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USAID OFFICE OF FOOD FOR PEACE  
USAID-BEST ANALYSIS ANNEXES  
MALI  
JANUARY 2015

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## Preface

The following annexes present essential background information to the full USAID-BEST report, including data and research on the economy, agricultural sector, household consumption and expenditure patterns, and food security. USAID-BEST also provides a list of contacts from research and field work as well as references cited.

# Annex 1. Select Economic and Agricultural Indicators

## A1.1. Introduction

This annex provides supplementary information regarding key macroeconomic and agricultural indicators for Mali. The findings noted below are entirely from secondary sources and informed the analysis presented in the main report.

The annex begins by presenting indicators on the macroeconomy and the agricultural sector, follows with information on international trade, and lastly concludes with a table summarizing the government policies most relevant for staple food markets in Mali.

## A1.2. Macroeconomy

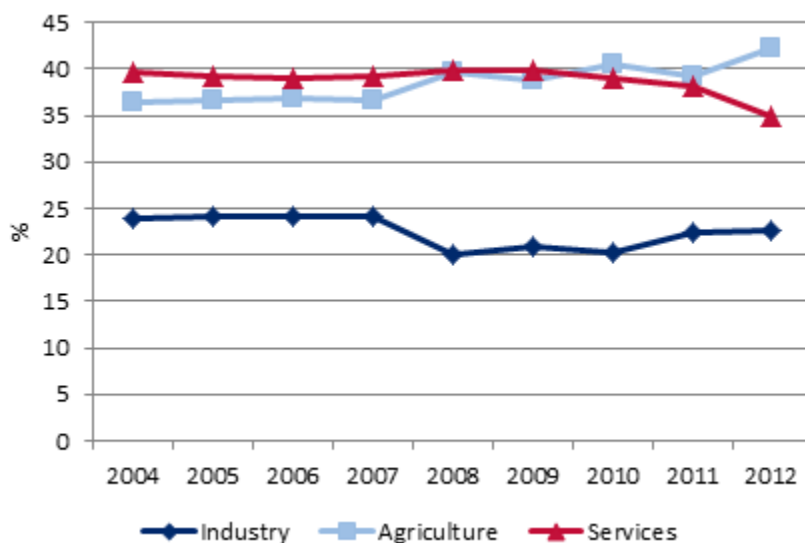
### A1.2.1. Gross Domestic Product (GDP)

**Table 1. GDP Indicators, 2006-13**

Indicator	2006	2007	2008	2009	2010	2011	2012	2013
GDP (constant 2005 US\$ millions)	5,760	6,008	6,307	6,588	6,971	7,161	7,132	7,286
GDP growth (annual %)	8.58	4.30	4.98	4.46	5.82	2.73	-0.41	2.15
GDP per capita (constant 2005 US\$)	467	472	480	486	498	497	480	476

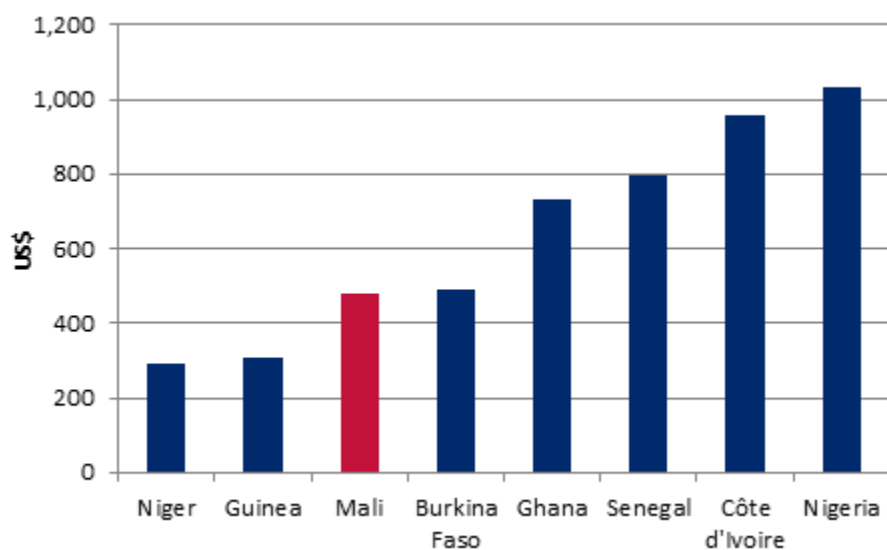
Source: USAID-BEST using data from World Bank World Development Indicators, accessed October 2014.

**Figure 1. Proportion of GDP (%) by Sector, 2004-12**



Source: USAID-BEST using data from World Bank World Development Indicators, accessed October 2014.

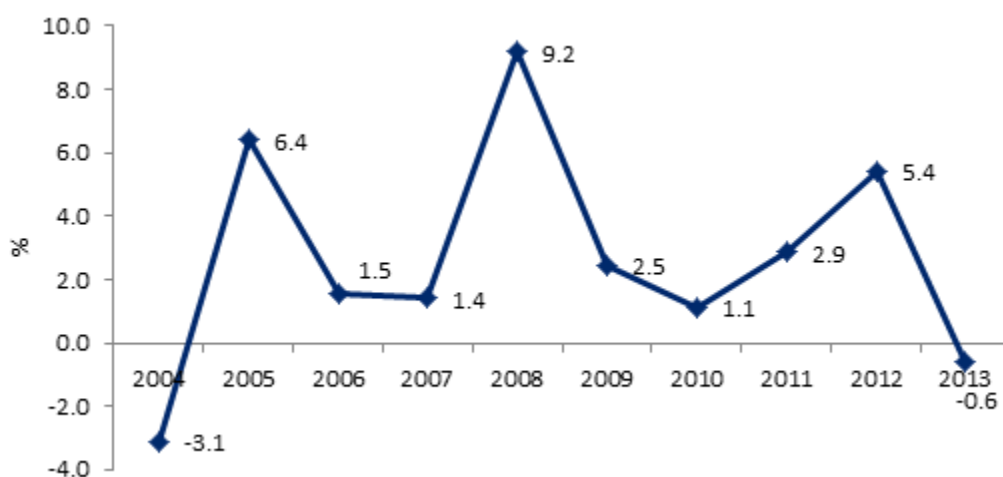
**Figure 2. GDP per Capita in West Africa (Constant 2005 US\$), 2012**



Source: USAID-BEST using data from World Bank World Development Indicators, accessed October 2014.

### A1.2.2. Inflation

**Figure 3. Annual Inflation Rate (%), 2004-13**

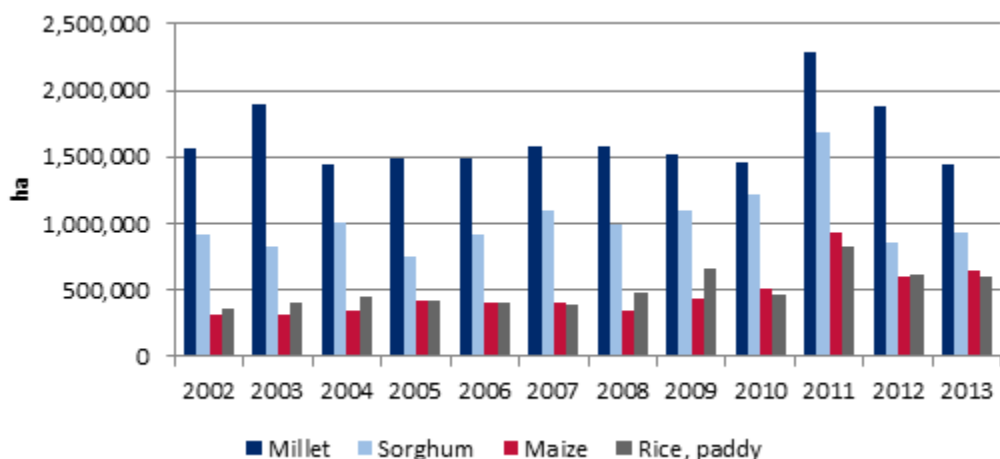


Source: USAID-BEST using data from World Bank World Development Indicators, accessed October 2014.

### A1.3. Agricultural Sector

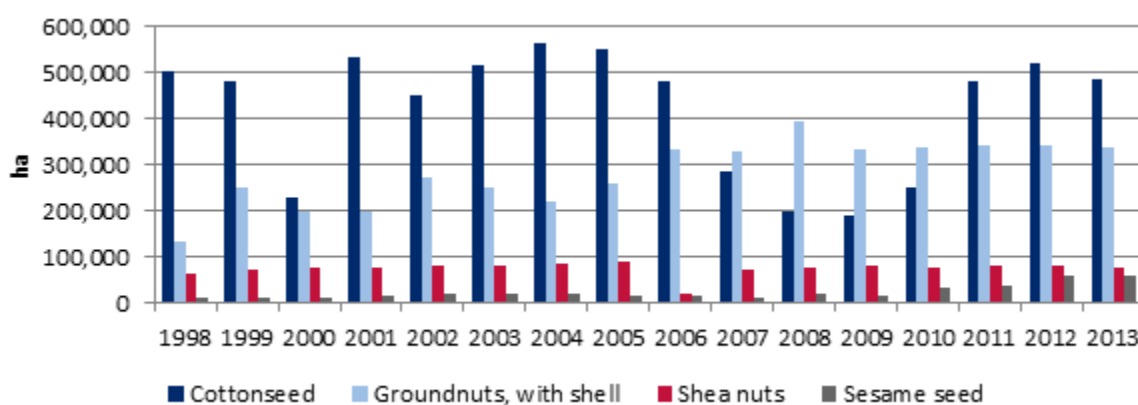
#### A1.3.1. Trends in Area Planted, Yields, and Production

**Figure 4. Area Harvested (hectares (ha)) of Staple Crops, 2002-13**



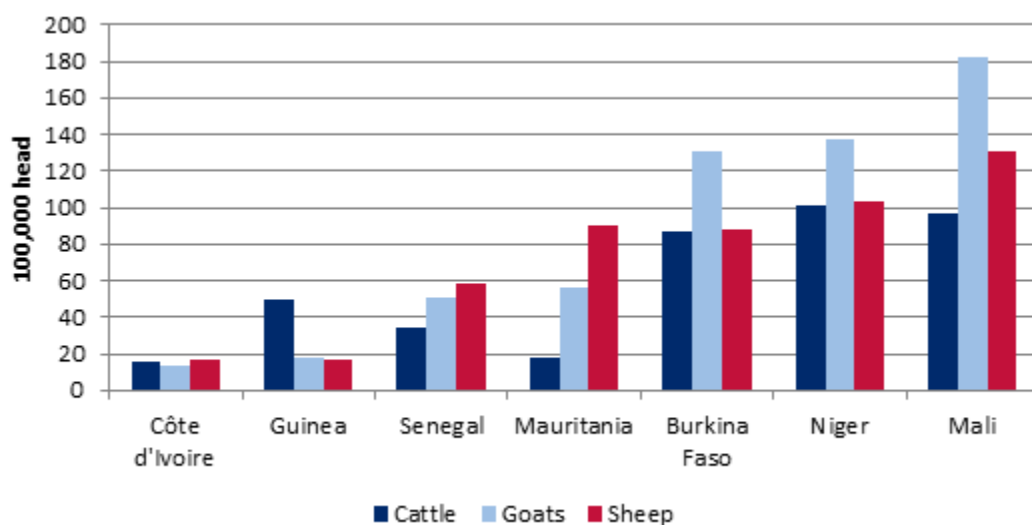
Source: USAID-BEST using data from FAOSTAT, downloaded November 2014.

