

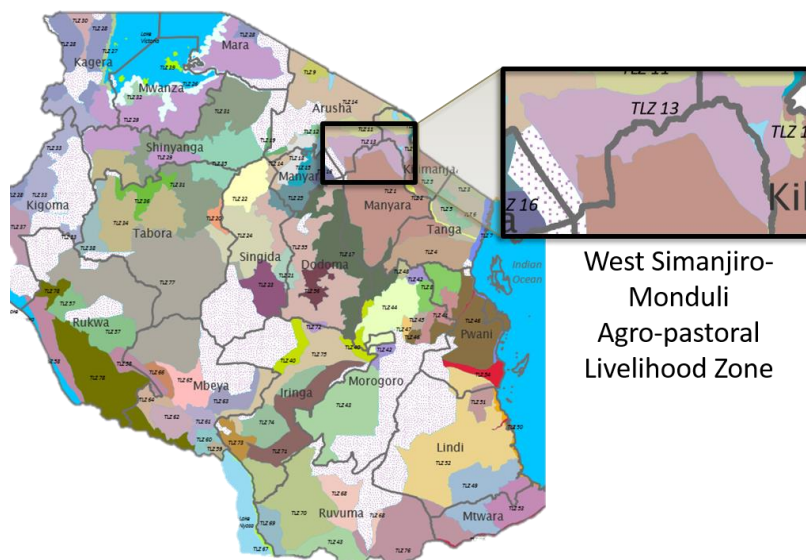
Tanzania Livelihood Baseline Profile

West Simanjiro-Monduli Agro-Pastoral Livelihood Zone (TLZ 13)

April, 2016¹

Zone Description

The *West Simanjiro Monduli Agro-pastoral Livelihood Zone*² is located in parts of Simanjiro and Monduli districts, including the following wards: Oljoro No. 5, Shambarai, Naisinyai, and Mererani in Simanjiro District; and Makuyuni, Lolkisale and Mswakini in Monduli District. The zone consists of semi-arid lowland plains, found between 500 and 1,000 meters, and covered with *acacia-commiphora* woodlands, grasslands and thickets. Agricultural plots are located near villages dotted throughout the extensive plains. Large herds of wildlife are



West Simanjiro-Monduli Agro-pastoral Livelihood Zone

concentrated in the Tarangire and Manyara National Parks, which are found close by. The Kikuletwa River, catchment, part of the Pangani River basin, is located here, along with and Nduruma River; both provide year-round access to water for those who live close by. Mt. Lokisale is another notable geographic feature in the zone. Sand mining and Tanzanite mining are conducted in a few places within the zone, Mererani and Losinyai/Mirongoine, respectively, and although some people work in the mines, they do not provide a common source of income for most households. The main ethnic groups residing here are the Maasai and Waarusha, with a population density of only around 9-10 people per square kilometre.

There is effectively one long rainy season, from November through May, although this is broken up by a regular dry spell in February, and the main rains upon which people rely for agricultural purposes only start in March. Annual precipitation ranges from 350-600 mm, and temperatures are warm, averaging 25 - 35°C. Droughts are not uncommon, occurring on average once every three years.

The local economy rests on livestock and crop production although livestock production is more central in cultural and social terms. Relatively large herds of cattle, goats and sheep are sustained here, grazing freely, and also benefitting from crop residues after the harvest. Herd sizes here are not as large as in TLZ01, The *Southern Maasai Agropastoral Livelihood Zone*, but these two zones share a very similar pattern of livelihood. In addition to livestock herding, households grow maize, beans, lablab beans and green grams. All production is rain-fed. The soils are relatively fertile, consisting of sandy loams and clay, and the use of fertilizers is not common. Very poor households prepare their land by hand, but ox-ploughs are commonly used by poor and middle households. Some very poor households also rent oxen for ploughing. Better off

¹ 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 May 2014 and ended in April 2015. Provided there are no fundamental and rapid shifts in the economy, the information in this profile is expected to remain valid for approximately five to ten years (i.e. until 2020-2025). All prices referred to in the document are for the reference year.

² The original livelihood zone boundaries need to be redrawn. The 2008 boundaries of Livelihood Zone 13 included areas that do not share a common livelihood pattern. The zone needs to be split into three parts: 1. West Simanjiro-Monduli Agropastoral; 2. Lower Arumeru and Hai Maize and Beans; and 3. East Simanjiro-Moshi Mwangi Irrigated Crops and Fishing.

(and some middle) households use tractors to cultivate large tracts of land. Weeding is one of the most labour-intensive activities here because it is all done by hand. Harvesting can also be very labour intensive. Middle and better off households hire members of poorer households during weeding and harvesting periods, and to a lesser extent for land preparation. Some labour (generally men from poor families) also migrates into the zone from Singida and Dodoma. Managing large herds in addition to large tracts of land creates a steady demand for seasonal labour.

Livestock provide a source of food and cash for all households. Cattle are central to Maasai culture, binding families together through marriage and labour relations, and providing the currency by which people's status is measured. Cattle provide milk for consumption and sale and they act as a bank account, drawn down on every year to provide cash for a range of basic necessities. Goats and sheep are also kept, eaten especially during festivals in November and December. They are also sold for cash income when smaller amounts of cash are needed. Chickens are used for eggs, eaten throughout the year, and they are sold whenever cash is needed, especially by poorer households. The larger livestock migrate during the dry season, taken to fresh pastures and permanent water sources by the men and older children of the household.

Rainy season water sources for livestock include seasonal pools, shallow wells, reservoirs and seasonal rivers. In the dry season, livestock kept around the homestead rely on village taps and shallow wells. Households need to pay for this water, although payment for water is not required in all villages. Both men and women manage the cattle and goats, with women responsible for milking animals left behind at the homestead during the migration period. Women are primarily responsible for the donkeys and chickens.

Poorer households, who have smaller plots and fewer livestock, depend on seasonal agricultural labour – mainly during the weeding and harvesting periods - to generate cash income. They also regularly sell firewood and charcoal in this dry season, which notably causes severe environmental damage.

