceous crops and maize beetles and rodents which destroy maize, cassava and beans, both in the field and in storage. Other pests affecting the pulse crops include aphids and pod borers. Fruit flies limit orange production in certain areas and some better off farmers use spray and bait traps to prevent infestation. The main crop diseases in the zone are Cassava Mosaic Disease (known locally as *batobato*), which is detected on leaves during weeding prior to harvest and Cassava Brown Streak Disease (CBSD), which affects the root and is not detected until harvest.

The public services in this zone are modest. Drinking water, for both poorer and better off households, comes from seasonal rivers, wells and boreholes. Not all villages have a water source and during the dry season women and children may spend several hours a day fetching water from wells in neighbouring villages. All households use pit latrines, with poorer households making due with temporary pit latrines and better off households constructing more permanent facilities, including Ventilated Improved Pit Latrines (VIPs). Only about half of the villages in the zone have health dispensaries, and many of them are understaffed and require day-long waits, particularly during peak disease periods like malaria season. To obtain advanced medical care, people must travel to ward or district health centres and only the better off households can afford the fees, transport costs and accommodation expenses associated with these centres. Electricity is available in only parts of the zone, and in these areas, only about half of the wealthiest households have electricity. Poor households use homemade kerosene lamps and purchase kerosene in small quantities weekly. Better off households use store-bought kerosene lamps, rechargeable torches, generators and a small number use solar panels. Mobile phones are widely used by households of all wealth

groups and network coverage is generally available. There are primary schools in most villages which children from both poorer and better off households attend. Secondary schools are located in the ward centres. Most better off families send their children to secondary school and some to college. Credit and savings facilities are available through village community banks (VICOBA) as well as through agencies such as savings and cooperative societies (SACCOS) and micro-financing institutions (FINCA). However, in practice, few households take out significant amounts of credit, and those who did repaid loans within the reference year, which explains why the data collected shows minimal credit use. There are four NGOs working in the zone, namely: World Vision, the Tanzania Social Action Fund (TASAF), WEKEZA, an association providing financial assistance for education and crop production, and MUVI, an organization that supports small-holder agricultural entrepreneurs.

Markets

Trade and market access in the *Tanga Maize and Orange Midlands Livelihood Zone* is made difficult by the lack of well-maintained, all-season roads at village level. While there are major trade routes into the zone with tarmac roads, the roads into villages are often gravel or dirt and become impassable during the rainy season. Rough roads also mean higher transport costs for farmers, including expensive tractor hire when roads are inaccessible by truck.

Three major trade routes service the zone: Tanga-Horohoro-Mombasa Road, Tanga-Segera-Moshi-Arusha Road and Tanga-Segera-Dar es Salaam Road. May to July and December and January are the times when oranges are sold and traded; oranges are the crop that is exported farthest outside the zone. Brokers bring trucks and harvest crews to village farms and transport oranges to towns where they are resold to traders who take them to markets as far away as Nairobi, Arusha and Dar es Salaam. The season for the sale of maize begins after the harvest in August and continues into November. Traders purchase maize at the farmgate and take it by truck to markets and stocking facilities in Mombasa and Dar es Salaam. Traders from village shops also go to farmsteads to buy maize. Some farmers carry maize by bicycle or headlots to ward markets or village shops. Most maize farmers in the zone do not have storage facilities and must sell all maize immediately after harvest. If local grain storage facilities were improved, many farmers would not need to sell their grain at a low price directly after harvest only to buy maize later in the season at a high price. Coconuts are harvested every three months and sold primarily from July through March along the Tanga-Dar es Salaam trade route. Rice is imported into the zone year round from Morogoro, Mbeya and Kilimanjaro and sold by traders at ward markets and village shops. Rice is purchased mainly by better off households, although during the harvest season (July to December) all wealth groups purchase rice to supplement the local maize supply. Beans are also imported into the zone throughout the year from Arusha, Lushoto and Kilimanjaro and sold in village shops and weekly markets.

Lack of secure access to markets for selling their oranges means that many poor and middle households end up selling (on disadvantageous terms) to middlemen who come to villages and pay cash in the lean season in exchange for harvesting rights, a money lending scheme known locally as *Kuwekeza*. Loan conditions require that the farmer not pick any of the fruit and accept the price determined by the middlemen, which is significantly below market rate—often as little as 3% of what the oranges will fetch at markets in Dar es Salaam and Nairobi. Because of the widespread exploitation by middlemen of this potentially lucrative cash crop, many villages mentioned marketing assistance for orange sales and processing facilities (to make diversified orange products that could be sold locally) as development priorities for the zone.

