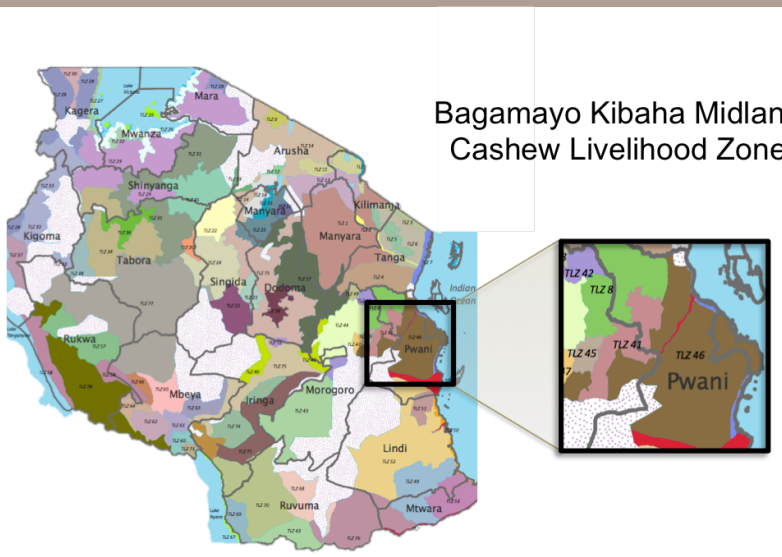
Tanzania Livelihood Baseline Profile

Bagamayo Kibaha Midland Cashew Livelihood Zone (TLZ 46)

October, 2014[1]

Zone Description



The *Bagamayo Kibaha Midland Cashew Zone i*s located on the coast just south of Dar es Salaam. Two vital rivers - the Ruvi and the Wami - originate in the Morogoro Region, pass through the zone and then flow out into the Indian Ocean. The zone is located in Pwani Region and includes five districts: Bagamayo, Kibaha, Kisarawe, Mukranga and Rufiji. The zone is characterised by riverine and coastal forest as well as bush that is not cleared for agriculture. Some of the forest areas are protected within a national park called *the Sadani and Kazimzumbwi Forest Reserve Area*. Sand and gravel are other important natural resources found in the zone. These are mainly used in the construction industry.

This midland zone is predominantly agricultural with a wide diversity of crops grown for food and for sale including cereals, root crops and fruit. Agricultural labour as well as charcoals sales are also important economic activities for the very poor and poor. On the whole, it is a fairly fertile zone. Moreover, farmers have two rainfall and cropping seasons which means agriculture occurs almost year-round. To this end, the zone is largely food self-sufficient. Rainfall averages about 800 mm – 1500 mm per year. The longer, more reliable rainy season generally runs from March to May. The short rains are from October to December. During the year, the average annual temperature is 25-30 ° C.

This agricultural zone is notable for its wide diversity of food and cash crops. The range of crops grown includes cereals (maize and rice); pulses (cowpeas); root crops (cassava and sweet potato); fruits (coconut, mango, oranges and pineapple); nuts (cashew); vegetables (okra) and sesame oil seeds (*simsim*). Of these, cassava, rice and maize are the principal crops grown for food. The three main crops sold are coconut, cashew nuts and cassava. In general, soils in the zone are fairly good for agriculture. The soils are sandy-loam in some areas and sandy-clay in others. Farming is predominantly rain-fed with minimal fertiliser use and minimal mechanisation. Farmers also practise minimum tillage. However, the zone is fertile enough to be reasonably self-sufficient in food production most years. In general, to boost production on their land, famers intercrop. Moreover, two distinct rainy seasons allow farmers to have two harvests of key crops such as maize. Wealthier households also employ labourers during the labour-intensive phase of land preparation and weeding. The better-off also use other inputs such as improved maize and rice seeds, improved cassava cuttings, sulphur (to reduce mildew on cashew trees) and a small amounts of fertiliser. These inputs are purchased mainly on the market with private income but also funded

