

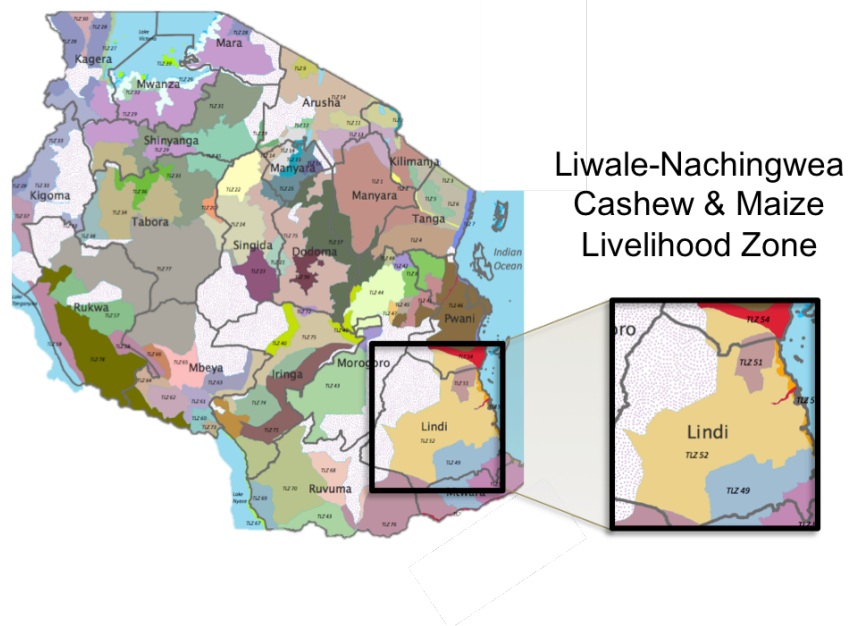
Tanzania Livelihood Baseline Profile

Liwale-Nachingwea Cashew and Maize Livelihood Zone

October, 2014¹

Zone Description

The *Liwale-Nachingwea Cashew and Maize Livelihood Zone* (West) is located in southern Tanzania, covering much of Lindi region, including Liwale and Nachingwea districts. The Western part of the zone crosses over into the Selous Game Reserve, and lions and elephants have been known to come into contact with villagers during the rainy season. Grassland and forest characterize the zone, and the Mbemkuru, Liwale, and Mavuji rivers are found here. Ruby and gold are also sometimes discovered in the region, and there have been recent reports of graphite and manganese. Timber and wild foods (such as *ming'oko* and *angadi*) also form part of the zone's natural resources. The population density is 13 people per square kilometre.



Liwale-Nachingwea Cashew & Maize Livelihood Zone

Overall this is a moderately productive zone, supporting rainfed mixed farming, principally maize cultivation and cashew farming (which is the key cash crop for the west of the zone). The zone has different types of soils. There are mid-range soils (550-850m above sea level) which are sandy/silt soils and support moderate crop production. Highland soils (850-915m above sea level) are mostly silt soils. Income is derived mainly from agriculture, with a significant number of the poorer households conducting agricultural labour during the reference year. Average annual rainfall for Lindi region is between 750 and 1200 mm. The unimodal rainy season (*Msimu*) occurs between the months of November and April, during which time human diseases, such as malaria and diarrhoea, are common. Maximum temperatures of 30 - 31°C occur between December and February.

The reference year witnessed average rains and rainfall distribution, factors that led to an average crop yield. However, dry spells are common in some pockets of the zone, and erratic rainfall and water scarcity are intermittent hazards affecting crop production. Consequently, there are food deficits in some pockets of

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

the zone each year, some of which receive assistance annually.

The main food crops grown in this zone are maize, rice, and sorghum. Pigeon peas and cowpeas are also a common source of both food and cash income in many parts of the zone. Maize, pigeon peas and cowpeas, as well as being harvested dry, are also consumed green in March and April, toward the end of the lean season. Cashew is the main cash crop and is grown by both poorer and better off farmers in the zone. Local farmers tend to retain some of their crop for seed for the following season. A small number of farmers use improved seeds (TMV or TMV-1) for maize. Pesticides are used only for cashew. Land preparation is mainly by hand hoe using own labour for very poor and poor households, or, in the case of wealthier households, hired labour. Agricultural labourers are recruited from among the poorer families who are paid either in kind or in cash. To a lesser extent, wealthier households use rented tractors. All wealth groups intercrop seasonal crops, except for paddy. New cashew farms are intercropped with maize until the cashew trees reach maturity, at which point the farmers move the trees to new plots.

