

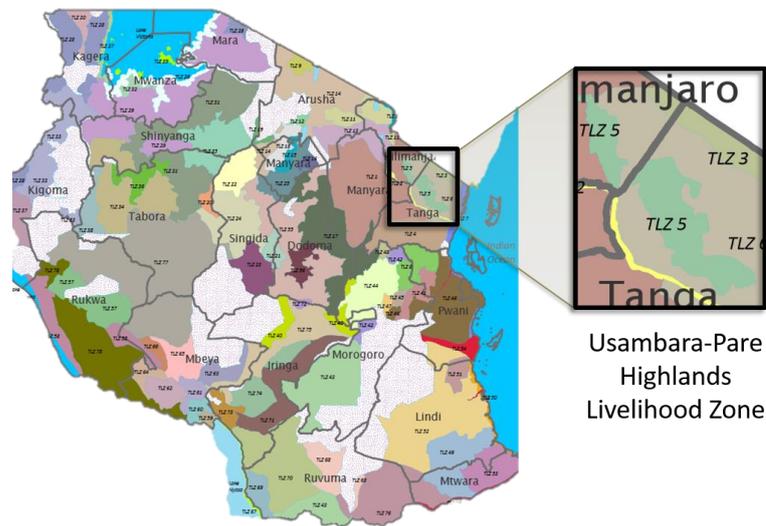
# Tanzania Livelihood Baseline Profile

## Western Usambara-Pare Highlands Livelihood Zone (TLZ 05)

February, 2016<sup>1</sup>

### Zone Description

The *Western Usambara-Pare Highlands Livelihood Zone* comprises a mountainous highland area in parts of Tanga and Kilimajaro regions. The administrative units that make up this zone include the wards of Kwai, Malibwi, Rangwi, Mwangoi, Mbaramo, Mtae, Soga, Soni, Mlalo, Shume, Malindi, Hamtoye, Ngweo, Lushoto, Gare, Baga, Mgwashi, Mwamboi, Ubiri, Mbuzii, Mayo, Bumbuli, Vuga, Mponde, Funta, and Tamota, all of which are found in Lushoto District<sup>2</sup>. The main ethnic groups living here are the Sambia and the Pare. The population density here is high: 141 people per km<sup>2</sup> in the western part of the zone and 104 per km<sup>2</sup> in the eastern part, although around Korogwe the density is much lower, around 68 people per km<sup>2</sup>.



Usambara-Pare Highlands Livelihood Zone

This livelihood zone consists of a mountainous areas containing some of the only rain forests in East Africa. The Usambaras are part of a mountain range that stretches from the Taita Hills in southern Kenya to Morogoro and the southern highlands of Tanzania. The Usambaras are commonly split into two sub-ranges, the West Usambara Mountains and the East Usambara Mountains. The East Usambara are closer to the coast, receive more rainfall, and are smaller than the West Usambara. Natural resources include timber and a range of fruit trees, which are exploited for cash by a large proportion of the population. Since the late 19<sup>th</sup> century, a mix of cash crops like coffee, tea, and timber have been harvested from this area. A range of fruit trees are also found here. In the eastern parts, bananas, mangoes, jackfruit and avocado are grown. In the western part apples, peaches, and avocados are found. Tea plantations can be found in both the eastern and western areas, but most small-holder households do not grow tea.

There are two rainy seasons – the *masika* rains, from March to June, and the *vuli* rains, from October to December. Total precipitation can be as high as 2,000 mm or as low as 500 mm depending on the year, but on average, based on a 43-year series of data, annual rainfall is around 1,036 mm. Temperatures are cool, ranging from 15°C to 30°C. The soils are fertile here, but there are severe constraints on land, with some of the highest population pressure in the country. Therefore, plot sizes are small, and production per household is low. All households cultivate maize, beans and Irish potatoes, all of which are rain-fed. Those with more land also cultivate a range of horticultural crops, such as cabbages, tomatoes and sweet peppers. These are grown in both seasons and bring in substantial cash income. Because of the mountainous terrain, tractors and ox ploughs are not

<sup>1</sup> Fieldwork for the current profile was undertaken in November and December of 2015. The information presented in this profile refers to the reference year, which was the consumption year that started in February 2014 and ended in January 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> Although the map shows a zone that includes Korogwe and Muheza, these areas are considered to be a separate zone because the *masika* season is the main season here (rather than the *vuli*) and there are different fruits cultivated in smaller amounts. Cassava is found in the east not the west; people work on tea estates in the east but not the west. Potatoes are important in the west but not the east. Therefore, a re-zoning exercise is necessary along with a new map.

feasible; therefore, all households – even the better off – use hand hoes to cultivate. Horticultural production is labour intensive, requiring arduous land preparation, planting, weeding, spraying, watering and harvesting. Middle and better off households pay poor household members in cash to help them complete these activities. Both men and women from poorer households work as labourers, helping provide their families with an important source of cash.

Livestock are raised here in small numbers. Because of the severe limitations on land, people are unable to keep more than a few cattle and goats or sheep per household. Chickens are also kept by all households. Zero grazing is the norm here, and animals are hand fed with grasses and crop residues. Cattle provide milk for consumption and sale and those who have them can convert them into cash when needed to cover a range of basic necessities. Goats and sheep are also kept here, used for cash income, but not for milk. Goats, sheep and chickens slaughtered and eaten throughout the year, but especially during the festival seasons. Livestock rely on water from seasonal rivers during the rainy seasons and shallow wells and springs during the dry season. Men are responsible for taking care of the cattle; both men and women take care of the goats and sheep, whereas women and children manage the chicken flocks.

