

Tanzania Livelihood Baseline Profile

Bahi-Kintinku Lowland Paddy, Sorghum, Maize & Livestock Livelihood Zone (TLZ 21)

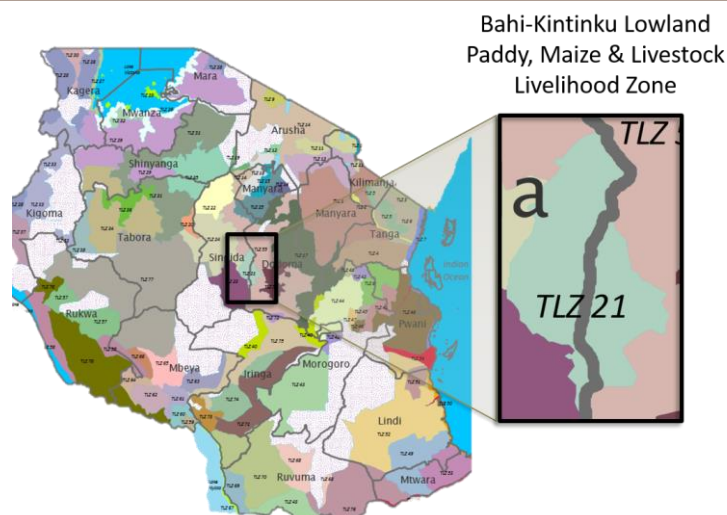
December, 2015¹

Zone Description

This lowland zone is very small, comprising 10 villages in total. It is located in the Bahi depression, also known as the Bahi wetlands. Most (i.e., 8) of the villages lie within Bahi District, Dodoma Region. The other 2 villages are in Kintinku Ward, Manyoni District, Singida Region. Both of these regions are located on the semi-arid central plateau of Tanzania. Rainfall is generally low but due to the wetlands, paddy is grown mainly using flood recession. Rice cultivation is the distinctive feature of this zone and it is grown both for consumption and for sale. Sorghum and maize are the two other staple crops

grown as well as groundnuts and bambara nuts. Crops grown for sale include paddy, sesame and groundnuts. Livestock are also important in this zone, mainly for sale but also for milk. Very poor households depend on income earned from agricultural labor in order to pay for food purchases which are important for about 6 months of the year. This zone is considered food surplus during years of average to good rainfall. However, there are years of low rainfall when many households are food deficit. 2012-2013 was a year when affected households received food aid and the 2014-2015 rains were also very poor. In addition to low and erratic rainfall, farmers also face chronic crop pests and diseases, as well as livestock diseases. These challenges are reportedly worsening due to climate change which has brought more extreme climatic variation to the area. A new threat are plans for uranium mining in the wetlands which could lead to population displacement as well as to the contamination of soils and water. Another problem is that irrigation infrastructure which was built from 1982-1990 (which were years of high irrigation investment) is no longer functional except in a few villages. Consequently, the zone's name has been changed from "irrigated rice" to a name that includes the different staple crops grown by all households. The zone is not very densely populated (26 people per km²).

The main topographical feature of this zone is the Bahi swamp. Located in the Eastern Rift Valley, the Bahi swamp is a natural depression in the land that provides drainage for the surrounding hills and highlands to the north. In years of average to good rainfall, a lake forms in the natural depression. The lake dries up slowly during the long dry season and dries up completely during years of poor rainfall. There is no outflow from the lake. However, several seasonal rivers drain into the swamp, such as the Rivers Bubu and Mponde.² All the rivers that feed the Bahi swamp dry up during the dry season. These seasonal rivers, however, are the main source of water for livestock during the wet season. Reservoirs and seasonal pools are also used, and in the dry season, some boreholes provide additional water access.



¹Fieldwork for the current profile was undertaken from 1-18 October 2015. The information presented in this profile refers to the reference year, which started March 2014 to February 2015. Provided there are no fundamental and rapid shifts in the economy, the information in this profile is expected to remain valid for approximately 5-10 years (i.e. until February 2025). All prices referred to in the document are for the reference year.

² In total, 8 major and 10 smaller rivers feed into the Bahi wetlands. In years of good rainfall, the lake can be up to 30 km in diameter and take 5 years to dry up.