Service provision in this zone is quite poor. Water for all purposes comes from bore holes, where they exist, but it is also procured from ponds, rivers and open wells where the water is often not safe to drink. There is a serious shortage of clean, potable water in this zone. Sanitation facilities are largely absent, and few poorer households have pit latrines, although better off households may have improved latrines. Waste is collected and burned. Health dispensaries are found in many villages, or at the ward centre, although these are often poorly stocked. Better off households have access to private hospitals if they can make their way to Arusha. Primary schools are found in the villages and secondary schools are available in the ward centres, which are often too far for children to reach on a daily basis. There is no electricity and households depend on battery-operated torches, kerosene lamps and lent cells (small solar lanterns) for light. Households in all wealth groups have mobile phones, with better off households having multiple phones, although the cellular network is not very reliable. People do not have access to credit here. Savings facilities are provided through VICOBA. A number of NGOs operate here, including World Vision Tanzania, DSW, which provides support to youth and women, and Wildlife Management Area (WMA).

Markets

The transportation infrastructure in this zone is not good. Arusha is the central market, but road access to and from Arusha and the zone's villages is extremely limited and villages are remote and hard to reach. Rough dirt roads, many with deep eroded gullies, provide access to vehicles during the dry season, but these become impassable in the wet season. There are very few bridges and the ones that do exist are in poor repair. Well-worn dirt tracks take people by foot from villages to cultivated fields, pastures and water points. Donkeys, owned by all households, are used to carry goods and people.

Maize, beans, cattle, goats and sheep are the commodities sold by households in this zone. Locally-produced crops are bought at the farm gate by traders, who arrange for crops to be transported to larger market hubs during the post-harvest dry season months, from July to September, when trucks can still travel on the dirt roads. Maize and pulses follow the same route, transported from local markets, like Mirongoine, Lokii, Duka

bovu and Makuyuni to Arusha town, where they are either consumed in the urban market or sent on to Nairobi. Green grams become available first, traded as early as June and July; beans come next, traded from July through October, followed by maize and lablab, both of which are traded from August to October.

Cattle, goats and sheep are sold at small weekly ward- and sub-ward level markets within the zone throughout the year. These include primary markets like Shambarai Burka, Kikatiti, Makuyuni, Lokii and Mererani; and secondary markets, like Themi, Meserani, Weru Weru and Mgagao. Traders collect large numbers of animals together from these markets and then truck them on to their final destination. Moshi, Arusha, Tanga, Dar es Salaam and Nairobi are the terminal markets for livestock. Much of this trade takes place in January and December, a time when livestock condition is relatively good, benefitting from renewed pastures from the *vuli* rains. This coincides with a time when people need large infusions of cash to pay for school fees and agricultural inputs (including hiring labour).

In addition to local commodities that are sold for 'export', there is an active importation of food and other basic goods, brought into the zone for consumption by local households. Poorer households need to buy maize grain to cover their needs for seven to nine months of the year, especially from November to April, even in good production years. Maize is the cheapest local staple, and some of this is locally sourced, procured from better off households who generally produce a large surplus. Other maize comes from Babati via Makuyuni and Shambarai or from Burka. Kiteto is another source of maize. Rice, purchased more commonly by the upper wealth groups, is sourced from Kahama, Magugu, and Lower Moshi, collected in Arusha and distributed via local markets. Non-food essentials, like salt, soap, batteries and kerosene, are sold in local kiosks, often owned by middle households.

The labour market is largely local and agriculturally based. Middle and better off households cultivate large tracts of land, requiring additional labour to help them complete the more intensive seasonal tasks, especially weeding and harvesting. It was estimated that in the reference year, 80% of seasonal labour was found within the zone on local farms. An additional 5% of labour demand came from local towns and the other 15% came from outside the livelihood zone in places like Arusha town, Monduli, and Usa River Township. Both men and women from poorer households take on paid agricultural work. Demand for labour is so high that there is some labour migration into the zone from other areas from January to August, to help with weeding and harvesting. A small number of people also find work on sand mines. In bad years, the demand for local agricultural labour especially for weeding and harvesting, contracts. As a result, people try to find additional work in other zones, or in the mining area.