Fungal disease and Mealy Bug disease affect cashew trees. To counteract these pests, farmers can purchase pesticide sprays at the market. Farmers pay a subsidised amount (fifty per cent) if they buy inputs from the Cashew Board, however if they purchase from the market they will pay the full amount.

Chickens are the main type of livestock kept here. Some migrant households keep cattle and goats, but these are relatively few. Chickens free graze and, consequently, are at risk of being attacked by wild animals. Moreover, villages in *Liwale-Nachingwea Cashew and Maize Livelihood Zone* experience yearly bouts of Newcastle disease from June to August. Villagers tend to sell their chicken at low prices in the months before the disease. The vaccine for Newcastle disease is the government-provided I-2 vaccine. Villagers note that they have used this vaccine, but to little effect.

Service provision in this zone is quite basic. Water for drinking, for both poorer and better off households, comes from seasonal rivers and wells. However some villages are far from functional wells – as far as 15 kilometres in some areas, creating enormous daily time burdens related to water collection. All households use pit latrines, with poorer households making due with temporary pit latrines, and better off households constructing more permanent facilities. Only a few villages have health dispensaries, and of these many are not fully operational. Supplies of drugs and staff are in short supply. To obtain any real medical attention people have to travel to ward or district centres, which can be very far away. Most poorer households can not afford the transport fees, or the accommodation expenses associated with this requirement. There is no public electricity supply and households rely on battery-operated devices for lighting (Richmond); a few better off households also use solar panels. Most villagers own mobile phones, but the mobile network in this area is not reliable. There are primary schools in most villages to which both poorer and better off households send their children. Secondary schools are located in the ward centres; most better off households send their children to secondary school, but these can be quite far away from home villages. There only savings facilities are Village Community Banks (VICOPA), but the provision of credit is not common. The only NGO working in this zone is LIMAS, which promotes conservation agriculture.

Markets

In the *Liwale-Nachingwea Cashew and Maize Livelihood Zone* access to the local markets from villages is made difficult during the wet season by the absence of tarmac roads. There is fair access to markets during the dry season, but many of the villagers must travel far to the ward centres on rough dirt roads. The principal road in the zone is the Nachingwea to Liwale road. Tarmac roads do not extend much further than the outskirts of the district centres.

Both food and cash crops are sold. Cashew is traded between the months of October to December. From the village Agricultural Marketing Cooperative Society (AMCOS) cashew is sent to three centres within the region (in Mtama, Nachingwea, and Lindi) after which it travels to the auction centre. Some cashew is

processed locally (in Dar es Salaam or Mtwara), but the majority is sent abroad to India. The season for the sale of maize begins after the harvest, in June, and continues until August. From the farmer, maize goes through middlemen to meet demands in the local markets in Nachingwea, Liwale, Kilwa and Lindi.

During the off-season, beans and maize are also imported into the zone from Songea. Maize tends to be imported during the rainy season, from November to February, whereas beans are imported all year, and constitute a significant portion of the local diet.

Timeline and Reference Year

The baseline assessment refers to a very specific time period called the reference year. In the *Liwale-Nachingwea Cashew and Maize Livelihood Zone* the reference year covered the consumption period from May 2013 to April 2014, which corresponds to the production year of 2012-13. During community leader interviews, key informants were asked to rank the last four years in terms of seasonal performance with '1' indicating a poor season and '5' an excellent season. The table below, which summarizes the responses of the community leaders, shows that the reference year (production year 2012-13) was ranked as below average, with erratic rains, below average yields and an outbreak of army worms. The baseline information presented in this profile, therefore, provides a view into how households in this livelihood zone make ends meet in a below average year.

From 2010-2014, the zone has witnessed a variety of seasonal outcomes, with erratic rainfall and poor rainfall distribution being the key determinants of seasonal performance. 2011 was ranked above average with good rainfall and good yields, whereas most other years have been average or below average.

