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# USAID OFFICE OF FOOD FOR PEACE FOOD SECURITY DESK REVIEW FOR MALI, FY2015–FY2019

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Food and Nutrition Technical Assistance III Project (FANTA)  
FHI 360  
1825 Connecticut Avenue, NW  
Washington, DC 20009-5721  
T 202-884-8000  
F 202-884-8432  
fantamail@fhi360.org  
www.fantaproject.org

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## ACRONYMS AND ABBREVIATIONS

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AEG	agro-enterprise group
AfDB	African Development Bank Group
AFD	Agence Française de Développement (French Development Agency)
AGIR	Global Alliance for Action for Drought Resilience and Growth in the Sahel
AIDS	Acquired Immunodeficiency Syndrome
AQIM	Al-Qaeda in the Islamic Maghreb
ASACO	association de santé communautaire (community health association)
BMI	body mass index
CAADP	Comprehensive Africa Agriculture Development Programme
CAP	Centre d'Animation Paysanne
CDA	community development agent
CEDAW	Convention on the Elimination of all Forms of Discrimination against Women
CFSM	Consortium for Food Security in Mali
CILSS	Comité permanent Inter-états de Lutte contre la Sécheresse dans le Sahel (Permanent Interstates Committee for Drought Control in the Sahel)
CLTS	Community-Led Total Sanitation
CMDT	Compagnie Malienne pour le Développement de Textiles
CNN	Conseil National de la Nutrition (National Nutrition Council)
CPS	Cellule de Planification et de Statistique
CPS/MS	Cellule de Planification et de Statistique du Ministère de la Santé
CPS/SDR	Cellule de Planification et de Statistique du Secteur Développement Rural
CPS/SSDSPF	Cellule de Planification et de Statistique du Secteur Santé, Développement Social et la Promotion de la Famille
CRS	Catholic Relief Services
CSA	Commissariat à la Sécurité Alimentaire (Food Security Commission)
CSCOM	centre de santé communautaire (community health center)
CSCR	Cadre Stratégique pour la Croissance et la Réduction de la Pauvreté (Growth and Poverty Reduction Strategy)
dL	deciliter(s)
DNA	Direction National de l'Agriculture
DNSI	Direction Nationale de la Statistique et de l'Informatique
EAC	Enquête Agricole de Conjoncture
ECOWAS	Economic Community of West African States
EDC	Education Development Center, Inc.
EDSM	Enquête Démographique et de Santé du Mali (Demographic and Health Survey)
EMOP	Enquête Modulaire et Permanente auprès des Ménages (Modular Household Survey)
EU	European Union
FAFSA-2	Second Food Aid and Food Security Assessment
FAO	Food and Agriculture Organization of the United Nations

FEWS NET	Famine Early Warning Systems Network
FGM	female genital mutilation
FHH	female-headed household
FFP	USAID Office of Food for Peace
FFW	Food for Work
FSC	food security committee
FSTP	Food Security Thematic Program
FY	fiscal year
g	gram(s)
GAP/RU	Early Warning Group/Emergency Response (Groupements d’Alerte Precoce et Reponse d’Urgence)
GDP	gross domestic product
Global Fund	Global Fund to Fight AIDS, Tuberculosis and Malaria
GOM	Government of Mali
ha	hectare(s)
HIV	human immunodeficiency virus
Hb	hemoglobin
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IDP	internally displaced person
IEC	information, education, and communication
IFAD	International Fund for Agriculture Development
IFPRI	International Food Policy Res(earch Institute
INSTAT	Institut National de la Statistique
INTSORMIL	International Sorghum and Millet Collaborative Research Support Program
IOM	International Organization for Migration
IPC	Integrated Phase Classification
IR	intermediate result
ITN	insecticide-treated bednet
IYCF	infant and young child feeding
JPC	Joint Planning Cell
kcal	kilocalorie(s)
km	kilometer(s)
L	liter(s)
LZ	livelihood zone
MAEP	Mécanisme Africain d’évaluation par les Pairs (African Peer Review)
MCHN	maternal and child health and nutrition
MICS	Multiple Indicator Cluster Survey
MOH	Ministry of Health
MOU	memorandum of understanding
mm	millimeter(s)



MNLA	Mouvement National pour la Libération de l’Azawad (National Movement for the Liberation of the Azawad)
MSU	Michigan State University
MT	metric ton(s)
MYAP	Multi-Year Assistance Program
NEMA	National Emergency Management Agency
NGO	nongovernmental organization
OMA	Observatoire du Marché Agricole (Agricultural Market Office)
OPAM	Office des Produits Agricoles (Agricultural Products Office)
PAP	Priority Action Plan
PDDSS	Plan Décennal de Développement Sanitaire et Social (10-Year Health and Social Development Plan)
PECIMA	prise en charge intégrée de la malnutrition aiguë (integrated management of acute malnutrition)
PNG	Politique Nationale Genre (National Gender Policy)
PNN	Politique National de Nutrition (National Nutrition Policy)
PRODESS	Programme Décennal de Développement Sanitaire et Social (10-Year Program for Social and Health Development)
PRP	Country Resilience Priority
REACH	Renewed Efforts Against Child Hunger and Undernutrition
RISE	Resilience in the Sahel Enhanced
SAP	système d’alerte précoce (early warning system)
SBC	social and behavior change
SBCC	social and behavior change communication
SIE	Stock de l’Intervention de l’Etat (State Intervention Stock)
SILC	savings and internal lending committee
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SO	strategic objective
SNC	safety net committee
SNS	Stock National de Sécurité (National Security Stock)
SUN	Scaling Up Nutrition
TFSI	Timbuktu Food Security Initiative
U.N.	United Nations
U.S.	United States
UNDP	United Nations Development Programme
UNHCR	United Nations High Commission for Refugees
USAID	U.S. Agency for International Development
USDA	U.S. Department of Agriculture
USG	U.S. Government
USGS	U.S. Geological Survey
VNE	village nutrition educator
WAEMU	West Africa Economic and Monetary Union

WASH	water, sanitation, and hygiene
WFP	World Food Programme
WHO	World Health Organization
WRSI	Water Requirements Satisfaction Index

## EXECUTIVE SUMMARY

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### *Introduction*

The goal of the U.S. Agency for International Development Office of Food for Peace (USAID/FFP) Desk Review for Mali is to provide an analysis of the food security situation in Mali to inform the design of an FFP-funded recovery and transition program for fiscal year (FY) 2015–FY 2019. To achieve this goal, the desk review summarizes data on the causes and distribution of chronic food insecurity in Mali; identifies the most at-risk population groups; describes existing policies, strategies, and programs in the country; and describes the implications of the current food security situation for future FFP programming.

USAID/FFP provided \$41 million for two 5-year development food assistance projects in Mali from 2008 to 2013 (extended to 2014): the Consortium for Food Security in Mali (National Emergency Management Agency [NEMA] Program), led by Catholic Relief Services (CRS) (in collaboration with Save the Children International and Helen Keller International), and the Timbuktu Food Security Initiative (TFSI/MYAP), implemented by Africare. In 2012, civil conflict disrupted both projects and required reprogramming of resources southward, until program closure in 2013/2014. FFP has decided to follow up on the recently ended development food assistance projects with a new program of approximately 5 years in duration, as resources permit. This desk review aims to inform planning of this new program.

Mali has a large-scale resilience crisis that is both an urgent emergency and a chronic development challenge. Mali faced acute food insecurity and humanitarian crises in 2005, 2008, 2009/2010, and 2011/2012. In 2011, a poor agricultural season triggered a serious food security crisis, which worsened when armed separatist movements proclaimed independence for the North and a coup d'état ousted the country's president in early 2012. The U.S. Government (USG) terminated assistance to the Government of Mali (GOM) in April 2012 after the coup d'état, with exceptions for life-saving and essential assistance in the areas of humanitarian response, food security, health, and governance. Despite presidential and parliamentary elections in 2013, the political climate remains uncertain. Even during 2013/2014, when cereal production was only 9% below the 5-year average, emergency food assistance was required for 1.9 million people (FEWS NET 2014a). Approximately 137,000 Malians are refugees in other countries, and 134,000 Malians are internally displaced due to conflict (United Nations High Commission for Refugees [UNHCR] 2014a and International Organization for Migration [IOM] 2013).

Over a third (38.3%) of children under 5 years of age are stunted, including almost half (46.5%) in Mopti Region. Important factors contributing to food insecurity in Mali include widespread poverty; land tenure insecurity; climate/environmental constraints and frequent droughts that limit the productivity of agriculture, pasture, and watering points; low levels of agricultural technologies and improved inputs among smallholders; inadequate transport infrastructure and high transport cost; corruption; lack of finance or credit; inadequate market information; inadequate availability and quality of storage and marketing infrastructure; entrenched gender discrimination against women; conflict and displacement; lack of improved livestock varieties; high animal morbidity rates; low quality of production and high risk of contamination of meat, meat products, fish, and/or produce en route to market; and illegal fines along livestock corridors and low political will to enforce laws against such fines across the borders of countries in the Economic Community of West African States (ECOWAS).

Although the incidence of poverty in Mali has declined in recent decades, poverty remains endemic and is highly correlated with food insecurity and chronic malnutrition in the country. Evidence suggests that the household- and individual-level variables are associated, at the national level, with a higher risk of poverty (as measured by low consumption) (World Bank 2013a). Critical factors that determine household food security include livelihood activity and income source, household demographics, educational status, and assets. Poverty, chronic child undernutrition, poor health, and gender inequity

result in households being even more sensitive to food security shocks given compromised adaptive capacity, which is due to lack of resources and assets, diversion of income or assets to respond to poor child or adult health, and lack of capacity and empowerment to adequately respond to shocks.

**Given the geographic distribution of shock exposure, shock sensitivity, and adaptive capacity, vulnerability to food insecurity is highest in northern Kayes, northern Koulikoro, northern Ségou, Mopti, and the North, while overall vulnerability to food insecurity is lowest on aggregate around major urban centers, though there are pockets of food insecurity within cities.** Vulnerability is defined here as “exposure + sensitivity – adaptive capacity,” where the shocks of concern are rainfall related (most commonly, drought), market price fluctuations, and conflict. *Cercles* of highest overall vulnerability to food insecurity include Yelimané, Niéro, Diéma, Kayes (northern part), and Kita (northern part) *Cercles* in Kayes Region; Kolokani (northern part), Banamba, and Nara *Cercles* in Koulikoro Region; Tominian, San (northern part), Ségou (northern part), Macina, and Niono *Cercles* in Ségou Region; all *cercles* in Mopti Region; and the North.

### **Lessons Learned from Prior FFP Development Food Assistance Projects in Mali**

The review team solicited the input of former FFP project managers to discern lessons learned for improved livelihoods, early warning, and literacy interventions. Given the significant reliance on livestock as a livelihood for many vulnerable Malian households, there should be an emphasis on improved training to improve animal health, production, and marketing. Experience shows that market gardens collectively farmed can be a successful intervention if there is strong cohesion among the group with a shared vision and access to markets and inputs. Technical support to input suppliers and the incorporation of Food for Work (FFW) for community-shared assets can have a multiplier effect on market gardens and other interventions related to improved market access. The former projects did an exemplary job of targeting women in livelihoods interventions and addressed issues related to diversifying diets through market and home gardens. Rotating savings also proved an excellent community mobilizer and acted as a safety net for many families during a time of intense insecurity. Finally, Mali’s desert-like climate requires a strategic approach to enhancing water and soil conservation techniques.

The former projects encouraged communities to establish food security committees (FSCs) to enhance community resilience. One of the critical ways these groups can interact with the national government is to provide rainfall data to the meteorological service and Early Warning System (SAP). FSCs may also be linked to other relief organizations such as Mali Red Crescent or the World Food Programme (WFP) in the event that emergency assistance is required. A best practice gleaned from this approach is to ensure that committee members are elected by their communities and are not drawn from traditional leadership. Women should be encouraged to participate. In the future, project implementers felt that improved mobile technology could facilitate the transfer of early warning data more effectively. Literacy programs can have a tremendous impact on improving people’s livelihoods and general welfare but should be frequently assessed for program quality and ensure that the timing of classes does not interfere with already busy schedules.

Lessons learned were also gleaned in maternal and child health and nutrition (MCHN) and water, sanitation, and hygiene (WASH). Former FFP projects in Mali have been largely focused on treatment rather than prevention of undernutrition. Since the time the former projects were designed, a body of evidence has demonstrated the effectiveness of various preventive nutrition interventions, focused on the 1,000-day period from pregnancy through a child’s second year of life, that result in greater gains in improved nutritional status than treatment of undernutrition alone. This paradigm shift is also reflected in the GOM’s recently completed national nutrition policy. FFP development food assistance projects in Mali will need to consider this new prevention-focused paradigm in their programming, while at the same

time supporting a continuum of care that bridges treatment and prevention. They will also need to consider including within their projects an emphasis on improving the health and nutritional status of pregnant and lactating women, which is in line with the GOM national nutrition policy and represented in the 1,000-day window. Project outcomes and impact can be improved through use of strong social and behavior change (SBC) strategies that focus on primary and secondary audiences to influence adoption of beneficial nutrition, health, and hygiene practices among target populations, while building upon past SBC experiences. Community health workers and volunteers will be vital elements for community-level programming and will need support to be as effective as possible, including providing them with training, materials, supplies, and adequate supervision by skilled staff. Program designs will need to include close monitoring of activities—for example, irrigation—to ensure they do not result in declines in child nutritional status, due to factors such as increased women’s workload, and should put in place appropriate mitigation measures to prevent negative impacts.

The former FFP program in Mali successfully implemented the Community-Led Total Sanitation (CLTS) initiative, and future projects should consider expansion of CLTS to all project villages from the start of the project. Water management committee training in basic literacy and the principles of infrastructure management were important factors in the committees’ successful management of wells, although collecting funds for well maintenance and repair was a challenge and will need to be resolved with community leaders and members. Labor for WASH infrastructure through FFW can deter communities from acquiring a sense of ownership of and commitment to maintaining the infrastructure, while donation of labor or materials for construction generated this sense of community ownership. Overall, an important factor in project success was strong collaborations with the GOM and local government officials to strengthen implementation and sustainability of project activities and outcomes.

# 1. INTRODUCTION

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The U.S. Agency for International Development’s (USAID) presence in Mali spans more than half a century, a period that has seen economic growth and contraction; political stability and intermittent political conflict and coups d’état; and repeated large-scale economic, food security, and nutrition crises. Challenges to development in Mali are daunting and include a limited natural resource base and increasingly erratic climate patterns; low access to education, health care, and other essential services; poor governance and social conflict; widespread and entrenched gender inequities; and high population pressure. A poor agricultural season in 2011 triggered a serious food security crisis, which worsened when armed separatist movements proclaimed independence for the North and a coup d’état ousted the president in early 2012. Elections in 2013 established Ibrahim Boubacar Kéïta as president; Moussa Mara assumed the role of prime minister in 2014, and government structural changes are ongoing, but the political climate remains tense and uncertain. Humanitarian programming and food security interventions are reducing the likelihood of humanitarian crises in the North, particularly northern riverine areas; Ghourma Rharous in Timbuktu (hereafter referred to as Tombouctou) and Bandiagara in Mopti, where poor harvests in 2013 and erratic rainfall in the beginning of 2014 have diminished pasture conditions and eroded goat-millet exchange rates (Famine Early Warning Systems Network [FEWS NET] 2014a).

The United States Government’s (USG) assistance portfolio in Mali aims to strengthen the policy environment and address the structural causes of repeated crises, as well as to provide short-term targeted relief where acute needs are demonstrated. USAID’s Office of Food for Peace (USAID/FFP) provided \$41 million for two 5-year development food assistance projects in Mali from 2008 to 2013 (extended to 2014): the Consortium for Food Security in Mali (NEMA Program), led by Catholic Relief Services (CRS) (with Save the Children International and Helen Keller International); and the Timbuktu Food Security Initiative (TFSI/MYAP), implemented by Africare. In 2012, civil conflict disrupted both projects and required reprogramming of resources southward until program closure in 2013/2014. FFP has decided to follow up on the recently ended projects with a new development food assistance program of about 5 years in duration, as resources permit.

The goal of this USAID/FFP Food Security Desk Review for Mali is to provide a review of food security in Mali for FFP to inform planning for FFP-funded programs for FY 2015–2019. A draft Request for Application and Country Guidance for a new program were released for comment in January 2015. This desk review draws from secondary data; interviews with staff implementing the most recent FFP projects in Mali; and representatives from USAID/Mali, Government of Mali (GOM) ministries, the private sector, and other donors and bilateral agencies with a presence in Mali.

The desk review draws on USAID’s Policy Determination 19, which states: “Food security exists when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life” (USAID 1992). This definition of food security focuses on three distinct but interrelated elements of food availability, access, and utilization. In accordance with USAID’s new Resilience Agenda and in recognition that Mali has a demonstrated high vulnerability to repeated crises, this desk review presents a food security analysis through a resilience lens (see **Box 1** for key definitions and **Appendix 1** for USAID’s conceptual framework for resilience). Briefly, addressing food insecurity through a resilience lens in the Mali context entails (USAID 2012a):

- A focus on resilience in the face of the most frequently recurring shocks faced by the local population, such as drought, market variability (especially high rice and/or millet prices), and conflict
- Sensitivity to risk factors for conflict and the need for conflict prevention and mitigation activities
- Early action on the basis of early warning and accurate information about risks
- Close coordination between humanitarian and development partners

- Country-led plans that emphasize good governance, political will, and leadership
- Joint multisectoral analysis and programming that aims to target the same populations, where appropriate, with strategic and complementary interventions (“layering”)
- Inclusion of vulnerable populations among beneficiaries and inclusion of resilience-building activities in program design (“integrating”)
- Incorporation of resilience design aspects into development programs that target crisis-prone populations (“sequencing”)

**Section 2** of this desk review presents an overview of the country context. **Section 3** examines the evidence about the levels, trends, and determinants of food insecurity and lack of resilience in Mali. **Section 3.1** presents a synthesis of findings to answer the question, “What regions and populations are most affected by food insecurity and lack of resilience in Mali?”<sup>1</sup> **Section 3.2** focuses on food availability and food access, as well as relevant key policies, strategies, and programs implemented by the GOM, USG, and others. **Section 3.3** focuses on food utilization and health, examines evidence about needs and vulnerabilities and lists relevant key policies, strategies, and programs in this technical area. **Section 4** presents lessons learned from earlier FFP development food assistance projects in Mali, primarily relating to livelihoods; early warning systems; maternal and child health and nutrition; and water, sanitation, hygiene and a cross cutting intervention to improve literacy. **Appendix 2** provides a map of Mali for reference.

### Box 1. Key Definitions

**Food availability:** having sufficient quantities of food from household production, other domestic output, commercial imports, or food assistance

**Food access:** having adequate resources to obtain appropriate foods for a nutritious diet, which depends on available income, distribution of income in the household, and food prices

**Food utilization:** proper biological use of food, requiring a diet with sufficient energy and essential nutrients; potable water and adequate sanitation; knowledge of food storage, processing, basic nutrition, and child care and illness management

**Resilience to recurrent crisis:** the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth

**Layering:** targeting the same populations when appropriate with different and complementary programming

**Integrating:** ensuring that resilience-building activities and vulnerable populations are included in humanitarian and development programs, and improving coordination between humanitarian and development assistance programs

**Sequencing:** examining areas where humanitarian assistance is no longer needed, and mainstreaming resilience concerns from these same areas into follow-on development activities

Sources: USAID 1992; USAID 2012a; USAID/Mali 2014.

<sup>1</sup> The region is the highest administrative unit below national level in Mali, followed by *cercle* and then commune.

## 2. COUNTRY CONTEXT

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**Section 2** presents a snapshot of the Malian context to provide a backdrop for the food security analysis presented in **Section 3**. Table 1 presents selected demographic, economic, development, and public health indicators for Mali, and Table 2 highlights rural-urban disparities.

### 2.1 GOVERNANCE AND CONFLICT

The democratic election of national presidential and parliamentary leadership in 2013/2014 provided hope for stability in Mali. The USG terminated assistance to the GOM in April 2012 as a result of the coup d'état, with exceptions for life-saving and essential assistance in the areas of humanitarian response, food security, health, and governance. Given positive political developments in Mali in 2013 and 2014, multilateral organizations and other donors are developing multi-year country strategies for Mali as they plan for normalization of assistance levels. However, concerns about the future persist. Questions about use of public funds continue to plague the president's office, and the widespread corruption and limited capacity of GOM officials that helped give rise to the 2012 coup d'état remain entrenched.

The present conflict in northern Mali is fueled in part by long-term inequalities between the North (Tombouctou, Gao, and Kidal Regions) and the South (Kayes, Koulikoro, Segou, Sikasso, and Mopti Regions). Inequalities between these areas are evident in levels of economic development, poverty, access to education, and access to health care, reinforcing a belief, among those in the North in particular, that GOM policies demonstrate an exclusionary bias against development of the North. Another key dimension of the North-South conflict is a tension between moderates and extremists within Islam: Although more than 90% of Malians self-identify as Muslim (CPS/SSDSPF et al. 2014; Central Intelligence Agency [CIA] 2014), extremist Islamic groups based in northern Mali are fighting to establish an independent state ruled by *sharia* law, as they did in the Independent State of Azawad they proclaimed in northern Mali following the coup d'état in 2012. Under the Algiers Accord, three rebel groups agreed to participate in peace talks that started in July 2014, and French and other international troops remain engaged in Mali in an effort to prevent further conflict and combat regional terrorism.

### 2.2 HUMANITARIAN CONTEXT

Mali faced acute food security and humanitarian crises in 2005, 2008, 2009/2010, and 2011/2012. Even during 2013/2014, when cereal production was only 9% below the 5-year average, emergency food assistance was required for 1.9 million people to prevent a slide from “Stressed” food security status (Integrated Phase Classification [IPC] Phase 2) into “Crisis” status (IPC Phase 3) during the April–June 2014 lean season (FEWS NET 2014a). From January to May 2014, humanitarian assistance was provided to almost 1 million Malians by the International Red Cross and the food security cluster agency members. Assistance included general food distribution; social safety nets; agriculture, livestock, and fishing activities; income-generating activities; and cash transfers (U.N. Office for the Coordination of Humanitarian Assistance 2014a). The number of people targeted for this assistance is expected to rise to 2 million by September 2014 (Ibid.). **Appendix 3** provides the Mali Humanitarian Snapshot for July 2014.

As of mid-2014, population displacement was on the decline but remained substantial (**Appendix 4** geographically situates these movements). The United Nations High Commission for Refugees (UNHCR) (2014a) reported that 137,202 Malians were refugees in other countries, while the International Organization for Migration (IOM) (2013) reported that 133,636 Malians were internally displaced. Despite positive political developments on the national front, continued civil insecurity, concerns about political uncertainty, and lack of essential services and recovery support continue to discourage voluntary mass repatriations of displaced Malian citizens.



## 2.3 AGRICULTURE AND RURAL DEVELOPMENT

Agriculture dominates Mali’s economy, and the GOM sees agriculture as the engine of future rural development, poverty reduction, and growth. Approximately 64% of Mali’s population of 15.3 million (9.8 million people) reside in rural areas, although Mali has a high urbanization rate (4.4% per year) (United Nations Development Programme [UNDP] 2014). An estimated 80% of the national population is engaged in the agriculture sector. The country’s major exports are gold, cotton, and livestock, and its major imports are rice and fuel. The land tenure situation is rife with competing claims and ambiguity, discouraging longer-term producer investment in things like irrigation infrastructure. Mali’s rural development and agriculture policies are fairly highly integrated into those of the Sahelian and broader West African region. Mali is a member of the Economic Community of West African States (ECOWAS) and of the West Africa Economic and Monetary Union (WAEMU). Mali also has high market connectedness in the region, facilitated by the ECOWAS’s and WAEMU’s policy harmonization efforts. As of 2009, Mali exceeded its commitment expressed in the Maputo Declaration by spending 12% (over the 10% objective) of the national budget on agriculture (Food and Agriculture Organization of the United Nations [FAO] 2013).

## 2.4 ECONOMIC TRENDS AND POVERTY

Conflict and political tumult since 2012 have undermined the economic and development progress that Mali had made in recent decades. The rate of gross domestic product (GDP) growth averaged 5.8% per year over the 2000–2010 period, and the percentage of the population living in poverty declined from 55.6% to 43.6% over the same period (World Bank 2013a). However, because of Mali’s high population growth rate, the number of people living in poverty actually rose during this period. In 2012, the UNDP ranked Mali 182 out of the 187 countries on the Human Development Index (UNDP 2014). The current political crisis has caused a reduction in the GDP, but agricultural production (particularly cotton) and gold production is likely to continue to support the economy and offset the losses suffered in the public works (reduced because of lack of GOM funding), tourism, and hospitality sectors (World Bank 2013b). Also, remittances from citizens abroad reached 5% of GDP in 2010 and rose to 7.4% of GDP during 2011 (World Bank 2011a). Household access to electricity across the country increased from 10% to 24% nationally from 2001 to 2010, but that increase is deceiving: While households in urban areas have 60% access, households in rural areas have only 11% access (World Bank 2013a). The poverty rate is higher in rural areas than urban areas and is highest in the region of Sikasso than in other regions.<sup>2</sup>

## 2.5 ENVIRONMENT, CLIMATE CHANGE, AND WASH

Mali has four broad ecological zones: the Sahara desert in the North, the arid and semi-arid Sahel spanning the width of the country, the Niger River Inner Delta (seasonally flooded freshwater wetland), and the humid forests in the southernmost part of the country (USAID 2010). Low rainfall (282 mm/annum nationally) is a key constraint given that most Malian households rely on agriculture or pastureland for livestock. Average annual rainfall ranges from < 200 mm in the Saharan zone to 200–600 mm in the northern half of the Sahelian zone (where the Niger River Inner Delta is situated) to 600–1,200 mm in the southern half of the Sahelian zone to 1,200 mm in the southern forests. Millet production is viable and fairly reliable when rainfall exceeds 600 mm/year. Mali has had average to below-average rainfall across the country before July 2014, with localized adverse consequences for agriculture and replenishment of pasture.

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<sup>2</sup> To some degree this is accounted for by the relatively high poverty line defined for Sikasso. But in the World Bank re-analysis of poverty in Sikasso using a (lower) poverty line closer to neighboring regions, Sikasso still has the highest poverty incidence of all regions in the country (World Bank 2013a).

Under existing climate change models, Mali faces increasingly frequent erratic rainfall patterns and extreme rainfall events, which can undermine resilience. Climate change increases temperatures and pressure to cultivate on marginal and forest lands, reducing soil moisture availability, aggravating the frequency and severity of drought and flooding events, increasing population pressure on natural resources, and increasing potential conflicts between pastoralists and farmers due to pasture depletion (FAO 2012). These effects are particularly problematic in an environment of very high population growth, land tenure ambiguity, and conflict, and are expected to hit the rural population harder than the urban population, given rural populations' relatively higher reliance on natural resources (e.g., land) for their livelihoods (FAO 2012).

Some progress appears to have been made in access to water and sanitation in recent years. For example, although the Enquête Démographique et de Santé du Mali (EDSM) (Demographic and Health Survey) and the Enquête par Grappes à Indicateurs Multiples (MICS) (Multiple Indicator Cluster Survey) show that access to an improved water source remained relatively unchanged between 2006 and 2010, increasing only from 56% to 57% (Cellule de Planification et de Statistique du Ministère de la Santé [CPS/MS] et al. 2007; Cellule de Planification et de Statistique du Secteur Santé, Développement Social et la Promotion de la Famille [CPS/SSDSPF] et al. 2012), access was 66% in 2012–2013 (CPS/SSDSPF et al. 2014).<sup>3</sup> However, available data suggest access to an improved water source in urban areas (93%) far exceeds access in rural areas (only 58.6%) (CPS/SSDSPF et al. 2014). Access to improved sanitation, on the other hand, lags far behind: nationally only 22% of households have access to improved sanitation (CPS/SSDSPF et al. 2014). Access to improved sanitation is low in both urban areas (41%) and rural areas (17%). Water, sanitation, and hygiene (WASH) is discussed further in **Section 3.3**.

## 2.6 MORTALITY, HEALTH, AND NUTRITION

Despite recent progress in reducing infant, under-5, and maternal mortality, there is a need for further improvements to achieve Mali's Sustainable Development Goals for health. Infant mortality decreased from 96 to 56 deaths per 1,000 live births between 2006 and 2012–2013; under-5 mortality decreased from 191 to 95 deaths per 1,000 live births during the same period (CPS/SSDSPF et al. 2014); and maternal mortality declined from 465 to 368 deaths per 100,000 live births from 2006 to 2012–2013 (CPS/SSDSPF et al. 2014).<sup>4</sup> The improvements in infant, child, and maternal mortality have been attributed to GOM and donor support for Mali's national roadmap to accelerate the reduction of neonatal and maternal mortality (World Bank 2013a; Lamiaux et al. 2011). That said, the high levels of mortality in Mali can be directly attributed to high levels of fertility, resulting from low access to and use of family planning services and low access to and use and quality of health services. Although the national total fertility rate in Mali decreased from 6.6 births per woman in 2006 to 6.1 in 2012–2013, the rate is still very high and higher still in rural areas (6.5) than urban areas (5.0), among women with no education (6.5) than women with secondary school or higher education (4.0), and among women from the poorest households (6.7) than women in the wealthiest households (4.7) (CPS/MS et al. 2007; CPS/SSDSPF et al. 2014; Zureick-Brown et al. 2013). A woman's reproductive life starts early in Mali: 45.8% of rural female teenagers (15–19 years) were mothers or pregnant with their first child, compared to 25.0% in urban areas; nationwide, 49% of adolescents 15–19 years of age with no education had begun their

<sup>3</sup> Results from the 2012–2013 EDSM do not include the three northern regions of Mali (Tombouctou, Gao, and Kidal) and three *cercles* of Mopti (Douentza, Ténenkou, and Youwarou), due to the poor security situation in these areas at the time of data collection (CPS/SSDSPF et al. 2014). Thus, the results from the 2012–2013 EDSM and prior EDSM reports are not directly comparable.

<sup>4</sup> Again, these results may in part reflect the fact that the 2012–2013 EDSM did not include the Tombouctou, Gao, and Kidal Regions and the Douentza, Ténenkou, and Youwarou *cercles*, due to the poor security situation in these areas at the time of data collection (CPS/SSDSPF et al. 2014).

reproductive life, compared to 22% of adolescents with secondary education or higher (CPS/SSDSPF et al. 2014). Teenage mothers and their children are at a higher risk of illness, malnutrition, and death.

Mali's health problems hinder national development and economic growth. The GOM has identified the following as priority health problems in the country: high maternal, neonatal, infant, and child mortality; high levels of child and maternal undernutrition; female genital mutilation (FGM) and violence against women; low contraceptive prevalence rate; and morbidity and mortality related to communicable diseases, such as malaria, HIV, and tuberculosis (GOM 2014e). High levels of malnutrition and poor health will have long-term consequences for Mali's development, through learning outcomes in school and through productivity and incomes for adults, which will keep Mali in a cycle of poverty (World Bank 2013c). Current estimates show that Mali loses more than US\$235 million annually in GDP due to vitamin and mineral deficiencies alone (Ibid.). High fertility rates and rapid population growth are resulting in increased numbers of people living in poverty, which has an especially negative affect on women's health, their productive capacity, and their potential contributions to economic growth (Ibid.). The recent Ebola virus outbreak in West Africa also poses a threat to Mali. Mali experienced several Ebola cases, although it was recently declared Ebola free. However, there is still the risk of vulnerability to shocks from Ebola if there are additional cases, especially given the weak health system (Al Jazeera 2015).

Mali's health system has made positive reforms, but more improvements are necessary to increase its effectiveness in reaching the poor (**Box 2**).

GOM health system reforms over the past three decades include allowing privatized health care services in 1985 and adopting the Bamako Initiative in 1987, which aimed to improve access to essential drugs and primary health care services and to promote community participation in local management of health services, including cost recovery (GOM 2014e; Lamiaux et al. 2011).

In 1989, Mali established private, nonprofit *centres de santé communautaire* (CSCOMs) (community health centers), created by communities grouped into *associations de santé communautaire* (ASACOs) (community health associations). CSCOMs offer a minimum package of health services (*paquet minimum d'activités*), including curative, preventive, social, and promotional services, and are the first point of contact in the health system (Lamiaux et al. 2011). In early 2000, the GOM began instituting a policy of decentralization of key services, including health. ASACOs and CSCOMs are now supported at the local level, but the skills and resources to adequately support them are low (Ibid.). CSCOMs are funded through cost recovery by charging a fixed price for health services and a 15% margin on drug sales, contributions from the communities, and subsidies from the government or nongovernmental organizations (NGOs) (Ibid.).

In 2002, the government supported the establishment of a system of community health workers (*agents de santé communautaire*) and community health volunteers (*relais*) to provide early care and to manage simple cases of common diseases at low or no cost at the community level, according to Ministry of

### Box 2. Constraints to Health Service Delivery in Mali

- Inadequate number, distribution, and quality of health facilities: Poor organization of health care services, lack of continuity and comprehensive care, and inadequate facilities
- Poor management of pharmaceuticals: Frequent stock-outs of drugs, poor use of drugs according to defined protocols, inadequate management of free pharmaceuticals at health facilities, and increases in drug sales in the informal sector
- Poor system integration: Poor referral system, lack of transport between villages and health units, and poor communication between second- and third-level hospitals and the rest of the health system
- Inadequate human resource system: Poor distribution of human resources, insufficient human resources, poor performance and lack of motivation, and poor training of health staff

Source: GOM 2014e.

Health guidelines (GOM 2014e).<sup>5</sup> However, GOM spending on health, as a percentage of the total budget, has remained 7%–8% over the past decade, far below the 15% agreed upon in the 2001 Abuja Declaration (GOM 2014d).<sup>6</sup>

Although the GOM has tried to prioritize interventions in areas with high levels of poverty and offers certain services free of charge (e.g., cesarean births; insecticide-treated bednets; malaria treatment for children and pregnant women; treatment for HIV, leprosy, and tuberculosis), an external evaluation found that free services do not always reach the most poor (GOM 2014e).

A greater number of CSCOMs does not automatically translate into improved coverage for the poor. CSCOMs and ASACOs need more capacity strengthening, support, and ownership at the local level to remain viable, and there is a lack of adequate safety nets for the poor to access health services (GOM 2014e). Only 58% of the population lives within 5 km of a CSCOM (GOM 2014e). The EDSM-V found that 55% of rural households that had to pay for health costs used their salary or available money, while 31% sold assets, 17.5% used savings, and far fewer borrowed money, either with no interest (9.6%) or with interest (3%) (CPS/SSDSPF et al. 2014). Among households in the lowest wealth quintile, 36.6% sold assets to pay medical costs.

The implications of the health context in Mali on FFP development food assistance programming in the country point to the need to **work closely with the GOM’s Ministry of Health to strengthen the community-level component of health systems**, particularly the capacity of community health workers and volunteers, their service to the community and ability to reach the most poor, and the link between communities and their CSCOMs. The health problems are numerous and primarily affect women and children, while the weaknesses in the health system result in lack of and poor quality of services to the detriment of women and children. In addition to FFP development food assistance projects working to strengthen community level health services, USAID/Mali and/or other donors will need to strengthen the overall local health system so it can provide quality services in response to increased demand from the community.

## 2.7 GENDER

Women and girls in Mali experience serious gender disparities. Mali ranks 141 out of 148 countries in the UNDP Gender Inequality Index (UNDP 2014).<sup>7</sup> Literacy is low among both men and women, but only 39% of women age 15–24 years are literate, compared to 56% of men in this age range (World Bank 2011b; World Bank 2011c). The ratio of girls to boys in primary school is 88%, but drops to 43% by the tertiary level of education (World Bank 2012a; World Bank 2012b).<sup>8</sup> Thirty-eight percent of girls 5–14 years of age work, either in the home or in some income-generating activity for the family, compared to 33% of boys (CPS/SSDSPF et al. 2012). Only 51% of women in Mali participate in the labor force, compared to 81% of men (World Bank 2012c; World Bank 2012d).<sup>9</sup> Women’s burden of domestic work, lack of access to education, discriminatory hiring practices, complex licenses or permits for businesses, and poor access to financial credit result in lower participation of women in income-generating activities

<sup>5</sup> *Agents de santé communautaire* and *relais* are compensated by the ASACOs. Compensation for the *agents* is a wage payment determined by the ASACO and can also include other types of incentives, as determined by the ASACO. *Relais* are provided with incentives, such as free or discounted health services, in-kind payments, and allowances for trainings and meetings (République du Mali 2014b).

<sup>6</sup> The World Bank reported in 2013 that GOM spending on health was 11% of government spending each year from 2005 to 2008 and 9% of spending in 2009 (World Bank 2013a).

<sup>7</sup> The Gender Inequality Index reflects gender-based inequalities in three dimensions: reproductive health, empowerment, and economic activity.

<sup>8</sup> The 88% ratio of female to male primary school enrollment means that there are 88 girls for every 100 boys in primary school. The ratio of girls to boys in tertiary education is only 43 girls for every 100 boys.

<sup>9</sup> The labor force participation rate includes both formal and informal labor.

compared to men (World Bank 2013a; World Bank 2013c). Women are seriously under-represented in the business sector, especially outside of Bamako, and it is difficult for women to go into business in Mali. When women do become owners and managers, they are more likely to employ female workers (World Bank 2013c). Both women and men in business in Mali find it very difficult to access credit (World Bank 2013a).

Early marriage, forced marriage, FGM, levirate and sororate marriages,<sup>10</sup> and violence against women are common and serious problems among women in Mali. The median age of marriage for women 20–49 years of age is 17.8 years, and 35% of women 15–49 years of age are in a polygamous marriage (CPS/SSDSPF et al. 2014). Forced marriage is reportedly common (CPS/SSDSPF et al. 2012; World Bank 2006). Ninety-one percent of Malian women 15–49 years of age have experienced some form of FGM, and 73% report they experienced FGM before they were 5 years of age (CPS/SSDSPF et al. 2014).<sup>11</sup> Levirate and sororate marriages take place without consulting the widow or sister and potentially expose women to HIV infection. Thirty-eight percent of women 15–49 years of age reported having experienced physical violence at some point since they were 15 years of age, and 25% reported experiencing physical violence either “sometimes” or “often” during the 12 months before the EDSM-V survey (CPS/SSDSPF et al. 2014). In 65% of violence cases, the perpetrator was the woman’s husband or current partner (Ibid.). Thirteen percent of women 15–49 years of age have experienced sexual violence at some time in their life, and 11% have experienced sexual violence in the 12 months before the EDSM-V (Ibid.). Ninety-three percent of women who experienced sexual violence reported that their husband or current partner committed the act (Ibid.). Sixty-nine percent of women who have experienced physical or sexual violence have never sought assistance or spoken to anyone about it (Ibid.). Gender-based violence has reportedly increased in northern Mali following the 2012 takeover by separatist and jihadist forces, including kidnappings, rape, and forced marriage (USAID n.d.)

The GOM has improved legislation around gender equity, but more work is needed to further improve laws, enforce laws, and change social norms that result in inequities. Mali’s 1992 constitution guarantees equality between men and women (GOM 2011a). However, cultural influences, inadequate laws, and poorly enforced laws result in discrimination against women (World Bank 2006). Culturally, Mali is a patriarchal society, where women have lower status and position in the family and society than men. Women are to be submissive to men, focusing on their reproductive role, which in turn limits girls’ opportunities to go to school and women’s capacity to make decisions and participate in the family and community in an equitable way (World Bank 2006). The GOM took a positive step in 2010 when it adopted the *Politique Nationale Genre* (PNG) (National Gender Policy), which is monitored by the Ministry for the Promotion of Women, Children, and the Family (Rupp et al. 2012). The PNG and the associated implementation plan include six strategic directions focused on gender equity.<sup>12</sup> However, in 2011 the National Assembly adopted the new Family Code (*Code du Mariage et de la Tutelle*), which removed some previously granted rights for women, such as keeping her children if her husband dies instead of having a family counsel decide (Rupp et al. 2012). The code also designates the male as

<sup>10</sup> The levirate marriage specifies that a widow should marry the brother of her deceased husband, while the sororate marriage specifies that a widower should marry the sister of his deceased wife. The practice allows the family of the husband to keep the bride price previously paid for the deceased wife and to keep the children (World Bank 2006).

<sup>11</sup> FGM is always traumatic and results in immediate complications, such as excruciating pain, shock, urine retention, ulceration of the genitals, and injury to adjacent tissue, while other complications can include septicemia, infertility, obstructed labor at the time of childbirth, fistula, and even death (CPS/SSDSPF et al. 2012). Seventy-one percent of women and 66% of men age 15–49 years think FGM is a practice required by religion (CPS/SSDSPF et al. 2014). Seventy-two percent of women 15–49 years of age in Mali believe the practice of FGM should continue. Women believe FGM facilitates childbirth, controls sexual desire, and ensures the personal hygiene of girls (World Bank 2006).

<sup>12</sup> The six strategic directions are: (1) equal rights for women and men, (2) development of human capital for women and men, (3) the integration of women into productive channels, (4) equal participation of women and men in spheres of decision, (5) establishing egalitarian values and behaviors in Malian society, and (6) the inclusion of man-woman equality as a guiding principle of good governance (Rupp et al. 2012).

household head, allows girls as young as 15 years of age to be married (the legal age for men is still 18 years of age), and indicates that a wife owes obedience to her husband (World Bank 2013a). Although the GOM has signed key international conventions regarding women’s rights, such as the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), there is lack of harmonization between national legislation and international conventions, and lack of political will to enforce international laws (World Bank 2006; African Development Bank Group [AfDB] 2011). Failures and loopholes in enforcing laws around child marriage, forced marriage, and domestic violence result in their continued practice (World Bank 2006; AfDB 2011). The GOM does not yet have legislation regarding FGM or domestic violence (Rupp et al. 2012). Where modern laws and local customs coexist, local customs, which often discriminate against women, take precedence, particularly regarding inheritance rights to land (AfDB 2011). Women in Mali also lack knowledge about their rights (World Bank 2006).