**Figure 5. Harvested Area of Cottonseed, Groundnuts, Shea Nuts, and Sesame Seeds (ha), 1998-2013**



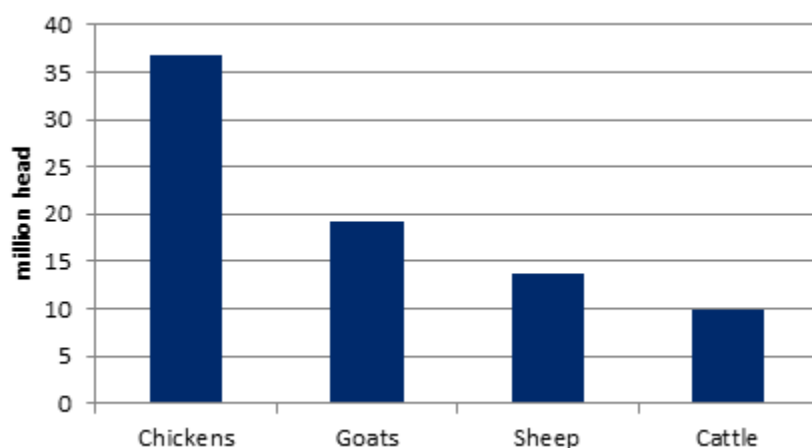
Source: USAID-BEST using data from FAOSTAT, downloaded November 2014.

**Figure 6. Total Number of Livestock In West Africa (100,000 head), 2012**



Source: USAID-BEST using data from FAOSTAT, downloaded November 2014.

**Figure 7. Total Number of Livestock (million head) in Mali, 2013**



Source: USAID-BEST using data from FAOSTAT, downloaded November 2014.

### A1.3.2. Characteristics of Agricultural Households

**Table 2. Land Area (ha), 2012**

Land description	ha
Country area	124,019
Land area	122,019
Other land	68,036
Agricultural area	41,651
Permanent meadows and pastures	34,640
Forest area	12,332
Arable land	6,861



Land description	ha
Temporary crops	5,500
Inland water	2,000
Fallow land (temporary)	1,000
Total area equipped for irrigation	378
Temporary meadows and pastures	361
Permanent crops	150
Agricultural area organic, total	15

Source: USAID-BEST using data from FAOSTAT, downloaded December 2014.

**Table 3. Fertilizer Usage (MT), 2006-12**

Fertilizer	2006	2007	2008	2009	2010	2011	2012
Urea	60,425	62,473	157,038	46,617	142,573	188,511	220,023
Diammonium phosphate	4,121	162,753	493	15,344	13,437	34,984	25,831
Monoammonium phosphate	0	0	0	0	64,383	37,501	29,955
Ammonium sulphate	0	0	30,839	196	20,109	40,912	30,937
NPK complex >10 kg	0	0	47,033	16,412	0	10,438	30,921
Potassium chloride	0	0	43,145	0	26,285	3,281	26,654
NPK complex	95,756	0	0	0	0	0	0
Ammonium nitrate	0	0	9,459	181	11,786	9,104	20,113
Calcium ammonium nitrate	0	0	1,203	0	0	0	0
Other nitrogen & phosphorus compounds	0	0	0	250	0	0	0
Potassium sulphate	0	0	0	0	0	0	50

Source: USAID-BEST using data from FAOSTAT, downloaded December 2014.

## A1.4. International Trade

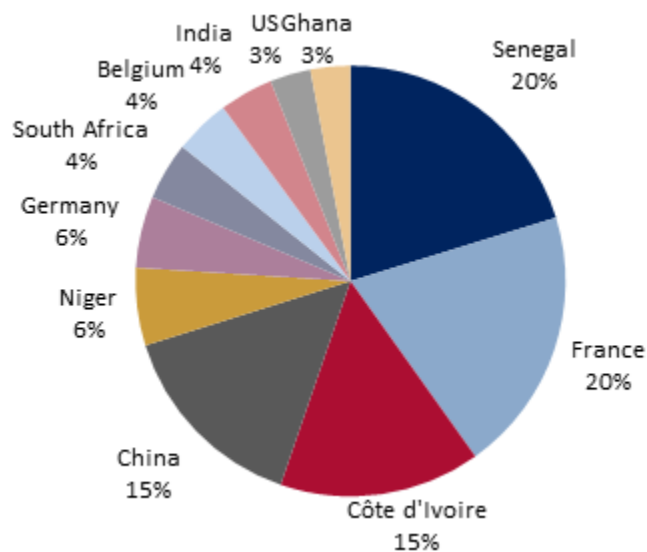
### A1.4.1. Imports and Exports

**Table 4. Top Imports by Value (US\$), 2012**

Description	Trade Value (US\$)
Petroleum	284,885,465
Cement	158,393,051
Cotton	116,028,781
Pharmaceutical products	138,112,039
Vehicles	51,890,972
Wheat	45,417,362
Electrical machinery and equipment	41,726,493
Soups, broths, and preparations there of	40,463,816
Palm oil	34,587,455
Nuclear reactors, boilers, machinery, and mechanical appliances	32,095,619
Broken rice	29,599,358
Preparations of cereals, flour, starch or milk	28,772,397

Source: USAID-BEST using data from Comtrade, downloaded November 2014.

**Figure 8. Proportion of Trade (%) with Top Import Partners, 2012**



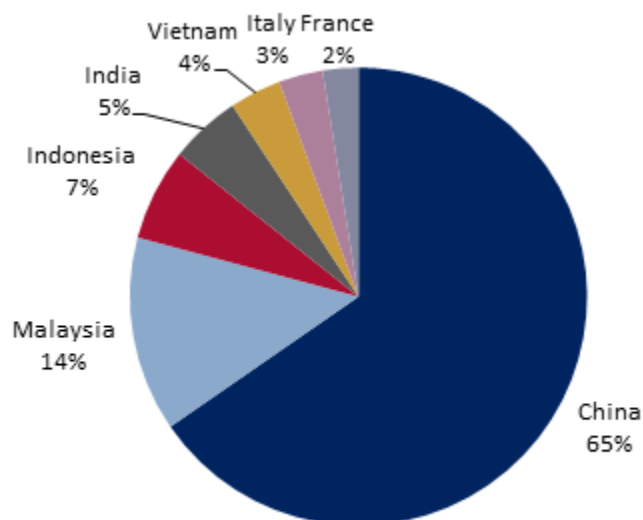
Source: USAID-BEST using data from Comtrade, downloaded November 2014.

**Table 5. Top Exports by Value (US\$), 2012**

Description	Trade Value (US\$)
Cotton	422,368,121
Sesame seeds	50,559,107
Raw hides and skins	21,154,661
Iron ores and concentrates	20,821,415
Mineral/chemical fertilizers	7,562,569
Guavas, mangoes, and mangosteens	7,268,058
Lac; gums, resins, and other vegetable saps and extracts	4,072,516
Gold	2,912,121

Source: USAID-BEST using data from Comtrade, downloaded November 2014.

**Figure 9. Proportion of Trade (%) with Top Export Partners, 2012**



Source: USAID-BEST using data from Comtrade, downloaded November 2014.

#### A1.4.2. Global and Regional Economic Linkages

**Table 6. Summary of Global and Regional Economic Linkages**

Countries	Agreement	Main Benefits	Signatory Date
Global	World Trade Organization	Full member.	1995
Benin, Burkina Faso, Cameroon, Central African Republic, Chad, Comoros, Republic of the Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Guinea, Guinea-Bissau, Mali, Niger, Senegal, Togo, Democratic Republic of Congo	Organization for the Harmonization of Business Law in Africa	Regional framework for business practices to be in line with international standards.	1993
Benin, Burkina Faso, Côte d'Ivoire, Guinea-Bissau, Mali, Niger, Senegal, Togo	West African Economic and Monetary Union	Common external tariffs; common framework for agricultural and mining policy.	1994
Benin, Burkina Faso, Cape Verde, Gambia, Ghana, Guinea, Guinea-Bissau, Côte d'Ivoire, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo	Economic Community of West African States	Customs union promoting trade liberalization and economic cooperation.	1975

Countries	Agreement	Main Benefits	Signatory Date
Burkina Faso, Cape Verde, Gambia, Guinea-Bissau, Mali, Mauritania, Niger, Senegal, Chad	Permanent Interstate Committee for Drought Control in the Sahel (CILSS)	Coordinate efforts toward research and action against the effects of drought; common regulation of pesticides.	1973

Source: USAID-BEST using information from USAID-EAT and WTO.

## A1.5. Major Economic and Agricultural Policies

**Table 7. National Agricultural Policies**

Policy	Objectives
Strategic Framework for Growth and Poverty Reduction (Cadre Stratégique pour la Croissance et la Réduction de la Pauvreté)	<ul style="list-style-type: none"> <li>• Framework for public investment planning toward strengthening agricultural sector of the economy, reform of the public sector, and strengthening social safety nets</li> </ul>
Agricultural Orientation Law (Loi d'Orientation Agricole)	<ul style="list-style-type: none"> <li>• Promotion of sustainable, modern and competitive agricultural sector based primarily on family farms</li> </ul>
National Food Security Strategy (Stratégie Nationale de Sécurité Alimentaire)	<ul style="list-style-type: none"> <li>• Improved food availability, access, utilization and stability</li> <li>• Agriculture-led economic growth</li> <li>• Creation of market-compatible social safety nets</li> </ul>
National Investment Plan of the Agricultural Sector (Plan National d'Investissement du Secteur Agricole)	<ul style="list-style-type: none"> <li>• Strategic investments in five value chains: rice, maize, millet and sorghum, inland fisheries, and livestock products</li> <li>• Strong nutrition education throughout the country</li> </ul>

Source: USAID-BEST using information from Michigan State University.