Climate in the zone reflects its lowland location (550-1,200 meters above sea level) on the central plateau. Rains are uni-modal with the single rainy season being relatively short, beginning in November/ December and lasting until March/April. Rainfall amounts average 500-650 mm per year. There is significant inter-annual variability in this region and climate conditions (including rain, wind and temperature) are reportedly more erratic and more extreme in current years. Temperatures in the lowlands are warm throughout the year with normal high-low temperatures averaging 31-18° C. The coolest months during the year are June-September. Vegetation is mainly scrub bush with isolated trees, and pasture growing seasonally after the rains. Although not extensive, some villagers engage in manual salt production, extracted from the edges of the Bahi swamp. Woody resources for firewood and charcoal production are the most common natural resources that are exploited by local residents. Some wild fruits (such as baobab and tamarind seeds) are collected by both men and women for local sale. Uranium is another resource found in the Bahi wetlands. Mining proposals by foreign investors were approved by the government more than 5 years ago and drilling was carried out in 2015 (against the wishes of local residents). Some researchers predict that uranium mines will contaminate local water sources and paddy land, and will displace the local population due to livelihood destruction and health concerns.³ The zone's location about 50-60 km north-west of Dodoma city is served by a major road that passes from Dodoma to Mwanza through Singida.

Wetlands are ideal for paddy production although local soil conditions are described as heavy, moderately fertile with high salinity in some areas, high surface run-off and shallow in depth⁴. Due to poor maintenance, irrigation equipment is no longer widely used and most farmers today combine flood-recession with rain fed agriculture to produce a range of crops. Rice is dominant in the wetlands whereas on drier land, sorghum, maize, groundnuts and Bambara nuts are grown. These are the crops produced mainly for home consumption. Paddy and groundnuts are also commonly sold as is sesame (*simsim*). Production methods are manual for the majority of poor farmers who use a traditional hand hoe to till the soil. Middle and better-off farmers use ox-ploughs for tilling and typically hire labor for other labor intensive tasks, such as weeding, harvesting and threshing. Farming in this area is very low input and very few commercial inputs are purchased. Seeds are taken from household seed stocks or else are obtained from the Ministry of Agriculture (MoA) using cash vouchers. Some farmers apply manure to fertilise their farmland. Other than manure and seeds, farmers do not use other inputs (such as pesticides). The main crop pest affecting the zone is white flies which attack sesame (*simsim*). There is no treatment available at this time to control the flies. All of the various farm tasks are carried out by both men and women, on their own farms as well as on others' farms (i.e., those working as hired farm laborers).

Many of the local farmers also raise cattle, goats and sheep as a supplementary source of food and income. Livestock are free range, grazing on common pasture land as well as on crop residues. Poultry are also kept by most households and they are fed grain concentrates. Livestock are watered from seasonal rivers, reservoirs and shallow pools, supplemented with water from a few boreholes in the dry season. For the most part, households do not pay for water although there were two exceptions (Chipanga A and Mtitaa villages). Only cattle are milked in this area with the peak milking season associated with the rains and the 4 month period from January-April. Typical yields average 1.5 L/day/cow of which one-third to one-half of the milk was sold in the reference year. Livestock are also reared for sale and slaughter. There are certain months during the year when sales typically peak, such as in June-July (when livestock prices are high) as well as in December-January (when households need cash to buy food). Cattle, goats and poultry are all sold during the year. The main animals slaughtered for meat are goats and chickens as well as sheep during traditional ceremonial sacrifices. To maintain herd sizes, some livestock are purchased (usually after the harvest) but in general, milk cows and oxen are replaced from within the herd through calving. Men are responsible for rearing livestock. Women, by contrast, are responsible for poultry. Both men and women deal with endemic diseases affecting cattle, goats and poultry. The most common are CBPP (contagious bovine pleuropneumonia) and CCPP (contagious caprine pleuropneumonia) affecting cattle and goats, and Newcastle disease, which is a highly contagious viral disease affecting poultry. Vaccinations can be purchased on the market to protect against all of these diseases but even for those households with sufficient cash income, they typically pay only for the CBPP vaccination to protect their cattle.

³ Mbogoro, D and Mwakipesile, A. 2010: *Economical and Ecological Research of Bahi Swamp*. CESOPE, December 2010.