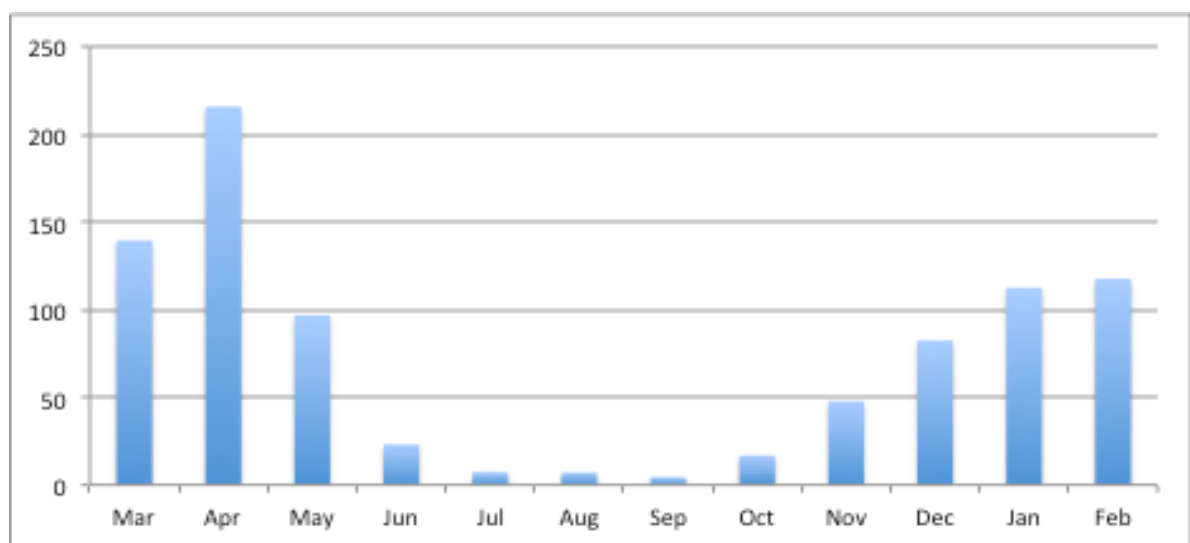
Year	Rank	Critical Events
2013	3	Average rains, yields, and crop production except for a few pockets
2012	2	Erratic and below average rainfall, below average yields, and an outbreak of army worms
2011	4	Good rainfall and good yields
2010	3	Average rains, yields, and crop production except for a few pockets
2009	2	Low rainfall, low production, stunted maize growth, and very low crop harvest

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

Month	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	
Rainy season	wet season								wet season				
Land preparation								land preparation					
Planting										planting			
Weeding	weeding									weeding			
Green consumption	maize & cassava				pigeon peas								
Harvest	cowpeas		maize		sorghum		pigeon peas						
Spraying	sesame		cashew										
Agricultural Labour	high												
Food purchase	high	low									high		
Poultry Disease				Newcastle									
Human Diseases	mal/diar									malaria/diarrhoea			
Festivals													

The graph to the right shows average monthly rainfall in mm for Kilwa Masoka based on a recent 10-year period. Source: TZ Met. Dept.



The *Liwale-Nachingwea Cashew and Maize Livelihood Zone* has one rainy season, the *Msimu* rains, from late October to February. The consumption year begins in March, and ends in February, overlapping with the lean season that occurs from October to February, during the rainy season.

Land preparation begins in September and for most crops it extends, coupled with planting, until November. The principal long-cycle food crops are maize, sorghum, pigeon peas, and paddy. Cashew and sesame are the long-cycle cash crops, although cashew production predominates in the west of the zone. Intercropping is common in the zone, and farmers tend to intercrop maize, sorghum, and pigeon peas. This is partly due to a lack of ploughing equipment, which limits the size farmers can cultivate. Additionally, there is a lack of knowledge on the advantages and disadvantages of intercropping. Subsequently, yields with intercropping tend to be lower than yields from pure stand crops.



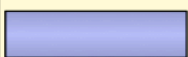
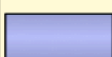
Weeding - the most labour-intensive of the farming activities in the zone - begins in December, and ends in February, before the start of the three-month-long green consumption period beginning in March. Harvesting for most crops begins in May, although cowpeas germinate more quickly, and green consumption of them may begin as early as December. Cashew trees must be sprayed four times during the year, however it is unclear how many farmers put this recommendation into practice. Spraying takes place from May to September.