## Annex 2. Select Food Security Indicators

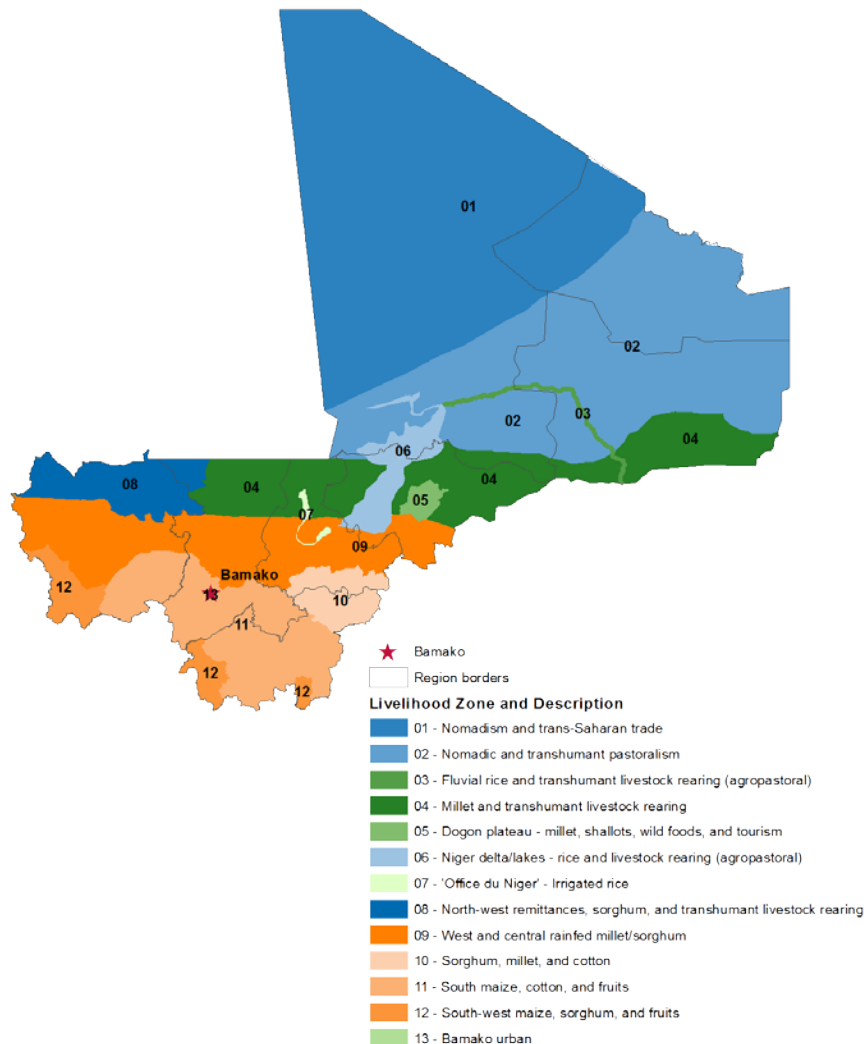
### A2.1. Introduction

To supplement the information on food security conditions in Mali presented in the main report, this annex provides additional data from relevant assessments. The annex begins with indicators on livelihoods and diets and then highlights data on water, sanitation, and hygiene (WASH) conditions. Next, the annex outlines typical shocks to food security and coping strategies, followed by information on the distribution of food insecure households (HHs) and malnutrition rates. Finally, the annex concludes with a table summarizing the recent major reports that informed desk research and a list of bulletins pertinent to food security in Mali.

### A2.2. Livelihoods

#### A2.2.1. Livelihood Zones

**Figure 10. Livelihood Zones Map, 2010**



Source: USAID-BEST using information from FEWS NET, January 2010, *Livelihood Zoning and Profiling Report: Mali*.

**Table 8. Livelihood Zone Characteristics by Zone, 2009**

Livelihood Zone	Regions	Livelihoods & Income Sources	Livestock	Main Crops	Shocks and Hazards	Select Agroecological Characteristics
Zone 01: Nomadism & trans-Saharan trade*	Timbuktu, Kidal	Pastoralism is the only viable livelihood. In bad years many migrate in search of labor opportunities	Camels, goats, and donkeys Products: milk, cheese, dried meat	Small amount of market gardening - onions, tomatoes	Reduction in water availability, conflict, price increases	Desert zone. If it rains, rainfall is between 0-200 mm per year over 75 days
Zone 02: Nomadic & transhumant pastoralism	Gao, Timbuktu, Kidal	Essentially, the only indicator of wealth in this zone is the number of livestock owned	Camels, cattle, sheep, goats	Agricultural activities not typical of zone, but poorest HHs grow some sorghum	Lack of diversity in livelihoods make HHs vulnerable to shocks affecting their herds. Hazards include: Insufficient rains/lack of pasture, lack of water, livestock diseases, livestock rustling, poor terms of trade between livestock and millet, wild animals, crickets, bushfires, conflict	North Sahelian ecology with sparse grass towards the edge of the desert
Zone 03: Fluvial & transhumant livestock rearing (agropastoral)	Gao, Timbuktu (Zone follows the banks of the Niger river)	Diversified livelihoods include: rice cultivation, livestock rearing, market gardening, fishing, and labor migration Livestock is most important determinant of wealth, followed by land; all HHs receive some money from labor migration	Cattle, sheep, goats	Rice, borgou (grass used for livestock feed) All wealth groups are able to grow market gardening crops: tobacco, tomatoes, marrows (squash), watermelon	Diversified livelihoods make life less risky than Zone 02. Hazards include: drought/insufficient rain/pasture, broken dykes, crop pests, livestock diseases, increase in cereal prices, malaria, rice-eating fish	Banks of the Niger river, low annual rainfall of 150-200 mm is insufficient for rainfed agriculture, the rise in river water is used for irrigation
Zone 04: Millet and transhumant livestock rearing	Koulikoro, Ségou, Mopti, Timbuktu, Gao	Wealthy: Livestock and crop sales Poor: Local labor, some agriculture, sale of wild foods Livestock is the main indicator of wealth	Cattle, goats, sheep, some camels	Millet, sorghum, cowpeas ( <i>niebe</i> ), as well as other food and cash crops such as groundnuts Wealthier groups cultivate rice and market gardening crops: onions, garlic, tobacco	Crop pests, grain-eating birds, lack of rain/late or early rains, livestock diseases, grasshoppers, high winds, floods, wild animals	Annual precipitation of 300-500 mm allows for rainfed agriculture
Zone 05: Dogon plateau - millet, shallots, wild foods, and tourism	Mopti	Wealthy: Crop and livestock sales Poor: Self-employment, local labor, sale of wild foods Livestock rearing is considerably less important than Zones 04 and 06, herd size is small. Market gardening is a principal activity	Cattle, goats, sheep, poultry All HHs own poultry. Goats are prevalent in villages near forests	Millet, shallots, cowpeas ( <i>niebe</i> ), groundnuts, market gardening crops such as tomatoes	Poorly distributed rains, high winds, malaria, lack of rains/late rains, crop pests, floods, livestock diseases, increase in cereal prices	On the Dogon plateau, much higher than the surrounding Sahelian plains. Annual rainfall of 400-600 mm allows for rainfed agriculture, however much of the zone's soil is poor quality
Zone 06: Niger delta/lakes - rice & livestock (agropastoral)	Timbuktu, Mopti (Zone follows the Niger delta)	Wealthy: Crop and livestock sales, labor migration/remittances Poor: Diversified livelihoods - crop and livestock sales, local labor (agricultural and other) Livestock rearing is an important activity. The wealthy only sell rice, while only the poor sell market garden products	Cattle, sheep, goats	Rice is the most important crop - for HH consumption and sales. Also: bourgou, sorghum, market crops such as tomatoes, shallots, lettuces	Rice-eating fish, malaria, insufficient rains/late rains, early receding of the floodwaters, grain-eating birds, livestock diseases, increase in cereal prices	Inland delta of the Niger river - the plain is one of the largest pastures in West Africa. Annual rainfall of 300 - 600mm, however each year the river floods over 20,000 sq km which allows for agricultural activity

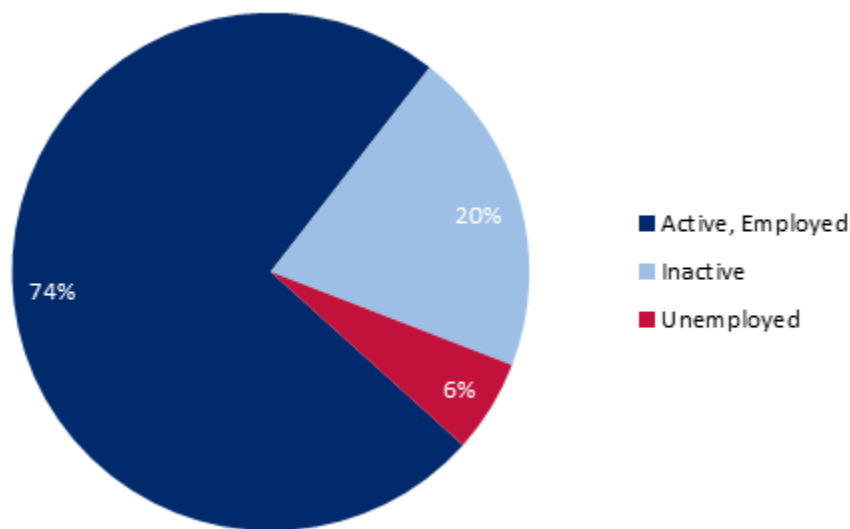
Livelihood Zone	Regions	Livelihoods & Income Sources	Livestock	Main Crops	Shocks and Hazards	Select Agroecological Characteristics
Zone 07: 'Office du Niger' - irrigated rice	Ségou	Wealthy: Mostly crop sales Poor: Crop sales and local agricultural labor  Livestock are less important here than in neighboring Zone 04	Cattle, sheep, goats, poultry  Sheep are more numerous than goats. All HHs own poultry	Rice is the most important crop. This area is the breadbasket of Mali with yields sometimes over 7 tons per hectare Other crops: market gardening crops including: shallots, tomatoes, cabbage, okra	Crop pests, malaria and diarrhea (including cholera), livestock diseases, conflict (the zone is densely populated and conflicts between farmers and livestock herders is common)	A fully irrigated agricultural zone, the 'Office du Niger' was created in 1932 and is one of the oldest areas of irrigated agriculture in West Africa
Zone 08: North-west remittances, sorghum, & transhumant livestock rearing	Kayes, Koulikoro	Wealthy: Remittances Poor: Diversified livelihoods - self-employment, livestock sales, labor (agricultural and other)  Remittances are the defining factor of livelihoods - the poor do not receive remittances, but the wealthy use remittance money to pay for labor and goods. Sedentary livestock rearing is also common	Cattle, sheep, goats, poultry  All HHs own poultry	Sorghum (main crop), also: millet, calabash, rainfed okra, market gardening crops such as shallot and lettuce (though cash crops are not typical across the entire zone)	Bushfires, grain-eating birds, malaria, damage caused by monkeys, livestock diseases, lack of rains/drought, locusts, floods	Contains part of the Senegal river valley and has an annual rainfall of 400-500 mm, which allows for rainfed cultivation. A very hot area, vegetation consists of plains and shrubland; and bas-fonds (depressions that retain moisture in the dry season) create some fertile soils
Zone 09: West and central rainfed millet/sorghum	Kayes, Koulikoro, Ségou, Mopti	Wealthy: Crop and livestock sales Poor: Self-employment, local agricultural labor  Rainfed agriculture and sedentary livestock rearing. This zone is the commercial axis between the north and south. Income from livestock is less important than in the north but more important than in the south.	Cattle, sheep, goats	Sorghum is dominant in the north and millet in the south of the zone. Also: cowpeas ( <i>niebe</i> ), maize, cotton, small-scale market gardening	Livestock theft, malaria, lack of pasture, insufficient rains/drought, caterpillars, livestock diseases, newcastle disease (a contagious bird disease), floods, bushfires Crop pests and insects, late payment to cotton farmers by Compagnie Malienne du Développement des Textile (CMDT), late provision of agricultural inputs by GoM, rain shortages/breaks at critical times, grain-eating birds, water-points drying up early, striga, stray animals damaging crops, lack of pasture, livestock disease, high price of inputs, insufficient water points, theft of small ruminants, malaria, sureties for cotton	Consists primarily of plains, hills, woodlands, and stretches of the Niger and Senegal rivers. Annual rainfall of 600-800 mm and allows for rainfed agriculture
Zone 10: Sorghum, millet, & cotton	Ségou, Sikasso	Wealthy: Almost exclusively crop sales Poor: Mixture of crop sales and agricultural labor  Livestock, while a key indicator of wealth, are generally sold to meet specific needs such as school fees.	High number of plow oxen used for agriculture, as well as sheep	A highly productive, food surplus zone. Sorghum, millet, maize (main food crops), cotton (primary cash crop); also: groundnuts, and market gardening crops such as: onions, tomatoes, cereals, cowpeas ( <i>niebe</i> )	Late rains/lack of rains/poorly distributed rains, high price of agricultural inputs, grain-eating birds, illness/death of plow oxen, wild animals damaging crops, cotton diseases, maggots damaging fruit, poor seed quality, livestock disease, lack of pasture, difficulty watering livestock, malaria, closure of borders (Côte d'Ivoire)	Vegetation is sudano-sahelian and soils are sandy-clay and generally fertile. Annual rainfall of 700-1,100 mm allows for rainfed agriculture
Zone 11: South maize, cotton, and fruits	Sikasso, Koulikoro, Kayes	Wealthy: Almost exclusively crop sales Poor: Mostly self-employment, as well as agricultural labor and some crop sales  Rainfed agriculture and sedentary livestock rearing	Cattle, sheep, goats	Maize is common in the south; sorghum and millet are the main food crops; also: cotton, cowpeas ( <i>niebe</i> ), groundnuts, sweet potatoes, sesame, sweet peas and market gardening	Late rains/lack of rains/poorly distributed rains, high price of agricultural inputs, grain-eating birds, illness/death of plow oxen, wild animals damaging crops, cotton diseases, maggots damaging fruit, poor seed quality, livestock disease, lack of pasture, difficulty watering livestock, malaria, closure of borders (Côte d'Ivoire)	Vegetation is sudano-sahelian and it is mostly flat with both permanent and seasonal rivers, soils are generally fertile. Annual precipitation is 1,000-1,300 mm and allows for rainfed agriculture

