Zamfara Mixed Crops LIVELIHOOD ZONE

Cotton, Groundnuts and Mixed Cereals

NIGERIA

Save the Children

DECEMBER 2012

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Funded by:

ECHO

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The Currency Rate:

At the time of field work, in November 2012, the value of the Nigerian Naira was NGN 150 = USD $1.

Photo Credits:

The photographs in the report show the people of Furfuri, Tofa and Wanke villages @ by Jennifer Bush, Nov 2012.

Data Credits:

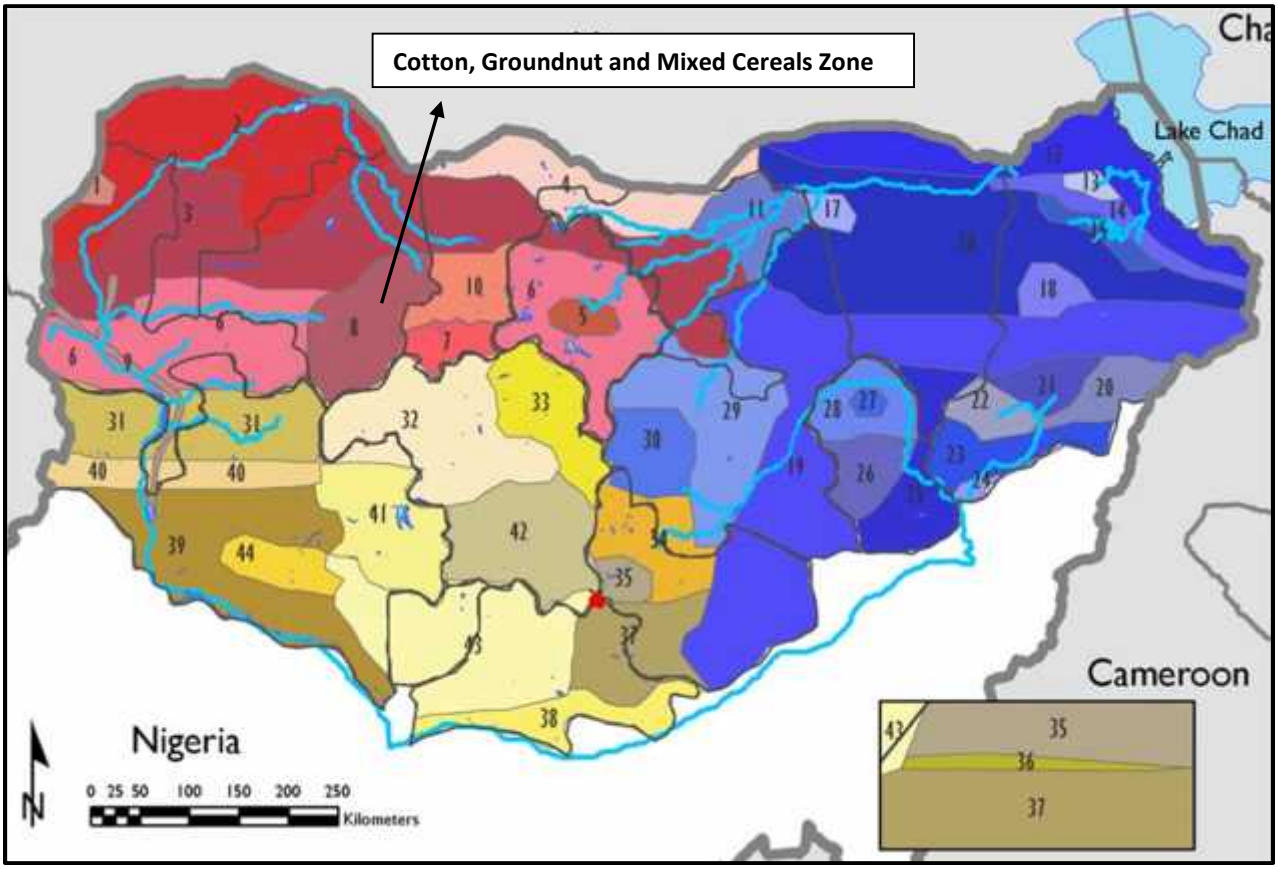
All the food, income and expenditure data graphed in the report is from primary field work. Production data is from Zamfara State (source: ADP Zamfara). Price data is from Gusau, Wanke and Mada markets and is based on primary data collection.

Thanks to:

Special thanks to SC International Zamfara for hosting the training and facilitating the field work, and to SCI partners who released staff for the 3 week event. Moreover the villagers deserve our special thanks for the time they spent responding to questions about their daily struggle for food and cash.

Livelihood Zone Map of Northern Nigeria

(Source: FEWS NET)



Cotton, Groundnut and Mixed Cereals Livelihood Zone Profile

Zamfara State, Nigeria

Map of Zamfara State, Nigeria CG**C Livelihood Zone**

Background and Methodology

For 3 weeks, from 19 November to 10 December, SCI staff and their partners from Zamfara State took part in an intensive Household Economy Analysis / **HEA** training and village baseline assessment. The HEA training involved classroom instruction as well as practical field work to apply the skills learned in class. The HEA assessment investigated the household economy of one livelihood zone. 8 villages were selected purposively to represent the livelihood pattern of the Cotton, Groundnut and Mixed Cereals Livelihood Zone. The field inquiry focused on household food and income access as well as expenditure patterns. These three elements, together with an asset profile, provide an excellent overview of household food and livelihood status. An important factor in the inquiry was organising and analysing data by wealth group rather than by a generic "average" household.

Data for this study focuses on a single livelihood zone. A FEWS NET exercise in 2007 identified 44 livelihood zones across the 15 states of northern Nigeria. Livelihood zones themselves are geographical areas in which households roughly share the same production and income options, as well as similar market access. This report reflects data gathered from the Cotton, Groundnut, and Mixed Cereals Livelihood Zone. This zone is located in 4 Local Government Authorities or **LGA**s namely: Bungudu, Gusau, Maru and Tsafe. The 8 villages selected for the HEA baseline assessment were located in these 4 LGAs with more weight given to picking villages in Bungudu LGA where SCI is operational. [1] As the name suggests, the zone is primarily agricultural, supporting a wide variety of dryland crops including millet, sorghum, maize, cowpeas and groundnuts, as well as rice and (increasingly) soybeans. Some market vegetables are also grown during the dry season on low lying flood plains (i.e., *fadama*). In the selected village from Maru in the southern part of the state, root crops such as sweet potato, cocoyam and cassava are also grown.

There are three main steps in the HEA baseline assessment. At the State and LGA level, secondary data on production, prices, population and hazards are collected and local units of measure are verified. At the village level, a meeting with key informants is held to develop a seasonal calendar and 5 year timeline of major events as well as a summary of the characteristics of very poor, poor, middle income and better-off households in the village

[1] The 8 villages were: Tofa, Furfuri and Bela (Bungudu LGA); Mada and Wanke (Gusau LGA); Yar Tasha and Unguwar Galadima (Maru LGA); and Magazu (Tsafe LGA).