Poorer households depend heavily on seasonal agricultural labour - land clearing, planting, watering, spraying, weeding and harvesting - to generate cash income. Some also piece together supplemental cash by collecting and selling firewood, selling building poles, or brewing. Middle and better off households earn extra cash from petty trade, running small kiosks, and – if they have a motorcycle – *boda boda* (motorcycle taxi hire).

Services in this zone are on a par with much of rural Tanzania. Drinking and washing water is sourced from springs and taps, usually not farther than 1 km from the village. Tap water is not free, costing 1,000 Tsh per household per month. Sanitation facilities consist of pit latrines, most of which are constructed with brick and mud and covered with aluminium sheets. Better off households may have improved concrete floors instead of mud floors. Health dispensaries are found within a 5-6 kilometre radius of most villages. Primary schools also available in villages, with secondary schools found at the ward level. Most poorer households send their children through primary school but not to secondary school. Middle and better off households, on the other hand, can afford to send their children to secondary school and vocational college. There is no electricity in this zone so households depend on battery-operated torches and kerosene lanterns for light; some better off households also have solar lanterns. In general, all households have at least one mobile phone and better off households having multiple phones. People do not have access to credit here and there are no options for savings. A few NGOs operate here, including the Tanzania Social Action Fund (TASAF), which provides grants to poor households to start income generating projects or to access social services; Oxfam, which promotes vegetable crop marketing; TwoAfrica, which provides improved yellow bean seeds; and ASARECA, which promotes soil conservation and provides seeds.

## Markets

In this mountainous zone, roads are mostly made of dirt and often in poor repair. One major tarmac road runs through the zone from Lushoto to Korogwe. In the dry season vehicles make it through on all the roads; but during the rains, the more difficult areas to reach, such as Kwai village in Lushoto District, become inaccessible. The majority of bridges are in good condition, although this can change rapidly in the wet season. Motorcycles, bicycles and foot traffic are the means by which most people get around in any case, and people sell their goods to traders who come into the zone to buy directly from farmers.

Vegetables, such as cabbage, tomatoes and sweet peppers, along with fruits and livestock are the main commodities sold by households in this zone. These transactions take place at the farm gate. Vegetables are sold in the largest quantities after both harvests, from January to February and June to July, but there are vegetables harvested throughout the year in valleys where water pools, and sales can take place at any time. Traders buy vegetables from farmers and then transport them to Lushoto, where they are sold on to Tanga,

Arusha or Dar es Salaam. Fruits are sold mainly in December and January. They follow the same trade route. Cattle, goats and chickens are sold in small numbers throughout the year at local markets.

Given the high requirement for purchased food in this zone, the route by which maize enters the zone is important to understand. Demand for purchased maize grain is high from April to July in Korogwe (the eastern part of the zone) and from August to January in Lushoto (the western part of the zone). All households need to buy maize grain to cover their needs for a large portion of the year. Maize is the cheapest local staple, and this is sourced from Handeni or from Dar es Salaam. It is trucked into the area by local traders and better off households (who own trucks and bring back maize after their sell their vegetables in Dar es Salaam). This helps to moderate maize prices and ensures a fairly steady supply. Beans are sourced from Kilindi and are distributed via local markets from October through December. Non-food essentials, like salt, soap, batteries and kerosene, are sold in local kiosks.

The labour market is almost entirely local seasonal agricultural work. It was estimated that in the reference year, 90% of seasonal labour was found within the zone on local farms, with middle and better off households hiring poorer household members to work on their land. An additional 10% of labour demand came from Lushoto town, where people regularly go to seek work.

## Timeline and Reference Year

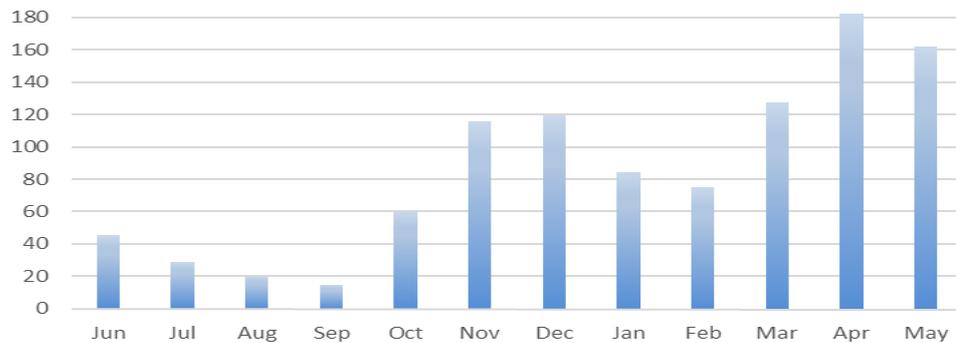
The baseline assessment refers to a very specific time period called the reference year. In the *Western Usambara-Pare Highlands Livelihood Zone* the reference year covered the **consumption** period from February 2014 to January 2015. During community leader interviews, informants were asked to rank the last four years (eight seasons) in terms of seasonal performance with '1' indicating a poor season and '5' an excellent season. The table below, which summarizes the response of the community leaders, shows year quality by *production* year (which starts with the *vuli* season planting period in October/November and ends with the April through July harvest of the following calendar year. Thus, the production year of 2013-2014 corresponds to the consumption year of 2014-2015. As shown in the table, the production year corresponding to the reference year was average, with average rains, average crop yields and normal food prices. In the past eight seasons, three were below average, three were just below average and two were average.