Cattle and goats are sold by local farmers when they need to raise cash income. There are several important primary markets for livestock in the zone. In Mkinga District, Machimboni Market near Maramba Ward and Horohoro Market near the Tanga-Kenya border are important primary markets for local livestock sales. In Korogwe District, livestock may be taken to one of four primary markets in Kweisewa, Bwiko, Mashewa and Mombo. From there, cattle and goats, if not purchased locally, are brought to the Korogwe Town secondary market, where they may be traded and taken on to markets in Dar es Salaam, Tanga, Zanzibar and Mombasa. Chickens are mainly sold at village and ward markets.

The labour market is local, with the majority of poorer households seeking casual labour on the farms of better off households within the village. Agricultural labour demand peaks in January and February for land preparation, March through May for weeding and July through December for harvesting, with the orange harvest peaking in December and January. An estimated 10% of casual labour in a normal year is found in local towns, primarily through domestic employment. In a bad year when seasonal crop harvests fail, an increased number of labourers may travel to orange-producing areas to assist with the orange harvest. There is no migration out of the zone. In a few areas, there is labour migration into the zone at peak cultivation periods.

Timeline and Reference Year

The baseline assessment refers to a very specific time period called the reference year. In the *Tanga Maize and Orange Midlands Livelihood Zone* the reference year covered the period from June 2013 to May 2014. 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 that the reference year was ranked as an average year with common production challenges, including below average rains and crop disease. Consequently, crop production was relatively low. To compensate for low maize production in the *Vuli* season, farmers planted more maize during the *Masika* rains and bought maize for consumption outside the village. Other coping strategies included increased livestock and charcoal sales.

From 2011 to 2014, the zone has seen relatively poor seasonal performance. Although the current consumption year (June 2014 – May 2015) is predicted to be above-average following a good long rainy season from March to May 2014 and consequent bumper harvest of staple crops, the previous three years were average and below average, primarily because of inadequate rainfall. In fact, farmers mentioned increasingly unreliable and insufficient rains as the primary challenge affecting their livelihoods. The baseline information presented in this profile provides a view into how households in this livelihood zone make ends meet in a typical year, drawing on a normal range of options.

Year	Rank	Critical Events
2014	4	Good rains and crop yields.
2013	3	Below average rains, crop disease (Cassava Mosaic), maize purchased outside the village, increased livestock & charcoal sales.
2012	2	Drought during <i>Vuli</i> decreased yields and excessive <i>Masika</i> rains destroyed crops in lowland farms. High food prices, armyworm outbreak destroyed maize, crop disease (Cassava Mosaic), rodents destroyed crops. Increased consumption of cassava, maize purchased outside the village, government allowed import of duty-free rice.
2011	2	Drought and low production due to insufficient rainfall.