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

to a lesser extent through subsidies. In small pockets of the zone there is riverine irrigation which allows some cash cropping of horticultural crops. There is also a small pocket of pineapple cash cropping. Production in the zone is affected by certain chronic pests and diseases. Most notable are the following: (i) army worm which attacks maize and rice; (ii) mildew which affects cashew nuts; (iii) leaf yellowing on rice; and (iv) cassava mosaic virus and cassava brown streak virus. Farmers have a few options to overcome these chronic problems To combat mildew, farmers purchase sulphur privately and spray the cashew nuts. Pesticide sprays are also used against army worm. Farmers access the sprays from the Ministry of Agriculture. Leaf yellowing is addressed through crop rotation. Finally, to combat the two diseases affecting cassava - the mosaic virus and brown strike disease - farmers have to replace old cassava trees with new varieties. Typically, farmers get cuttings of the new varieties at research centres for free. Both men and women are fully engaged in agricultural production.

Livestock production is not practised in this zone except for poultry keeping. Instead poor men and women supplement agriculture through agricultural labour and charcoal sales. Sustained demand for energy from Dar es Salaam fuels the charcoal business although a negative effective is the felling of coastal forests. Men and women from wealthier households typically engage in trade or run small retail businesses to supplement farming. In addition, young men from wealthier households dominate the *bod aboda* (small motorcycle transport) business.

The zone is reasonably well serviced. Three major roads originate in Dar es Salaam and then cross the zone, leading to neighbouring regions and countries. Moreover, two railway lines - from Dar es Salaam to Zambia and from Dar es Salamm to Kigoma - also cross through the zone. In terms of other basic services, most villages have access to tap water for a fee which is piped to the village distribution site. The fee covers payment to a worker to guard the generator that pipes the water. For the poor without income to pay, water is collected from boreholes, open and closed wells, and nearby rivers. With respect to health services, there are health dispensaries in some villages but the coverage is not universal. Electricity is available for those with cash to pay for the service so most of the poor use kerosene for lighting. Some better-off households use solar power. Almost all households use pit latrines for basic sanitation control. Mobile phones are widely used and households depend on solar power to re-charge the batteries. However, the network coverage is at times inconsistent. There are credit facilities offered in the zone through VICOBA (village community banks) as well as through certain NGOs and micro-finance institutions. However, the availability of credit is not high. Generally, villagers seemed interested in greater access to credit to pay for agricultural inputs or for start-up business capital. There are several government and non-governmental agencies working in the zone. These agencies include: TASF/Tanzania Social Action Fund, which delivers the government safety net programme; Plan International; Action Aid (assistance with school fees); AMREF (health services); and MUVI (agricultural production and marketing).

Markets

Marketing and trade activities are strengthened by the three major roads that pass through the zone connecting Dar es Salaam with upcountry regions and neighbouring countries. The railway line from Dar es Salaam to Zambia and from Dar es Salaam to Kigoma (on the border with Burundi) also facilitates the transport of local goods to the market.

One feature of this zone is its relative proximity to the major urban market of Dar es Salaam. First, the city provides a vital port for the export of cashews. The nuts are brought into the city from various collection sites from October to December each year. Cashew exports are mainly destined for India markets. Second, the city is the destination market for locally-grown rice and cassava. The peak period for the sale of rice is July to October. For cassava, sales peak from May to October. Conversely, there are times in the year when rice is imported into the zone. The demand for rice in local markets is highest from January to May. Beans are also imported into the zone year round. For both goods, the trade route is Mbeya to Dar es salaam to local village market as well as from Morogoro to Dar es Salaam to local village market.

There is a strong demand for hired labour on farms within the zone. Most of the local poor who look for work to supplement their farm production secure some type of casual employment on farms within the zone. Other poor labourers from neighbouring areas also migrate into the zone in search of farm work. If necessary, poor labourers

may go to Dar es Salaam or local towns in search work there. However, most years they find sufficient employment on farms within the zone. The main type of job requiring additional hired labour is land preparation.

The road network within the zone is fairly well maintained. During the assessment, roads were considered to be in good condition. Although few of the roads are tarmac, the local gravel and dirt roads are passable throughout the year. There are exceptions, namely the routes from Kibaha to Bagamoyo via Vikawe as well as from Mukuranga to Kiserawe which are not passable during the rainy season.