⁴ As the Bahi swamp is characterised as an inland drainage system, the soils are affected by highly saline groundwater (Msiija, E.H. 1993: *Irrigation of Wetlands of Tanzania*. Ministry of Agriculture, Livestock and Cooperatives. Dar-es-Salaam. 1993

The Bahi wetlands are located relatively close to Dodoma city (Tanzania's nation capital), just 50-60 km to the northwest. There is a major tarmac road that connects the Bahi area to the city, passing through Singida and ending in Mwanza. Other Infrastructure and services are fairly basic. Nonetheless, villagers have access to primary education, health dispensaries, mobile communication and water taps at the village level. At the ward and district level there are secondary schools as well as health centres. At the household level, people mainly use torches in the evening although solar panels for lighting are favoured by better-off households. Sanitation at the household level is managed with pit latrines. Water is drawn from seasonal rivers, open wells, a few bore holes and from village-based water taps. There is some support for very poor households from TASAF which includes safety net transfers.⁵ World Vision also supports health and education facilities in the zone. Communities themselves also support each other through VICOBA. VICOBA are local saving schemes whereby members chip in money weekly or monthly and once a year each member gets to use the saved sum. There are no other micro-finance institutions at the village level. The UN WFP used to operate school feeding in this zone but this intervention has now stopped.

Markets

Dodoma city is located relatively close to the Bahi livelihood zone and for villagers selling livestock or crops, proximity to this major urban centre is a benefit. There is a tarmac road from Dodoma city to Singida which passes through Bahi District and this road is the main artery connecting rural markets to the city market. Once off the primary tarmac road, feeder roads are mainly dirt. Hence, market access is reasonably good in the dry season but during the rains, roads become muddy and often impassable. This can be a particular problem at the tail end of the rainy season when paddy and groundnuts are often sold. In this zone, the market system is based on mobile traders who travel to the villages to sell supplies and to purchase farmers' produce at farm-gate prices. Paddy, groundnuts and *sesame (simsim)* are the main crops sold. For the most part, Dodoma city is the destination market for local produce. However, the destination market for sesame is Dar-es-Salaam market which also serves as a transit market for sesame exports to Europe. Crop sales occur post-harvest which is June-August for most crops except for groundnuts which are harvested from May to July.

The reverse trend occurs from September-March when traders from Dodoma bring food supplies, such as rice and maize, to the village for local sale. Some village-based traders also travel into Dodoma to buy staple food items for re-sale in their village shop or kiosk. Prices during this period of peak demand for staple grains rise significantly. For instance, during the reference year, maize sold on average for TSh 400/kg post-harvest but during peak demand in the pre-harvest months, buyers paid on average TSh 550/kg. Similarly, the producer sale price for paddy was on average TSh 550/kg. This contrasts with the average consumer price for rice of TSh 2,000/kg.

Livestock are sold at ward-level auction markets. Traders come to the auction markets and buy many livestock at once. The purchased animals are then transported by truck to major urban centres such as Dodoma and Dar-es-Salaam. Peak months for livestock sales usually occur post-harvest because animals are typically in good condition and fetch the highest price at this time.

Many poor households rely on agricultural labor income to make ends meet during the rainy season. These jobs are found mostly within the local area. Poor laborers pick up agricultural work during the cultivation season which starts with land preparation in October and runs until July when the last crops are harvested. This type of paid work is not daily but usually 1-2 a week. Most years, there is very little labor migration out of the zone and in the reference year itself, an estimated 99% of casual labor was found locally on-farm.

Timeline and Reference Year

The most recent production year – November 2014-October 2015 - was considered very poor due to below-average rainfall. This latest drought was associated with a la Nina event that affected the entire Horn of Africa and East Africa. However, the 2014-2015 consumption year, which started in March 2014 and continued until February 2015 was ranked as average to above-average. This was based on the good rainfall of 2013-2014. This ranking reflected

⁵ TASAF: Tanzania Social Action Fund

not only rainfall conditions but also production outcomes for crops and livestock, as well as producer and consumer prices, and market access. Prior to this, there had been a number years with relatively good production outcomes.