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

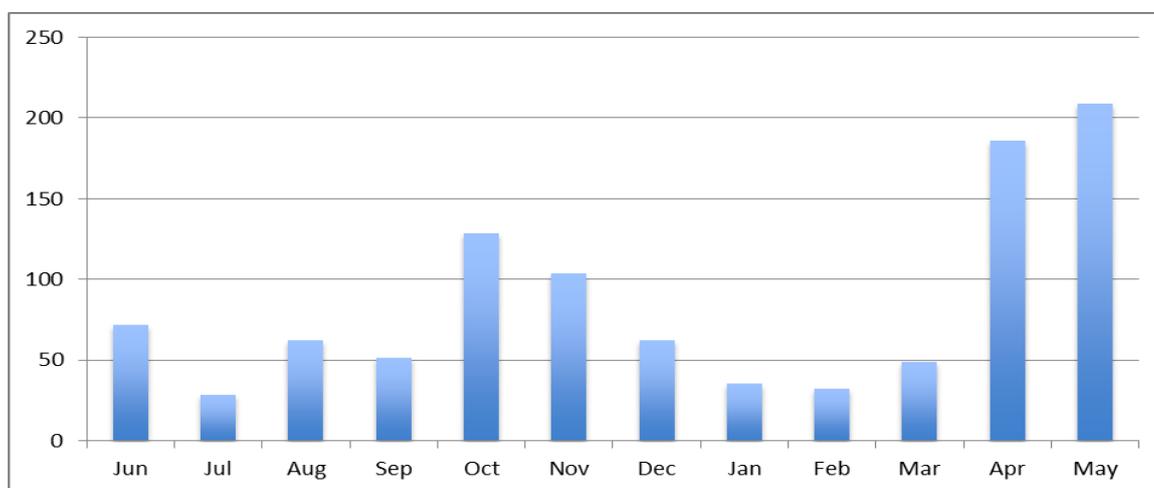
Seasonal Calendar for Reference Year

	June	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Rainy season					vuli					masika		
Maize 1				LP	P	W	GH	H				
Maize 2	GH	H						LP	P	W		
Orange cultivation				W				LP	W	P	W	
Orange harvest							H					
Cassava					H			LP	P	W		
Paddy	H							LP	P	W		
Livestock diseases												
Lean season												
High staple food prices												
Low staple food prices												
Agricultural labour	H	LP	H		W	H				P		
Petty trade												
Malaria												
Diarrhoea/Dysentary												
URTI												

Legend

LP	land preparation	GH	green harvest	T	threshing
P	planting	H	harvest		
W	weeding	S	sales		

The graph to the right shows average monthly rainfall (mm) in Tanga based on a recent 10-year period (2004 – 2013). Source: TZ Meteorology Department



The Tanga Maize and Orange Midlands Livelihood Zone has two seasons, the long *Masika* rains from March to May and the short *Vuli* rains from October to December. Although technically a bimodal zone, the zone's short rains have become increasingly unreliable and inconsistent across the zone. Therefore the yields of staple food crop production are significantly higher during the season following the long rains.

Land preparation for maize begins in September for the *Vuli* season and the seeds are sown in October, with the start of the rains. Weeding occurs in November before the first grain is harvested for green consumption in December, with the main dry harvest following in January. Consumption from this short rainy season of maize production accounts for about 9% of annual calorie needs for poor households and 14% of annual calorie needs for better off households. In comparison, the primary maize harvest from the long rainy season provides 24% of annual calories for poor households and 48% of annual calories for better off households. The main maize season begins in January with land preparation, which continues until March when the rains come and maize is planted. Weeding takes place during April and May and the lean season (March-May) comes to an end as households begin to consume fresh maize (green) from the first harvest in June. The dry maize harvest occurs in July and August. For areas that grow paddy, land preparation and planting follow the same schedule as maize, with the harvest occurring in June and July. Cassava is also planted at the start of the long rains in March and is harvested from October through December. Unlike maize, which must be harvested when mature and sold soon after harvest if a farm does not have storage facilities, cassava stores well in the ground for months after maturity and poor households harvest small amounts daily to meet household consumption needs.

For permanent crops like oranges and coconut, land is prepared in January and February so new graphs and seedlings can be planted in with the rains in March. Orange trees start bearing fruit after 3 years and are harvested in December and January (the peak harvest) and May through August. Coconuts take 7-8 years to bear fruit and produce every three months, four times a year.

Poor households in need of cash income search for work throughout the year, however, it is the period of land preparation from January to March and harvest time from May to August and December to January when labourers are able to find substantial amounts of work, earning significant cash income by working for better off farmers. These are periods of intense farm work; land preparation, weeding and harvesting are also needed on labourers' own farms at the same time. For very poor households requiring cash, the need to work on other farms for immediate income often means they are unable to complete their own farm's cultivation requirements and compromise their yields and even their entire harvests.

Opportunities to earn income through petty trade such as brickmaking, construction and food vending peak in July, August and September during the harvest season.

Staple food prices are lowest during the harvest season from June through September and food prices peak from March through May, during the period of the year known as the "hunger season." During this time household food stocks are low and money to purchase food is especially tight, placing a high burden on poorer households.

Livestock diseases peak from January to March and include Contagious Bovine Plueropneumonia (CBPP), Foot and Mouth Disease and tick-borne diseases such as East Coast Fever, Anaplasmosis and Black Quarter, which affect cattle. Contagious Caprine Plueropneumonia (CCPP) is the main disease affecting goats and New Castle Disease reduced household chicken flocks significantly during the reference year. The main human diseases peak during the rainy season and include Malaria, Diarrhoea and Dysentery. Upper Respiratory Tract Infections (URTI) also occur annually and prevalence is highest in July and August.