Timeline and Reference Year

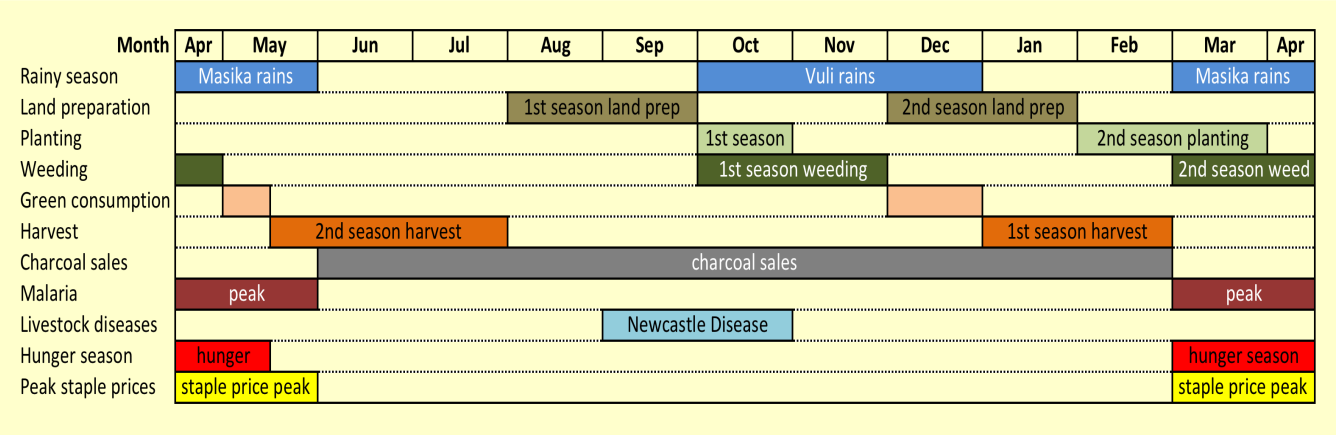
The baseline assessment refers to a very specific time period called the reference year. In the *Bagamayo Kibaha Midland Cashew Livelihood Zone*, the reference year is the consumption year that began mid-May 2013 and ended mid-May 2014. This corresponds to the production year of 2012-2013. During community leader interviews, key 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 responses of the community leaders, shows that the reference year (production year 2012-13) was ranked as average, with erratic long rains. The baseline information presented in this profile, therefore, provides a view into how households in this livelihood zone make ends meet in a typical year, drawing on a normal range of options.

Overall in the zone the last 4 years have been good to average. In most cases, the long rains were typically good but the short rainy season was less reliable and often insufficient. However, cassava acts as a reserve food that can be drawn on to offset grain shortages. The last poor year was 2009-2010. Conditions were very difficult due to the combination of insufficient rain and an outbreak of rodents. At that time, some food aid was distributed to households most affected by food shortages.

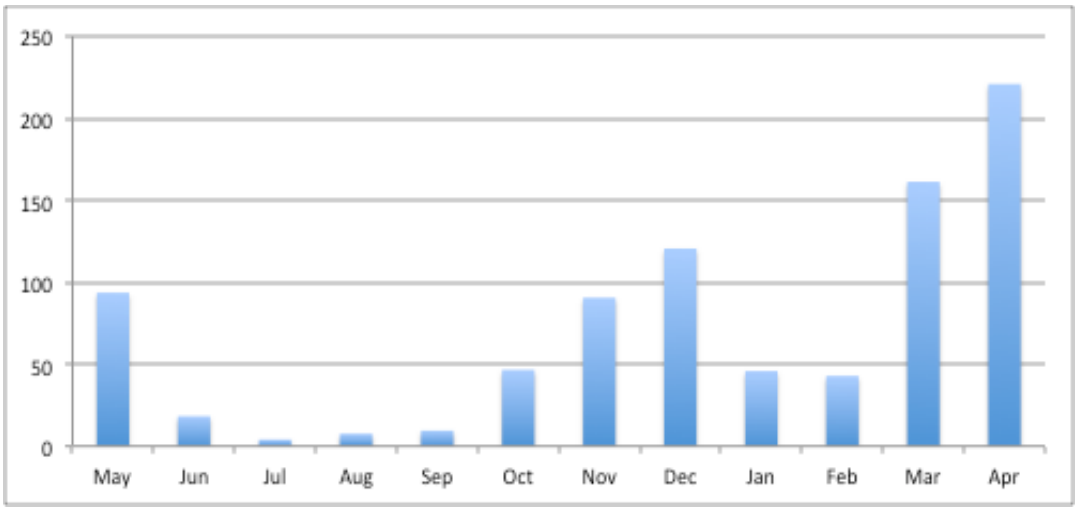
Year	Rank	Critical Events
2014	**4**	Good 2014 long rains but 2013 short rains were erratic (leading to higher maize purchase and more cassava consumed)
2013	**4**	2013 long rains were good. The 2012 short rains were also good.
2012	**3**	Erratic 2012 long rains. Floods during the 2011 short rains (ranked 3) which destroyed some rice and maize. HH response was to buy more maize and eat more cassava.
2011	**4**	Good 2011 long rains and harvest. 2010 short rains was erratic and insufficient (ranked 3). HH response was to increase cassava consumption.
2010	**3-2**	Rainfall during the 2010 long rains was erratic and insufficient. This followed a poor 2009 short rain season that was aggravated by a rodent infestation. HH response was to purchase rodenticides. Relief food was distributed by the Government of Tanzania.

