

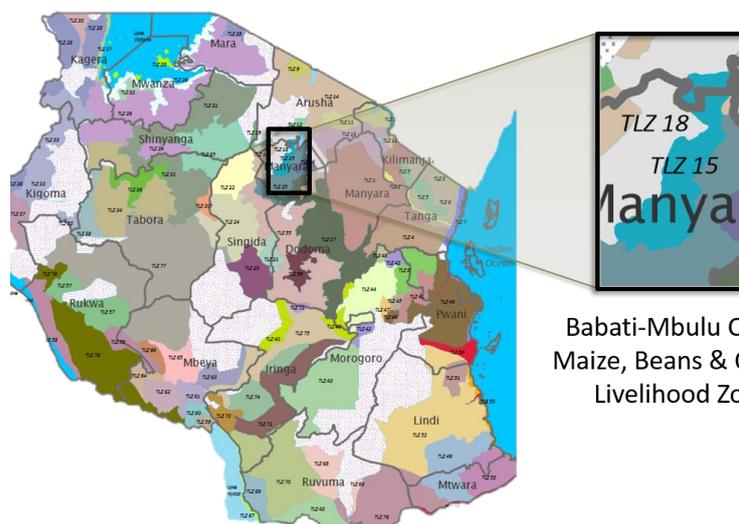
# Tanzania Livelihood Baseline Profile

## Babati-Mbulu Cattle, Maize, Beans & Onions Livelihood Zone (TLZ 15)

April, 2016<sup>1</sup>

### Zone Description

The *Babati-Mbulu Cattle, Maize, Beans & Onions Livelihood Zone*<sup>2</sup> is found in Manyara Region and includes parts of Babati and Mbulu districts as well as a small part of Karatu District in Arusha Region<sup>3</sup>. The topography of this area varies from cool mountainous highlands at elevations as high as 2,400 meters above sea level to lower-lying hills and valleys at 1,000 meters above sea level. Agricultural plots are interspersed with forest and bush. The Bubu River, part of the great East Africa Rift system wetlands, is found here, along with the Nou Forest Reserve and a series of salt ponds. The main ethnic group residing here is the Iraqw, and the population density is around 57 people per square kilometre.



Babati-Mbulu Cattle, Maize, Beans & Onions Livelihood Zone

Annual rainfall can reach as high as 1,000-1,200 mm, but amounts vary quite a bit depending on elevation and they change from year to year. The average annual precipitation for Babati, based on a 30-year time series, is 854 mm. There is one long rainy season that begins in November; a short dry period usually occurs in February, followed by heavier and more reliable rains from March to May. Temperatures range from 10-25° C. Soil fertility is relatively high, and this is a moderately productive zone when the rains are good. In areas with higher rainfall, such as in the wards of Kainam, Murray and Karatu, two harvests a year can be obtained, especially of beans, but in most areas people expect to harvest just once a year.

This zone is characterised as an agro-pastoral area, with the household economy resting on two main pillars: crop production and livestock. Despite this label, the livestock-based income here is severely constrained by a lack of pasture land. In 1974, during the implementation of the villagization (*Ujamaa*) policy, all households were allocated four acres of land. But after years of population growth and land fragmentation, the amount of land each household owns has steadily eroded. This has led to severe restrictions on the amount of land available for livestock. Given the choice between livestock and crop production, households have opted to retain the land for crop production, and to focus, especially on the cultivation of onions. This area is a major supplier of onions to much of East Africa. Maize and beans are the main food crops, along with small amounts of pigeon peas and sweet potatoes. The main cash crops are onions and garlic, which have increased in importance over the past decade. Irish potatoes are also sold, along with maize. Oxen are used to plough

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

<sup>2</sup> It should be noted that the name given to this zone in the 2008 FEWS NET livelihood zoning exercise needs to be changed from *Babati Maize, Beans & Onions* to *Babati-Mbulu Cattle, Maize, Beans & Onions*.

<sup>3</sup> Within the zone there are a total of 17 wards. The 5 wards in Babati are Dareda, Dabil, Sechetda, Madunga and Ufana. The 10 wards in Mbulu are Tumati, Yaeda, Ampa, Murray, Nambish, Kainam, Nahasey, Bargish, Buges and Endamarariak.

the land, along with digging by hand. Very poor households with no oxen obtain access to animal traction by exchanging their crop residues as fodder and also by providing labour to better off households. Poor households typically have around two oxen and they pair up with another household that has oxen since a team of four oxen is needed to plough due to the heavy soils. The most labour-intensive activities are planting, weeding and harvesting, particularly for maize and onions; for these tasks households with larger tracts of land hire people from households with less land to work in their fields. Payment is usually made in cash.

Despite the limited access to pasture, most households still keep small numbers of cattle, goats, sheep and chickens. Some also have pigs. Cattle are used for milk (for household consumption only), for animal traction, manure and to generate income through sales of live animals. Sheep, goats, pigs and chickens are also sold for cash throughout the year, and sheep, goats and chickens are slaughtered for meat during festivals and other special occasions. Cattle and goats graze (and browse) freely and are also fed crop residues after the harvest. Livestock rely on water from seasonal and permanent rivers, shallow wells and seasonal ponds during the rainy season. In the dry season, water from permanent rivers is used. Animals are kept around the homestead throughout the year and livestock migration is not common.