(as defined locally). The wealth breakdown exercise allows the team to organise the next stage of interviews. 6 household representatives from each wealth group are selected. Interviews are conducted separately for each focus group. When possible, male and female household representatives are chosen. During the 3-4 hour interview, household representatives are asked to provide quantified information about the amount of food and cash typically secured by households like them from a variety of different sources (production, purchase, wild foods, gifts, savings, and so on). This data is stored in a baseline storage spreadsheet. In future, it can be used in conjunction with a livelihood impact assessment spreadsheet to predict or assess the impact of change.

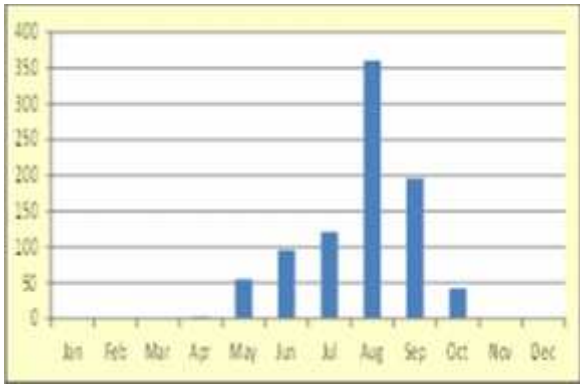
The HEA training and assessment in Zamfara built on a similar effort in Katsina State (the Millet and Sesame Livelihood Zone), which was carried out in November 2010. The Zamfara State assessment was also complemented by a parallel effort in Jigawa State (the Hadejia Valley Mixed Economy Livelihood Zone) led by ACF with support from SCI. These three HEA baseline assessments will be used to help design hunger and poverty reduction programmes in SCI`s operational areas. The baseline data and the Livelihood Impact Assessment tool (LIAS) allow planners to quantify the magnitude of seasonal and/or annual food and income gaps measured against transparent food and livelihood protection thresholds. This type of analysis is useful in determining how much support is needed, when, and to meet what type of need.

The reference year selected for this study was the 2011-2012 consumption year beginning with the harvest in September 2011 and ending in August 2012. This was an average production year marked by rising prices due to the phasing out of fuel and fertiliser subsidies. (See the timeline on page 18)

Overview of the Livelihood Zone

The Cotton, Groundnut and Mixed Cereals Zone (herein called the **Zamfara Mixed Crops Zone**) is located east of the main rice-producing area in the state (which lies along the Sokoto-Rima River Basin complex). The Zamfara Mixed Crops Zone belongs to the sudan-savannah agro-ecological belt. Rain-fed agriculture is carried out during the single rainy season which runs from April/May to October. The peak months are June to August. Cumulative total annual rainfall has varied in the last 5 years from about 1,300 mm in 2008 to 875 mm in 2011 (ADP Zamfara State). The rain-fed growing season is from June to October. Those with access to flood plain land along the Rivers Ka, Zamfara and Sokoto have an extended growing season during the dry season for *fadama* agriculture.

2011 Annual Rainfall (in MM), Gusau (*Source: ADP Zamfara State)*



In the sudan-savannah agro-ecological belt, millet, sorghum, and maize are the principal crops grown for food. Cowpeas, groundnuts, cotton and increasingly soybeans are grown mainly for sale. Some rice is grown in the flood

plains in Bungudu, Gusau and Maru LGAs. However, the Zamfara Mixed Crops Zone is considered by the state's ADP to be a priority 3 area; in short, those LGAs with less, or lower potential *fadama* land. The largest dam in Zamfara State – the Bokolori Dam – lies west of the Zamfara Mixed Crop Zone.

The flood plains and savannah grasslands also provide suitable grazing for livestock. A major advantage of this zone is that it is located in a belt free from the tsetse fly. The Fulani are traditionally known as nomadic cattle herders but settled Hausa farmers also rear mixed herds (including camels, cattle, sheep, goats, and donkeys) to supplement farming.

In the state`s major centres, industrial development has centred around agriculture, livestock and mining. Agro-based industries in the zone include cotton ginneries, tanneries, groundnut oil mills, flour mills, manufacturing of tinned beans, and a few textile enterprises. In addition, there is some mining, mainly of granite but also some gold, chromite, talc, and tantalite columbite. Granite polishing industries are found in each of the four LGAs.

Population numbers in Bungudu, Gusau, Maru and Tsafe LGAs were an estimated 1,198,987 people (based on the 2006 census). This comprises 37% of the total population of Zamfara State. Gusau is the state capital and it is located on a principal transport route between the central urban hubs (Zaria, Kaduna, Kano and Abuja), and the market towns to the north on the border with Niger. The rural population is comprised mainly of Hausa and Fulani although urban areas are home to a greater mix of ethnicities and nationalities.

Crop Production

In northern Nigeria, land is accessed in three ways: it is (i) inherited; (ii) rented-in or rented-out; and/or (iii) purchased. Both men and women inherit land from their parents. Most wealth groups also rent in or rent out land depending on their individual situation, paying a portion of the harvest to the land's owner in exchange. Only better-off farmers do not typically rent-in or rent-out land. Instead, they purchase additional land as needed.

Cultivated land is measured in *ridges.* Typically, 133 *ridges* (0.75m) by 100m comprise a hectare. Poor farmers (who cultivate 1.5 ha or less) do not cultivate food and cash crops on separate land but rely instead on intercropping. Groundnuts might be intercropped with millet or sorghum, for instance, and cotton with cowpeas. Middle-income and better-off farmers reserve 1-2 ha just for cash crops.

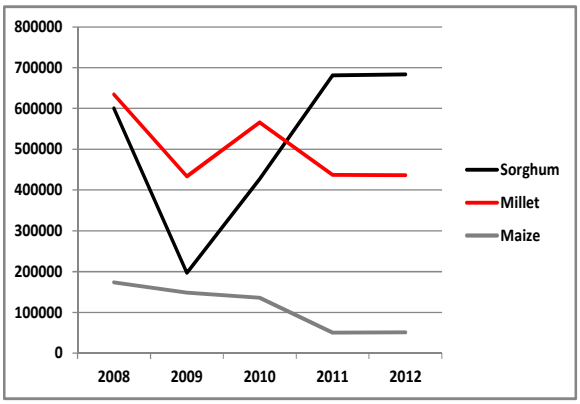
Crop output is measured in *bundles.* Once threshed, grain is measured in *tiers*. There are a different number of *tiers* in a *bundle* depending on the grain. These local units of measure were verified both in the market as well as in each village to ensure accurate calculations of output and consumption in kilogrammes (kgs).

Four main issues have affected crop production over the last five years. The first is **climatic conditions**. In the Zamfara Mixed Crops Zone, there has not been a major crisis in the last 5 years.[2] 2009 was a relatively poor harvest year however. The early end to the rainy season affected sorghum in particular. 2010 saw another poor sorghum harvest due to heavy wind and rain at harvest time. (See graph

[2] The last year of widespread crop failure was 2007.