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



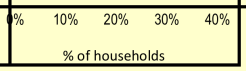
The graph to the right shows average monthly rainfall in mm based on a recent 10-year average for Kibaha District. Source: TZ Met. Dept.



The *Bagamayo Kibaha Midland Cashew Zone* has a bimodal rainfall pattern which allows for the production of mixed grains, tubers, legumes, fruit and nut trees almost year round. The period of the long rains (*masika*) is March to May. This rainy season is more reliable than the short rains (v*uli)* which are expected from October to December. Land is prepared for planting just before the start of the rains in January. Long-cycle crops are then planted in February and March. Most of the crops are intercropped except for sweet potato. Short-cycle crops such as cowpeas and sweet potato are planted in April. By mid-May, crops such as maize and cowpeas are ready for green consumption. June, July and August are the peak months for the long-rains harvest. During these months, maize, rice, cowpeas, pigeon peas, sweet potatoes, and oranges are harvested. Coconut and cassava are harvested throughout the year but the peak occurs from July to September. After the main harvest, crops such as maize and cassava are planted in October-November in time for the short rains. If the rains are sufficient, there is a second maize harvest in January-February. Fruit trees such as pineapple and mango as well as cashews, are typically harvested for consumption and sale in November-December.

Most of the poor need to supplement their own crop production with additional cash income. Firewood and charcoal are sold throughout the year except during the months of peak farm work (March to May). Consequently, this is the period called the “hunger season” when households’ own food stocks are at their lowest level. Moreover, food prices peak at the same time as food purchases peak. This is also the period when diseases such as malaria are highest due to the rains. Higher medication expenses mean more pressure to earn an income even while farm tasks must be carried out as well. Consequently, there is less money available for essential food purchases.

Wealth Breakdown

		Wealth Groups Characteristics				
		HH size	Land area cultivated (acres)	Perennial crops cashews, fruit trees (acres)	Poultry	Other
Very poor		5-7 (6)	1 - 2 (1.5)	0 - 1 (0.5)	5 - 10 chickens	0-1 mobile phones
Poor		5-7 (6)	2 - 4 (3)	0 - 2 (1)	5 - 15 chickens	0-2 mobile phones, 1 bicycle
Middle		5-7 (6)	3 - 5 (4)	0 - 2 (1)	10 - 20 chickens	1-3 mobile phones 1 bicycle 0-1 motorcycle
Better off		5-9 (7)	6 - 10 (8)	0 - 4 (2)	20 - 40 chickens	1-3 mobile phones 1 bicycle 0-2 motorcycle
						

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

In this mixed farming zone, wealth is defined by how much land is owned and cultivated as well as how much land is used for perennial crops (such as cashews and other fruit trees). Another important asset that distinguishes one wealth group from another is ownership of a motorcycle to run a *boda boda* (motorcycle taxi) business. In addition, household assets such as mobile phones are also a sign of wealth. A further indicator is education. Children from middle and better off households typically complete secondary school whereas children from poor households only get a primary school education. Another indicator of relative poverty is that only poorer households plant cassava during the short rainy season (*vuli*). In pockets of the zone where pineapple is grown, only wealthier households are able to manage the labour intensive requirements of pineapple farming.