In practice, gender has not been adequately taken into consideration in government planning and program implementation, for example, in health planning and service delivery (GOM 2014e). As in many Malian ministries, there is a low percentage of women in positions of leadership and management in the health system, with little input from women on developing and implementing health programs that meet their needs (Ibid.).

The implications of the gender context on FFP development food assistance projects in Mali point to the critical need to **conduct a gender assessment to inform project design**. As indicated in this section, women’s status in Mali is affected by much more than just culture. National legislation is not harmonized with international conventions for the rights of women signed by the GOM, and there is lack of political will to enforce laws that ensure women’s rights, including child marriage, forced marriage, domestic violence, and inheritance rights to land. FFP development food assistance programming in Mali will need to be based on a design closely informed by an assessment of these and other gender issues.

## 2.8 YOUTH

More than half of Mali’s population is under 18 years of age (54%) (UNICEF 2012; United Nations 2010). This large youth population lacks education and employment opportunities to pull themselves out of poverty. The vast majority of youths (65%) live in rural areas (United Nations, 2010). Only 50% of men 15–24 years of age participate in the labor force by either having a job or actively pursuing employment, and only 31% of women 15–24 years of age are active in the labor force (United Nations Population Fund et al. 2012). In 2012, official data show youth unemployment among men 15–24 years of age was 7.7%, compared to 14.3% among young women (World Bank 2012e; World Bank 2012f). However, rural and urban underemployment is pervasive in Mali, particularly affecting youth and significantly contributing to household poverty and vulnerability (World Bank 2013c).

Educated youth in Mali are disillusioned by a lack of formal sector jobs, particularly service sector and other professional jobs that require a high school diploma or higher education (Education Development Center, Inc. [EDC] 2010). The informal sector accounts for 94% of all employment in Mali, and most informal sector jobs are in agriculture (Ibid.). However, in the non-agricultural dry season, rural youths migrate to urban areas to earn cash by selling water, mobile phone cards, shoes, or clothing (Ibid.). Cash is seen as important to provide support for the family, access to manufactured goods (especially among young women for marriage trousseaus), and payment for medical services and other goods (Ibid.). Rural youths without close family or friends in urban areas feel marginalized and risk exploitation and abuse, and many would prefer to remain in their rural village (Ibid.).

Although the primary school enrollment rate is 88%, only 59% of students complete primary school, and only 44% of secondary school-age youth attend secondary school (World Bank 2011d, 2012g, 2012h). Primary and secondary school attendance is much lower in rural areas than in urban areas, and lower among girls than among boys (CPS/SSDSPF et al. 2012). The quality of learning is also low (World Bank

2013c). Fifty-two percent of primary school teachers have received only the minimum teacher training required for teaching at the primary school level (World Bank 2011e). The educational system lacks adequate vocational training to meet the demand for skilled labor while universities are overcrowded with limited numbers of professors and limited opportunities once students graduate (Klein 2007; EDC 2010). In northern Mali, many schools have been destroyed, closed, and/or occupied by either the army or the separatist or jihadist fighters, resulting in setbacks to prior improvements in educational access for boys and girls in this area (USAID n.d.).

Increased government resources are needed to fund education and vocational programs for youth or the country runs the risk of youth protests and of youths being drawn into trafficking, criminal activity, and/or terrorist networks (World Bank 2013a). There are particular concerns about the recruitment of local youths by the Mouvement National pour la Libération de l'Azawad (MNLA) (National Movement for the Liberation of the Azawad), Al-Qaeda in the Islamic Maghreb (AQIM), and other rebel groups operating in northern Mali (United Nations 2014; Palus 2012; Welsh 2013). The unrest in the North has resulted in a large number of internally displaced persons (IDPs) and international refugees, including many youth.

The implications of the youth context in Mali on FFP development food assistance programming in country points to the need for projects to **conduct an assessment on the needs and opportunities for youth**. Future programs should consider a component focused on youth, such as youth-focused on-farm and off-farm income-generating opportunities in their communities, given that evidence suggests many youth would prefer to remain in their villages rather than move to urban centers.

## 2.9 FOOD SECURITY INFORMATION

The food security information context in Mali includes systems related to agriculture, prices, national food stocks, food security early warning, and humanitarian information and response coordination. The Cellule de Planification et de Statistique du Secteur Développement Rural (CPS/SDR) conducts national harvest assessment surveys immediately after the main harvest in October/November, followed by an update in March. The Observatoire du Marché Agricole (OMA) (Agricultural Market Office) collects and reports national and regional market prices weekly, along with prices in neighboring countries. The Office des Produits Agricoles du Mali (OPAM) (Agricultural Products Office of Mali) manages and monitors stocks in the two national food stock systems: the Stock National de Sécurité (SNS) (National Security Stock) and the Stock de l'Intervention de l'Etat (SIE) (State Intervention Stock). The USAID-funded FEWS NET Project publishes monthly food security early warning reports and seasonal projections.

The national Système d'Alerte Précoce (SAP) (Early Warning System) engages many international actors, including USAID and FEWS NET, to conduct monthly assessments of pasture, agriculture, and climate for a food security bulletin. In addition, the recently completed FFP projects managed by Africare and Catholic Relief Services (CRS) helped to create the Community Early Warning System (CEWS), composed of community members who collected and reported rainfall data regularly to the Mali Meteorology Service. The Cadre Harmonisé (Harmonized Framework) process is a national and regional collaborative multi-agency process, supported by the Comité Permanent Inter-Etats de Lutte contre la Sécheresse dans le Sahel (CILSS) (Permanent Interstates Committee for Drought Control in the Sahel), whereby international actors working in food security in Mali develop food security analyses by compiling a broad range of local assessments and other information inputs. The Cadre Harmonisé has

undergone a process of harmonization with the IPC system.<sup>13</sup> The U.N. system has activated 11 clusters in Mali, including a Nutrition Cluster and a Food Security Cluster. The Commissariat à la Sécurité Alimentaire (CSA) (Food Security Commission) elaborates food security policies, implements the national food security strategy, and provides coordination during food security crises.

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<sup>13</sup> Due to methodological differences among FEWS NET, SAP, and the Cadre Harmonisé framework, FEWS NET projections tend to appear more optimistic than those of SAP or (more markedly) the Cadre Harmonisé. Differences mainly derive from three factors: 1) only the FEWS NET system incorporates coping capacity assumptions derived from “normal year” livelihoods frameworks; 2) FEWS NET and SAP use different methodologies to estimate the percentage of the population in each IPC phase (the methodologies differ around how receipt of humanitarian assistance affects the phase a beneficiary population is in); and 3) the SAP and Cadre Harmonisé systems, through reliance on local assessments of crisis-stricken areas specifically, may result in a bias toward negative findings, while FEWS NET’s use of scenario development based on a “normal year” may result in a bias toward positive findings.



**Table 1. Selected Public Health and Development Indicators for Mali**

Indicator <sup>14</sup>	
<b>Population</b>	
Total (million)	15.3
Rural population (% of total)	64
Population density (per sq km)	12
<b>Economy</b>	
GDP per capita (current US\$)	715
Consumer price index (2010=100)	107.8
<b>Poverty</b>	
Age dependency ratio (% of working age population)	101
Population below poverty line of \$1.25 a day (% of population)	50.4
<b>Human Development</b>	
Human Development Index (Source: UNDP, accessible at data.undp.org)	0.344
Gender Inequality Index (Source: UNDP 2014)	0.649
Mobile cellular subscriptions (per 100 people)	129
Internet users (per 100 people)	2.3
<b>Agriculture</b>	
Food production index	160.1
Agriculture value added per worker	842.1
Cereal yield (kg/ha)	1,667
<b>Education</b>	
Literacy rate (adult female—% of females age 15 and above)	25
Literacy rate (adult male—% of males age 15 and above)	43
Literacy rate (male and female—% of people age 15–24)	47
Net primary school enrollment (% of primary school age children)	69
Net primary school enrollment (female—% of female primary school age children)	64
Net primary school enrollment (male—% of male primary school age children)	73
Net secondary school enrollment (male and female—% of people secondary school age)	34
Net secondary school enrollment (females—% of females of secondary school age)	28
Net secondary school enrollment (males—% of males of secondary school age)	40
<b>Life Expectancy, Fertility, and Mortality</b>	
Life expectancy at birth (female)	54
Life expectancy at birth (male)	55
Total fertility rate (births per woman) (Source: EDMS-V 2014)	6.1
Under-5 mortality rate (per 1,000 live births) (Source: EDMS-V 2014)	95
Infant mortality rate (per 1,000 live births) (Source: EDMS-V 2014)	56
Neonatal mortality rate (per 1,000 live births) (Source: EDMS-V 2014)	34
<b>HIV Prevalence</b>	
Prevalence of HIV (% among female 15–24 years) (Source: EDMS-V 2014)	1.3
Prevalence of HIV (% among male 15–24 years) (Source: EDMS-V 2014)	0.3
<b>Maternal Health</b>	
Maternal mortality ratio (modeled estimate, per 100,000 live births) (Source: EDMS-V 2014)	368
Median age at first marriage for women age 25–49 (years) (Source: EDMS-V 2014)	18.0
Median age at first birth for women age 25–49 (years) (Source: EDMS-V 2014)	19.6

<sup>14</sup> Sources are the World Bank's online database except where noted.

Indicator <sup>14</sup>	
% of women 15–19 years who have begun childbearing by age 19 (Source: EDSM-V 2014)	66.2
<b>Food Security Indicators</b>	
Global Hunger Index (Source: IFPRI, accessible at <a href="http://www.ifpri.org/tools/2013-ghi-map">http://www.ifpri.org/tools/2013-ghi-map</a> )	14.8
Proportion undernourished in total population (%) (2012) (Source: FAO 2014c)	7.3
<b>Water and Sanitation</b>	
Improved sanitation facilities (% of population with access) (Source: EDSM-V 2014)	23.8
Improved water source (% of population with access) (Source: EDSM-V 2014)	66.4
<b>Malnutrition</b>	
Stunting prevalence (children under 5) (Source: EDSM-V 2014)	38.3
Wasting prevalence (children under 5) (Source: EDSM-V 2014)	12.7

**Table 2. Rural-Urban Disparities in Mali**

	Rural	Urban	National average
% children 6–59 months of age stunted	41.9	23.2	38.3
% HH* with access to improved water source	58.6	93.0	66.0
% HH with access to improved sanitation	16.8	41.2	22.0
Percentage of households that are headed by females	8.6	12.1	9.3
Percentage of women who are literate	11.8	47.4	20.6
Percentage of women who are exposed to no media or exposed to media less than once per week	53.8	21.3	45.8
Percentage of women who deliver at a health facility	46.4	91.4	55.0
Neonatal mortality rate (per 1,000 live births)	38	27	34
Under-5 mortality rate (per 1,000 live births)	113	64	95

\* HH = households.

Source: CPS/SSDSPF et al. 2014.

## 3. FOOD SECURITY CONTEXT

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### 3.1 REGIONS AND POPULATIONS MOST VULNERABLE TO FOOD INSECURITY AND RESILIENCE CRISES

USAID defines resilience as “the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth” (USAID 2012a). Resilience is a multidimensional concept that accounts for many significant contributors to transitory and chronic food insecurity. In Mali, resilience provides the overarching framework for GOM, USG, European Union (EU), and other key partners’ efforts, and USAID anticipates using both emergency and development funding to contribute to enhancing resilience to recurrent crises. **Appendix 5** summarizes the food security, nutrition, and population data discussed, with the aim of providing an overview of which regions and *cercles* are most affected by food insecurity and malnutrition.

#### 3.1.2 Key Institutional Efforts and Resources

**Since 2012, USAID has invested considerable resources to tailor and operationalize a resilience approach to its activities at the global, regional, and national levels, including:**

- USAID’s global guidance on resilience, entitled “Building Resilience to Recurrent Crisis: USAID Policy and Program Guidance” (USAID 2012a)
- USAID/Mali (with support from the Joint Planning Cell for the Sahel [JPC-Sahel]) plan for Mali, called “Mali JPC Plan: Operationalizing for Resilience 2012–2016” (USAID/Mali 2012)
- USAID/JPC-Sahel regional strategic plan, entitled “Sahel JPC Strategic Plan: Reducing Risk, Building Resilience, and Facilitating Inclusive Economic Growth” (USAID 2012b)
- USAID/Mali (with support from the JPC-Sahel) revised resilience strategy, entitled “Resilience Program Assessment: Challenges and Opportunities” (USAID 2014)
- USAID/Mali Country Development Cooperation Strategy, which is currently in development and is expected to incorporate resilience as a central principle

**Additional efforts led by GOM, EU, and other key stakeholders that entail significant vulnerability and food insecurity analysis include:**

- EU-led Global Alliance for Action for Drought Resilience and Growth in the Sahel (AGIR-Sahel) and notably the forthcoming AGIR Country Resilience Priorities for Mali (PRP-AGIR Mali) for which USAID is currently the lead donor agency
- GOM-led food security strategies and activities, including the Cadre Stratégique pour la Croissance et la Réduction de la Pauvreté (CSCR) III (Growth and Poverty Reduction Strategy) and Priority Action Plan (PAP); the Comprehensive Africa Agriculture Development Programme (CAADP); Initiative 166; the National Food Security Strategy; and the Cadre Harmonisé and SAP frameworks for monitoring, early warning, and projections
- GOM national nutrition strategy priorities, including Mali’s participation in the Scaling Up Nutrition (SUN) Movement, and development of the National Nutrition Policy and a Multisectoral Nutrition Action Plan<sup>15</sup>

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<sup>15</sup> SUN activities are also being facilitated via the REACH (Renewed Efforts Against Child Hunger and Undernutrition) initiative, which is hosted by the World Food Programme (WFP) and the Ministry of Health on behalf of the four UN partners (UNICEF, FAO, the World Health Organization (WHO), and WFP), and supported by the Food Security Thematic Program (FSTP), funded by the EU and implemented by UNICEF (World Food Programme [WFP] 2012a).

- The GOM Plan Décennal de Développement Sanitaire et Social (PDDSS) (Ten-Year Health and Social Development Plan)

### 3.1.3 Regions and Populations Most Vulnerable to Food Insecurity and Lack of Resilience

USAID/FFP advises that FFP development projects target regions and population groups at greatest risk of food insecurity and malnutrition, based on an understanding of the food security shocks they face, their sources of vulnerability, and their capacity to mitigate the effects of those shocks. Recovery and transition programs must consider these factors as well, while aiming to foster the social and economic recovery of crisis-hit areas and populations. A population's resilience gap is a product of its exposure to shocks and stresses, its sensitivity to those shocks and stresses, its internal adaptive capacity, and the extent of external risk reduction efforts, all of which are discussed in the following subsections. This discussion is followed by information about the geographic areas of highest vulnerability to food insecurity in Mali and about the characteristics of the most vulnerable households and individuals in those areas, based on existing data.

One limitation of this desk review is that it draws on data and studies that are sometimes incomplete or constrained by quality or scale issues; however, despite these constraints, the intention was to develop an evidence-based argument about who is most vulnerable to food insecurity and least resilient to guide FFP-funded programs. **Appendix 5** summarizes available data on geographic variation in exposure to food security shocks, sensitivity to food security shocks, adaptive capacity, overall vulnerability to food security shocks, humanitarian crisis levels, food availability at the household level, and nutritional status.

#### *Exposure to Food Security Shocks*

**The principal shocks that contribute to food insecurity in Mali include adverse climate/rainfall events (especially drought), market shocks (especially increases in the price of rice, millet, and non-food commodities such as cotton and petroleum), and conflict.**

**Rainfall estimates for the 2013/2014 growing season were normal to below normal, and long-term rainfall and climate change projections are alarming for agricultural livelihoods.** Cumulative rainfall levels appear to have been normal to below normal across Mali during the 2013/2014 growing season (FEWS NET 2014b). Following the main harvest, which will take place in October 2014, the SAP and other partners will conduct post-harvest assessments and develop food supply and price projections for the 2014–2015 agropastoral season. Climate change models suggest that Mali faces rising temperatures, declining average rainfall levels, and increasing geographic and temporal variability in rainfall in the future, resulting in an increased likelihood of drought (U.S. Geological Survey [USGS] and USAID 2012). Increased flooding frequency and severity are also possible. Drought reduces agricultural production, diminishes pasture availability, and reduces water availability for people and livestock. Indeed, the northern limit for rain-fed millet and sorghum production (which delimits the area in which these agricultural livelihoods are viable) is already moving southward in Mali, undermining production potential in the country's already precarious Sahelian agropastoral belt.

**The areas with highest exposure to drought are in northern Kayes Region, northern Koulikoro Region, northern Segou Region, Mopti Region, and the three regions in the North. The regional distribution of greatest frequency of exposure to drought in farming areas is depicted in Appendix 6, Figure 6A (USAID 2014a).** Based on historical geospatial (Water Requirements Satisfaction Index [WRSI]) data, drought strikes from 1 in every 9 years to as frequently as 1 in every 3 years in these areas.

- The hardest-hit *cercles* are in the arid agropastoral belt in northern Kayes, northern Koulikoro, northern Ségou, and northern Mopti.

- *Cercles* in which farming areas have the highest exposure to drought include Nara in northern Koulikoro Region; Macina, Niono, Ségou, and San in Ségou Region; Bandiagara, Bankass, Djénne, Douentza, Koro, Mopti, Tenenkou, and Youwarou in Mopti Region; Bafoulabé, Diéma, Kayes, Nioro, and Yélimané in northern Kayes Region; Diré, Goundam, Gourma-Rharous, and Niafouké in Tombouctou Region; and Ansongo in Gao Region (Kidal Region was not assessed because of physical insecurity, very low population density, and logistical challenges in the remote region).

**Regarding drought’s effects on pasture, the areas with the most frequent exposure to drought-related depletion of pasture are depicted in Appendix 6 (Figure 6B) (USAID 2014a).**

- *Cercles* in which grazing areas have the highest exposure to drought include Niono in northern Ségou Region; Douentza, Mopti, Tenenkoun, and Youwarou in Mopti Region; Diéma and Nioro in northern Kayes Region; Diré, Goundam, Gourma-Rharous, and Tombouctou in Tombouctou Region; and Ansongo, Bourem, Gao, and Menaka in Gao Region (Kidal Region was not assessed).

**Appendix 7 displays the geographic variation of drought exposure in Mali overall and reaches the same conclusion: The areas that are most frequently exposed to drought are in northern Kayes, northern Koulikoro, northern Segou, Mopti, and the North.**

- *Cercles* that have the highest overall exposure to drought (combining both farming- and grazing-related drought) include Kayes, Bafoulabé, Yélimané, Nioro, Diéma, and northern Kita in northern Kayes Region; Niara *Cercle* in northern Koulikoro Region; Ségou, Macina, and Niono *Cercles* in northern Ségou Region; all *cercles* in Mopti except for southern Bankass *Cercle*; and the North.

**The main market shocks that contribute to food insecurity in Mali are: sharp increases in retail prices of millet or rice domestically and globally, insecurity, fuel price hikes, and declines in the global prices of gold and cotton.** Each shock has different impacts on different population groups.

- Food price shocks: Since the 2008 global food price crisis, the GOM’s efforts to boost domestic cereal (especially rice) production have gone some distance toward reducing the vulnerability of Malian consumers to global rice price fluctuations, bolstered by the strategic use of national rice stocks to moderate market prices during the lean season, as necessary. Millet and sorghum also provide cheaper, though less preferred, dietary alternatives to rice, should rice prices spike beyond the reach of consumers. Domestic prices for rice, millet, and sorghum are also somewhat subject to subregional trade dynamics, although the purchasing power of Nigerien consumers (who represent a significant cereal demand in the subregion) tends to not be as strong as that of Malian consumers. Consumers in remote deficit production areas, such as in the North (beyond riverine valley areas), have the highest exposure to market price increases because of associated transportation and storage costs.
- Fuel price shocks: Because all of Mali’s petroleum is imported, the country is highly vulnerable to fuel price changes (as evidenced by the 2008 crisis), although urban consumers have significantly higher baseline fuel consumption—and therefore higher vulnerability to fuel price shocks—than rural households. Extended fuel price increases until early 2015 have contributed to higher prices for imported foodstuffs and local cereals (World Food Programme [WFP], 2012b).
- Insecurity: Concerns over the impact of conflict in the North in 2012 led to an increase in price of food staples of 28%, 37%, and 24% for millet, sorghum and maize, respectively.
- Gold and cotton price shocks: Malian gold and cotton producers are highly vulnerable to price fluctuations of those commodities. Gold mining is concentrated in the west and south of the country, and cotton production is concentrated in the south of the country.

**Populations in the North (especially Tombouctou and Gao), Mopti, Segou, Koulikoro, and Bamako have been the most affected by domestic and regional conflicts and conflict-induced displacement.**

Exposure to conflict undermines food security by displacing populations, interrupting or preventing cultivation and/or marketing activities, changing cereal trader behaviors, creating market uncertainty, and reducing access to off-farm income (such as income derived from tourism and handicrafts). Conflict reduces wage employment opportunities, including migrational employment. The impacts of conflict on food security are difficult to predict. Regional conflicts (such as the 2010 conflict in Côte d’Ivoire, which triggered the return of many economic migrants to urban Mali and eliminated an important export market for Malian livestock) further undermine Malian food security.

*Sensitivity to Food Security Shocks*

**Sensitivity to food security shocks is largely driven by longer-term and structural factors, most notably poverty and gender inequity.**

Although the incidence of poverty in Mali has declined in recent decades, poverty remains endemic and is highly correlated with food insecurity and chronic malnutrition in the country (World Bank 2013a; Eozenou et al., 2013). Poor households in Mali tend to have less food access, lower asset ownership, and lower overall income. They also allocate a higher proportion of total expenditures to meeting minimum food needs than their non-poor counterparts. Poor households are highly sensitive to price shocks, and modeling suggests that a 50% increase in the price of rice alone would lead to an increase of 2.4% in the poverty headcount, lower than it would have been if households lacked the option to substitute millet or sorghum for rice (World Bank 2013a). If rice prices rose 50%, the poverty headcount would rise by 3.3% in urban areas, compared to 2.1% in rural areas, where home production for home consumption provides a larger proportion of food intake. In contrast, a 50% increase in the price of all cereals would lead to an increase of 4.3% in the poverty headcount. This rise in the poverty headcount would be higher in the northern regions (where households access cereals predominantly by purchase, given sub-optimal production conditions) than in the southern regions, where home production for home consumption predominates. By comparison, a 50% rise in petrol prices would increase the poverty headcount by only 1.1% nationally (1.4% in urban areas and 0.9% in rural areas).

Shocks and stressors deplete limited resources in already resource-poor impoverished households and can increase the risk of deteriorating health and nutritional status for family members, especially the most vulnerable—pregnant and lactating women and young children. Poor families with children who are undernourished need more care, time, and resources to manage the frequent illness and poor health status their children experience. Women who are undernourished are at greater risk of illness and can lack the capacity to effectively carry out their household responsibilities due to lack of access to resources, less decision-making power in the household, and more demands on their time in terms of caring responsibilities. In addition, managing their illness may also deplete scarce household resources. This combination of factors results in an increased risk of household food insecurity because the resources that would have been used to purchase food are diverted to manage the frequent health shocks, and households are also less able to produce food or earn income given time diverted away from productive activities.

**The figure in Appendix 8 depicts areas of greatest sensitivity to drought-related shocks, where sensitivity is a product of lack of household wealth, poverty, child stunting, infant mortality, malaria, conflict, and soil quality (USAID 2014a).** Noteworthy observations include:

- While exposure to climate-related shocks tends to increase as one moves north in Mali, sensitivity to drought-related shocks as a whole does not follow a simple north-south gradient. Rather, most of Mali has a high to moderately high sensitivity to drought-related shocks, with pockets of severely high sensitivity, except for the area around Bamako, which has low sensitivity to drought-related shocks.

- Highly agriculturally productive areas in south-central and southeast Mali (i.e., southern Koulikoro, southern Ségou, and Sikasso) have low exposure to climatic shocks but high to very high sensitivity to food security shocks. The very high sensitivity to food security shocks in south-central and southeast Mali is driven by high poverty rates that belie the relative advantages of southern Mali in agricultural production.

### *Adaptive Capacity and Risk Reduction Efforts*

**Broadly, Malians’ adaptive capacity depends on their ability to capitalize on a range of strategies, and households with the lowest adaptive capacity are the rural poor with the lowest access to markets and services.** Key strategies include:

- Changing food consumption patterns, such as substituting lower-cost commodities (e.g., millet) for higher-cost commodities (e.g., rice), reducing meal frequency and volume, reducing meal quality (e.g., preparing a water-based sauce without cereals or protein sources), and increasing consumption of wild fruits and leaves
- Altering economic or livelihood activities to increase net income or reduce risk, such as providing more work opportunities for others, participating in off-season activities (market gardening and handicraft production), or increasing livestock sales
- Changing household expenditure patterns, such as reducing fuel consumption, reducing food consumption (described above), or reducing education or health service use
- Increasing reliance on borrowing money and/or food
- Migrating to domestic (e.g., gold mines, urban centers) or foreign destinations to search for work opportunities
- Relying more on remittances from migrants
- Using health services to address morbidity and malnutrition challenges as they arise, income permitting

Individual and household capacity to exploit adaptive or coping strategies is constrained by poverty status, market accessibility, human capacity (including educational status), access to productive assets (such as irrigation for dry season production), and access to health and nutrition services. Gender is also of fundamental importance when considering adaptive or coping strategies, as Malian women face disadvantages along all of these axes: Males are prioritized for food consumption in the household; women have lower educational attainment; and women’s ability to control and market their production or make decisions about the use of land is limited.

**Appendix 9 depicts areas of least adaptive capacity to food security shocks in Mali, where adaptive capacity is a product of a mother’s education level, market accessibility, health infrastructure availability, land development (anthropogenic biomes such as areas of agriculture, urbanization, and forestry), and access to irrigation (USAID 2014a).** Noteworthy observations from this figure include:

- Whether the shock is drought, price fluctuations, or conflict, adaptive capacity is driven by access to markets and services. Thus, adaptive capacity is highest near Bamako, Kayes, and other major urban centers where road, health, and market infrastructure are densest.
- Adaptive capacity is also higher near the Niger River, which provides opportunities for transport and marketing.
- Because adaptive capacity declines with increasing distance from Bamako, Kayes (and other major urban centers), and the Niger River, households with the lowest relative adaptive capacity are the low-income rural poor. These populations also face barriers to migration for employment

and receiving of remittances due to low educational status (with the exception of northern Kayes, where migration for employment is culturally promoted and widely practiced).

The resilience crisis is created because adaptive capacity in Mali is being eroded by recurrent food security and nutrition crises, which causes stock depletion and decapitalization, debt accumulation, and prevention of cultivation or other income-generating activities in the absence of external assistance.

While the GOM has strong systems in place to monitor markets and rainfall (discussed more below), systems for monitoring adaptive capacity are less well established, and information about adaptive capacity is often anecdotal and rarely population-representative. The SAP is the principal GOM early warning system, and the Cadre Harmonisé analysis framework is also used by the GOM and international partners to develop early warning projections. FEWS NET also provides monthly food security early warning. Hazard assessment is conducted through meteorological monitoring and market monitoring. National disaster risk reduction and climate change adaptation efforts aim to mitigate risk, and national food stocks are used to provide emergency food assistance and/or stabilize markets when required. Finally, the GOM lacks large-scale safety net projects, though the World Bank works in this area (see Section 3.2.3).

### *Areas of Highest Vulnerability to Food Insecurity*

As the above discussions demonstrate, different geographic patterns exist with regard to distribution of exposure, sensitivity to food security shocks, and adaptive capacity, depending on many variables. In this section, the authors attempt to answer the question “which areas have the highest vulnerability to food insecurity and lack of resilience” by examining an available analysis of “vulnerability to food insecurity,” as well as demonstrated needs for international assistance. The EDSM-V data found that 9.0% of rural households experienced inadequate food supply (i.e., no food in the household or a member going to bed hungry in the previous 4 weeks), compared to 6.9% of urban households. Of all regions, Mopti had the highest percentage (10.3%) of households with inadequate food supply (CPS/SSDSPF et al., 2014).

**The above findings on geographic distribution of shock exposure, shock sensitivity, and adaptive capacity suggest that overall vulnerability is highest in northern Kayes, northern Koulikoro, northern Ségou, Mopti, and the North, while overall vulnerability to food insecurity is lowest in and around major urban centers.** A map of vulnerability to food insecurity is presented in **Appendix 10** (USAID 2014a). Vulnerability is defined here as “exposure + sensitivity – adaptive capacity,” where the shocks of concern in the map are rainfall related (most commonly, drought).

- *Cercles* of highest overall vulnerability to food insecurity include Yelimané, Nioro, Diema, Kayes (northern part), and Kita (northern part) *Cercles* in Kayes Region; Kolokani (northern part), Banamba, and Nara *Cercles* in Koulikoro Region; Tominian, San (northern part), Ségou (northern part), Macina, and Niono *Cercles* in Ségou Region; all *cercles* in Mopti Region; and the North.

**The overarching objective of development and resilience efforts in Mali is to end the cycle of recurrent crises and chronically high needs for humanitarian assistance. The highest levels of need for international assistance since 2008 have been in the North, as well as in an arid agropastoral belt that stretches across the north of Kayes, Koulikoro, Ségou, and Mopti Regions. Appendix 11** displays the regions and communes that have had the highest levels of need for international assistance from 2008 to 2012, ranked according to the IPC (Level 2 and above) (FEWS NET 2014d). Areas with the highest frequency of poor food security outcomes include the Gao and Kidal Regions, Douentza *Cercle* in Mopti Region, and Nara *Cercle* in Koulikoro Region. Areas with the second-worst level of poor food security outcomes include all of Tombouctou Region; Niono *Cercle* in Ségou Region; Mopti *Cercle* in Mopti Region; and Kayes, Yélimané, and Nioro *Cercles* in Kayes Region.



The areas with the highest need for assistance to address acute food insecurity for July–September 2014 are projected to be: Diéma and northern Kayes *Cercles* in Kayes Region; Nara and Banamba *Cercles* in Koulikoro Region; Douentza and Bandiagara *Cercles* in Mopti Region; and all *cercles* in Tombouctou, Gao, and Kidal Regions (see **Appendix 12**) (FEWS NET 2014a; FEWS NET 2014b). It is notable that many of the *cercles* projected to be most affected by acute food insecurity in the July–September 2014 time frame are among those that most frequently experience humanitarian crises at IPC level 2 and above.

It is not possible to determine whether the areas with the highest frequency of chronic and acute food insecurity are the same as the areas with the highest level of chronic malnutrition, given the lack of recent data for Gao, Kidal, and Tombouctou and the lack of comparable data on malnutrition prevalence at the *cercle* level. **Appendix 13** presents available regional malnutrition prevalence data. The most recent EDSM (2013) shows that the highest levels of chronic malnutrition are in Mopti, Ségou, Sikasso, and Koulikoro, while the Standardized Monitoring and Assessment of Relief and Transitions (SMART) 2013 survey shows the highest levels in Ségou, Sikasso, and Koulikoro. However, the most recent EDSM does not include data on children’s nutritional status for Gao, Kidal, and Tombouctou, due to the security situation during data collection.

The appearance of Sikasso in these lists is particularly striking. The World Bank indicates that poverty rates in Sikasso are high despite it being a fertile region with good agricultural conditions and that this “Sikasso Paradox” is caused by the dominance of cash crop production (cotton) in this region; however, more information is needed to elucidate the driving factors behind this paradox (Eozenou et al., 2013).<sup>16</sup> The levels of chronic malnutrition in Sikasso are a result of poverty and poor health and nutrition practices and must be addressed through activities to 1) improve incomes and the enabling environment around income generation for vulnerable populations, and 2) social and behavior change to improve health and nutrition practices. In addition, it is necessary to ensure the availability and access to quality health services and improved water sources and sanitation facilities for the poor.

**Appendix 5, Tables 5A and 5B** summarize the data discussed in this section, regarding shock exposure, shock sensitivity, adaptive capacity, overall vulnerability, need for external assistance, malnutrition, and population. The tables also highlight the regions and *cercles* that were selected as highest priority under the GOM Initiative 166 and USAID resilience initiatives.

### *Characteristics of the Most Vulnerable*

Comprehensive nutrition and household food security survey data are not available for Mali at levels (such as the *cercle* level) that would allow for systematic analysis. Evidence suggests that the following household- and individual-level variables are associated, at the national level, with a higher risk of poverty (as measured by low consumption) (World Bank 2013a):

- **Livelihood activity and income source.** Households are at greatest risk of poverty if they work in agriculture, followed by manufacturing and construction; households are at greatest risk if the household head is unemployed, or self-employed in agriculture.
- **Household demographics.** Households are at greatest risk of poverty if they have a larger number of members (e.g., polygamous households) and/or have a higher percentage of dependents (particularly children under 5). This is particularly true among rural households. Whether a household is headed by a man or a woman does not seem to imply a significantly different level of vulnerability when other variables (e.g., poverty) are controlled for.

<sup>16</sup> The World Bank indicated that integrated household surveys with production modules together with standard welfare measurement modules, or more focused qualitative surveys in the Sikasso region could be considered to fill the knowledge gap; additional data was to be collected but was disrupted by the March 2012 coup. The World Bank also indicated that there is a relatively high poverty line for Sikasso region (Eozenou et al., 2013); see footnote 2.

- **Educational status.** Lower educational attainment of the household head is associated with higher poverty risk.
- **Assets.** Poverty is associated with lower access to livestock, lack of access to potable water, cultivation of less land, cultivation of fewer varieties of crops, lower overall cereal production, and a longer lean season.

As mentioned above, the EDSM-V provides data on the percentage of households reporting insufficient household food availability (no food available in the household or people going to bed hungry) and found that several factors are associated with this outcome:

- **Educational status.** As expected, households headed by individuals with secondary or higher education reported lower frequency of insufficient household food availability.
- **Wealth quintile.** Only the highest wealth quintile had a low reported percentage of households reporting insufficient household food availability in the previous 4 weeks (3.5%), compared to 8.8%–11.7% for others (CPS/SSDSPF et al., 2014).

## 3.2 FOOD AVAILABILITY AND ACCESS

**Section 3.2.1** discusses the determinants and distribution of food availability in Mali, including land, crop and livestock production, fishing and aquaculture, cereal availability and food stocks, and agricultural trade. **Section 3.2.2** focuses on the determinants and distribution of food access in Mali, including food consumption and poverty, livelihoods and off-farm income generation, food purchase, gender and food access, and population coping capacities and strategies. **Section 3.2.3** highlights selected policies, strategies, and programs related to food availability and access in Mali.

### 3.2.1 Food Availability

#### *Land Availability and Access*

Around one-third of Mali's total land area of 124.1 million hectare (ha) is suitable for agriculture, including pastureland (45.9 million ha). Of this 45.9 million ha, the large majority is used as pastureland, and 5.3 million ha is cultivable for food production (USAID 2010). Forests account for 10% of land area (Ibid.). The Niger River Inner Delta, 3 million ha in size, is flooded from September through May annually. The Niger River winds through Mali, boosting the value of adjacent land (and thus land pressure and conflicts) by enabling irrigation in villages along the way. Although only 5% of cultivated land is irrigated, Mali offers a high potential for irrigated agriculture, with only 12% of Mali's large irrigation potential currently developed (Ibid.).

Although the GOM recognizes the right to land ownership in the Land Code and Agricultural Orientation Law and has decentralized administration of land, water, and pastoral resources to a significant degree, the majority of land remains officially owned by the State, and customary land tenure administration systems (which allocate use-rights of land units rather than ownership) remain in effect through much of the country. Most agricultural units in Mali are run by smallholder farmers on land secured through customary use-rights, which implies a high degree of land insecurity. The GOM legally recognizes the following tenure types: ownership, leasehold, rural concession, permit rights, use-rights to customary land, and use of land by pastoralists (USAID 2010). Pastoralists' access to land is primarily governed by the Pastoral Charter, which calls on local authorities to work with pastoralists, traditional authorities, and farmers to ensure that pastoralists can maintain their access to traditional grazing routes and water sources in the face of encroaching agricultural interests. Access to grazing areas in the Niger River Inner Delta is especially important because a native grass there called Bourguou (or Burgu) (*Echinochloa stagnina*) is widely valued by pastoralists for grazing (Ibid.).

In contrast, the GOM intensively manages and supports agricultural production in high potential farmland areas, i.e., in the “modern sector.” Modern sector production areas have been established in Ségou, Sikasso, Mopti, Tombouctou, and Koulikoro. GOM Development Offices have been established to manage those areas. Development Offices include:

- Office du Niger and Office Riz Ségou, both in Ségou Region, which manage rice production
- Office Riz Mopti in Mopti Region (rice production)
- Office de la Haute Vallée du Niger and Office de Développement Rural de Sélingué, both in Sikasso Region (rural development office)
- Office du Périmètre Irrigué de Baguineda in Koulikoro Region (small-scale irrigation)
- Northern office to manage the Petits Périmètres Irrigués Villageois (small-scale village irrigation schemes) in the North
- Compagnie Malienne pour le Développement de Textiles (CMDT) (southern Koulikoro Region, southern Ségou Region, southern Kayes Region, and Sikasso Region), which was established to manage cotton production in the South and production of cereals like maize that are often grown in rotation with cotton in those same areas

The historical distinction between the agricultural South and the pastoral North has blurred over time. Pastoralists and farmers have traditionally enjoyed a symbiotic relationship in which nomadic or transhumant pastoralists migrate southward between November and January to graze cattle on post-harvest farm plots, benefit from crop residues, and drink from water points replenished during the rainy season. Once the rainy season begins, pastoralists return to their northern rainy season grazing areas. However, in recent years, southern farmers have become more involved in livestock husbandry, while pastoralists have become more sedentary (shifting from nomadism to transhumance and semi-transhumance), and a broad agropastoral belt developed in the arid and semi-arid Sahel region that reaches across Mali. The ecological zones are inextricably linked to each other through the interdependence of livelihoods. There are natural synergies between livestock and farming due to increased availability of manure, soil tillage via animal traction, and income generation from dairy products, a traditionally important livelihood in Mali.<sup>17</sup> However, livestock in Mali rely on natural pasture, which is increasingly overutilized and stressed by prolonged drought and climate change. Despite the existence of the *diina*<sup>18</sup>—especially in the Niger River Inner Delta—inconsistencies between land law and customary land tenure create conflicts, as do the differences between the livelihood interests of smallholder farmers, larger-scale commercial farmers, and pastoralists. Irrigation and seasonal flooding (in the lowlands, or *bas-fonds*) increase land value and demand and intensify the effects of land tenure ambiguity. Constraints to the full implementation of land law include limited financial and human capacity of relevant GOM institutions at all levels, illiteracy of producers, producers’ lack of experience with government institutions, and lack of financial means to travel to courts or pay the often costly fees to secure land titling and ownership (USAID 2010). Customary land tenure systems discriminate against women’s land security, as do intra-household customs across the country. Women are often entitled to land of low fertility and are typically allocated use-rights rather than ownership (Michigan State University [MSU] 2011).

Mali is a nation of subsistence farmers: Of the country’s approximately 800,000 farmers, two-thirds (68%) cultivate less than 5 ha (USAID 2010), and the average farm size (growing cereals) is 1.7 ha (GOM 2014a). Farmers in Mopti and Ségou have the highest average farm size, at 2.2 and 2.1 ha, respectively, while farmers in Gao cultivate cereals on only 0.4 ha on average (Ibid.).

<sup>17</sup> More information is available at the following website: <https://ilri.org/InfoServ/Webpub/fulldocs/V6200B/V6200B0H.HTM>

<sup>18</sup> A customary law from King Sékou Ahmadou in the early 19th century, aiming at the sustainable use of the Niger Delta environment for a peaceful coexistence between sedentary people (farmers, fishermen, traders) and nomadic herders (Abdoul Diallo, 2014).

### *Rainfall and Climatic Events*

**Section 3.1** discussed exposure to drought in Mali (**Appendices 7 and 8**). **Appendix 14** provides the FEWS NET seasonal calendar for Mali (<http://www.fews.net/west-africa/mali>). The 2014/2015 rainy season started well in the southern agricultural areas and replenished vegetation and watering holes for livestock in the South, though livestock conditions were poor in Bandiagara and the North. Cumulative rainfall totals are expected to be average to below average across the country for 2014 (FEWS NET 2014a). **Appendix 15** depicts annual rainfall zones in Mali (USAID 2014a). Climate change modeling suggests that climate change may result in small increases or decreases in rainfall in the country, depending on the model used. What is more certain is that Mali will face higher temperatures, and drier areas (e.g., agropastoral and pastoral areas) will warm the fastest (Ibid.). This will have alarming implications for agricultural production in the already vulnerable agropastoral belt, where the northern boundary of viable rain-fed agriculture is already creeping southward; impacts on pasture are not yet known.

### *Agricultural Production Systems, Crops, Levels, and Trends*

**Overview of production systems.** The GOM aims for Mali to be self-sufficient in cereals and become a regional breadbasket. The country's comparative advantage in coarse grains production stems in large part from the Niger River, whose Niger River Inner Delta and seasonal flooding afford intensive agriculture (including irrigated and *contre-saison* agriculture) and extensive fishing. Smallholder farmers account for the large majority of Mali's agriculture sector operators. Broadly, agricultural production is analyzed and reported on for two sectors: the traditional sector and the modern sector. The traditional sector encompasses production units—mostly those of rural smallholders—managed without the extensive research, extension, irrigation, and financial support (especially credit) typically available in the cotton and irrigated rice zones (MSU 2011). Use of inputs, such as fertilizer and improved seed, is very low in the traditional sector. Producers are poorly connected to markets and have little access to financial institutions for access to credit. Millet, sorghum, and fonio are the staple crops of the traditional sector.