Timeline and Reference Year

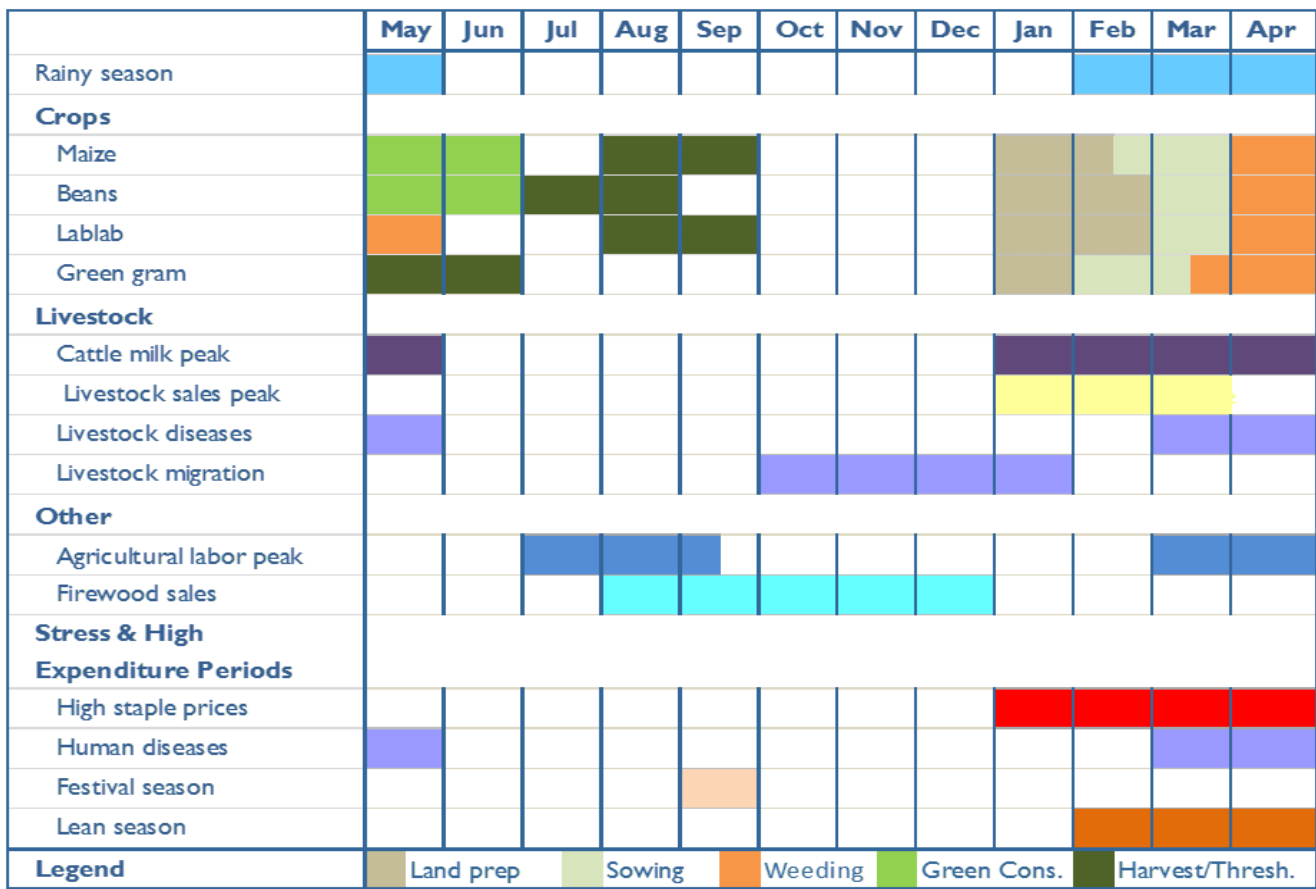
The baseline assessment refers to a very specific time period called the reference year. In the *West Simanjiro Monduli Agropastoral Livelihood Zone* the reference year covered the **consumption** period from May 2014 to April 2015. During community leader interviews, informants were asked to rank the last 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 year quality by *production* year (which starts with the planting season in February and ends with the harvest in July of the same calendar year). Thus, the production year of 2013 corresponds to the consumption year of 2013-2014. As shown in the table, the production year corresponding to the reference year of 2014-2015 was slightly above average, with good rains, a good harvest, relatively low staple food prices, good pastures and good livestock prices. The reference year followed an average year and a below average year. The baseline information presented in this profile, therefore, provides a view into how households in this livelihood zone make ends meet in a slightly above average year after a fairly normal sequence of years.

Production Year	Season	Rank	Critical Events
2015	<i>Masika</i>	2	Poor rains, below average harvest, high staple prices, poor pastures, low livestock prices
2014	<i>Masika</i>	3.5	Good rains, good harvest, low staple food prices, good pastures, higher livestock prices

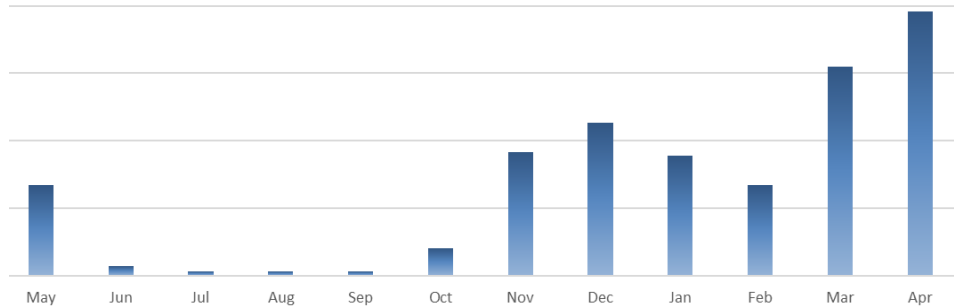
2013	Masika	3	Average annual rainfall distribution, average crop yields, average staple food prices, average livestock prices
2012	Masika	2.5	Poorly distributed rains, below average harvest, high staple prices, poor pastures, low livestock prices
2011	Masika	3	Average annual rainfall distribution, average crop yields, average staple food prices, average livestock prices

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



The graph to the right shows average monthly rainfall (mm) in Monduli District based on a 31-year period (1980-2010)
Source: TZ Meteorology Department



The competing demands of livestock raising and crop production are clear in the seasonal calendar above. The people living in this zone are culturally more pastoral than agricultural, and the management of livestock herds

is still a primary concern. The rains determine the timing of productive activities here, signalling the start and stop of a range of crop and livestock management tasks. There is one long rainy season, which begins in November and continues through May, although it is common for rains to stop for a while in February. The November rains do not provide enough moisture in most years to warrant the investment in planting, so households usually wait until February to begin planting. Any rains received before that time provide a welcome boost to pastures, and they help soften the ground for land preparation, which usually occurs in January. All crops are planted in February and March, followed by a period of weeding that lasts from late March through May. The green harvest of maize and beans starts in May and full harvests of maize, beans and lablab occur from July through September. Green gram is harvested earlier, starting in May and lasting through June.

The peak agricultural labour periods are during weeding and harvesting periods. Land preparation is not as arduous here as in many areas because ploughing takes place using tractors and ox ploughs. Some poorer households are able to use the plough oxen from better off households, which they get in exchange for work. Most, however, use hand hoes. Weeding is done entirely by hand, and poorer households are hired throughout the weeding period to work on the larger farms of middle and better off households. At the same time, poorer households need to weed their own fields, which leads them to split their labour pool, sending some members to work for cash, while others work in their own fields. The ultimate result is that poorer households have lower yields due to less-intensive management during this period.

The weeding period coincides with a time when poorer households have run out of their stocks from the previous year's harvest. Some, in fact, run out as early as December or January, and by February none of the poorer households have their own food stocks left at home. These households need to purchase all of their staple foods just when the price of staple foods is highest (from January through April). Thus, demand for labourers from middle and better off households helps provide needed cash to poorer households, allowing them to bridge the gap until May, when the green harvest of maize and beans comes in. This is also one reason that livestock sales peak from January through March. Another reason is that households need to pay school fees in these months, and better off households need money to pay for labour and other productive inputs.