Production Year*	Rank	Critical Events
2014-2015	1	Very little rainfall throughout the zone. This resulted into poor crop production and poor pasture conditions. Staple food prices were high. Households sold more livestock, firewood, wild food and handicrafts and also migrated away in search of work.
2013-2014	3-4	Good rains, good pasture and a good harvest.
2012-2013	3	Average rains which led to average crop yields.
2011-2012	4	A year of above average rainfall and good production outcomes.
2010-2011		Villagers did not accurately recall the outcome of rainfall and production 5-6 years ago.
2009-2010		

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

* The production year starts with the rainy season and goes from November to the following October

** The consumption year starts with the green harvest and goes from March to the following February.

Seasonal Calendar for Reference Year

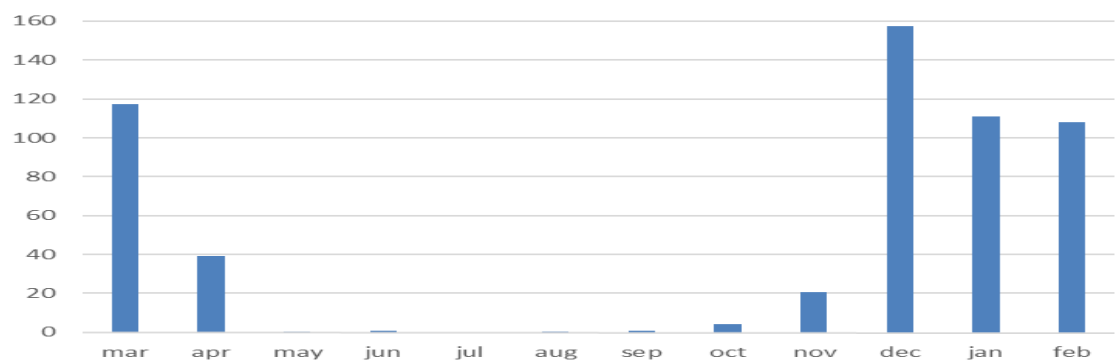
There is only one rainy season in this zone. Often called the “short rains”, the wet season months are November/December to March/April. A mix of rain fed and flood recession agriculture is practised but throughout the zone there is only a single cropping season. Land is tilled in October-November, prior to the rains. The next stage is planting which is carried out between November and January. Staples such as maize, sorghum and groundnuts are intercropped but paddy and sesame are both grown in single stands. Moreover, paddy is technically transplanted rather than planted per se. While crops are growing, there is weeding to do and this labour intensive task peaks from January-March. By late March, maize, groundnuts and Bambara nuts are ready to be eaten fresh or green. The harvest period begins once the rains have ended in April and crops continue to be harvested until June, starting with early maturing crops, such as Bambara nuts, groundnuts, sunflower and maize. In May, the longer maturing crops (sorghum, sesame and paddy) are harvested and this is carried out over several months until June/July. During the two post-harvest months of July-August, crop sales peak.

Milk production peaks during the rainy season as this is the optimal period for calving. The rainy season renews water sources and pasture is plentiful for the cattle herd. Better-off households on average own 12 lactating cows although not all of the cows are milked for household consumption. The milking period peaks during the 4 months of the wet season (January-April) with a typical yield of 1.5 L/cow/day. In this zone, households do not continue to milk their cattle during the dry season so the milk season ends in April. In addition, only cows are milked, not goats. All types of livestock are sold during the year with sales peaking during the cool, dry season from July-September. This is when livestock are in best condition and prices are typically highest. It is also the period of festivals (June-August) and hence there are cash needs at this time. Sheep and goat sales continue for much of the year, especially goat sales which are almost year round (the exception is the harvest months of March-May).

Other labour activities are also very seasonal. There are dry season activities, such as firewood and charcoal sales (August-November), as well as wild food collection and sale (May-June for some wild foods; August-September for tamarind). Salt production and sale is also concentrated toward the tail-end of the dry season (August-October). Furthermore, petty trading is considered a dry “off-season” activity as well. Wet season income earning activities involve agricultural labour and at this time poor labourers have to balance work on their own farms with paid work on the farms of other households. During this period cash needs are high as own-stocks are generally finished; staple food purchases are high; and staple prices are peaking. Moreover, human diseases and livestock diseases are highest during the wet season which means that there are costs for treatments that need to be met.