The majority of households fall in the middle and poor categories. During the reference year, poor households were estimated to be the largest wealth group. They comprised 25 - 40% of all households. Middle households were a similarly large group and comprised about 20 - 35% of all households. At either end of the wealth spectrum, the very poor were an estimated 15 - 25% of households whereas the better off comprised about 15 - 20%. Notably, households in almost all the wealth groups are on average about 5-7 people with the exception of the better off who have slightly larger household sizes, with around 6 - 8 people on average.

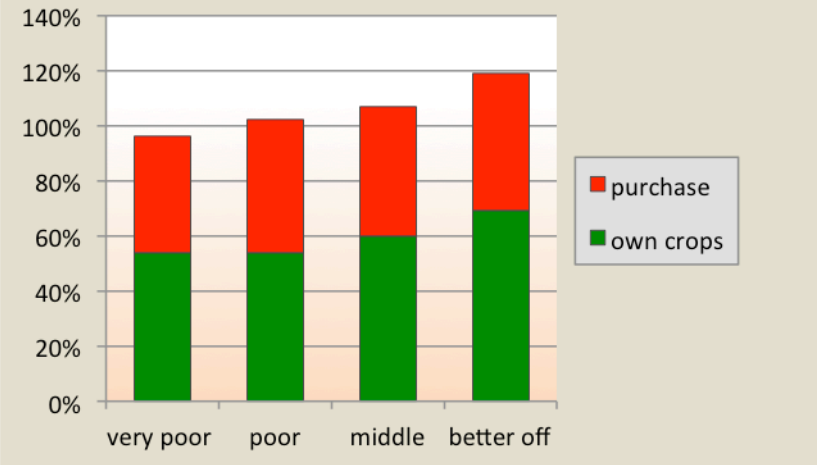
Not unexpectedly, land size increases with wealth. The very poor cultivated on average about 1 - 2 acres of land of which 0 - 1 acres was used for perennial crops. Poor households typically cultivated about double this size of land, namely 2 - 4 acres of which 0 - 2 acres was set aside for perennial crops. Although middle households cultivated on average 3 - 5 acres, both poor and middle households were estimated to use about the same amount of land for perennial crops, specifically 0-2 acres. By contrast, those who are better off in the villages, farm about 5 - 10 acres of land of which 2 - 4 acres is set aside for perennials.

Two other major assets that indicate who is poor and who is better off in the community are mobile phones and motorcycles. These transport and communication devices are important tools for marketing and trade activities. Whereas the very poor households typically do not own such assets (or own very few; for instance 0-1 mobile phones), poor households are more likely to own a mobile phone (0-2 phones on average) as well as a bicycle for transport. Middle and better off households are distinguished from their poorer neighbours though the ownership of a bicycle as well as, in many cases, a motorcycle (0 - 1 on average for middle-income households) in addition to mobile phones (an estimated 1 - 3 per household).

Households do not typically keep larger livestock in this agricultural zone. However, the majority of people do keep flocks of chickens. The size of the flock increases with wealth. During the reference year, better off households owned fairly substantial flocks of about 20 - 40 chickens. About half this number (10 - 20 chickens on average) were owned by middle households. Very poor and poor households typically raised much smaller flocks of chickens, i.e., about 5 - 10 chickens for the very poor and 5 - 15 chickens for poor households.