The poorer households tend to spend about 25% of their labour on their own farms, and more than half of their time working as agricultural labourers for the better off households. This is a key factor in the low yields of the poorer households. Agricultural labour takes place throughout the year, although there is little activity in August.

Ninety per cent of casual labour performed in the zone is undertaken in the local rural area, and most of the rest occurs in local towns. Labour migration can take place anytime during the year, but it is uncommon. People from very poor and poor households sometimes migrate to Dar es Salaam, Mtwara, and Lindi town to perform construction work, house help, and in some cases, hawking.

Food purchases are at their highest after the harvest and during the rainy season. This period begins in November, when the poor have finished their food from the harvest. This is also the period in which the staple food prices are highest. Food purchases begin to decline around April due to the start of green consumption from maize.

Wealth Breakdown

		Wealth Groups Characteristics			
		HH size	Land area owned (acres)	Land area cultivated (acres)	Other
Very poor		4-6 (5)	4 - 5	3 - 4	10 - 15 chickens; 1 bicycle
Poor		5-7 (6)	7 - 8	6 - 7	15 - 25 chickens; 1 bicycle
Middle		6-8 (7)	12 - 13	11 - 12	15 - 30 chickens; 1 - 2 bicycles
Better off		6-8 (7)	21	18	20 - 30 chickens; 2 bicycles, 1 motorcycle
	0% 10% 20% 30% 40% % of households				

Note : The wealth breakdown percentages reflect the mid-point of a range

In this farming zone, wealth is determined by the amount of land under cultivation. Most farmers, across the wealth divide, tend to own more land than they cultivate. The crops produced in this zone are similar across all wealth groups, however, due to poor land management and inadequate inputs, poorer households have lower yields than the better off.

Over half of households in the zone (57%) are very poor or poor. Among these, 23% are considered to be very poor. In *Liwale-Nachingwea Cashew and Maize Livelihood Zone*, being very poor means only cultivating between two and five acres of land, nearly two of which are dedicated to permanent crops. In this zone, the permanent crop is cashew, which is cultivated by all wealth groups.

Middle and better off households together comprise 43% of households in the zone. The larger of the two groups is the middle, which makes up an estimated 20-35% of households. Cultivated land sizes for the middle group are between 8 and 15 acres, and the better off are estimated to cultivate between 15 and 20 acres. Of the acres cultivated, the middle reserves 5 to 8 acres for cashew, and for the better off, this number ranges between 8 and 15. All groups cultivate the staple crop, maize, and most cultivate rice, sorghum, pigeon peas and cow peas.

Livestock holdings are not significant for this zone, however, the number of chickens owned increases with wealth.

The principal reasons for which the better off do not have greater yields are the labour-intensive nature of digging with hand hoes, limited funds for inputs, and not following recommended farming practices.

Average household sizes range from five to six for poorer households and seven for middle and better off.

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 March 2013 to February 2014. March 2013 represents the start of the consumption year because it is when people begin to consume crops green and marks the end of the hunger period. Food is presented as a percentage of 2100 kcal per person per day for the 12-month period.

The graph indicates the reality reflected in the field interviews, which is that people receive more than half of their annual calorie requirements from their own crops, and either buy the rest or receive it in exchange for work.



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

As shown in the graph, green consumption covers a surprising amount of annual food needs in this zone – more than in any other zone where baseline work was completed during this assessment. For very poor and poor households, who rely on this source to break the hunger period, green consumption of maize and pigeon peas covers around two months of household food needs. Middle and better off households also consume crops green, obtaining just about a month's worth of food from this source.

Maize and sorghum are the most important staple crops grown. As you move up the wealth continuum the concentration on maize (relative to sorghum) increases. Very poor and poor households grow more sorghum than maize because it is a lower-risk crop, better able to withstand erratic and low rainfall. Middle and better off households are able to manage the risk associated with growing maize and it brings in additional cash income for them. (Sorghum is not sold in this zone.) Maize covers roughly 60% of better off household annual food needs and 28% of very poor household food needs. Sorghum, on the other hand, meets between 16 – 22% of poorer household food needs and only 10% of better off household needs. Better off and middle households also grow rice, which adds around 12 – 13% of annual calorie needs to their food basket. Very poor and poor households do not have sufficient labour nor do they have enough cash to buy inputs to grow rice. Pigeon peas make up the remainder of the 'own crops' component of food income in this zone.