Poorer households, who have smaller plots and fewer livestock, earn cash from seasonal labour, planting and weeding for others from November to March, and helping with the harvest from July through August. Both men and women engage in seasonal agricultural work. During times of low agricultural demand, men from poorer households also make and sell bricks. Middle and better off households collect and sell timber during this time, using saws to cut down trees in local forests and transporting them with their ox carts. This activity is pursued only by men, not women.

Service provision here is similar to much of rural Tanzania, and characterised as very basic. Each village has tap-water, which households contribute a small amount of money to help maintain. Tap water is used for drinking purposes along with water from rivers, ponds, open wells and boreholes. Water for washing and laundry comes from rivers, ponds and open wells at no cost. All households use pit latrines, and some better off households use improved pit latrines. Each household has its own location for garbage disposal. Health dispensaries are found at village level and health centres are located in ward centres. Health facilities are not well-staffed, however, and dispensaries are often poorly stocked. Primary schools are found in the villages and secondary schools are located at ward level. Most poorer households send their children through primary school but not to secondary school because they cannot afford the extra expenses involved with secondary school, including transportation (and sometimes boarding), uniforms, stationery and books. Middle and better off households, on the other hand, typically send their children to secondary school, but usually not beyond. Electricity is available in only a few villages; poorer households rely on solar lamps, and better off households may have access to solar panels and electricity. Almost all households own mobile phones, with better off households having multiple phones. Credit facilities and options for savings are not available. Farm Africa, which supports tree planting, bee keeping and mushroom production, is the only NGO operating in the zone.

## Markets

Market access in the *Babati-Mbulu Cattle, Maize, Beans & Onions Livelihood Zone* is relatively good. Markets are readily accessible in the district and at ward level and markets centres are relatively close to the production areas. The Babati - Kiteto - Simanjiro and Babati - Bashnet - Mbulu roads are the main arteries. From Babati there is direct access to Arusha, which acts as a regional hub and distribution centre for the zone. Many of the smaller internal roads are quite rough, made of dirt or poorly-maintained marram. Despite the rough roads, there are no significant access problems during the dry season, but in the wet season some areas become inaccessible as vehicles get stuck in the mud and seasonal rivers temporarily wash out roads.

The main agricultural commodities sold by farmers in this zone include onions, garlic, maize and beans. Onions and garlic are sold to small scale traders who travel from village to village and buy directly from farmers. The traders bag the onions and then hire trucks to transport them to Dar es Salaam, from where they get distributed widely. This area supplies onions to much of East Africa, including Zanzibar, Mozambique, Uganda, Burundi, Rwanda and Kenya, as well as more local markets. June to August is the main period during which these transactions take place.

Maize and beans are also sold at the farm gate, or brought to local markets by farmers who sell to traders that transport agricultural commodities to Arusha. From Arusha maize often gets exported to Kenya. The beans tend to remain in Tanzania. Maize is sold from July to August, and beans are sold in March.

Livestock are the other main commodity sold by local households. Individual households sell cattle, goats, sheep, pigs and chickens all year around to mobile livestock markets, which shift from village to village. Livestock are collected by traders and then trucked to Arusha and on to Dar es Salaam. The urban market fuels most of the demand for livestock. Livestock sales peak both when livestock conditions are best and when households need cash. Livestock conditions are good from January through April due to good pastures and water, and then again in August when livestock benefit from crop residues. The lean season, from January to March, coincides with this first period; and August is also when households need to have extra cash on hand to purchase agricultural inputs.

During the lean season, starting as early as November for the poorest households, but intensifying from January to March, maize is purchased by most local households. Rice is bought by better off households (especially) throughout the year to diversify their diet. These commodities are distributed via local markets, but rice is sourced from outside the zone and transported from Arusha.

The labour market is almost entirely local, with the vast majority of poorer rural household members seeking seasonal employment on larger farms; the periods of most labour demand include planting, weeding and harvesting. A small minority (around 10%) of households also find work in towns such as Babati, Mbulu and Arusha.

## Timeline and Reference Year

The baseline assessment refers to a very specific time period called the reference year. In the *Babati-Mbulu Cattle, Maize, Beans & Onions Livelihood Zone* the reference year covered the **consumption** period from April 2014 to March 2015. During community leader interviews, informants were asked to rank the last four years as well as the current year 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* season planting period in November/December and ends with the *masika* harvest in July-August of the following calendar year). Thus, the production year of 2013-2014 corresponds to the consumption year of 2014-2015. As shown in the table, rainfall during the production year corresponding to the reference year was above average with good rains and above average crop production. The 2014-2015 production year was the worst in the past five years, forcing people to sell extra livestock and seek food aid from the government.

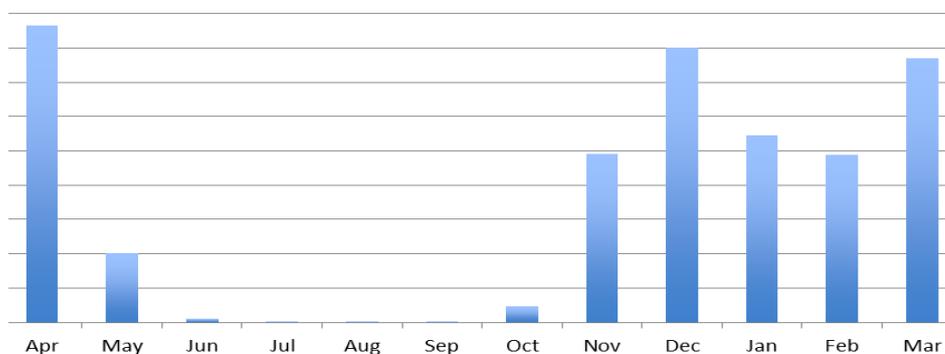
Production Year	Season	Rank	Critical Events
2014-2015	<i>Masika</i>	2	Poor rainfall, high staple prices, below average crop production. Outbreak of crop and livestock diseases.
2013-2014	<i>Masika</i>	3.5	Good rains, above average crop production and livestock production, average price of staple crops and livestock. Overall better than previous year.
2012-2013	<i>Masika</i>	2.5	Good rains, average crop production and livestock production, average price of staple crops and livestock. Overall similar to previous year.