Month	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Jan	Feb
Rainy/dry season	wet season			dry season						wet season		
Land preparation								land preparation				
Planting										planting		
Weeding	weeding											
Green consumption	g/nuts, maize		harvest									
Harvest						harvest						
Crop sales						peak crop sales						
Cow milk peak	milk										milk	
Livestock sales					peak livestock sales							
Agricultural labour	ag labour							ag labour		peak		
Firewood sales						firewood						
Salt production						salt						
Construction labour				non-ag labour								
Tamarind collection						wild fruits						
Human diseases	diseases											
Festivals						festivals						
Hunger season									hunger season		peak	
Peak staple prices										peak staple prices		

The graph to the right shows average monthly rainfall (mm) in Dodoma Region based on a recent 10-year period (2005 – 2014)
 Source: TZ Meteorology Department



Wealth Breakdown

		Wealth Groups Characteristics					
		HH size	Number of wives	Land cultivated (acres)	Livestock	Poultry	Other
Very poor		5 - 7	1	1 - 3	none	5 - 10 chickens	1 cell phones; 0-1 bicycles
Poor		6 - 8	1	3 - 5	4 - 8 goats; 0-4 sheep	10 - 15 chickens	1 cell phone; 1 bicycle
Middle		7 - 9	1	5 - 9	2 - 4 oxen; 10 - 30 cattle; 10 - 25 goats; 5 - 15 sheep	15 - 20 chickens	2 cell phones; 1 bicycle; 1 - 2 ox plows
Better off		7 - 9	2	9 - 15	4 - 6 oxen; 30 - 70 cattle; 20 - 40 goats; 15 - 35 sheep	15 - 25 chickens	3 cell phones; 1-2 bicycle; 2 ox plows

% of households

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

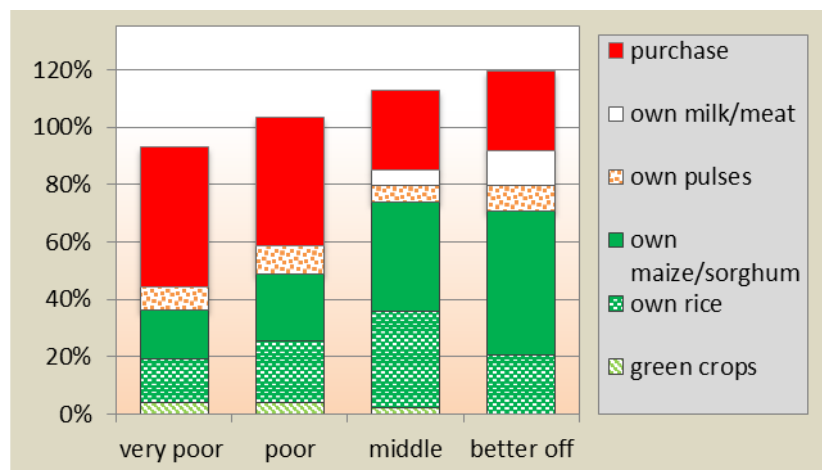
There is a high incidence of poverty in this zone. In the reference year, over half of households (56.5%) were considered poor and very poor. A further 25% of households were ranked “middle” and only 18% were considered better-off. In terms of the population, better-off and middle household sizes are only slightly bigger than poor and very poor households (7-9 members compared to 5-8 members). Thus the proportion of poor to better-off in terms of population numbers would be fairly similar to household numbers.

Land and livestock are the two key assets in this zone and wealth is determined by how many of these assets a household owns. Very poor households own very little land (1-3 acres) and own no livestock at all except some chickens. Poor households own some land (3-5 acres) as well as a few *shoats* (4-12 sheep and goats) but they do not own cattle. Middle and better-off households own land, oxen and plough, cattle, *shoats* and chickens. Thus, they own the same types of assets although better-off households own more. This leads to more food consumption (especially milk consumption) as well as higher income from milk sales, crop sales and livestock sales. This higher level income allows the better-off to cover all their essential costs and also have income left over to cover more discretionary costs.

In addition to land and livestock, which are the two key assets in the zone, there are other productive assets that are distinguish the better-off from the poor. For instance, cell phones, bicycles and ox-and-plough are three additional productive assets. The poor typically own a cell phone and a bicycle whereas only about half of very poor households own a bicycle. Middle households usually own a bicycle for transport as well as an ox-and-plough for tilling. By comparison, better-off households own not just one but a couple of bicycles and two pairs of oxen and ploughs.