In contrast, the modern sector refers to the areas where the GOM, often with donor support and/or private investment, has invested considerable resources in construction of irrigation infrastructure and provision of support in production, credit, and marketing. The GOM and FEWS NET produced a livelihood zone (LZ) map that is widely used for food security monitoring and early warning in Mali (**Appendix 16**). Thirteen LZs are delineated on the basis of the food and income sources among the population living in each zone. **Section 3.2.2** discusses the relationship between livelihood activities and food security in more detail, but several observations should be noted here. Transhumant pastoralism dominates the arid northern regions; this gives way to agropastoralism, dominated by drought-resistant crops, in the agropastoral belt sweeping across the northern half of the southern regions (Kayes, Koulikoro, Sikasso, and Mopti); maize cultivation with livestock keeping is prevalent in the southern half of the southern regions; and rice cultivation with livestock keeping dominates where the Niger and Senegal Rivers (and their tributaries) allow.

**Crops.** The broad roles of individual crops in Malian consumption and the economy are as follows (MSU 2011).

- **Millet and sorghum.** These drought-resistant national staple crops are grown and cultivated throughout Mali, and, as such, national food security is widely perceived as a function of sorghum and millet availability. Production of these traditional sector crops is rain-fed on smallholder plots in both the main season and *contre-saison*, and variation in rainfall contributes to significant interannual variation in production. Sorghum and millet account for the bulk of the annual diet (as couscous, porridge, etc.), with the highest consumption of these crops among Mali's lowest-income population. Sorghum and millet production serves a domestic market. Well-performing varieties of sorghum and millet include CSM-63E, Malisor, Jakumbé,

Diarradjé, Diarrablé, and Ginkan. Sorghum in particular is highly responsive to intensification using fertilizer (manure) and can be used and sold as forage. The SNS stockpiles sorghum and millet around Mali each year, guided by the SAP, to enable local distributions in deficit production and/or other food insecure areas. The main constraints to sorghum and millet production include low yields and mediocre quality of production among certain zones and producers, lack of access to inputs (seeds, fertilizer, herbicides, etc.), insufficiency of post-harvest materials (e.g., threshing equipment), lack of storage and conservation infrastructure, lack of transformation/processing and conservation/preservation technologies, lack of access to information on potential marketing opportunities, lack of access to credit for marketing activities, and poor organization of the subsector.

- **Maize.** Most maize is produced on private rain-fed plots in southern Mali (southern Kayes, Koulikoro, Sikasso, and Ségou), where many producers replaced cotton with maize following overproduction and the sharp price decline in the global cotton sector between 1980 and 2000. Maize is a preferred dietary staple in southern Mali. Maize production serves a domestic market for human consumption and, increasingly, for livestock (especially poultry and cattle). Maize is also exported to other African countries. Most common varieties include Dembanyuma and Sotubaka. The main constraints to the maize subsector include weak yields in certain zones, mediocre quality of production among some producers, lack of access to inputs (seeds, fertilizer, herbicides, etc.), insufficiency of post-harvest materials, lack of storage and conservation infrastructure, lack of transformation/processing and conservation/preservation technologies, lack of access to information on potential marketing opportunities, and lack of access to credit for collection, warehousing, and marketing.
- **Rice.** The most important rice production zones are in the Niger River Inner Delta (especially the Office du Niger in Ségou Region), the *bas-fonds* of Sikasso Region, and Tombouctou. Rice is an urban staple, although as a preferred staple food, rural rice consumption increases with rising household income. Because of irrigation—a GOM priority under the Rice Initiative—rice production exhibits less interannual variability in production than sorghum and millet. Transplanting, short cycle varieties, improved seeds, value-added processing, fertilizers, and incentivizing prices for producers have boosted production. Rice is produced mainly for a domestic market, and Mali is a net rice importer, although in years of poor rice production in Nigeria and other neighboring countries, Mali can see significant rice exports to regional markets. The main threats to rice production are: isolation of production zones (poor transport infrastructure and high transport costs); rural land tenure insecurity; lack of quality equipment and low use of inputs, due in part to their high cost; high cost, poor design, and poor management of water management schemes; rice price volatility; poor crop quality for marketing; weak capacity for local input distribution; lack of private investment; insufficiency of credit; and persistence of waterborne diseases and environmental degradation of production zones.

Riziculture takes several forms in Mali. Riziculture with total water management (large, medium, and small irrigated sites) is most common in the Office du Niger, around Sélingué Dam, and in the *petits périmètres irrigués villageois* in the North and in Mopti. Riziculture with partial water management (floodplains of ponds and lakes) is most common on the plains of the middle Bani River at San; in the floodplains of lakes and ponds of the Niger and Bani Rivers, with controlled submersion in Ségou, Mopti, Tombouctou, and Gao Regions; and in the managed *bas-fonds* in Koulikoro, Sikasso, and Kayes Regions. Rain-fed riziculture is practiced throughout Koulikoro, Sikasso, and Kayes Regions where rainfall levels permit.

- **Fonio.** Fonio is a rain-fed traditional sector crop grown in the Dogon Plateau and southwest Mali. Fonio represents only a fraction of national cereal production. It is primarily cultivated by women, and offers the advantages of low labor requirements for production; early season

harvest; resistance to drought, weeds, and pathogens; no requirements of inputs for production; and cultivability on marginal lands. Fonio production shows high interannual volatility, with no overall trend of increase or decrease, which is a disincentive to its expansion. Domestic markets include low- and high-income consumers, as well as export markets. The major challenges to fonio production include relatively low yields, high labor and time requirements for processing, need for improved agronomic techniques and cultivars, and lack of credit for producers. One of its main advantages is that it can shorten the *période de soudure*, the lean period, as it is harvested early in the season.

- **Wheat.** Wheat is produced as an irrigated dry-season crop in Tombouctou and accounts for only a small fraction of national cereal production. GOM efforts to boost wheat production and milling aim to replace imports from other countries in the region. Key constraints to the wheat subsector include higher water management requirements relative to rice and low availability of quality or improved seeds.
- **Legumes.** Legumes, such as groundnuts and niébé (cowpeas/black-eyed peas), provide dietary protein and generate income. Niébé are grown throughout Mali, with the highest production levels in Mopti, Ségou, Koulikoro, and Sikasso. Malian research has developed a range of improved niébé varieties designed for drought tolerance and Striga<sup>19</sup> resistance, although adoption is low because of poor access to quality seeds (International Crops Research Institute for the Semi-Arid Tropics [ICRISAT] 2013). Groundnut production is also concentrated in southern Mali. The main constraints to groundnut production include lack of access to improved varieties or seed, poor access to equipment to expand land under cultivation, difficulties in accessing fertilizers, variable rainfall conditions, labor constraints for weeding and harvesting, poorly developed markets and volatile prices, poor access to credit, poor road infrastructure to transport produce to markets, poorly developed processing industry, and lack of coordination of actors along the value chain (Ibid.).
- **Oilseeds.** The main oilseeds produced in Mali are peanuts, cottonseed, shea, sesame, and sunflowers (MSU 2011). Shea can be exported, but aflatoxin contamination prevents the export of groundnuts to Europe or the United States and presents health risks for domestic markets. For cottonseed oil, industrial oil processors are relatively expensive and are declining in numbers, while artisanal processors are unable to adequately process the seed. Shea has two markets: domestic markets, where low-quality versions of the product are sold at a low price, and export markets, where high-quality versions of the product are sold at a high price. Value chain studies reveal that domestic shea consumption in Mali is 65%, quite high compared to other exporting countries (Holtzman 2004).
- **Other horticultural crops.** Valuable horticultural crops include onions/shallots, potatoes, tomatoes, and green vegetables such as leeks and cabbages (FAO, n.d.). Mali exports fresh mangoes to international markets, particularly in the EU fresh fruit market.
- **Cotton.** The large majority of Mali’s cotton is produced in the South where the CMDT invested heavily in irrigation and in production and processing infrastructure and provided credit and technical assistance to producers. Cotton is considered a modern sector crop produced for export. Mali’s decision not to adopt genetically modified cotton poses concerns about Mali’s competitiveness (MSU 2011). The cotton sector is being restructured, including the monopsony CMDT.

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<sup>19</sup> Striga, also known as “witchweed,” is a parasitic plant prevalent in the Sahel that affects the production of millet, rice, sorghum, and some other crops.

**Crop production levels.** Significant quality issues plague agricultural data systems in Mali.<sup>20</sup> For agricultural production estimates specifically, the estimates cited by the CPS/SDR and the Direction Nationale de l’Agriculture (DNA) (Agriculture Department), and not those of the Enquêtes Agricole de Conjoncture (EACs) (Agricultural Surveys), were used below.

As **Appendix 17, Table 17A** illustrates, the total area cultivated in cereals in 2013/2014 (i.e., harvest of 2013 with the consumption year extending until September 2014) was 3.69 million ha, 18% below the 5-year average. Millet and sorghum accounted for two-thirds (67%) of land cultivated in cereals in 2013/2014, with maize and rice accounting nearly equally for much of the balance. In terms of absolute production (Figure 1 and **Appendix 17, Table 17B**), millet production was down 16% relative to the 5-year average, while sorghum production was down 30% relative to the 5-year average. Despite this, rice and maize production was sufficient so that the overall cereal production was down by less than 10% from the 5-year average (5.4 million metric tons [MT], compared to 6.0 million MT).

- **Millet and sorghum.** Mali’s traditional sector produced an estimated 1.24 million MT of millet and 866,000 MT of sorghum in 2013/2014. Regions with the highest production of millet were Ségou, Mopti, Sikasso, and Koulikoro, while sorghum production was highest in Sikasso, Koulikoro, Ségou, and Kayes. High interannual production volatility of both staple cereals reflects their predominance in semi-arid and rain-fed areas with high interannual variation in rainfall. Millet and sorghum production overall is increasing, and most of the increase derives from increases in the area under cultivation rather than intensification.
- **Maize and rice.** Mali produced an estimated 1.3 million MT of maize in 2013/2014, principally in the traditional sector in the South. The rising trend of maize production can be accounted for by domestic and export demand for human consumption and for livestock (poultry and cattle feed). Fertilizer subsidies, improved varieties, and access to irrigation infrastructure (especially in former cotton zones) have also increased yields. Mali produced an estimated 1.98 million MT of rice in 2013/2014 in the traditional and modern sectors combined. Rice production has grown with the investment by the GOM into full water management schemes and provision of inputs for irrigated rice production known as *Initiative Riz*.
- **Fonio and wheat.** Fonio production was very low in 2013/2014 (16,488 MT), less than half of the 5-year average. An estimated 28,512 MT of wheat was produced in 2013/2014, slightly more than the 5-year average.

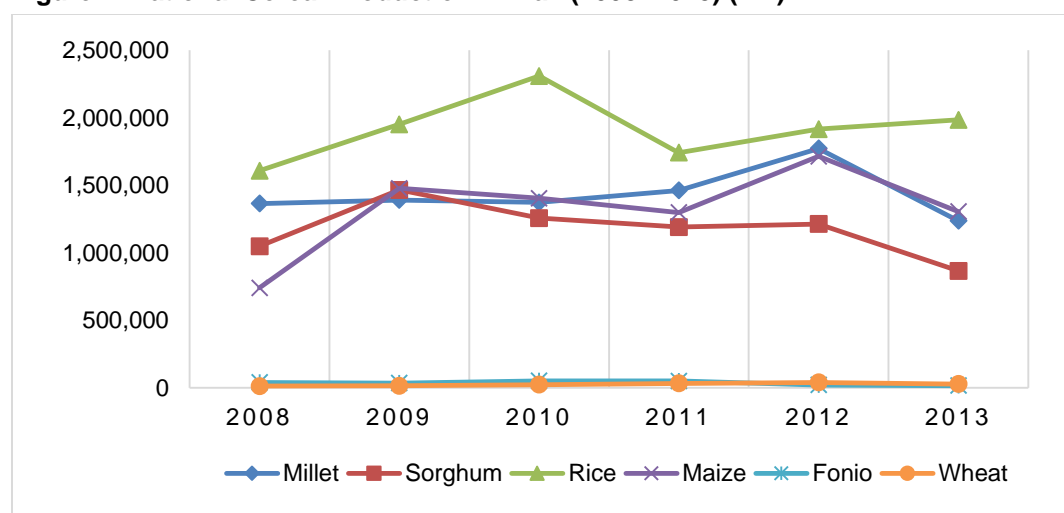
The principal constraints to agricultural production in the traditional sector include (MSU 2011):

- Land tenure insecurity due to discriminatory and non-incentivizing customary land practices and low enforcement of land law
- Displacement in conflict-affected areas, particularly the North
- Climate constraints, interannual rainfall volatility, erratic geographic and spatial distribution of rainfall, and a short growing season (low soil moisture availability during the dry season) aggravated by climate change trends
- Limited access to water and irrigation infrastructure to counter climatic constraints
- Poor soil quality and land degradation
- Very low level of agricultural technologies among smallholders

<sup>20</sup> Marked inconsistencies were found between the national cereal production estimates of the Direction Nationale de l’Agriculture (DNA), CPS/SDR, and the Enquêtes Agricole de Conjoncture (EACs). Datasets provided by the GOM frequently contained missing data points and apparent errors. Fortunately, a compilation of production estimates sourced from the DNA and CPS/SDR, with the assistance of FEWS NET, enabled the completion of Tables 17A–17H in **Appendix 17**. The consistency between the national production figures and the regional figures is sufficiently high to use these data for this report, i.e., inconsistencies are negligible and do not interfere with the conclusions drawn from the data about relative production levels between regions and over time. However, data quality and presentation constraints prevented the disaggregation of production between the traditional and modern sectors in this report.

- Limited access to improved seed, a weak seed multiplication sector, and reliance on local seed sales and exchanges
- Limited access to fertilizers, a weak fertilizer distribution system, and lack of access to credit to pay for high cost of fertilizers
- Poor access to agricultural techniques and GOM or private extension and technical services
- Poor purchasing power and lack of access to finance or credit
- Lack of storage facilities or improved methods of pest management
- Labor- and time-intensive post-harvest processing techniques
- Low human capacity and high illiteracy rates among smallholders
- High cost and low availability of energy (especially for agroprocessing)
- Poor-quality transport infrastructure and high cost of transport
- Limited knowledge and practice of improved agricultural techniques for the Sahel
- Persistent and deep gender inequality that discriminates against women

**Figure 1. National Cereal Production in Mali (2008–2013) (MT)**



Source: GOM DNA, 2014; GOM CPS/SDR, 2014

### Livestock

Livestock, Mali's third major export, is a priority sector for the GOM, due to its significant contribution to GDP and to the household economy and diet and because demand for livestock products increases significantly as incomes increase domestically and in the region (**Appendix 18**). The GOM invests in research and extension on animal health and feeding, intervenes to regulate and maintain pastoral trade and migration corridors (*couloirs*), and invests in livestock market information systems and regulation of marketing and slaughter infrastructure. Land law stipulates that the GOM owns most communal grazing land and surface water, and current GOM priorities include improved pasture management and genetic improvement of animal stock (especially cattle) (MSU 2011).

Livestock production systems in Mali include nomadic stock rearing, transhumant stock rearing, livestock-dominated agropastoralism, crop-dominated agropastoralism, and commercial production systems. In the nomadic stock rearing system, stock rearing families move frequently, following availability of natural resources without fixed encampments. In transhumant stock rearing, herding families follow a regular seasonal migration pattern between agricultural areas toward the south and arid areas toward the north, according to the availability of natural resources. Traditional transhumant stock rearing customs in the Niger River Inner Delta, for example, divided herds into three categories: the *garti* (large herds that undertook transhumance under a chief herder), the *benti* (milking cattle and young calves



that remained close to villages but migrated a small distance for pasture and water), and the *dumti* (small dairy herds kept at the village to provide milk for the women, children, and the elderly who remained there year-round). As noted earlier, pure stock rearing is increasingly rare in Mali, as most households practice agriculture and livestock keeping to some degree. In the northern Sahelian belt, agropastoralism focuses on free-range livestock keeping, with little to no improved inputs, and agricultural cultivation is quite limited. As one moves farther south, households (production units) are increasingly sedentary; livestock provide draft power and dung for agriculture; and improved inputs such as nutrient-dense animal feed supplements are used as finances allow (FAO 2006).

Livestock contributes to food security by serving as a rural savings account, providing income year-round through meat, egg, and milk sales, providing draft power to boost production, providing manure to increase soil fertility, and providing a valuable source of protein in the diet. In most regions, at varying degrees based on ethnicity and the availability of other economic assets, livestock also plays an important social function by serving as part of the dowry for marriages. Malian herders tend to hold on to their cattle rather than sell them. Studies show that herders only sell an average of 11% of their cattle and 35% of their small ruminants. This suggests a cultural preference for larger herd sizes, balanced with a willingness to sell in case of market incentives or necessity (MSU 2011). Increasingly, producers in the North and Mopti fatten sheep for Muslim holidays for export markets. In terms of meat consumption, cattle sold for meat tend to serve an urban market, while small ruminants serve more of a rural market. In terms of shocks to livestock production in recent years, civil conflict in the North and Mopti disrupted access to water and grazing areas and the migration *couloirs*, and subregional conflict disrupted trade to Côte d'Ivoire, Mali's former main livestock export partner. However, drought is a far more significant shock to livestock production, curtailing access to pasture/grazing, crop residues, and watering holes; aggravating livestock morbidity and mortality; and eroding livestock-to-millet exchange rates.

Mali has comparative advantages in livestock production. Ruminants are owned by around 85% of Mali's agricultural households, although the size and composition of herds varies significantly across the country (MSU 2011). Nomadic and transhumant pastoralism dominate livelihoods in the arid North, while agropastoralism is practiced farther south, as pictured in the Mali LZ map (**Appendix 16**). The peri-urban dairy production sector is growing to serve the urban milk market (MSU 2011). Mopti has the highest number of cattle (more than 2.8 million), followed by Sikasso and Koulikoro. Only 20% of Mali's cattle are kept in the North. Gao, Mopti, Tombouctou, and Kidal have the highest numbers of both goats and sheep (around 31% of the nation's small ruminants collectively), which are well suited to withstand the harsher environmental conditions of the North. Cattle production has slowly increased over the past 6 years, reaching around 10 million in 2013. Sheep and goats are kept in greater numbers, with production exceeding 32 million in 2013. The large majority of camels are kept in the North.

The livestock sector contributes to women's income mainly through the sale of fresh or fermented milk, poultry, and small ruminants. The milk value chain includes two production systems: traditional milk production using local breeds, which accounts for the majority of dairy production in Mali, and peri-urban commercial milk production with cross-breeds and high input use, which accounts for the balance. Milk sales provide income that, though fluctuating seasonally, can provide income year-round with a large enough herd. Local cattle breeds produce only 0.5–3.0 liters (L)/day of milk, in contrast to the 20 L/day produced by cross-breeds (MSU 2011). The large majority of processed milk in Bamako comes from imported powdered milk, pointing to a large potential market for import substitution by domestically produced fresh milk and processed milk products (MSU 2011). Animal feed used in the peri-urban commercial dairy sector includes pasture supplemented by purchased forage (e.g., groundnut and cowpea hay), crop residues, and feed concentrates (MSU 2011).

The poultry sector is composed of three production systems: traditional free range production in rural areas, semi-improved production, and modern urban commercial production for eggs and meat (MSU 2011). Four-fifths (80%) of the population keeps poultry using traditional methods. Semi-improved

production capitalizes on relatively low-cost options for improved housing, improved hygiene, and illness prevention measures, an approach considered to have significant promise for rural and peri-urban poverty reduction in Mali.

The principal constraints to livestock production include (MSU 2011; GOM 2014a):

- Frequent drought-induced insufficiency of traditional grazing and watering points
- Lack of improved varieties—most cattle, goats, and sheep are local breeds with low milk yields
- Limited access to agricultural finance or credit
- Limited availability and quality of GOM and/or private extension and technical services, coupled with high illiteracy among producers and low knowledge of techniques to boost livestock production or integrate livestock production into farming
- Lack of affordable feed supplements, such as hay or seed cakes or concentrates, for cattle, small ruminants, and poultry
- Poor animal health, high morbidity rates (e.g., parasites, Newcastle Disease), and seasonal nutritional deterioration in livestock
- Lack of professional organizations at all points along the livestock value chains
- Low quality of meat, hides, and skins from slaughter facilities and high risk of contamination from slaughter to market
- Excessive number of illegal fines (*taxes sauvages*) along the *couloirs* and very low political will to enforce existing laws against illegal fines across ECOWAS countries' borders
- Need for research into new livestock export markets

### *Fishing and Aquaculture*

Although fishing accounts for less than 5% of GDP, fish consumption in Mali rivals that of meat. Dried fish constitutes an important source of protein, as fish is more affordable than beef, goat, or sheep meat. Fish is also an important income source in Mali. Mali's fishing sector has not received attention or investment to the same degree as the livestock sector, but it does offer some promise for poverty reduction and food security. Landlocked Mali's strategic advantages in the fishing sector stem from the Niger River's extensive riverine resources. The Niger River Inner Delta, with its abundant ponds and lakes, provides a continual, albeit seasonally fluctuating, source of aquatic protein via inland fisheries and artisanal fish capture. Concerns about declining catches due to overexploitation highlight the importance of exploiting intensive aquaculture, such as fish farming. Intensive aquaculture has risen in prominence globally but is still relatively new to Sahelian producers—many of whom practice extensive aquaculture when flooding brings fish fingerlings into rice fields that are then harvested when fully grown—but stocking and other fish management techniques have not been intensively adopted (Sanni and Juanich 2006). The model of rice-fish farming, or *rizipisciculture*, should be researched in Mali to enable tailoring to the local context, e.g., in terms of selecting concurrent or rotational production and selection of fish species for stocking and reproduction.

GOM strategies to support fishing include investment in fishing development sites, investment in the value and value-added of artisanal fishing in the Niger River Basin, development of fishing in the Senegal River Basin, and establishment of a modern fish market in Bamako (GOM *Mécanisme africain d'évaluation par les pairs* MAEP 2014). The GOM has several objectives for fisheries management and aquaculture development: participatory planning; management and guidance for fishing at all levels; support to artisanal fishing and artisanal fry production in all regions; support to rizipisciculture in all irrigation scheme areas (managed irrigated areas) and *bas-fonds*; development of aquaculture infrastructure; development of fish farming in floating cages in deep bodies of water (Lakes Sélingué, Manantali, Markala, Kambo, Magui, Weignan, Fala de Molodo, Macina, Kolongotomo, and Kokry); development of enclosed fish farming in flooding zones; development of aquaculture with production of

mussels, turtles, crayfish, freshwater shrimp, spirulina, and Bourgou; support to education, food hygiene, and WASH in fishing communities; and support to access to credit (GOM 2011b).

An estimated two-thirds of national fish production originates in the central Niger River Inner Delta, which constitutes a major area of high fish production potential and focus for GOM investment in fishing. The main fish harvested artisanally from the Niger River are catfish, carp, and Nile perch. Livelihood data suggest that fishing is most commonly practiced as a principal livelihood in Mopti and Ségou, in the Niger River Inner Delta (GOM 2014a). Other than in the Office de Niger, the fish sector remains largely artisanal, whereby fishing communities use traditional methods to catch and process wild fish. Most fish harvesting draws from the Niger River, which crosses Koulikoro, Bamako, Ségou, Mopti, Tombouctou, and Gao Regions. The Niger River Basin, considered to be Mali's Niger River Inner Delta, includes a vast floodplain with many lakes, streams, and ponds suitable for fishing. The Senegal River basin provides fishing opportunities to the west, principally in Kayes. Those who benefit the most from fishing as a livelihood strategy include traditional fishing communities, such as the Bozo and Somono communities along the Niger River (LZ 3); communities in the Niger River Basin/Delta (Niger River Inner Delta) (LZ 6); and those associated with the Office de Niger and around the Sélingué Dam, both GOM-managed irrigation schemes using hydrological resources from the Niger River (LZ 7) (FEWS NET 2010). National fish production has ranged between 100,000 and 120,000 MT/year (GOM MAEP, 2014), although it declined 34% from 108,134 MT in 2011 to 71,299 MT in 2012 (GOM 2014a). The main causes of the production estimate decline in 2012 include insecurity in northern Mali (Mopti, Tombouctou, and Gao), which disturbed both fishing and the monitoring of fishing activities, and severe flooding (Ibid.). Dams along the Niger River (e.g., Sotuba, Sélingué, Markala, and Manantali) and water-offtake from irrigation in the Office du Niger area also reduce the annual flooding of the Niger River Inner Delta, which is essential to livelihoods in the region (Wetlands International 2012).

Women are very involved in fish processing (smoking) and marketing, and, as such, the fishing and aquaculture subsectors provide opportunities to boost food security and reduce vulnerability among women.

The principal constraints to fishing in Mali include weak legal rights or access to waterways, limited access to finance, overexploitation of community-held water resources with declining catch as a result, and limited access to GOM and/or private extension and technical services. The principal constraints to the aquaculture sector include weak legal rights or access to waterways or land, limited access to finance/credit, lack of access to GOM and/or private extension/technical services, and low levels of knowledge among farmers. The principal constraint to fish marketing is food hygiene and transmission of foodborne illness.

### *Cereal Availability, Food Stocks, and Agricultural Trade*

In a typical year, Mali can meet the majority or all of its cereal equivalent needs through domestic production. From 2008–2011, the Malian food supply averaged 2,815 kilocalories per person per day (kcal pppd), with cereals accounting for 1,812 kcal pppd (64%) (FAO 2014a). During this same period, Mali imported an average of 276,500 MT annually (Ibid.). The GOM and international partners have invested heavily in cereal—namely rice—production to increase food availability and ensure price stabilization during drought or other food crisis.

The Office of Agricultural Products of Mali (OPAM) was created in 1960 to manage the cereals market. In 1981, the GOM instituted the Cereals Market Restructuring Program (PRMC) with the financial and commodity support of food aid donors. (Afrique Verte, 2010).

Food stocks are composed of four categories:

- Local stocks primarily include stocks kept at the household or producer group level after harvest.
- The SNS (National Security Stock) has a maximum limit of 35,000 MT of commodities (primarily millet and sorghum). The commodities are pre-positioned in the communes and known as *stocks de proximite*. OPAM manages the stock under the PRMC via matched funding. The PRMC's technical committee defers to recommendations from the SAP on whether food should be distributed (Ibid.). In the post-harvest (October/November) assessment, the SAP indicates where the commodities should be pre-positioned, and the Food Security Commissioner (CSA) makes a request for cereals for pre-positioning before the lean season begins.
- The SIE (State Intervention Stock) was set up by the CSA after the 2004–2005 campaign. During this period, the national authorities wished to distribute food aid and increase the SNS' holdings to 70,000 MT. Donors were reluctant to do this given the complications of managing such a large stock and its associated costs. In late 2005, the government created the SIE with a maximum capacity of 35,000 MT with stocks of millet, sorghum, corn, and rice. The SIE stocks are stored in cereal storage banks at the commune level and can be released at the discretion of OPAM (Ibid.). The SIE is also used to inject rice stocks into the market to stabilize rice prices during the lean season, as needed. The OPAM tracks monthly market price monitoring to advise on the use of SIE resources.
- The Ministry of Solidarity, Humanitarian Action, and Reconstruction of the North maintains a stock for potential distribution in the North.

Following the post-harvest assessment, the SAP conducts a follow-up assessment each May to update the food security situation and report on food stocks around Mali. In May 2014, for example, SAP reported that family reserves were low in Gao, Tombouctou, Kidal, and Kayes, and average in other regions; other community stocks were replenished in the regions of Kayes, Koulikoro, Sikasso, Ségou, and Mopti; the SNS included stocks of millet and sorghum in Gao, Kayes, Mopti, Ségou, and Tombouctou; the SIE included stocks of millet in Mopti; and the Ministry of Solidarity, Humanitarian Action, and Reconstruction of the North reported a stock of local rice in Gao (see GOM 2014b for details).

Mali is relatively insulated from global grain markets with the exception of rice, which increasingly substitutes for millet as an urban staple. Normally in deficit years, relatively low levels of imported rice tend to flow to Bamako and onward to regional markets during the lean season to supplement the availability of domestically produced rice. Rice flows in Mali are affected by rice prices in Malian regions and in neighboring countries, in whose domestic markets Malian rice exports become more competitive when global rice prices rise. Mali is very integrated into the West African regional cereal markets, and shortfalls in neighboring countries can boost export demand and thus domestic prices in Mali, even if Mali had a good harvest (such as in 2008). Situated in one of the country's most important grain production zones, Ségou is one of the most important markets for Mali and the region. Bamako serves as the country's largest assembly market. Cereals produced in Koulikoro, Ségou, and Sikasso are transported to Bamako for assembly, local consumption, and/or further trade with northern Mali (including northern Kayes and northern Koulikoro) and Mauritania. Traders transport millet and rice to deficit regions of the North, primarily from Mopti, Ségou, and Sikasso (FEWS NET 2014c).

As of July/August 2014, grain prices around Mali were stable (localized small increases reflected boosts in demand due to Ramadan); prices were lower than a year ago and slightly higher than the 5-year average (FEWS NET 2014b). Livestock prices were higher than the 5-year average in most major markets, with the notable exception of Gao and Tombouctou, where insufficient grazing was driving poor livestock conditions, eroding terms of trade, and reducing income for agropastoralist and pastoralist households (Ibid.). Food distribution in the North and in the Dogon Plateau is preventing further millet price increases in those areas. Livestock prices are generally expected to increase through December, due

to improved animal nutrition and export demand during Ramadan (July), Tabaski (October), and the Christmas season. Production and market flow maps for rice, millet, sorghum, and livestock can be found in **Appendix 19**.

Key constraints to agricultural trade in Mali include (MSU 2011):

- Low capacity (including literacy and numeracy) of producer and marketing groups and need for strengthening of value chain actors such as input suppliers, microcredit institutions, transporters, agro-processors, warehousing, etc.
- High cost of transport and poor road infrastructure within Mali and to neighboring countries
- Corruption and ambiguity in enforcement of codes and standards
- Inadequate access to market information for sellers
- Inadequate availability and quality of secure storage/warehousing facilities
- High perishability and risk of contamination (especially horticulture, dairy, livestock, and fish products), which prevents marketing to distant and especially export markets
- Entrenched discrimination against women that limits their ability to work as market actors

### 3.2.2 Food Access

#### *Distribution of Food Insecurity*

FAO estimates that the prevalence of undernutrition declined steadily from 26.9% in 1994 to 7.3% to 2012 (FAO 2014b), although because of population growth, that only constitutes a 54% drop in absolute terms (2,356,171 to 1,084,342) (FAO 2014c). Quality population-representative food security surveys are scarce in Mali, and available data are from WFP- or NGO-led, localized emergency assessments, such as the WFP Emergency Food Security Assessments in March 2013 and July 2013 in Gao, Kidal, Tombouctou, and northern Mopti, and the WFP Emergency Food Security Assessments in August 2013 in Kayes, Koulikoro, Ségou, and southern Mopti (WFP 2013). Section 3.1.2 identified the regions and populations that are most vulnerable to food insecurity and that lack resilience based on a range of factors, including exposure to food security shocks, sensitivity to food security shocks (especially poverty, chronic undernutrition, and poor health), adaptive capacity, and risk reduction.

Temporal distribution of food insecurity has two main components: interannual fluctuation and seasonality. Food insecurity varies interannually depending on global food prices for and domestic production and prices of rice, maize, millet, and sorghum, and the severity of major shocks (especially drought). Food insecurity also follows a clear pattern of seasonality, with the period of July through September constituting the lean season for most of Mali.

#### *Food Consumption and Poverty*

Poverty is a major determinant of food insecurity. Due to GOM and donor development and poverty reduction investments, poverty incidence declined from 55.6% to 43.6% from 2000 to 2010, although this actually reflected an increase in poverty in absolute numbers (5,705,116 in 2000 to 6,097,896 in 2010). Most of that decline in poverty incidence seems to be accounted for by a large decline in poverty in Kayes and Koulikoro Regions (World Bank 2013a). Sikasso Region has the highest poverty incidence, as well as the highest poverty headcount, despite being a highly productive agricultural area. As noted above, poor households in Mali are more likely to possess specific characteristics relative to non-poor counterparts: lower food access, lower asset ownership, lower overall income, higher proportion of expenditure allocated to meeting minimum food needs, larger household size, larger number of dependents, older heads of households, and lower educational level of household heads (World Bank 2013a; Eozenou et al., 2013). The sex of the household head is associated with poverty in univariate analysis (with female-headed households [FHHs] at greater risk). FHHs are at higher risk of poverty than non-FHHs, in

significant part because female household heads tend to have lower educational status and earn less money due to limited opportunities for income generating activities.

Household expenditure on rice and cereals increases greatly with increasing income (World Bank 2013a). Food-poor (extremely poor) households in Mali have fewer assets than non-food-poor households, indicating they are less able to sell assets in case of a shock.

### *Livelihoods and Off-Farm Income Generation*

Although household income data are not plentiful in Mali, three resources are useful to understand livelihoods and off-farm income generation in the country: the thrice-yearly GOM/Institut National de la Statistique (INSTAT) Enquête Modulaire et Permanente auprès des Ménages (EMOP) (Modular Household Survey); the twice-annual Enquête Agricole de Conjoncture (EAC) (Agricultural Survey); and the GOM/FEWS NET Livelihood Profiles, developed in 2010. **Appendix 16** presents the LZ map developed by the GOM and FEWS NET in 2010, which is still used for food security monitoring and early warning today.

Because so many Malians (80%) are employed in the agriculture sector, most household livelihoods are focused on farming, livestock or a combination of the two. Reinforcing this view, the most recent EMOP (May 2014) estimated that a little over a third (36%) of Bamako residents had salaried employment, while less than a fifth (18%) of residents in other cities had salaried employment, and only 2.9% of rural residents had salaried employment (GOM 2014c). Availability of employment with public works projects or international organizations' development projects have both diminished during the political and economic crisis that began in 2011/2012.

The LZ map defines 13 LZs, broadly described as follows (FEWS NET 2010):

- Nomadism and trans-Saharan trade (LZ 1)
- Nomadic and transhumant pastoralism (LZ 2)
- Fluvial rice and transhumant livestock rearing (LZ 3)
- Millet and transhumant livestock rearing (LZ 4)
- Dogon Plateau: Millet, shallots, wild foods, and tourism (LZ 5)
- Niger Delta/lakes: Rice and livestock rearing (LZ 6)
- Office du Niger: Irrigated rice (LZ 7)
- North-West: Remittances, sorghum, and transhumant livestock rearing (LZ 8)
- West and Central: Rain-fed millet and sorghum (LZ 9)
- Sorghum, millet, and cotton (LZ 10)
- South: Maize, cotton, and fruits (LZ 11)
- South-West: Maize, sorghum, and fruits (LZ 12)
- Bamako Urban (LZ 13)

Only three LZs have significant levels of non-agricultural income: LZ 5 is heavily reliant on tourism; LZ 8 is characterized by high levels of labor migration out of Mali; and LZ 13 is the urban center of Bamako. Political uncertainty has reduced tourism and tourism-related profits from goods and services (e.g., handicrafts), particularly in the Dogon Plateau and Kidal, Gao, and Tombouctou Regions. Migrant remittance inflows increased from 3.4% of GDP to 7.4% of GDP from 2001 to 2011 (World Bank 2011a). Poverty research in 2013 has shown that poor, extremely poor (“food poor”), and malnourished households tend to have lower levels of domestic remittances (domestic transfers) than other households—and fewer of them are likely to receive foreign remittances (foreign transfers), although the amount received is the same for those households that do receive remittances (Eozenou et al., 2013).

Gold, Mali’s largest non-agricultural export, is mined in southern and western Mali (especially Sikasso, Kayes, and Koulikoro). Gold exports grew significantly between the 1990s and the present but remained relatively stable (as a percentage of GDP) from 2001 to 2010 (World Bank 2013a). Unfortunately, most workers in the mining industry are not originally from Mali, and complaints about the mining industry include lack of returns for communities, displacement, use of child labor (especially in small-scale mining), and pollution.

### *Food Purchase*

Food is the largest category of household expenditure, and cereals account for a large percentage of that expenditure. Cereal consumption for the average Malian household constitutes 30–50% of household expenditure. This varies from urban and rural zones and proximity to production zones. As incomes rise, the consumption of cereals declines and diets become more diverse including increased consumption of meat, eggs, fruits and vegetables, and fats (MSU 2011). Any reduction in cereal costs will significantly improve food security for the most vulnerable households.

For most households, the cost of staples (especially sorghum and millet) is a major determinant of risk of falling into poverty and food insecurity (World Bank 2013a). The EMOP (Passage 3: October–December 2013) found that (GOM 2014c):

- Nationally, four-fifths (81%) of the food households consumed was purchased.
- Urban households bought more of the food they consumed compared to rural households (96% and 70%, respectively).
- The national average household expenditure on food and non-alcoholic beverages was 59%.
- The percentage of expenditure on food was higher for rural households (70%) than for urban households (45%).
- The percentage of expenditure on food was highest in Koulikoro (74%) and lowest in Bamako (41%).
- The percentage of expenditure on food was highest in the poorest wealth quintile (74%) and lowest in the best-off wealth quintile (45%).

### *Gender and Food Access*

Gender-related norms and customs vary among the sociocultural and ethnic groups in Mali, but the overall observation can be made that gender norms in Mali tend to allocate very different economic and social roles to men and women, in which men are responsible for their households’ economic production, while women are responsible for social relationships (GOM 2011a). The family’s land is principally under the control of the man, who maintains overall responsibility for the family’s agricultural production (although women have many agricultural labor responsibilities, they do not have overall responsibility for or authority over household production.) Because of the labor requirements of establishing and maintaining an irrigation system, as well as discriminatory practices in land allocation by gender, irrigated land tends to be controlled by men. The main fields for food and cash crops tend to be primarily the responsibility of men, although shea and peanuts are often produced and sold by women. If a woman maintains a backyard garden (e.g., to diversify household consumption and grow items for the “sauce,” such as tomatoes and onions, that accompanies most meals), then that is under the woman’s control. Women generally are responsible for poultry and often manage the small livestock (e.g., goats, sheep, and pigs, the latter of which are much less common than small ruminants), as well as milk production and sales from dairy cows. Men manage the cattle (including their use for draft power) and may manage small livestock as well. Both men and women engage in fishing and fish sales. Women are almost solely responsible for household duties like child care, food production, water collection, and cleaning. These duties, combined with agricultural labor responsibilities, result in women having less time to rest than

men for most of the year, underscoring the need to be sensitive to the implications of programming strategies on the labor and time burden of women.

In addition to production challenges, women face significant constraints in marketing beyond very local markets, including illiteracy, cultural norms about mobility and independence, access to credit, access to economic and social networks outside of the village, and competing obligations in the domestic sphere (particularly in the context of the country’s extremely high fertility rate). The traditional and ethnic related division of labor for production of some crops tends to disappear under certain economic realities. For example, in certain areas only women grow the rice that is used for afternoon porridges

Mali faces a scarcity of quality population-representative data linking gender to food security or food consumption outcomes, though World Bank research has found several important pieces of information (World Bank 2013a). First, FHHs tend to be poorer than non-FHHs. Within non-FHHs, females tend to perceive themselves as poorer in terms of both wealth and decision-making power than their spouses. Women are underrepresented in business and formal employment.

### *Coping Capacities and Strategies of Populations Vulnerable to Food Insecurity*

The frequency of price hikes, drought, and conflict in the past 5 years is stretching the coping capacity of Malian households. Household coping strategies reported in Mali include reducing household expenditure on food and non-food items; borrowing money or food from family members, community members, or traders; selling livestock and other productive assets; selling firewood and charcoal; increased fishing, hunting, and/or collecting wild foods; departing for transhumance early (if pasture is lacking); migrating for labor; increasing reliance on remittances; placing children with better-off households; and increasing market gardening and handicrafts (FEWS NET 2010). The national EMOP survey in October–December 2013 found that almost a third (31%) of households reported that seeking assistance from a parent or friend was their principal strategy for managing food insecurity, followed by taking out a loan (30% of households), and selling livestock (21%). One-fifth (20%) of households reported having no strategy for managing food insecurity (GOM 2014c). During the 2014 lean season specifically, FEWS NET reports that food insecure households whose livestock have already been sold are borrowing more than in a normal year, are reducing dietary quality (increased frequency of plain porridge consumption), and are forgoing expenditure on health care, education, agricultural inputs, and other necessities (FEWS NET 2014b).

### **3.2.3 Implications of Food Availability and Access Constraints and Considerations for FFP Development Food Assistance Programming in Mali**

The information on food availability and food access in Mali presented in this section points to the need for FFP’s program in Mali to consider the following priorities for future development food assistance projects—either through FFP projects or in combination with other USAID/Washington and/or USAID/Mali Mission projects—to help improve incomes and access to food in targeted areas:

#### **Agricultural production**

- Promotion of improved agricultural practices to mitigate climate constraints, variations in rainfall, poor soil quality, and land degradation
- Improved smallholder access to high quality, certified seeds
- Improved access to water and irrigation infrastructure
- Promotion of improved agricultural technologies
- Links to sustainable sources of improved seed and fertilizers
- Improved access to quality GOM or private extension and technical services
- Improved access to credit



- Promotion of improved storage facilities and pest management
- Promotion of improved post-harvest processing techniques
- Gender-sensitive programming to decrease gender inequalities and discrimination against women in the agriculture sector
- Integration of literacy/numeracy programs into project components

### **Livestock production**

- Improved management of traditional grazing and watering points
- Promotion of improved varieties of livestock
- Improved access to credit for livestock production and processing
- Improved access to quality GOM or private extension and technical services for livestock management
- Promotion of improved techniques to increase livestock production and integrate livestock production into farming
- Improved access to feed supplements
- Improved access to quality animal health services
- Improved access to various points along livestock value chains by removing brokers from the meat trade and investment in the dairy sector, especially cold chain, slaughterhouses, and trade lots
- Improved food safety from slaughter to market through enhanced slaughter and processing facilities

### **Fishing and aquaculture**

- Improved access to waterways
- Improved access to credit for fishing and aquaculture
- Improved access to GOM and/or private extension services for fishing and aquaculture
- Promotion of improved technologies

### **Marketing**

- Improved capacity of producer and marketing groups (literacy, numeracy, establishing market linkages, managing production for the market, etc.)
- Improved usage of agricultural inputs among farmers through training and marketing by input suppliers
- Improved access to safe and high quality storage/warehousing facilities, including cold storage
- Improved access to market information
- Improved access to affordable and appropriate transport
- Increased opportunities for women to improve their marketing capacities and work as market actors

### **Off-farm and non-farm income generation**

- Increased opportunities for quality off-farm and/or non-farm income generation, especially for youth and women

## **3.2.4 Key Policies, Strategies, and Programs Related to Food Availability and Access**

### *Introduction*

Following the coup d'état in March 2012, the USG terminated non-emergency assistance to the GOM. Since then, life-saving humanitarian assistance and democracy- and governance-related interventions

have been approved on a case-by-case basis. Democratically held presidential elections (July–August 2013) established Ibrahim Boubacar Keïta as the new president of Mali, and parliamentary elections followed in November 2013. Despite these elections, civil conflict continues to plague northern Mali, and full resumption of USG assistance to Mali depends on resolution of the civil conflict and re-establishment of a more stable governance environment. The political events of 2012–2013 and continuing civil conflict in the North constrain bilateral and multilateral development programming in Mali. Many donors and multilateral agencies have responded by establishing multi-year transition strategies, which aim to achieve development gains on a shorter time frame than typical development strategies (e.g., 3 years versus 5 years). Selected existing large-scale policies, strategies, and programs pertaining to improved agriculture/livestock production supported by GOM, USG, other bilateral and multilateral organizations, and implementing partners are highlighted below. FFP implementers may seek ways to collaborate with the government to support their overall mission (see **Appendix 20** for a list of selected policies, strategies, and programs).