2011-2012	Masika	2.5	Good rains, average crop production and livestock production, average price of staple crops and livestock. Overall slightly worse than previous year.
2010-2011	Masika	3	Good rains, average crop production and livestock production, average price of staple crops and livestock.

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

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
<b>Rainy season</b>												
<b>Crops</b>												
Maize												
Pulses												
Onions												
<b>Livestock</b>												
Cattle milk peak												
Livestock diseases												
Livestock sales peak												
<b>Other</b>												
Agricultural labor peak												
Construction income												
Brewing income												
Firewood sales												
<b>Stress &amp; High Expenditure Periods</b>												
High staple prices												
Human diseases												
Festival season												
Lean season												
<b>Legend</b>												



The graph to the right shows average monthly rainfall (mm) in Babati District based on a 30-year period (1972-2011)  
Source: TZ Meteorology Department

There is one extended rainy season in the Babati-Mbulu Cattle, Maize, Beans & Onions Livelihood Zone: the rains start in November and are usually interrupted in February by a short dry period, after which they resume and

last through May. The dry season occurs from June through October. Planting starts in December after a period of land preparation that begins in October. A short cycle crop of beans is planted in December and harvested in March, but this is not as important as the later crop grown from March until May. Long cycle crops include maize, planted in December and harvested in July/August; and pigeon peas, grown from December to August/September. Maize and beans and maize and pigeon peas are intercropped while onions, garlic, Irish potatoes and sweet potatoes are grown as single stands.

The peak agricultural labour season corresponds to the months when land preparation, planting, weeding and harvesting occur, namely: October through March and then July and August. This is a time when poorer households are especially busy, working on the farms of middle and better off households while trying to balance the labour requirements on their own plots of land. Poorer households earn a large portion of their annual cash during these months, which is especially important from January to March, when the lean season occurs. Some poor households rent out a portion of their land to better off households to raise enough money at planting time to purchase local seeds and to buy food and other essentials. In order to get access to plough oxen for their fields, poor households work for better off households, helping prepare their land in exchange for a certain number of days of plough oxen time. This often leaves them ploughing their fields after the most advantageous times for planting have passed, further exacerbating the constraints posed by their smaller plots of land and inability to buy improved seeds and other inputs. During these months most households have run out of their harvests from the previous year and need to buy maize from the market. As a result, staple prices are highest during these months. This also corresponds to a time of year when human diseases – especially malaria – tend to be highest, putting even more pressure on poorer households.

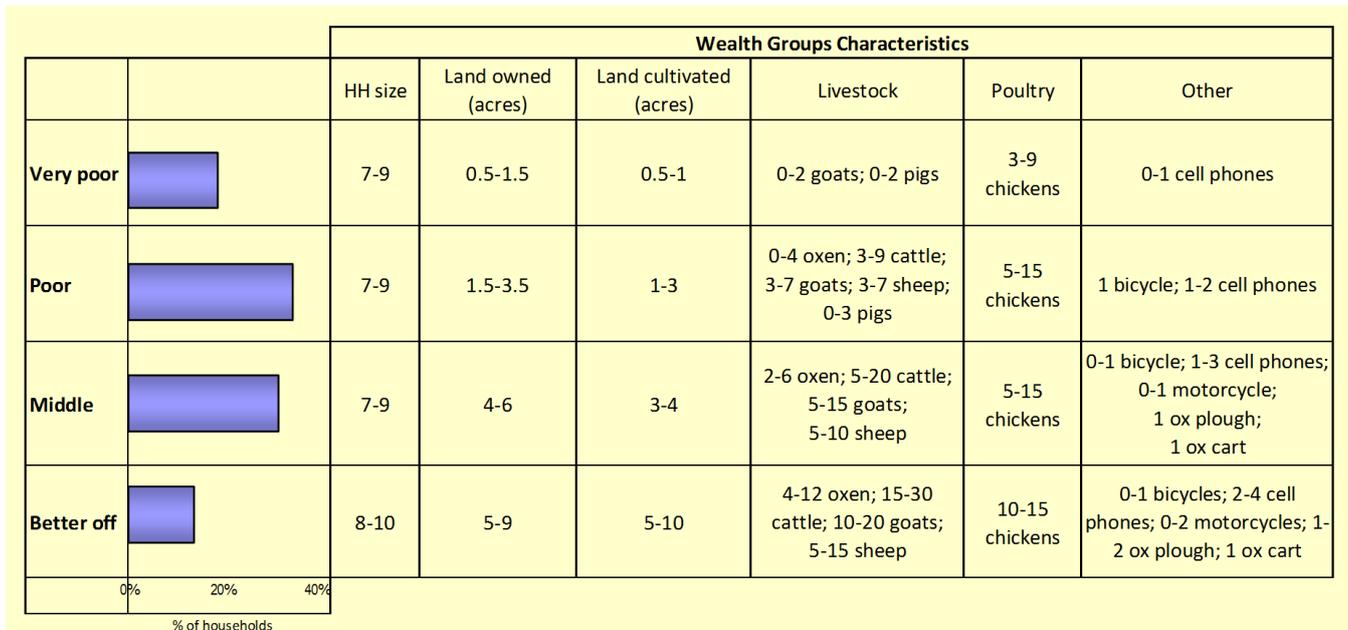
Milk production is highest from January through April, when the rains make fresh pastures and water resources available. There is no livestock migration during bad years and no pattern of regular seasonal labour migration either into or out of the zone. Livestock are moved locally, taken to fields not far from the villages during the cultivation period and brought back to the farms after the harvest period to feed on crop residues. Livestock sales peak from September through November, which is when households need to build up their cash reserves to prepare for the coming agricultural season. Livestock diseases, like East Coast Fever and Black Quarter, can occur at any time of year, but they tend to peak during the rainy season.