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 2014-February 2015. March 2014 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.



For most households their main source of food was own-crop production. This amounted to only about 5 months of food for the very

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.

poor; around 7 months of food for the poor; and 9-10 months of food for middle and better-off households. The consumption of paddy, sorghum, groundnuts and Bambara nuts was quite similar across the wealth groups. What was quite different was the level of own-maize production and consumption. For example, for better-off households, own-maize comprised 25% of their annual food needs. In the case of the poor and very poor, the figure was just 3-4%.

The balance of households food needs was met through purchase. Poor and very poor households bought just enough to meet their basic (survival) food energy needs for the year. By contrast, middle and better-off households bought more than needed for basic survival. Maize was the principal grain bought by all wealth groups. Poor and very poor households bought more maize (26-36% of their annual food needs) as they produced less. They also bought some sorghum and rice which wealthier households did not. Otherwise, households in all wealth groups bought fairly similar levels of other food, including beans, dried fish, sugar and cooking oil. Only better-off and middle households purchased meat during the year.

Differences between wealth groups showed up in terms of milk consumption too. Only middle and better-off households are cattle owners so milk was a food source during the reference year for those two wealth groups only. Own-milk consumption reached 12% of the annual food needs of better-off households which in practice

was about 12 L/day/household for 4 months. Middle households owned about half the number of milk cows (i.e., 5-6) and their milk consumption averaged about 4 L/day/household or 5% of their annual food energy.

Sources of Cash Income

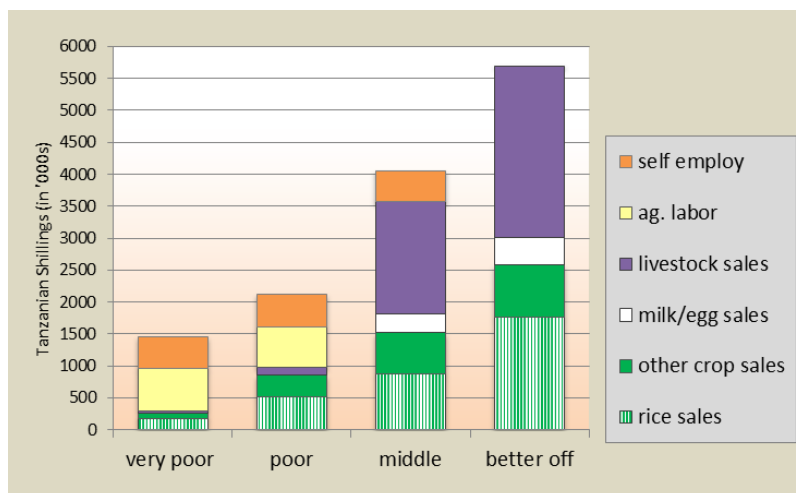
For poor and very poor households, the majority of their income was earned as agricultural laborers in 2014-2015. Usually one person from the household found work roughly twice a week, every week for about 8-10 months in the year. These earnings added up to 45% of the annual income of the very poor in 2014-2015, and 30% of the annual income of the poor. Their other major source of income was selling firewood, charcoal, local brew, local salt and wild fruits (i.e., baobab and tamarind). Cash earned from these sales accounted for a further 25-35% of annual income. These two principal cash sources provided households with some cash in both wet season and dry.

Poor households typically earn more cash income than the very poor and this is managed through the sale of

higher amounts of paddy and the sale of more livestock. The very poor only sold chickens in the reference year and sales of paddy, groundnuts and sesame (*simsim*) added up to an average of TSh 257,000. By contrast, poor households sold a couple of goats as well as a half dozen chickens, and their crop sales added up to an average of TSh 853,400 (or 40% of their annual cash income).

For the very poor and poor households, livestock sales were only about 5% of their annual income. By contrast, livestock sales for middle and better-off households comprised 40-50% of their annual income. In the reference year, it was common for these households to sell 3-6 cattle in the year as well as 5-7 goats and 3-4 sheep. They also sold milk during the 4 months of the wet season when their cows produced milk

For middle and better-off households, the balance of their income was earned through the sales of crops. In this zone, paddy sales are particularly important. For instance, in 2014-2015, sales of paddy alone accounted for 20-30% of the annual income of these two upper wealth groups. A further 15% was earned through sales of groundnuts and sesame. Middle households also earned income through the sale of local brew which was often done on a monthly basis for 8-12 months of the year.