### *GOM Policies, Strategies, and Programs*

Frequent and ongoing restructuring of ministerial and sub-ministerial purviews complicates the identification of discrete national partners. **Box 3** lists the GOM ministries at the time of this writing. The principal GOM actors in food availability and access at the national level include the Ministry of Rural Development, which includes the Ministry of Agriculture, the National Directorate of Agriculture, and the Rural Development Sector Planning and Statistics Office; the Ministry of Livestock and Fisheries and the National Directorate of Livestock and Fishing; the Ministry of Solidarity, Humanitarian Action and Reconstruction of the North, which now includes the SAP; the CSA; and the Ministry of Sanitation, Environment, and Water. A key GOM-led and CILSS-supported interagency network is the *Cadre Harmonisé*, which is responsible for implementing the harmonized food security framework for Mali.

Food security governance is decentralized in Mali, so the principal GOM institutions working in food availability and access operate in all 8 regions (plus Bamako District), 49 *cercles*, and 703 communes. The *Assemblée Permanente des Chambres d'Agriculture du Mali* (Permanent Assembly of Chambers of Agriculture in Mali) is a group of government bodies that advise on issues of agricultural interests, including agricultural prices, income, credit, and marketing policies; agricultural, pastoral, forest, fishing, fiscal, and customs regulations; agroforestry and pastoral enterprise rights and land access; agricultural professional training; and general promotion of agriculture. In recent decades, the GOM has moved away from monopolies and monopsonies in agriculture. GOM agricultural law promotes the establishment of interprofessional organizations to manage contractual relationships, monitor production and marketing, conduct market analyses, strengthen capacity of members, and ensure food safety. In principle, such organizations will benefit from the input of various actors in the sector who have a fundamental understanding of the market compared to state-controlled marketing boards prevalent throughout Africa starting in the 1960s. The cotton subsector has a well-established inter-professional organization (CMDT), and analogous organizations are being established in other subsectors, particularly for cash crops. Additionally, a large number of local NGOs and civil society organizations are working to improve food security but have a very low capacity.

The GOM has a range of key policies and strategies in place that aim to strengthen food availability and access. The foundational legal document is the Agricultural Orientation Law, which sets out a decentralized, private-sector-oriented, and modern vision for the role of the GOM in Mali's agricultural development (MSU 2011). The CSCR III 2012–2017 and PAP form the backbone of poverty reduction and development policy in Mali. The National Priority Investment Plan for the Agriculture Sector (2011–2015) prioritizes investment in five value chains: rice, maize, millet and sorghum, inland fisheries, and livestock production (meat and dairy). The CAADP process was started in 2007 and endorsed in 2009 in Mali; it orients economic policy and investments to increase the country's economic and agricultural growth, which is seen as the engine behind the GOM's poverty reduction strategies.

The conflict and coup d'état of 2011–2012 led to the development of strategies and plans that placed increasing importance on governance, humanitarian programming, and post-conflict recovery interventions. Notable among these were the Transition Roadmap (2013), the Emergency Priorities Support Plan (2013–2014), and the Plan for the Sustainable Recovery of Mali (2013–2014). Released around the same time, the Agricultural Development Policy (2013) covers a broad array of policy areas, including national agricultural research, trade and marketing, capacity strengthening of agricultural actors at all levels, environmental preservation, and natural resource management.

The National Food Security Strategy was established in 2002, in alignment with the original CSCRP (MSU 2011). The strategy established the CSA as the central GOM focal point for overseeing responses to transitory and chronic food security crises, informed by the SAP and the OMA. Mali has also developed various strategies and plans related to irrigation, the seed sector, fishing and aquaculture, marketing, and climate change, among others. Finally, the PNG (2010) addresses such gender-related factors as equity in access to productive assets and equal access to employment for food security.

Several other GOM-led efforts have identified areas of very high chronic vulnerability to food insecurity and malnutrition, including the AGIR (see below); Initiative 166, which identified 166 communes with the greatest chronic food insecurity and poverty; and the SAP, which conducts routine food security and early warning surveillance. Additional food security surveillance and early warning systems that provide valuable information for targeting include the FEWS NET system, the WFP, and Cadre Harmonisé.

**Box 3. Government Ministries of the Republic of Mali (June 2014)**

Ministry of Defense and Veterans Affairs  
 Ministry of the Interior and Security  
 Ministry of Justice and Human Rights (and Attorney General)  
 Ministry of Economy and Finance  
 Ministry of National Reconciliation  
 Ministry of Foreign Affairs, African Integration, and International Cooperation  
 Ministry of Rural Development (includes Agriculture, Livestock and Fisheries, National Agriculture Directorate, National Livestock Directorate, Food Security Commissariat, Cellule de Planification et de Statistique du Secteur Développement Rural [CPS/SDR], Institut National de la Statistique [INSTAT], Direction National de l'Agriculture [DNA], Direction Nationale des Productions et des Industries Animales [DNPIA]).  
 Ministry of Solidarity, Humanitarian Action, and Reconstruction of the North, including SAP  
 Ministry of Infrastructure and Transport  
 Ministry of Higher Education and Scientific Research  
 Ministry of Planning, Land Development, and Population  
 Ministry of State and Territorial Affairs  
 Ministry of Labor, Public Service, and Institutional Relations  
 Ministry of Commerce  
 Ministry of Sanitation, Environment, and Water  
 Ministry of Decentralization and the City  
 Ministry of Urbanization and Housing  
 Ministry of Health and Public Health, including National Nutrition Office  
 Ministry of National Education  
 Ministry of Information, Communication, and the Digital Economy  
 Ministry of Energy  
 Ministry of Mines  
 Ministry of Industry and Promotion of Investment  
 Ministry of Employment and Vocational Training  
 Ministry of Women, Children, and Family  
 Ministry of Malians Abroad  
 Ministry of Youth and Civic Construction  
 Ministry of Sports  
 Ministry of Handicrafts and Tourism  
 Ministry of Culture  
 Ministry of Religious Affairs and Worship

Source: Diallo, A. (2014).

*USG Policies, Strategies, and Programs*

USG-disbursed foreign assistance to Mali totaled US\$872.2 million from 2009 to 2013 (an average of US\$174.4 million/year) (USG 2014). More than 95% of those funds were disbursed by USAID and the Millennium Challenge Corporation, although the USG also programmed funds through the Peace Corps; the U.S. Department of Agriculture (USDA); and other security, governance, and associated programs. The USG is implementing five initiatives in Mali: the President's Malaria Initiative, the Global Health Initiative, the Feed the Future Initiative, the Global Climate Change Initiative, and the Mali Transition Initiative. USAID/Mali is currently in the early stages of developing a Country Development Cooperation Strategy, a 5-year strategy that will provide the overarching framework for USAID assistance to Mali and that will clarify how USAID efforts are aligned with other USG efforts in the country.

FFP supported two development projects in Mali from 2008 to 2013, although security conditions forced both projects to shift to new intervention areas in 2012. A description and lessons learned from these projects can be found in Section 4.

Other major USG-funded projects related to agriculture, economic development, markets, and trade and related aspects of food security include those implemented under USAID’s Feed the Future Initiative, the USDA Food for Progress Program, and the USDA McGovern-Dole Food for Education and Child Nutrition Program. Regional USG-funded programs that serve Mali include Resilience in the Sahel Enhanced (RISE), the West Africa Trade Hub, and Feed the Future regional programs.

As discussed above, the concept of resilience is central for USAID programming in Mali. The Sahel JPC was established in 2012 to ensure a broad, multisector, integrated approach to humanitarian and development assistance during the food crisis affecting the Sahel. In 2012, the Sahel JPC developed the *Sahel JPC Strategic Plan: Reducing Risk, Building Resilience, and Facilitating Inclusive Economic Growth* (USAID 2012b). The Sahel JPC guided new resilience investments in Niger and Burkina Faso, through the RISE project. In November 2012, USAID/Mali received support from the Sahel JPC to develop a plan to operationalize the Sahel JPC regional resilience strategy. Under this plan, USAID/Mali aimed to focus on three *cercles* in Mopti and one *cercle* in Koulikoro. Unfortunately, accelerating conflict in the North prohibited work there until circumstances improved, and the decision was made to drop Nara, the commune in Koulikoro Region. In November 2013, USAID/Mali invited the Sahel JPC to revisit Mali and update the Mission’s resilience strategy in light of evolving political and financial realities. The result of this effort was the *Mali Resilience Program Assessment: Challenges and Opportunities* (USAID/Mali 2014). This 2014 assessment recommended that USAID focus on Mopti.

The Mali Country Development Cooperation Strategy is currently in development, and it is expected that resilience will be a central organizing analytic and strategic concept in that framework document. Additionally, USAID actively participates in the AGIR-Sahel (below).

### *Other Policies, Strategies, and Programs*

Key multilateral stakeholders implementing large-scale food security and nutrition projects include the World Bank, the International Fund for Agricultural Development (IFAD), the AfDB, and U.N. agencies (e.g., FAO, WHO, WFP, UNICEF). Key bilateral stakeholders implementing large-scale food security and nutrition projects include the EU, the Agence Française de Développement (AFD) (French Development Agency), the Netherlands, and others.

The EU is currently preparing a Country Strategy Document to extend through 2020, as insecurity delayed activities programmed under the 2008–2013 strategy. EU/Mali expects the new strategy to embody four main sectors: consolidation of the country, education, transport, and rural development/food security. In turn, rural development/food security is expected to encompass three axes: intensification and increase of agricultural production, governance of the food security sector, and improvement in food security and malnutrition. Ongoing EU-funded projects pertaining to food availability and access are listed below. The AGIR provides the overarching resilience framework that guides the EU’s portfolio of interventions. The EU provides substantial funding to the AGIR Initiative, which entails the development of a nationally inclusive dialogue designed to identify the AGIR country resilience priorities (PRP-AGIR). The PRP-AGIR is anticipated to be finalized in August–September 2014. The EU’s approach to resilience globally is articulated in its Resilience Communication.

The AfDB is currently developing a new country partnership document for Mali. The AfDB funds activities in primary education, agriculture, WASH, rural and urban development, health, environment, energy, and other sectors in Mali. The Office du Niger Zone Development Project II invests in public water and irrigation infrastructure, organization and capacity strengthening of agricultural actors, and

support to the Master Development Plan for the Office du Niger in Ségou Region. The Cotton Zone Economic Development Project II partners with the Office de la Haute Vallée du Fleuve Niger to strengthen the cotton sector at multiple points along the value chain in Sikasso, Kayes, and Koulikoro Regions. The AfDB also funds agricultural inputs and producer capacity strengthening and humanitarian interventions, especially in Tombouctou and Gao.

### 3.3 FOOD UTILIZATION AND HEALTH, AND RELATED POLICIES, STRATEGIES, AND PROGRAMS

#### 3.3.1 Food Utilization and Health

##### *Trends in Child Nutritional Status*

**Anthropometric status.** According to the EDSM-V, stunting is a serious problem in Mali affecting 38% of children under 5 years of age.<sup>21</sup> The percentage of stunted children under 5 years of age varies among regions, with rural areas showing on average higher levels of stunting than urban areas (42% vs. 23%) (CPS/SSDSPF et al. 2014). Although stunting affects families at all income levels, it most affects children in the lowest income level, with more than 46% of children in the lowest wealth quintile being stunted, compared to 21% in the highest wealth quintile (CPS/SSDSPF et al. 2014). Nationally, 19% of children under 5 years of age are severely stunted (Ibid.). For infants under 6 months of age, the prevalence of stunting is about 15%, indicating that some infants start out with very poor nutritional status at birth and/or experience poor feeding practices and/or illness that seriously compromises their growth at a very early age (Figure 2, CPS/SSDSPF et al. 2014). Levels of stunting continue to increase dramatically with age. Among children 18–23 months of age, almost 50% were already stunted (Ibid.).<sup>22</sup>

Overall in Mali, 13% of children under 5 years of age are wasted, indicating a serious problem (CPS/SSDSPF et al. 2014).<sup>23</sup> Prevalence of wasting is highest among infants 9–11 months of age (Ibid.).<sup>24</sup> The EDSM-V showed that wasting was lowest in Bamako (11.7%) and highest in Mopti (14.7%), but later in the same year, a U.N.-funded survey found wasting was lowest in Sikasso (3.9%) and highest in Gao (13.5%) (GOM 2013a; GOM 2013b). Gao was not included in the EDSM-V due to the poor security situation at the time of data collection. Wasting in Mopti at the time of the U.N.-funded survey was 6.5%.<sup>25</sup> Ministry of Health (MOH) data on health facility treatment of severe and moderate acute malnutrition in 2013 shows 2–3 times more cases than in 2012 during each quarter of the year (UNICEF 2014).<sup>26</sup> Case levels to date in 2014 are generally similar to the figures seen in 2013 (Ibid.).

<sup>21</sup> Stunting is defined as a height-for-age < -2 z-score; severe stunting is defined as height-for-age < -3 z-score. WHO classifications for population prevalence of stunting: ≥ 40% is “very high”; 30%–39% is “high”; 20%–29% is “medium”; and < 20% is “low” (WHO 1995).

<sup>22</sup> Note that it is not possible to directly compare national results from prior EDMS surveys, given that the 2012–2013 survey did not include Gao, Kidal, and Tombouctou Regions, or three *cercles* from Mopti because of conflict and insecurity in these regions at the time of data collection (CPS/SSDSPF et al. 2014).

<sup>23</sup> Wasting is defined as weight-for-height < -2 z-score. Wasting reflects acute malnutrition. WHO classifies population-level prevalence of wasting according to the following categories: “acceptable” (< 5%), “poor” (5%–9%), “serious” (10%–14%), and “critical” (≥ 15%) for purposes of emergency response.

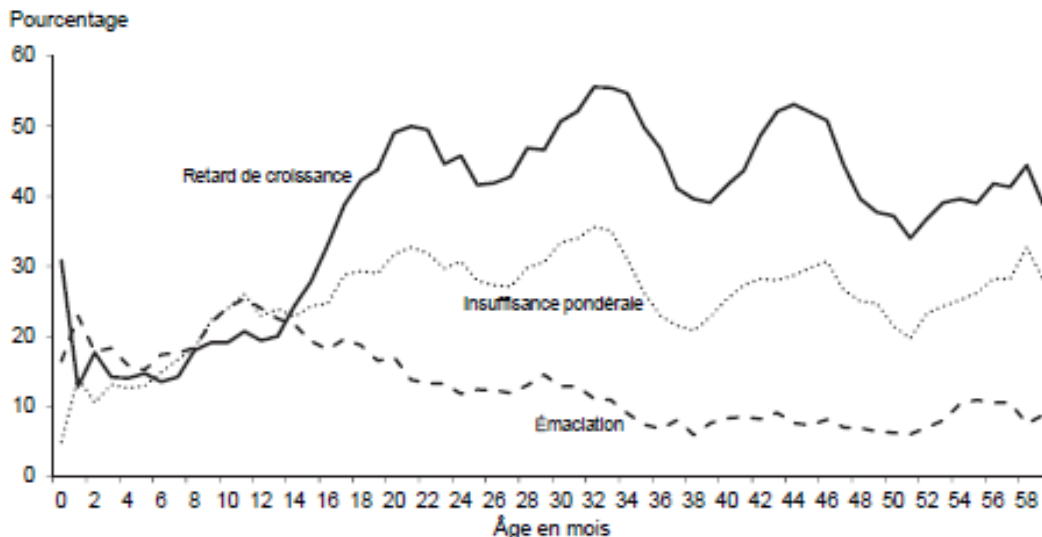
<sup>24</sup> The EDSM-V data in 2012–2013 were collected from November 2012 to December 2013. The lean or hungry period for agriculturalists is from July to October, while the lean season for pastoralists is from April to June. The rainy season is from June to September.

<sup>25</sup> The U.N.-funded SMART survey was conducted during the lean season, from July to August, with the exception of the data in Gao, which were collected in May.

<sup>26</sup> The increase in cases is due in part to financial and technical assistance from implementing partners that supported the scale-up of community-based management of acute malnutrition and the strengthening of weekly and monthly data collection for the nutrition information system. However, there are still weaknesses in regular, active screening of children and the quality and timely collection of data (Bianchi 2014).

Among children under 5 years of age, 26% are underweight, which WHO classifies as “high” (CPS/SSDSPF et al. 2014).<sup>27</sup> This figure is lower in urban areas (17%) than in rural areas (28%) and ranges from 18% to 32% among regions. Prevalence of underweight among children 18–23 months is 32%. See **Table 3** for regional data related to anthropometric measures.

**Figure 2. Nutritional Status of Malian Children by Age**



Source: CPS/SSDSPF et al. 2014

### *Factors that Influence Child Health and Nutritional Status*

The very high levels of malnutrition seen among young children in Mali, and especially children under 2 years of age, are a direct result of a number of factors, which are presented and discussed below.

#### **Infant and young child feeding**

- Poor breastfeeding practices contribute to child malnutrition.** Nationally, the proportion of children under 6 months of age who are exclusively breastfed is only 33% (CPS/SSDSPF et al. 2014).<sup>28</sup> Median duration of exclusive breastfeeding was very low in the EDSM-V, less than 1 month. Only 58% of infants began breastfeeding within 1 hour of birth, and 21% of infants received a prelacteal feed within 3 days of birth (CPS/SSDSPF et al. 2014). Median duration of breastfeeding in Mali is 23.2 months, ranging from 20.5 months in Bamako to 23.8 months in Kayes and Mopti (CPS/SSDSPF et al. 2014).
- Inappropriate complementary feeding practices are a critical problem contributing to high levels of child malnutrition.** An analysis of EDSM-V data showed that only 8% of children 6–23 months of age in Mali are fed a minimum acceptable diet, meeting minimum standards in food diversity and feeding frequency (CPS/SSDSPF et al. 2014). Among children 6–23 months of age, only 28% met minimum standards for meal frequency, while 22% met minimum standards for dietary diversity. Only 45% of children 6–8 months of age receive solid, semi-solid, or soft foods (CPS/SSDSPF et al. 2014). Appropriate child feeding during illness, especially diarrhea, is

<sup>27</sup> Underweight is defined as weight-for-age < -2 z-score. Underweight reflects both chronic (past) and/or acute (present) malnutrition, though it does not distinguish between the two. WHO classifications for population prevalence of underweight are as follows: ≥ 30% is “very high”; 20%–29% is “high”; 10%–19% is “medium”; and < 10% is “low” (WHO 1995).

<sup>28</sup> Note that it is not possible to directly compare national results from prior EDMS surveys, given that the 2012–2013 survey did not include Gao, Kidal, and Tombouctou Regions, or three cercles from Mopti because of conflict and insecurity in these regions at the time of data collection (CPS/SSDSPF et al. 2014). Data from prior DHS surveys will not be used for comparison in this report, given the data are not comparable.

critical to ensure adequate fluid and food intake to prevent dehydration and minimize adverse consequences on child nutritional status, but the percentage of children under 5 years of age given increased fluids or oral rehydration therapy and continued feeding during diarrhea episodes in the 2 weeks before the EDSM-V was low, at 34%.

**Table 3** provides additional data related to infant and young child feeding (IYCF) and complementary feeding in Mali. Applicants for FFP development projects should also examine results of qualitative studies on IYCF practices in Mali.<sup>29</sup>

### Micronutrient status and anemia

- Anemia is a serious public health concern in Mali.** The EDSM-V found that more than three-quarters of children 6–59 months of age were anemic (82%), with these figures ranging from 68% in Bamako to 89% in Mopti. The primary causes of anemia among young children in Mali are insufficient bioavailable dietary iron and parasitic infections, such as malaria and helminths (GOM 2013c). The percentage of children 6–23 months of age who consumed iron-rich foods in the 24 hours before the EDSM-V was only 48.8%, and only 23.8% of children 6–8 months of age consumed iron-rich foods.<sup>30</sup> Only 31.4% of children 6–59 months received deworming medication in the 6 months before to the EDSM-V survey.
- Malaria is a contributing factor to anemia.** Malaria is the primary cause of morbidity and mortality in Mali, particularly among children under 5 years of age (USAID 2014b). The EDSM-V showed that 52% of children 6–59 months of age tested positive for malaria, 17% in urban areas and 60% in rural areas. Insecticide-treated nets (ITNs) can be used to prevent malaria by limiting contact with mosquitoes, especially during sleep. The EDSM-V showed that 69% of children under 5 years of age slept under an ITN the night before the survey. The National Malaria Control Program includes mass distribution of free long-lasting ITNs as part of a universal campaign and targeted distribution for children under 5 years of age and pregnant women, indoor residual spraying in select high-risk areas, prevention and prompt treatment of malaria during pregnancy, community-level case management, and behavior change communication activities. Although the program appears to be having a positive impact on ITN use, there is still a need for more progress to reduce infections.<sup>31</sup>
- Vitamin A and zinc deficiencies contribute to poor child nutritional status.** Vitamin A is essential for the functioning of the immune system. Vitamin A deficiency can increase the severity and duration of infections, including measles and diarrhea, and, in severe cases, can cause eye damage. The percentage of children 6–23 months of age who consumed vitamin A-rich foods during the 24 hours before the EDSM-V survey was low, only 54.6%, and only 28% of children 6–8 months of age consumed vitamin A-rich foods.<sup>32</sup> In addition to intake of vitamin A-rich foods, high-dose vitamin A supplements provided to children every 6 months, starting at 6 months of age, ensures that children at risk do not develop vitamin A deficiency. The EDSM-V showed that 60.8% of children 6–59 months of age received a high-dose vitamin A supplement during the 6 months before the survey. Breastfed children also benefit from micronutrient supplementation that mothers receive, especially high-dose vitamin A given to mothers within 6 weeks postpartum. Postpartum vitamin A supplementation was 50% in the EDSM-V, but much higher in urban areas (64%) than in rural areas (47%) (CPS/SSDSPF et al. 2014).

<sup>29</sup> Qualitative IYCF study sources for Mali include Wuehler et al. 2011.

<sup>30</sup> Iron-rich foods include meat and organ meat, fish, poultry, and eggs.

<sup>31</sup> A 2013 World Bank report noted that the availability of ITNs is insufficient to meet the need in Mali (World Bank 2013c).

<sup>32</sup> Vitamin A-rich foods included meat (and offal), fish, poultry, eggs, pumpkins, red or yellow yams or squash, carrots, red sweet potatoes, dark green leafy vegetables, mangoes, papayas, other locally available fruits and vegetables rich in vitamin A, and red palm oil (CPS/SSDSPF et al. 2014).



Zinc is also critical for immune function, growth, and development. The Mali national development policy for nutrition states that zinc deficiency in Mali is estimated to be common but not well documented (GOM 2013c). The risk of zinc deficiency may be elevated when the percentage of children with a height-for-age z-score  $< -2$  is greater than 20%. The high prevalence of stunting among young children in Mali indicates that zinc deficiency may be a serious problem. In such a context, interventions to improve population-level zinc status is recommended (de Benoist et al. 2007; Hess et al. 2009).<sup>33</sup>

See **Table 3** for additional data related to micronutrient status and anemia.

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<sup>33</sup> The percentage of children under 5 years of age with height-for-age  $< -2$  z-score has been recommended as the best functional indicator to assess the likely risk of zinc deficiency in a population (de Benoist et al. 2007).

**Table 3. Select Indicators for Child Health and Nutritional Status in Mali**

Location	Prevalence of Malnutrition			Micronutrient Nutrition					Breastfeeding Practices			Complementary Feeding Practices			Illness Prevalence and Prevention				
	% children under 5 stunted	% children 6–59 months wasted	% children under 5 underweight	% children 6–23 months consuming iron-rich foods in the past 24 hours	% children 6–23 months consuming vitamin A-rich foods in the past 24 hours	% children 6–59 months living in a house with adequately iodized salt	% children 6–59 months who received a vitamin A supplement in the 6 months prior to the survey	Percent of children 6–59 months receiving deworming medication in the 6 months prior to the survey	% children who received a prelacteal feed <sup>a</sup>	Median duration (months) of exclusive breastfeeding <sup>b</sup>	Median duration (months) of breastfeeding <sup>b</sup>	% children 6–23 months fed 4+ food groups	% children 6–23 months fed minimum no. times or more	% children 6–23 months fed minimum acceptable diet <sup>c</sup>	% children 6–59 months who are anemic (Hb < 11 g/dL)	% children 6–59 months who tested positive for malaria	% children sleeping under an ITN	% children with diarrhea during the 2 weeks prior to the survey	% children under 5 given continued feeding and oral rehydration therapy and/or increased fluids during diarrhea
<b>National</b>	38.3	12.7	25.5	48.8	54.6	95.4	60.8	31.4	21.1	0.7	23.2	21.6	27.9	7.7	81.7	51.6	69.0	8.6	34.4
<b>Urban</b>	23.2	11.2	16.8	58.6	63.1	97.1	72.9	36.5	20.9	1.1	21.7	31.0	29.9	11.1	67.5	16.8	68.0	9.0	40.2
<b>Rural</b>	41.9	13.0	27.5	46.4	52.5	95.0	57.9	30.2	21.1	0.7	23.5	19.2	27.3	6.8	84.9	59.5	69.2	8.5	33.0
Kayes	34.3	12.2	21.4	48.8	54.0	84.8	62.6	37.1	21.1	*	23.8	22.9	29.7	9.3	79.3	36.9	63.0	6.0	36.1
Koulikoro	39.5	11.1	24.4	50.9	55.7	95.1	61.8	33.2	19.0	1.4	23.4	23.5	30.2	9.0	79.6	50.2	66.8	8.9	30.4
Sikasso	39.9	13.4	27.3	45.9	53.7	97.9	59.0	26.4	23.1	*	23.4	21.8	28.2	7.2	83.5	62.1	70.3	9.9	38.3
Ségou	40.5	12.9	26.2	47.5	51.0	97.6	64.7	36.0	17.7	*	22.8	17.6	24.5	5.8	84.8	55.7	77.8	7.7	32.4
Mopti	46.5	14.7	32.1	40.6	49.9	96.9	47.6	22.8	22.6	1.6	23.8	10.3	28.0	3.7	88.6	70.6	66.5	7.2	31.0
Bamako	21.1	11.7	18.3	62.7	66.7	97.7	70.1	34.2	24.3	1.0	20.5	34.8	25.9	11.9	68.0	9.9	64.8	11.8	37.2
Tombouctou	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Gao	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Kidal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

<sup>a</sup> Percentage of last-born in the 2 years preceding the survey who received a prelacteal feed.

<sup>b</sup> Among children born during the 3 years before the EDSM-V; an asterisk indicates values based on less than 25 unweighted cases, in which case the value was deleted.

<sup>c</sup> Minimum acceptable diet: Child was fed breast milk or milk products, fed 4+ food groups, and fed a minimum number of times or more.

Source: CPS/SSDSPF et al. 2014.

## *Health Status*

**Respiratory infections and diarrhea are also leading causes of morbidity and mortality among children under 5 years of age in Mali** (WHO 2009). Respiratory infections and diarrhea contribute to child malnutrition and are more severe in malnourished children. Nationally, 1.6% of children under 5 years of age had symptoms of an acute respiratory infection during the 2 weeks before the EDSM-V, less than a third of caregivers sought assistance from a health care provider (31%), and only 28% of children with symptoms of an acute respiratory infection were treated with antibiotics (CPS/SSDSPF et al. 2014). The percentage of children with symptoms of acute respiratory infection was highest in Sikasso (2.1%) and Mopti (2.0%).

The percentage of children under 5 years of age with diarrhea in the 2 weeks before the EDSM-V was 8.6%. This figure was slightly higher in urban areas than rural areas (9.0% and 8.5%, respectively), and higher among children 6–11 months and 12–23 months of age (12.8% and 13.0%, respectively) compared to children 24–35 months of age (9.0%). Diarrhea prevalence was highest in Bamako (11.8%) and Sikasso (9.9%).

## *Water, Sanitation, and Hygiene*

**Access to safe water and appropriate sanitation is low in rural areas of Mali and contributes to high levels of diarrhea and child malnutrition.** The EDSM-V showed that only 58.6% of households in rural areas had access to an improved water source, compared to 93% in urban areas.<sup>34</sup> Nationally, 73% of households reported not treating their drinking water, and only 18% of households that accessed their water from an unimproved source treated their drinking water (CPS/SSDSPF et al. 2014; CPS/SSDSPF et al. 2012).<sup>35</sup> The majority of the population of Mali has access to water either within the home (37%) or within 30 minutes of the home (53%) (CPS/SSDSPF et al. 2014). As previously noted, in 77% of households, women 15 years of age or older are the primary haulers of water (CPS/SSDSPF et al. 2012).

Only 17% of households in rural areas have access to improved sanitation facilities, compared to 41% in urban areas (CPS/SSDSPF et al. 2014).<sup>36</sup> Eleven percent of households practice open defecation, 13.8% in rural areas and 0.8% in urban areas (Ibid.). According to the 2010 MICS, nationally, only 21% of households in 2010 had access to both an improved water source and improved sanitation. This value was extremely low in rural areas (11%) and only 47% in urban areas (CPS/SSDSPF et al. 2012).<sup>37</sup>

**Poor handwashing practices also contribute to diarrheal illness and child malnutrition.** The 2010 MICS showed that only 27% of households had a place for handwashing and, of these households, only 39% had water and soap available for handwashing at the time of the survey (CPS/SSDSPF et al. 2012).

## *Trends in Women's Health and Nutritional Status*

### **Anthropometric status**

**The nutritional status of women is poor in Mali.** Nationally, 11.6% of women 15–49 years of age are underweight (BMI < 18.5), which indicates a medium prevalence and poor situation according to WHO

<sup>34</sup> Improved sources of water include private or public tap or standpipe, drilled borehole, protected dug well, protected water source, or rainwater.

<sup>35</sup> Treated water is defined as water that had been boiled, filtered, or treated with chlorine or by solar disinfection.

<sup>36</sup> Improved sanitation facilities include pour flush (or flush) toilets connected to a sewer, pour flush (or flush) toilets connected to a septic tank or pit, and pit latrines (improved ventilated latrines, latrines with slabs, or compost latrines).

<sup>37</sup> The value for urban areas would be even lower in 2012–2013, given the low level of access to improved sanitation facilities in urban areas shown in the 2012–2013 EDSM.

classifications (CPS/SSDSPF et al. 2014).<sup>38</sup> The percentage of women who are underweight is highest among girls 15–19 years of age (19.4%). As noted above, 45.8% of rural female teenagers (15–19 years) in Mali were mothers or pregnant with their first child. Pregnancy during adolescence places girls at increased risk of underweight due to the additional nutritional needs during pregnancy and lactation, above and beyond their needs for continued growth into adulthood. Adolescent mothers are at higher risk of experiencing complications in pregnancy, and they and their children are at higher risk of undernutrition and death. The prevalence of undernutrition among women indicates the need for nutrition interventions, such as supplementation with micronutrients and/or fortified foods, increased food production, education, and/or social and behavior change. The percentage of women who are overweight or obese (BMI  $\geq$  25.0) is 18.0%. However, only 12.9% of rural women are overweight or obese, compared to 32.9% in urban areas; only 11.6% of women in the lowest wealth quintile are overweight or obese, compared to 33.9% in the highest wealth quintile. See **Table 4** for more data on women’s nutritional status.

**Table 4. Select Indicators for Maternal Health and Nutrition and Reproductive Health in Mali**

Location	Maternal Health and Nutrition		Reproductive Health						
	% women 15–49 years with BMI < 18.5	% women 15–49 years who are anemic <sup>a</sup>	Among women 15–49 years with a live birth in the last 5 years, % who took iron tablets/syrup for 90+ days during pregnancy	Among women 15–49 years with a live birth in the last 5 years, % who took deworming medication during pregnancy	% births delivered by a skilled provider <sup>b</sup>	% married women 15–49 years using any modern method of birth control <sup>c</sup>	% girls 15–19 years of age who have already become pregnant or given birth to a child	Median number of months since preceding birth (among women 15–49 years of age)	% of women 15–49 years of age married or in union with an unmet need for family planning
<b>National</b>	11.6	51.4	18.3	27.2	58.6	9.9	39.3	33.5	26.0
<b>Urban</b>	9.3	44.2	23.1	33.2	92.4	21.8	25.1	37.2	23.9
<b>Rural</b>	12.4	53.7	17.1	25.6	50.7	6.8	45.8	32.8	26.5
Kayes	11.2	52.7	20.9	30.4	49.7	6.4	51.1	32.9	25.1
Koulikoro	11.6	47.1	20.5	28.7	64.6	9.3	40.4	33.7	26.8
Sikasso	13.0	52.0	16.9	26.2	66.0	10.8	43.3	34.5	29.2
Ségou	10.3	54.5	18.5	26.3	48.8	9.5	40.1	31.9	23.2
Mopti	14.2	56.9	11.3	20.3	29.8	2.7	39.4	32.4	26.3
Bamako	9.0	46.3	22.1	32.0	95.9	22.5	24.3	37.3	23.0
Tombouctou	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Gao	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.
Kidal	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.	n.d.

<sup>a</sup> EDSM-V defined anemia as Hb < 12 g/dL for non-pregnant women and Hb < 11 g/dL for pregnant women.

<sup>b</sup> EDSM-V defined skilled provider as a doctor, nurse, or midwife.

<sup>c</sup> EDSM-V defined modern methods as birth control pill, intrauterine device (IUD), injectables, implants, diaphragm, lactation amenorrhea method, male condom, female condom, female sterilization, male sterilization, or other modern method (undefined).

Source: CPS/SSDSPF et al. 2014.

<sup>38</sup> WHO classifications for population prevalence of underweight among adults are: BMI < 18.5  $\geq$  40% is “very high prevalence (critical situation)”; 20%–39% is “high prevalence (serious situation)”; 10%–19% is “medium prevalence (poor situation)”; and 5%–9% is “low prevalence (warning sign, monitoring required)” (WHO 1995, p. 362).

### Adequacy of women's diets

**Women's intake of several key nutrients is inadequate in Mali.** A 2007 study of the dietary adequacy of women's diets in Bamako found nutrient intake of riboflavin, niacin, vitamin B12, folate, vitamin A, and calcium were inadequate (Kennedy et al. 2009). Women's diets consisted mostly of starchy staples, such as refined white rice, refined wheat flour, and millet, which provided almost 50% of total dietary energy. A significant proportion of total dietary energy (roughly a third) was provided by fat, mainly consumed as vegetable oil. Most women consumed grains and grain products and also some beef, pork, veal, lamb, goat, or game meat. Women also consumed vitamin C-rich vegetables, vitamin A-rich deep yellow/orange/red vegetables, nuts, and seeds but in small quantities. No women consumed soybeans or soy products, cheese, organ meat, chicken or other fowl, or insects, and few women consumed any fruit. Given these data are only for women in Bamako, there is a need for quantitative and qualitative data on women's diets, nutrient intake, adequacy of nutrient intake, and barriers and facilitators to improving women's diets in other regions of Mali.

**Anemia is a serious problem among women in Mali.** The EDSM-V showed that 51% of women 15–49 years of age in Mali were anemic (see Table 4). Adequate iron intake during pregnancy is important for the health of the mother and the child and helps prevent anemia. Anemia can result in serious, life-threatening conditions during pregnancy and labor (Institute of Medicine 2003). The EDSM-V showed that only 18% of women took iron-folate tablets for 90 or more days during their last pregnancy; 32% of pregnant women in the EDSM-V did not take any iron-folate tablets during their pregnancy.<sup>39</sup> Table 4 contains additional data on anemia in women.<sup>40</sup>

**Malaria and intestinal parasites also contribute to anemia in women.** Malaria can be prevented by sleeping under a bednet, preferably an ITN, and, in addition, for pregnant women, by taking intermittent preventive antimalarial medication. The EDSM-V found that 73% of pregnant women 15–49 years of age slept under an ITN the night before the survey. However, only 20% of pregnant women who had been pregnant in the 2 years before the survey were given 2 doses of intermittent preventive treatment with antimalarial medication, including 38% in urban areas and only 15% in rural areas (CPS/SSDSPF et al. 2014). Only 27% of pregnant women were provided deworming medication during their last pregnancy, 33% in urban areas and 26% in rural areas (Ibid.).

### Antenatal and postnatal services

**Quality antenatal and postnatal services are inaccessible and those that do exist are underutilized in rural areas.** The EDSM-V showed that only 41.2% of pregnant women attended antenatal clinics the recommended four or more times, only 34.6% in rural areas compared to 66.6% in urban areas. The EDSM-V showed that 59% of pregnant women were attended during delivery by a skilled health care provider (i.e., a doctor, nurse, or midwife). This figure was much higher in urban areas (92%) than in rural areas (51%). Sixty percent of pregnant women in rural areas did not have any postnatal visits following the birth of their child, compared to 23% in urban areas (CPS/SSDSPF et al. 2014). Nationally, only 10% of married women 15–49 years of age use a modern method of birth control (Ibid.). Sixty-six percent of girls 19 years of age have already become pregnant or have given birth to a child (CPS/SSDSPF et al. 2014). Sixty-three percent of women in rural areas reported having one or more problems accessing health care for themselves, compared to 46% in urban areas. The problems rural women reported regarding access to health care were lack of access to money to pay for treatment (55%),

<sup>39</sup> Although specific documentation of the reasons for low levels of supplementation of pregnant women with iron-folate tablets do not appear to be available, the Republic of Mali's 10-year health and social development plan does indicate that the country's health system suffers from poor health care coverage; regional disparities in coverage due to dispersed populations, mobile populations, and seasonal isolation of some regions; poor quality of health services; and stock-outs of pharmaceuticals, which most likely also includes supplements, such as iron-folate tablets (GOM 2014e).

<sup>40</sup> Causes of anemia among women in Mali are dietary iron deficiency, malaria, and helminth infections (GOM 2008).

distance to the health center (40%), obtaining permission to go for treatment (31%), and not wanting to go alone (25%) (CPS/SSDSPF et al. 2014). Table 4 provides additional data related to reproductive health.

## HIV

**The prevalence of infection with HIV in Mali is low, but it affects almost twice as many women as men.** The prevalence of HIV infection in Mali is 1.1%. However, the prevalence among women 15–49 years of age is 1.3%, compared to 0.8% among men (CPS/SSDSPF et al. 2014). The prevalence of infection with HIV is twice as high in urban areas as in rural areas (1.9% and 0.9%, respectively). While the prevalence of HIV overall decreased in Mali from 1.7% in 2001 to 1.2% in 2006, it has declined only slightly since then (INFO-STAT et al. 2013). The EDSM-V showed that of the less than 1% of women 15–49 years of age who said that they had two or more sexual partners in the 12 months before the survey, only 10% reported using a condom during the last time they had sexual intercourse.

**Prevention of mother-to-child transmission of HIV services exist, but more effort is needed to ensure that pregnant women are tested for HIV and that HIV-positive women receive appropriate prevention services.** As of 2011, there were 338 health facilities that provided prevention of mother-to-child transmission of HIV services in Mali (Présidence de la GOM 2012). These facilities were situated throughout the eight regions of Mali and the capital city of Bamako. Approximately 88% of pregnant women were counseled for HIV testing, 36% were tested for HIV, and 2% tested positive. Ninety-six percent of pregnant women placed on antiretroviral drugs received highly active antiretroviral therapy. However, 7% of women on antiretroviral therapy were lost to follow-up. Eighty-seven percent of infants born to HIV-positive mothers received prophylactic antiretroviral drug treatment. In 2011, 443 18-month-old children were tested for HIV, of whom 46 tested positive. However, it is estimated that in 2011, only 42% of HIV-positive pregnant women received antiretroviral therapy. Funding for HIV prevention and treatment in Mali was affected by a 2011 decision by the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund) to transfer management of a \$28.77 million HIV/AIDS grant from Mali’s national AIDS council to a new principal recipient, given preliminary results from an ongoing investigation by the Global Fund’s Office of the Inspector General regarding misappropriation of funds (AllAfrica 2011). In November 2012, the Global Fund signed an accord with UNDP to resume a full-scale HIV program in Mali (Global Fund 2012).