Production Year	Season	Rank	Critical Events
2014-2015	<i>Vuli</i>	2.5	Drought, high staple food prices, low crop production. People increased livestock sales and tried to find more seasonal agricultural labour.
	<i>Masika</i>	2	Drought, high staple food prices, low crop production. People increased livestock sales and tried to find more seasonal agricultural labour.
2013-2014	<i>Vuli</i>	3	Average rainfall; average crop production average prices
	<i>Masika</i>	3	Average rainfall; average crop production average prices
2012-2013	<i>Vuli</i>	2.5	Average rainfall; average crop production average prices
	<i>Masika</i>	2.5	Average rainfall; average crop production average prices
2011-2012	<i>Vuli</i>	2	Drought, high staple food prices, low crop production. People increased livestock sales and tried to find more seasonal agricultural labour.
	<i>Masika</i>	2	Drought, high staple food prices, low crop production. People increased livestock sales and tried to find more seasonal agricultural labour.
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

	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan
Rainy season		Masika							Vuli			
<b>Crops</b>												
Land preparation												
Maize - (vuli)												
Beans												
Irish potatoes												
Vegetables/fruit												
<b>Livestock</b>												
Cattle milk peak												
Cattle sales peak												
<b>Other</b>												
Agricultural labor peak												
Non-agricultural labor peak												
Firewood sales												
<b>Stress &amp; High Expenditure Periods</b>												
High staple prices												
Human diseases												
Festival season												
Lean season												
<b>Legend</b>												
	Land prep	Sowing	Weeding	Green Cons.	Harvest/Thresh.							

The graph to the right shows average monthly rainfall (mm) in Lushoto District based on a 43-year period (1971-2013) Source: TZ Meteorology Department



In this livelihood zone there are two distinct rainy seasons: the first, called the *vuli*, starts in October and lasts until January; the second, called the *masika*, occurs from March through May. Households in the western part of the zone consider the *vuli* rains to be the main production season, whereas those in the eastern part consider the *masika* rains to be the main production season. The seasonal calendar below shows the pattern for the western part of the zone, but even here, there is production in both the *vuli* and *masika* seasons, and many crops rely on irrigation which, while supported by the rains, is not entirely dependent on them.

Land preparation takes place twice a year: from August to October (for the *vuli* season) and February and March (for the *masika* season). This is a time of intense labour demand and those at the lower end of the wealth spectrum are working in both their own fields and in the fields of those with bigger farms, earning much of their annual cash during this period. Maize is grown in only one season, but beans and Irish potatoes

are planted twice. Maize, beans and horticultural crops are planted in October and November, once the rains are fully established. Irish potatoes are planted before this, starting in September, since they need slightly less water to get started. Weeding takes place from November to January, and once again poorer households are hired by those with larger farms to help with this activity. Irish potatoes and some of the horticultural crops start to get harvested as early as January, and households begin to harvest maize green, and beans, starting in February. The main harvest of *vuli* maize is in April and March. As maize from the *vuli* crop is being harvested green, fields are once again prepared for the next season, with planting for the *masika* beans, Irish potatoes and vegetables taking place in March and April. May is when households are tied up with weeding activities, again followed by a harvest of the second season crops in June and July. The whole cycle starts again in the following month, in August.

Milk production is highest from February through June since conceptions are highest in May and cattle give birth around nine months later. This is a time when the consumption of milk is highest within the household, and cash income from the sale of milk peaks. Livestock diseases may occur any time throughout the year, but the rainy season is when some of the most damaging diseases, such as East Coast Fever and Blackquarter, are likely to occur.

Livestock sales can also take place at any time of the year, but November through January tends to be a time of especially high sales, when households need extra cash for food since staple prices are highest in these pre-harvest months.

Poorer households in this zone are especially busy during land preparation and weeding periods, splitting the household to work partly on their own farms to grow their own food and cash crops, and partly on others' farms for cash. February and March, and August through October are periods of intense agricultural labour demand. During the months when there is more time for off-farm work (from April through July), poorer households may seek temporary jobs in town, or they collect and sell firewood to supplement their cash income.

June through September is the festival season. This brief period between the *masika* harvest and the start of the *vuli* season is when people have slightly more cash available from their cash crop sales, and the break in agricultural labour gives people a time to rest.