Wealth Breakdown

		Wealth Groups Characteristics				
		HH size	Land area cultivated (acres)	Perennial crops	Livestock	Chickens
Very poor		5-7 (6)	0.75-1.75	0-1 acre oranges	0	5-7
Poor		5-7 (6)	2-4	1-2 acres oranges	1-3 goats	8-10
Middle		5-7 (6)	4-6	2-3 acres oranges	4-6 goats 0-2 cattle	12-14
Better off		5-7 (6)	8-10	3-9 acres oranges	8-10 goats 4-6 cattle	16-20
	0% 10% 20% 30% 40%					
	% of households					

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

Wealth in this mixed farming zone is based on the amount of land a household cultivates and the amount of land it uses for perennial crops (orange and coconut trees). To a lesser extent, livestock ownership and businesses (shops, kiosks and motorcycle transport) determine wealth. Farmers typically own more land than they cultivate. In general, all wealth groups grow a similar mix of crops, primarily maize, cassava, oranges and

coconuts, as well as smaller amounts of pulses and bananas. However, poorer farmers have fewer orange and coconut trees and their seasonal crop yields are generally lower.

Oranges are an important cash crop in the zone. In addition to differences in acres cultivated, tree density per acre varies significantly between wealth groups. Very poor households grow on average 40 trees per cultivated acre, often intercropped with seasonal crops and coconuts. Better off households typically grow 70 trees per acre cultivated, making for a significant difference in yield and income from this cash crop between wealth groups.

The majority (about 55%) of households in the zone are poor or very poor. Of this group, about 20-30% are considered very poor. In this zone, being very poor means cultivating land of about 0.75-1.75 acres, primarily with maize and cassava. Among the very poor, slightly more than 50% of households grow oranges, using less than 1 acre, due to lack of capital for planting materials, farm management practices and scarcity of land. For poorer households it can be difficult to occupy land with orange trees that won't produce returns for at least three years. Crop production for the poorest households is constrained in part by lack of capital for inputs like seed (farmers use their own seed which is less tolerant to drought and disease and has lower productivity than seed purchased by better off farmers from agro-dealers in the markets). Minimal tillage and use of the hand hoe as the only cultivation tool, as well as intercropping maize with beans and even cassava, further reduce yields. Very poor households grow more cassava than better off farmers because it is more drought tolerant than maize and ensures food availability if crops fail. However, there is virtually no market demand for cassava, so it cannot be converted into cash like maize can. Very poor households generally opt for crop production over livestock due to lack of money, inadequate land for grazing and competition of land use for crops. Very poor households typically only raise poultry, in the range of 5-7 chickens.

Poor households comprise 25-35% of households in the zone. A poor household typically cultivates 2-4 acres of land and about 80% of poor households have orange trees. Orange trees may be grown on 1-2 acres and are generally intercropped with coconut trees and maize and beans when the trees are young. Poor households do not typically own cattle, although most have some goats, usually in the range of 1-3, as well as poultry, in the range of 8-10 chickens.

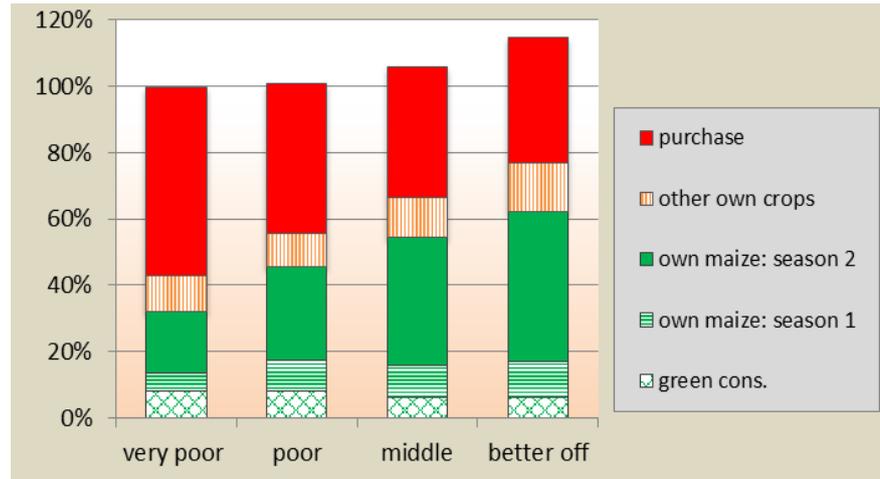
Middle and better off households together constitute about 45% of households in the zone. Middle households make up an estimated 25-35% of households and better off households make up about 10-20% of households. Cultivated land sizes are an estimated 4-6 acres for the middle and 8-10 acres for the better off. Households in these wealth groups cultivate the same broad mix of crops as poorer households, with the addition of paddy, which is grown by some middle and better off households. These two wealth groups grow more of the staple crop maize and have significantly more orange and coconut trees than poor households. Middle households typically cultivate 2-3 acres of oranges and better off households typically have 3-9 acres of orange trees. Importantly, the livestock holdings of the wealthier groups include cattle. Middle households typically had 0-2 cattle, 4-6 goats and 12-14 chickens in the reference year. Better off households typically owned 4-6 cattle, 8-10 goats and 16-20 chickens.