## Gender and Nutrition

Women in Mali play a critical role in household nutrition and food security through their responsibilities and central role in subsistence food production for the household, unpaid labor for their husband’s commercial agricultural production, and income-generating activities to supplement family income and meet community social demands (baptisms, funerals, weddings, etc.), as well as their domestic responsibilities and caregiving (Rupp et al. 2012; World Bank 2006). Research on the relationship of women’s status to child nutrition in developing countries conducted by the International Food Policy Research Institute (IFPRI) determined that higher status of women was associated with improved nutritional status of their children (Smith et al. 2003).<sup>41</sup>

The EDSM-V collected information on women’s empowerment, including information on women’s participation in household decision making related to health care, making large household purchases, and visiting relatives and friends (see **Table 5**). Men make the majority of decisions in every aforementioned area. EDSM-V data show that younger women (15–19 years of age) were less likely than older women (45–49 years of age) to participate in these three household decisions (6.5% and 13.6%, respectively), and less than 10% of women in all regions except Bamako participated in all three decisions. These data are important because they indicate that women lack decision-making authority and ultimately do not decide

<sup>41</sup> The research was conducted in Latin America and the Caribbean; sub-Saharan Africa; and South Asia, including Bangladesh, India, Nepal, and Pakistan.

on the welfare of their children or themselves, including their own fertility, which has a very large influence on nutritional status. Men’s very significant role in decision making in the household means that men should be included in activities that aim to change behaviors in nutrition and health so they may positively influence health and nutrition-related decisions for their wives and children.

**Table 5. Gender and Household Decision Making in Mali**

Decision	Mainly the wife (%)	Mainly the husband (%)	Wife and husband jointly (%)	Other (%)
Woman’s own health care	7.2	83.6	8.1	1.1
Major household purchases	7.4	80.1	10.7	1.8
Visits to family or relatives	7.8	75.4	15.2	1.6

Source: CPS/SSDSPF et al. 2014.

Violence against women has serious consequences for women’s mental and physical health and the health and nutritional status of their children (Heise et al. 1999; Ziaei et al. 2012; Rahman et al. 2012; and Sobkoviak et al. 2012). The EDSM-V found that 91% of Malian women 15–49 years of age have undergone some form of FGM, which is one of the highest levels in the world and reflects deep-seated gender norms that disempower women. The EDSM also found that 76% of women 15–49 years of age believed that a husband was justified in beating his wife for at least one of the following reasons: going out without telling him, neglecting the children, arguing with him, refusing to have sexual intercourse with him, or burning the food during meal preparation. There were no large differences between urban and rural areas (74% and 77%, respectively), younger women compared to older women (73% and 74%, respectively), women with no education compared to women with the higher levels of education (78% and 70%, respectively), or women in the poorest households compared to women in the wealthiest households (74% each). Forty-two percent of women 15–49 years of age in Mali have experienced either physical or sexual violence in their lifetime (CPS/SSDSPF et al. 2014). Forty-four percent of women 15–49 years of age who are married or in union have experienced emotional, physical, or sexual violence committed by their husband or partner, and 37% reported experiencing this violence sometimes or often in the 12 months before the EDSM (Ibid.).

### 3.3.2 Implications of Women’s and Children’s Health and Nutritional Status and Considerations for FFP Development Food Assistance Programming in Mali

The programming implications given the health and nutritional status of women and children in Mali suggest a need for a significant focus on maternal and child health and nutrition, with a focus on preventing chronic malnutrition in children in tandem with efforts to screen, prevent, and treat acute malnutrition. As such, programming efforts will need to focus on preventing malnutrition in children under age 5 with an explicit programming focus on preventing malnutrition in the critical 1,000 days between pregnancy and the child’s second birthday. Given the scale, breadth, and nature of the nutrition problems for women and children in Mali, for FFP efforts to help reduce stunting among young children in Mali, consideration should be given to:

- **Improving infant and young child feeding**, including exclusive breastfeeding for children under 6 months of age and appropriate complementary feeding for children 6–23 months of age in terms of frequency, dietary diversity, quantity, consistency, active feeding, and feeding during and after illness
- **Improving dietary intake for pregnant and lactating women**, including improving dietary diversity and quantity of food consumed, and decreasing workload during pregnancy
- **Preventing and treating anemia** among children 6–23 months of age and pregnant and lactating women, including promoting improved dietary iron intake, iron supplementation for pregnant and lactating women and children according to MOH norms, and prevention and treatment of parasitic infections such as malaria and helminths per MOH protocols

- **Improving vitamin A and zinc intake** among children 6–23 months through increasing consumption of foods rich in vitamin A and zinc and promoting routine vitamin A supplementation for children and zinc supplementation for children with diarrhea, per MOH norms
- **Increasing access to improved sources for drinking water and adoption of improved sanitation and hygiene practices**, including appropriate disposal of feces, handwashing, treatment and safe storage of water for consumption, and appropriate food hygiene
- **Prompt identification of children with respiratory infections, diarrhea, malaria, severe acute malnutrition (SAM), or moderate acute malnutrition (MAM) and referral to quality child health and nutrition services** for prompt care and treatment for all children under 5
- **Referral to quality prenatal and postnatal services, including family planning services and promotion of healthy timing and spacing of pregnancies**, and working with households and communities to overcome barriers to accessing services
- **Including men in targeting of social and behavior change (SBC) strategies to improve the health and nutritional status of women and children**, given men’s significant role in decision making in the household, so they may positively influence health- and nutrition-related decisions for their wives and children
- **Conducting formative research on IYCF, health, and WASH practices** to fill gaps in understanding of barriers and facilitators to adopting improved practices
- **Conducting a gender assessment** that informs program design, including identification of influential household- and community-level decision makers for SBC strategies, such as men and grandmothers/mothers-in-law; potential impacts of project activities on women’s workload, status in the household, and relationships with husband/partners and other influential family members; and program designs that reduce and/or mitigate the risk of potential negative repercussions due directly or indirectly to program activities, such as violence against women

### 3.3.3 Key Policies, Strategies, and Programs Related to Food Utilization and Health

#### *Government of Mali Policies, Strategies, and Programs*

The GOM joined the Scaling Up Nutrition (SUN) Movement in March 2011.<sup>42</sup> The Politique National de Nutrition (PNN) (National Nutrition Policy) was adopted in January 2013. The general objective of the PNN is to contribute to ensuring satisfactory nutritional status for each Malian for his/her well-being and for national development (GOM 2013c).<sup>43</sup> The policy establishes the formation of the Conseil National de la Nutrition (CNN) (National Nutrition Council) and the Comité Technique Intersectoriel de Nutrition (Intersectoral Technical Committee for Nutrition). The CNN, chaired by the Minister of Health, meets annually and is attended by ministries that support nutrition, the CSA, local authorities, and representatives from civil society and the private sector. The CNN is responsible for approving the

<sup>42</sup> The SUN Movement is a renewed effort to eliminate all forms of malnutrition by bringing together governments, civil society, the United Nations, donors, businesses, and scientists in a collective action to improve nutrition. It is a movement to strengthen political commitment to nutrition and accountability for those commitments. A total of 53 countries have committed to signing on to the SUN Movement as of July 2014 (Scaling Up Nutrition 2014).

<sup>43</sup> The PNN has seven specific objectives related to its overall goal (GOM 2013c):

- Reducing levels of acute malnutrition among children under 5 years of age
- Reducing chronic malnutrition in children under 5 years of age and school-age children 6–14 years of age
- Eliminating micronutrient malnutrition (iodine, iron, zinc, vitamin A)
- Reducing anemia among children under 5 years of age, school-age children, and women of reproductive age
- Improving nutrition during pregnancy and the postpartum period
- Improving the management of chronic illnesses related to diet and nutrition
- Ensuring sustainable access to adequate food for all people



multisectoral strategic plan for nutrition, ensuring nutrition is included in national strategies, monitoring implementation through sectoral annual reports, ensuring that each player carries out its specific actions, and advocating for national resource mobilization for nutrition. The CNN is supported by the Intersectoral Technical Committee for Nutrition, which focuses on the implementation of the PNN. Under the SUN Movement, Mali has also developed a national multisectoral nutrition action plan to ensure effective implementation of the PNN.

Other GOM strategies that support nutrition include the Stratégie Nationale pour l'Alimentation du Nourrisson et du Jeune Enfant (National Strategy for Infant and Young Child Feeding), the Plan Stratégique National pour l'Alimentation et la Nutrition (National Strategic Plan for Food and Nutrition), the Normes et Procédures de Politique en Matière de Nutrition (Policy Standards and Procedures in Nutrition), the Stratégie Nationale pour les Soins Nutritionnels des Personnes Vivant avec le VIH/SIDA (National Strategy for Nutritional Care of People Living with HIV/AIDS), and the Directives Nationales pour l'Apport de Suppléments en Vitamine A (National Guidelines for Vitamin A Supplements) (Scaling Up Nutrition 2013).

Policies that help prevent women and children from becoming ill and that provide timely and appropriate treatment for illness are extremely important to maintain and improve nutritional status. Mali's Programme Décennal de Développement Sanitaire et Social (PRODESS) III (10-Year Program for Social and Health Development), currently under development, will include a description of the government programs that support the PDDSS 2014–2023 (GOM 2014e). Other key health policies that affect nutrition in Mali include the Politique National de la Population (National Population Policy) (GOM 2003) and Mali's Feuille de Route pour l'Accélération de la Réduction de la Mortalité Maternelle et Néonatal au Mali ("Road Map" to Accelerate the Reduction of Maternal and Neonatal Mortality) (GOM 2007). In 2010, the Ministry of Health also developed the Soins Essentiels dans la Communauté—Guide National pour la Mise en Œuvre (an implementation guide for the provision of health care by community health workers and volunteers).

In addition to health, good WASH access and practice are critical to maintain maternal and child health and nutritional status. Mali has both a Politique National de l'Eau (National Water Policy) (GOM 2006) and a Politique National d'Assainissement (National Sanitation Policy) (GOM 2009). Other policies and strategies relevant to nutrition can be found in **Appendix 20**.

### *USAID Strategies and Programs*

The goal of USAID/Mali's Health Strategy for 2013–2018 is "sustained improvements in health through increased use of high impact health services and healthy behaviors" (USAID 2013). The strategy includes programming in three key areas: delivery of an integrated package of high-impact health services at the community level, social and behavior change communication, and health systems strengthening. Technical intervention areas include maternal, neonatal, and child health; family planning and reproductive health; malaria; infectious diseases; nutrition; and water and sanitation. The geographic focus of the main components of the strategy includes peri-urban areas of Bamako and all districts in Kayes, Koulikoro, Sikasso, and Gao Regions, with the addition of other areas in the North as the security situation allows. The strategy also includes some activities that support national-level efforts. Various USAID/Mali health and nutrition and WASH programs are listed in **Appendix 20**.

### *Other Donor Strategies and Programs*

Other major donors that support efforts to improve nutrition in Mali include the Canadian Department of Foreign Affairs, Trade and Development; the EU; the Belgian Development Agency; the International Development Bank; the World Bank; and U.N. organizations such as UNICEF and WFP. Water and sanitation activities are being supported by Germany, the Danish, the World Bank, and UNICEF, among others. Selected donor programs are listed in **Appendix 20**.

## 4. LESSONS LEARNED FROM PRIOR FFP DEVELOPMENT FOOD ASSISTANCE PROJECTS IN MALI

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A review of past FFP projects in Mali and consultations with former staff was undertaken to compile lessons learned to guide future programming. FFP supported two development food assistance projects in Mali—implemented by Africare and CRS—from 2008 to 2013, although security conditions forced both projects to shift to new intervention areas in 2012. The projects’ strategic objectives and activities are summarized in **Boxes 4a** and **4b**.

The original goal of Africare’s 5-year Timbuktu Food Security Initiative (TFSI)/Multi-Year Assistance Program (MYAP) was to increase food security in 60 targeted communities in the Tombouctou Region by: (a) enhancing community capacity to deal with risk and vulnerability; (b) increasing agricultural and livestock production; (c) increasing household incomes through participation in commercial agricultural activities; and (d) improving the health and nutritional status of targeted households, with a focus on women and children under 5 years of age.

In March 2012, Africare’s main field office in Goundam was occupied by the National Movement for the Liberation of Azawad (MNLA) rebels and later by extremist Ansar Dine groups. The subsequent pillaging and destruction of offices, food storage warehouses, markets, banks, government buildings, communications infrastructure, and many private residences forced the evacuation of all humanitarian agencies from northern Mali. Most Malian TFSI/MYAP staff and their families were among the mid-April 2012 evacuees, bringing an early end to all TFSI-related activities in the Tombouctou Region. Africare developed a plan for an emergency program in the Nara *Cercle*. The new project identified a range of activities targeting 25 villages in the Nara, Ouagadou, and Dilly communes. The program’s main objectives were to reduce the vulnerability of individuals and households affected by food insecurity and nutritional crisis, help strengthen and preserve means of subsistence and resilience of persons and communities affected by the food crisis, and reduce the rate of acute malnutrition in children 6–59 months.

Since August 2008, a CRS-led Consortium for Food Security in Mali (CFSM) that included Save the Children International, Helen Keller International, and local partners Caritas Mali and Tassaght, implemented the FFP-supported National NEMA project in Douentza and Bourem, two very food insecure *cercles*. The original goal of NEMA (2008–13) was “to reduce the food insecurity prevalence in vulnerable populations” through three strategic objectives related to improved livelihood strategies, improved health and nutritional status, and increased capacity to manage shocks. Two cross-cutting themes—functional literacy and good governance—supported all three objectives. The original zone of intervention was 130 of the most vulnerable villages in Douentza and Bourem, supporting 124,859 people.

In March 2012, CFSM was forced to suspend its activities due to the occupation of the area by rebel groups. CRS redeployed many of the same activities and staff to an emergency IDP program benefitting 39,830 IDPs in the regional capital of Mopti (April–September 2012) and to a quick-start FFP initiative for three vulnerable *cercles* in the South (Kayes, Koulikoro, and Sikasso)—using a slightly amended version of the original program—from 2012–2014.

Despite the occupation of various rebel groups in early 2012 and the projects’ withdrawal from their original zones, both projects carried out qualitative final evaluations in late 2013, comprising interviews with local officials, program beneficiaries, project staff, and other key informants. Consultation with

former staff for this desk review focused on discussing lessons learned and recommendations in the final evaluations.

#### **Box 4a. Summary of Strategic Objectives and Activities in Recent Africare FFP Development Food Assistance Projects in Mali**

##### **Timbuktu Food Security Initiative (TFSI) Project (2008–2013)**

*Strategic Objective (SO) 1: The capacity of communities to manage risks and cope with shocks resulting from vulnerability will be strengthened*

- Establish food security committees
- Food for Work
- Food for Training
- Literacy training programs

*SO2: Households' access to food is improved*

- Increase and expand local agricultural, livestock, and fisheries production, including the development of village irrigated perimeters
- Introduce advanced production techniques and improved varieties of goats and chickens
- Improve the skills of volunteer lead farmers and GOM agricultural agents
- Develop community food storage facilities
- Support the formation and training of producer groups
- Support the expansion of village-managed credit/savings funds

*SO3: Improved health and nutrition of vulnerable populations*

- Community-based growth monitoring and promotion
- PD/Hearth and follow-up home visits for underweight children
- Information, education, and communication (IEC) sessions on health, nutrition, and sanitation
- Construction and management of community water supplies (wells)
- Train GOM health agents, village nutrition educators (VNEs), and traditional birth attendants in nutrition and health

##### **Nara Emergency Assistance Project (2012–2013)**

*SO1: Reduce the vulnerability of individuals and households affected by food insecurity and nutritional crisis*

- Distribute commodities to vulnerable groups

*SO2: Contribute to strengthening and preserving means of subsistence and resiliency of persons and communities affected by the food crisis*

- Train village-level food security committees

*SO3: Reduce the rate of acute malnutrition in children 6–59 months*

- Protective food rations provided to households with malnourished children
- Incentive food rations provided to health/nutrition volunteers
- Train GOM health agents and VNEs in community-level identification of children with SAM and MAM, referral to CSCOMs, home outreach, and delivery of IEC sessions

##### **Goundam Food Security Initiative Project (2003–2007)**

*SO1: Increased agricultural production*

- Train food security committees and special interest groups on planning to improve food security
- Improve access to micro-dams and wells for irrigation
- Increase access to improved agricultural practices
- Form and train local microenterprises to access agricultural inputs
- Train producers in savings and credit programs

*SO2: Improved marketing options and diversification of income*

- Train women's and community groups in income generation activities
- Train households in techniques to increase on-farm livestock production
- Develop market information systems

*SO3: Improved household health and nutrition*

- Child growth monitoring and promotion
- Health, nutrition, and sanitation education and food preparation demonstrations
- PD/Hearth program for children with moderate or severe malnutrition (unclear if acute malnutrition or underweight)
- Train VNEs in health and nutrition

Sources: Short et al. 2013; Short and Sidibe 2014; Beninati et al. 2006.

#### **Box 4b. Summary of Strategic Objectives and Activities in a Recent CRS FFP Development Food Assistance Project in Mali**

##### **NEMA Project (2008–2013)**

*SO1: Livelihood strategies more profitable and resilient*

- Support improved community infrastructure through Food for Work
- Develop and train agro-enterprise groups (AEGs)
- Promote group savings through the creation of savings, investment, and lending committees (SILCs)
- Improve agricultural production through extension

*SO2: Reduce the vulnerability of children under 5 years of age to illness and malnutrition*

- Behavior change communication focused on Essential Nutrition Actions (ENA)
- Community-level identification of children with SAM and MAM and referral to CSCOMs
- PD/Hearth for underweight children
- Food rations for children with SAM and MAM and their families
- Promote sanitation infrastructure and teach improved hygiene and sanitation practices
- Train communities in integrated water management and increase the number of potable water points
- Train community health volunteers (*relais*) in nutrition and health

*SO3: Targeted communities manage shocks more effectively*

- Establish food security committees
- Establish safety net committees

Source: McMillan and Sidikiba, 2013

## 4.1 LESSONS LEARNED RELATED TO FOOD AVAILABILITY AND ACCESS

This section presents lessons learned related to food availability and access from the recent FFP projects in Mali, with a focus on livelihoods, early warning systems, and cross-cutting activities. Related project strategic objectives and activities appear in Boxes 4a and 4b.

### 4.1.1 Livelihoods Lessons Learned

#### *Livestock*

Managers and evaluators of both projects noted that any efforts to improve livelihoods in rural areas should have a livestock component. Many Malian households have livestock, which serve as a safety net, dowry, source of income, and means to diversify diets. However, as noted earlier, the frequent incidence of drought and animal disease affect livestock populations. Further, many households in the projects' target areas in Tombouctou and Douentza lost livestock due to pillaging by rebels. The review of project documents and consultations suggests that:

- Project beneficiaries valued efforts to improve animal health, fodder, and restocking or breeding programs. Africare successfully introduced a method to increase the availability of fodder during the lean period by training producers to make salt-enriched straw bales mixed with cowpea or groundnut hay. These bales allow pastoralists to improve fodder quality and minimize storage space compared to traditional bulk straw storage.
- To extend this impact, future programs could work with the livestock division of the Ministry of Agriculture's network of paravets to implement breeding programs and promote nutritious fodder and protected pens for a range of livestock.
- Livestock activities in future projects should be tailored to the zone, and households should be classified based on the type of livestock they own, such as goats, cows, camels, poultry, etc.
- A full-time livestock specialist should be hired to ensure that activities in this technical sector are well designed and appropriate.

#### *Market Gardening*

The projects introduced various techniques to promote market gardens in their intervention areas. One organization helped female farmer groups establish fenced, irrigated market gardens with a focus on marketable and nutritious crops such as lettuce, potatoes, shallots, beetroot, and tomatoes. Another organization established agro-enterprise groups (AEGs) of 20–25 community members who worked together and contributed to a shared production and marketing plan with technical and financial support from the project. Women's participation in the AEGs was much higher than anticipated, almost equivalent to the participation of men. Furthermore, one evaluation found that AEG members were trained in organization development, basic business skills, and the importance of market requirements. AEG members conducted market chain analyses to identify opportunities that complemented each group's resources, strengths, and potential (McMillan and Sidikiba 2013). Lessons learned include:

- An AEG's success depended on "social cohesion within the group, a shared vision, the availability of markets, a certain level of experience among group members, and availability of resources" (Ibid.). In this respect, only a fraction of AEGs involved with market gardening were both successful and sustainable.
- Irrigated market gardens and nutritional gardens should be distinct activities, as they are set up at cross-purposes, with one focused on profit and the other improved nutrition.
- Gardens' long-term sustainability and profitability are also determined by the group's ability to access seeds, drip irrigation equipment, and other inputs. The Second Food Aid and Food Security Assessment (FAFSA-2) report supports this finding, noting that joint market gardening

activities can thrive only if there is sufficient motivation (profit), access to resources (e.g., seeds), and farmer capacity to employ improved techniques (van Haeften et al., 2013).

- Women are more likely to retain and employ the skills learned during the implementation period compared to men, by a significant margin.
- Using Food for Work (FFW) to prepare market garden sites was a best practice.

### *Support to Input Suppliers*

Input suppliers are critical players in many agricultural value chains in Mali, but they are often absent in remote and impoverished regions. Africare’s emergency program in Nara provided short-cycle cereal and horticultural seeds to smallholder farmers and market gardening groups through vouchers redeemable at small input supply shops. In addition to processing these orders through the shops, the program provided basic equipment for the shops. Some shops initially supported through that program are still in business and credit this inflow of customers and capital as a turning point in their profitability and continued success. Such an approach may be a best practice when supporting market gardening or cooperatives through a seed voucher program. However, this will depend on the pre-existence of these shops and the accessibility to markets and wholesale seed suppliers that are in Bamako and larger towns. Future interventions may consider providing additional training to input supply shops in bookkeeping, inventory control, safe handling of commodities, and marketing (Africare 2015).

Due to the lack of input supply shops in some project original intervention zones, one project sought to graduate farmer groups into certified seed producers. Participating farmers received some inputs, such as seeds, fertilizer such as DAP,<sup>44</sup> and urea to facilitate improved farming techniques. Many farmers interviewed for the final evaluation noted that they no longer could implement these techniques due to the lack of inputs in their area. The evaluator recommended that farmer groups be trained to become certified seed suppliers, meaning the groups would understand principles of seed multiplication and selection. This may be possible for some groups, but some former program managers contend that it depends on the profitability and AEG members’ interest in such a venture. New interventions should also examine lessons learned from the Ministry of Agriculture’s long-term collaboration with the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) and World Bank work in the Mopti region called International Sorghum and Millet Collaborative Research Support Program (INTSORMIL). From 1979 to 2013, the INTSORMIL, led by the University of Nebraska and several land grant universities in the United States, worked to develop and introduce dozens of new sorghum lines and products (baked goods, animal feed, beer, etc.) and reach thousands of smallholder farmers. In Mali, INTSORMIL worked through government agricultural extension agents to strengthen agricultural cooperatives’ access to inputs (improved seed, fertilizer, minerals, and fungicide) and cultivation techniques. The cooperative management committee redistributes the inputs to the members of the cooperative society. Each member of the cooperative reimburses the value of the seed, fertilizer, and fungicide, paying in grain after threshing. It is important to note that many farmers later joined these cooperatives and/or formed sub-groups to access seeds and fertilizer which helped sustain the intervention (McMillan and Sidikiba, 2013).

### *Food for Work*

Africare and CRS used FFW to support a variety of livelihood and disaster risk reduction interventions, such as preparation of demonstration plots, fencing for market gardens, soil conservation techniques to reduce erosion and desert encroachment, road rehabilitation, and bridge and water infrastructure improvements. An assessment of FFW-constructed infrastructure one year after CRS’s departure from Douentza and Bourem revealed that the majority of these structures were still in place and maintained by the communities. This improved infrastructure also helped communities manage flooding and sand and water erosion. CRS targeted much of its FFW work to AEGs and food security committees (FSCs) to

<sup>44</sup> *Diammonium phosphate* (DAP) is 18% nitrogen and 46% phosphorus.

improve livelihoods and reduce disaster risk. Using FFW in this way is a recommended practice, with a caveat from one implementer that “individualized FFW” for vulnerable households is not recommended due to the potential for stigma and communal context extant in Mali.

### *Gender Roles and Relations*

The significant involvement of women in farmer groups and AEGs has strengthened the community’s support for women to have more autonomous livelihoods and access to additional land. At the early stages of implementation, Africare and CRS made an effort to ensure that women participated in the formation of farmers groups (especially for irrigated vegetable gardens), training in improved agricultural techniques, and savings and loan groups. This was an important element to establish from the onset since it is quite common in Mali for men to receive the bulk of training or reclaim land allocated to women’s groups once these activities are shown to be profitable and/or donor funding ends. However, one important point is that an earlier FFP project in Mali that introduced irrigation resulted in higher levels of chronic malnutrition in children in that project area, due to women’s increased involvement in agriculture and reduced time for child care (van Haeften et al., 2013). Programs will need to monitor the impact of their interventions to ensure there are no negative consequences.

### *Integration of Maternal and Child Health and Nutrition and Livelihood Activities*

Though it was initially envisioned that Positive Deviance (PD)/Hearth groups under the two projects’ health objectives would be integrated with livelihoods and rotating savings programs, this did not occur in either project.<sup>45</sup> One important lesson learned and recommendation from the final evaluation is that mother’s groups should receive training in improved livelihoods at an earlier stage. After one project’s mid-term evaluation, community development agents (CDAs) were supposed to perform multiple functions to improve integration of program interventions. Insecurity in early 2012 prevented this from being fully realized, but it did occur in some areas. Although the mid-term evaluation recommended that multidisciplinary field agents be trained in both health and livelihoods to ensure that mother care groups received integrated training from the beginning, the final evaluation found that “generalist CDAs” appeared to be good for the livelihoods portion of the project, accelerating AEGs and savings and internal lending committees (SILCs), but were detrimental to health and nutrition activities. The final evaluation recommended that mothers who graduate from the maternal and child health and nutrition (MCHN) portion of the project be supported to create rotating savings programs similar to the SILC approach.

### *Rotating Savings*

Rotating savings and loan programs in Mali have a proven track record and can contribute to improved food security. The projects helped to create village *caisses*, small community-managed savings and credit funds managed by the community, sometimes by the FSCs. These programs enabled vulnerable households to invest in small income-generating activities and access funds for short-term household needs, especially during the lean season. The *caisses* continued to function during the rebel occupation in 2012, despite the threat of losing such funds to the occupiers. As noted, former implementers recommended that PD/Hearth mother’s groups form their own SILCs to improve child nutrition and livelihoods. Follow-up evaluations completed one year after the FFP projects’ departure from the original intervention zone reveal that most of the *caisses* and SILCs continue to function and often serve as a village’s only source of cash. Former program managers disagreed with the final evaluation recommendations that SILCs should be linked to microfinance institutions to access more credit. They felt that introducing external debt to the otherwise “contained” SILCs would fundamentally weaken them

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<sup>45</sup> PD/Hearth is a community-based rehabilitation and behavior change intervention for families with underweight preschool children. The “positive deviance” approach is used to identify behaviors practiced by the mothers or caretakers of well-nourished children from poor families and to transfer such positive practices to others in the community with malnourished children. The “hearth,” or home, is where the nutrition education and rehabilitation sessions are held.

and undermine their long-term sustainability. They were also reluctant to support the recommendation that AEGs should access loans from microfinance institutions for similar reasons.

### *Water*

Lack of water for agriculture and drinking is a perennial problem in Mali that is likely to get worse due to climate change. Africare and CRS tackled this problem by training farmers in soil conservation techniques, introduction of drought-resistant crop varieties, drip irrigation for some market gardens, and construction of other water infrastructure through FFW and other technical assistance. Farmers who received training from Africare continue to practice *Zai*<sup>46</sup> and half-crescent techniques<sup>47</sup> that improve soil structure, soil moisture conservation, and seedling growth and promote intercropping. Africare program managers observed that it is critical to do a hydrology study before a well/borehole has been identified. They also emphasized the importance of setting up water user committees at an early stage to collect user fees and maintain equipment. There is a recent migration to solar-powered pumps, but maintenance and access to and cost of spare parts must be considered.

### *Summary of Lessons Learned in Livelihoods*

1. Future FFP development food assistance projects in Mali that include efforts to improve livelihoods in rural areas should have a livestock component. Projects should consider hiring a full-time livestock specialist, tailoring activities to the project zone and household level activities based on the type of livestock owned, and working with the livestock division of the Ministry of Agriculture’s network of paravets to implement breeding programs and promote nutritious fodder and protected pens for a range of livestock.
2. Market garden AEGs should continue to receive training in organization development, basic business skills, and the importance of market requirements, and to conduct market chain analyses to identify opportunities that complement group resources, strengths, and potential. Groups also need guidance to ensure access to seeds, drip irrigation equipment, and other inputs. Factors that were important in group success should be taken into consideration in future programs, including social cohesion, a shared vision, the availability of markets, experience among group members, and availability of resources.
3. Given the importance of input supplies in agricultural value chains in Mali, if feasible, future FFP projects may consider training input supply shops in bookkeeping, inventory control, safe handling of commodities, and marketing and/or consider training some farmer groups to become certified seed producers, depending on profitability and group interest in this activity.
4. FFW activities improved community infrastructure and helped communities manage flooding and sand and water erosion, thereby improving livelihoods and reducing disaster risk, which is a recommended practice in the use of FFW. However, “individualized FFW” for vulnerable households is not recommended due to the potential for stigma and the communal context extant in Mali.
5. Women’s significant involvement in farmer groups and AEGs strengthened the community’s support for women to have more autonomous livelihoods and access to additional land. However, although women’s involvement in these activities should continue to be encouraged in future projects, it will be important to monitor the impacts of women’s involvement to ensure there are no negative consequences for themselves or their children.

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<sup>46</sup> A *Zai* is a planting pit, with a diameter of 20–40 cm and a depth of 10–20 cm that is dug in the dry season (November–May). Organic matter is added to the pit after the first rainfall and covered with a thin layer of soil. Seeds are placed in the middle of the pit. This approach both captures water for and fertilizes the seeds.

<sup>47</sup> The half-crescent technique is a means of collecting rainwater using earth bunds in the shape of a semi-circle by digging out holes along the contours of the land where planting will occur.



6. Future projects should consider training mother's groups in improved livelihoods at an earlier stage, with mothers who graduate from the MCHN portion of the project being supported to create rotating savings programs similar to the SILC approach.
7. Rotating savings and loan programs in Mali have a proven track record and can contribute to improved food security. However, linking them to microfinance institutions to access credit or loans may weaken them and undermine their long-term sustainability, due to the introduction of external debt to the otherwise "contained" SILCs.
8. Training farmers in agricultural techniques and use of improved technologies to mitigate poor access to water; construction of infrastructure to improve access to water; and establishment of trained committees to manage infrastructure and water use will continue to be important activities in FFP projects in Mali, due to continual problems with lack of water for agriculture and drinking.

#### 4.1.2 Early Warning Systems Lessons Learned

##### *Establishment of Food Security Committees*

The projects established FSCs or Early Warning Group/Emergency Response (GAP/RU) committees as the projects' key mechanism for planning and implementing all project activities at the village level and to strengthen local institutional capacity. The primary aim of the groups was to increase community resilience by enhancing organizational capacity to prevent and manage risks and catastrophes, developing and implementing community-scale food security action plans, and gathering and reporting monthly early warning data to commune officials, as well as integrating these data into regional and national food monitoring and planning. The groups were also directly involved in mobilizing and leading each village's participation in FFW, food distribution, and selection of households for safety net programs.

There is evidence that the groups continued to function and serve as a liaison with rebels on behalf of their communities after the projects withdrew from Tombouctou, Bourem, and Douentza. When relief from other agencies began to arrive after the crisis, the groups were able to interact effectively to identify needy households, specify needs for the community, etc. However, evaluators found that one year after one organization's departure from the original intervention zone only eight (38%) of the 21 GAP/RU groups contacted were considered "functional" in the sense that they still collected and reported rainfall data in the local community; only one of the 21 continued transmitting data to the SAP. Despite this result, both projects set a precedent for creating such committees, and the Malian government expects communities to create FSCs that will report early warning data, such as rainfall, to the government. In this respect, FSCs must be an integral part of future FFP development food assistance projects in Mali and should be linked to the SAP.

##### *Leadership of Food Security Committees*

According to Africare's experience in the field, FSC members should not be drawn from the traditional leadership in villages. Using traditional leadership poses a conflict of interest due to the need to select beneficiaries for safety net and FFW programs, which may be influenced by tribal dynamics. The broader community should nominate people to be on the committee and should be encouraged to consider gender balance. Local authorities should also be involved with the committees from the beginning. FSC term limits should be well established and understood by all members at the outset of the activity so that leadership changes regularly. The FSCs should also understand implementing partners' expectations for the committees and the fact that support to them eventually will be phased out.

##### *Link Food Security Committees to Other Humanitarian Organizations*

FSCs can be further enhanced by linking them to other humanitarian agencies in the event of an emergency. The FSCs proved to be an effective conduit for articulating their needs to humanitarian actors following the rebel occupation. Interestingly, they also proved to be adept at negotiating with the rebels to

ensure the safety of their communities by understanding rebel demands and limits. In one striking case, FSCs in Tombouctou whose community cereal banks had been looted by rebel groups alerted other FSCs, which redistributed grain to community households before the rebels arrived. The lead agency/agencies of future FFP project(s) in Mali could liaise with humanitarian actors such as WFP, UNICEF, and Red Cross/Red Crescent. CRS noted that this could be an added benefit to new programs but agreements with FSCs should be simple and avoid the complexity that could come from a formal memorandum of understanding (MOU) with such entities. One good example and precedent for such an arrangement is ACDI/VOCA's FFP project in Haiti (2008–2012), wherein the agency signed MOUs with UNICEF and WFP to pre-position supplies before each hurricane season in coordination with local disaster management committees.

### *Creation of Safety Net Committees*

One project created safety net committees (SNCs) composed of village leaders to select vulnerable households for safety net assistance under its FFP project in Mali. The safety net component included food rations for vulnerable households during the lean season. The SNCs developed a prioritized list of needy households and managed the distribution discreetly to lessen the impact of stigma. Beneficiary households and SNCs had positive feedback about the transparent nature of the selection process and household food security improved during an otherwise challenging period. Former program managers concurred with the final evaluation recommendation that future safety net programs should include income generating activities for the most vulnerable households. However, they disagreed with recommendations that vulnerable households should be organized into separate groups for livelihood and FFW activities because this would cause further stigmatization. They were also opposed to the idea of creating self-assessment tools to measure the committee's impact, calling it unrealistic. Finally, one implementing partner felt that village leaders should not be incorporated in any project-formed committees. As such, it is recommended that if SNCs are created in the future, their members should be formally elected through a clear and democratic process and frequently rotated, reflecting the best practices used with FSCs.

### *Incorporate Technology to Collect and Disseminate Early Warning Information*

During the projects' implementation period, FSCs collected rainfall data that they reported to Mali Meteo (Mali's meteorological service) and the SAP. One of the final evaluations noted that the process of recording and sending information from rainfall meters daily could be done more efficiently using technology. In future projects, this could be done using a mobile application with data sent by text message to a government or project-managed, cloud-based database. Programs should also consider additional early warning metrics, such as food prices at regional markets and mid-upper arm circumference among children under 5 years of age, and identify GOM and other institutions that could benefit from the data, which can also be collected and sent using mobile technologies. A final evaluation also recommended that this information could be broadcast via radio in the communities where it is collected. Former program managers agreed with both of these recommendations but noted that radio airtime is expensive and that the transcript must be prepared in the appropriate local language.

### *Summary of Lessons Learned in Early Warning Systems*

1. The most recent FFP development food assistance projects in Mali created FSCs that appear to have continued to serve their communities after project closure, liaising with rebel groups, and later, aid organizations. However, few continued to collect rainfall data and report it to SAP. FSCs should be an integral part of future FFP projects in Mali and should be linked to the SAP, given that the Malian government expects communities to create FSCs that will report early warning data, such as rainfall, to the government.

2. FSC members should be nominated by the broader community, considering gender balance, with well-established term limits and involvement of local authorities from the outset. FSCs also should have a clearly defined plan for phase-out of support from implementing partners.
3. FSCs can be further enhanced by linking them to other humanitarian agencies in the event of an emergency, such as the WFP, UNICEF, and Red Cross/Red Crescent.
4. The successful establishment of SNCs and their transparent selection of vulnerable households, as well as their discreet provision of assistance, should be considered for future FFP projects in Mali. SNC members should be formally elected through a clear and democratic process and frequently rotated, reflecting the best practices used with FSCs. SNCs should also consider including income generating activities for the most vulnerable households.
5. Future projects should consider supporting communities to send rainfall data by text message to a government or project-managed cloud-based database. They also should consider adding other relevant early warning metrics, such as food prices at regional markets and mid-upper arm circumference among children under 5 years of age, and should identify GOM and other institutions that could benefit from the data.

### 4.1.3 Cross-Cutting Activity

#### *Literacy*

Both FFP projects in Mali included a cross-cutting activity to bolster literacy among target beneficiaries in support of their strategic objectives. They established literacy centers with at least two trained teachers in all project villages, which would continue once the project ended. Rather than a physical structure, the communities identified meeting places for the literacy centers, which consisted of a gathering of people. Project personnel trained the teachers and provided basic equipment for the class, as well as the training manuals and supervision and student review needed to certify literacy levels. They also worked with the Ministry of Education to improve literacy using core literacy trainers. The trainers used community tools translated into the local language, such as meeting procedures and cash reporting/recordkeeping tools so that committee members would find these skills relevant and use them in the future. By early 2012, 122 literacy centers had been created.

Beneficiaries interviewed for one of the mid-term evaluations were very positive about the program's literacy component. They noted that improved literacy helped them with recordkeeping and was useful to track the growth of their infants and participate in other MCHN activities. However, when participants were tested for their literacy skills by the GOM's Centre d'Animation Paysanne (CAP) (Village Training Center) in August 2011, less than half passed the test; women, in particular, did not perform well. At the time of the final evaluations, one year after the projects closed due to insecurity, not a single literacy center or literacy activity was still functioning in either project.

The projects' literacy programs had both strengths and weaknesses. One strong point concerned the collaboration with the Ministry of Education's literacy programs such as CAP. Ostensibly, such a linkage will make literacy initiatives more sustainable following a project's closure and help them adhere to the government's curriculum. The selection of literacy trainers by community members themselves and significant participation by women were also strengths. The ability to select their own teachers gave community members more confidence in their teachers and respected their insight about who had the most capacity to undertake this work. In terms of weaknesses, evaluators noted that the motivation among literacy teachers was low. This may have been linked to remuneration, an issue that must receive greater attention in the future. Though women participated in literacy programs, their test scores were poor compared to men, possibly due to their significant workload at home and on the farm. Finally, impact assessments were insufficient during project implementation. This should be built into future programs

from the outset to improve the quality of literacy interventions. Literacy programs should also be well linked to subjects discussed in livelihood, MCHN, early warning, and other interventions.

There is a strong rationale for including literacy programs in future FFP projects, especially those that build upon the foundation set by recent interventions. One lesson learned is that implementers should assess a community's literacy needs before launching literacy training programs. Close collaboration with the GOM's CAP also is recommended, but regular monitoring of the quality of literacy programs must be improved to increase test scores. Project staff can also work with literacy trainers to compile strategic plans for the coming year based on student progress and to ensure that lessons are relevant to beneficiaries' livelihoods and health needs. Former field staff also noted that literacy programs should take place after the harvest season, when beneficiaries have relatively more time to participate in classes.

### *Summary of Lessons Learned in Literacy*

1. Implementers should assess a community's literacy needs before launching literacy training programs, and monitoring and impact assessments must be built into future programs from the outset to improve the quality of literacy interventions.
2. Although women's participation in the literacy program was high, their test scores were low compared to men. This will require attention in future projects to understand the reasons why and to modify the literacy program, if needed, to better meet women's learning needs.
3. The collaboration between former FFP projects in Mali and the Ministry of Education's literacy programs, such as CAP, was a project strength that should be included in future projects to assist in sustaining literacy efforts after project closure.
4. The selection of literacy trainers by community members themselves gave community members more confidence in their teachers and respected their insight about who had the most capacity to undertake this work. This was also a project strength that should be considered in future FFP programs in Mali. However, motivation among literacy teachers was low, which may have been related to remuneration. Motivation is an issue that must receive greater attention in future programs.
5. Future projects should consider having their staff work with literacy trainers to develop strategic plans based on student progress and to ensure that lessons are relevant to beneficiaries' livelihoods and health needs and are linked to subjects discussed in livelihood, MCHN, early warning, and other interventions.
6. Literacy programs should take place after the harvest season, when beneficiaries have relatively more time to participate in classes.

## **4.2 LESSONS LEARNED RELATED TO FOOD UTILIZATION**

This section addresses lessons learned and program recommendations in recent FFP development food assistance projects in Mali related to food utilization, specifically focused on MCHN and WASH, as well as gender as it relates to MCHN and WASH. **Boxes 4a and 4b** provide a summary of the activities under each project's SO.

### **4.2.1 MCHN Lessons Learned**

#### *Prevention of Chronic Malnutrition*

The MCHN component of the FFP development food assistance projects in Mali were largely focused on treatment rather than prevention. The two most recent projects were designed at a time when a global paradigm shift was occurring in development-oriented nutrition, from a focus on treatment of undernutrition to a focus on prevention (Bhutta et al. 2008; Bhutta et al. 2013). Evidence has

demonstrated that various preventive nutrition interventions have resulted in greater improvements in child nutritional status than treatment of undernutrition alone. Treatment programs for undernutrition alone would be inadequate to affect FFP’s impact indicator of stunting. As noted in **Section 3.2.2**, the GOM joined the SUN movement in 2011 and developed a national nutrition policy in 2013. New FFP development food assistance projects in Mali should support the country’s national nutrition policy, with a focus on preventing undernutrition among children and pregnant and lactating women in the 1,000-day window, who are the primary target group of the SUN movement. To achieve the greatest improvement in stunting in Mali, FFP projects would benefit from considering a combination of the following:

- Preventive food rations provided for pregnant women, lactating women up to six months postpartum, and children 6–23 months of age, conditional on participation in MCHN services. An additional household ration may also be provided to accommodate sharing. Preventive food rations are most appropriate for targeted areas that lack access to food and experience poor food utilization.
- Promotion of improved access to quality preventive and curative MOH health and nutrition services for children and women, according to national protocols.
- SBCC, generally through community-level participation in MCHN-focused activities, in focus areas as indicated in **Section 3.3.1**.