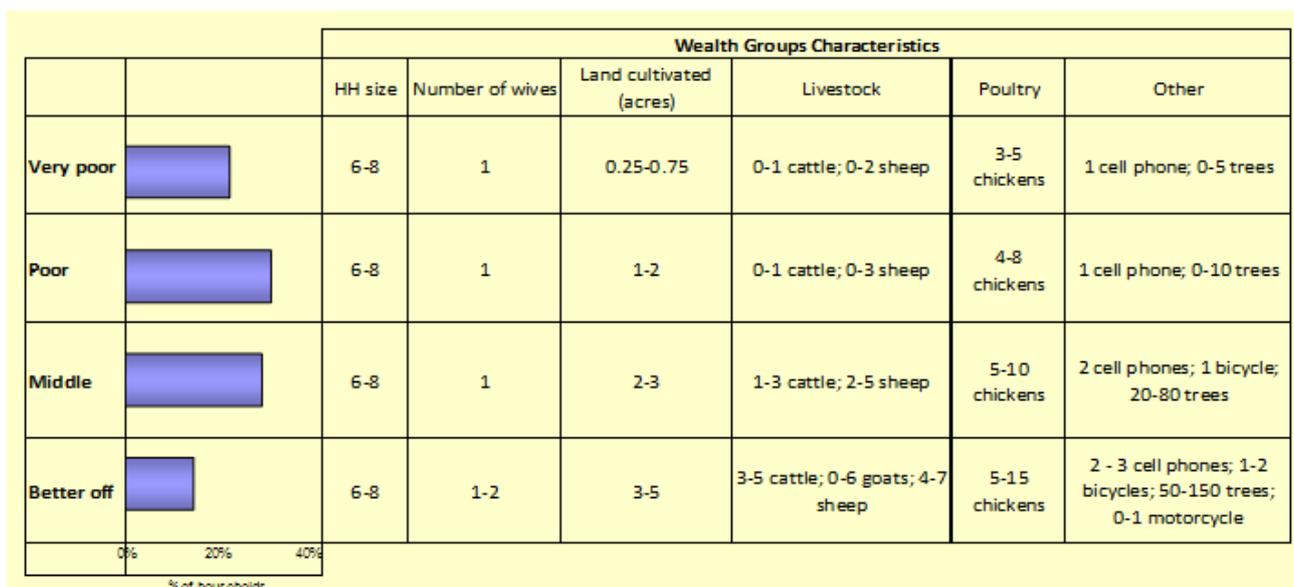
Human diseases occur throughout the year as well, but respiratory infections tend to peak during the dry seasons, and malaria is highest in the wet seasons. Having a sick household member is extremely taxing, especially for poorer households who need as much labour on hand as possible to manage the demands of their own farms while taking advantage of changing seasonal employment opportunities. They are also more limited in being able to pay for medicines (where they are available) given the severe constraints on their budgets.

## Wealth Breakdown

Given that crop production is the main source of cash income in this zone, it follows that wealth is determined largely by the area of land cultivated by a household. In addition, ownership of productive assets, like motorcycles (which enable households to make money from *boda boda*), livestock and fruit trees contributes to the basis on which differences of wealth are determined. These other productive assets are relatively more important in this zone than in many others because the population is dense, land is very limited and, thus, the land areas cultivated are severely constrained. No land is left uncultivated, and even better off households are unable to plant on more than 5 acres.

Very poor households plant on less than an acre, concentrating mainly on food crops rather than horticulture. Poor households cultivate 1-2 acres and middle households cultivate 2-3 acres. The difference between these two amounts of land seems minor, but there is a critical divide between poor and middle households: poor and very poor households need to work for others to earn enough cash to live on and middle households generally do not. In part this is because middle households have that extra acre that allows them to plant

vegetables for sale and also allows them to cultivate – importantly – a significant number of fruit trees, which provide another source of cash income that poor households do not have.



Note: The percentage of household figures represent the mid-point of a range. All asset numbers are per wife (in the case of polygamous households).

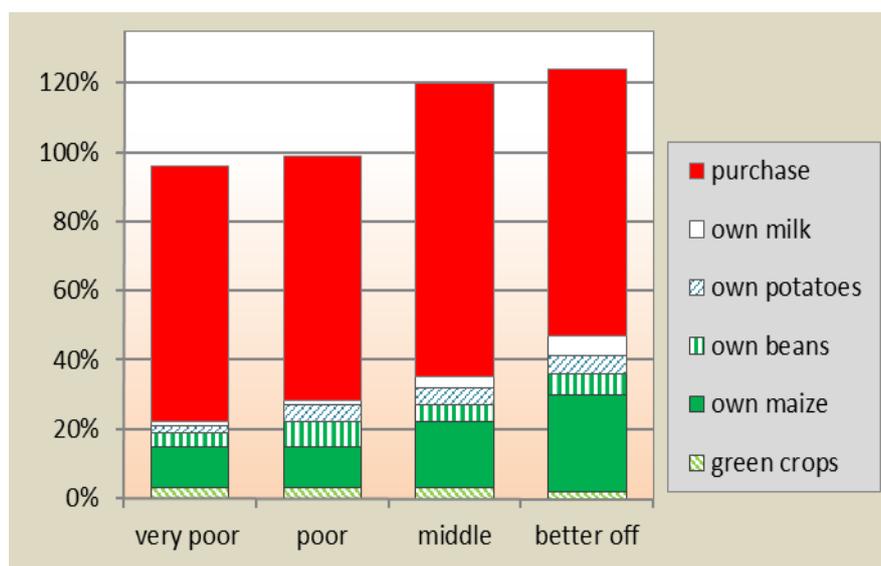
Another difference between poor and middle households is the number of livestock owned. Although livestock are not a major source of cash income in this zone – limited in numbers because of the lack of land for grazing and maintenance - they still help provide milk for consumption and sale, and the cash from live animal sales is not insubstantial. A middle household with up to 3 cattle has different prospects for cash income than a poor household with none.