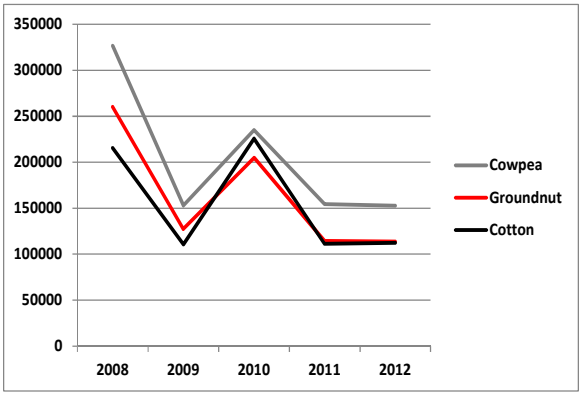
below.) Notably, 2008, 2011 and 2012 have been bumper crop years for sorghum.

Cereal Yields (in MT), Zamfara State, 2008-2012



The second factor is **disease and pests**. The zone has been greatly affected by aphids as well as by other diseases affecting both cowpeas and groundnuts. For both these two crops, production fell in 2011 and 2012. (See graph below. Note that the production pattern for cash crops is the reverse pattern for sorghum.)

Cash Crop Yields (in MT), Zamfara State, 2008-20012



Although farmers suffered a drop in production, they were able to salvage some additional income from the sale of groundnut haulms (i.e., the vegetation from the groundnut plant). Haulms are bought by better-off farmers for fodder.

In light of these production problems, farmers in the zone are increasingly planting soybeans to replace groundnuts as a cash crop. Soybeans have two advantages at present. The current selling price of soybeans favours producers. Moreover, soybeans do not need much fertiliser. This makes it an attractive crop even for poor households.

A third factor affecting production is **fertiliser availability**. Under the Nigeria government`s fertiliser subsidy programme, a sack of fertiliser sold for Naira 1,000. Farmers could purchase 2-3 bags at the subsidised price, supplementing these subsidised sacks with 2-5 additional bags bought at the prevailing market price. Under this system, an estimated 80 percent of farmers used chemical fertiliser together with organic fertiliser. Since 2011, the subsidy has been slowly phased out, leading to a rise in fertiliser prices and declining use. Very poor farmers reportedly used a few *tiers* of fertiliser in the reference year or about 5-10 kgs. Poor farmers were able to afford about 50-100 kg (0.5 – 1 sack) and middle households used 5-10 sacks. Better-off farmers used an estimated 15-40 sacks. Chemical fertiliser is especially used in maize production (see cereal production graph at upper-left showing declining maize output).

Wealth Group	Land Cultivated in 2011	Ave. total fertiliser use in 2011	Ridges p.kg fertiliser
V.Poor	120 ridges	7.5 kg	16 ridges
Poor	200 ridges	75 kg	3 ridges
Middle	665 ridges	750 kg	1 ridge
Better-off	1330 ridges	2800 kg	0.5 ridges

A fourth factor, which has affected cotton in particular are **low international prices**. Prices are low enough for farmers to consider shifting to soybeans as a replacement cash crop.

Livestock Production

Crops and livestock form the basis of the farming economy in the livelihood zone. Livestock have many functions. Milk is both consumed and sold; livestock are sold for cash income; rams are slaughtered for meat during certain religious festivals, and new animals are purchased as a safety net against harvest failure or simply as a place to bank money. Manure is used to fertilise fields and oxen provide draught power to pull a plough or to transport goods.

In Zamfara, both Fulani and Hausa farmers are cattle keepers although Fulani herds tend to be larger. Furthermore, milk sales are more common amongst Fulani herdsmen. Amongst the Hausa, cattle are kept for their draught power rather than for breeding (or milking). Amongst the Hausa, only the better-off typically consume and sell fresh milk. Milk production peaks for 3-4 months during the rainy season (June-September) then continues, with lower yields, for another 2-3 months. The rainy season is when livestock are near the villages. Milk yields (for human use) range from 1-2 L per cow per day of which half is typically sold.

Camels are not very common in the Zamfara Mixed Crops Zone. Nonetheless, this situation is changing as camel rearing is beginning to spread south from the LGAs bordering Niger toward the central and southern LGAs of Zamfara State.

In very poor households, the household head typically does not have any livestock. However, very poor women typically have a few sheep and goats of their own as well as poultry (hens, ducks, or guinea fowl). These animals are kept to generate cash income when needed. During the reference year, as much as 100 percent of the original herd was sold for cash.

Notwithstanding these sales, herd sizes stayed relatively stable over the year due to new births. Sahelian goats (a popular breed in the state) produce less milk than the Sokoto Red breed but are still favoured because a breeding female can give birth to 3-4 kids.

One problem affecting small stock is **disease.** The state is notably free from tsetse flies (which affect cattle). However, the livelihood zone is prone to PPR, a disease that affects small stock. Every year, according to the state ADP, a single household will typically lose 2-3 goats from PPR. With support from IFAD, the state government implements an annual vaccination campaign to try to prevent outbreaks of PPR. Despite this effort, the disease is considered a significant problem.

A second problem affecting livestock production, as reported in Tofa, was **access to fodder**. Groundnut leaves (amongst others) are used as livestock fodder and leafy fodder was scarce in 2011-2012. Subsequently, goats gave birth once in the year, not twice.

Markets

Market Routes, Demand and Supply

Market days are important days in rural life and major towns host the market on different days of the week: Monday and Friday in Gusau; Thursday in Shinkafi; and Wednesday in Wanke for example. Market flows depend on the type of good. See **Annex 1**. In general, livestock come from the north (including Niger and the northern Nigerian states) and are sold south. Demand for meat comes from the large urban markets in central and southern Nigeria (including Kaduna, Zaria, Abuja, Lagos, Port Harcourt, and so on). In contrast to the south-bound livestock flow, grains and legumes are exported north to Niger. Overall, Zamfara State is a net exporter of grain.[3] However, during the year, there are seasonal imports. Specifically, during the rainy season, millet, maize and cowpeas are imported into the Mixed Crops Zone from the Niger Delta states. Local sorghum and local rice are generally sufficient to meet local demand and are not imported.

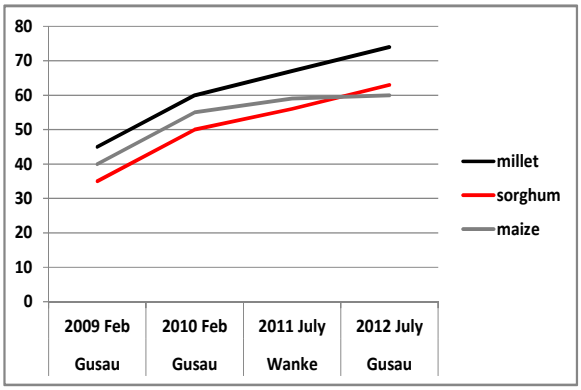
Zamfara's cash crops –groundnuts, cowpeas, soybeans and cotton – are generally sold to major buyers in Nigeria. (i) Groundnuts are sold both to oil mills in the state as well as to larger markets such as Kano and Illela (Sokoto State). (ii) Cow peas are also sold to major urban markets in Nigeria as well as to neighbouring countries. (iii) Soybeans are exported (i.e., to Niger) and are also sold to major buyers within Nigeria to make oil products or to use in supplementary protein mixes for malnourished children. (iv) Cotton sales are mainly within the livelihood zone as most local cotton is destined for ginneries within Zamfara State.