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



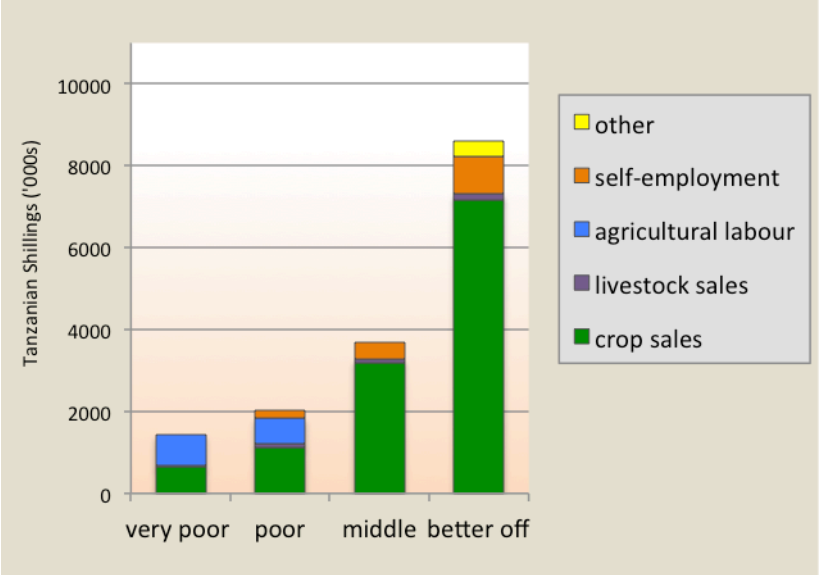
In the graph, food access is expressed as a percentage of minimum food requirements, taken as an average food energy intake of 2100 kcals per person per day.

In this agricultural zone, all households secured the majority of their annual food energy from their own crops. The amount secured increased by wealth group and ranged from 55% of annual food needs (very poor and poor households) to 70% (better-off households). During the 2013-2014 reference year, maize comprised the major source of food energy from own crop production. For the very poor, about 60% of food energy from their own crops came from maize. The reference year was an average year allowing for two harvests of maize. Rice, a second major food, was harvested only once (i.e., during the *masika* season). Cassava was the third principal food crop. Like maize and rice, much of the cassava that is produced is sold. In the *Bagamayo Kibaha Midland Cashew Zone,* households from all wealth groups produced sufficient food to meet over 100% of their annual food needs. For instance, during the reference year, even very poor households produced over 115% of their annual food needs from maize, rice, cassava, sweet potato and cowpeas. However, crops are grown for both food and sale. Hence, in the case of the very poor, the amount consumed was about half of what was produced and the rest was sold. In the case of the better-off households, own crop production was an estimated 550% of their annual food needs (coconut and cashew nuts added an extra 125%). However, "only" 70% of their annual food energy came from own crop consumption with the rest being sold.

Purchase was the other significant food source for all wealth groups. In the reference year, 70% of the food purchased by the very poor was staple food (maize in particular but also a little rice). By comparison, 40% of food purchased by middle households went toward maize and rice. In short, the majority of the food purchased by the poor and very poor was on staple food whereas for middle and better off households the majority of the food energy from food purchases was spent on non-staple food. Non-staple food included oil, sugar, beans and dried fish as well as a little meat and vegetables.

Sources of Cash Income

Throughout the *Bagamayo Kibaha Midland Cashew Zone*, the sale of own crops is a vital source of income for all households. The importance of crop income differs by wealth group. For very poor and poor households, crop income comprised an estimated 45%-55% of their total annual cash income in the reference year. Crop income is significantly more important for wealthier households. In their case, crop income made up about 85% of their total cash income. Another difference between wealth groups was the type of crops that were sold. Very poor and poor households mainly sold maize, rice and cassava. Sales of mixed cash crops (fruits, nuts and seeds) supplemented staple crop sales. By contrast, better off and middle households not only sold the basic staple crops but they also sold important cash crops such as cashew nuts and coconut. In addition, they sold a diversity of other crops such as pineapple, oranges, mango, sesame and vegetables.



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

INCOME SUMMARY TABLE in Tanzania Shillings ('000s)				
Wealth group	**Very poor**	**Poor**	**Middle**	**Better off**
Annual income per household[2]	684,000 - 2,484,000	1,351,000 - 5,354,000	2,174,000 - 10,147,000	4,077,000 - 15,126,000

The second major source of income for poorer households was agricultural labour. This source was particularly important for the very poor. During the reference year, 52% of the annual cash income of very poor households came from agricultural labour. For poor households, agricultural labour comprised about 30% of their annual cash income. The work was typically found within the zone, particularly during the land preparation phase of the crop cycle. Both men and women are hired for agricultural labour including land preparation, weeding and harvesting.