Livelihood Zone	Regions	Livelihoods & Income Sources	Livestock	Main Crops	Shocks and Hazards	Select Agroecological Characteristics
Zone 12: South-west maize, sorghum, and fruits	Kayes, Sikasso	Wealthy: Almost exclusively crop and fruit sales Poor: Local agricultural labor, self-employment  Self-employment in this zone consists largely of gold-mining and wild product sales	Cattle, sheep, goats	Maize, sorghum, rice, cotton, groundnuts, dah ( <i>Dahlia arborea</i> - a plant), fruit trees, market gardening crops such as: tomatoes, okra, shallots, lettuces, aubergines	Flooding, crop insects and parasites, poorly distributed rainfall, increase in the price of agricultural inputs, late payment of cotton farmers by CMDT, livestock diseases, livestock theft	Humid with fairly fertile soils and lots of rivers as well as bas-fonds. Annual rainfall of 1,000-1,300 mm allowing for rainfed agriculture
Zone 13: Bamako Urban	Koulikoro	No data	No data	No data	No data	No data

Source: USAID-BEST using data from FEWS NET, January 2010, Livelihood Zoning and Profiling Report: Mali.  
\*FEWS NET did not carry out field work in this zone.

### A2.2.2. Income Indicators

Figure 11. Employment (% of Population Age 15-64), 2013

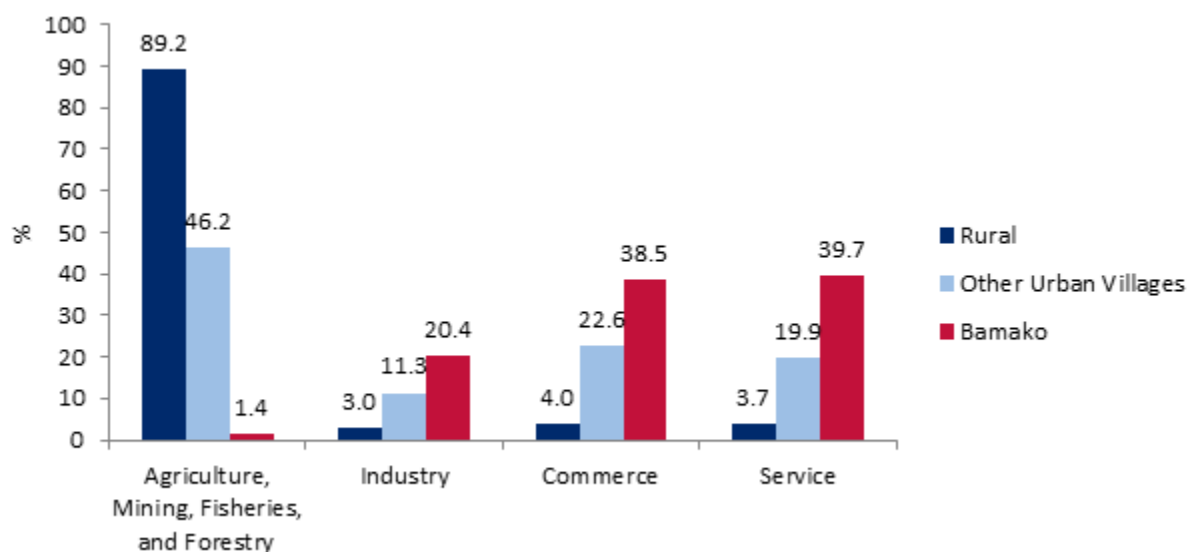


Source: USAID-BEST using data from INSTAT, May 2014, Sante, Emploi, Securite Alimentaire et Depenses de Consommation des Menages. October - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013).

Note: Inactive individuals are of working age but are outside the labor force for various reasons such as education, family duties, retirement, or sickness/disability. This report calculates the inactive population by subtracting the workforce from the total working age population.



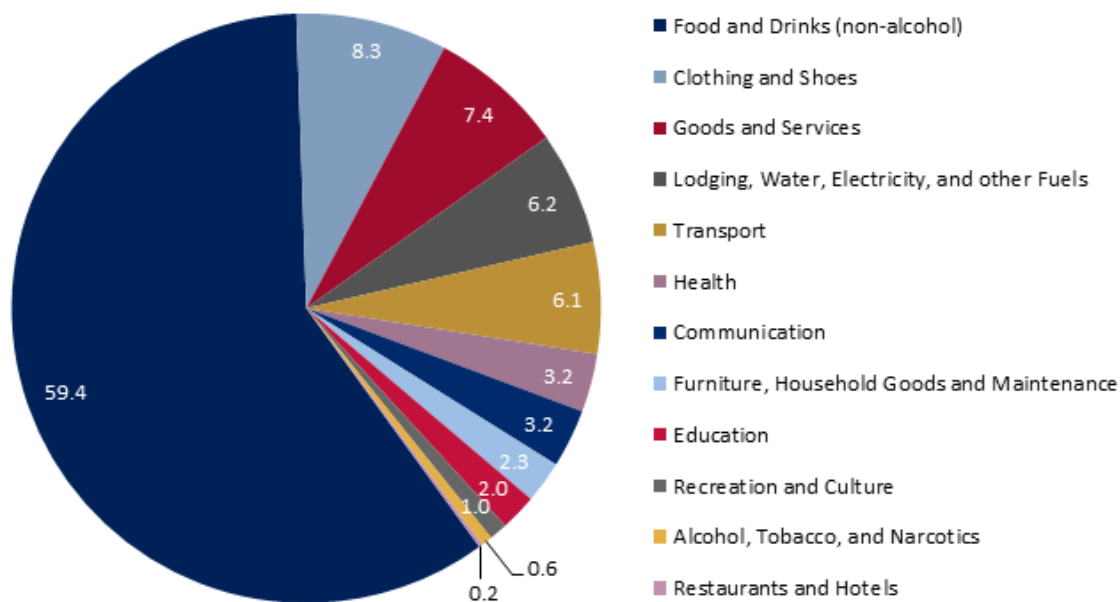
**Figure 12. Employment by Sector (% of Population) by Strata, 2013**



Source: USAID-BEST using data from INSTAT, May 2014, Sante, Emploi, Securite Alimentaire et Depenses de Consommation des Menages. October - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013).

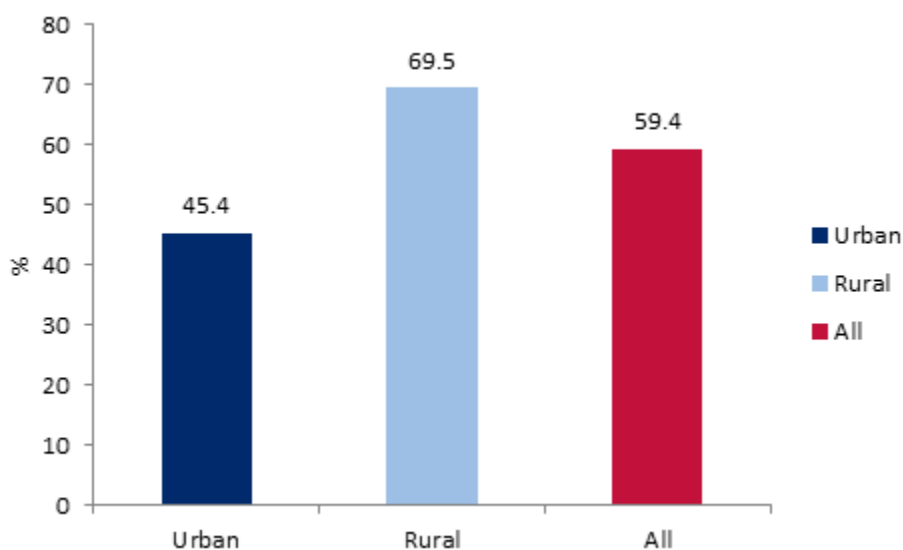
### A2.2.3. Expenditure Indicators

**Figure 13. HH Expenditure (%) by Category, 2013**



Source: USAID-BEST using data from INSTAT, May 2014, Sante, Emploi, Securite Alimentaire et Depenses de Consommation des Menages. October - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013).

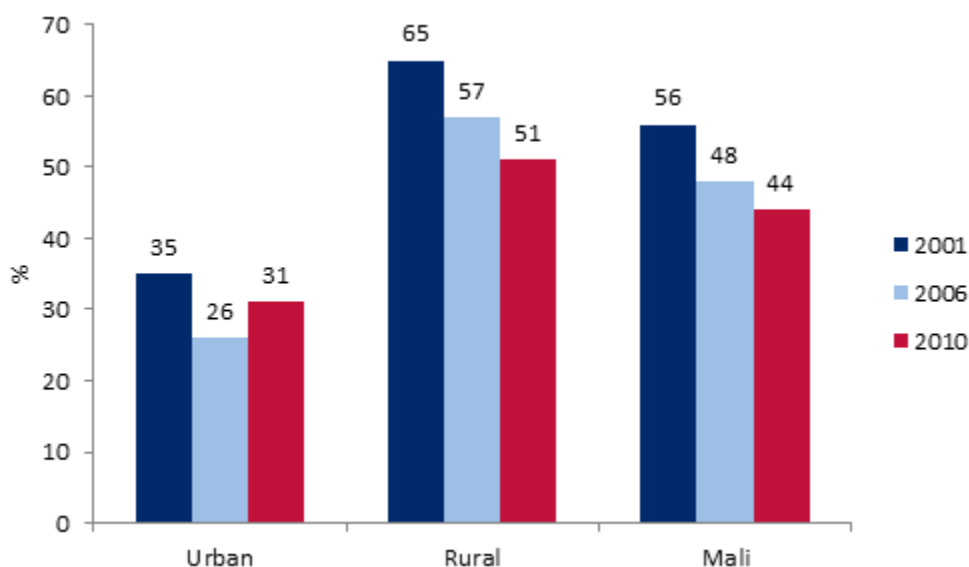
**Figure 14. HH Expenditure on Food (%) by Strata, 2013**



Source: USAID-BEST using data from INSTAT, May 2014, Sante, Emploi, Securite Alimentaire et Depenses de Consommation des Menages. October - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013).