There is a certain amount of intra-household redistribution in this livelihood zone. All households cultivate with hand hoes, which means that those with more land need extra help, unable to rely exclusively on their intra-household labour to complete all their agricultural tasks throughout the year. Thus, households on the upper end of the wealth spectrum hire those on the lower end, especially during land preparation and weeding. The local labour market acts mechanism for redistributing cash, giving poorer households access to needed cash income and better off households access to the labour they need. In addition, there are some share-cropping arrangements in place, in which middle households provide land, fertilizers and seeds to poorer households in exchange for a portion of the crop that is harvested by the poor household.

The distribution of wealth in this zone is fairly even. Very poor (23%) and poor (32%) households together comprise just over half of the households in the zone. Middle (30%) and better off (15%) households combined represent just under half the population.

## Sources of Food

The graph to the right presents the sources of food for households in different wealth groups in the livelihood zone for the period February 2014 to January 2015. February represents the start of the consumption year because it is when people begin to consume green crops and it marks the end of the hunger period. Food is presented as a percentage of 2100 kcal per person per day for the 12-month period. This was considered an average year.



What is striking about livelihood patterns in this zone is the heavy reliance on the market for all

*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.*

wealth groups. All households needed to purchase food to cover a production gap – even better off households generally do not produce enough to meet their minimum calorie needs. In the reference year, an average year, very poor households bought almost 60% of their minimum calories in the form of maize grain (the cheapest staple) and better off households bought around 30% of their calories in the form of maize grain. All households also bought some rice, with middle and better off households buying more of this expensive grain than poorer households; and middle and better off households also bought wheat flour, which was around twice as expensive as maize grain. Sugar, meat, oil, Irish potatoes, beans and dried fish also contributed to the purchased food basket. Combining both staple grain and non-staple food purchases, households here relied on the market to cover 70-85% of their minimum calorie requirements in the reference year. It is important to note that, even with these purchases the typical very poor and poor households were left with a gap.

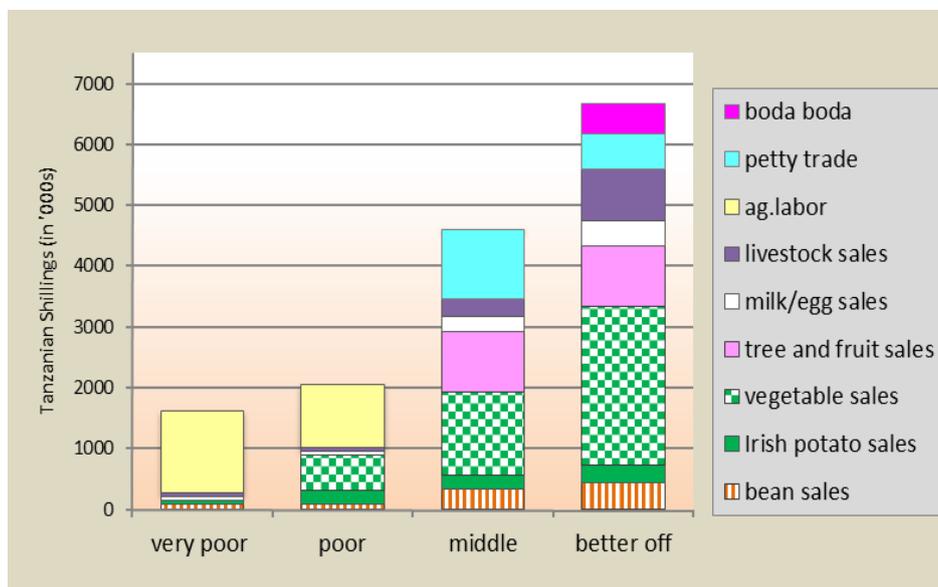
In addition to the market, households depended on two other sources of food: their own crop production and their own milk production. All households grow a range of crops, including maize, beans, Irish potatoes and vegetables, such as cabbage, sweet peppers. Better off households also cultivate fruit trees; in the eastern part of the zone, where the altitude is not as high, bananas, mangoes, jackfruit and avocados are grown; in the western, higher altitude part of the zone, apples, peaches, avocados and *futari* (*matunda damu*) are grown. Despite this large variety, households do not grow enough to meet their own consumption requirements, even in an average year like the reference year. People have relatively small plots, and only one season of maize is grown. In that one season (the *vuli* season in the western part of the zone and the *masika* season in the eastern part), total production of maize was quite low in the reference year, ranging on average from 175 kg for very poor households up to 430 kg for better off households. All of the maize was consumed, but this amount accounted only around 10-30% of minimum calorie requirements. Beans are grown in both seasons, and a large portion of the bean harvest is sold. Given that beans fetch a higher price than maize grain, selling this crop to generate cash for purchased maize makes economic sense. The beans that households retained for consumption covered an additional 4-7% of minimum food needs. Irish potatoes, grown in the *masika* season, provide an additional 2-5% of minimum calorie needs for households. When combined, own crops accounted for only around 20-40% of households' annual food needs in the reference year.