June through October is a period of relative plenty, when harvests are brought in from the field and the heavy labour demands of the agricultural season begin to wane. Festivals occur in these months, which also means that corresponding brewing activities peak. This can be a period of higher expenditure for better off households, who are expected to fund much of the festival-related outlays.

## Wealth Breakdown

The main determinant of wealth in this agro-pastoral zone is the amount of land a household cultivates, but this is determined in part by the number of livestock a household owns, since oxen provide critical traction services, and cattle provide manure to fertilize the fields. The very poor cultivate 0.5-1 acres and comprise 15-25% of households, with 7-9 members, on average. The poor group cultivates 1-3 acres and make up 25-45% of households; middle households, cultivating 3-4 acres, represent 25-40% of households, and the better off, who cultivate 5-10 acres and have 8-10 members, make up 10 - 20% of households. Land is inherited or purchased, and better off households often rent in additional land for cultivation.

Not only do households in the upper two wealth groups cultivate more land, but they also obtain better yields per acre and they grow more of the higher-value crops, like garlic and onions, which require particular types of land, and more expensive seeds, fertilizers and pesticides. Poorer households are more likely to use hand hoes, for cultivation, whereas middle and better off households employ plough oxen. It is also common for very poor households to obtain access to plough oxen by exchanging their crop residues and their labour with middle or better off households.



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

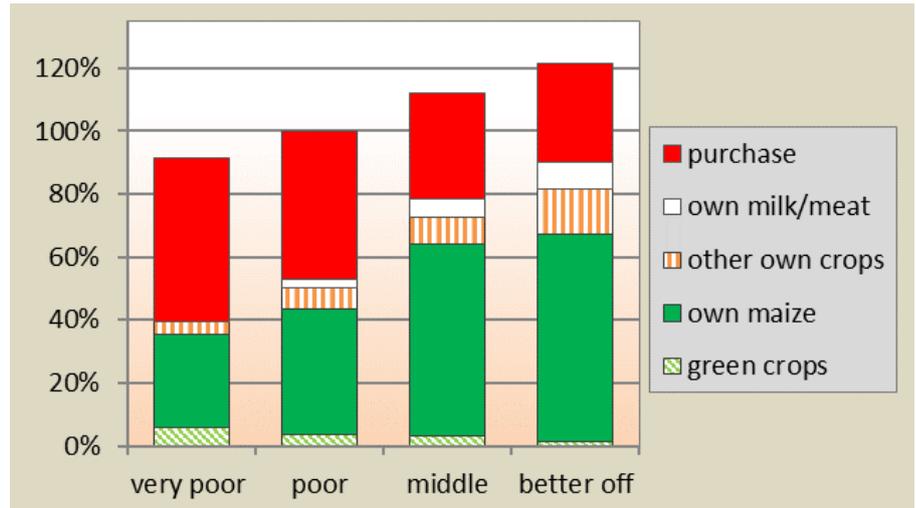
Cattle are used for traction, manure and for food (in the form of milk and meat). They also provide a savings account, of sorts, providing large infusions of cash when sold. People also own goats and sheep, used for meat and for cash income, along with pigs, which provide important cash income for poorer households. Livestock ownership increases in direct proportion with wealth. Very poor households own chickens and possibly a small number of goats and pigs. Poor households are distinct from very poor households in that they own more livestock, particularly cattle and a few oxen, giving them access to milk and animal traction. Better off households own as many as 15-30 cattle with a sizeable herd of goats and sheep along with oxen and chickens. Livestock numbers in this zone have been decreasing over time, and are severely constrained by the limited amount of pasture land available.

Other assets, like bicycles, cell phones, motorcycles, ox carts and ploughs also vary by wealth, with those at the top end of the spectrum owning more of every item. Most of these assets have a productive value as well, with cell phones used to arrange trade transactions and to find out about prices in different parts of the country; bicycles and motorcycles used to transport goods; ox carts rented out for cash; and ploughs used to cultivate land and rented out for cash.

The distribution of wealth in this zone is fairly even. Very poor (19%) and poor (35%) households together comprise just over half of the households in the zone. Middle (32%) and better off (14%) households combined represent just under half the population. Amongst these groups there is a fair amount of re-distribution and intra-community links are strong; better off and middle households hire poorer household members to work in their fields and they sometimes lend cattle to poorer households. This helps to redistribute cash, and it also allows those at the top to generate a surplus. Without the labour of the lower groups, the production that better off groups generate would not be possible. Likewise, without the cash income supplied from agricultural labour, poorer households would not be able to survive.