The average household size in the zone is 5-7 people for all wealth groups.

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 June 2013 to May 2014. June 2013 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.

There are two main sources of food in this livelihood zone: own crop production and the market.



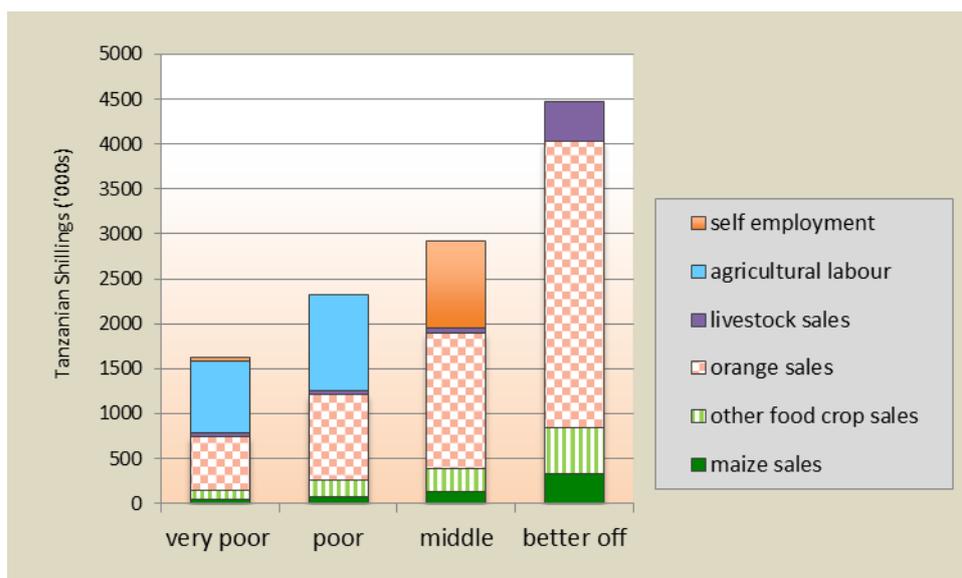
In the graph, food access is expressed as a percentage of minimum food requirements, taken as an average food energy intake of 2100 kcals per person per day.

Better off and middle households access the highest proportion of their food energy from own crop production, securing about 65-75% of their food energy from this source alone; for poor and very poor households, on the other hand, own crops contributed about 45-55% of their minimum calorie needs. Maize is by far the most important crop, covering 35-45% of very poor and poor household food needs and 54% and 62% of middle and better off household food needs, respectively. Of this, about 6-8% is from green consumption, with poorer households consuming more green maize than better off households. Most of the harvested maize comes from the second season's (July/August) production. The 'other own crops' category shown on the graph above includes small contributions from cassava and coconut, and for better off households paddy and beans.

Purchase is the second most important food source for all wealth groups, accounting for 35-55% of households' annual food energy needs in an average year. The proportion of food types that were purchased differed significantly by wealth group. Very poor and poor households purchase mainly maize, covering around a third of the minimum calories for very poor households. In contrast, maize represented 15% of food energy purchased by middle households and only 1% of food energy purchased by better off households. Wealthier households were able to store and consume their maize harvest year round, whereas poorer households had to quickly sell after harvest only to rebuy maize later in the year. This explains the higher maize purchases on the part of poor households. Middle and better off households purchased rice, wheat flour, beans, oil, dried fish and meat. Poor households also purchase rice, beans, dried fish and oil, but in smaller amounts. Poor households purchased rice mainly during the harvest season when they have cash and during festivals. Better off households purchase more rice and reduce maize consumption after the orange harvest when they have more cash. Sugar was the one food item purchased in the same quantity across wealth groups.

Sources of Cash Income

In the *Tanga Maize and Orange Midlands Livelihood Zone*, households earn cash income in two main ways: income is sourced either from labour or from crop and livestock production. Households in the upper wealth groups rely heavily on crop sales to obtain cash income. Poorer households rely more on agricultural labour and middle households depend on self-employment activities.