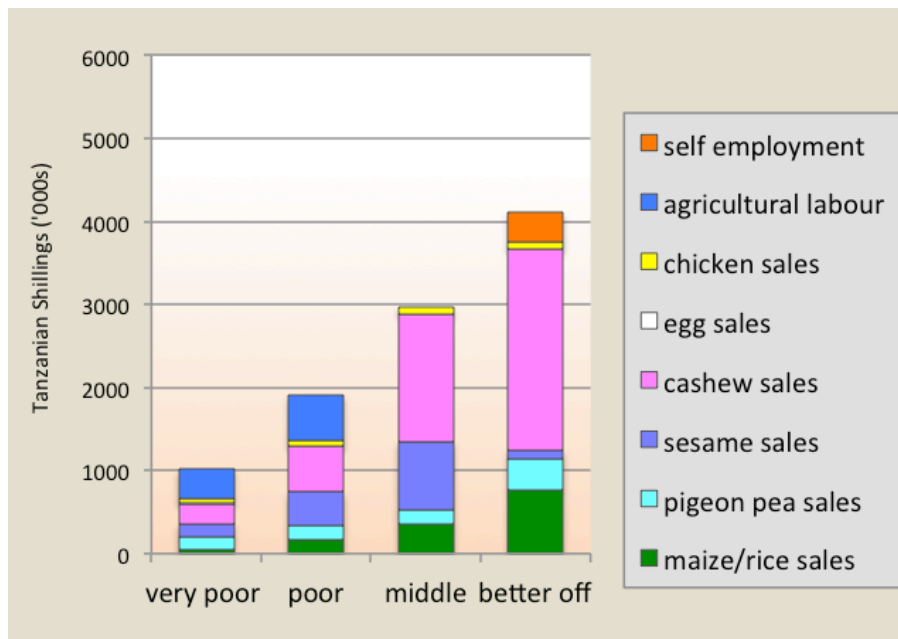
Very poor households do not grow enough of their own crops to meet their annual food needs, so they supplement with food obtained directly in exchange for labour. Typically at least one member of a very poor household will work for a better off neighbour on things like ploughing, weeding, or harvesting at various points in the year, peaking between December and February. Around 15% of very poor households' food for the year comes from this source.

All households also purchase a significant amount of their food every year. This is a particularly important source of food for the poor, who have a real production gap, but do not tend to work in direct exchange for food. While very poor and poor households buy food to fill a gap, middle and better off households purchase not because they have to, but because they want a more varied diet. In fact, if better off households consumed all the staple grains (maize, sorghum, rice) they produced (and didn't sell it instead) they would be able to cover around 170% of their annual calorie requirements. Middle households, likewise, would also cover more than their minimum calorie needs with their own harvest. As such, better off households do not buy maize, and only purchase a small amount of rice, concentrating instead on oil, rice, sugar, beans and dried fish. Maize purchases for very poor and poor households, on the other hand, cover 10 – 23% of annual calorie needs. These households have less to spend on high cost items like sugar and oil, so buy very little of them.

Sources of Cash Income

In the *Liwale-Nachingwea Cashew and Maize Livelihood Zone*, households rely heavily on selling crops to obtain cash income. In addition, agricultural labour (for poorer households) and self employment (for better off households) provide supplemental sources of cash.

As shown in the bar charts to the right, this area relies heavily on cashew sales. This is the most important cash-earner for better off and middle households, bringing in over 2 million TZS for better off households and over 1 million TZS every year for middle households. It also generates the most crop-related cash income for very poor and poor households, far outweighing what they get from maize sales. The critical importance of cashews in the local economy also makes households



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

INCOME SUMMARY TABLE				
Wealth group	Very poor	Poor	Middle	Better off
Annual income per household ²	800,000 - 1,200,000	1,500,000 - 2,500,000	2,500,000 - 3,500,000	3,500,000 - 6,500,000

vulnerable to tree diseases like mealy bug and fungal blight, which can wipe out a large proportion of their annual income. Sesame sales are the second-most important crop-related income for very poor, poor and middle households. This high value crop is grown only for sale, and provides almost as much cash for poor households as cashews. Pigeon peas are also sold by all households, making up a respectable proportion of very poor and poor annual cash income. Finally, maize and rice sales are particularly profitable for better off households, who have the extra labour and land to generate surpluses for sale.