For better off and middle households, their second major source of income was petty trade. Petty trade comprised about 10% of their total annual cash income. Wealthier households run small kiosks or run a trade business selling local produce or own a motorcycle taxi *(bodaboda*) business.

Poor households supplemented crop sales and agricultural labour with charcoal sales. Charcoal sales comprised about 10% of their total annual cash income during the reference year. Typically, it is men who are engaged in charcoal sales.

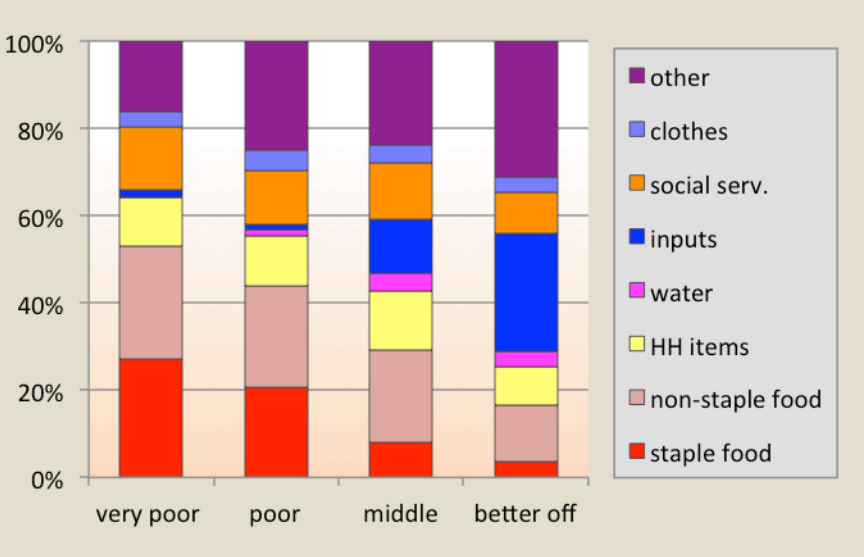
All wealth groups earned small amounts of cash income from the sales of chickens. For most households, chicken sales comprised less than 5% of their total annual cash income. For the better off households, a final source of income during the reference year was credit.

[2] The average exchange rate during the reference year from June 2013-May 2014 was US$1 = Tsh 1,585

Expenditure Patterns

The graph presents expenditure patterns for the reference year mid-May 2013 to mid-May 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 comprised about half (45%-55%) of the annual expenditures of very poor and poor households. Non-staple foods, such as pulses, oils and meat, are relatively costly.



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

Hence, non-staple foods comprised about 50% of food spending even though non-staple food was only about 30% of the food energy purchased by the very poor. By contrast, only about 18 - 30% of the total annual expenditures of wealthier households was spent on food. Most of their spending was on items like oil, sugar, beans, dried fish, meat and vegetables.

Another important expenditure by all wealth groups was education. Together, education and medical expenses comprised about 15% of the total annual expenditures of the very poor, poor and middle households. Of the two, education expenses were much more significant than medical. In terms of a single expenditure item, education expenses were one of the highest expenditures of any non-food item.

Household items comprised about 10 - 15% of total annual expenditures for all wealth groups. Of the 6 - 8 items included in this category, for the very poor and poor households, soap and kerosene were the two highest expenditure items. By contrast, middle and better off households spent the most on water (for domestic use), firewood and kerosene.

Livelihood inputs were an important expenditure item for better off households, comprising 30% of their total annual expenditures during the reference year. Of the various livelihood inputs included in this category, the most important expenditure item was labour.

For poor, middle and better off households, about 20 - 25% of their total annual expenditures is classified as "other". This category brings together a number of different expenses, including transport, social occasions, festivals, savings, cosmetics, hair supplies, beer, tobacco, and phone credit. Of these items, phone credit expenses as well as gift, festivals, social obligations were the most important individual expenses. Transport was also a large expense for better off households.

Hazards

The *Bagamayo Kibaha Midland Cashew Zone* suffers chronically from problems of crop pests and disease. Maize is often attacked by army worms which destroy the crop. Mildew affects cashew nuts, and leaf yellowing is a disease that affects rice. The other staple crop, cassava, is notably affected by the mosaic virus as well as the brown streak virus.