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

As shown in the graph to the right, this zone relies heavily on orange sales. This is the most important cash-earner for better off and middle households, bringing in over 1 million TZS in the

reference year for middle households and over 3 million TZS for better off households. Orange sales accounted for about 37% of cash income for very poor households and about 41% of cash income for poor households. Middle households get around half their cash income from orange sales, while better off households benefit the most, earning about 72% of cash income from orange sales. While poorer and some middle households are forced to accept the purchase price offered by middlemen in exchange for credit prior to harvest (around 16 shillings per orange throughout the year), better off households can wait and sell their oranges on more favourable terms post-harvest. By providing their own transport to markets or working with local brokers, wealthier farmers receive close to 20 shillings or more per orange, the higher price point increasing the value of this crop for the better off. After oranges, maize and coconuts bring in roughly equal percentages of cash income; regardless of wealth group, 3%-8% of cash income comes from maize sales and between 3%-6% of income from coconut sales.

Very poor and poor households do not generate enough cash from crop sales alone to meet their annual expenditure needs. About half their income comes from seasonal agricultural labour. For the very poor, the cash earned from on-farm labour is their most important source of income (just under 50% of annual income during the reference year). For poor households, cash earned from agricultural labour represented about 45% of household income. Preparing land for cultivation, weeding and harvesting are the main types of work available to casual labourers. Of the on-farm jobs, land cultivation contributes the most to labourers' household cash income. Typically, land preparation is done by both men and women from January through March, followed by weeding from March to May. The main harvest labour is done from

INCOME SUMMARY TABLE (in Tanzanian Shillings)				
Wealth group	Very poor	Poor	Middle	Better off
Annual income per household ²	1,427,000 – 1,827,000	2,126,000 – 2,526,000	2,727,000 – 3,127,000	4,273,000 – 4,673,000

² The average exchange rate from June 2013-May 2014 was 1 USD = 1,585 TZS

June through August. The importance of this work is not just as a cash-earner for these poorer households; it also allows middle and better off households to increase the fields they have in production and improve the management of their crops. In many ways this casual agricultural labour is the backbone of the local economy.

Livestock sales comprised about 10% of annual income for better off households, whereas for very poor, poor and middle households, livestock sales only contributed about 2% of total annual income.

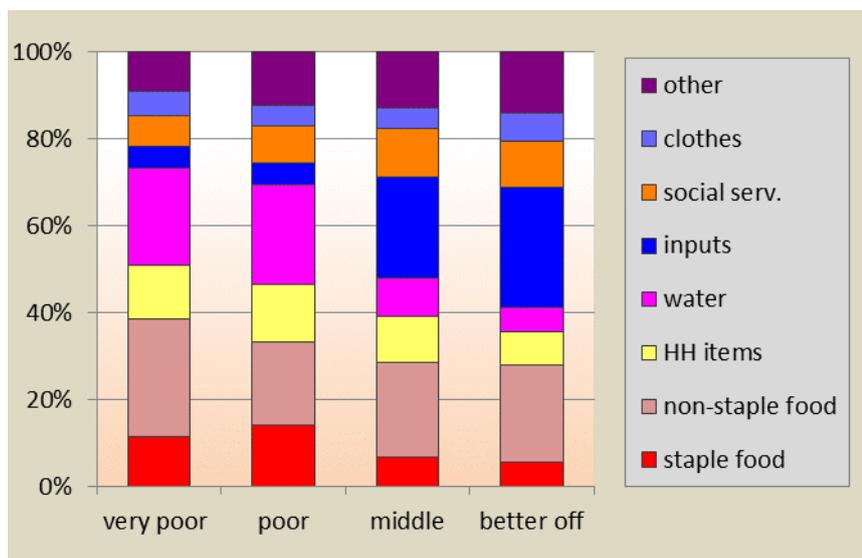
In addition to crop sales, casual labour and minimal livestock sales, households engage in a number of activities to generate extra income. For poor households, these include brickmaking, construction, selling firewood and charcoal, petty trade and selling prepared foods during harvest time. Middle households earn additional cash through various small businesses, using their capital to purchase goods that they resell locally in shops and kiosks, or investing in motorbikes to transport people and goods.

Expenditure Patterns

The graph presents expenditure patterns for the reference year June 2013 to May 2014. While total expenditure increases with wealth, the expenditure breakdown by percentage in this graph shows the relative amount of income spent on different categories.