## Sources of Food

The graph to the right presents the sources of food for households in different wealth groups in the livelihood zone for the period April 2014 to March 2015. April represents the start of the consumption year because it is when people begin to consume green maize 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 above-average year.



*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.*

There are three sources of food in this livelihood zone: own crop production; own milk/meat; and the market. The contribution from own crops and milk/meat increases with wealth and the importance of the market as a source of food decreases as you move up the wealth spectrum.

Even though crop production in the reference year was better than average, the bottom two wealth groups produced, at most, only half of their own food. Maize, beans and sweet potatoes are the main food crops, with maize contributing the majority of home-produced calories, as shown in the graphs. A typical very poor household, cultivating 0.5-1 acre, produced around 500 kg of maize in the reference year, along with 70 kg of beans and 100 kg of sweet potatoes. A typical better off household, on the other hand, cultivated 5-10 acres and produced, on average, over 4,500 kg of maize, 1,300 kg of beans, and 100 kg of sweet potatoes. Poor and middle household production fell in between these two extremes. Very poor households usually consume all of their own maize, but the other three wealth groups sold a portion of both their maize and their beans in the reference year. What they did not sell they consumed, and this accounted for just over 80% of minimum calories for better off households, and just over 70% of minimum calories for middle households. Very poor and poor households had very little to sell; they consumed most of their food crops, which met 40-50% of their minimum calorie needs in the reference year. Keeping in mind that the reference year was a good year, the contribution of own crops for very poor and poor households shown in the graphs above is as high as it is ever likely to be; in most years it will likely be lower.

Purchased food makes up the second-most important source of food for all wealth groups. The majority of food purchased by very poor and poor households was maize, the cheapest staple, helping these households meet 35-40% of their minimum household food needs in the reference year. They also purchased a small amount of rice, beans, sugar and oil. These other foods contributed 10-15% of their minimum calorie requirements. Middle and better off households purchased much less maize, buying enough to cover only 5-15% of their calorie needs; rice, beans, sugar, oil and meat procured from the market contributed 20-25% of food needs. The balance between maize and these higher-value food items tells us something about the priorities of the different wealth groups: poorer households purchased food because they needed to; their total production, assuming no sales, only would have covered 40-65% of their minimum food requirements in the reference year. Better off households, on the other hand, could have met over 300% of their calorie needs with their own production in the reference year if they did not sell any of their maize or beans. Middle households could have covered over 150% of minimum needs given the same circumstances. These two upper wealth groups bought food not because they needed to fill a gap, but because they wanted to diversify their diets.

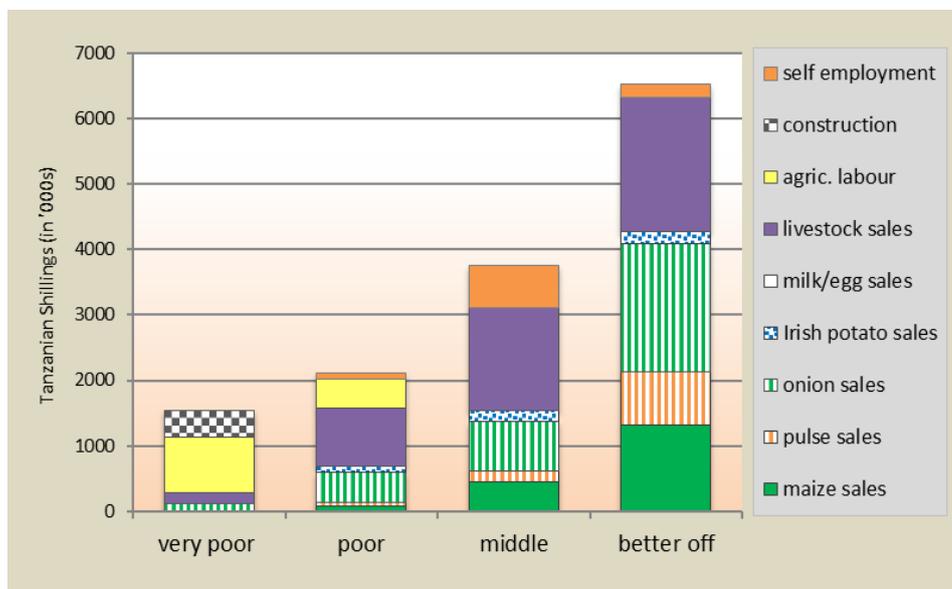
Milk and meat from households' own livestock made up 0-10% of the annual food needs here, increasing in line with wealth. Poor households had 1-2 cows milking; middle households had an average of 3 cows milking; and

better off households had around 5 cows milking in the reference year. Milk yields are low, ranging from 0.5-1 litre per cow per day depending on the season. Total annual production was as high as 825 litres for better off households, and under 250 litres for poor households. All of the milk was used for household consumption. In calorie terms this helped cover 3%, 5% and 8% of minimum calories for poor, middle and better off households. Very poor households did not benefit from milk at all because they had no milking cows. A small amount of meat from goats slaughtered throughout the year provided an additional 0-1% of calorie requirements for the upper three wealth groups.