#### A2.2.4. Poverty Indicators

**Figure 15. Poverty Rate (% of Population) by Strata, 2001-10**

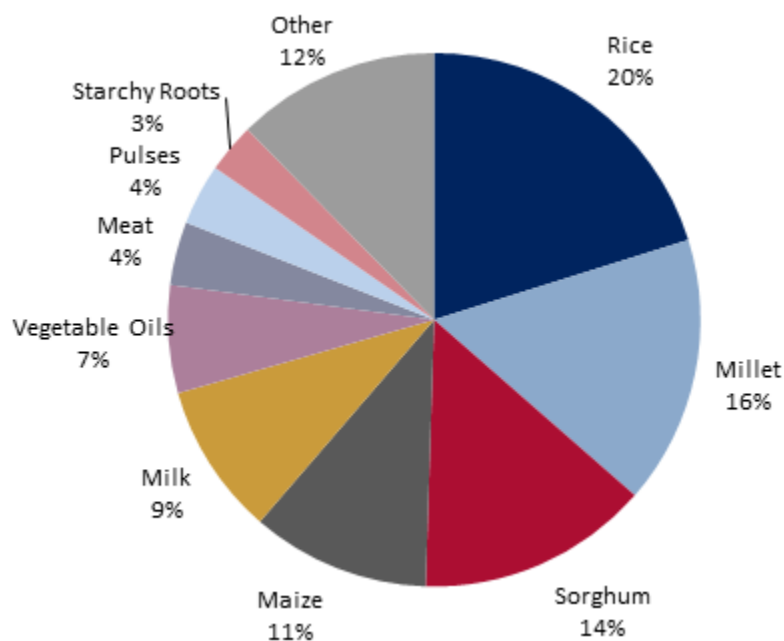


Source: USAID-BEST using data from IMF, May 2013, Mali Poverty Reduction Strategy Paper.

#### A2.3. Typical Diet

### A2.3.1. Food Consumption Patterns

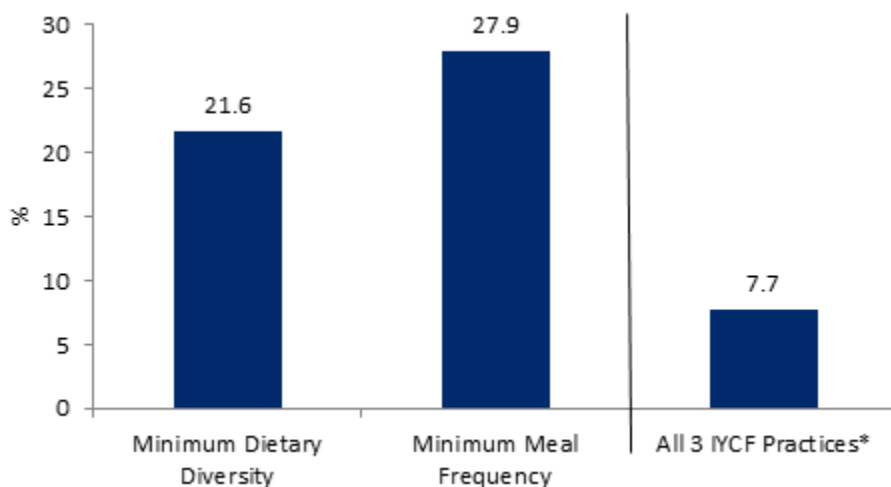
**Figure 16. Contribution (%) to Daily Energy Consumption by Main Food Groups, 2011**



Source: USAID-BEST using data from FAOSTAT Food Balance Sheet, 2011 accessed October, 2014.

Note: Other includes wheat and wheat products, other cereals, sugar and sweeteners, tree nuts, oil crops, vegetables, fruit, tea, spices, alcoholic beverages, offal, animal fats, eggs, and fish.

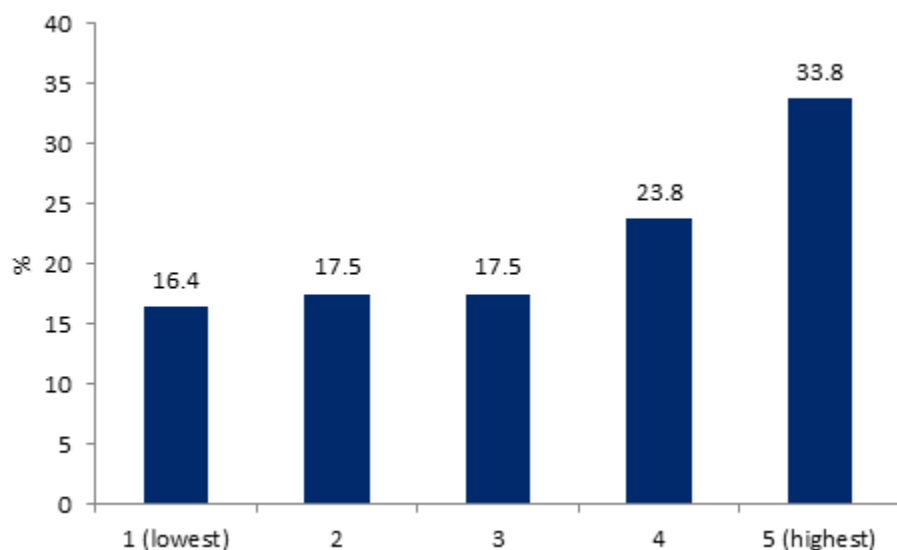
**Figure 17. Adequate Infant and Young Child Feeding Practices (% of Children 6-23 months) by Practice, 2012-13**



Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V).

Note: Minimum dietary diversity is classified as food from at least four of seven assessed food groups. All three IYCF practices include minimum dietary diversity, minimum meal frequency, and breastfeeding or appropriate consumption of other milk, or milk products. (Comparable summary statistics for breastfeeding/consumption of milk products not provided.)

**Figure 18. Children (6-23 months) Achieving Minimum Dietary Diversity (%) by Expenditure Quintile, 2012-13**

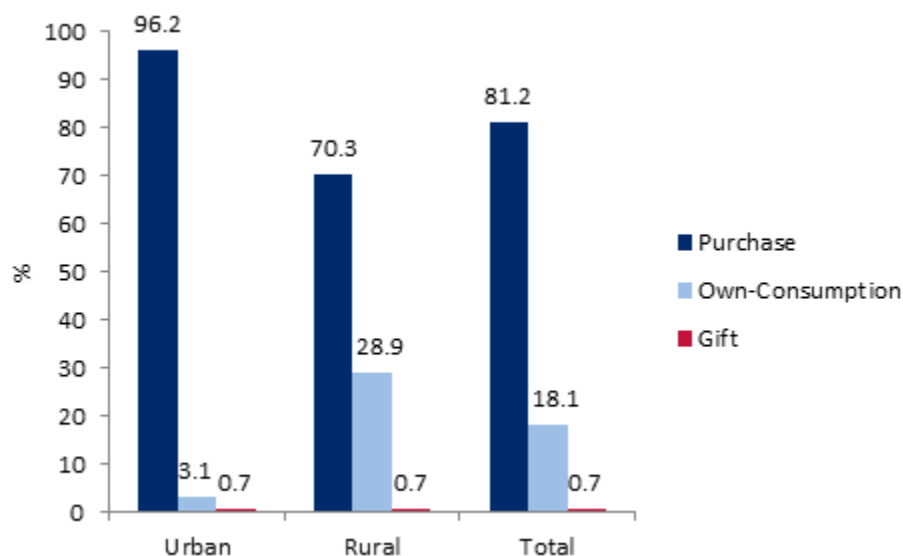


Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V).

Note: Minimum dietary diversity is classified as food from at least four of seven assessed food groups.

### A2.3.2. Sources of Food

**Figure 19. HH Food Sources (%) by Strata, 2013**



Source: USAID-BEST using data from INSTAT, May 2014, Sante, Emploi, Sécurité Alimentaire et Dépenses de Consommation des Ménages. Octobre - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013).

## A2.4. Water, Sanitation, and Hygiene

### A2.4.1. Water

**Table 9. Drinking Water Source (% of HHs) by Strata, 2012-13**

Source	Bamako	Other Cities	Rural	Total
<b>Improved Source</b>	<b>97.5</b>	<b>88.4</b>	<b>58.6</b>	<b>66.0</b>
Faucet in Home/Concession/Courtyard/Plot	34.9	35.9	1.7	8.9
Public Faucet/Fountain	53.0	25.7	10.7	16.8
Hand-pump/Well	1.4	6.5	27.1	22.1
Protected Well	8.1	20.0	18.7	17.7
Protected Spring	0.1	0.3	0.4	0.3
Rainwater	0.0	0.0	0.1	0.1
<b>Non-Improved Source</b>	<b>1.6</b>	<b>11.3</b>	<b>39.5</b>	<b>32.4</b>
Well (non-protected)	1.4	10.3	38.1	31.2
Spring (non-protected)	0.1	0.6	1.3	1.1
Tanker, or Cart with Water Tank	0.1	0.3	0.0	0.1
Other	0.0	0.0	0.0	0.0
Not	0.8	0.3	1.9	1.6

Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V).

**Table 10. Water Treatment Methods (% of HHs) by Strata, 2012-13**

Method	Bamako	Other Cities	Rural	Total
Boiled	0.2	0.8	0.6	0.6
Chlorine	10.4	20.5	16.0	15.9
Pass Water through a Sheet or Cloth	4.7	8.0	14.6	12.8
Ceramic, Sand, or Other Filter	0.2	0.0	0.4	0.3
Solar Disinfection	0.0	0.0	0.0	0.0
Other	0.6	0.9	1.3	1.2
<b>No Treatment</b>	<b>86.1</b>	<b>74.7</b>	<b>71.2</b>	<b>73.2</b>
<b>Percent Utilizing One Effective Form of Treatment</b>	<b>10.6</b>	<b>21.1</b>	<b>16.6</b>	<b>16.4</b>

Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V).

**Table 11. Travel Time to Water Source (% of HHs) by Strata, 2012-13**

Travel Time	Bamako	Other Cities	Rural	Total
Water on site	53.7	65.8	30.9	37.1
Less than 30 minutes	38.6	26	59	53.3
More than 30 minutes	4.9	4.4	7.4	6.8
Not Available/Unknown	2.8	3.8	2.7	2.8

Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V).