During the reference year, food purchases (both staple and non-staple) comprised about one third (between 33-36%) of the annual expenditures of very poor and poor households. Very poor households spent roughly 12% of income on staple foods like maize, rice and wheat flour and 24% on non-staple foods like tea, sugar and oil. Poor households spent 14% of their annual income on staple foods and 19% on non-staple foods. Very poor and poor households spent a significant portion of their remaining income on water and household items. These households spent about 22-23% of their income to purchase water for domestic use and about 13-14% of their annual income on household items. Other important individual costs for poorer households during the year were schooling fees, clothing and phone credit.

In contrast, middle and better off households spent a smaller portion (26%-28%) of annual income on food. Staple food purchase comprised only 7% of annual expenditures made by middle households and 5% of better off household expenditure. Non-staple food purchases comprised 19% of middle households' total annual expenditure and 23% of better off households' expenditure. The significantly lower percentage of income spent on staple foods than poor households is explained by the fact that the middle and better off households can afford not to sell off their crops immediately after harvest and therefore fulfil most of their food needs through consumption of their own stored crops throughout the year. It is also explained, in part, by the higher cash income of middle and better households. As a portion of total cash, the amount spent on food by middle and better off households (although higher in absolute terms than poorer households) takes up a smaller slice of the overall pie.



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

For middle and better off households, the most important expenditure of non-food items was for agricultural inputs. Middle and better off households spent 24-26% of annual expenditure on seasonal farm labour, primarily ploughing, land preparation, weeding and harvesting. Other input expenses included seed, tractor rental, tools, pesticides for orange crops and livestock vaccinations. Schooling, phone credit, clothing and "other" (hair, cosmetics and building/construction) were additional significant expenses for better off households. In the reference year, better off households spent approximately the same amount on phone credits (440,000 TZS) as they did on schooling (400,000 TZS).

Hazards

Three significant chronic hazards affect the *Tanga Maize and Orange Midlands Livelihood Zone* on a yearly basis. First is the problem of the increasing lack of rain during the period from October to December, known as the short rainy season (*Vuli*). The unreliability of the short rains and their uneven distribution throughout the zone mean farmers must depend increasingly on the harvest from the long rains to provide food and income for the majority of the year. Any failure of crops during the main harvest, due to drought, pest or disease, therefore becomes even more damaging in the absence of reliable harvests in the short rainy season.

The second hazard households face in this zone is crop and storage pests. Each year there are outbreaks of *Scania*, or maize beetles, which destroy maize, cassava and beans in the field. Many households lose crops annually post-harvest to rodents and other storage pests, which infest stored crops. It is in large part due to these pests and lack of adequate storage facilities that poor households are forced to sell their crops for low prices immediately after harvest. Armyworms and stalk borers are other significant pests that destroy maize and paddy. Informants noted, however, that infestations tended to occur only every 2-3 years. Fruit flies are a pest that damages orange production annually, though outbreaks occur only in certain areas of the zone.

The third hazard is crop and livestock disease. Cassava Mosaic Disease (CMD) and Cassava Brown Streak Disease (CBSD) are two virus-transmitted diseases that affect cassava leaves and roots, rendering the crop inedible. These diseases have become serious threats to local varieties of cassava throughout the zone. Given the importance of cassava as a staple food source for poor households, and the difficulty of preventing the disease, CMD and CBSD are significant hazards, particularly for poor farmers. Newcastle Disease is a risk to household chicken flocks on an annual basis. Tick-borne diseases such as East Coast Fever and Anaplasmosis, as well as Foot & Mouth Disease and CBPP, are hazards for households with cattle, though they do not present annually like NCD.

Response Strategies

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

For very poor and poor households, these include:

Increase in casual labour: When inadequate rainfall, pests or disease decrease crop production, a typical response by very poor and poor households is to seek more casual labour such as land cultivation and weeding for better off farms. While at these times pay may be low, the extra cash is used to purchase food.

Increase in purchase of staple foods: In the face of low crop yields, very poor and poor households respond by reducing expenditure on non-essential items in order to purchase more staple foods such as maize and maize meal instead of relying on their own crop production.

Reduction in food consumption/shift to less-preferred foods: Very poor and poor households may also respond to crop shortages by reducing household food consumption to two meals a day instead of three. They may also consume higher quantities of less-preferred, cheaper staples, like cassava instead of maize.

Immediate sale of crops: In response to storage pest threats, very poor and poor households will sell all crops immediately after harvest for quick cash.