While the FFP projects in Mali implemented the Positive Deviance (PD)/Hearth approach, the FAFSA-2 recommends against implementing stand-alone PD/Hearth approaches without community- and population-based preventive interventions to improve nutritional status (van Haeften et al. 2013). A systematic review of the PD/Hearth approach found mixed results in improving nutritional status (Bullen 2011). The final evaluation for one project in Mali found that by project year 4, PD/Hearth had been implemented in only 27 of 45 targeted villages, only 580 children had participated, and only 57% of those children were rehabilitated (McMillan and Sidikiba 2013).<sup>48</sup> Communities in one area could acquire the food and firewood for PD/Hearth sessions only during the harvest season, the only time food and funds were available. In addition, children were insufficiently monitored after graduation from PD/Hearth. The FAFSA-2 cited other common problems with PD/Hearth: Recuperation across PD/Hearth programs was only 48%; PD/Hearth sessions could be conducted only during a narrow window of time when food was plentiful and mothers had time to participate; and follow-up was inadequate. The FAFSA-2 also found that some projects thought PD/Hearth would be simple to implement, but the approach was actually very time-consuming and required nutrition expertise that some projects did not have.

### *Treatment of Acute Malnutrition*

Former FFP projects in Mali supported the implementation of community-level activities for the MOH’s integrated management of acute malnutrition program (*prise en charge intégrée de la malnutrition aiguë*, [PECIMA]) and referral of SAM and MAM cases to the CSCOMs. Project training for community health agents and community volunteers in the community-level aspects of PECIMA, collaboration with MOH health services, and community outreach were found to be very useful. However, the support to PECIMA worked well where CSCOMs existed; where there was no CSCOM, there were challenges, such as the long distances that caregivers and their children had to travel for treatment. Future programs will need to work out solutions to these challenges with the MOH and communities. One project working in communities with no CSCOM negotiated with the MOH to allow community health volunteers to travel to the nearest CSCOM to acquire therapeutic foods for children suffering from acute malnutrition without medical complications; this arrangement seemed to work well. Activities supporting community-level PECIMA should encompass a continuum of care that bridges treatment and prevention, with a special

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<sup>48</sup> Please note that throughout this lessons-learned section, when results and lessons learned are shared from one former FFP project and not another on the same topic, it is because the other project’s final evaluation report did not provide similar information.

emphasis on the target groups in the 1,000-day window of opportunity—pregnant and lactating women and children 6–23 months of age.

### *Nutritional Status of Pregnant and Lactating Women*

Although one of the projects originally proposed SBCC interventions that included nutrition during pregnancy and lactation, the emphasis was switched during implementation to child nutrition and recovery of malnourished children at the community and CSCOM levels (McMillan and Sidikiba 2013). As a result, there was no focus on feeding women during pregnancy or lactation, which is critical for the health of the woman and her child. A focus on pregnant and lactating women also supports the GOM's new nutrition policy, which emphasizes the 1,000-day window of opportunity.

### *Social and Behavior Change Strategies*

One project intended to target decision makers, such as grandmothers, fathers, and community leaders, in addition to mothers, with SBC interventions. However, the project's final communication strategy only focused on targeting mothers. An increased focus on fathers was included when the project shifted to new implementation areas after the security crisis. Future programs must consider focusing SBC approaches on other influential family members, such as fathers and grandmothers, to promote support for nutrition and health of women and young children. One project developed a series of messages about improved nutrition practices and care for acute malnutrition that were translated into local languages for broadcasting by radio stations. However, at the time of the final evaluation, the impact of the messages had not been evaluated. Project evaluators recommended that the impact of the radio messages be evaluated before considering using radio messages in future programs. The FAFSA-2 recommends that SBC strategies include approaches that have been shown to be successful in FFP development food assistance projects, such as interpersonal counseling for behavior change and home visits; this was also recommended by the evaluators of one of the FFP projects in Mali (van Haeften et al. 2013; McMillan and Sidikiba 2013). One project implemented two unique activities that it had not originally planned: training SILC groups in health and nutrition and including nutrition and hygiene education in the literacy training materials used in beneficiary villages.

### *Relais (Community Health Volunteers)*

The former FFP development food assistance projects in Mali both trained *relais* (community health volunteers) and encouraged sustainability by building activities on the existing system of *relais*. Future projects will need to work closely with the MOH to recruit and retain the most qualified *relais* (McMillan and Sidikiba 2013). The *relais* should be provided support materials (SBCC and training materials) that are appropriate for their literacy levels so they can continue to do their jobs after project closure. Project staff in some intervention areas reported that the number of official MOH *relais* was insufficient to meet the needs of communities and that the *relais* existed only where CSCOMs were located. To overcome this challenge, the projects trained additional *relais*, but they were not always officially recognized by the MOH. MOH policy also stipulates that *relais* should not receive remuneration; however, it was difficult to motivate these volunteers to continue after project close-out without remuneration. It is necessary to discuss and resolve this issue with the MOH and communities. Evaluators suggested that communities could be encouraged to support *relais* through in-kind support, such as the development of income generating activities through AEGs and SILCs, community support for the farming activities of the *relais*, or creating a system for the community to provide in-kind compensation.

Projects will also need to ensure that there is an adequate number of skilled nutrition and health staff to oversee community-level nutrition activities during project implementation. One project switched from using community development agents (CDAs) who focused on nutrition, agriculture, or early warning/emergency response to using generalist CDAs who would cover all community-level activities;

the change hampered the efficacy of the project's health and nutrition activities (McMillan and Sidikiba 2013). This lesson learned was incorporated in the new areas of implementation after the 2012 crisis, when new staff were hired to support nutrition activities.

### *Prevent/Mitigate Potential Negative Impacts across Integrated Program Interventions*

The final evaluation of one former FFP development food assistance project in Mali found that child nutritional status had deteriorated in project areas with village irrigation projects (Beninati et al. 2006). The percentage of children 2 to 5 years of age who were underweight increased from 28% in 2003 to 61% in 2006 ( $p=0.003$ ) in these villages, and wasting increased from 0 to 23% ( $p=0.009$ ) in the same period. In the project area overall, underweight among children 2 to 5 years increased from 38% to 43% but decreased among children 6–24 months from 44% to 35% ( $p=0.01$ ), despite droughts and locust infestations. The negative impacts on child nutritional status in these villages were attributed to the introduction of irrigation, which added a second agricultural cycle in the year and affected child care because women had to do even more agricultural work (van Haeften et al. 2013). Children under 2 years of age were less affected because they were taken to the fields with their mothers and breastfed, while children 2 to 5 years of age were left at home with inadequate substitute caregivers. This experience is a good example of why it is critical to conduct a gender analysis during project design and monitor the project's impact on gender equity.

### *Summary of Lessons Learned in MCHN*

1. Former FFP projects in Mali have been largely focused on treatment rather than prevention of undernutrition. Since the time those projects were designed, a body of evidence has demonstrated the effectiveness of various preventive nutrition interventions, focused on the 1,000-day period from pregnancy through a child's second year of life, that result in greater gains in improved nutritional status than treatment of undernutrition alone. This paradigm shift is also reflected in the GOM's recently completed national nutrition policy. FFP development food assistance projects in Mali will need to consider this new prevention-focused paradigm in their programming.
2. Project training for community health agents and community volunteers in the community-level aspects of PECIMA, the collaboration with MOH health services, and community outreach was found to be very useful. However challenges related to long distances to reach treatment centers will need to be overcome.
3. Past FFP projects in Mali have not incorporated an emphasis on improving the health and nutritional status of pregnant and lactating women. However, given the GOM's recent national nutrition policy with its focus on the 1,000-day window, new FFP development food assistance projects in Mali should strongly consider including components related to improving the health and nutritional status of pregnant and lactating women.
4. Project outcomes and impact can be improved through use of strong SBC strategies that focus on primary and secondary audiences to influence adoption of beneficial nutrition, health, and hygiene practices among target populations, while building upon past SBC experiences.
5. Community health workers and volunteers will be vital elements for community level programming in any new FFP programming in Mali, and they will need support to be as effective as possible, including providing them with training, materials, supplies, and adequate supervision by skilled staff.
6. Program designs will need to include close monitoring of activities, for example, irrigation, to ensure they do not result in declines in child nutritional status, due to factors such as increased women's workload, and put in place appropriate mitigation measures to prevent negative impacts.

## 4.2.2 WASH Lessons Learned

### *Community-Led Total Sanitation*

One FFP project in Mali applied the Community-Led Total Sanitation (CLTS) approach in several communities during the third year of the project; 142 latrines were built in the last two months of year 3 and 190 latrines in year 4 (McMillan and Sidikiba 2013), all without financial support from the project. Given this positive result and the GOM's adoption of the CLTS approach, the project's evaluators recommended that the approach be adopted in all future project communities at project inception. In addition, the FAFSA-2 report recommended that projects conduct an inventory of the sanitation infrastructure in every project community and develop a plan to close any sanitation gaps through project activities or through other USAID or donor-funded projects and partners. Such inventories and plans to fill gaps were also recommended regarding community sources of drinking water. Given that USAID/Mali is funding integrated nutrition and WASH projects, it will be important for FFP development food assistance projects to ensure there is no duplication of services in targeted communities and to incorporate lessons learned from these projects.

### *Improved Drinking Water Sources*

Integrated WASH services are essential for reducing diarrhea, undernutrition, and food insecurity (van Haeften et al. 2013). WASH includes three critical components, one of which is access to improved sources of drinking water. As seen in **Section 3.3**, this is particularly important in Mali, where only 59% of rural households have access to an improved source of drinking water. Priority must be given to the most vulnerable communities (McMillan and Sidikiba 2013). The success of well construction under one of the former Mali projects was attributed to the strong collaboration with the state water service and strong supervision by the field team's water specialists (McMillan and Sidikiba 2013). Each completed well was managed by a water management committee, whose members were trained in basic literacy and principles of infrastructure management. One challenging area may be collecting funds for well maintenance and repair, which is an issue that projects may need to resolve with community leaders and members.

The FAFSA-2 indicated that an important lesson learned from FFP development food assistance projects around the world is that community donated labor or materials to construct water systems and latrines gives community members a sense of ownership and commitment to maintain the systems and latrines (van Haeften et al. 2013). The FAFSA-2 found that paying for this community labor with FFW can be a deterrent to community ownership of the infrastructure.

Given USAID/Mali is funding integrated nutrition and WASH projects, it will be important for future FFP development food assistance projects to ensure that well construction activities are not duplicated in targeted communities and to incorporate any lessons learned to date from these projects. Projects are also encouraged to explore other opportunities for funding drinking water infrastructure through other organizations or private-donor funds (McMillan and Sidikiba 2013).

### *Collaboration with the GOM and Local Government*

Evaluators found that a major strength of one of the projects in MCHN and WASH was effective involvement of administrative authorities (city mayors, prefects) and state technical services (e.g., from the ministries of health, environment, and water) in implementing, monitoring, and evaluating the project's nutrition, water resource development, and sanitation activities. The close collaboration was instrumental in: (a) encouraging beneficiary communities to participate in activities; (b) ensuring the integration of these activities into the national sector strategies for nutrition, rural water resource development, and sanitation; (c) constructing cooking demonstration facilities at the CSCOM level; and (d) increasing the adoption of improved health and nutrition practices by mothers who took advantage of



nutrition activities. The evaluators of another project also found that the project staff had established and maintained an excellent collaboration and working relationship with MOH staff at all levels (Short et al. 2013).

### *Summary of Lessons Learned in WASH*

1. A former FFP project in Mali successfully implemented the CLTS initiative with positive results in behavior change, and future projects should consider expanding CLTS to all project villages from the start of the project.
2. Based on the FAFSA-2 recommendations, projects should consider conducting an inventory of the sanitation infrastructure and sources of drinking water in every program community and develop a plan for closing gaps in close coordination with other USAID/Mali partners and other stakeholders working in WASH.
3. Water management committee training in basic literacy and the principles of infrastructure management was an important factor in the committees' successful management of wells, although collecting funds for well maintenance and repair may be a challenge that will need to be resolved with community leaders and members.
4. According to the FAFSA-2, using FFW to pay the communities to work on WASH infrastructure can deter them from developing a sense of ownership of and commitment to maintaining the infrastructure, while donation of labor or materials for construction generates this sense of community ownership.
5. The strong collaboration with the GOM and local government officials was a major strength in the former FFP projects and an important factor in their success. Future projects in Mali should consider continuing strong collaboration with the GOM and local government officials to strengthen implementation and sustainability of project activities and outcomes.

## 5. REFERENCES

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- African Development Bank Group. 2011. *Mali, Profil du Genre Pays*.
- Africare. 2015. Africare/Mali Quarterly Programmatic Report—FY14Q1, October–December 2013, Emergency Food Assistance Project Nara /MYAP Reprogramming Agreement No. FFP-A-00-08-00069, Submission Date: February 21, 2015.
- Afrique Verte. 2010. “Strengthening the Capabilities of Agricultural Organization Networks through Analysis of the Evolution of Local Grain Prices in Burkina, Mali and Niger during the Period 2001–2010.” December 2010. Financed by the French Development Agency (AFD).
- Al Jazeera. 2015. “Mali declared free of Ebola.” Available at: <http://www.aljazeera.com/news/africa/2015/01/mali-declared-free-ebola-2015118212433434599.html>.
- AllAfrica. 2011. “Mali: Global Fund to Transfer Management of HIV Grant in Mali.” Available at: <http://allafrica.com/stories/201110191252.html>.
- Beninati, Noel; Gervais, Suzanne; Maslowsky, Stacey; Dollo, Samba; and Diallo, Aboubacar Moussa. 2006. Africare Goundam Food Security Initiative: Final Evaluation. Bamako, Mali: Africare (January). Submitted January 9, 2006.
- Bhutta et al. 2008. “What works? Interventions for Maternal and Child Undernutrition and Survival.” *The Lancet*.
- Bhutta et al. 2013. “Evidence-Based Interventions for Improvement of Maternal and Child Nutrition: What Can Be Done and at What Cost?” *The Lancet*.
- Bianchi, Ilaria. UNICEF. July 24, 2014. Personal communication.
- Bisits Bullen, P.A. 2011. “Systematic review of the positive deviance/hearth approach”. *Tropical Medicine and International Health*. Volume 16 no 11 pp 1354–1366, November 2011.
- Black, R.E. et al. 2013. “Maternal and child undernutrition and overweight in low-income and middle-income countries.” *Lancet*. Volume 382, Issue 9890. pp. 427–451.
- Central Intelligence Agency. 2014. “The World Factbook: Mali.” Accessed January 29, 2014 at <https://www.cia.gov/library/publications/the-world-factbook/geos/ml.html>.
- CPS/MS, Direction Nationale de la Statistique et de l’Informatique du Ministère de l’Économie, de l’Industrie et du Commerce, and Macro International Inc. 2007. *Enquête Démographique et de Santé du Mali 2006*. Calverton, Maryland: CPS/DNSI and Macro International Inc.
- CPS/SSDSPF and INSTAT. 2012. *Enquête par Grappes à Indicateurs Multiples 2009–2010, Rapport final*. Bamako, Mali : CPS/SSDSPF and INSTAT.
- CPS/SSDSPF, INSTAT/MPATP, INFO-STAT, and ICF International. 2014. *Enquête Démographique et de Santé au Mali 2012–2013*. Rockville, Maryland: CPS, INSTAT, INFO-STAT, and ICF International.
- de Benoist, B. et al. 2007. “Conclusions of the joint HO/UNICEF/IAEA/IZiNCG interagency meeting on zinc status indicators.” *Food Nutr Bull* 2007; 28:S480–S79.
- Diallo, A. 2014. Personal communication.
- Education Development Center, Inc. (EDC). 2010. “Mali Youth Assessment Report.” Available at: <http://www.equip123.net/docs/e3-malifinal.pdf>.

- Eozenou, P.; Madani, D.; and Swinkels, R. 2013. *Poverty, Malnutrition and Vulnerability in Mali*. The World Bank Africa Region, Poverty Reduction and Economic Management Department, Policy Research Paper 6561.
- Food and Agriculture Organization of the United Nations (FAO). 2006. *Country Pasture/Forage Resource Profiles: Mali*. Rome: FAO.
- . 2012. *Potential Impacts of Climate Change on Food Security in Mali*. Rome: FAO.
- . 2014a. “Mali: Food Balance.” Available at: [http://faostat3.fao.org/faostat-gateway/go/to/browse/FB/\\*E](http://faostat3.fao.org/faostat-gateway/go/to/browse/FB/*E).
- . 2014b. “Mali: Food Security.” Available at: [http://faostat3.fao.org/faostat-gateway/go/to/browse/D/\\*E](http://faostat3.fao.org/faostat-gateway/go/to/browse/D/*E).
- . 2014c. “Mali: Annual Population.” Available at: <http://faostat3.fao.org/faostat-gateway/go/to/download/O/OA/E>.
- FEWS NET. 2008. Mali Markets and Trade Maps. Available at: <http://www.fews.net/west-africa/mali>.
- . 2010. *Livelihood Zoning and Profiling Report: Mali*.
- . 2014a. *Mali: Food Security Outlook Update (June 2014)*. Washington, DC: USAID.
- . 2014b. *Mali: Perspectives sur la Sécurité Alimentaire (Juillet–Décembre 2014)*. Washington, DC: USAID.
- . 2014c. *Mali Price Bulletin (July 2014)*.
- . 2014d. Personal communication.
- Flor, R.; Konate, A.; and Niang, A. 2010. *Scaling Up the Millennium Villages Project in Mali: Assessing Agribusiness Opportunities in the 166 Most Vulnerable Districts*.
- Global Fund. 2012. “Full-scale HIV program to resume in Mali.” Available at: [http://www.theglobalfund.org/en/mediacenter/newsreleases/2012-11-21\\_Full-scale\\_HIV\\_program\\_to\\_resume\\_in\\_Mali/](http://www.theglobalfund.org/en/mediacenter/newsreleases/2012-11-21_Full-scale_HIV_program_to_resume_in_Mali/).
- Government of Mali (GOM). 2003. *Politique Nationale de la Population, Ministère de l’Economie et des Finances*.
- . 2006. *Politique Nationale de l’Eau, Ministère des Mines, de l’Energie et de l’Eau*.
- . 2007. *Feuille de Route pour l’Accélération de la Réduction de la Mortalité Maternelle et Neonatal au Mali*.
- . 2008. *Plan Stratégique de Communication pour le Changement de Comportement en Nutrition*.
- . 2009. *Politique Nationale de l’Assainissement, Ministère de l’Environnement et de l’Assainissement*.
- . 2011a. *Politique Nationale de la Genre*. Bamako: GOM.
- . 2011b. *Politique Nationale de Développement de la Pêche et de l’Aquaculture*. Bamako: GOM.
- . 2011c. *Enquête Nationale Nutritionnelle Anthropométrique et de Mortalité Rétrospective Mali, Juin-juillet 2011. Rapport définitif*.
- . 2012. *Enquête Nationale Nutritionnelle Anthropométrique et de Mortalité Rétrospective Mali, Août–Septembre 2012*.
- . 2013a. *Enquête Nutritionnelle Anthropométrique et de Mortalité Rétrospective dans les 4 Districts Sanitaires de la Région de Gao, Protocole basé sur la méthodologie SMART, Juin 2013*.

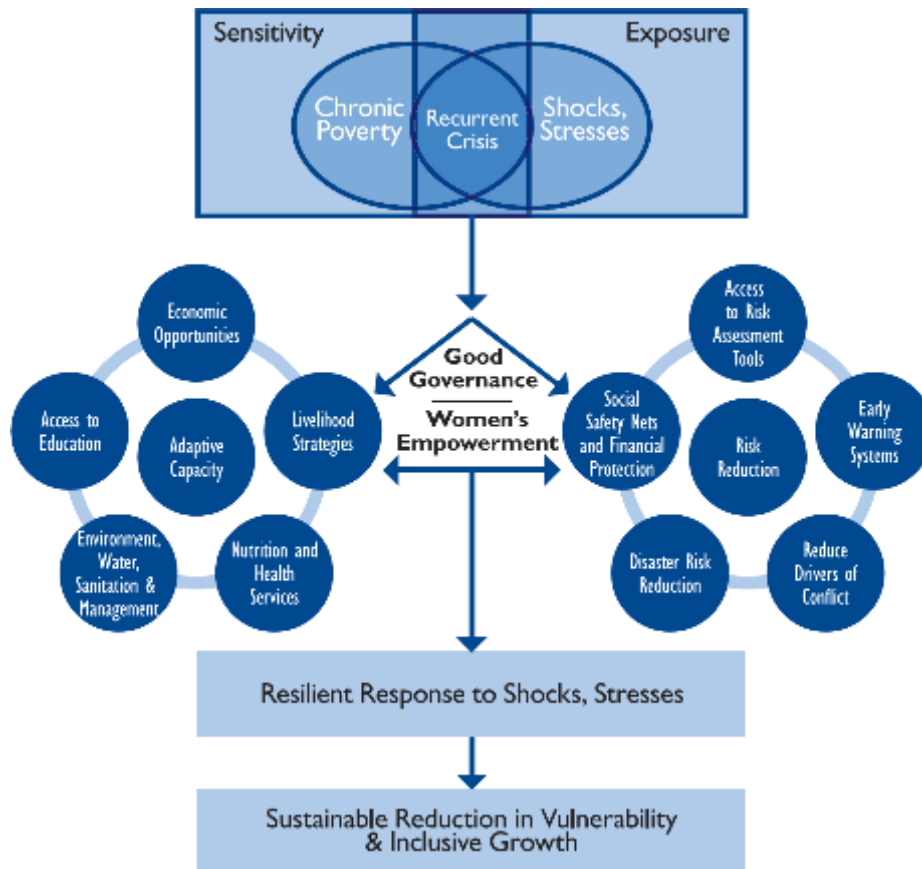
- . 2013b. *Enquête Nutritionnelle Anthropométrique et de Mortalité Rétrospective Mali, Juillet–Août 2013*.
- . 2013c. *Politique Nationale de Nutrition*.
- . 2014a. *Bilan de la Campagne Agropastorale et Halieutique 2012–2013: March 2014*. Bamako: GOM.
- . 2014b. *Bulletin SAP N. 329*. Bamako: GOM.
- . 2014c. *Santé, Emploi, Sécurité Alimentaire et Dépenses de Consommation des Ménages (Octobre–Décembre 2013)*.
- . 2014d. *Programme de Développement Socio-Sanitaire III*.
- . 2014e. *Plan Décennal de Développement Sanitaire et Social (PDDSS) 2014–2023*.
- GOM INSTAT. 2009. “RGPH 2009.” Available at: [http://instat.gov.ml/contenu\\_documentation.aspx?type=29](http://instat.gov.ml/contenu_documentation.aspx?type=29).
- GOM MAEP. 2014. “*Le Développement des Ressources Halieutiques*.” Available at: [http://elevage-peche.gouv.ml/contenu\\_page.aspx?pa=33](http://elevage-peche.gouv.ml/contenu_page.aspx?pa=33).
- GOM SAP. 2014. *Rapport Atelier Cadre Harmonisé du 10 au 14 Mars 2014*. Bamako: Mali.
- Heise, L.; Ellsberg, M.; and Gottemoeller, M. 1999. “Ending Violence against Women.” Population Reports. Series L, No. 11. Baltimore, Maryland: Johns Hopkins University School of Public Health.
- Hess, S.Y. et al. 2009. “Recent advances in knowledge of zinc nutrition and human health.” *Food Nutr Bull*. Vol. 30, No. 1 (supplement).
- Holtzman, J. *The Shea Butter Value Chain: Study Synthesis and Recommendations for WATH—West African Trade Hub Technical Report 1*. Report prepared for the U.S. Agency for International Development. Durham, NC: Abt Associates. 2004.
- ICRISAT. 2013. “Cowpea Farming in Mali.” *Bulletin of Tropical Legumes*.
- INFO-STAT, CPS, INSTAT, and ICF International Inc. 2013. *Enquête Démographique et de Santé du Mali (EDSM-V) 2012–2013, Rapport Préliminaire sur la Prévalence du VIH*. Calverton, Maryland: INFO-STAT, CPS, INSTAT, and ICF International Inc.
- Institute of Medicine. 2003. *Improving Birth Outcomes, Meeting the Challenges of the Developing World*.
- IOM. 2013. “Mali: Displacement Tracking Matrix (DTM).” Available at: <https://www.iom.int/files/live/sites/iom/files/Country/docs/DTM-Mali-June-2014.pdf>.
- Kennedy, Gina; Fanou, Nadia; Seghieri, Chiara; and Brouwer, Inge D. 2009. *Dietary Diversity as a Measure of the Micronutrient Adequacy of Women’s Diets: Results from Bamako, Mali Site*. Washington, DC: Food and Nutrition Technical Assistance II Project, FHI 360, 2009. Available at: [www.fantaproject.org/sites/default/files/resources/WDDP\\_Mali\\_Dec09.pdf](http://www.fantaproject.org/sites/default/files/resources/WDDP_Mali_Dec09.pdf).
- Klein, Elise, 2007. *Mali Education Needs Assessment*, Mali Initiative, December 2007.
- Lamiaux, M.; Rouzaud, F.; and Woods, W. 2011. *Private Health Sector Assessment in Mali, The Post-Bamako Initiative Reality*. World Bank Working Paper No. 212.
- Michigan State University. 2011. *Mali Agricultural Sector Assessment*. Washington, DC: USAID.
- McMillan, Della E. and Sidikiba, Sidibe. 2013. *Final Qualitative Evaluation of the Consortium for Food Security in Mali (CFSM) “Nema” Program*, P.L. 480 Title II Multi-Year Assistance Program, FFP-A-00-08-00068-00. Bamako, Mali: CRS (December). Submitted December 30, 2013. Revised February 25, 2014.

- Palus, Nancy. 2012. “Mali Youth Group Warns Against Inaction Against Rebels in North.” Available at: <http://www.voanews.com/content/mali-youth-group-warns-against-inaction-against-rebels-in-north-149325255/370048.html>.
- Présidence de la République du Mali. 2012. *Report National UNGASS 2012, Période: Janvier 2010–Décembre 2011*.
- Rahman, M. et al. 2012. “Maternal exposure to intimate partner violence and the risk of under nutrition among children younger than 5 years in Bangladesh.” *American Journal of Public Health*. Jul: 102 (7): 1336–45.
- Rupp, E.; Diallo, A.; and Phillipps, S. 2012. *Mali Gender Assessment, Draft*. USAID/Mali.
- Sanni, Djawadou and Juanich, Godardo. 2006. “A Feasibility Study of Rice-Fish Farming in Western Africa.” Available at: <http://www.fao.org/docrep/009/a0444e/A0444E08.htm>.
- Scaling Up Nutrition (SUN). 2013. “Scaling Up Nutrition, Mali” Available at: <http://scalingupnutrition.org/sun-countries/mali>.
- . 2014. “What Is SUN?” Available at: [http://scalingupnutrition.org/wp-content/uploads/2014/04/SUN\\_web\\_brochure\\_ENG\\_20140417.pdf](http://scalingupnutrition.org/wp-content/uploads/2014/04/SUN_web_brochure_ENG_20140417.pdf).
- Short, Michael; Magara, Doumbia; and Sidibe, Yacouba. 2013. *Final Evaluation Report, Nara Emergency Assistance Program, (Timbuktu Food Security Program – TFSI/MYAP)*, Agreement No. FFP-A-00-08-00069-00. Bamako, Mali: Africare (December). Submitted December 20, 2013.
- Short, Michael and Sidibe, Yacouba. 2014. *Timbuktu Final Evaluation Report, Draft V-5 1/14/2104; (Timbuktu Food Security Program – TFSI/MYAP)*; Agreement No. FFP-A-00-08-00069-00. Bamako, Mali: Africare (January). Submitted January 17, 2014.
- Smith, L.C. et al. 2003. *The Importance of Women’s Status for Child Nutrition in Developing Countries*. Research Report 131. IFPRI.
- Sobkoviak, R.M.; Yount, K.M.; and Halim, N. 2012. “Domestic violence and child nutrition in Liberia.” *Social Science & Medicine*. Jan: 74(2): 103–11.
- U.N. Office for the Coordination of Humanitarian Assistance (OCHA). 2014a. “Bulletin Humanitaire: Mali.” Available at: <http://mali.humanitarianresponse.info>.
- U.N. OCHA. 2014b. Mali: Humanitarian Snapshot Available at: <http://reliefweb.int/map/mali/mali-carte-de-r%C3%A9f%C3%A9rence-septembre-2013>.
- U.N. OCHA. 2014c. Mali: Carte de Reference. Available at: <http://reliefweb.int/report/mali/mali-humanitarian-snapshot-30-june-2014>.
- UNICEF. 2012. “Mali Statistics, Demographic Indicators.” Available at: [http://www.unicef.org/infobycountry/mali\\_statistics.html#1](http://www.unicef.org/infobycountry/mali_statistics.html#1).
- . 2014. “General nutrition statistics, Mali.” Unpublished data. Received from UNICEF/Mali on July 18, 2014.
- United Nations. 2010. *World Youth Report 2010: Youth and Climate Change*. New York: United Nations.
- . 2014. “Office of the Special Representative of the Secretary General for Children and Armed Conflict: Mali.” Available at: <http://childrenandarmedconflict.un.org/countries/mali/>.
- United Nations Development Programme. 2014. “Human Development Report 2013. The Rise of the South: Human Progress in a Diverse World – Mali.” Available at: <http://hdr.undp.org/sites/default/files/Country-Profiles/MLI.pdf>.

- United Nations High Commission for Refugees (UNHCR). 2014a. “2014 UNHCR country operations profile – Mali.” Available at: <http://www.unhcr.org/pages/49e484e66.html>.
- UNHCR. 2014b. Situation au Mali. Available at: <http://www.unhcr.org/cgi-bin/texis/vtx/page?page=49e484e66&submit=GO>.
- United Nations Population Fund and Population Reference Bureau. 2012. “Status Report: Adolescents and Young People in Sub-Saharan Africa – Opportunities and Challenges.” Available at: <http://www.prb.org/pdf12/status-report-youth-subsaharan-Africa.pdf>.
- U.S. Agency for International Development (USAID). 1992. *USAID Policy Determination 19*. Washington, DC: USAID.
- . 2010. *USAID Country Profile: Property Rights and Resource Governance*.
- . 2012a. *Building Resilience to Recurrent Crisis: USAID Policy and Program Guidance*. Washington, DC: USAID.
- . 2012b. *Sahel Joint Planning Cell Strategic Plan: Reducing Risk, Building Resilience, and Facilitating Inclusive Growth*. Washington, DC: USAID.
- . 2013. *Health Strategy, October 1, 2013 to September 30, 2018*.
- . 2014a. *Mali Climate Vulnerability Mapping*. Washington, DC: USAID.
- . 2014b. *President’s Malaria Initiative Mali, Malaria Operational Plan FY 2014*.
- . n.d. *Addendum to USAID/Mali Mission Gender Assessment*.
- USAID/Mali. 2012. *Mali Joint Planning Cell Plan: Operationalizing for Resilience 2012–2016*. Washington, DC: USAID.
- . 2014. *Mali Resilience Program Assessment: Challenges and Opportunities*. Washington, DC: USAID.
- U.S. Geological Survey and USAID. 2012. *A Climate Trend Analysis of Mali*.
- United States Government (USG) 2014. Mali: Foreign Assistance. Available at: <http://www.foreignassistance.gov/web/OU.aspx?FY=2015&OUID=209&AgencyID=0&FromRGA=true>.
- van Haeften, R.; Anderson, M.A.; Caudill, H.; and Kilmartin, E. 2013. Second Food Aid and Food Security Assessment (FAFSA-2). Washington, DC: FHI 360/FANTA.
- Welsh, May Ying. 2013. “Making sense of Mali’s armed groups.” Available at: <http://www.aljazeera.com/indepth/features/2013/01/20131139522812326.html>.
- Wetlands International. 2012. “The Niger River and its deltas.” Available at: <http://africa.wetlands.org/Whatwedo/NigerRiverandDeltas/tabid/2944/language/en-GB/Default.aspx>.
- World Bank. 2006. *Strategic Gender Assessment of Mali*. Bamako, Mali: World Bank.
- . 2011a. “Data: Personal Remittances Received (% of GDP).” Available at: <http://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS>.
- . 2011b. “Data: Literacy rate, youth female (% of females ages 15–24).” Available at: <http://data.worldbank.org/indicator/SE.ADT.1524.LT.FE.ZS>.
- . 2011c. “Data: Literacy rate, youth male (% of males ages 15–24).” Available at: <http://data.worldbank.org/indicator/SE.ADT.1524.LT.MA.ZS>.

- . 2011d. “Data: School enrollment, secondary (% gross).” Available at: <http://data.worldbank.org/indicator/SE.SEC.ENRR>.
- . 2011e. “Data: Trained teachers in primary education (% of total teachers).” Available at: <http://data.worldbank.org/indicator/SE.PRM.TCAQ.ZS>.
- . 2012a. “Data: Ratio of female to male primary enrollment (%).” Available at: <http://data.worldbank.org/indicator/SE.ENR.PRIM.FM.ZS>.
- . 2012b. “Data: Ratio of female to male tertiary enrollment (%).” Available at: <http://data.worldbank.org/indicator/SE.ENR.TERT.FM.ZS>.
- . 2012c. “Data: Labor force participation rate, female (% of female population ages 15+) (modeled ILO estimate).” Available at: <http://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS>.
- . 2012d. “Data: Labor force participation rate, male (% of male population ages 15+) (modeled ILO estimate).” Available at: <http://data.worldbank.org/indicator/SL.TLF.CACT.MA.ZS>.
- . 2012e. “Data: Unemployment, youth male (% of male labor force ages 15–24) (modeled ILO estimate).” Available at: <http://data.worldbank.org/indicator/SL.UEM.1524.MA.ZS>.
- . 2012f. “Data: Unemployment, youth female (% of female labor force ages 15–24) (modeled ILO estimate).” Available at: <http://data.worldbank.org/indicator/SL.UEM.1524.FE.ZS>.
- . 2012g. “Data: School enrollment, primary (% gross).” Available at: <http://data.worldbank.org/indicator/SE.PRM.ENRR>.
- . 2012h. “Data: Primary completion rate, total (% of relevant age group).” Available at: <http://data.worldbank.org/indicator/SE.PRM.CMPT.ZS>.
- . 2013a. *Mali Poverty and Gender Notes*. World Bank Poverty Reduction and Economic Management 4, Country Department West Africa 3, Africa Region, Report No. 77752-ML.
- . 2013b. *Mali: Rapport Economique Bi-Annuel*, AFTP4, Région Afrique, Banque mondiale.
- . 2013c. *Interim Strategy Note for the Republic of Mali for the Period FY 14–15*. Country Department West Africa 3, Africa Region, International Finance Corporation, Africa Region, Multilateral Investment Guarantee Agency, Report No. 76233-ML.
- World Food Programme. 2012a. “REACH in Mali.” Available at: <http://www.reachpartnership.org/reach-countries/mali/reach-in-mali>.
- . 2012b. *The Market Monitor, Trends and impacts of staple food prices in vulnerable countries*. Available at <http://documents.wfp.org/stellent/groups/public/documents/ena/wfp246930.pdf>.
- . 2013. “Mali.” Available at: [www.wfp.org/countries/mali/publications/emergency-assessments](http://www.wfp.org/countries/mali/publications/emergency-assessments).
- World Health Organization. 2009. “World Health Statistics. Cause-specific mortality and morbidity – Table 2.” Available at: [http://www.who.int/whosis/whostat/EN\\_WHS09\\_Table2.pdf](http://www.who.int/whosis/whostat/EN_WHS09_Table2.pdf).
- Wuehler, S.A. and Coulibaly, M. 2011. “Situational analysis of infant and young child nutrition policies and programmatic activities in Mali.” *Maternal and Child Nutrition*. 7 (Suppl. 1). pp. 83–112.
- Ziaei, S.; Naved, R.T.; and Ekström, E.C. 2012. “Women’s exposure to intimate partner violence and child malnutrition: Findings from Demographic and Health Surveys in Bangladesh.” *Maternal and Child Nutrition*.
- Zureick-Brown, S. et al. 2013. “Understanding global trends in maternal mortality.” *International Perspectives on Sexual and Reproductive Health*. Mar 39 (1): 32–41.

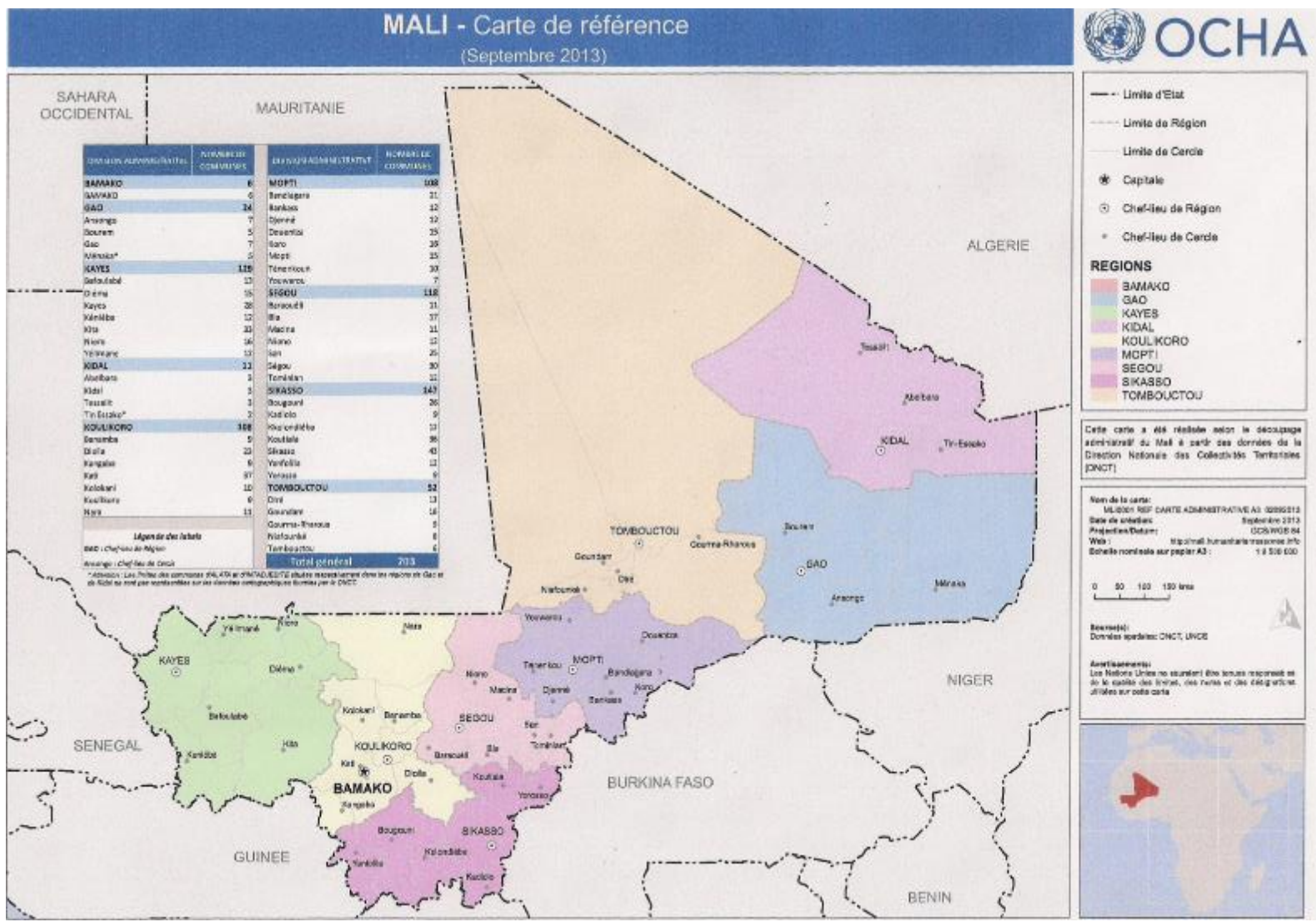
## APPENDIX 1. USAID CONCEPTUAL FRAMEWORK FOR RESILIENCE



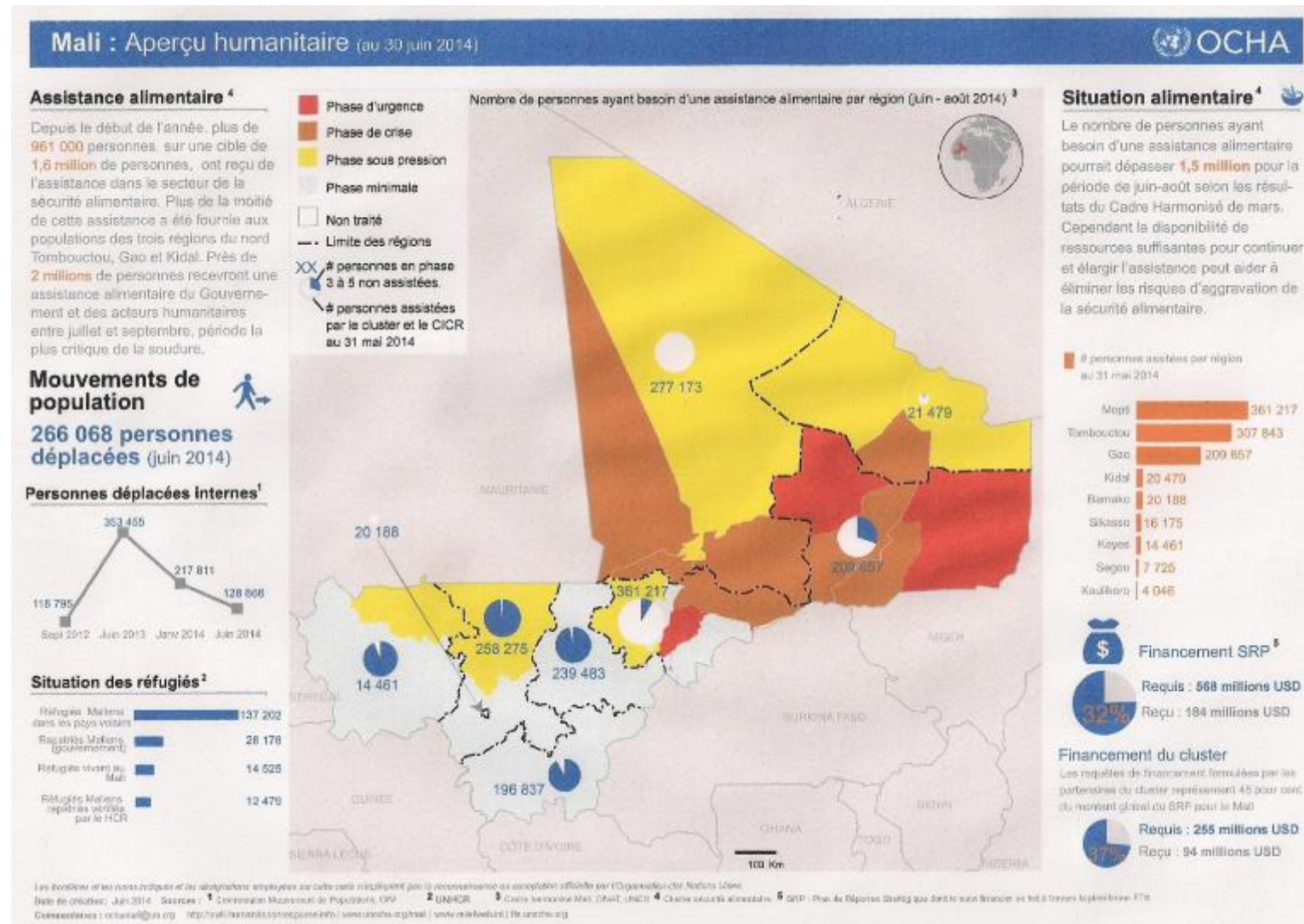
Source: USAID 2012a.