## A2.4.2. Sanitation

**Table 12. Sanitation Facilities (% of HHs) by Strata, 2012-13**

Type of Facility	Bamako	Other Cities	Rural	Total
<b>Improved facilities, unshared</b>	<b>43.7</b>	<b>38.6</b>	<b>16.8</b>	<b>22.0</b>
Flush/pour flush to piped sewer	9.1	3.3	0.1	1.4
Flush/pour flush to septic tank	4.6	1.3	0.7	1.2
Flush/pour flush to pit latrine	2.6	2.3	2.2	2.2
Ventilated improved pit latrine	2.1	0.7	0.4	0.6
Pit latrine with slab	25.2	31.0	13.4	16.5
Composting toilet	0.2	0.0	0.2	0.1
<b>Shared facilities</b>	<b>46.8</b>	<b>42.3</b>	<b>12.2</b>	<b>19.1</b>
Flush/pour flush to piped sewer	0.6	0.2	0.0	0.1
Flush/pour flush to septic tank	2.7	0.4	0.6	0.8
Flush/pour flush to pit latrine	2.4	3.6	1.6	1.9
Ventilated improved pit latrine	1.8	0.4	0.1	0.3
Pit latrine with slab	39.3	37.5	9.9	16.0
Composting toilet	0.1	0.0	0.1	0.1
<b>Non-improved facilities</b>	<b>9.4</b>	<b>19.1</b>	<b>71.0</b>	<b>58.8</b>
Flush/pour flush not to sewer/septic tank/pit latrine	0.0	0.3	0.2	0.2
Pit latrine without slab/open pit	8.4	17.7	56.2	47.0
Hanging toilet/hanging latrine	0.4	0.0	0.7	0.6
No facility/bush/field	0.6	1.0	13.8	11.0

Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V).

## A2.4.3. Hygiene

The following table presents data on handwashing facilities from the 2012-13 Demographic and Health Survey (DHS) in the absence of nationally representative information on actual practice. However, the availability of these facilities does not necessarily translate into proper hygienic handwashing.

**Table 13. Availability of Handwashing Facilities (% of HHs) by Wealth Quintile, 2012-13**

Wealth Quintile	Place for hand washing	Had water only	Had soap and water	Had water and another cleansing agent
Lowest	18.4	47.2	13.9	2.1
Second	21.5	40.5	19.1	1.5
Middle	23.2	38.0	27.6	2.4
Fourth	25.3	25.9	38.2	0.9
Highest	41.5	12.2	63.0	0.2

Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V).

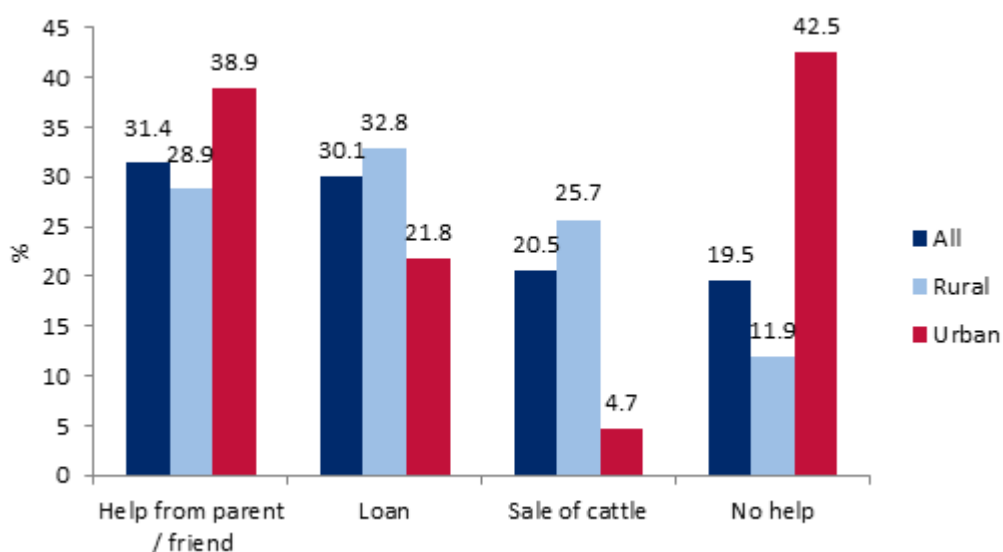
## A2.5. Shocks and Coping

### A2.5.1. Main Shocks

Shocks such as conflict, irregular rainfall, and high food prices often negatively affect Malian HHs. However due to insecurity in the northern region, which complicates or prohibits rigorous data collection, there is a paucity of recent nationally representative data on shocks by HH. For information on the most common shocks by livelihood zone, see Table 1 of this annex.

### A2.5.2. Main Coping Strategies

**Figure 20. Coping Strategies for Managing Food Insecurity (% of HHs) by Strata, 2013**



Source: USAID-BEST using data from INSTAT, May 2014, Sante, Emploi, Securite Alimentaire et Depenses de Consommation des Menages. October - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013).

## A2.6. Distribution of Food Insecurity

### A2.6.1. Food Insecurity by Region

Given the lack of a recent comprehensive food security study for Mali surveying the entire country, national food insecurity data are scarce. The food insecurity data that exist are either conducted in select areas and do not provide regional level data or, due to the frequency of conflict and other crises, no longer accurately represent the food security situation. In lieu of the more frequently used Food Consumption Score data, the following table presents data from the 2012-13 Demographic and Health Survey as a proxy for food insecurity.

**Table 14. HHs Experiencing a Lack of Food in the Past Four Weeks (% of HHs) by Region and Wealth Quintile, 2013**

Region	Lack of Food	Severe Lack of Food
Kayes	9.0	2.9
Koulikoro	8.6	4.0
Sikasso	8.2	3.4

Region	Lack of Food	Severe Lack of Food
Ségou	8.0	3.3
Mopti	10.3	4.6
<b>Wealth Quintile</b>		
1 (lowest)	9.1	4.3
2	11.7	6.3
3	9.6	3.6
4	8.8	2.5
5 (highest)	3.5	1.1

Source: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, *Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V)*.

Note: Lack of food = HHs who stated they had nothing to eat in the HH or a HH member had gone to bed hungry in the four weeks before the interview. Severe lack of food = HHs who reported that a member had spent 24 hours without food in the four weeks preceding the interview due to a lack of food.

### A2.6.2. Malnutrition Rates

To provide a complete picture of malnutrition rates in Mali, the table below presents data from four surveys:

- 2012-13 Demographic and Health Survey (DHS),
- 2006 DHS,
- 2014 National Anthropometric Nutrition and Retrospective Mortality Survey (SMART), and
- 2010 Multiple Indicator Cluster Survey (MICS).

Due to security concerns in the north the two most recent surveys, the 2012-13 DHS and the 2014 SMART, did not survey all eight regions.<sup>1</sup> For data on Kidal and Gao, USAID-BEST consulted the 2006 DHS and 2010 MICS. The inclusion of information from all four surveys allows for comparison of data points over time and variance between reports.

<sup>1</sup> The 2012-13 DHS did not collect data in the regions of Timbuktu, Kidal, and Gao and the 2014 SMART did not survey Gao and Kidal.



**Table 15. Prevalence of Child Undernutrition (% of Children 0-59 Months) by Survey, 2006-14**

DHS 2012-2013				SMART 2014			
	Stunting	Wasting	Underweight		Stunting	Wasting	Underweight
Kayes	34.3	12.2	21.4	Kayes	16.1	11.3	14.3
Koulikoro	39.5	11.1	24.4	Koulikoro	29.0	13.8	25.8
Sikasso	39.9	13.4	27.3	Sikasso	33.0	9.4	22.9
Ségou	40.5	12.9	26.2	Ségou	28.9	14.0	25.1
Mopti*	46.5	14.7	32.1	Mopti	23.5	11.6	19.0
				Timbuktu	23.9	14.8	22.4
All	38.3	12.7	25.5	All	28.1	13.3	24.2

DHS 2006				MICS 2010			
	Stunting	Wasting	Underweight		Stunting	Wasting	Underweight
Kayes	30.7	15.2	22.0	Kayes	22.1	5.9	11.4
Koulikoro	39.1	16.2	29.1	Koulikoro	25.1	7.9	16.0
Sikasso	45.2	15.8	30.8	Sikasso	36.6	9.4	23.5
Ségou	40.0	14.6	25.7	Ségou	32.6	10.3	23.1
Mopti	40.9	12.7	28.1	Mopti	28.4	9.8	20.0
Timbuktu	43.9	16.5	32.3	Timbuktu	34.5	14.7	31.0
Gao	33.5	17.4	27.0	Gao	26.2	9.0	20.8
Kidal	32.6	27.2	28.7	Kidal	25.2	10.5	17.1
All	37.7	15.2	26.7	All	27.8	8.9	18.9

Sources: USAID-BEST using data from CPS/SSDSPF, INSTAT, et al, 2014, *Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V)*.; and INSTAT, July 2014, *Enquête Nutritionnelle Anthropométrique et de Mortalité Rétrospective, Mali 2014 (National Anthropometric Nutrition and Retrospective Mortality Survey)*.; and CPS/SSDSPF and INSTAT, December 2007, *Enquête Démographique et de Santé de Mali (EDSM) 2006 (2006 Mali Demographic and Health Survey, DHS)*.; and CPS/SSDSPF and INSTAT, 2013, *Enquête par Grappes à Indicateurs Multiples 2009 - 2010, Rapport final (2009-2010 Multiple Indicators Survey, Final Report)*.

\*The region of Mopti was not fully surveyed.

## A2.7. Recent Food Security Assessments

The following table provides a summary of the major food security reports for Mali including select findings.