Very poor and poor households do not generate enough cash from crop sales alone to meet their annual needs. They earn a significant proportion of their yearly cash as local agricultural labourers. Weeding and land preparation were the most common types of agricultural labour provided by very poor and poor households. Typically this is done by both men and women. The importance of this work is not just as a cash earner for these poorer households, but it also allows middle and better off households to expand the fields they have under production and improve the maintenance of their fields. In many ways this labour is the backbone of the local economy.

This is not an area known for its reliance on livestock, and livestock sales do not feature largely as a component of cash income. However, all households do sell chickens, and very poor households sell eggs as well. Very poor household income from egg sales and chickens sales combined is equivalent to around 70% of what these households need to spend on education each year. So although it seems a small amount, every bit is important to these cash-strapped households.

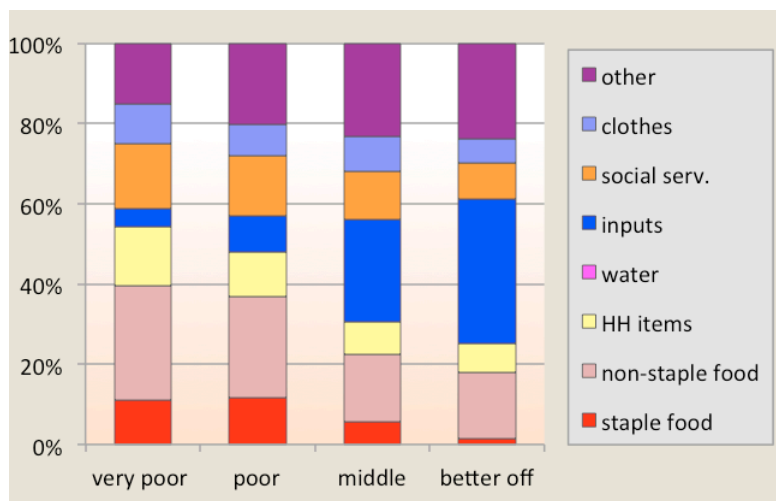
Better off households earn additional cash through various small businesses, using their capital to purchase goods that they re-sell locally, or engaging in other forms of trade.

² The average exchange rate from March 2013 to February 2014 was US\$1 = TZS1600

Expenditure Patterns

The graph presents expenditure patterns for the reference year March 2013-February 2014. While total expenditure increases with wealth, the expenditure breakdown by percent in this graph demonstrates the relative amount of income spent on different categories.

During the reference year food purchases (of both staple and non-staple items) comprised between 37 and 40 per cent of the very poor and poor households' expenditures. The remaining income was spent primarily on social services (including expenses on school), household items, and clothes.



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

The very poor and poor spent approximately the same amount of their annual income on sugar, used for tea in this zone. However, for other purchases such as oil and dried fish (*dagaa*), the poor's purchases were comparable to the middle and better off.

As concerns expenditure patterns for the middle and better off, between 19 and 23 per cent of their income was spent on food. Of the remaining income, 10% (middle) to 20% (better off) was spent on hiring farm labour. For these households, the most important single expenditure items were labour, and pesticides and fertiliser. Soap and grinding of grain were the major expenditure items across all wealth groups, who spent approximately the same amount on each item. On average, households spent TSh 55,000 per year on soap, and approximately TSh 83,000 on grinding of grain. Other expenditures included beer and cigarettes, where the amount purchased increased by level of wealth. Expenditure on gifts, community obligations, and *zakat/sadaka* followed a similar pattern.

The very poor and poor spend more of their income on food purchases (particularly during the rainy season, which coincides with the hunger season) due to low crop production on their own farms, and subsequently fewer months of consumption from their own harvest. This is also when medical costs tend to increase as malaria is most prevalent during this time.