Cereal and Legume Price Trends

Prices for staple grains are lowest in November-December directly after the harvest. Many farmers are forced to sell at a low price to re-pay debts taken during the growing season. Prices then rise from February onwards, reaching their peak price during the rainy season (i.e., June-August). During the reference year, prices for millet and sorghum were 30-50 percent higher in July than in November.

In the last 4 years, prices for staple grains as well as prices for most produce have slowly increased (see graph below). These price increases can be attributed to the phasing out of fertiliser and fuel subsidies. The price rise will likely continue next year as subsidies are fully phased out in 2013.

Grain Price Trends per KG in Naira 2009-2012, Gusau

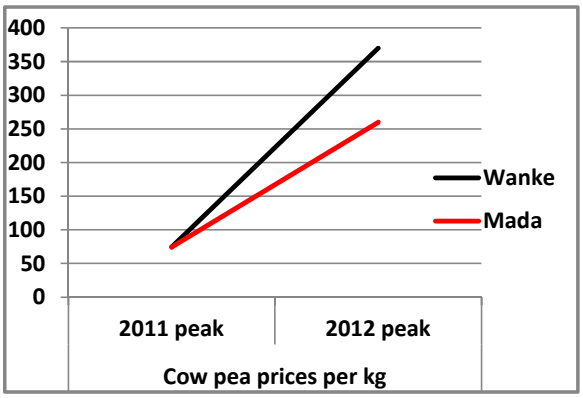


The 2011 and 2012 price rise for cowpeas, by contrast, was attributed to reduced supply from disease and pests, not rising input costs. For example in Wanke and Mada village markets, the price for cowpeas rose from NGN 74/kg in 2011 to Naira 260-370/kg at its peak in 2012. In short, the price increased to **400%** of its 2011

[3] Only in 2009 – which was a particularly poor production year for sorghum – were there no grain exports.

value. This steep price change was not seen for groundnuts.

Cowpeas, NGN Price Trends per KG 2011-2012



Livestock Price Trends

Livestock prices also have seasonal highs and lows which reflect seasonal trends in demand as well as seasonal changes in animal health and condition. Prices peak during religious festivals in November / December when demand is highest. Sales are also high in April/May at the start of the growing season when farmers need to pay for inputs. Poorer farmers typically sell goats in July/August to pay for food while their crops are still growing in the field. During the reference year, the seasonal price changes were not extreme. For goats, prices increased by 20 percent from October (low price) to July (peak price); for sheep, prices increased by 30 percent; and for cattle, prices increased by 10 percent although there was also variability in prices (and seasonal price differences) between markets.

Seasonal Calendar

In the Zamfara Mixed Crops Zone, agricultural activities dominate the seasonal calendar for 8-9 months of the year. Just before the first rainfall in April/May, land preparation begins, followed by planting. The June to September period marks the peak rains. This is the growing season for crops when last season's stocks are scarce and many poor farmers look for additional farm employment to avoid hunger. Short-cycle millet and maize ripen first after 60-70 days. By late August, poor farmers begin to consume maize and millet fresh (or green) from the field. Millet and maize are harvested in September and October followed by the groundnut harvest. Sorghum ripens later (after 90 days) and is harvested with cowpeas in November. Cowpeas are also eaten fresh from the field, supplementing the millet harvest in October. Cotton is the other crop harvested in November. In favourable conditions, a second planting of vegetables provides an additional cash crop harvest in November/December. Farmers with access to irrigated, *fadama* fields have a dry season harvest as well. For instance, irrigated rice is planted in December or January and harvested in April just prior to the onset of the rain-fed agricultural season.

Forest or bush products are also available during the rainy season. The availability of wild plants is short (i.e., 1-2 months toward the end of the rains). Bush products include foods such as the baobab fruit and leaves. Baobab leaves are used in soup whereas the fruit is dried into a powder and sold in local markets. There are other wild plants sold for income, such shea nut. Local shea nut is sold mainly to OLAM International, a company that exports of number of agricultural products from Nigeria (including cashews and cotton). Field plants and flowers are also sold for export, such as merengue leaf and the hibiscus flower (both red and white). Merengue is sold internationally for use as a water purifier as well as for use in diabetes treatment. Hibiscus likewise has international markets.

Seasonal Calendar, Zamfara Mixed Crops Zone

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rainy Season												
Millet, Maize, Cowpeas				LP	P	W	W	GH	H	H		
Sorghum				LP	P	W	W	W		H	H	H
Cotton				LP	P					H	H	H
Irrigated crops	P	W	H	H	H							
Wild foods												
Livestock milk production						peak	peak	peak				
Livestock sales				peak	peak							peak
Labour		migrant	labor	agri	labor				peak	agri	labor	
Food purchase						peak	peak	peak				
School expenses	peak			peak					peak			
Health expenses	cough			cholera		malaria						cough

Typically, once the harvest is in, older boys and young men leave their village in search of construction work in urban centres (such as Gusau, Sokota, Kaduna and Abuja). Typical construction work includes brick making and/or brick laying; loading and portering goods; and loading and delivering water. Boys are also hired as herders, especially when the cattle are taken to dry season pastures in Sokoto and the Niger delta states from February/March.

During the dry season, girls and young women also look for casual work. Typically, they earn income through firewood sales (this is mainly a dry season activity) or by selling prepared foods and local drink. Women also sell their own small stock and poultry as well as undertake daily work such as crushing rocks. Pounding grain into flour is a job that is in demand all year round. Some girls are also hired on as domestic help.

For most poor households, the agricultural season means an intensification of work. Not only must they work on their own farms but they also need to look for daily employment to fill food gaps. Both women and men find on-farm work from May-December. Agricultural work has a defined gender division of labour. Women, in general, do not harvest millet, sorghum and maize. They do, however, harvest cowpeas and groundnuts. Women are also employed to thresh grain. Typically, young unmarried women, as well as women older than 45 years, are employed in farm work.

Household expenditures have seasonal peaks and lows. Food, health and input expenses are lowest during the harvest period (September-November) although poor farmers often have debt repayments to make. Input expenses are highest in April when fertiliser is purchased. April to August is the period when food

expenses are highest. The poorest household typically begin buying staple food in February. By June, the majority of households have to purchase their staple food. The rainy season also brings malaria and associated health expenses. Health costs have several peaks during the year. The first peak is during the rainy season. The second peak occurs during the cold windy harmattan season which is associated with coughs and colds. Prior to the rains, cholera outbreaks often occur. For livestock, the peak expenses occur in August/September during the rainy season.

Livestock production peaks with the rains as rain brings new pasture and new animal births. Access to own-milk is highest from June/July to December. After this period, beginning in January, livestock migrate away to dry season pastures. By March, most of the herd is gone, returning once good pasture is established again. Their migration route is generally toward the Niger delta states as well as to neighbouring states (Kaduna, Katsina and Sokoto). In a dry year, cattle will be herded away to dry season grazing areas earlier (i.e from November) which reduces access to milk.

To bridge income gaps at times of the year when input or food expenses are high, poor households typically take loans. These loans are taken in a number of forms. One type of loan is for ploughing. There are various arrangements but one option is for a worker to be partly paid in ploughing rather than directly in cash. Another type of loan is for fertiliser. During the reference year, the State government provided subsidised fertiliser (NGN 1,000/sack) to households in exchange for payment in grain post-harvest (the grain went to the Emergency Food Reserve). Another type of loan is prepared food. Women provide breakfast to workers who repay at the end of the day (or every other day) once they have received their daily wage.