**Table 16. Recent Food Security Assessments**

Author, Publication Date, Title	Data Collected	Objective	Methodology	Select Findings
INSTAT, July 2014, <i>Enquête Nutritionnelle Anthropométrique et de Mortalité Rétrospective, Mali 2014 (National Anthropometric Nutrition and Retrospective Mortality Survey)</i> .	30 June - 31 July 2014	Track the nutritional status of children 0-59 months, and females 15-49 years of age	<ul style="list-style-type: none"> <li>• Survey intended to be representative at the national and regional levels</li> <li>• Data collected for: Kayes, Koulikoro, Sikasso, Ségou, Mopti, Timbuktu, and Bamako (Gao and Kidal excluded due to security concerns)</li> <li>• 14,192 HHs; 21,822 children under 5</li> <li>• Collected data on anthropomorphic measures, nutrition, infant and young child feeding, and mortality</li> </ul>	<ul style="list-style-type: none"> <li>• 28.1% of children under 5 are stunted, 13.3% are wasted, 24.2% are underweight</li> <li>• Proportion of exclusive breastfeeding for infants under 6 months is 24.7% in Mopti and 40% in Sikasso</li> <li>• In Mopti only 8.3% of children 6-23 months consumed food from 4 or more food groups in the past 24 hours, 8.0% in Sikasso</li> </ul>
SAP and WFP, February 2014, <i>L'enquête de Mise à Jour des Indicateurs de Sécurité Alimentaire (MAJISA) Février 2014 (Updated Food Security Indicator Survey February 2014)</i> .	February 2014	Update key food security indicators	<ul style="list-style-type: none"> <li>• HH survey, focus group discussions, analysis of secondary data</li> <li>• Regions surveyed: Gao, Timbuktu, Kidal, Koulikoro, Kayes, and Mopti</li> <li>• 2,668 HHs</li> <li>• Collected data on food security, expenditures, shocks, prices, and income sources</li> </ul>	<ul style="list-style-type: none"> <li>• Most HHs surveyed dedicate 50% or more of their expenditures to food, in Kidal 91% of HHs surveyed dedicate over 75% to food</li> <li>• 14.52% of rural HHs are experiencing severe food insecurity vs 12.09% for urban areas.</li> </ul>
INSTAT, May 2014, <i>Sante, Emploi, Securite Alimentaire et Depenses de Consommation des Menages. October - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013)</i> .	1 October - 31 December 2013	Track changes in employment, health, food security, and consumption indicators	<ul style="list-style-type: none"> <li>• Stratified sample survey covering all eight regions of Mali and Bamako</li> <li>• 72,000 HHs</li> <li>• Collected data on employment, expenditure, health, coping</li> </ul>	<ul style="list-style-type: none"> <li>• Nationally, HHs purchase 81.2% of their food, 18.1% is own-consumption, and 0.7% from gifts</li> <li>• On average, 59.4% of HH expenditure is dedicated to food (69.5% in rural areas, 45.4% in urban areas)</li> <li>• 74% of the population is actively employed, 20% is inactive, 6% is unemployed</li> <li>• Nationally, the most common coping strategy for food insecurity is help from a parent or friend: 31.4%, followed by loans: 30.1%</li> </ul>

Author, Publication Date, Title	Data Collected	Objective	Methodology	Select Findings
CPS/SSDSPF, INSTAT, et al, 2014, <i>Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V)</i> .	November 2012 - February 2013	Track health and nutrition indicators	<ul style="list-style-type: none"> <li>• Survey representative of each of the five regions surveyed and Bamako, also urban and rural divisions</li> <li>• Due to security concerns Timbuktu, Gao, Kidal, and three <i>cercles</i> of Mopti were not surveyed</li> <li>• Due to these exclusions "national" data from this survey cannot be strictly compared to previous DHS national data</li> <li>• Women (15-49 years), men (15-59 years), children (under 5 years)</li> <li>• 15,200 HHs</li> <li>• Collected data on fertility, health, childhood mortality, and nutrition</li> </ul>	<ul style="list-style-type: none"> <li>• 38.3% of children under 5 are stunted, 12.7% are wasted, 25.5% are underweight</li> <li>• 21.6% of children ages 6-23 months achieve minimum dietary diversity</li> <li>• 66% of all HHs use an improved source of drinking water</li> </ul>
CPS/SSDSPF and INSTAT, 2013, <i>Enquête par Grappes à Indicateurs Multiples 2009 - 2010, Rapport final (2009-2010 Multiple Indicators Survey, Final Report)</i> .	December 2009 - February 2010	Provide updated data on key indicators of the status of women and children	<ul style="list-style-type: none"> <li>• Sample based on geographic breakdowns of 2009 census</li> <li>• 13,852 HHs; 23,497 children under 5</li> <li>• Collected data on nutrition and child health, water and sanitation, reproductive health, education, child protection, HIV/AIDS</li> </ul>	<ul style="list-style-type: none"> <li>• 27.8% of children under 5 are stunted, 8.9% are wasted, 18.9% are underweight</li> <li>• 71.9% of children 6-59 months and 55% of women are anemic</li> <li>• 56.7% of HHs use an improved source of drinking water</li> </ul>
FEWS NET, January 2010, <i>Livelihood Zoning and Profiling Report: Mali</i> .	23 November - 9 December 2009	Provide analysis of rural livelihoods and food security by geographic area	<ul style="list-style-type: none"> <li>• Revised version of 2003 map</li> <li>• Data collected via interviews at regional, <i>cercle</i>, and local levels</li> <li>• Collected data on livelihoods, markets, main crops, hazards, risks, and vulnerability</li> </ul>	<ul style="list-style-type: none"> <li>• Mali is divided in to 13 livelihood zones, including a distinct zone for urban Bamako</li> <li>• Rainfall is the most common distinguishing factor between zones, playing a role in determining the degree of dependence on livestock vs arable land</li> <li>• In the south HHs depend more on their own production of food and less on the market, with the poor in all zones more often relying on market purchases</li> </ul>

Source: USAID-BEST using information from CPS/SSDSPF and INSTAT, 2013, *Enquête par Grappes à Indicateurs Multiples 2009 - 2010, Rapport final (2009-2010 Multiple Indicators Survey, Final Report)*. and SAP and WFP, February 2014, *L'enquête de Mise à Jour des Indicateurs de Sécurité Alimentaire (MAJISA) février 2014 (Updated Food Security Indicator Survey February 2014)*. and FEWS NET, January 2010, *Livelihood Zoning and Profiling Report: Mali*. and CPS/SSDSPF, INSTAT, et al, 2014, *Enquête Démographique et de Santé (EDSM V) 2012-2013 (2012-13 Demographic and Health Survey, DHS V)*.; INSTAT, July 2014, *Enquête Nutritionnelle Anthropométrique et de Mortalité Rétrospective, Mali 2014 (National Anthropometric Nutrition and Retrospective Mortality Survey)*. and INSTAT, May 2014, *Sante, Emploi, Securite Alimentaire et Depenses de Consommation des Menages. October - Décembre 2013 (Health, Employment, Food Security and Households Expenditure on Consumption. October to December 2013)*.

## A2.8. Bulletins

**Table 17. Bulletins Relevant to Food Security**

Publication Title, Source	Frequency	Description
Mali Country Brief, FAO, GIEWS	As needed	<ul style="list-style-type: none"> <li>• Presents the overall food security situation in Mali</li> <li>• Provides information on crop production, food price trends, HH food access, environmental conditions, and macro-economic indicators</li> </ul>
Mali Food Security Outlook Update, FEWS NET	Monthly	<ul style="list-style-type: none"> <li>• Provides an assessment of the current food security situation and a forecast for the upcoming three-six months</li> <li>• Uses data from key partners to conduct scenario development and analyses; presents information on agriculture, climatic conditions, markets, and food security</li> <li>• Focuses on trends in staple food prices</li> <li>• Provides charts showing monthly prices in the current marketing year in select urban centers, and compares current trends with five-year average prices</li> </ul>
Mali Price Bulletin, FEWS NET	Monthly	<ul style="list-style-type: none"> <li>• Provides charts showing monthly prices in the current marketing year in select urban centers, and compares current trends with five-year average prices</li> </ul>
Food Security and Humanitarian Implications in West Africa and the Sahel, WFP*	Monthly/ Bi-monthly (since February 2014)	<ul style="list-style-type: none"> <li>• Highlights key trends affecting food security across the region each month,</li> <li>• Provides information on agriculture, displacement, international markets, markets in West Africa, and food security along with recommendations for regional partners</li> <li>• Lists updates on the food security and humanitarian crisis situations in the Sahel region as well as USAID's response</li> <li>• Provides information on USAID/OFDA funding in the region, and highlights key regional and country specific developments in Burkina Faso, Cameroon, Chad, The Gambia, Mali, Mauritania, Niger, Nigeria, and Senegal</li> </ul>
Fact Sheet: Sahel - Food Insecurity and Complex Emergency, USAID	As needed	<ul style="list-style-type: none"> <li>• Lists updates on the food security and humanitarian crisis situations in the Sahel region as well as USAID's response</li> <li>• Provides information on USAID/OFDA funding in the region, and highlights key regional and country specific developments in Burkina Faso, Cameroon, Chad, The Gambia, Mali, Mauritania, Niger, Nigeria, and Senegal</li> </ul>

*Source: USAID-BEST using information from Mali Country Brief, FAO, GIEWS, and Mali Food Security Outlook Update, FEWS NET and Mali Price Bulletin, FEWS NET, and Food Security and Humanitarian Implications in West Africa and the Sahel, WFP, and Fact Sheet: Sahel - Food Insecurity and Complex Emergency, USAID.*

*\*This bulletin is produced under the framework of the Regional Food Security and Nutrition Working Group for West Africa.*

## Annex 3. Market Integration Analysis

### A3.1. Introduction

To inform an understanding of the degree to which markets are integrated in Mali, USAID-BEST measured the correlation of retail prices at markets across the country using price data obtained from Agricultural Market Watch (OMA, Observatoire du Marché Agricole). This annex describes the data and presents the results of the correlation analysis.

### A3.2. Data

OMA collected retail prices (in West African CFA franc (XOF)) for cowpeas, imported rice, local rice, maize, millet, and sorghum. Prices for grains are reported for eight regions of Mali and Bamako. Although prices for cowpeas are available for about 60 markets across the country, USAID-BEST chose seven representative markets based on the robustness of data. The price data ranges from January 2009-November 2014. Summary statistics appear in the table below.

**Table 18. Summary Statistics for Retail Price Data**

Commodity/Market/Region	Number of Observations	Mean (XOF/kg)	Standard Deviation (XOF/kg)	Minimum (XOF/kg)	Maximum (XOF/kg)
<b>Cowpeas</b>					
Bla	70	338.86	89.66	200.00	604.25
Diallassagou	66	273.12	65.39	157.00	472.50
Dougouolo	55	340.97	87.19	172.00	525.00
Fana	67	376.30	89.12	175.00	650.00
Koulogon	66	272.21	66.11	157.50	475.00
Koury	71	349.81	71.36	200.00	587.50
Koutiala	71	378.90	83.75	250.00	612.50
<b>Imported Rice</b>					
Bamako	70	398.42	54.88	347.92	584.90
Gao	48	361.54	27.99	325.00	400.00
Kayes	70	346.35	15.73	302.92	405.83
Kidal	0				
Koulikoro	70	411.78	69.06	342.50	620.60
Mopti	2	337.00	18.38	324.00	350.00
Ségou	0				
Sikasso	31	366.20	17.21	325.00	381.25
Timbuktu	0				
<b>Local Rice</b>					
Bamako	70	398.42	54.88	347.92	584.90
Gao	48	361.54	27.99	325.00	400.00
Kayes	70	346.35	15.73	302.92	405.83
Kidal	0				
Koulikoro	70	411.78	69.06	342.50	620.60
Mopti	2	337.00	18.38	324.00	350.00
Ségou	0				
Sikasso	31	366.20	17.21	325.00	381.25
Timbuktu	0				
<b>Maize</b>					
Bamako	70	193.56	24.59	155.83	252.08
Gao	51	193.68	26.74	150.00	250.00
Kayes	70	197.87	35.38	154.75	287.50
Kidal	19	228.75	26.87	200.00	300.00
Koulikoro	70	192.60	28.78	150.00	288.75
Mopti	70	175.27	25.99	140.83	243.38
Ségou	70	168.56	28.63	123.13	251.00

Commodity/Market/Region	Number of Observations	Mean (XOF/kg)	Standard Deviation (XOF/kg)	Minimum (XOF/kg)	Maximum (XOF/kg)
Sikasso	70	145.52	25.79	117.25	219.00
Timbuktu	49	196.80	28.53	151.25	261.25
<b>Millet</b>					
Bamako	70	220.49	41.68	169.27	324.48
Gao	51	195.06	26.16	162.50	256.25
Kayes	70	242.70	37.12	193.71	335.42
Kidal	39	222.73	23.68	188.00	300.00
Koulikoro	70	207.10	44.58	147.50	316.67
Mopti	70	189.36	32.52	146.43	278.25
Ségou	70	178.02	39.55	121.25	275.80
Sikasso	70	211.57	42.69	150.00	314.50
Timbuktu	50	214.90	29.30	171.25	300.00
<b>Sorghum</b>					
Bamako	70	204.20	36.21	154.83	300.00
Gao	49	183.85	18.25	150.00	250.00
Kayes	70	203.29	43.51	162.81	304.17
Kidal	30	211.94	14.98	200.00	246.25
Koulikoro	70	190.86	39.91	128.75	300.63
Mopti	70	181.41	32.15	142.00	270.25
Ségou	70	172.21	37.30	116.25	271.88
Sikasso	70	168.41	32.87	127.60	250.00
Timbuktu	50	208.89	36.90	156.25	304.00

Source: USAID-BEST using data from OMA.