## APPENDIX 2. MAP OF MALI

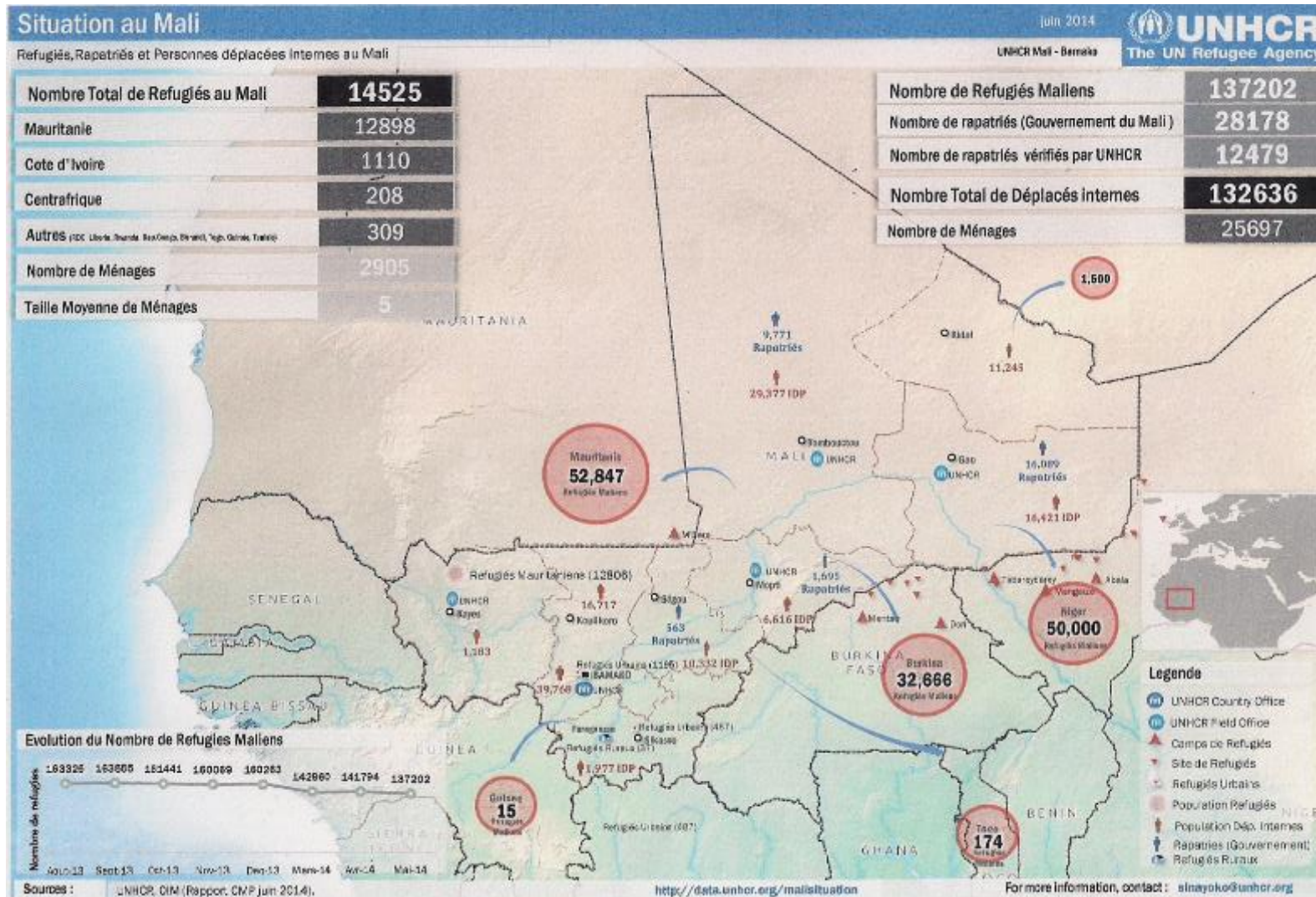


## APPENDIX 3. HUMANITARIAN SNAPSHOT OF MALI



Source: U.N. OCHA 2014c.

## APPENDIX 4. DISPLACEMENT IN MALI



Source: UNHCR 2014b.

## APPENDIX 5. FACTORS RELATED TO FOOD SECURITY, BY REGION

**Table 5A. Factors Related to Food Security by Region: Exposure to drought and measures of vulnerability to and occurrence of food insecurity**

Region and Cercle	Highest frequency of drought exposure		Highest vulnerability to food insecurity (1)	Highest frequency of IPC 2+ status (2)	Highest prevalence of food insecurity	
	Farming areas (1)	Pasture areas (1)			June–Aug. 2014 Cadre Harmonisé (3)	July–Sept. 2014 FEWS NET (4)
<b>Bamako</b>						
Bamako						
Regional						
<b>Koulikoro</b>						
Banamba			X		X	X
Dioila						
Kangaba						
Koulikoro						
Kolokani			X		X	
Kati						
Nara	X		X	X	X	X
Regional	-	-	-	-	-	-
<b>Sikasso</b>						
Bougouni						
Kolondieba						
Kadiolo						
Koutiala						
Sikasso						
Yanfolila						
Yorosso						
Regional	-	-	-	-	-	-
<b>Ségou</b>						
Bla						
Barouéli						
Macina	X		X			
Niono	X	X	X			
Ségou	X		X			
San	X		X			
Tominian			X			
Regional	-	-	-	-	-	-
<b>Mopti</b>						
Bandiagara	X		X	X	X	X
Bankass	X		X			
Djénne	X		X		X	
Douentza	X	X	X	X	X	X
Koro	X		X			
Mopti	X	X	X			

Region and Cercle	Highest frequency of drought exposure		Highest vulnerability to food insecurity (1)	Highest frequency of IPC 2+ status (2)	Highest prevalence of food insecurity	
	Farming areas (1)	Pasture areas (1)			June–Aug. 2014 Cadre Harmonisé (3)	July–Sept. 2014 FEWS NET (4)
<b>Tenenkou</b>	X	X	X	X	X	
<b>Youwarou</b>	X	X	X	X	X	
<b>Regional</b>	-	-	-	-	-	-
<b>Kayes</b>						
<b>Bafoulabé</b>	X					
<b>Diéma</b>	X	X	X		X	
<b>Kita</b>			X			
<b>Kéniéba</b>						
<b>Kayes</b>	X		X	X		X
<b>Nioro</b>	X	X	X	X	X	
<b>Yélimané</b>	X		X	X	X	
<b>Regional</b>	-	-	-	-	-	-
<b>Tombouctou</b>						
<b>Diré</b>	X	X	X	X	X	X
<b>Goundam</b>	X	X	X	X	X	X
<b>Gourma-Rh.</b>	X	X	X	X	X	X
<b>Niafouké</b>	X		X	X	X	X
<b>Tombouctou</b>			X	X	X	X
<b>Regional</b>	-	-	-	-	-	-
<b>Kidal</b>						
<b>Abeibara</b>	n/a	n/a	n/a	X	X	X
<b>Kidal</b>	n/a	n/a	n/a	X	X	X
<b>Tessalit</b>	n/a	n/a	n/a	X	X	X
<b>Tin Essako</b>	n/a	n/a	n/a	X	X	X
<b>Regional</b>	-	-	-	-	-	-
<b>Gao</b>						
<b>Asongo</b>	X	X	X	X	X	X
<b>Bourem</b>		X	X	X	X	X
<b>Gao</b>		X	X	X	X	X
<b>Menaka</b>		X	X	X	X	X
<b>Regional</b>	-	-	-	-	-	-

**Table 5B. Factors Related to Food Security by Region: Children’s Chronic Malnutrition, Lack of Access to Food in the Household, Priority Areas for Resilience, and Population**

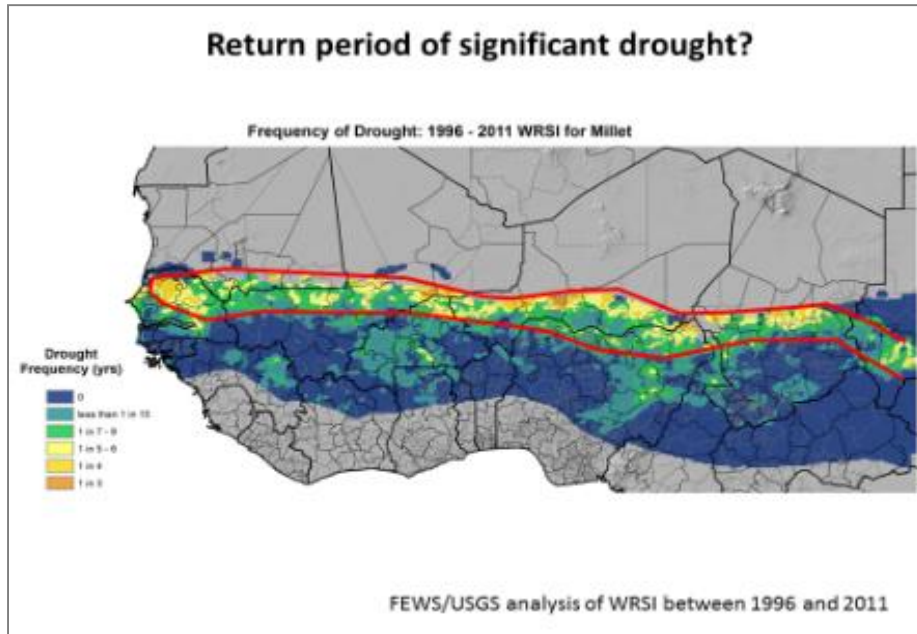
Region and Cercle	% children under 5 stunted (8)	% HH facing lack of food in HH (8)	Priority areas for resilience programming			Population (2009 census) (9)
			Initiative 166 (5)	Resilience priority (6)	Resilience priority (7)	
<b>Bamako</b>						
Bamako						1,809,106
Regional	21.1	7.6				1,809,106
<b>Koulikoro</b>						
Banamba			X			190,235
Dioila						491,210
Kangaba						100,720
Koulikoro						211,103
Kolokani						233,919
Kati						948,128
Nara			X	X		242,990
Regional	39.5	8.6				2,418,305
<b>Sikasso</b>						
Bougouni						459,509
Kolondieba						202,618
Kadiolo						239,713
Koutiala						575,253
Sikasso						725,494
Yanfolila						211,824
Yorosso						211,508
Regional	39.9	8.2				2,625,919
<b>Ségou</b>						
Bla						283,663
Barouéli						203,550
Macina			X			237,477
Niono			X			365,443
Ségou						691,358
San						334,911
Tominian						219,853
Regional	40.5	8.0				2,336,255
<b>Mopti</b>						
Bandiagara			X			317,965
Bankass						263,446
Djénne			X	X	X	207,260
Douentza			X			247,794
Koro			X			361,944
Mopti			X	X	X	368,512
Tenenkou			X			163,641
Youwarou			X	X	X	106,768
Regional	46.5	10.3				2,037,330
<b>Kayes</b>						
Bafoulabé						233,926

Region and Cercle	% children under 5 stunted (8)	% HH facing lack of food in HH (8)	Priority areas for resilience programming			Population (2009 census) (9)
			Initiative 166 (5)	Resilience priority (6)	Resilience priority (7)	
<b>Diéma</b>			X			212,062
<b>Kita</b>						434,379
<b>Kéniéba</b>						194,153
<b>Kayes</b>			X			513,362
<b>Nioro</b>			X			230,488
<b>Yélimané</b>						178,442
<b>Regional</b>	34.3	9.0				1,996,812
<b>Tombouctou</b>						
<b>Diré</b>			X			111,324
<b>Goundam</b>			X			150,150
<b>Gourma-Rh.</b>			X			111,386
<b>Niafouké</b>			X			184,285
<b>Tombouctou</b>			X			124,546
<b>Regional</b>	n.d.	n.d.				681,691
<b>Kidal</b>						
<b>Abeibara</b>			X			10,286
<b>Kidal</b>			X			33,087
<b>Tessalit</b>			X			16,289
<b>Tin Essako</b>			X			7,976
<b>Regional</b>	n.d.	n.d.				67,638
<b>Gao</b>						
<b>Asongo</b>			X			132,205
<b>Bourem</b>			X			115,958
<b>Gao</b>			X			239,853
<b>Menaka</b>			X			56,104
<b>Regional</b>	n.d.	n.d.				544,120

Sources: (1) USAID 2014a; (2) FEWS NET 2014d; (3) GOM SAP 2014; (4) FEWS NET 2014a; (5) Flor, R.; Konate, A.; and Niang, A. 2010; (6) USAID/Mali 2012; (7) USAID Mali 2014; (8) CPS/SSDSPF et al., 2014; (9) GOM INSTAT 2009.

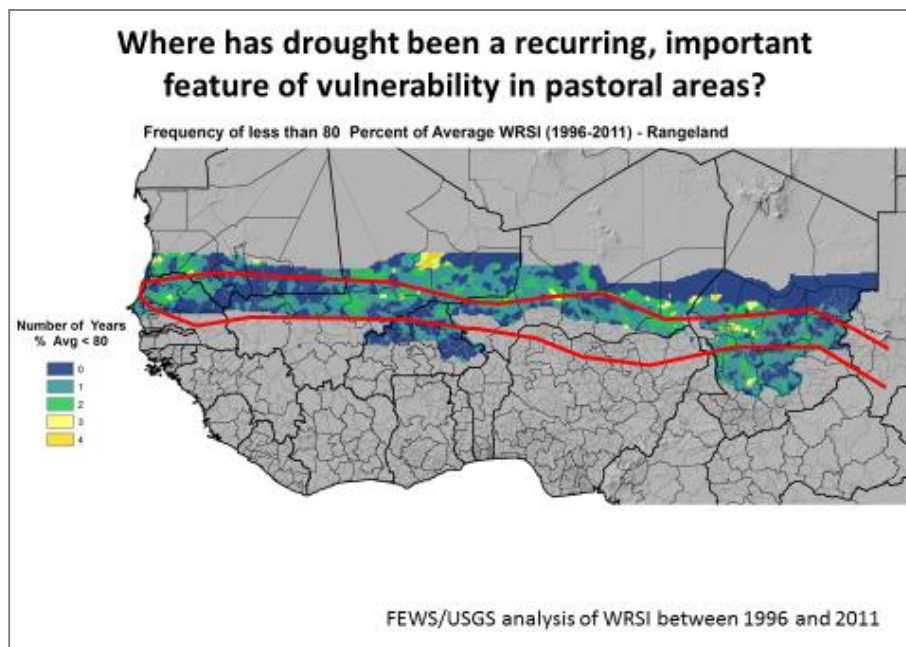
## APPENDIX 6. EXPOSURE OF FARMING AND PASTURE TO DROUGHT: REGIONAL

Figure 6A. Frequency of Drought as It Affects Millet Production



Source: FEWS NET 2014d.

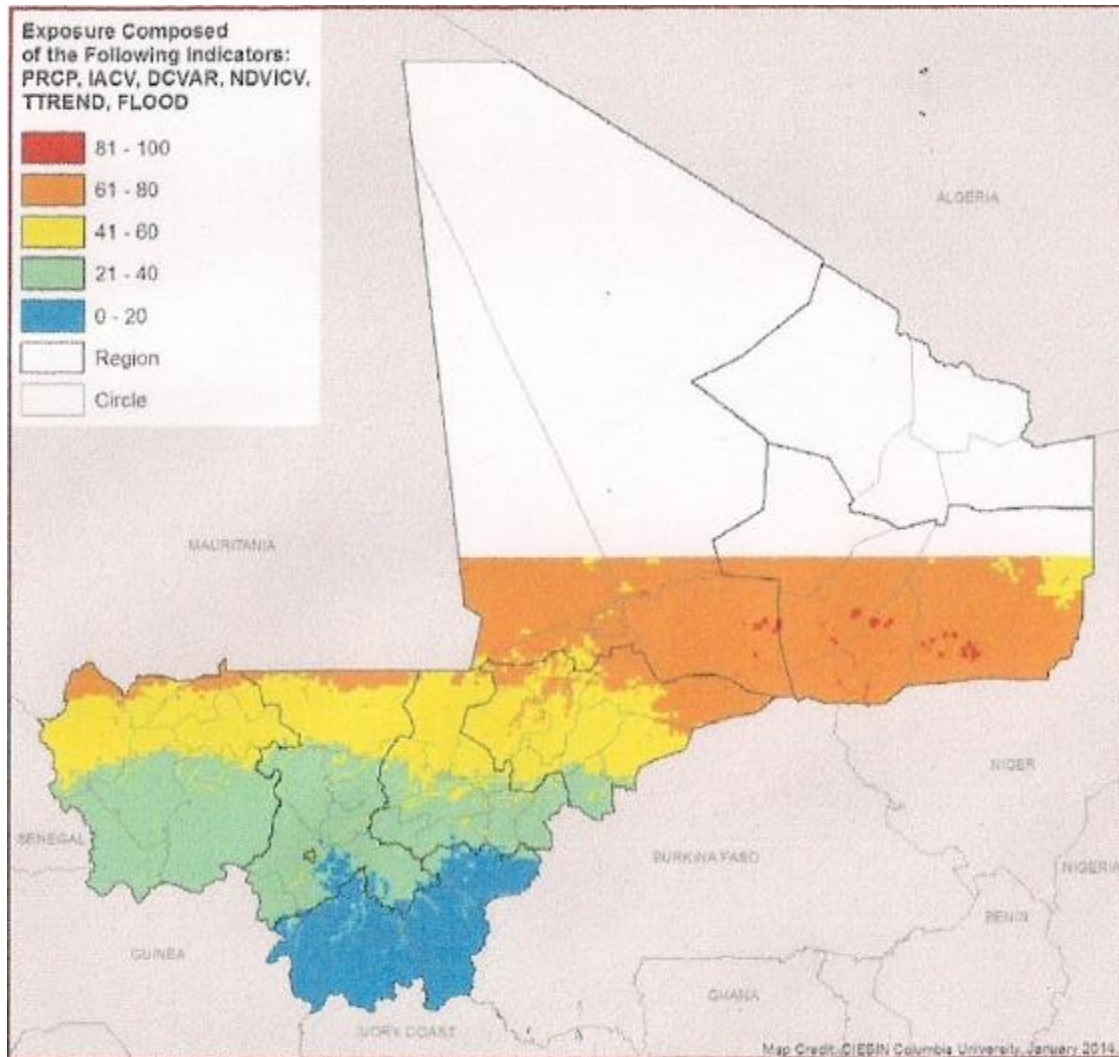
Figure 6B. Frequency of Drought as It Affects Rangeland



Source: FEWS NET 2014d.



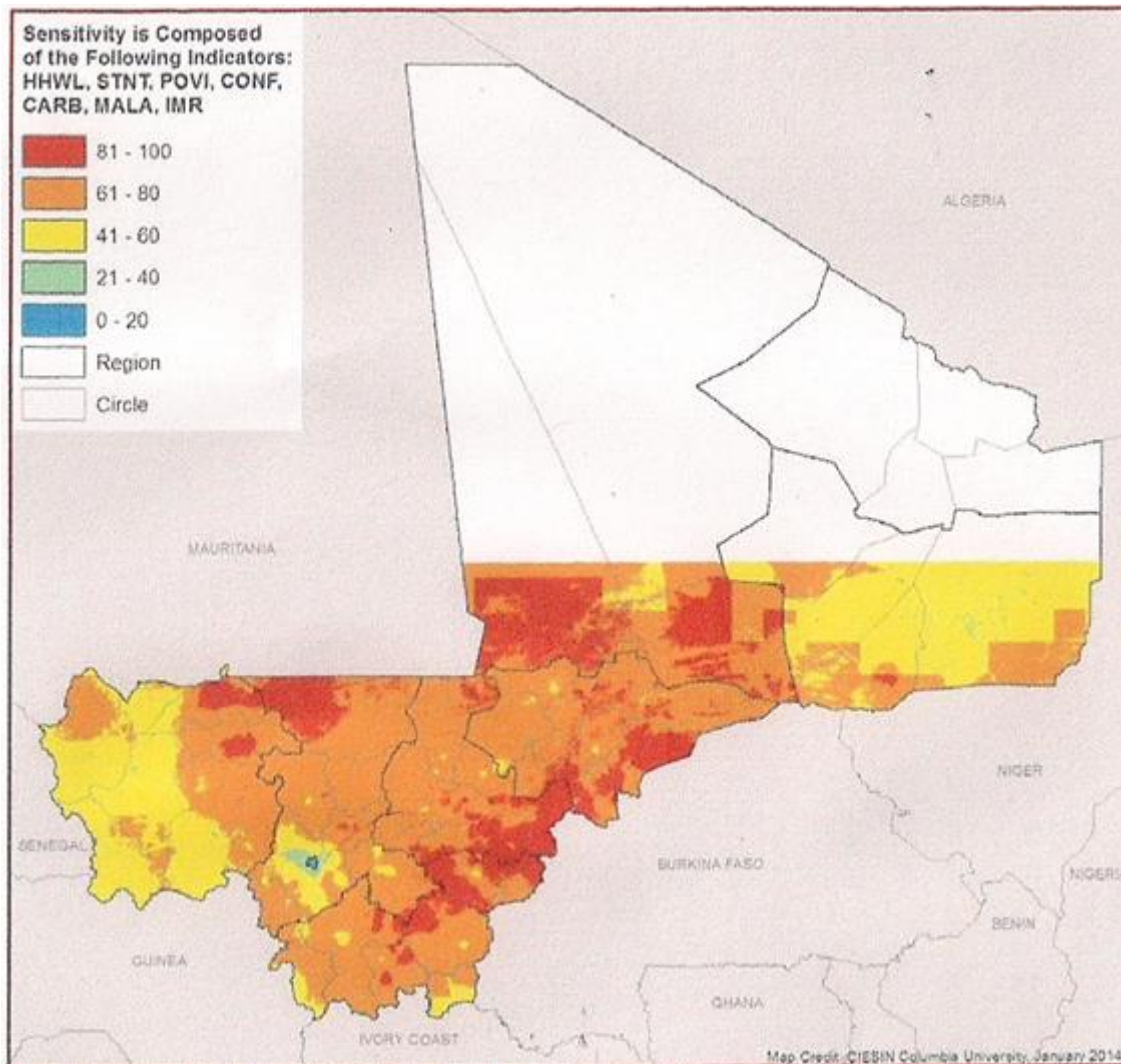
## APPENDIX 7. EXPOSURE TO DROUGHT: MALI



Note: PRCP = Average annual precipitation (1950–2009); IACV = Inter-annual coefficient of variation in precipitation (1950–2009); DCVAR = Percent of precipitation variance explained by decadal component (1950–2009); NDVICV = Coefficient of variation of the Normalized Difference Vegetation Index (NDVI) (1981–2006); TTREND = Long-term trend in temperature in July-August-September (1950–2009); FLOOD = Flood frequency (1999–2007).

Source: USAID 2014a.

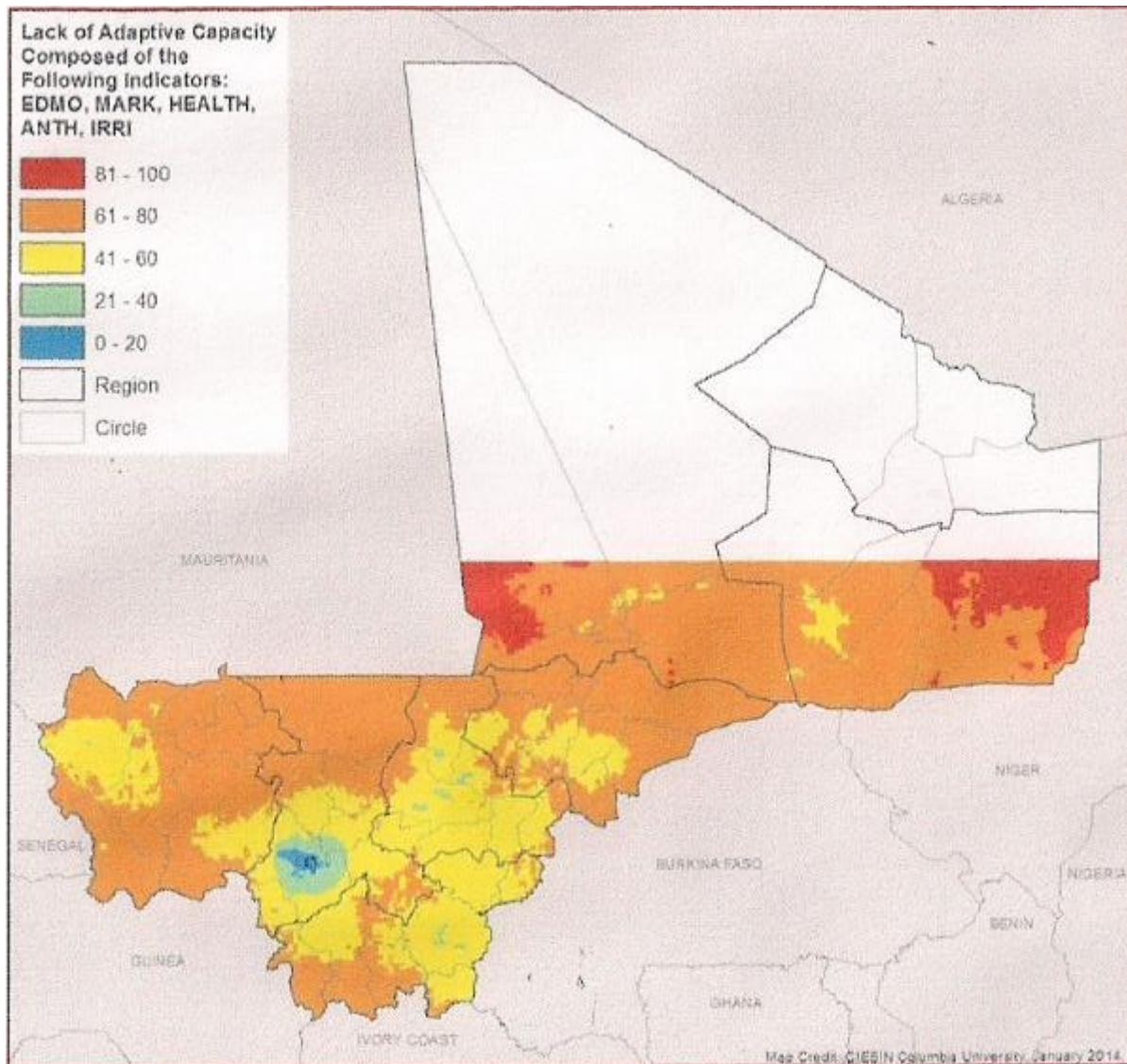
## APPENDIX 8. SENSITIVITY TO DROUGHT-RELATED SHOCKS



Note: HHWL = Household wealth (2006); STNT = Child stunting (2006); POVI = Poverty index by commune (2008); CONF = Conflict events/political violence (1997–2012); CARB = Soil organic carbon/soil quality (1950–2005); MALA = Malaria stability index; IMR = Infant mortality rate (IMR) (2006).

Source: USAID 2014a.

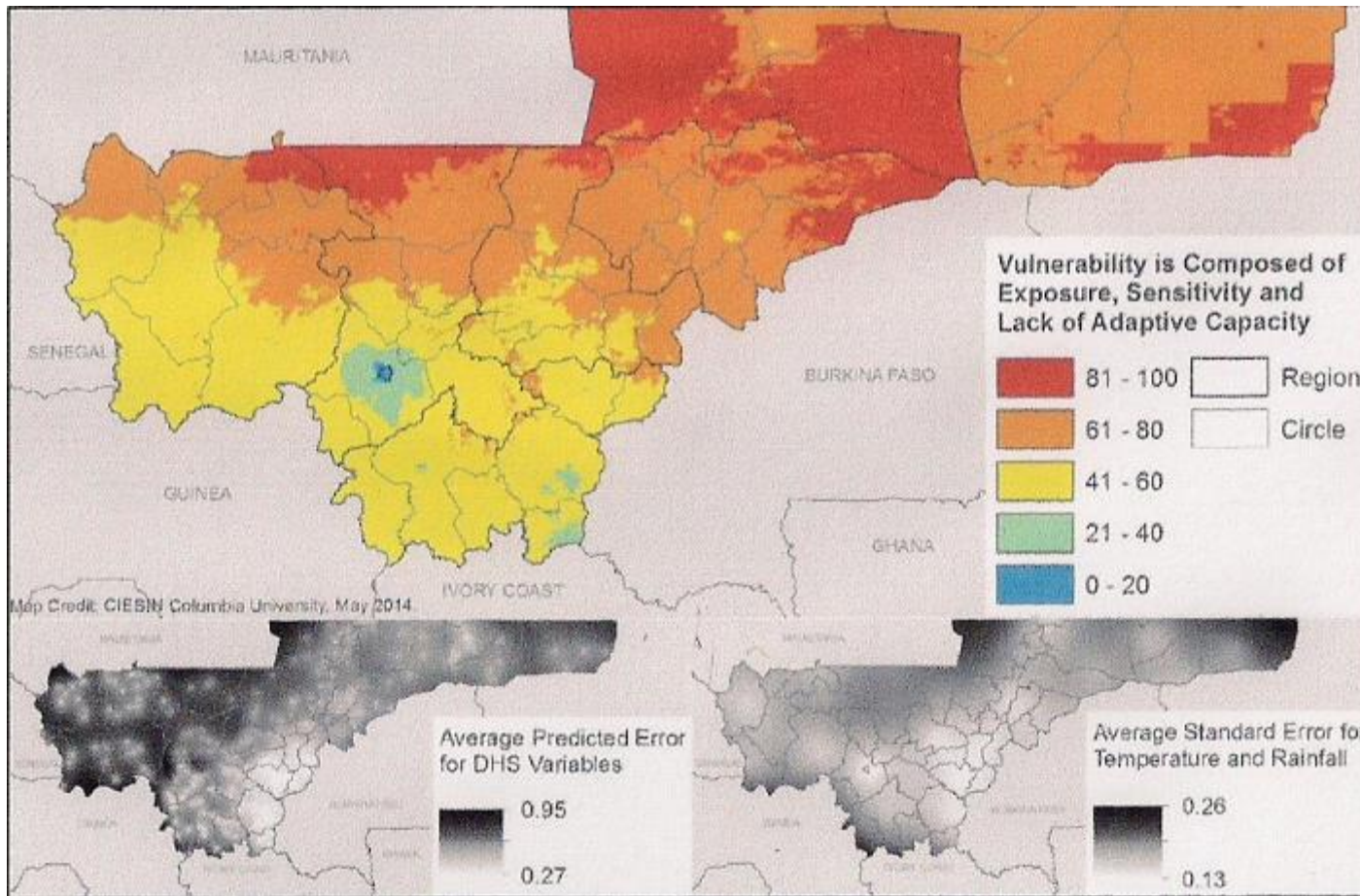
## APPENDIX 9. LACK OF ADAPTIVE CAPACITY IN THE FACE OF DROUGHT-RELATED SHOCKS



Note: EDMO = Education level of mother (2006); MARK = Market accessibility (travel time to major cities); HEALTH = Health infrastructure index (2012); ANTH = Anthropogenic biomes (2000); IRR1 = Irrigated areas (area equipped for irrigation) (1990–2000).

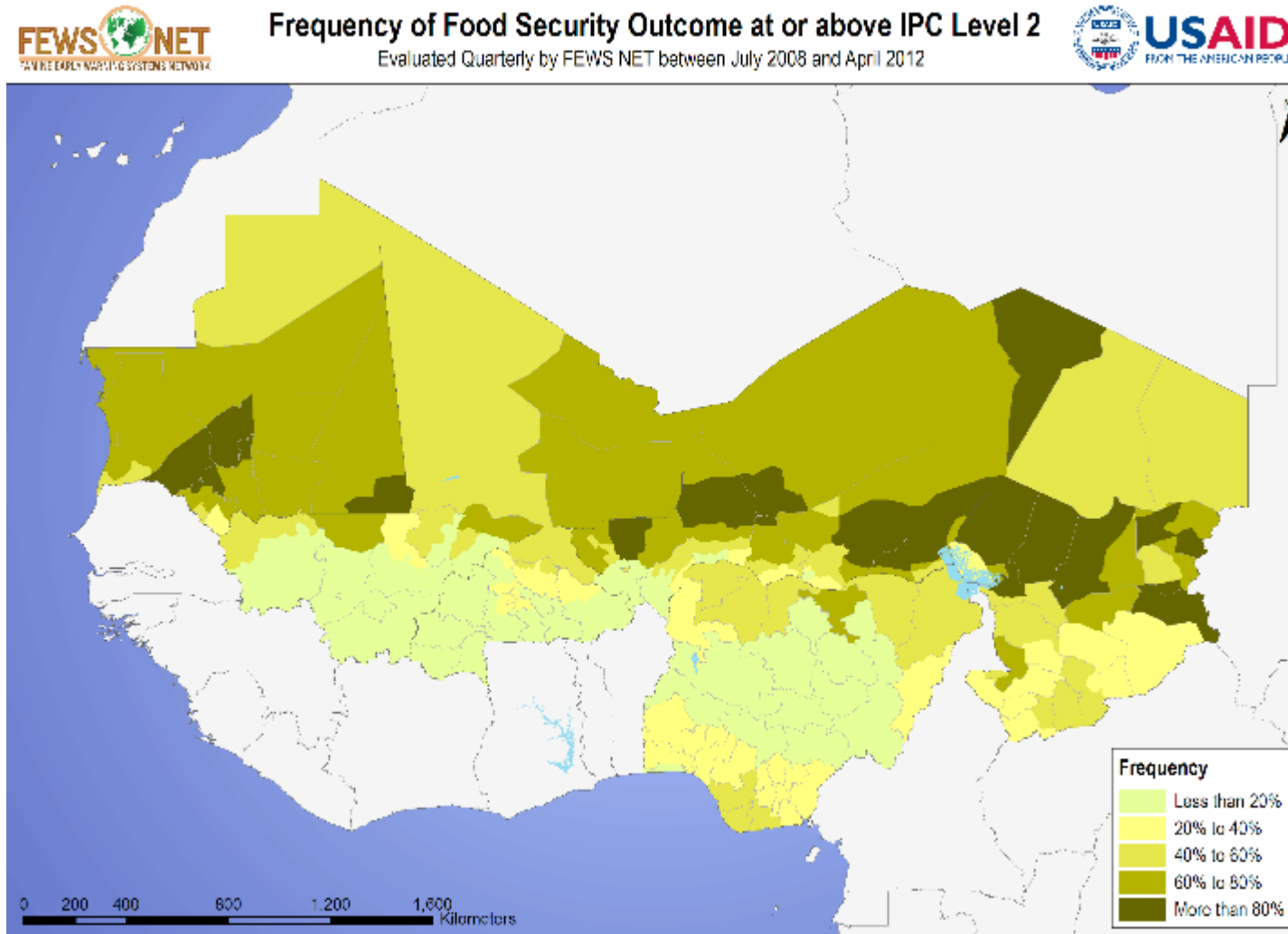
Source: USAID 2014a.

## APPENDIX 10. VULNERABILITY (EXPOSURE + SENSITIVITY – ADAPTIVE CAPACITY) TO FOOD INSECURITY



Source: USAID 2014a.

## APPENDIX 11. FREQUENCY OF ACUTE FOOD INSECURITY (IPC LEVEL 2+)

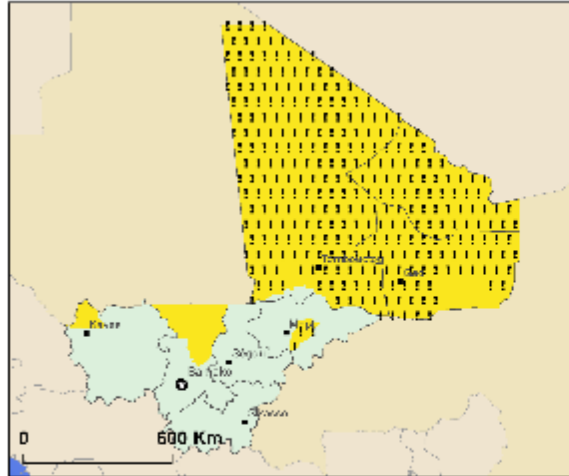


Source: Famine Early Warning Systems Network (FEWS NET). Updated June 14, 2012. Based on quarterly Food Security Outcome analyses from October 2009 to April 2012.

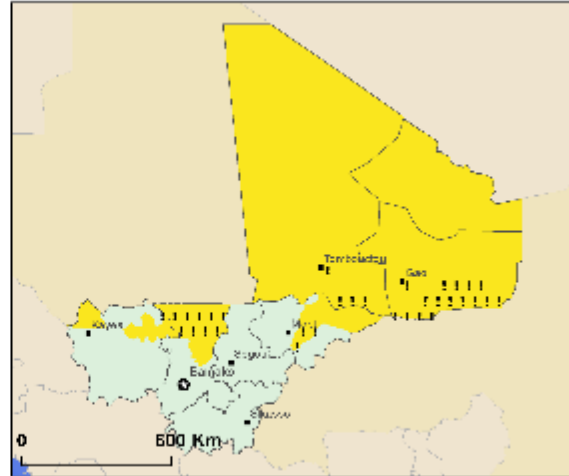
Source: FEWS NET 2014d.

# APPENDIX 12. FOOD SECURITY PROJECTIONS FOR 2014

Near Term: April-June 2014



Medium Term: July-September 2014



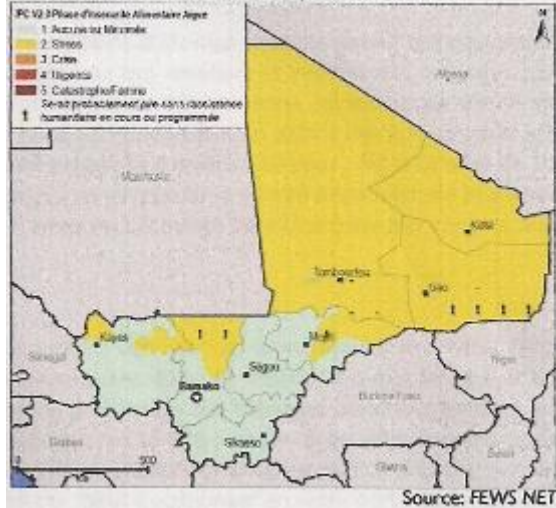
PG V2 D Acute Food Insecurity Phase

Minimal Stressed Crisis Emergency Famine

Would likely be worse without current or programmed humanitarian assistance

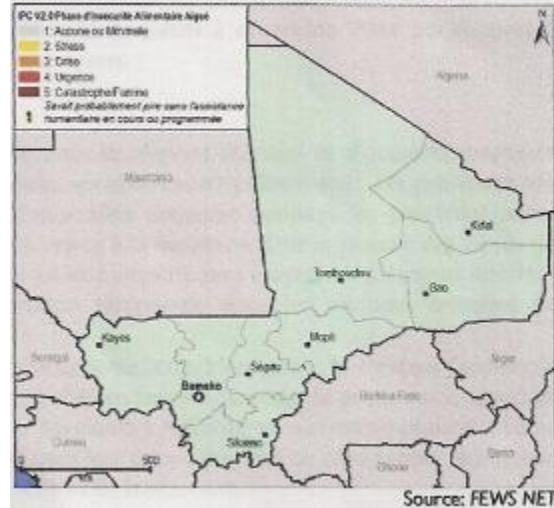
Source: FEWS NET 2014a.

Carte des résultats estimés plus probables de la sécurité alimentaire, août-septembre 2014



Source: FEWS NET

Carte des résultats estimés plus probables de la sécurité alimentaire, octobre-décembre 2014



Source: FEWS NET

Source: FEWS NET 2014b.