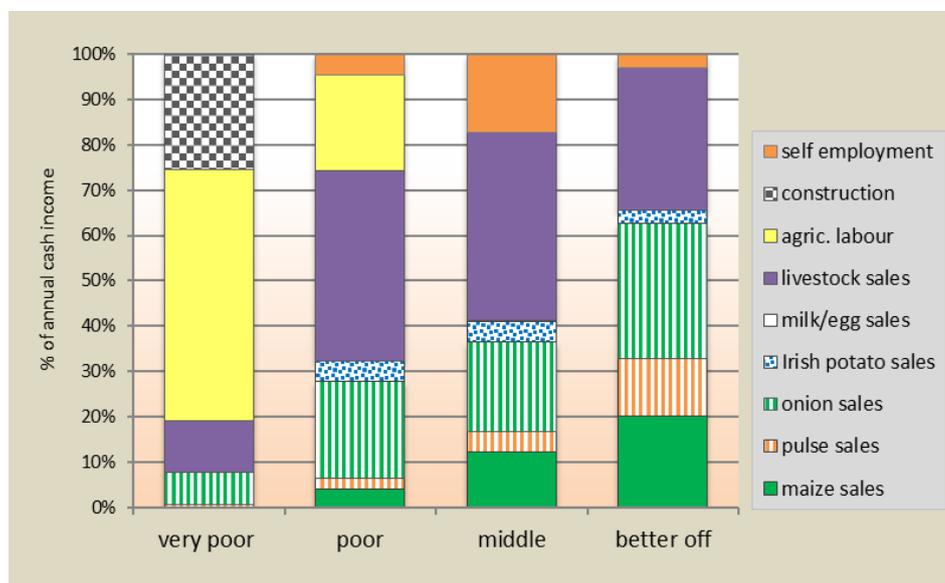
## Sources of Cash Income

The graphs to the right highlight the unique importance of onions in the local economy. For the top two wealth groups, crop sales, livestock sales and self-employment activities comprise the three main sources of cash income in this zone. The bottom two groups rely on crop sales, livestock sales, casual labour (in both agriculture and construction) and self-employment.

Crop sales are the main source of cash income for only better off households. This source of cash made up just over 60% of annual cash income for these households in the reference year. For poor and middle households, crop sales accounted for around 30-40% of annual cash income, and for very poor households crops made up less than 10% of cash income. Onions are the most important cash earner of these crops, but maize, pulses and Irish potatoes were also sold by the upper three wealth groups. In fact, a typical better off household sold over 3,500 kg of maize in the reference year, for an average price of 400 TZS/kg. They also sold



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



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

INCOME SUMMARY TABLE (in Tanzanian Shillings)				
Wealth group	Very poor	Poor	Middle	Better off
Annual income per household <sup>4</sup>	1,300,000 – 1,700,000	1,700,000 – 3,000,000	3,000,000 – 4,800,000	4,800,000 – 9,000,000

<sup>4</sup> The average exchange rate from April 2014-March 2015 was 1 USD = 1,800 TZS

around 990 kg of beans for around 830 TZS/kg; and over 450 kg of Irish potatoes for 430 TZS/kg. However, the most valuable crop was onions, with a unit price of around 1,500 TZS/kg. Better off households sold around 1,300 kg of onions in the reference year, generating 1,950,000 TZS from this crop alone. Middle and poor households sold, on average, 500 kg and 300 kg of onions, respectively; very poor households sold only around 75 kg.

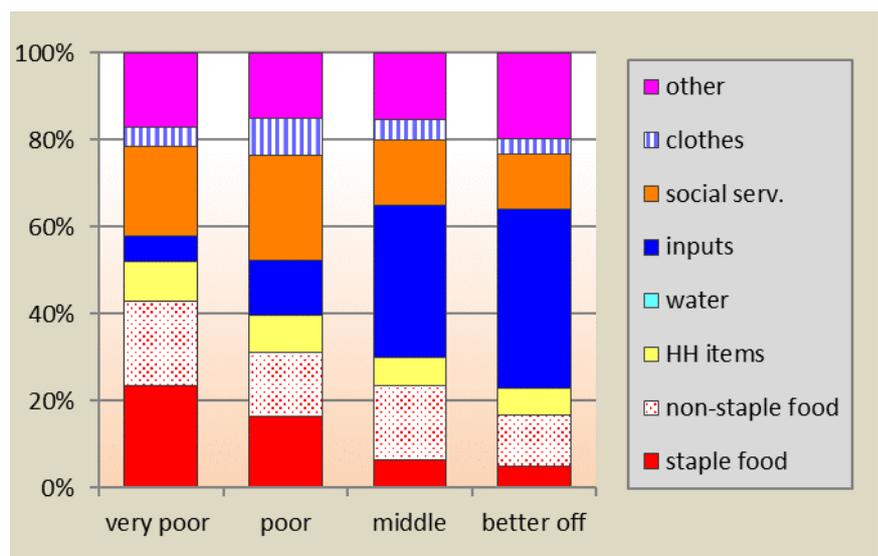
For the poor and middle wealth groups, the most important source of cash income is not crop sales, but livestock sales. Oxen, cattle, goats and sheep are of central importance in the local economy, and sales of these livestock account for around 30-40% of annual cash income for the top three wealth groups in the reference year. Very poor households are only able to sell pigs and chickens; which severely constrains their cash income. The sale of just one ox can bring in 550,000-600,000 TZS and cattle are sold for 400,000-490,000 TZS per head. A typical better off household sold 1 ox in the reference year and 2-3 cattle. Poor and middle households might sell an ox once every year and a half; and they typically sold 1-2 cattle, with poor households selling a cow once every two years. Goats and sheep are worth considerably less money, ranging from 67,500-137,500 for a goat and 35,000-88,000 for a sheep. The price depends on the age, quality and condition of the animal, and it also depends on the market where the animal is sold. Poor households were able to sell 2-3 goats and sheep in the reference year; middle households sold around 4 goats and sheep; and better off households sold 4-5. As a rule, better off households were able to get a much better price per head than very poor households, selling their animals in prime condition and at the most advantageous markets. Chickens, worth around 10,000 per bird; and pigs, worth around 75,000 per head, brought in some cash income for very poor and poor households. Overall, the cash income that better off households earned from livestock sales was over 12 times greater than that earned by very poor households.