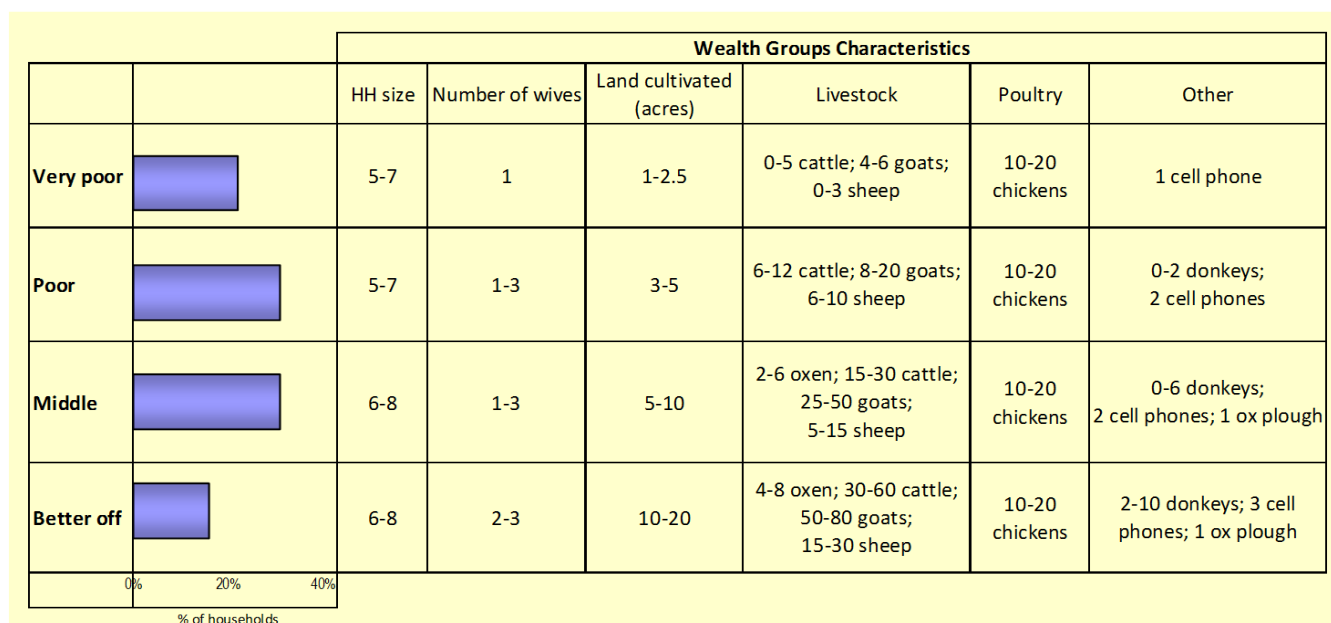
The rainy season is also when most human and livestock illnesses occur. Malaria is a serious problem here, and the rains bring about a new influx of mosquitoes and a proliferation of illness. Many of the common livestock diseases, such as Contagious Bovine Pleura-pneumonia (CBPP) and Contagious Caprine Pleura-pneumonia (CCPP) and Black Quarter, occur with higher frequency during the rains. This increases the expenditure requirements for medical and vet treatment at a time of year when other outlays (on staple food and education) are already high.

Milk production is highest from January through May. The scattering of 'vuli' rains that occur from November through January may not be sufficient to initiate the cropping season, but they are usually enough to replenish pastures. Thus, January is a period when fresh pastures and water sources provide a supportive environment for cattle and goats to give birth, and, therefore, this is when milk production begins to peak. The consumption of milk is highest within the household, and cash income from the sale of milk also increases.

June through January is the dry season (although some rains do begin to fall as early as November). At this time, livestock are moved to areas with fresh pasture and permanent water sources, including Emboret, Kimotorok, (in the southern reaches of Simanjiro) and Kondoa (in Dodoma). It is not uncommon for this migration to extend as far as 150 kilometres. The entire herd moves, leaving behind just a few milking animals to be cared for by the women and children who remain at the homestead. Men and older boys migrate with the herds. In bad years, like 2012-2013, the areas to which people move livestock are the same, but the period of migration is extended.

During the dry season poorer household members who remain near the homestead earn extra cash by collecting and selling firewood, or making charcoal. It is often women and children who collect the firewood; men are involved in charcoal production. People need to set aside money at this time to prepare for the costs associated with the coming agricultural season and to pay back any loans accrued in the past year.

Wealth Breakdown



Note: The percentage of household figures represent the mid-point of a range. The asset figures are per wife.

The graphic above summarizes information related to how wealth is determined and distributed in this livelihood zone. The main determinants of wealth are the number of livestock, particularly cattle, a household owns and the amount of land it cultivates. In important ways these two things are inter-related: bigger herds generate more cash, which enables people to buy or rent tractors and hire labourers to expand the area they have under cultivation. On the flip side, the more land a household has under cultivation, the larger its harvests; and with more crop production, a household is able to reduce the money it spends on food for survival, and – with the proceeds from crop sales - invest more in the health and growth of its livestock herd. In pastoral economies where crop production does not occur, households need to sell significant numbers of livestock to buy food and other basic goods; here, crop production helps to reduce the food-related need for these sales.

Another point to note is that the number of wives in a *boma*³ is also related to wealth. The more cattle a man owns, the more wives he is able to marry, the more children he tends to have and the bigger his *boma*. The Maasai term which applies to a rich *boma*, *Orkasis*, combines material wealth with status, and effectively means that you have a lot of cattle and a lot of children. *Ortajiri* is a term used for those who have a lot of cattle but a small family, in which case, although food secure, the *boma* is not really 'rich' in local terms, and is not viewed as prestigious by the community⁴. Not just status, but significant economic advantages can accrue with having a large family. Children provide an important pool of labour for the many tasks associated with both crop production and managing large herds of livestock. In addition, when girls marry, their parents are paid in cattle; and older sons may earn money through mining or other means that gets channelled back into the *boma*. Thus a better off *boma* may be comprised of 2-3 wives, each of whom has 6-8 members in her hut; whereas a very poor *boma* would typically have just one wife with 5-7 family members.

The man owns the *boma's* cattle and he distributes them among his wives, for her use. The livestock numbers in the chart above refer to the average number of livestock per wife. A better off household in this zone, therefore, can own 90- 180 cattle if he has 3 wives, each with 30-60 cattle. Each wife would have 10-20 acres under cultivation along with 50-80 goats and 15-30 sheep. Very poor households, on the other hand, have almost no livestock by local standards, and are much more dependent on their crop production and casual employment than their livestock. These households have 1-2.5 acres under cultivation, along with 0-5 cows, 4-6 goats and 0-3 sheep.