## APPENDIX 13. REGIONS OF GREATEST VULNERABILITY TO CHRONIC AND ACUTE MALNUTRITION<sup>49</sup>

Region	EDSM-IV 2006 (May–Dec.) <sup>1</sup>	MICS 2010 (Dec. 2009–Jan. 2010) <sup>2</sup>	SMART 2011 (June–July) <sup>3</sup>	SMART 2012 (Aug.–Dec.) <sup>4</sup>	EDSM-V 2013 (Nov. 2012–Feb. 2013) <sup>5</sup>	SMART 2013 (July–Aug.; May in Gao) <sup>6,7</sup>
<b>Chronic malnutrition<sup>a</sup></b>						
National	37.7	27.8	27.1	29.1	38.3	27.5
Kayes	30.7	22.1	20.4	25.9	34.3	21.8
Koulikoro	39.1	25.1	29.8	30.5	39.5	31.2
Sikasso	45.2	36.6	41.7	35.4	39.9	32.8
Ségou	40.0	32.6	25.4	33.3	40.5	33.4
Mopti	40.9	28.4	34.2	22.4	46.5	21.7
Bamako	23.2	16.3	13.8	14.1	21.1	13.0
Tombouctou	43.9	34.5	27.9	n.d.	n.d.	n.d.
Gao	33.5	26.2	21.1	n.d.	n.d.	16.3
Kidal	32.6	25.2	12.8	n.d.	n.d.	n.d.
<b>Acute malnutrition<sup>b</sup></b>						
National	15.2	8.9	10.9	8.9	12.7	8.6
Kayes	15.2	5.9	12.6	10.1	12.2	7.7
Koulikoro	16.2	7.9	12.4	8.6	11.1	8.9
Sikasso	15.8	9.4	6.5	6.5	13.4	3.9
Ségou	14.6	10.3	5.7	12.2	12.9	11.9
Mopti	12.7	9.8	9	8.6	14.7	6.5
Bamako	14.3	7.6	8.7	7	11.7	11.5
Tombouctou	16.5	14.7	15.4	n.d.	n.d.	n.d.
Gao	17.4	9	14.1	n.d.	n.d.	13.5
Kidal	27.2	10.5	4.9	n.d.	n.d.	n.d.

Notes: SMART is an interagency initiative launched in 2002 by a network of organizations and humanitarian practitioners; the SMART Methodology is an improved survey method for the assessment of severity of a humanitarian crisis (see: <http://smartmethodology.org/>).

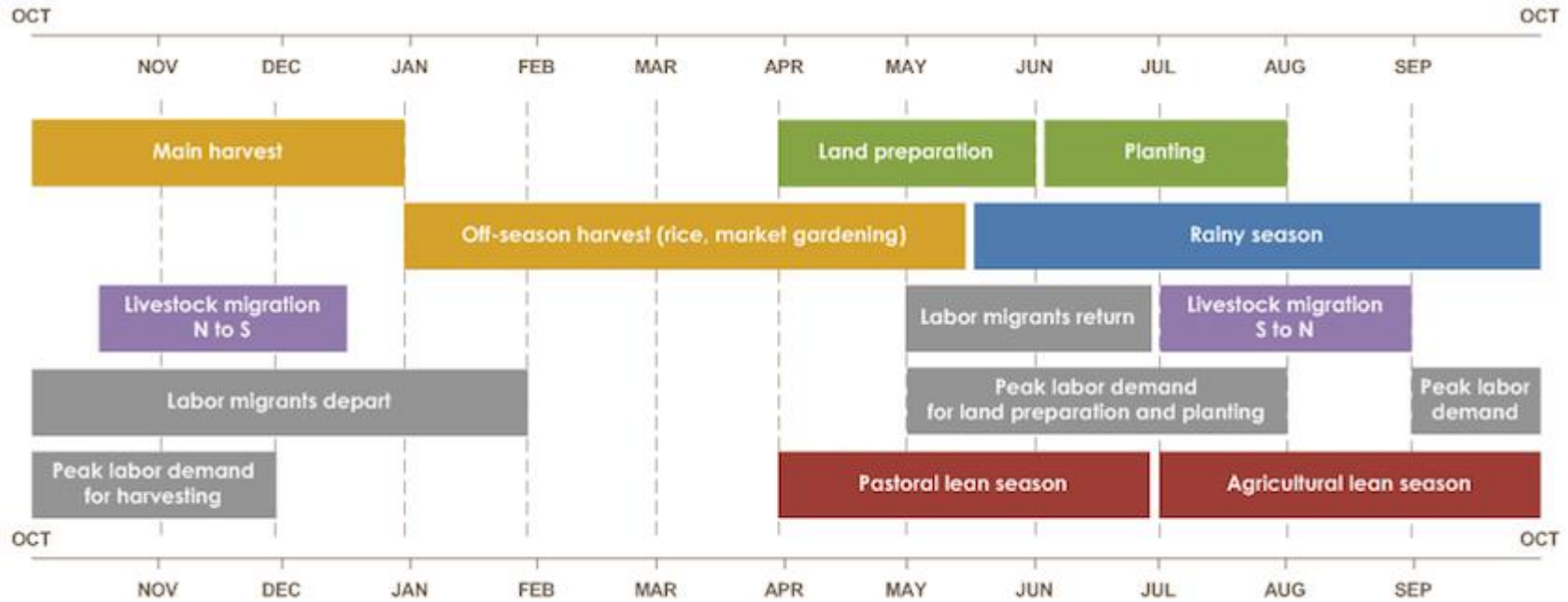
<sup>a</sup> Chronic malnutrition = height-for-age < -2 z-score.

<sup>b</sup> Acute malnutrition = weight-for-height < -2 z-score.

Sources: <sup>1</sup>CPS/MS et al. 2007; <sup>2</sup>CPS/SSDSPF et al. 2012; <sup>3</sup>GOM 2011c; <sup>4</sup>GOM 2012; <sup>5</sup> CPS/SSDSPF et al. 2014; <sup>6</sup>GOM 2013a; <sup>7</sup>GOM 2013b.

<sup>49</sup> Data on chronic and acute malnutrition at the *cercle* level may be available in late August or September 2014.

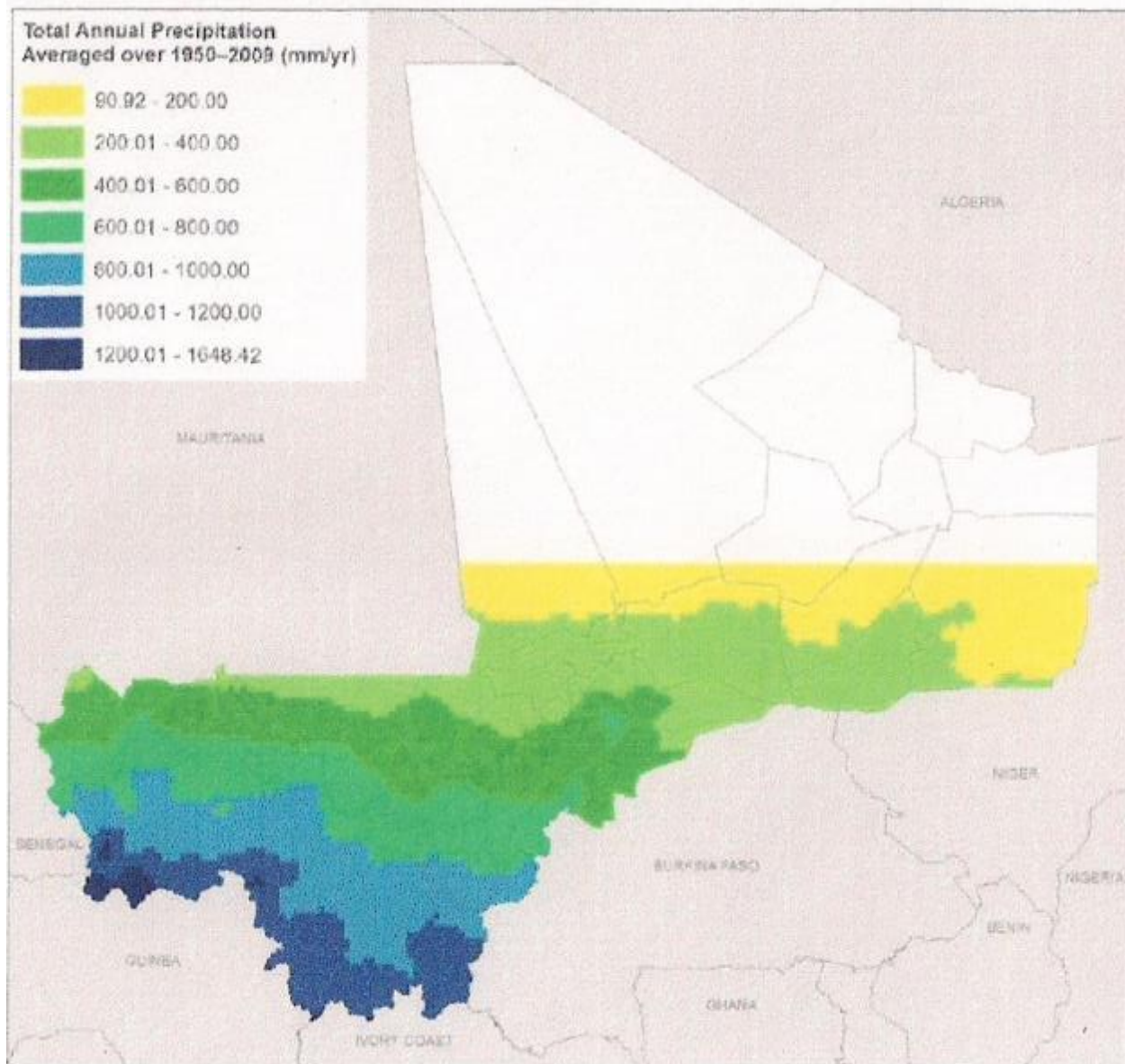
## APPENDIX 14. SEASONAL CALENDAR FOR TYPICAL YEAR



Source: FEWS NET 2010.

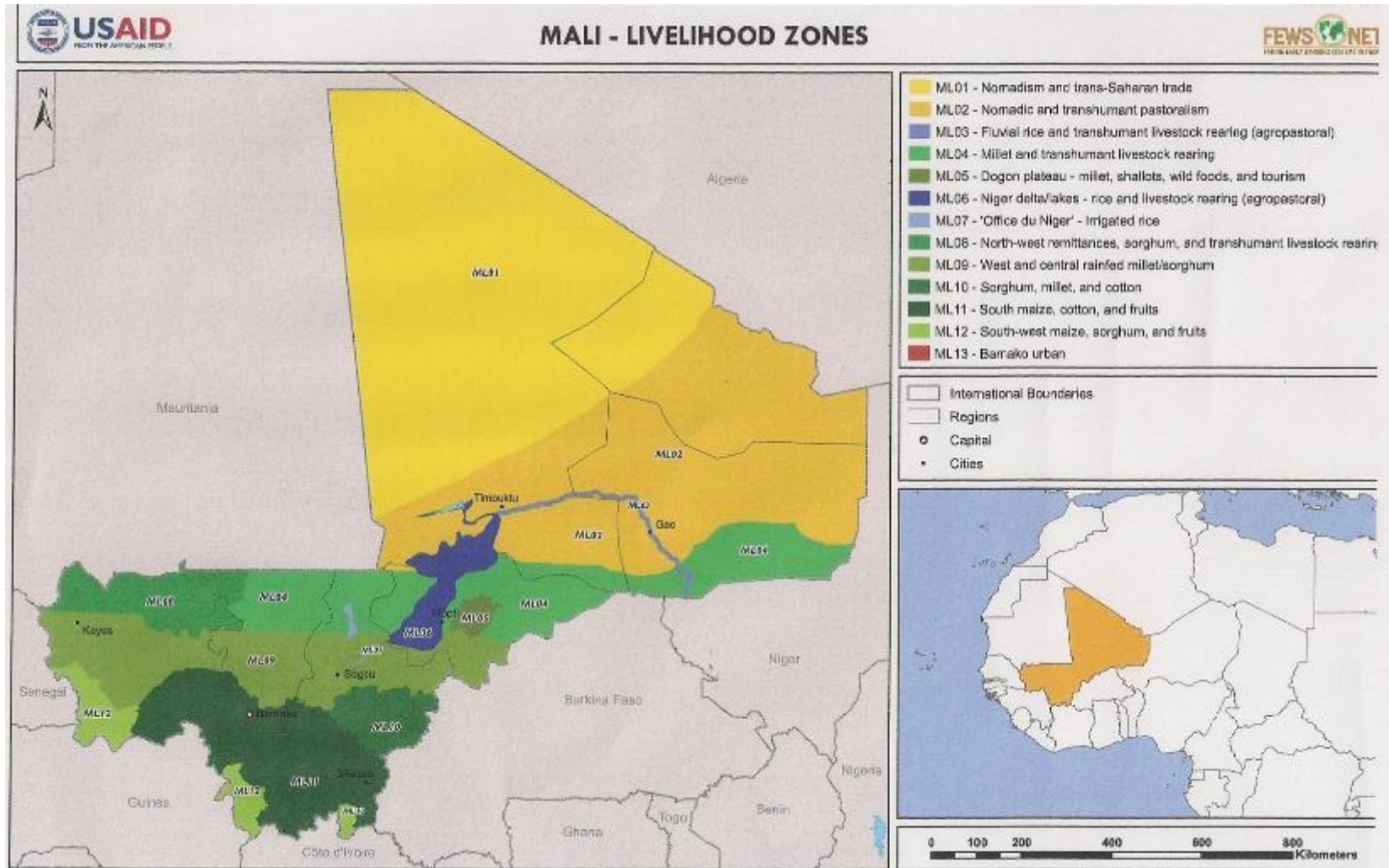


## APPENDIX 15. ANNUAL PRECIPITATION MAP



Source: USAID. 2014. Mali Climate Vulnerability Mapping.

## APPENDIX 16. LIVELIHOOD ZONES OF MALI



Source: FEWS NET. 2010. Livelihood Zoning and Profiling Report: Mali.

## APPENDIX 17. NATIONAL CEREAL PRODUCTION

**Table 17A. National Area Cultivated in Cereals in Mali**

Crop	2008/ 2009 (ha)	2009/ 2010 (ha)	2010/ 2011 (ha)	2011/ 2012 (ha)	2012/ 2013 (ha)	2013/ 2014 (ha)	5-yr avg: 2008/2009– 2012/ 2013 (ha)	2013/2014 as a % of 5- yr avg (%)
Millet	1,591,720	1,724,496	1,462,583	2,283,665	1,873,644	1,477,337	1,787,222	82.7
Sorghum	1,041,529	1,520,305	1,225,928	1,685,412	1,245,569	983,806	1,343,749	73.2
Rice	626,573	665,109	686,496	830,408	679,369	543,501	697,591	77.9
Maize	403,877	558,350	523,375	924,850	598,833	641,463	601,857	106.6
Fonio	72,174	62,305	66,875	65,252	43,809	35,612	62,083	57.4
Wheat	5,414	5,101	9,515	9,844	10,349	6,900	8,044	85.8
<b>TOTAL</b>	<b>3,741,287</b>	<b>4,535,666</b>	<b>3,974,772</b>	<b>5,799,431</b>	<b>4,451,573</b>	<b>3,688,659</b>	<b>4,500,546</b>	<b>82.0</b>

Source: GOM DNA, GOM CPS/SDR.

**Table 17B. National Cereal Production in Mali**

Crop	2008/ 2009 (MT)	2009/ 2010 (MT)	2010/ 2011 (MT)	2011/ 2012 (MT)	2012/ 2013 (MT)	2013/ 2014 (MT)	5-yr avg: 2008/2009– 2012/ 2013 (MT)	2013/2014 as a % of 5- yr avg (%)
Millet	1,364,469	1,390,410	1,373,342	1,462,139	1,772,275	1,236,593	1,472,527	84.0
Sorghum	1,048,688	1,465,620	1,256,806	1,191,020	1,212,440	866,227	1,234,915	70.1
Rice	1,607,647	1,950,805	2,308,233	1,741,472	1,914,867	1,984,503	1,904,605	104.1
Maize	740,108	1,476,995	1,403,576	1,298,234	1,713,737	1,304,969	1,326,530	98.4
Fonio	40,793	35,480	52,345	51,021	21,038	16,488	40,136	41.1
Wheat	13,166	15,132	23,788	33,842	40,071	28,512	25,200	113.1
<b>TOTAL</b>	<b>4,814,871</b>	<b>6,334,442</b>	<b>6,418,091</b>	<b>5,777,729</b>	<b>6,674,428</b>	<b>5,437,293</b>	<b>6,003,912</b>	<b>90.6</b>

Note: Figures in red vary to a small degree from the corresponding “totals” in the regional tables that follow.

Source: GOM DNA, GOM CPS/SDR.

**Table 17C. Regional Millet Production in Mali**

Region	2008/ 2009 (MT)	2009/ 2010 (MT)	2010/ 2011 (MT)	2011/ 2012 (MT)	2012/ 2013 (MT)	2013/ 2014 (MT)	5-yr avg: 2008/2009– 2012/ 2013	2013/2014 as a % of 5- yr avg (%)
Kayes	41,660	43,470	54,156	22,666	54,212	26,280	43,233	61
Koulikoro	226,925	217,600	189,214	205,049	294,196	134,349	226,597	59
Sikasso	317,137	262,420	261,206	214,623	205,708	172,783	252,219	69
Ségou	474,595	354,600	431,405	549,644	697,379	438,925	501,525	88
Mopti	289,685	444,510	391,007	423,437	490,087	458,761	407,745	113
Tombouctou	51,355	54,530	39,980	44,898	30,348	1,828	44,222	4
Gao	12,552	13,280	6,374	1,822	345	3,667	6,875	53
<b>TOTAL</b>	<b>1,413,909</b>	<b>1,390,410</b>	<b>1,373,342</b>	<b>1,462,139</b>	<b>1,772,275</b>	<b>1,236,593</b>	<b>1,482,415</b>	<b>83</b>

Note: Data are unavailable for Kidal and Bamako. Figure in red varies to a small degree from the corresponding “total” in the national table above (Table 17B).

Source: GOM DNA, GOM CPS/SDR.

**Table 17D. Regional Sorghum Production in Mali**

Region	2008/ 2009 (MT)	2009/ 2010 (MT)	2010/ 2011 (MT)	2011/ 2012 (MT)	2012/ 2013 (MT)	2013/ 2014 (MT)	5-yr avg: 2008/2009– 2012/ 2013	2013/2014 as a % of 5- yr avg (%)
Kayes	247,310	277,550	178,894	84,542	280,407	128,870	213,741	60
Koulikoro	200,437	437,540	338,043	386,371	331,138	230,800	338,706	68
Sikasso	384,713	487,520	479,142	496,599	254,775	340,264	420,550	81
Ségou	144,255	89,830	207,560	152,626	283,467	136,391	175,548	78
Mopti	32,260	65,570	34,552	50,269	45,035	27,525	45,537	60
Tombouctou	13,530	92,340	8,371	20,459	17,383	1,760	30,417	6
Gao	4,697	15,270	4,307	154	235	617	4,933	13
<b>TOTAL</b>	<b>1,027,202</b>	<b>1,465,620</b>	<b>1,250,869</b>	<b>1,191,020</b>	<b>1,212,440</b>	<b>866,227</b>	<b>1,229,430</b>	<b>70</b>

Note: Data are unavailable for Kidal and Bamako. Figures in red vary to a small degree from the corresponding “totals” in the national table above (Table 17B).

Source: GOM DNA, GOM CPS/SDR.

**Table 17E. Regional Rice Production in Mali**

Region	2008/ 2009 (MT)	2009/ 2010 (MT)	2010/ 2011 (MT)	2011/ 2012 (MT)	2012/ 2013 (MT)	2013/ 2014 (MT)	5-yr avg: 2008/2009 –2012/ 2013	2013/2014 as a % of 5- yr avg (%)
Kayes	2,905	57,700	94,519	2,601	21,475	6,868	35,840	19
Koulikoro	48,133	72,930	133,557	160,506	103,348	54,391	103,695	52
Sikasso	158,514	268,300	191,941	97,185	113,040	85,798	165,796	52
Ségou	843,924	774,800	946,320	801,087	952,471	1,324,696	863,720	153
Mopti	366,267	369,010	439,472	278,356	534,535	369,350	397,528	93
Tombouctou	161,975	227,700	322,925	362,175	156,864	107,664	246,328	44
Gao	42,528	83,630	65,328	39,562	33,134	35,736	52,836	68
<b>TOTAL</b>	<b>1,624,246</b>	<b>1,854,070</b>	<b>2,194,062</b>	<b>1,741,472</b>	<b>1,914,867</b>	<b>1,984,503</b>	<b>1,865,743</b>	<b>106</b>

Note: Data are unavailable for Kidal and Bamako. Figures in red vary to a small degree from the corresponding “totals” in the national table above (Table 17B).

Source: GOM DNA, GOM CPS/SDR.

**Table 17F. Regional Maize Production in Mali**

Region	2008/ 2009 (MT)	2009/ 2010 (MT)	2010/ 2011 (MT)	2011/ 2012 (MT)	2012/ 2013 (MT)	2013/ 2014 (MT)	5-yr avg: 2008/2009 –2012/ 2013	2013/2014 as a % of 5- yr avg (%)
Kayes	101,680	187,650	176,099	50,122	127,834	62,409	128,677	49
Koulikoro	67,837	238,230	261,361	305,197	237,275	144,137	221,980	65
Sikasso	442,774	648,410	795,039	887,307	1,193,244	1,029,119	793,355	130
Ségou	44,482	345,810	105,946	43,490	99,293	52,012	127,804	41
Mopti	324	12,930	17,598	12,118	6,537	1,925	9,901	19
Tombouctou	37,976	–	–	–	49,512	–	17,498	–
Gao	–	190	–	–	42	–	46	–
<b>TOTAL</b>	<b>695,073</b>	<b>1,433,220</b>	<b>1,356,043</b>	<b>1,298,234</b>	<b>1,713,737</b>	<b>1,289,602</b>	<b>1,299,261</b>	<b>99</b>

Note: Data are unavailable for Kidal and Bamako. Figures in red vary to a small degree from the corresponding “totals” in the national table above (Table 17B).

Source: GOM DNA, GOM CPS/SDR.

**Table 17G. Regional Fonio Production in Mali**

Region	2008/ 2009 (MT)	2009/ 2010 (MT)	2010/ 2011 (MT)	2011/ 2012 (MT)	2012/ 2013 (MT)	2013/ 2014 (MT)	5-yr avg: 2008/2009– 2012/ 2013	2013/2014 as a % of 5- yr avg (%)
Kayes	9,446	10,340	21,987	2,117	2,205	1,694	9,219	18
Koulikoro	5,948	1,760	3,147	2,720	402	314	2,795	11
Sikasso	4,112	6,760	7,665	6,388	5,044	3,363	5,994	56
Ségou	8,234	11,220	13,410	10,990	7,659	9,138	10,303	89
Mopti	13,535	5,400	6,136	28,806	5,725	1,979	11,920	17
Tombouctou	–	–	–	–	–	–	–	–
Gao	–	–	–	–	4	–	–	–
<b>TOTAL</b>	<b>41,275</b>	<b>35,480</b>	<b>52,345</b>	<b>51,021</b>	<b>21,039</b>	<b>16,488</b>	<b>40,232</b>	<b>41</b>

Note: Data are unavailable for Kidal and Bamako. Figure in red varies to a small degree from the corresponding “total” in the national table above (Table 17B).

Source: GOM DNA, GOM CPS/SDR.

**Table 17H. Regional Wheat Production in Mali**

Region	2008/ 2009 (MT)	2009/ 2010 (MT)	2010/ 2011 (MT)	2011/ 2012 (MT)	2012/ 2013 (MT)	2013/ 2014 (MT)	5-yr avg: 2008/2009– 2012/ 2013	2013/2014 as a % of 5- yr avg (%)
Kayes	–	–	–	–	–	–	–	–
Koulikoro	–	–	–	–	–	–	–	–
Sikasso	–	–	–	–	–	–	–	–
Ségou	–	–	1300	1,855	1206	800	872	92
Mopti	–	–	–	–	–	–	–	–
Tombouctou	13,166	15,132	22288	31,987	38,863	27,437	24,287	113
Gao	183	115	200	–	–	270	100	271
<b>TOTAL</b>	<b>13,349</b>	<b>15,247</b>	<b>23,788</b>	<b>33,842</b>	<b>40,069</b>	<b>28,507</b>	<b>25,259</b>	<b>113</b>

Note: Data are unavailable for Kidal and Bamako. To address significant discrepancy between 2010/2011 regional and national production estimates for wheat, regional estimates for Ségou, Tombouctou, and Gao were extrapolated on the basis of production in other years. Figures in red vary to a small degree from the corresponding “totals” in the national table above (Table 17B).

Source: GOM DNA, GOM CPS/SDR.

## APPENDIX 18. NATIONAL LIVESTOCK PRODUCTION

**Table 18A. National Livestock Production from 2008 to 2013**

Species	2008	2009	2010	2011	2012	2013
Cattle	8,385,703	8,896,392	9,163,284	9,438,182	9,721,328	10,012,968
Sheep	10,249,657	11,300,247	11,865,259	12,458,522	13,081,448	13,735,520
Goat	14,272,716	15,735,670	16,522,454	17,348,576	18,216,005	19,126,805
Horse	393,834	478,187	487,751	497,506	507,456	517,605
Donkey	825,277	861,820	880,694	899,981	919,691	939,832
Camel	869,305	904,425	922,514	940,964	959,783	978,979
Pig	72,666	74,272	75,015	75,765	76,523	77,365

Note: Figures in red vary to a small degree from the corresponding "totals" in the regional table that follows (Table 18B).  
Source: GOM CPS/SDR (EAC 2013/2014), March 2014, p. 40, quoting "DNPIA" as the source.

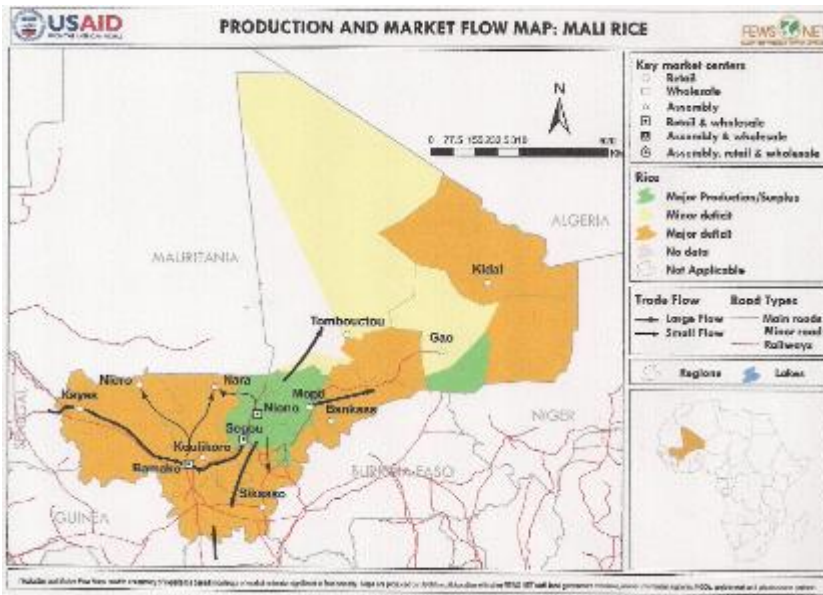
**Table 18B. Regional Livestock Production in 2013 (MT)**

Region	Cattle	Sheep	Goats	Horses	Donkeys	Camels	Pigs	Poultry
Kayes	1,066,380	1,590,574	1,610,478	167,030	82,897	2,741	249	6,672,984
Koulikoro	1,436,859	1,146,916	2,029,355	88,459	105,826	10,181	32,589	9,832,381
Sikasso	1,596,067	1,019,176	1,220,289	2,071	73,683	0	10,412	10,596,134
Ségou	1,129,464	1,199,112	1,899,292	86,026	88,155	784	30,503	7,343,385
Mopti	2,803,631	2,532,831	3,651,308	34,938	137,310	16,056	3,796	2,957,029
Tombouctou	1,013,312	1,738,917	2,884,322	109,578	182,610	204,019	0	419,080
Gao	863,118	2,793,805	3,697,211	22,153	170,110	227,319	0	275,515
Kidal	71,092	1,661,998	2,102,036	6,884	98,496	517,880	0	125,518
Bamako	33,043	52,195	32,516	467	658	0	46	5,957,351
<b>TOTAL</b>	<b>10,012,966</b>	<b>13,735,523</b>	<b>19,126,806</b>	<b>517,605</b>	<b>939,835</b>	<b>978,980</b>	<b>77,594</b>	<b>36,850,378</b>

Note: Figures in red vary to a small degree from the corresponding "totals" in the national table above (Table 18A).  
Source: GOM CPS/SDR (EAC 2013/2014), March 2014, p. 41, quoting "DNPIA" as the source.

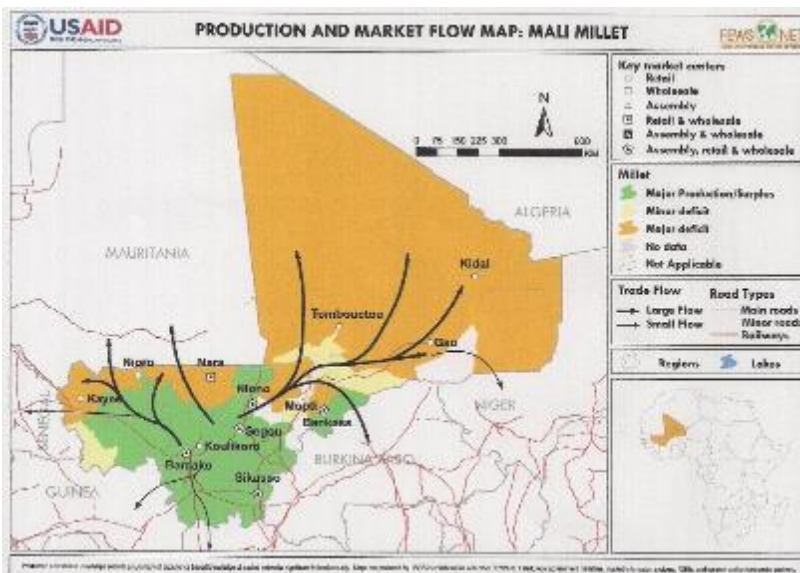
## APPENDIX 19. PRODUCTION AND MARKETING MAPS

Figure 19A. Production and Market Flow Map: Mali Rice



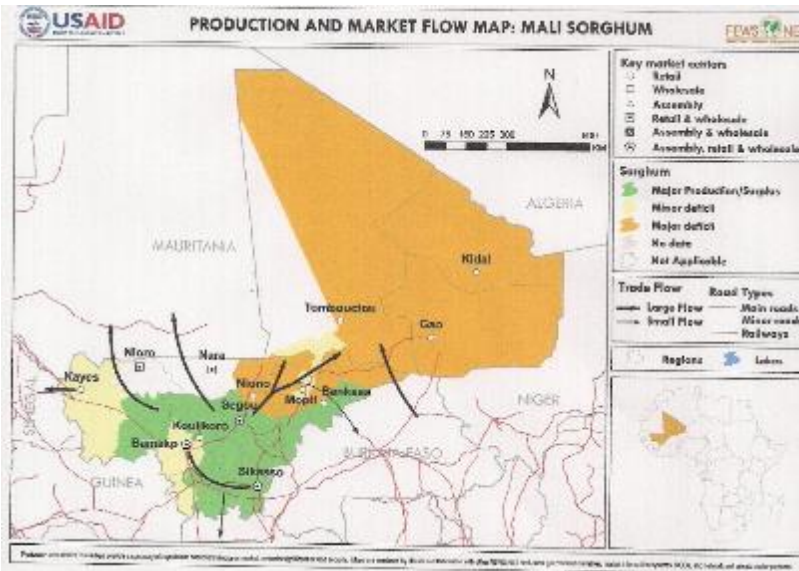
Source: FEWS NET 2008.

Figure 19B. Production and Market Flow Map: Mali Millet



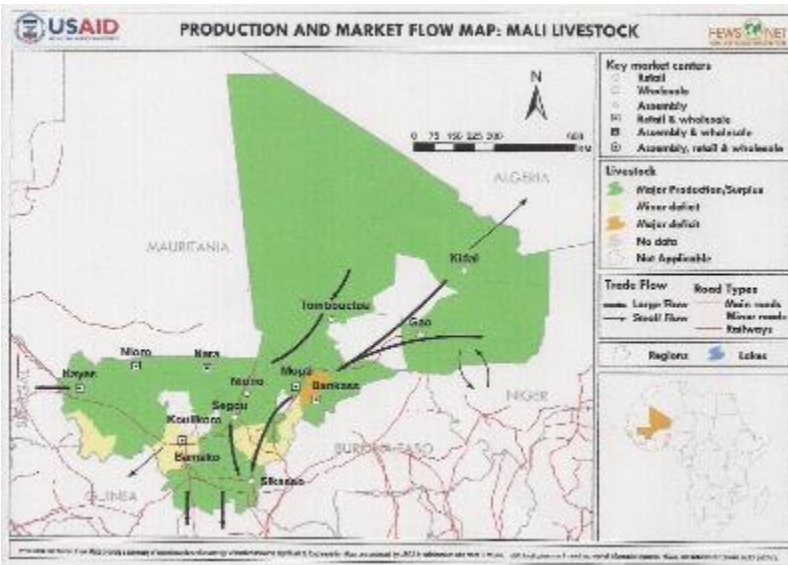
Source: FEWS NET 2008.

Figure 19C. Production and Market Flow Map: Mali Sorghum



Source: FEWS NET 2008.

Figure 19D. Production and Market Flow Map: Mali Livestock



Source: FEWS NET 2008.



## APPENDIX 20. SELECTED POLICIES, STRATEGIES, AND PROGRAMS

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### Government of Mali

- CSCRIP III and PAP (2012–2017) (with World Bank)
- Transition Roadmap (2013)
- Emergency Priorities Support Plan (2013–2014)
- Plan for the Sustainable Recovery of Mali (2013–2014)
- CAADP Compact for Mali (2009)
- Agricultural Development Policy (2013)
- Agricultural Orientation Law (2005)
- National Priority Investment Plan for the Agriculture Sector (2011–2015)
- National Seed Policy (2009)
- National Riziculture Development Strategy (2011)
- National Irrigation Development Strategy (1999)
- PNN (2012)
- National Nutrition Development Policy (2013)
- National Multi-Sector Nutrition Plan (2013)
- Integrated Management of Acute Malnutrition Protocol
- National Strategic Plan for Health System Strengthening (2009–2015)
- National Climate Change Policy (2011) and Strategic Investment Framework for Sustainable Land Management (2010)
- National Food Security Strategy (2002)
- National Gender Policy (2010)
- National Water Policy (2006)
- National Sanitation Policy (2009)
- National Food Security Program (2011–2015)
- National Fishing and Aquaculture Development Policy and Priority Action Plan (PAP) (2011–2015)
- National Economic and Social Development Project
- PRODESS III
- National Action Plan for Development of Fishing and Aquaculture (2012–2016)
- National Pastoral Planning Program (2008–2012)
- Charter for Food Crisis Prevention and Management in the Sahel and West Africa (2011)
- Pastoral Charter (2001)

### U.S. Government

- USAID Global Health Initiative and Mali Health Strategy (2014–2018)
- USAID Malaria Initiative and Mali Malaria Operational Plan
- USAID Feed the Future Initiative and Mali Feed the Future Multi-Year Strategy (2011–2015)
- USAID Global Climate Change Initiative in Mali
- USAID Mali Resilience Program Assessment: Challenges and Opportunities (2014)
- USAID Sahel Joint Planning Cell Strategic Plan (2013)
- USAID Transition Initiative in Mali
- USAID/West Africa RISE
- USAID/West Africa Trade Hub
- USAID/West Africa Farmer-to-Farmer Program
- USAID-funded FEWS NET Project in Mali

- USDA McGovern-Dole Food for Education and Child Nutrition Program (FFE), including CRS FFE program in Koulikoro and Mopti Regions
- USDA Food for Progress Program (FFP), including the Mopti Coordinated Area Development Program implemented by Aga Khan Foundation
- USAID/FFP Timbuktu Food Security Initiative MYAP (TFSI, implemented by Africare) (2008–2014)
- USAID/FFP NEMA MYAP (implemented by CRS-led Consortium for Food Security in Mali, with Save the Children and Helen Keller International) (2008–2014)
- USAID/BFS Cereal Value Chain Award (CVC), implemented by ACDI/VOCA
- USAID/FFP and USAID/OFDA (joint funded), implemented by Mercy Corps
- USAID/FFP and USAID/OFDA (joint funded), implemented by Near East Foundation
- USAID/FFP and USAID/OFDA (joint funded), implemented by CRS, in Gourma-Rharous, Tombouctou Region (soon to be awarded)
- USAID/FFP EFSP, implemented by CRS, in Nara, Koulikoro Region (soon to be awarded)
- U.S. State Department Relief to Development Transition (R2DT)
- USAID Strengthening Partnerships, Results and Innovations in Nutrition Globally (SPRING)
- USAID GCC-funded ADAPT Project (upcoming)
- USAID-funded L4G (Livestock for Growth) (upcoming)
- USAID/Mali (CARE) USAID Integrated Rural Program to Improve Nutrition and Hygiene in Mali (10/01/2013–09/30/2018)
- USAID/Mali (Save the Children) USAID Integrated Rural Program to Improve Nutrition and Hygiene in Mali (10/01/2013–09/30/2018)
- USAID/Mali (ASDAP) USAID Integrated Rural Program to Improve Nutrition and Hygiene in Mali (12/31/2013–12/31/2015)

#### Other

- U.N. Development Assistance Framework for Mali (2008–2012)
- U.N. Joint U.N. Framework to Support Transition in Mali (2014–2016)
- U.N. Mali Strategic Response Plan (2014)
- WFP Country Programme for Mali (2008–2014 Extended)
- WFP Emergency Operation for Mali (2013–2014 Extended), Assistance for Crisis-Affected Populations in Mali: Internally Displaced People, Host Families, and Fragile Communities
- WFP PRRO (in development)
- EU Mali Country Strategy Paper
- EU Global Alliance for Resilience Initiative in the Sahel (AGIR-Sahel) (Regional)
- EU Food Security Support Program (PASA)
- EU Office of Niger Contract Implementation Support Plan (PAMOCP-ON)
- EU Private Sector Support Program (PASP)
- EU Support to Local Communities for Drinking Water and Sanitation Program (PACTEA)
- EU Global Climate Change Action (AGCC-Mali)
- EU Transport Sector Support Program – Opening of the North and Niger Delta
- EU Center for Migration Information and Management (CIGEM)
- EU Administrative Reform, Decentralization and Regional Economic Development Support Program (PARADDER)
- EU Economic, Social, and Cultural Development Support Program (PADESC)
- ECHO Humanitarian Implementation Plan (2013)
- UNICEF Programme Strategy for Mali (2008–2012)
- U.N. Strategic Response Plan for Mali (2012–2016)
- WHO Country Cooperation Strategy
- AfDB Mali Transition Management Support Strategy
- AfDB Moyen Bani Plains Development Program
- AfDB Irrigated Crop Development for Food Security Strengthening Project
- AfDB Bamako Potable Water Supply Project
- AfDB Land Productivity Improvement Project

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- AfDB Bamako Sanitation Project
  - AfDB Phedie Sabalibougou Planning Project
  - AfDB Bani Bassin and Selingue Irrigation Development Program
  - AfDB Community Development Support Project in Kayes and Koulikoro Regions
  - AfDB AEPA Project in Gao, Koulikoro, and Ségou Regions (potable water and sanitation)
  - AFDB Animal Production Development Support Project in Southern Kayes Region (PADEPA-KS)
  - IFAD Mali Country Strategy Document (2007)
  - IFAD Portfolio Management during Interim Period (2012)
  - IFAD Adaptation for Smallholder Agriculture Programme (ASAP)
  - IFAD Rural Youth Vocational Training, Employment, and Entrepreneurship Support Project (FIER)
  - IFAD Fostering Agricultural Productivity Project (PAPAM)
  - IFAD Rural Microfinance Program (PMR)
  - WB Growth and Poverty Reduction Strategic Paper (CSCR III) and Priority Action Plan (PAP) (2012–2017) (with GOM)
  - WB Interim Strategy Note (2014–2015)
  - WB Improving Vegetable Production and Consumption in Mali (2011–2014)
  - WB Natural Resources Management in a Changing Climate in Mali (2013–2019)
  - WB Mali Reconstruction and Economic Recovery (2013–2018)
  - WB Bamako Water Supply Project (2013–2018)
  - WB Emergency Safety Net Project (*Jigisé méjiri*) (2013–2018)
  - WB Agricultural Competitiveness and Diversification Project
  - WB GFDRR Mainstreaming Disaster Risk Reduction in Mali (2011–2014)
  - WB Fostering Agricultural Productivity Project (2010–2016)
  - WB Mali Sustainable Land Management Project (2010–2016)
  - WB Niger Basin Water Resources Development and Sustainable Ecosystems Management (regional project) (2007–2014)
  - AFD Partnership Framework Document (2006)
  - AFD Bamako Sanitation and Urban Development Project
  - AFD Private Sector Development Program (PASP Mali)
  - AFD Water and Sanitation in Semi-Urban Centers in Southern Mali Project
  - AFD Water and Sanitation in Mopti Region Project
  - AFD Economic Development in Office of Niger Zone Project
  - Africa RISING
  - AVRDC (The World Vegetable Center)
  - Canadian Department of Foreign Affairs, Trade, and Development (DFATD): Mali - Health and Nutrition Assistance - Médecins du Monde Appeal 2014 (2014–2015)
  - Canadian DFATD: Health Centre Construction and Rehabilitation (2013–2015)
  - Canadian DFATD: Community-Based Nutritional Health in Southern Mali – III (2012–2017)
  - Canadian DFATD: Basic Health Care and Nutrition for Mothers and Children (SESAME) (2012–2015)
  - Canadian DFATD: Food, Infant and Maternal Nutrition and Education (2012–2015)
  - Canadian DFATD: Improving Community Health in Sikasso and Koulikoro regions (2011–2015)
  - Canadian DFATD: Community-Based Nutritional Health in Southern Mali – I & II (2011–2017)
  - Canadian DFATD: Continuing Support for Maternal, Newborn and Child Health – I & II (2011–2017)
  - Canadian DFATD: Maternal Evacuation in District of Kayes (2011–2017)
  - Canadian DFATD: Strengthening Decentralized Health Systems (2010–2018)
  - Canadian DFATD: Water, Sanitation, and Hygiene for Southern Mali (2013–2015)
  - DANIDA: PADS-PROSEA (2010–2015)
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