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

INCOME SUMMARY TABLE in Tanzania Shillings				
Wealth group	Very poor	Poor	Middle	Better off
Annual income per household ⁶	1,140,000-1,780,000	1,725,000-2,420,000	3,145,000-5,800,000	4,540,000-6,715,000

Expenditure Patterns

⁶ The average exchange rate during the reference year from April 2014 - March 2015 was 1 USD = 1,675 TZS

The graph presents expenditure patterns for the reference year March 2014- February 2015. While total expenditure increases with wealth, the expenditure breakdown by percent in this graph demonstrates the relative amount of income spent on different categories.

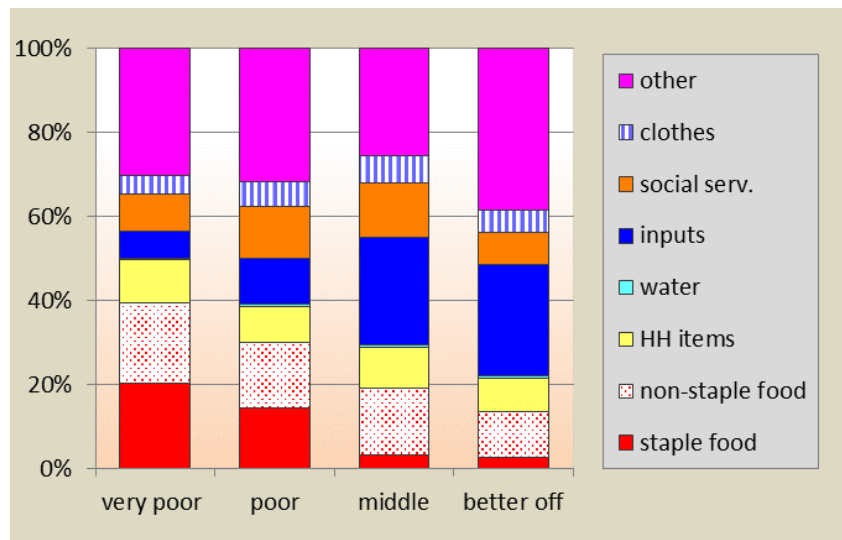
For roughly 6 months of the year, very poor households purchased about 2.5 kg of maize each day as well as other basic food supplies. The cost of this food added up to 40% of their total cash expenditures, of which half went toward maize (and a little sorghum), and the other half was spent on beans, dried fish, cooking oil and sugar.

The pattern was similar for poor households. However, the poor produced more crops; hence they bought proportionately less food. Their food expenditures were an estimated 30% of total cash expenditures in the year.

Another 30-40% of the cash expenditures of poor and very poor households was spent on basic necessities such as clothes, household items (tea, salt, soap, utensils, kerosene, grinding fees and water), school and medicine, and livelihood inputs such as phone credit, seeds and tools. Poor households spent a little more on inputs as they also paid for medications for their animals and also bought a goat or two during the year. The remaining 30% of expenditures included some necessary items such as transport costs and social obligations, as well as more discretionary items such as beer and cosmetics.

Middle and better-off households purchased some staple food during the year, typically about 250 kg of maize or enough for 2-3 months. However, in context of their higher income, maize spending amounted to less than 5% of their annual expenditures. Non-staple food items, such as beans, meat, dried fish, cooking oil and sugar were more costly, and together, these items came to about 12-18% of their annual expenditures.

For the two upper wealth groups, the bulk of their spending was on livelihood inputs. They had significantly higher costs for labor as well as livestock purchase, phone credit, house and vehicle repairs, seeds and tools. These costs came to an estimated 20-25% of their annual expenditures in the reference year. Their other major category of expenses was "other" which includes a mix of important expenses (transport, festivals and social obligations) as well as more "luxury" expenses such as hair cosmetics and beer. For better-off households, these items accounted for about 40% of their spending in the reference year. Notably, middle households spent more on education than the better-off due to a higher priority put on a school education whereas better-off households often needed their older children to help with the family herd.