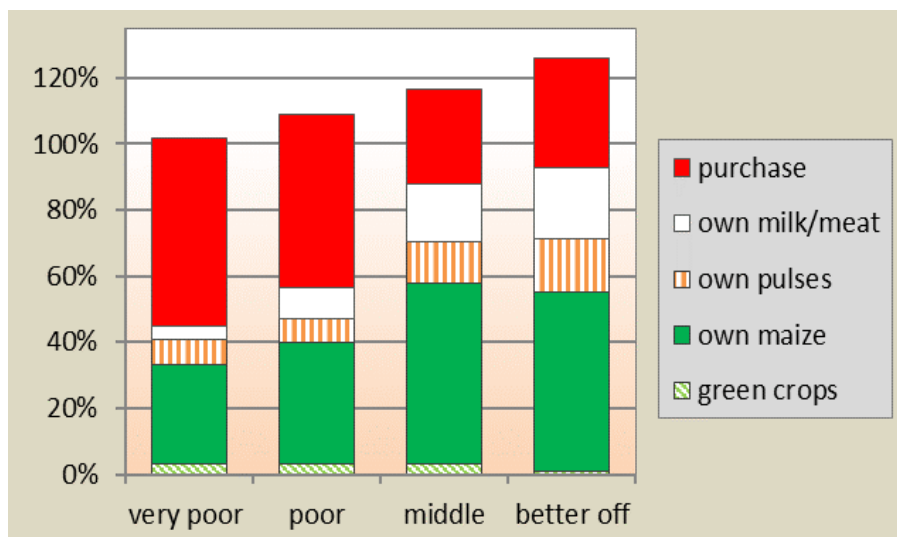
³The *boma* is the fundamental economic unit in Maasai society. A *boma* is a physical settlement comprised of a man, his wives, their children and their associated livestock.

⁴ Boudreau, T., Household Food Economy Assessment, Arusha Region, Save the Children, 1999

The distribution of wealth in this zone is fairly even. Very poor (22%) and poor (31%) households together comprise just over half of the households in the zone. Middle (31%) and better off (16%) households combined represent just under half the population. However, as middle and better off households are larger, with multiple wives and more members per wife, it is important to remember that the percent of the *population* (as opposed to the percent of *households*) represented by the upper wealth groups is larger.

Sources of Food

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



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.

Own crops, own milk and meat, and purchased food were the three sources of food in this zone in the reference year. All wealth groups were able to meet their minimum food requirements, although poorer households clearly consumed less than middle and better off households.

Although livestock are central to the local economy, crop production plays an equally important role, providing food for consumption and sale, and enabling people to build and protect their herds. By producing their own crops, households offset the need to sell additional livestock to buy food, thereby allowing them to increase herd numbers through natural reproduction. In the reference year, characterised by community leaders as an average year, own crop production accounted for 40-70% of minimum food energy requirements. Maize, planted during the *masika* season, accounted for much of this (30-55% of minimum calorie needs); the rest came from beans and a very small amount of green grams. A typical very poor household, cultivating 1-2.5 acres of land was able to produce around 850 kg of maize and 330 kg of beans. On the upper end, better off households, cultivating 10-20 acres of land, generated around 5,350 kg of maize and 1,100 kg of beans. Households sold between 45% and 65% (poorer households sold a lower proportion) of the maize they produced, and 60-70% of their beans, generating an important source of cash income along with food.

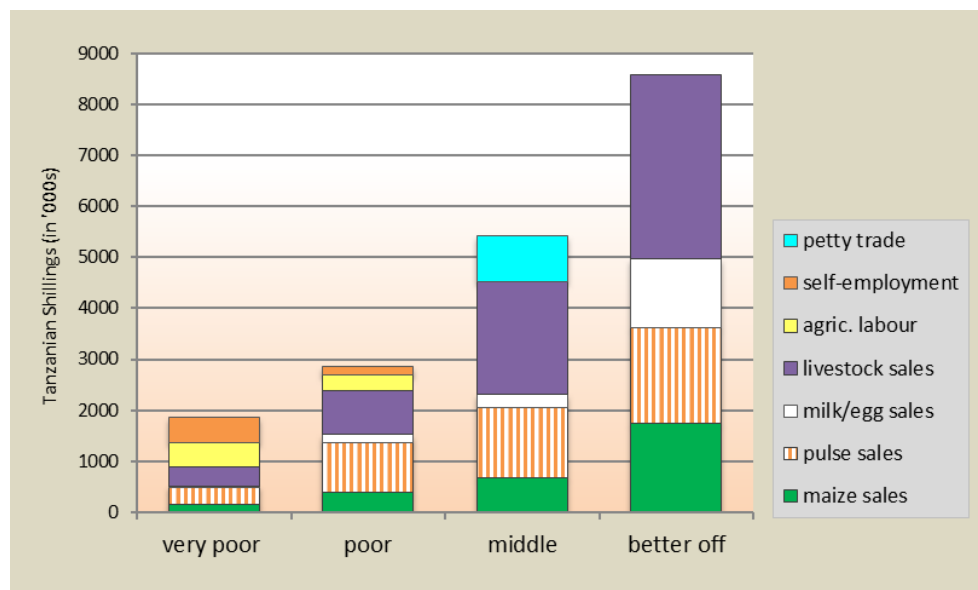
Milk is also an important part of the diet, both in nutritional and in cultural terms. Cows and goats both provide milk, which is especially important as a source of food for young children, and all members of the household drink large amounts (both fresh and curdled), in the wet season, when yields are high. The contribution of milk to the household food basket increases with wealth, since wealthier households have larger herds and more milking animals. Poor households have around 2 milking cows and 4 milking goats; middle households have around 4 cows and 3 goats milking; and better off households have at least 10 milking cows. Goats are more important as a source of milk on the lower end of the wealth spectrum, and many on the upper end do not bother milking their goats. Very poor households may have one cow milking, borrowed from a relative or neighbour, or they may have none, but they also milk 2-3 goats. On average, cows here (which are the Zebu variety) produce 1.75 litres of milk a day during the first rainy season (lasting around 4 ½ months) and 1 litre of milk a day in the second season (which lasts around 3 months). Goats yield only around ½ litre a day and lactate for a period of around 2 ½ months. When

added together, these sources of milk generated around 270 litres of milk for very poor households and as much as 3,690 litres of milk for better off households during the reference year. Households in the top three wealth groups sold some of this milk, but the milk that was consumed accounted for around 5-20% of the calories required by households. Meat (from animals that were either slaughtered or died naturally throughout the year contributed an additional source of food for middle and better off households, for whom it covered 3-4% of their minimum food needs.