Wealth Breakdown

In rural Zamfara, wealth is determined principally by how much land is cultivated. Other assets also contribute to wealth, particularly productive assets such as plough oxen, fertiliser, ploughs, other draught animals and irrigation pumps. Wealth status is reflected in education levels – some children from very poor households do not even complete primary school – as well as in the ways households earn their income.

Land is inherited by both men and women. Better-off households access additional land through purchase or rental. Very poor households cultivate 0.5 -1 ha of land (typically inherited; sometimes rented-in). In the reference year, this amount of land was sufficient to provide food stocks for 2-4 months post-harvest. Poor households cultivate 1-2 ha of land which provided food for 5-6 months post-harvest. Middle-income households cultivate 4-7 ha of land, both inherited and rented-in. Of this, about 1 ha is reserved for cash crops. The remaining land is typically sufficient to produce food for a household of 14-15 members for the full year. Better-off households cultivate 6-8 ha of land that they inherit as well as purchase. They typically produce food in surplus to the annual needs of a household of 20. Note that better-off and middle-income households use about 30 percent of their land for cash-cropping. The poor, by contrast, intercrop food and cash crops as their land is more limited.

Another significant asset that determines wealth status is plough oxen. The very poor do not own oxen. Some poor households own an

Wealth Breakdown, 2011-2012

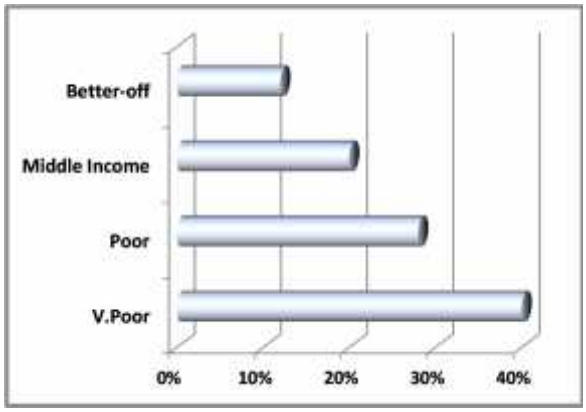
	Wealth Group Information			
	Very Poor	Poor	Middle	Better-off
HH Size	7	10	14	20
No. of wives	1	1-2	2-3	3-4
Area cultivated**	120 ridges	200 ridges	665 ridges	1330 ridges
Livestock	0 cattle	0-1 cattle	2-8 cattle	5-35 cattle
	0 ox	0-1 ox	2-6 oxen	4-10 oxen
	0-5 shoats***	5-10 shoats	10-40 shoats	20-60 shoats
	0-1 donkey, 10 ooultry	0-1 donkey, poultry	1 donkey, poultry	2 donkeys, poultry
Assets		0-1 plough	2 ploughs	2-3 ploughs
Main food sources	purchase	purchase	crops	crops
	crops	crops	purchase	purchase
				milk & meat
Main Income Sources	labour	labour	petty trade	crop sales
	firewood sales	firewood sales	crop sales	trade
	petty sales	petty sales	livestock sales	livestock sales
** 133 ridges x 100m = 1 ha		*** shoats = goats + sheep		

ox or access 1-2 oxen through loans; they provide farm labour and in exchange they use the oxen to plough their land. Wealthier households own a couple of pairs of oxen, if not more.

Cattle and camels are almost exclusively owned by middle-income and better-off households. Middle-income households typically own 2-10 cows. Better-off households own herds of 10-35. This asset gives wealthier households access to manure, milk, meat and cash income.

Poor households do own small stock (often these animals are owned and managed by women). The very poor typically have 0-5 goats and sheep whereas poor households own a mixed flock of 5-10 sheep and goats. The numbers substantially increase for wealthier households. Husbands and wives from middle-income households generally own mixed flocks of 10-30. In better-off households, only women typically own small stock and their combined flock comprise an estimated 30-60 small stock.

Proportion of Households in each Wealth Group, 2011-12



In the Zamfara Mixed Crops Zone, the poor and the very poor comprise the majority (60-70 percent) of households. An estimated 30-40 percent of households fall in the middle-income and better-off wealth groups (of which about 12 percent are better-off). Although this is a rough

estimate, it provides a clear indication of the extent of poverty in the zone.

Household Size

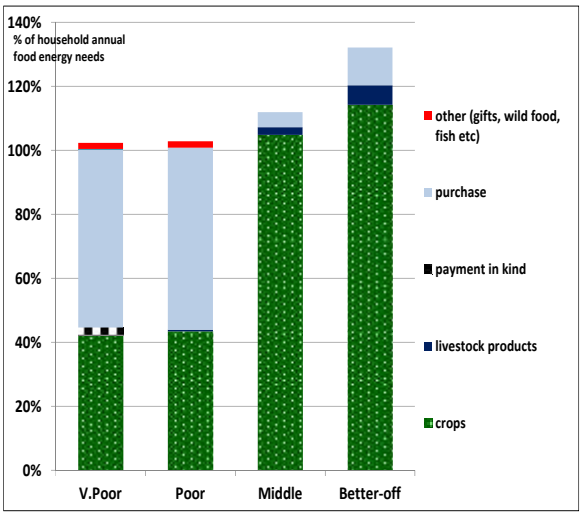
Household size typically increases with wealth. Very poor households typically have 6-8 members; the poor have 10 members (the range is 8-12). Middle-income households have a typical household size of 13-15 members; and better-off households have about 15-25 members. Larger households reflect polygamous arrangements whereby one man is married to several wives. The extended family compound may also include other "dependents" such as elderly parents or unmarried siblings.

Given different size households, the proportion of the population in each wealth group is as follows: Very poor comprise 26 percent; the poor are 26 percent; middle-income are 26 percent; and the better-off form 22 percent.

Food Sources

In the Zamfara Mixed Crops Zone, agriculture is the primary economic activity. From the 2011 harvest, middle-income and better-off households secured sufficient food to last the entire year with surplus food also stocked in reserve. By contrast, poor and very poor households met just 40-45% of their annual food energy needs through own crop production. What distinguishes the very poor from the poor is that the very poor cultivate mostly sorghum, millet and maize for household consumption. They produce very few cash crops for sale (see the income source graph on page 15). Poor households produce both food and cash crops. For this reason, own consumption from food crops was at a similar level (40-45% of annual food needs) for both poor and very poor households even though the poor cultivate about 0.5 ha more than the very poor.

Annual Food Sources, 2011-2012



Both the poor and very poor households eat very little of their legume crops. Amongst both of the poorest wealth groups, households sold over 85 percent of their soybeans and over 95 percent of their groundnuts as well as 35-70 percent of the cowpea harvest. These proportions are similar for all wealth groups. However, middle-income and better-off households produce more of these crops. Hence, despite selling more than 80% of their legume crops, these two upper wealth groups nonetheless secured 8-10% of their annual food needs from cowpeas, groundnuts and soybeans. This compares to 1% for poor households.