As shown in the second set of graphs above, very poor households depend most heavily not on crops nor on livestock income, but on agricultural labour, which earned them well over 50% of their cash income in the reference year. Planting and weeding times are most lucrative and this period of pre-harvest labour (from November to March) is when they earn around two-thirds of their agricultural labour income; the remaining third comes from harvesting and threshing, which occurs from July through August. Both men and women from very poor and poor households work on the larger farms of middle and better off households. In August and September, after the harvest is in, these same households find work in the construction industry, making and selling bricks or helping to repair and build houses. Better off and middle households during the same period earn cash selling building poles or timber. Some also hire out oxcarts and ploughs and – for those who have them - tractors. A few also own kiosks. Except for the kiosks, which can be run by any family member, all of these extra businesses are managed by men.

## Expenditure Patterns

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

Households in this zone, as in other areas of Tanzania, must spend money on a range of basic goods and services throughout the year, including: staple and non-staple food, household items, productive



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

inputs, social services like schooling and health, as well as clothing and other miscellaneous items. The graph above conveys a number of key messages.

First, both absolute and relative expenditure on staple food decreases as we move up the wealth spectrum. In other words, poorer households have to spend a larger portion of their annual cash, and more cash in absolute terms than better off households, just to meet basic food needs. Even in a relatively good year like the reference year, very poor households devoted over a fifth of their income to staple foods, which consisted largely of maize grain, the cheapest staple, along with small amounts of rice, beans, oil and dried fish. Better off households also bought maize grain, but less than a fifth of what very poor households buy. They spend more of their available cash on non-staple foods, like sugar, meat, oil and rice. In fact, better off households allocated over two and a half times more to non-staple foods than very poor households did in the reference year, with high spending on sugar especially notable. Better off households spend almost as much on sugar as very poor households devote to their entire non-staple food budget. The non-staple foods are preferred commodities, so with more income available, more is spent on these items. Nevertheless, in *proportional* terms, very poor households spent more on non-staples than better off households. Better off households devoted only around 12% of their annual cash to non-staple foods, deriving in return around 15% of their annual minimum calorie requirements. Very poor households, on the other hand, spent around 19% of their annual cash on non-staple foods, but were only able to convert this into 3% of their minimum calories.

Second, as you move up the wealth spectrum there is a notable increase in the money spent on productive inputs. This category includes livestock drugs, ploughing, land rental, seeds and tools, pesticides and fertilizers, labour hire, livestock purchase, phone credit and house repairs. Not all wealth groups spend equally in all of these areas; very poor and poor households do not spend any cash on land rental, pesticides, fertilizers, livestock purchase, or labour hire. Very poor households generally allocated only around 2% of their annual budget to productive inputs in the reference year and poor households spent, on average, 8%. Of this amount, most is spent on phone credit (for very poor households) and seeds and tools (for poor households). Middle and better off households spent 30-37% of their reference year cash on productive inputs. In absolute terms, better off households spent around 77 times more on inputs than very poor households. Two categories of expenditure are particularly high for middle and better off households: labour hire, which takes up 50-60% of the inputs budget; and livestock purchase, which eats up an additional 10-20% of this budget. The amount that better off households spent on just hiring labour was equivalent to around fifteen times the amount very poor households spent on all of their inputs combined. This is an important way that cash gets re-distributed throughout the community, because the more money spent on hiring labour, the more cash income for very poor and poor households in the form of agricultural labour.

Third, in the graph above, the 'hh items' category includes basic household necessities, such as tea, salt, soap, kerosene, grinding services and utensils. Within this category, the two poorer wealth groups spent the most money on grinding services and soap. These households did not spend anything on kerosene. Grinding alone comprised around 40% of the inputs budget for very poor households; soap comprised 30-40% of this budget for the poorer two wealth groups. Better off households spent the most on soap, followed by utensils. On an annual basis, spending on basic household goods, which occurred in weekly or daily incremental outlays, accounted for around 6-9% of total expenditure for all wealth groups.

Households also spent a large proportion of their annual cash on education and medical services, which are shown on the graph as 'social services'. Accounting for 20-25% of very poor and poor household cash income, and 10-15% of middle and better off household cash income, schooling expenses included school fees, uniforms, stationery and transportation, where relevant. On a per capita basis, holding household size constant, absolute spending on education during the reference year increased as you moved up the wealth spectrum. Better off households spent around 2 times more than very poor households and 1.3 times more than middle and poor households. The difference between poor and middle households was not significant. Very poor households are generally only able to afford to send their children to 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 college. With respect to health costs, better off households again spent around 3 times more than very poor households on a per capita basis; it is likely that

these households sought treatment, when necessary, at facilities other than the village dispensary, including private hospitals and clinics.