Food purchased from the market made up all of households' remaining food needs, comprising around 30-57% of minimum calorie requirements. Those in the upper two wealth groups bought less (30-35% of minimum calories) and those in the bottom two wealth groups bought more (50-60% of minimum calories). This is because poorer households produced less of their own food in the reference year and needed to buy food to make up for this. In fact, if very poor households consumed all of the food they produced, rather than selling it, they would still be left with a deficit of around 15% of their annual needs. However, if better off households consumed all of the maize and beans they produced rather than selling them, they would have a surplus of 250% over their minimum energy requirements. The same calculation for poor and middle households reveals a surplus of 45% and 90% above minimum calorie needs for both these groups, respectively. In actual fact, all households sell part of their harvests in average years in order to meet their cash needs, which creates a deficit for very poor and poor households that they fill with purchased maize grain, the cheapest staple. These are the only two wealth groups who purchased maize in the reference year, meeting 25-40% of their food needs in this way. Middle and better off households did not buy maize grain, purchasing food, instead, to add variety to their diet, including wheat, rice, sugar, meat, bananas and oil. Thus, while all households purchase food, they do so for different reasons. This has implications in a bad year, because poorer households' gap would only increase in a bad year, forcing them to buy even more; but middle and better off households could switch their expenditure on 'luxury' food items to cheaper staple foods as a strategy for covering production shortfalls.

Sources of Cash Income

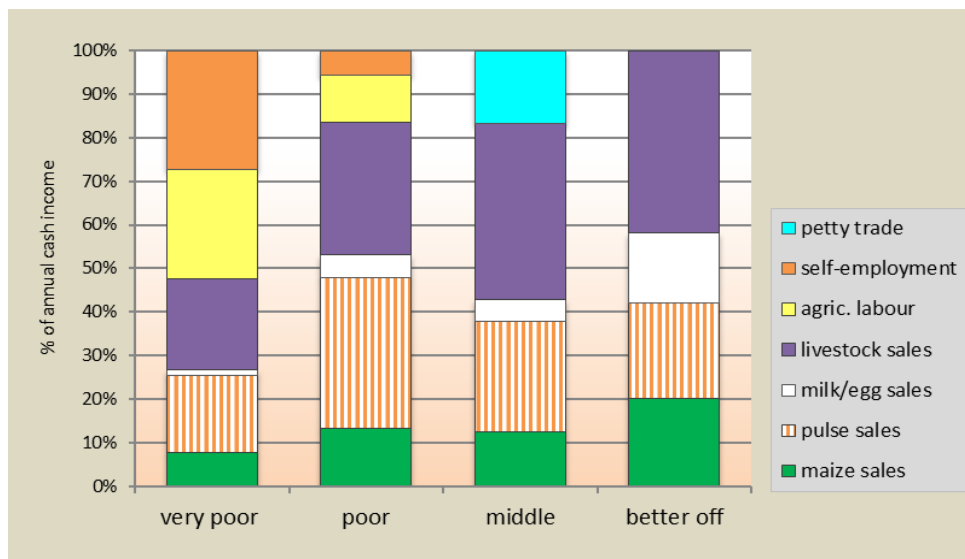
The graphs to the right highlight a number of points about the local household economy. First, the 'agropastoral' in this livelihood zone's name becomes clear, with a relatively even split between livestock-based and crop-based cash income evident. Second, there is a critical difference between the cash income of those on the upper end and those on the lower end of the wealth spectrum, which boils down to the fact that the poorer you are, the less you are able to depend entirely on your own livestock and fields to make



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

your living. Poorer households needed to find work off their farms in order to supplement whatever cash they could generate from their livestock and crops. Better off households, on the other hand, derived all of their required cash income from their herds and their crop production.

The six main sources of cash income in this zone are crop sales, milk and egg sales, livestock sales, agricultural labour, self-employment and petty trade. Annual cash income for middle and better off households is amongst the highest in rural Tanzania. On average, it is 4-5 times higher than very poor household cash income.



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 ⁵	1,400,000 – 2,450,000	2,450,000 – 4,000,000	4,000,000 – 7,500,000	7,500,000 – 10,000,000

In the reference year, crop sales accounted for 25-48% of cash income for households in this livelihood zone. Maize, beans and lablab (hyacinth beans) are sold, with the high value pulses especially important as a source of cash. In absolute terms, the amount of cash generated from crop sales increased with wealth and better off households earned 7-8 times more than very poor households, which corresponds roughly with the fact they cultivate an average of 8.5 times more land. It isn't just that better off and middle households sell larger quantities of crops; they also sell at a higher price per kilogram. For example, a typical very poor household sold roughly 400 kg of maize, 210 kg of beans, and 145 kg of lablab (hyacinth beans). They sold the maize at an average price of 360 TZS/kg, the beans for 750 TZS/kg, and the lablab for 920 TZS/kg. A typical better off household sold around 3,460 kg of maize, 730 kg of beans, and 1,080 kg of lablab. The price they got, on average, was 500 TZS/kg for maize, 895 TZS/kg for beans and 938 TZS/kg for lablab. Thus, not only did better off households sell 3 ½ times more beans, almost 7 ½ times more lablab and 8 ½ to 9 times more maize, but they also got up to 140% more per kg for their produce. Better off households can wait until prices go up later in the year, and they can also transport their crops to central markets, like Arusha, where prices can be more advantageous.