For 6-8 months of the year, the very poor and poor purchase their food. In a middling year – such as the year following the 2011 harvest – food from their harvest lasts until February/March (the very poor) and April/May (the poor). In fact, most poor households begin to supplement their own grain stocks with purchased food in January/February. By May-June, the poor rely solely on the market.

During the rainy season, while crops were growing, poor households secured food by earning cash or grain through local agricultural employment. They also borrowed. In Nohoche (the pilot village), household representatives from the very poor wealth group described their system of food loans as follows:

"*From February to August we have to borrow food every day for our morning meal. We may borrow* ***kuli kuli*** *(fried groundnut balls) or* ***hoche*** *(maize cake eaten with stew) or* ***fura*** *(millet/sorghum porridge cooked with either water or milk). Typically, we spend about NGN 240 every day on this meal. We usually pay back this debt after two days. If we don't pay, we cannot keep borrowing."*

An important finding is that the poor have very little dietary diversity. Whether grown or purchased, poor households principally eat sorghum and millet. They bought a little oil, collected local greens and a little fruit, and used very small amounts of their own cowpeas and groundnuts. By contrast, middle-income and better-off households purchased non-staple foods (such as oil, sugar, rice and sweet potato) and ate more of their own legumes and rice.

In Zamfara Mixed Crops Zone, livestock are kept mainly as draught animals rather than for dairy. Milk and meat (and some eggs) provided on average 2-6% of the annual food needs of middle-income and better-off households. Milk is also an important cash source. Better-off households sold about one-third (30-35 percent) of their milk to earn cash. In the Zamfara Mixed Crops Zone, milk is typically consumed only from cows. Milk from goats and sheep are left for their own offspring.

In the 2011-2012 reference year, food gifts on average amounted to 2 percent of poor and very poor households' annual food needs. Gifts of grain were typically received through community *zakat*, post-harvest. Alternatively, gifts were given in the form of a meal during Ramadan. The State government also operates feeding centres for fasting Muslims from poor families during Ramadan. Another form of gifts is from begging. In Furfuri, women from very poor households reported that their children went into the village to beg when food at home was scarce. Overall, in 5 of the 8 villages visited gifts were recorded. The maximum amount received was 5 percent of a very poor household's annual food needs.

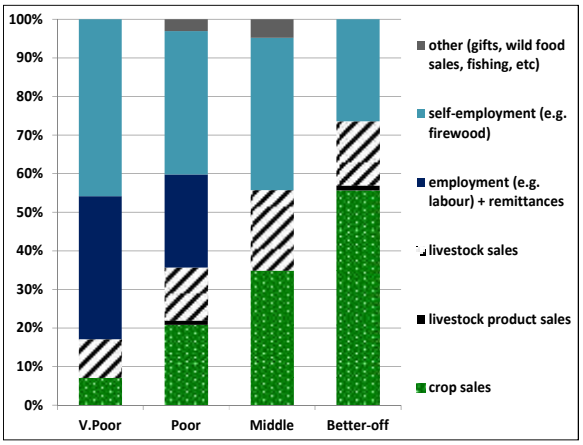
Income Sources

In the Zamfara Mixed Crops Zone, a distinct pattern of cash earning distinguishes the poor and very poor from the middle-income and better-off wealth groups. Middle-income and better-off households combine cash crop sales with trade and sales of livestock (as well as some milk) to raise cash. The poor and very

poor, by contrast, combine petty sales with seasonal labour. (See graph below.)

What marks the poor from the very poor is the capacity to raise cash through cash cropping. Poor households cultivate more land which allows them to plant cotton as well as other legumes and grains for sale.

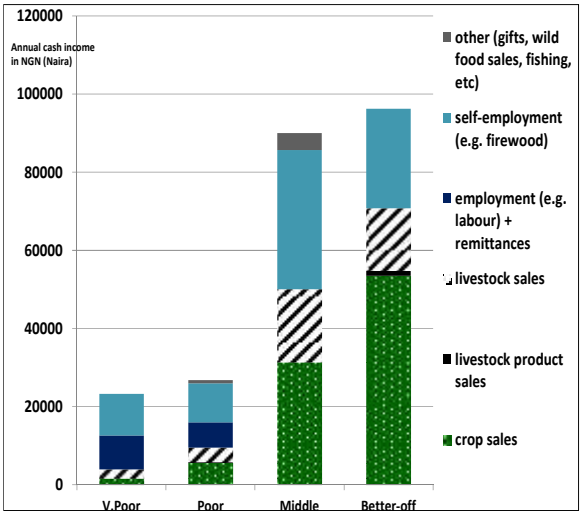
Proportional Importance of Annual Income Sources, 2011-2012



On average, poor households earned NGN 4,600 per capita per year more than very poor households from cash cropping. 25 percent of these cash crop earnings was from cotton. The rest was derived from sales of groundnuts and soybeans followed by cowpeas and grains (including rice). Not all poor or very poor households engage in cash cropping. Amongst the very poor, the incidence was low. In roughly 3 or the 8 villages visited, the very poor grew some cash crops. Amongst the poor, the incidence was higher. In 7 of the 8 villages visited, poor households cultivated some cash crops (including, in 4 villages, cotton).

For poor and very poor families, most of their cash income is earned through daily labour. Income is earned through a mix of different income activities. Typical off-farm work for **men** includes brick making, construction, loading, hauling water, and cutting firewood.[4] Only men and older boys migrate away in search of casual work on construction sites (not women). The major labour markets include: Gusau, Sokoto, Kaduna and Abuja.

Annual Income Sources per capita in Naira, 2011-2012



On-farm labour opportunities begin in April. Casual farm work includes: land preparation, weeding, and harvesting. Cash rather than grain is the preferred payment. Daily wage rates during the reference year were NGN 400-500/day for local farm work; NGN 500-700/day for urban work. Ploughing pays more; a hired labourer in the reference year earned NGN 700-800 to plough 100 ridges.

> In the last 2 years, disease and pests have greatly reduced groundnut yields. Nonetheless, one advantage of groundnuts is that their leaves (*haulms*) are a source of fodder for livestock. 10 bags of groundnuts provide 50 bags of *haulms.* In 2012, just before the rainy season, 1 bag of haulms was selling for NGN 1,000.

[4] The full range of activities includes work as a tailor, mechanic, carpenter, pottery producer, herder, taxi moto, and stone crusher.

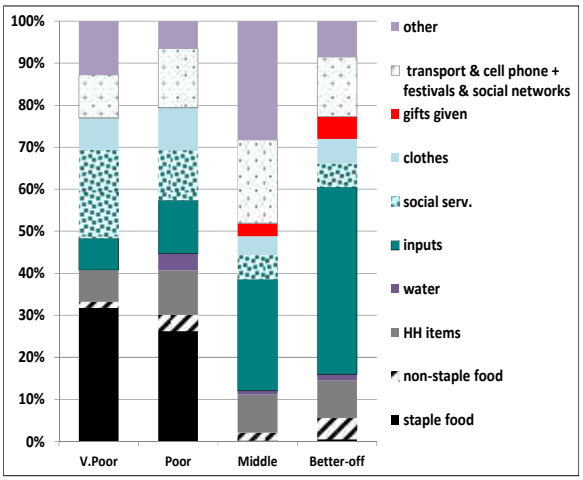
Women earn income by pounding grain, crushing rocks and selling firewood. They also sell prepared meals or snacks and local drinks. Women furthermore earn cash by styling hair or working as a tailor. Furthermore, women earn income through the sales of goats and sheep. Better-off women run small businesses such as lending grain (at interest) to salaried village residents. On-farm labour for cash or in-kind payment mainly involves threshing. Older women, as well as older, unmarried girls, are also hired during the cash crop harvest (groundnuts and cowpeas). Although some poor women leave their compounds to engage in sales and petty trade, in many cases children do the marketing for their mothers.