Milk makes up the last component of the diet for households in this zone, although it does not make a large contribution in calorie terms, providing only 1-6% of minimum calorie needs in the reference year, increasing

with wealth. Middle households typically have around 1 cow milking, and better off households have, on average, 2 cows milking. Very poor and poor households may borrow a cow, or share in the milk from a neighbour. Yields are relatively high, at 3-4 litres a day in the first rainy season (lasting around four months) and 1.5-2 litres a day in the second rainy season (lasting around three months). When added together, the milk from both seasons amounted to around 660 litres for middle households, and 1,300 litres for better off households during the reference year. Around 50-65% of this was sold, providing some cash income (shown in the section below) for these three wealth groups.

## Sources of Cash Income

The graph to the right highlights six main sources of cash income in this livelihood zone: own crop sales, milk/egg sales, livestock sales, agricultural labour, petty trade and *boda boda*. All households need to depend on sources of cash from off-farm activities, although the majority of cash income for middle and better off households is generated on the farm (from crop and livestock-related sales.) The bottom two groups rely quite heavily on agricultural labour to supplement their crop and livestock-related sales. Their on-farm production is much too low to meet all of their cash needs



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

INCOME SUMMARY TABLE (in Tanzanian Shillings)				
Wealth group	Very poor	Poor	Middle	Better off
<b>Annual income per household</b> <sup>3</sup>	1,157,000 – 1,760,000	1,760,000 – 2,355,000	2,600,000 – 5,600,000	5,600,000 – 7,000,000

The importance of vegetable and fruit sales stands out in this livelihood zone, especially for the upper two wealth groups. For these households, the purchased food that dominated the 'Sources of Food' graphs is funded in large part by these sales of vegetables and fruits. All the crop sales combined (including beans, Irish potatoes, vegetables and fruit) accounted for (on average) 9%, 43%, 64% and 65% of annual cash income for very poor, poor, middle and better off households, respectively. Middle and better off households derived over 80% of their crop-based cash income from vegetable and fruit sales. As noted above, in the eastern part of the zone, where the altitude is not as high, bananas, mangoes, jackfruit and avocados are grown; in the western, higher altitude part of the zone, apples, peaches, avocados and *futari (matunda damu)* are grown. Fruit sales made up 25-30% of the crop-based cash income for middle and better off households in the reference year. Tomatoes, cabbages and sweet peppers are the main horticultural crops grown and sold; better off households marketed as much as 5,400 kg of cabbage, 1,500 kg of sweet peppers and 2,100 kg of tomatoes. Poor households also benefitted from vegetable sales, deriving over 60% of their crop-based cash from horticulture. Very poor households, on the other hand, sold only beans and Irish potatoes, and in only very small quantities. In many ways the main distinction between poor and very poor households is that very poor households are unable to cultivate vegetables, whereas poor households do; the cash incomes of very poor households suffer as a result.

<sup>3</sup> The average exchange rate from February 2014-January 2015 was 1 USD = 1,776 TZS

Two other sources of on-farm cash income (milk/egg sales and livestock sales) are less important, making up only 7-19% of annual cash income combined for all wealth groups. People keep small number of cattle, sheep and chickens and use them to generate milk, eggs and cash income from sales of live animals. Poorer households generated around 74,000 Tsh from milk and egg sales in the reference year; this was enough to cover the agricultural inputs budget of very poor households, or at least part of the school fees for their children. So although this does not compare to the 400,000 Tsh generated by better off households from milk and egg sales, it is nevertheless a meaningful amount. Sales of live animals (sheep and chickens for all households and cattle in addition to the sheep and chickens for middle and better off households) brought in around the same amount of money as milk and egg sales did for the poorer two wealth groups, and around twice as much as milk and egg income for better off households. In any case, livestock are not the major engine of the local economy in this livelihood zone, providing a relatively small supplement to other more important sources.

Far more important for very poor and poor households than either crop sales or livestock-based income is the cash derived from agricultural labour. Agricultural labour is the single most important source of cash for both of these wealth groups, accounting for almost 85% of annual cash income for very poor households, and 50% of annual cash income for poor households in the reference year. Land preparation for vegetables is an especially arduous task, as everyone is forced to use hand hoes in this highland zone. There are no tractors or ox ploughs. Poorer households are routinely hired throughout the four months when this work is undertaken; land preparation alone accounts for over half of the agricultural labour income for very poor households. Watering, spraying, weeding and harvesting times also see an increase in the demand for seasonal labour, and these activities bring in the rest of the cash income in this category. All of the labour is performed for local middle and better off households. There is no seasonal agricultural labour migration to other areas.