Sales of live animals and milk sales provided an additional source of earnings in the reference year, making up 20-35% of very poor and poor household annual cash income, and 45-60% of middle and better off cash income. Middle and better off households sold, on average, 3-5 heads of cattle in the reference year (at around 525,000-550,000 TZS per head) and 9-12 goats (at 52,500 TZS each) and 2-5 sheep (at 40,000 TZS each). Very poor and poor households sold 0-1 bull, 2-4 goats, and 0-2 sheep, typically at lower rates (400,000-490,000 TZS per head of cattle and 47,500 per goat) because their animals are in poorer condition. All households sell chickens as well, although better off households tend to sell very few, because this income source is not meaningful for them. Chickens were worth around 7,500 TZS per hen in the reference year, and very poor, poor and middle households sold 7-9 in the reference year. Although households sell a number of livestock species, cattle are the most important, both economically and culturally, and the cash that better off households generated with their cattle sales alone exceeded the average annual cash income (all sources combined) of both very poor and poor households. Cattle are also important because of the milk they provide. Milk sales brought in substantial cash income for the upper

⁵ The average exchange rate from May 2014-April 2015 was 1 USD = 1,810 TZS

three wealth groups in the reference year. With as many as 11 cows milking, better off households sold 1,500-2,000 litres of milk in the reference year, which accounted for almost 20% of their cash income. In addition, egg sales contributed a small amount of cash for the bottom three wealth groups.

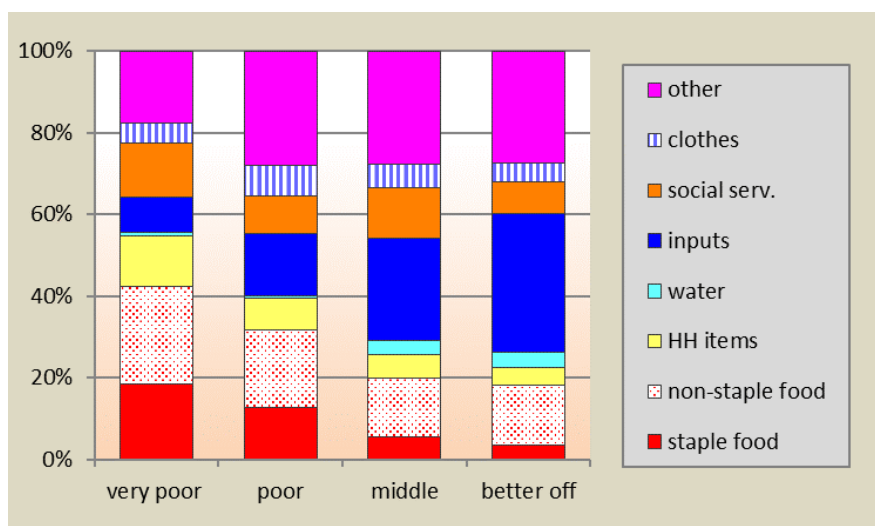
While better off households obtain all of their cash income from livestock- and crop-based sources, poorer households need to turn to other options. Seasonal agricultural labour and self-employment both provide additional cash for poorer households. Weeding is an especially busy time. Very poor and poor households split their time between their own farms and the farms of middle and better off households, where they work for a daily fee. Some also find work during land preparation period, but because middle and better off households use ox ploughs and tractors, land preparation activities are not as labour-intensive as weeding, which is done entirely by hand. People also get hired for harvesting work. Seasonal agricultural labour provided very poor households with around a quarter of their cash income in the reference year, and it provided poor households with around 10% of their cash income. In the dry season, after the harvest ends, but before the next agricultural season begins, (August to December), poorer households rely heavily on firewood and charcoal sales as a source of earnings.

Finally, middle households, who do not have quite the same livestock herds as better off households, also take part in various petty trade activities, owning small kiosks, acting as livestock brokers, or hiring out their motorcycles for *boda boda* (motorcycle transport). Petty trade covered 15-20% of cash income for middle households in the reference year.

Expenditure Patterns

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

Throughout the year people in this zone need to buy a number of essential goods, and they spend money on basic services. Their main categories of spending 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 points can be made after considering the expenditure data shown here.



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

First, even in an average year like the reference year, all wealth groups buy staple foods; very poor households devote a larger proportion of their annual cash to meeting immediate food needs than the other wealth groups. In the reference year, households in the very poor wealth group bought around 37% of their minimum calories in the form of maize grain, the cheapest staple. Poor households covered (on average) 26% of their minimum calorie needs with purchased maize grain. Middle and better off households did not purchase any maize grain at all. What shows up on the graph as 'staple food' for these wealth groups is actually beans, dried fish and oil. This is an important point, because without the purchase of staple foods, the two poorer wealth groups would have been facing a food deficit, but the same cannot be said for the two upper wealth groups. The upper wealth groups purchased staple foods to diversify their diets, not to meet their minimum food needs. The same can be said for the non-staple food category, which reflects money spent on sugar, rice, wheat, meat and vegetables, including cooking bananas (which are used with lablab beans to make a popular local dish). Sugar is used in relatively high

amounts here, with around 1-2 kg of sugar purchased and consumed by all households every week. In absolute terms, spending on non-staple foods increased with wealth in the reference year, and better off households spent an average of 2 ½ to 3 times more than very poor households on these more expensive foods. However, because their cash income levels were much higher, they only spent around 15% of their annual cash on non-staple foods, compared to very poor households, who spent almost 25% of their cash income on non-staple foods. Thus, better off households benefitted disproportionately in calorie and nutritional terms, since they derived around 22% of their minimum calorie needs from purchasing non-staples, while very poor households obtained only 8% of minimum calories from this source. In other words, in relative terms, very poor households spent a lot more to get a lot less, and better off households spent a lot less to get a lot more.

Moving up the graph, the 'hh items' category (in yellow) includes basic household necessities, such as tea, salt, soap, kerosene, grinding services and utensils. These are items that households usually pay for in incremental amounts on a week-by-week basis. Within this category, poorer households spent the most money on payment for grinding and soap. These two items alone comprised 50-55% of the inputs budget for poorer households in the reference year. Better off households spent the most on soap followed by utensils. On an annual basis, spending on basic household goods comprised 4-12% of total expenditure, decreasing as a proportion of annual expenditure as wealth increases (although increasing in absolute terms).