The two upper wealth groups earn 25-45 percent of their annual income from trading activities. They manage local grain and livestock trading enterprises, run village shops, and sell higher value goods such as petrol or clothes. They also earn cash through blacksmith or carpentry trades.

Expenditures

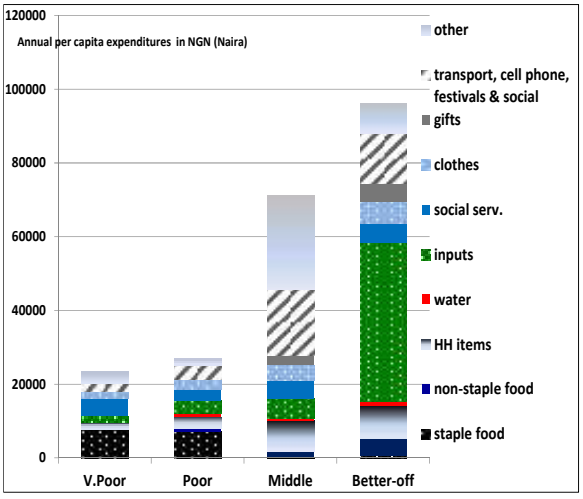
About 30 percent of spending during the reference year by the poor and the very poor households is on food. The black bar in the graph at right illustrates staple food spending. Principally, poor and very poor households bought millet and sorghum. Poor households were able to diversify their food purchases a little, supplementing staple grains with some oil, cassava, sweet potato, rice and maize. Middle-income and better-off households did not need to buy staple grains. Instead, they bought non-staple foods to add dietary diversity, including oil, sugar, rice, cocoyam, cassava, meat, fish and pasta.

Proportional Expenditures by Wealth Group, 2011-2012



The graph below shows per capita spending over the reference year for each wealth group. Expenditures per person (or per capita) are not very different between the two poor groups. The poor earn a little more and this translates into a little more spending on non-staple food, festivals and clothes as well as on labour-saving services such as firewood, water hauling and grinding.

Annual Expenditures per Capita in Naira, 2011-2012

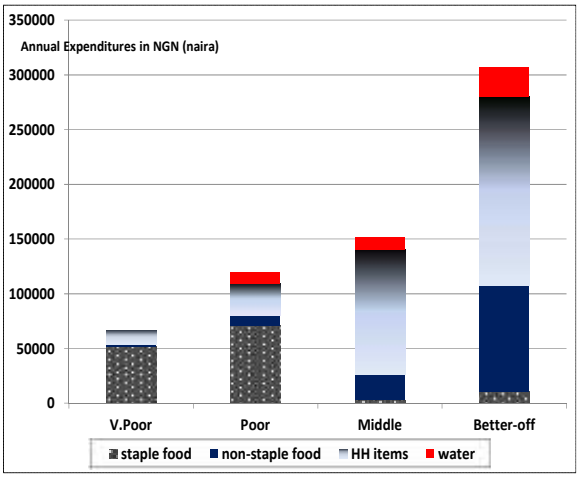


Middle-income and better-off households also spent more cash income on **labour-saving** goods and services. The graph below compares spending on *household items* (including water,

firewood and grinding as well as salt, soap and kerosene) across the wealth groups. In terms of total spending, the difference is significant. For instance, middle-income households on average spent NGN 5,860 *per person* on firewood, grinding and water compared to NGN 550 *per person* by the very poor, and NGN 2,560 per *person* by the poor.

> In Furfuri, a sign of poverty is that the very poor cannot afford to buy bar soap. Instead, they use powder for washing clothes and for washing their hands and bodies.

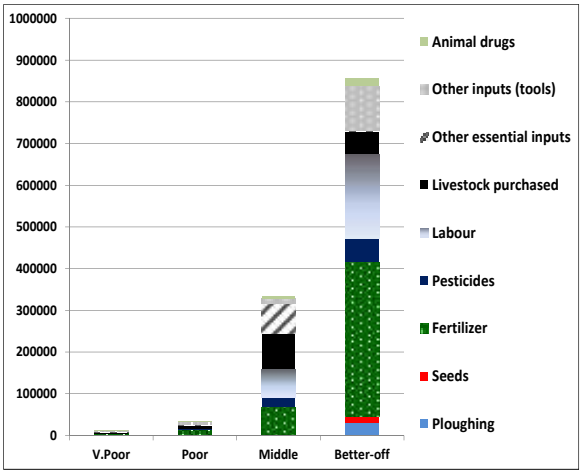
Annual Household Expenditures in Naira on Food, Water and Other Household Items, 2011-2012



For very poor households, their limited income means prioritising key goods and services; in this case staple food (30 percent of annual expenditures), and **health and education** (20 percent of annual expenditures). At primary level, school expenditures comprise a PTA contribution (NGN 100-150 per child per term) as well as the school uniform (roughly NGN 500-1,000 per child) and other supplies (NGN 200-500 per child). Health expenses can vary widely by household but as a rule of thumb, the poor said: "*Most years, we don't spend less than NGN 2,000 per person on health costs*."

Livelihood inputs absorb significant cash during the year for middle-income and better-off households (see graph below). This category includes a number of items, including seeds, tools, labour, fertiliser, pesticides, land rental, ploughing, livestock drugs and livestock purchases. Better-off household spent almost 50 percent of their annual cash earnings on livelihood inputs. Middle-income households spent almost 30 percent. For better-off farmers, their greatest expense is **fertiliser**. In the reference year, spending on fertiliser comprised 43 percent of their livelihood input spending (and 20 percent of total annual expenditures). **Labour** was the second greatest expense. Paying farm workers comprised about 23 percent of livelihood input expenditures (11 percent of total annual expenditures).

Household Annual Expenditures in Naira on Livelihood Inputs, 2011-2012



Hazards and Coping

Across the Sahel, drought events have been associated with certain decades. The 1940s witnessed major droughts, as did the 1970s and 1980s. This last period was particularly severe.

Drought affected more than 70% of northern Nigeria and occurred almost every year from 1982-1987. The drought probability rate for the 1980s was 83%. The 1970s were almost as dire with a 50% drought probability rate. Extreme dryness occurred almost every other year (affecting 50-70% of the north).