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

Hazards

Erratic rain and dry spells are very common in this zone. Although the zone consists of the Bahi swamp and wetlands, it is nonetheless part of the semi-arid central plateau where rainfall is relatively low and erratic. Hence, poor rainfall is a chronic problem. The most recent example is the 2014-2015 rainy season which was very poor. This recent drought was associated with the la Nina-El Nino event which in this part of Africa brings drought one year then often flood the next.

Pests and diseases affect both crops and livestock. Many of these are chronic problems in the area. For instance, CBPP and CCPP (which affect cattle and goats respectively) are common across Tanzania’s broad central plateau. These chronic diseases can be managed through vaccinations although this requires cash to pay privately for the vaccination drugs. Newcastle disease is also highly contagious and is deadly for poultry. *Quelea quelea* bird attacks are high once every three years and fierce winds affect crops every 5 years.

Response Strategies

To tackle an emerging food gap, poor and very poor households try to augment their usual ways of earning income, such as looking for agricultural work, or selling firewood, charcoal and wild fruit. Charcoal production in particular is often the fall-back strategy that poor households take to secure income for food purchases.

Middle and better-off households also typically intensify their usual income sources. To this end they typically sell more livestock and/or sell more of their high value crops (paddy, groundnuts and sesame) in order to buy lower-cost food such as maize. They also usually increase their involvement in petty trade or selling local brew.

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 *Lowland Paddy, Sorghum, Maize and Livestock 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 • Sorghum • Paddy • Groundnuts • Sesame (simsim) 	<ul style="list-style-type: none"> • Paddy • Groundnuts • Sesame (simsim)
Livestock production	<ul style="list-style-type: none"> • Cow’s milk (season 1) • Cattle sales • Goat sales • Sheep sales 	<ul style="list-style-type: none"> • Cow’s milk prices (season 1) • Cattle prices • Goat prices • Sheep prices
Other food and cash income	<ul style="list-style-type: none"> • On-farm labour (cultivation) • On-farm labour (harvesting) • Self-employment: firewood, charcoal sales, baobab sales, salt sales 	<ul style="list-style-type: none"> • On-farm wage rates in cash (cultivation) • On-farm labour wage rates (harvesting) • Firewood, charcoal prices; baobab prices; salt prices
Expenditure	<ul style="list-style-type: none"> • Maize (staple grain) 	<ul style="list-style-type: none"> • Maize price
		<ul style="list-style-type: none"> • School fees • Soap prices

Program Implications

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

The key priority for households in the Bahi wetlands is **agricultural improvements** in order to increase production. In particular, two points were highlighted during household representative interviews:

(a) *Provision of agricultural inputs* (such as improved seeds, fertilizer and pesticides). Households currently use limited inputs. The most common input is manure that is used to fertilise fields. A common perspective is that better access to, or provision of, inputs will improve productivity of staple crops.

(b) *Construction and rehabilitation of irrigation infrastructure*: Irrigation infrastructure was once used in the Bahi wetlands but has largely fallen into disrepair. Local farmers view this proposal as a way of adding an off-season cycle in order to increase production.

Another priority in this zone is *Improved services and infrastructure*. This recommendation covers the range of services from health to water and from roads to electricity. Better access to credit services is also desired at the village level.

Very Poor	Poor	Middle-Income	Better-off
Provision of agr.inputs	Provision of agr.inputs	Provision of agr.inputs	Provision of agr.inputs
Construction and rehabilitation of irrigation scheme	Construction and rehabilitation of irrigation scheme	Construction and rehabilitation of irrigation scheme	Construction and rehabilitation of irrigation scheme
Improvement of health services	Improvement of health services	Improvement of health services	Improvement of health services
Supply of water for human and livestock in the villages	Supply of water for human and livestock in the villages	Supply of water for human and livestock in the villages	Supply of water for human and livestock in the villages
	Provision of credit and saving services (VICOBA)	Provision of credit and saving services (VICOBA)	Provision of credit and saving services (VICOBA)
Livestock loans	Livestock loans	Agricultural loans	Agricultural loans
		Electricity networking	Electricity networking
Rehabilitation of feeder roads	Rehabilitation of feeder roads	Rehabilitation of feeder roads	Rehabilitation of feeder roads
Construction of dams to support horticulture	Construction of dams to support horticulture		