Next, all households spend a certain amount of money on water for human consumption, and this expenditure is especially notable for middle and better off households. There are serious potable water shortages in this zone, and the upper two wealth groups incur costs associated with paying poorer households to transport water for them in the dry season.

The dark blue bar on the graph above represents spending on productive inputs, including the following: livestock drugs, water for animals, ploughing, seeds and tools, labour, livestock purchase, house repair and phone credit. Of these items, the poorer two wealth groups spent the majority of their money on ploughing and livestock drugs, followed by livestock purchases (for poor but not very poor households). Middle and better off households spent the most on labour hire and livestock drugs. These two groups were the only ones who purchased water for their livestock or invested in house repairs. In absolute terms, better off households spent, by far, more than any other wealth group on inputs; their spending on productive inputs was equivalent to almost 20 times the amount spent by very poor households and double the amount spent by middle households. Better off households had to invest large amounts of cash into livestock drugs (which took almost a quarter of their inputs budget in the reference year), labour for their fields (which took just over a quarter their inputs budget), and water for their livestock (accounting for 10% of this budget). Having larger herds and more land generates a high income, but it also requires enormous investments.

'Social services' includes schooling and health costs. Schooling expenses included school fees, uniforms, stationery and transportation, where relevant. On a per capita basis, holding household size constant, middle and better off households spent the same amount on education, and these two wealth groups spent around 2 to 2 ½ times more than poor and very poor households. The poorer two wealth groups usually are not able to send their children beyond primary school, whereas the upper two wealth groups are likely to send them through at least secondary school, and often on to college. Secondary schools are found only at ward level, and this means paying for things like transportation, boarding, higher fees and more expensive uniforms and supplies. In addition, better off households spent around twice as much on health care as very poor households on a per capita basis, indicating that these households may have had access to better clinics and private hospitals. Very poor households seek medical care at village dispensaries and ward-level health centres, which are often understocked and understaffed.

Spending on clothes and other miscellaneous items are the last two categories included here. The 'other' category includes things like beer, tobacco, cigarettes, transportation (including fuel and service for motorbikes) 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 in the upper three wealth groups have the most available in this discretionary budget; and because the reference year was a relatively good year, even the very poor wealth group has more in this budget than it would in a bad year.

Hazards

There are a number of hazards that affect this zone on a regular basis. The first is **crop pests and diseases**. Stalk borers and army worms, which affect maize; aphids, which reduce yields for beans and lablab; and birds cause problems throughout the zone almost every year. The second chronic hazard is **livestock disease**, such as tick-borne diseases and East Coast fever, affecting cattle, sheep and goats, as well as contagious bovine pleuropneumonia (CBPP) and contagious caprine pleuropneumonia (CCPP) for cattle and goats, respectively⁶. Helminthiasis (worms) is also a common problem, along with New Castle Disease, which can wipe out an entire flock of chickens. Livestock diseases can cause significant herd losses, translating into large declines in income. In addition, **wild animals**, like elephants, zebras and wild pigs, cause significant damage to crops most years. Less a hazard, and more of a constraint, it was also noted that the **cash crop marketing infrastructure** is quite under-developed, leading to extreme price fluctuations and unreliable income for producers.

The main, and most devastating, periodic hazard is **drought**, which leads to severe crop failures, degradation of pastures, drying up of local water sources and spikes in food prices. **Heavy winds** also cause damage to standing crops once every three years, on average.

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.
- All households also try to increase their **livestock sales**, although this strategy is far more successful for middle and better off households than for poorer households. Poorer households have less protection, because they can afford to sell only a few animals and still maintain viable herds. Also, 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.
- Very poor and poor households try to increase cash income through **finding more casual work**, either locally (working in many cases in direct exchange for food) or migrating outside the zone. In particular, people may go to Arusha, Monduli town or Usa River township. 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.
- All households also try to increase their self-employment income. Poorer households try to increase cash income from **charcoal and firewood sales**. However, as more and more households try to do the same thing in a bad year, the value of each bundle of wood or charcoal decreases, which makes it difficult to expand this source of income substantially. The environmental damage that accumulates from this pursuit should be a source of serious concern. Middle and better off households try to increase income from **petty trade**.

⁶ <http://www.lrrd.org/lrrd26/8/swai26138.htm>

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 *West Simanjiro Monduli Agro-pastoral Livelihood Zone*. These should be monitored to indicate potential losses or gains to local household economies, either through on-going monitoring systems or through periodic assessments.

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

Item	Key Parameter - Quantity	Key Parameter – Price
Crops	<ul style="list-style-type: none"> • Maize – masika – amount produced • Beans – amount produced • Green gram – amount produced • Lablab beans – amount produced 	<ul style="list-style-type: none"> • Maize– producer price • Beans – producer price • Green gram – producer price • Lablab beans – producer price
Livestock production	<ul style="list-style-type: none"> • Cow milk – yields • Cattle – herd size • Goats – herd size • Sheep – herd size • Chickens – flock size 	<ul style="list-style-type: none"> • Cow milk – price • Cattle – producer price • Goats – producer price • Sheep – producer price • Chickens – producer price
Other food and cash income	<ul style="list-style-type: none"> • Agricultural labour (land clearing and preparation, planting, weeding) – number of jobs • Agricultural labour (harvesting) – number of jobs • Firewood/charcoal – amount collected • Self-employment – level of activity • Petty trade – level of activity 	<ul style="list-style-type: none"> • Agricultural wage rates (land clearing and preparation, planting, weeding) • Agricultural labour rates (harvesting) • Firewood/charcoal - prices • Self-employment – return on activities • Petty trade – return on activities
Expenditure		<ul style="list-style-type: none"> • Maize grain – consumer price • Rice – consumer price • Sugar – consumer price • Oil – consumer price

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 affordable and effective health care	Improve access to affordable and effective health care	Improve access to affordable and effective health care	Improve access to affordable and effective health care

Improve road infrastructure	Improve road infrastructure	Improve road infrastructure	Improve road infrastructure
		Improve market infrastructure to ensure fair producer prices	Improve market infrastructure to ensure fair producer prices
		Ensure access to affordable and timely agricultural inputs	Ensure access to affordable and timely agricultural inputs