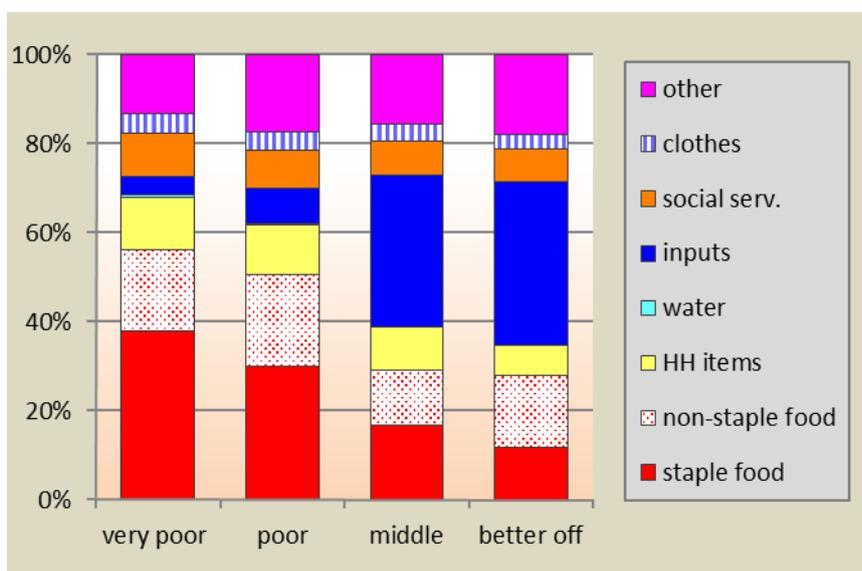
The other sources of cash income on the graph above are 'petty trade' and 'boda boda', both the domains of middle and better off households. Petty trade requires households here to have a means of transporting goods and some extra cash to purchase goods for re-sale. *Boda boda* requires the ownership of a motorcycle – something only the better off households have. These extra sources of cash make up between 15% and 25% of the cash income for these upper two wealth groups.

The spread in income distribution is fairly large here, with those at the upper end of the wealth spectrum generating, on average, four times more than those at the bottom. Being able to cultivate vegetables in large quantities, and fruit trees, is the critical differentiator in this zone, with fruit and vegetable sales alone for the better off equivalent to 175% of the total cash income of poor households and 225% of the total annual cash income of very poor households.

## Expenditure Patterns

The graph presents expenditure patterns for the reference year February 2014 to January 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 here, as in other areas of Tanzania, need to spend money throughout the year on a range of goods and services. These include: staple and non-



staple food, household items, productive inputs, social services like schooling and health, as well as clothing and other miscellaneous items. A number of conclusions can be drawn from the expenditure data for this zone.

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

First, the amount of cash spent on staple food is higher here for the top two wealth groups than in many other zones. This reflects the high purchase requirement for all wealth groups discussed in the 'Sources of Food' section. While relative expenditure on food, both staple and non-staple, decreases as we move up the wealth spectrum, in absolute terms, expenditure on food increases with wealth. Very poor households spent, on average, around 608,500 Tsh on staple food in the reference year; better off households spent 781,800 Tsh. Even in a normal year like the reference year, all households must devote a large sum of money to meeting food needs, with the proportion of annual cash spent on staple foods highest for very poor households because their total income is lowest, as discussed in the section above. In the reference year, households in the very poor wealth group bought around 58% of their minimum calories in the form of maize grain, the cheapest staple; better off households bought 31% of their calories in the form of maize grain and the other wealth groups fell somewhere in between. This was the equivalent of around 850 kg and 455 kg of maize, respectively. Middle and better off households also purchased wheat flour, which was twice as expensive as maize. All households also spent money on other foods, such as rice, sugar, meat, dried fish and oil. Very poor households also purchased cassava, as well as some Irish potatoes (along with poor households). These are all included in the non-staple food basket.

Second, it is clear from the graph above that middle and better off households are investing heavily in their agricultural production, spending 30 - 40% of their annual cash income on inputs. Very poor and poor households, on the other hand, devoted only 4-8% of their annual budget to productive inputs in the reference year, either unable or unwilling to spend more. In absolute terms, better off households spent over 36 times more than very poor households on productive inputs. 'Inputs' on the expenditure graph above includes the following: livestock drugs, house repair, seeds and tools, pesticides and fertilizers, labour, and phone credit. All households spend part of their inputs budget on seeds and tools, and on phone credit. Very poor households, in fact, spend three-quarters of their inputs budget on phone credit and the rest on seeds and tools. Middle and better off households spend the majority of their inputs budget (60-65%) on hiring labour. Pesticides and fertilizers also account for a sizeable portion of the budget, taking up 35% of poor households' inputs budget in the reference year and around 16% of middle and better off households'. Only middle and better off households spent money on livestock drugs and house repairs, but combined these took up less than 10% of their inputs budget.

Another category of expenditure ('hh items') includes all of the items bought by households over the year – often in small incremental amounts - to meet basic needs, such as tea, salt, soap, kerosene, grinding services and utensils. Within this category, the highest expenditure was on grinding, kerosene and soap; very poor households devoted 55% of their 'hh items' budget to grinding in the reference year; better off households spent around 45% of this budget on kerosene; and for middle households, grinding and soap together comprised almost 50% of this same budget. On an annual basis, spending on basic household goods comprised 7-12% of total expenditure, generally decreasing in proportional terms (although increasing in absolute terms) with increasing wealth. Finding ways to reduce the relatively high costs of grinding for poorer households could help them free up some money for other productive uses.