Hazards

There are three significant chronic hazards that affect *Liwale-Nachingwea Cashew and Maize Livelihood Zone* on a yearly basis.

The first of these is crop diseases, which affect mostly cash crops. Secondly, there is Newcastle disease that affects poultry and causes farmers to sell most of their poultry at lower prices in the months preceding the disease. Finally, wild animals are a common source of worry to farmers in this zone. Wild pigs, elephants and monkeys destroy the crops, with elephants being particularly attracted to young cassava plants.

Intermittent hazards affecting the zone are all related to water. Erratic rainfall is common and every year there is an uneven distribution of rainfall. Moreover, almost every year there are temporary dry spells in some parts of the zone. Water scarcity is a yearly hazard that is particularly acute during the dry season.

Response Strategies

Households engage in a number of strategies in an attempt to cope with hazards. The coping strategies used by all households are as follows:

Crop diseases: Both better off and poorer households spray cashew crops that have been affected by fungal diseases, and both uproot diseased cassava from the affected area. However, only some of the poorer households use pest-resistant varieties of their staple and cash crops, whereas most of the better off households do.

Poultry disease: The typical response strategy to Newcastle disease is to sell and consume poultry en masse in the months preceding the outbreak of the disease.

Wild animals: Setting traps and lighting fires to scare animals away are the most common methods of protecting crops from wild animals. Alternative practices include chasing the animals away themselves and keeping watch over the fields at night.

Water-related agricultural problems: Due to the chronic nature of water-related problems, many farmers try to plant short-term crops, such as cowpeas. In addition, they also grow drought-resistant varieties such as cassava and sweet potato (only noted to have been grown in bad years in the zone).

Domestic-related agricultural problems: When water is in short supply, it is not only crops, but health in general that will decline. The villagers in *Liwale-Nachingwea Cashew and Maize Livelihood Zone* dealt with this by creating boreholes, and travelling further to look for drinking and cooking water.

During bad years, the better off households adopt the following strategies:

Purchasing greater amounts of food from other zones. They also **sell more food crops**. In addition, they will take loans and sell **valuable assets** such as bicycles.

The poorer households adopt different coping strategies during a bad year:

As concerns their normal year strategies, they increase the number of days in which they are doing **agricultural labour**. Otherwise, they are more dependent on **chicken sales, wild foods, and food aid**.

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 *Liwale-Nachingwea Cashew and Maize 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 produced • Green consumption • Sorghum • Pigeon peas • Rice • Sesame • Cashew 	<ul style="list-style-type: none"> • Maize price • Pigeon pea price • Rice price • Sesame price • Cashew price
Livestock production	<ul style="list-style-type: none"> • Chicken sales 	<ul style="list-style-type: none"> • Chicken price
Other food and cash income	<ul style="list-style-type: none"> • Labour exchange • Agricultural labour • Self-employment for the better off 	<ul style="list-style-type: none"> • Agricultural labour rates • Self-employment rates
Expenditure		<ul style="list-style-type: none"> • Staple maize price (consumer price)

Programme Implications

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

There were a number of development priorities that emerged, although each wealth group ranked them in a different order

1. Providing loans for agricultural inputs
2. Improving transport infrastructure
3. Improving healthcare infrastructure
4. Providing agricultural inputs
5. Ensuring better prices for farm produce

Very poor	Poor	Middle	Better off
Provide tractors for digging	Provide agricultural inputs and agricultural loans	Improve transport infrastructure and provide mobile network	Provide loans to buy agricultural equipment and for building
Improve water supply	Provide tractors and oxen for ploughing	Lower prices of farm equipment and inputs	Provide tractors for ploughing

Agricultural inputs <ul style="list-style-type: none"> • Supply subsidised inputs on time • Provide inputs 	Provide livestock	Provide tractors for ploughing and other agricultural equipment	Provide livestock and designate grazing areas
Improve transport infrastructure	Provide good medical facilities and services	Provide and ensure water availability	Provide agricultural inputs
Improve health services	Improve transport infrastructure	Provide livestock	Provide water infrastructure
Improve prices for cashewnut	Provide good prices for farm produce	Improve health facilities	Improve health facilities
	Provide water	Provide good prices for farm produce	Support in controlling wild animals