### A3.3. Correlation Analysis

USAID-BEST conducted bivariate (pairwise) correlation analysis with all commodities included in the dataset. All correlation coefficients were analyzed considering a 10 percent significance level and excluding missing cases. This report considers correlation coefficients greater than 0.75 indicative of high levels of market integration; coefficients between 0.50-0.75 indicative of a moderate degree of integration; and coefficients below 0.50 as indicative of poorly integrated markets. The following tables display the results of the calculation by commodity in alphabetical order.

**Table 19. Cowpeas**

	Bla	Diallassagou	Dougouolo	Fana	Koulogon	Koury	Koutiala
<b>Bla</b>	1						
	70						
<b>Diallassagou</b>	0.88	1					
	0.00						
	65	66					
<b>Dougouolo</b>	0.96	0.85	1				
	0.00	0.00					
	55	51	55				
<b>Fana</b>	0.94	0.89	0.89	1			
	0.00	0.00	0.00				
	66	64	53	67			
<b>Koulogon</b>	0.88	1.00	0.85	0.89	1		
	0.00	0.00	0.00	0.00			
	65	66	51	64	66		
<b>Koury</b>	0.88	0.85	0.84	0.94	0.86	1	
	0.00	0.00	0.00	0.00	0.00		
	70	66	55	67	66	71	
<b>Koutiala</b>	0.91	0.89	0.88	0.96	0.89	0.93	1
	0.00	0.00	0.00	0.00	0.00	0.00	
	70	66	55	67	66	71	71

Source: USAID-BEST using data from OMA.

Note: Results are presented in the following order: correlation coefficient (top), significance level (middle), number of observations (bottom).

**Table 20. Imported Rice**

	Bamako	Gao	Kayes	Koulikoro	Sikasso
Bamako	1				
	70				
Gao	0.73	1			
	0.00				
	51	51			
Kayes	0.45	0.45	1		
	0.00	0.00			
	70	51	70		
Koulikoro	0.95	0.65	0.42	1	
	0.00	0.00	0.00		
	70	51	70	70	
Sikasso	0.89	0.58	0.24	0.92	1
	0.00	0.00	0.05	0.00	
	70	51	70	70	70

Source: USAID-BEST using data from OMA.

Note: Results are presented in the following order: correlation coefficient (top), p-value (middle), number of observations (bottom). Market pairs with no observations were excluded from the table.

**Table 21. Local Rice**

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
Bamako	1								

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
	70								
<b>Gao</b>	0.73	1							
	0.00								
	51	51							
<b>Kayes</b>	0.45	0.45	1						
	0.00	0.00							
	70	51	70						
<b>Kidal</b>	0.52	0.58	0.43	1					
	0.00	0.00	0.01						
	33	33	33	33					
<b>Koulikoro</b>	0.95	0.65	0.42	0.49	1				
	0.00	0.00	0.00	0.00					
	70	51	70	33	70				
<b>Mopti</b>	0.79	0.64	0.10	0.31	0.79	1			
	0.00	0.00	0.43	0.08	0.00				
	70	51	70	33	70	70			
<b>Ségou</b>	0.85	0.58	0.24	0.35	0.87	0.85	1		
	0.00	0.00	0.05	0.05	0.00	0.00			
	70	51	70	33	70	70	70		
<b>Sikasso</b>	0.89	0.58	0.24	0.49	0.92	0.85	0.90	1	
	0.00	0.00	0.05	0.00	0.00	0.00	0.00		
	70	51	70	33	70	70	70	70	

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
Timbuktu	0.68	0.46	0.44	0.46	0.74	0.59	0.60	0.60	1
	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	
	50	49	50	32	50	50	50	50	50

Source: USAID-BEST using data from OMA.

Note: Results are presented in the following order: correlation coefficient (top), p-value (middle), number of observations (bottom).

**Table 22. Maize**

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
Bamako	1								
	70								
Gao	0.83	1							
	0.00								
	51	51							
Kayes	0.94	0.80	1						
	0.00	0.00							
	70	51	70						
Kidal	0.28	0.26	0.32	1					
	0.25	0.29	0.18						
	19	19	19	19					
Koulikoro	0.94	0.85	0.93	0.36	1				
	0.00	0.00	0.00	0.13					
	70	51	70	19	70				
Mopti	0.88	0.63	0.90	0.49	0.88	1			
	0.00	0.00	0.00	0.03	0.00				

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
	70	51	70	19	70	70			
<b>Ségou</b>	0.88	0.62	0.89	0.40	0.89	0.91	1		
	0.00	0.00	0.00	0.09	0.00	0.00			
	70	51	70	19	70	70	70		
<b>Sikasso</b>	0.92	0.85	0.87	0.18	0.88	0.86	0.81	1	
	0.00	0.00	0.00	0.47	0.00	0.00	0.00		
	70	51	70	19	70	70	70	70	
<b>Timbuktu</b>	0.19	0.14	0.31	-0.33	0.34	0.38	0.47	0.02	1
	0.20	0.32	0.03	0.18	0.02	0.01	0.00	0.88	
	49	49	49	18	49	49	49	49	49

Source: USAID-BEST using data from OMA.

Note: Results are presented in the following order: correlation coefficient (top), p-value (middle), number of observations (bottom).

**Table 23. Millet**

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
<b>Bamako</b>	1								
	70								
<b>Gao</b>	0.94	1							
	0.00								
	51	51							
<b>Kayes</b>	0.86	0.67	1						
	0.00	0.00							
	70	51	70						

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
<b>Kidal</b>	0.60	0.66	0.56	1					
	0.00	0.00	0.00						
	39	39	39	39					
<b>Koulikoro</b>	0.97	0.89	0.79	0.58	1				
	0.00	0.00	0.00	0.00					
	70	51	70	39	70				
<b>Mopti</b>	0.92	0.80	0.85	0.58	0.91	1			
	0.00	0.00	0.00	0.00	0.00				
	70	51	70	39	70	70			
<b>Ségou</b>	0.94	0.91	0.83	0.57	0.92	0.95	1		
	0.00	0.00	0.00	0.00	0.00	0.00			
	70	51	70	39	70	70	70		
<b>Sikasso</b>	0.98	0.91	0.86	0.56	0.96	0.89	0.91	1	
	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	70	51	70	39	70	70	70	70	
<b>Timbuktu</b>	0.83	0.82	0.56	0.59	0.89	0.79	0.80	0.79	1
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	50	49	50	38	50	50	50	50	50

Source: USAID-BEST using data from OMA.

Note: Results are presented in the following order: correlation coefficient (top), p-value (middle), number of observations (bottom).

**Table 24. Sorghum**

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
<b>Bamako</b>	1								

	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
	70								
<b>Gao</b>	0.80	1							
	0.00								
	49	49							
<b>Kayes</b>	0.94	0.77	1						
	0.00	0.00							
	70	49	70						
<b>Kidal</b>	0.06	0.13	0.16	1					
	0.77	0.49	0.39						
	30	29	30	30					
<b>Koulikoro</b>	0.94	0.69	0.84	0.04	1				
	0.00	0.00	0.00	0.82					
	70	49	70	30	70				
<b>Mopti</b>	0.93	0.66	0.85	-0.15	0.92	1			
	0.00	0.00	0.00	0.44	0.00				
	70	49	70	30	70	70			
<b>Ségou</b>	0.95	0.74	0.87	0.06	0.93	0.94	1		
	0.00	0.00	0.00	0.74	0.00	0.00			
	70	49	70	30	70	70	70		
<b>Sikasso</b>	0.96	0.81	0.92	-0.01	0.93	0.95	0.93	1	
	0.00	0.00	0.00	0.95	0.00	0.00	0.00		
	70	49	70	30	70	70	70	70	



	Bamako	Gao	Kayes	Kidal	Koulikoro	Mopti	Ségou	Sikasso	Timbuktu
Timbuktu	0.60	0.48	0.56	0.37	0.54	0.63	0.63	0.67	1
	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	
	50	47	50	29	50	50	50	50	50

Source: USAID-BEST using data from OMA.

Note: Results are presented in the following order: correlation coefficient (top), p-value (middle), number of observations (bottom).

## Annex 4. Contacts

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Bocoum	Mariam	Matrans Mali	Manager, Port Logistics
Bocoum	Hamadou	Veritable Petit Navire	Dealer, Import/Export
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Bouveau	Romain	WFP	Head of Procurement
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Coulibaly	Boubacar	Matrans Mali	Director General
Cyrille	Somboro	CRS	Administration Manager

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Dembele	Bandjougue	Oxfam	Humanitarian Programme Manager
Dembele	Ousmane	CRS	Head of Operations
Dia	Abdoulaye	Oxfam	Associate Country Director
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Diarra	Assanatou	Near East Foundation	Director
Diarra	Sidiki	Save the Children	Resilience Food Security and Livelihoods Advisor
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Goita	Souleymane	World Vision	Bamako IDP Recovery Project Manager
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Knieriemen	Marily	Helen Keller International	Country Director

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Noma	Idrissa	WFP	Market Analyst
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Sesay	Baika	CRS	FFE Coordinator
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Soumano	Sadio Kouyate	DNPP	Division Manager, Stock Management
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Tall	Cheick Tidiani	GDCM	Director General
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Thiero	Mamadou	N/A	Cereal Trader
Thiero	Bakary	World Vision	Food Security and Livelihoods Specialist
Thumba	Guillaume Tendeme	ICRC	Logistics Coordinator
Toure	Alkaidi Amar	CMC	Civil Service Administrator, Secretary General
Traore	Modibo	Ministry of Health and Public Hygiene	Head of Nutrition Division
Traore	Baba	Bolloré Africa Logistics	Manager, Maritime Solutions
Traore	Abdoulaye	OPAM	Administrator
Traore	Baber	Baber Traore Construction	President and General Director
Traore	Sekou	Bureau of Grain Expertise	Administrator (Manager)
Van Campen	Willem	ACDI/VOCA	Chief of Party
Vannetelle	Franck	ACF	Country Director
Viale	Christian	Groupe AMI	Director General
Vigroux	Alain	Groupe AMI	Koulikoro Site Manager
Weltzien-Rattunde	Eva	ICRISAT	Principal Scientist

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