For instance, a 2007 study showed that during the 34 year period between 1973-2007 there was an increase in 1.43 degrees celcius and a decrease of 178 mm rainfall from the 34 year period just prior i.e., between 1938-1972 (Odjugo 2010, p:4).[5]

Timeline of Events, 2008-2012, Zamfara

YEAR		Rank	EVENT
2012	rains+harvest	4	Average to poor harvest for millet & cowpeas. Excellent harvest of sorghum. Farmers are replacing groundnuts with soya beans due to groundnut pests and disease. Flooding in Zamfara State (north-west of the zone).
	dry season	3	Partial removal of fuel and fertiliser subsidies. Relatively high food prices due to removal of subsidies. Violence and displacement in the north.
2011	rains + harvest	3	Relatively poor rains but a decent harvest. Groundnuts and cotton were affected by disease.
	dry season	2	National elections with associated violence.
2010	rains + harvest	3	Government provided free certified seeds and fertiliser was subsidised (NGN 1,000 per sack). However, heavy rainfall and wind in October affected the sorghum harvest. Good cash crop harvest on fadama land.
	dry season	2	Insecurity in the north. Food prices were relatively high.
2009	rains + harvest	2	Dry spell led to low sorghum harvest. Fertiliser deliveries were delayed.Flooding occurred in north-west LGAs of Zamfara State. The Government provided relief food and staple food prices were subsidised in the market.
	dry season	3	Beginning of insecurity in the north
2008	rains + harvest	5	Good rainfall conditions. Agricutural inputs were available. Good harvest.

In the last 5 years (2008-2012) the Zamfara Mixed Crops Zone has not had a severe climatic event. Bad flooding during the 2012 rains affected the northern part of the state (Shinkafi LGA) prompting an emergency response but this was outside of the zone. Within the zone, the principal hazards in the last 5 years were crop pests and disease combined with reduced subsidies on fertiliser.

Nonetheless, climate change is expected to bring an increase in extreme hazard events, such as flooding or drought or major pest and disease epidemics. In addition, another aspect of climate change is a gradual warming of temperatures and a greater unpredictability in the seasons. Research from Nigeria confirms that these trends are already being observed.

Farmers have adapted by planting millet and short-cycle hybrid maize as well as groundnuts and cowpeas. Nonetheless, this warmer and drier trend, coupled with climate unpredictability and associated hazards (such as pests) will pose a significant challenge to farmers in the coming years.

When there are major production shortfalls, households have 3 basic options: (i) increase income; (2) reduce non-essential expenditures and instead buy staple food; and (3) reduce food intake.

[5] Dr. Odjugo, Peter. 2010: *Adaptation to Climate Change in the Agricultural Sector in the Semi-Arid Region of Nigeria*. Paper presented at the Climate, Sustainability and Development in Semi-Arid Regions Conference, Brazil.

Increase Income

In Zamfara Mixed Crops Zone, the ways that people increased their income when faced with an economic shock reflected their wealth status. Wealthier households have savings banked in livestock, for instance, that can be sold. Poorer people have few assets. Instead, they must intensify their labour in order to raise additional cash.

Coping Strategies to Increase Food and Income

Very Poor, Poor

Plant short cycle millet to ensure access to fresh grain in late August.

Migrate away for 8-10 months rather than 4 months.

Increase firewood sales; sell firewood daily throughout the year, including in the rainy season.

Collect and sell bush foods such as baobab fruit when in season.

Increase daily labour twice per day, every day, up from 4/week

Middle, Better-off

Increase livestock sales by 1-2 cattle and 2-5 shoats;

Sell other assets and household items;

Increase trade activity.

Plant short cycle millet.

Protect the herd by migrating earlier and for longer, for example, from March to August.

During economic hardship, the very poor turn to better-off relatives to secure gifts of food and cash. During the reference year, after a middling harvest, better-off households reported spending about 5 percent of their annual cash income on gifts to the poor. (The same proportion was spent on clothes, and on health and education.) Gifts of food and meals to the poor tend to increase in a bad year.

Reduce and/or Switch Expenditures

Poor households do not have many expenses on non-essential goods or services. However, there are ways to cut spending. Households from all wealth groups limit spending on festivals when stressed. Spending on clothes is also reduced as people make do with their old clothes. Certain labour-intensive services that people pay for if there is additional cash – such as grinding grain or fetching water – are also reduced.

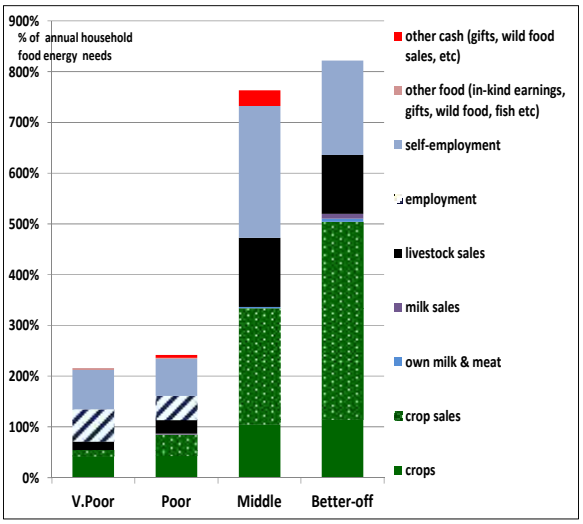
Very Poor, Poor	Middle, Better-off
Reduce:	**Reduce:**
festivals	festivals
clothes	clothes
transport	firewood
grinding	transport
water	communication
seeds	

Implications of HEA Results

The total resources available from the various food and income sources can be expressed as a percentage of annual food energy requirements. In this case, not only food sources but also cash income is calculated in terms of its value in staple food. At first glance, the graph (next page) underlines previous observations: the value of cash cropping for middle-income and better-off households coupled with trade and livestock sales; and for the very poor and poor, the importance of daily labour and petty sales to meet their food and non-food needs. The difference in the total resources of the upper wealth groups compared to the poor is significant when calculated both

on a per capita as well as on a household basis (see below).

Total Household Food + Income expressed as a percentage of annual food energy needs, 2011-12



The value of this calculation lies in using the data to assess the impact on available household resources when a shock occurs. For example, the total resources of a typical very poor household are an estimated 210 percent of their annual food energy needs. If crop production fell to 25 percent of normal, assuming no change in other parameters, then total resources available to a typical very poor household would be an estimated 180 percent of their annual food needs. This level of resources is still sufficient to purchase all their staple food needs during the year. If a bad harvest was accompanied by a doubling of staple food prices as well as a 10 percent fall in self-employment income (e.g., as other households cut back on paying for firewood and paying for water) then very poor households would face an expenditure (or livelihood protection) deficit but not a food deficit. This type of predictive impact analysis assists planners to decide which type of intervention best fits the needs of the affected population in light of a particular combination of shocks.

A food and income calculation of this type is also helpful in assessing whether development interventions are meeting the project`s goals. A goal of reduced child malnutrition through cash transfers, for instance, can be evaluated by using the HEA data to explore how much cash is needed to achieve dietary diversity and whether the transfer type and timing will best promote buying diverse food stuffs. Furthermore, the size of the cash transfer can be put in context with local incomes. Can current income sources be strengthened or can new income sources be promoted in order to help the poor generate sufficient income to buy a diversity of food?

The HEA baseline is the first step to a better understanding of local livelihoods. When the HEA baseline is used in conjunction with impact assessment tools, planning becomes much more informed. Ultimately, the goal is to make better decisions about what type of intervention is needed, when, to whom and for how long.

ANNEX 1: Markets

Trade routes of main goods

Livestock trade route ⟶

Grains and legumes trade route ⟶