Periodically, crops are destroyed by wild animals as well as by rodents. The last case of rodents causing significant damage was in the 2009 *vuli* season. Another occasional problem in the zone is conflict between livestock keepers and farmers. During an extended dry season, herders from other livelihood zones may migrate into the area in search of pasture and browse. At this time, livestock may graze onto farm land especially in the lowland areas and close to the rivers.

Response Strategies

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

For the very poor and poor households, these strategies include:

Plant cassava, a drought-resistant crop: Severe and extended droughts are not common in this zone. Nonetheless, the short rainy season is often unpredictable and erratic. To cope with uncertain maize harvest outcomes in January-February, poorer households plant cassava. Cassava acts as a hardy reserve crop that can be substituted for maize when maize stocks are low.

Diversify crops through intercropping: One way of spreading risk is to diversify the selection of crops. Households in this zone have quite a diversified crop base including grains, tubers, legumes, fruits and nuts. This makes them less vulnerable to disease, pests or climate shocks that may affect a particular crop.

Sell charcoal/firewood/timber: High demand for fuel from a major urban centre (Dar es Salaam) provides the very poor and poor households with a fairly reliable source of income. One concern is the negative impact of charcoal sales on the surrounding coastal and riverine forest.

For the better-off and middle-income, these strategies include:

Use pesticides and fungicides: This is not a distress coping strategy in as much as a response to a chronic hazard affecting their crops and livelihood. The required items can be purchased privately on the market. Certain fungicides, such as sulphur, are subsidised by the government and can be accessed through the Cashew Board of Tanzania (CBT). However, this service is only really available in Mukuranga and Rufiji Districts and does not cover all districts in the livelihood zone.

Maintain savings in the form of a grain reserve: In response to the fairly normal vagaries of weather (particularly a more unreliable short rainy season), better-off households try to maintain a grain reserve for the years when the maize and rice harvest is low.

Employ labour to scare away animals: Wild animals are a common threat to farmers and their crops in the zone. In some years, herders and their livestock also pose a threat to growing crops. To reduce the threat to their harvest, middle-income and better-off households respond by hiring labour to scare away animals that encroach on their farmland.

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 *Bagamayo Kibaha Midland Cashew 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	• Maize, season 1 • Maize, season 2 • Cowpeas • Rice • Cassava • Sweet potato • Coconut • Cashew nuts • Mixed cash crops (oranges, mangoes, pineapples)	• Maize, season 1 • Maize, season 2 • Cowpeas • Rice • Cassava • Sweet potato • Coconut • Cashew nuts • Mixed cash crops (oranges, mangoes, pineapples
Livestock production	• Chicken sales	• Chicken prices
Other food and cash income	• On-farm labour (land preparation, weeding) • On-farm labour (harvesting) • Charcoal sales • Petty trade and small business – volume of trade	• On-farm wage rates in cash (land preparation, weeding) • On-farm labour wage rates (harvesting) • Charcoal prices • Petty trade and small business profit
Expenditure	• maize	• maize price

Programme Implications

The longer-term programme implications suggested below are those highlighted by the wealth group interviewees themselves. All of these suggestions require further detailed feasibility studies.

There were several development priorities that were mentioned by all four wealth groups and which can be categorized under two main headings:

1) Improved agriculture
    - Agricultural extension services to increase crop productivity
    - Wild anima control
    - Provision of disease-tolerant cassava
    - Provision of improved seeds and pesticides
    - Lower input prices
    - Irrigation infrastructure

2) Improved services and infrastructure
    - Provision of tap water and electricity
    - Credit and savings group

- Improve marketing (for fruit, maize and vegetables)
- Loans and credit for tractors for ploughing and other agricultural inputs
- Improved feeder road infrastructure
- Improved health services and greater availability of clinics

In addition to the development priorities mentioned by wealth group interviewees, there were two additional observations made by the assessment team.

1) Promote the sale and consumption of eggs through education about the nutritional benefits of eggs.
2) Promote livestock production by extension workers as the livelihood zone has good grazing and pasture.