'Social services' includes the money spent on education and medical services. Education covers school fees, uniforms, stationery and transportation, where relevant. Absolute spending on school during the reference year was about the same for very poor and poor households (approximately 125,000 Tsh per year per household). Middle households spent more than double this amount, and better off households spent three times the amount spent by poorer households. As you move up wealth groups, households are spending more on stationery, books, uniforms, school fees and transportation. Very poor households are unlikely to be able to afford to send their children beyond primary school, whereas those at the upper ends of the wealth scale are likely to send them through at least secondary school, and sometimes on to vocational school. Better off and

middle households also spend more on medicine and health care, with each wealth group spending on average 30-50% more than the one below it.

Spending on clothes and other miscellaneous items are the last two categories included here. The 'other' category includes things like beer, tobacco, cigarettes, cosmetics, hair braiding, transportation and festivals. This is discretionary spending that can be reduced or redirected in bad years to buy more essential items if necessary. In both absolute and relative terms, those at the upper end of the wealth spectrum have the most available in this discretionary budget.

## Hazards

There are a number of hazards that affect this zone on a regular basis. The first is **inadequate and erratic rainfall**. All households rely heavily on crop production from one season to at least partially meet their food needs. If rains in this season are poor, if they are interrupted at the growing stage, or if they end early, households are at risk of losing their maize, beans and Irish potato crops, all of which are rain-fed. Horticultural crops can also be damaged because, although they rely on irrigation, they are also partially rain-dependent. Thus the food and cash income of households here is substantially reduced when rains are poor. Second, **livestock diseases**, such as Food and Mouth disease (FMD) and East Coast fever – both of which affect cattle – and New Castle Disease, which can wipe out an entire flock of chickens, are serious problems. Third, **crop pests and diseases** are a constant threat. Stalk borers, which affect maize; American bollworm and late blight, which affect tomatoes and sweet peppers are among the worst. A new crop pest, known locally as *kanitangaze*, has been causing problems for tomatoes, African eggplants and sweet peppers. Fourth, human diseases, like malaria and typhoid, undermine the most important livelihood capital held by poorer households – their labour pool.

## Response Strategies

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

- All households try to **reduce expenditure** on non-essential or more expensive items first, buying less sugar and rice, for instance, and using that money to buy the cheaper staple – maize – instead, or cutting down on festivals, tobacco and beer.
- Poorer households try to find more work, either locally or migrating outside the zone, or sometimes into towns. The expandability of this option is limited in bad years because of the increase in labour supply as more and more people look for work. This puts a downward pressure on wages so that even if people do find more days of work, they may earn less per day, making it hard to substantially increase cash income above normal year levels.
- Middle and better off households try to increase their **livestock sales**. The value of livestock tends to drop in bad years, both because supplies increase as more people try to earn cash in the same way, and because their body condition deteriorates as grazing and water resources decline. Therefore, this option has quite severe limitations in this zone, where people do not have many livestock to begin with.
- Middle and better off households **take their crops directly to markets** to try to get a better price, cutting out the middlemen traders in order to increase their cash income.
- Middle and better off households try to increase their reliance on **small businesses**, buying and selling goods to make as much cash as they can with which to buy food.

## 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 *Western Usambara-Pare Highlands 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 - vuli – amount produced</li> <li>• Beans – vuli – amount produced</li> <li>• Beans – masika – amount produced</li> <li>• Irish potatoes – masika – amount produced</li> <li>• Tomatoes – amount produced</li> <li>• Cabbage – amount produced</li> <li>• Sweet peppers – amount produced</li> <li>• Fruits – amount produced</li> </ul>	<ul style="list-style-type: none"> <li>• Beans - vuli – producer price</li> <li>• Beans - masika – producer price</li> <li>• Irish potatoes – masika – producer price</li> <li>• Tomatoes – producer price</li> <li>• Cabbage – producer price</li> <li>• Sweet peppers – producer price</li> <li>• Fruits – producer price</li> </ul>
<b>Livestock production</b>	<ul style="list-style-type: none"> <li>• Cow milk – yields</li> <li>• Cattle – herd size</li> </ul>	<ul style="list-style-type: none"> <li>• Cow milk – price</li> <li>• Cattle – 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, watering, spraying, weeding) – number of jobs</li> <li>• Agricultural labour (harvesting) – number of jobs</li> <li>• Petty trade – amount of trade</li> <li>• Boda boda – level of activity</li> </ul>	<ul style="list-style-type: none"> <li>• Agricultural wage rates (land clearing and preparation, planting, watering, spraying, weeding)</li> <li>• Agricultural labour rates (harvesting)</li> <li>• Petty trade – margins on trade</li> <li>• Boda boda – fares</li> </ul>
<b>Expenditure</b>		<ul style="list-style-type: none"> <li>• Maize grain – consumer price</li> <li>• Rice – consumer price</li> <li>• Sugar – consumer price</li> <li>• Oil – consumer price</li> </ul>

## Programme Implications

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

- 1) Provide subsidized and improved agricultural inputs, especially for seeds and fertilizers
- 2) Provide affordable loans
- 3) Improve health services and increase the availability of medicines
- 4) Improve education services, deploying sufficient numbers of primary and secondary school teachers and adequate school facilities
- 5) Improve road infrastructure and invest in maintenance of existing roads
- 6) Construct irrigation infrastructure and provide pumps
- 7) Develop soil water conservation systems through construction of terraces
- 8) Improve access to and availability of safe and reliable water supplies for humans
- 9) Provide electric service throughout the zone
- 10) Provide support for expansion of dairy cattle industry