Coping strategies of middle and better off households include:

Increase in food crop purchase from poor: When crops fail, middle and better off households who have capital may take advantage of lower prices to buy more food crops from the poor, leveraging their storage facility assets to resell the crops later for a profit when prices rise.

Decrease in payment for agricultural labour: Decreasing the daily wage paid to very poor and poor households for agricultural labour means middle and better off farmers can continue hiring labour even when they have less cash. While this coping strategy benefits the better off, although reversible, it has a negative sum impact on the community as poor labourers will be made more vulnerable to the shock conditions by the decrease in pay.

Increase in livestock sales: While livestock herds are not large in this zone (middle and better off households typically own 0-6 cattle and 4-10 goats) cattle and goats can be sold in periods of stress, as long as they are sold before they become malnourished or ill.

Increase in crop sales: When maize production is low during periods of drought, one response is to sell more of the high value crops such as paddy, in order to buy maize, which is a cheaper staple. Better off households may elect to sell oranges for lower prices to middlemen in order to earn immediate cash.

Small businesses: Middle and better off households may respond to a shock by increasing the prices of essential goods sold in their small shops and kiosks. While this strategy hurts the consumer, it represents one strategy by business owners to earn extra cash to meet their own pressing cash needs in a bad 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 *Tanga Maize and Orange Midlands 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"> Green maize, seasons 1 & 2 – amount produced Maize, seasons 1 & 2 – amount produced Cassava – amount produced Paddy – amount produced Oranges – amount produced Coconuts – amount produced 	<ul style="list-style-type: none"> Maize, season 2 – producer price Paddy – producer price Oranges – producer price Coconuts – producer price
Livestock production	<ul style="list-style-type: none"> Cattle – herd size Goats – herd size Chicken – herd size 	<ul style="list-style-type: none"> Cattle – producer price Goats – producer price Chicken – producer price
Other food and cash income	<ul style="list-style-type: none"> On-farm labour (land preparation, weeding) – number of jobs On-farm labour (harvesting) – number of jobs 	<ul style="list-style-type: none"> Wage rate per acre On-farm wage rates (land preparation, weeding)

	<ul style="list-style-type: none"> • Firewood/charcoal – amount sold 	<ul style="list-style-type: none"> • On-farm daily labour rates (harvesting) • Firewood/charcoal prices • Water fetching prices • Shop/kiosk prices
Expenditure		<ul style="list-style-type: none"> • Maize meal – consumer price • School fees • Soap prices • Cooking oil 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.

Several development priorities emerged (although each wealth group ranked the priorities in a different order).

Very Poor	Poor	Middle	Better off
Improved water services	Improved water services	Improved water services	Improved water services
Orange processing facilities	Orange processing facilities	Orange processing facilities	Agricultural mechanization
Clinics and improved health services	Clinics and improved health services	Electricity	Infrastructure/roads
Infrastructure/roads	Market for oranges and marketing assistance	Loans and capital for small businesses and cash flow	Agricultural inputs

Improved water services: Many villages in the zone do not have a water source. Women and children often walk for hours to fetch water, reducing time available for wage labour. Villages that have wells or boreholes mentioned long queues and waits to access water. Cost of water was a hindrance for poor households.

Marketing assistance for orange sales: There are no local markets for oranges. Very poor and poor households have no option but to sell oranges at a low price to middlemen who transport and resell the oranges at significantly higher prices in major cities. All orange-producing households would like help to find market outlets or ways to promote their oranges to cut out the middlemen and receive a higher price.

Orange processing facilities: Processing facilities that make orange juice and diversified orange products would add value to orange sales by guaranteeing a local market and better product competition at city markets.

Clinics and improved health services: A number of villages do not have clinics, and those that do, do not have adequate facilities, services and opening hours when health care professionals are available.

Infrastructure/roads: Many village roads become impassable during the rainy season and rough roads increase crop transport costs for farmers.

Agricultural inputs and mechanization: Middle and better off households requested increased availability of affordable fertilizers, pesticides, herbicides and improved seed. Insufficient agro-dealers in village and ward markets and high transport costs to purchase inputs outside the village make obtaining inputs difficult. Villages in the plains and with minimal permanent crops would benefit from power tillers, tractors and tractor implements to help with threshing of maize and paddy and shelling of groundnuts.

Electricity: Many villages in the zone do not have electricity. Middle and better off households would like business opportunities associated with electricity, including grain grinding, paddy milling, barbershops, welding and processing facilities for oranges.