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, bicycle service, savings, transportation and festivals. This is discretionary spending that can be reduced or redirected in bad years to buy more essential items if necessary. In relative terms all wealth groups have almost the same amount in this category, however, in absolute terms, those at the upper end of the wealth spectrum have the most available in this discretionary budget; and because the reference year was a relatively good year, the two bottom wealth groups have more in this budget than they would in a bad year.

## Hazards

There are three chronic hazards that affect this zone. **Crop pests and diseases**, such as maize lethal necrosis disease, reduce yields on a regular basis, affecting access to both food and cash income. **Livestock diseases**, such as East Coast Fever and Foot and Mouth Disease are a serious threat to local livestock herds. New Castle Disease, which can wipe out an entire flock of chickens, is also a regular concern. The third is **wild animals**, such as wild pigs, hyenas and monkeys, which regularly damage crops and reduce production.

The main, and most devastating, periodic hazard is **unreliable or inconsistent rainfall**, occurring once every three years, and leading to serious declines in crop production. **Army worm outbreaks** are a problem once every two years or so. When this happens, maize yields are reduced substantially. Less a hazard than a constraint, **unfavourable market conditions** for local farmers mean they are often forced to accept unfair prices for their commodities and this lowers the income for local residents every year.

## 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, or eliminating clothing purchases.
- Poorer households try to increase their **labour income** by seeking additional work on local farms, but this market is quickly saturated in a bad year, especially since better off households tend to reduce their hiring of labour when production conditions decline. Thus the expandability of this option is limited. When local labour is unavailable households seek work outside the zone in urban areas like Arusha or even Dar es Salaam.
- Poorer households try to borrow food from better off households with the promise to repay it after the next harvest. This puts poorer households into debt and means that even if the coming year is good, they will not be able to benefit fully from it.
- All households also try to increase their **livestock sales**. Poorer households have less protection, because they have very few animals. Even better off households are limited in this regard because 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.
- Better off households try to **increase their sale of reserved crops**.
- Better off households also may **reduce their spending on agricultural labour**, which has knock-on effects for poorer households.

## 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 *Babati-Mbulu Cattle, Maize, Beans & Onions Livelihood Zone*. These should be monitored to indicate potential losses or gains to local household economies, either through on-going monitoring systems or through periodic assessments.

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

Item	Key Parameter - Quantity	Key Parameter – Price
<b>Crops</b>	<ul style="list-style-type: none"> <li>Maize – <i>masika</i> – amount produced</li> <li>Beans – amount produced</li> <li>Onions – amount produced</li> <li>Irish potatoes – amount produced</li> </ul>	<ul style="list-style-type: none"> <li>Maize - producer price</li> <li>Beans – producer price</li> <li>Onions – producer price</li> <li>Irish potatoes – producer price</li> </ul>
<b>Livestock production</b>	<ul style="list-style-type: none"> <li>Oxen – numbers per household</li> <li>Cattle – herd size</li> <li>Goats – herd size</li> <li>Sheep – herd size</li> <li>Pigs – number per household</li> </ul>	<ul style="list-style-type: none"> <li>Oxen – producer price</li> <li>Cattle – producer price</li> <li>Goats – producer price</li> <li>Sheep – producer price</li> <li>Pigs – producer price</li> </ul>
<b>Other food and cash income</b>	<ul style="list-style-type: none"> <li>Agricultural labour (land clearing and preparation, planting, weeding) – number of jobs</li> <li>Agricultural labour (harvesting) – number of jobs</li> <li>Construction – number of jobs</li> <li>Bricks – number produced</li> <li>Self-employment – level of activity</li> </ul>	<ul style="list-style-type: none"> <li>Agricultural wage rates (land clearing and preparation, planting, weeding)</li> <li>Agricultural labour rates (harvesting)</li> <li>Construction – labour rates</li> <li>Bricks – price per brick</li> <li>Self-employment – return on activities</li> </ul>
<b>Expenditure</b>		<ul style="list-style-type: none"> <li>Maize grain – consumer price</li> <li>Sugar – consumer price</li> <li>Oil – consumer price</li> </ul>

## Programme Implications

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

Very poor	Poor	Middle	Better off
Improve access to and availability of safe and reliable water supplies	Improve access to and availability of safe and reliable water supplies	Improve access to and availability of safe and reliable water supplies	Improve access to and availability of safe and reliable water supplies
Improve access to and affordability of health services, including health insurance	Improve access to and affordability of health services, including health insurance	Improve access to and affordability of health services, including health insurance	Improve access to and affordability of health services, including health insurance

Rehabilitate existing roads and construct new roads to provide easier access throughout the zone	Rehabilitate existing roads and construct new roads to provide easier access throughout the zone	Rehabilitate existing roads and construct new roads to provide easier access throughout the zone	Rehabilitate existing roads and construct new roads to provide easier access throughout the zone
Improve market infrastructure to ensure fair producer prices	Improve market infrastructure to ensure fair producer prices	Improve market infrastructure to ensure fair producer prices	Improve market infrastructure to ensure fair producer prices
Provide affordable and timely access to agricultural inputs	Provide affordable and timely access to agricultural inputs	Improve agricultural and livestock extension services and training	Improve agricultural and livestock extension services and training
Ensure fair and equitable distribution of land for crop production	Improve agricultural and livestock extension services and training	Develop irrigation infrastructure	Develop irrigation infrastructure
Provide credit for investment in agriculture and livestock	Develop irrigation infrastructure	Improve communication network	Improve communication network