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USAID OFFICE OF FOOD FOR PEACE FOOD SECURITY COUNTRY FRAMEWORK FOR MADAGASCAR FY 2014–FY 2019

SEPTEMBER 2013

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FOOD AND NUTRITION TECHNICAL ASSISTANCE

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Acronyms and Abbreviations

ADRA	Adventist Development and Relief Agency
ADS	Automated Directives System
AFD	*Agence Française de Développement* (French Development Agency)
AFDB	African Development Bank
AIDS	Acquired Immunodeficiency Syndrome
AINA	*Actions Intégrées en Nutrition et Alimentation* Project
ANC	antenatal care
AU	African Union
AVSF	*Agronomes et Vétérinaires Sans Frontières* (Agronomists and Veterinarians Without Borders)
BMI	body mass index
C-IMCI	Community-based integrated management of childhood illness
CA	conservation agriculture
CAADP	Comprehensive Africa Agriculture Development Programme
CFSVA+N	Country Food Security and Vulnerability Assessment Plus Nutrition
CHV	community health volunteer
CIRAD	*Centre de Coopération Internationale en Recherche Agronomique pour le Développement* (Center for International Cooperation on Agricultural Research for Development)
CPI	consumption price index
CRS	Catholic Relief Services
CSA	*Centre de Services Agricoles* (Agricultural Service Center)
DAP	development assistance program
DHS	Demographic and Health Survey
DPMP	disaster prevention and mitigation plan
ENA	Essential Nutrition Actions
EPP-PADR	Permanent Pilot Team for the Rural Development Action Plan
EU	European Union
FANTA	Food and Nutrition Technical Assistance III Project
FAO	Food and Agriculture Organization of the United Nations
FEWS NET	Famine Early Warning Systems Network
FFP	USAID Office of Food for Peace
FFS	farmer field school
FHH	female-headed household
FSCF	Food Security Country Framework
FY	fiscal year
GBV	gender-based violence
GDP	gross domestic product
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
GIZ	*Deutsche Gesellschaft für Internationale Zusammenarbeit* (German Society for International Cooperation)
GOM	Government of Madagascar
GMP	growth monitoring and promotion
GNI	gross national income
GSDM	*Groupement Semis Direct de Madagascar* (Madagascar Direct Seeding Group)
GTDR	*Groupe de Travail de Développement Rural* (Working Group for Rural Development)

ha	hectare(s)
HAT	President of the High Authority of the Transition
HH	household(s)
HIV	human immunodeficiency virus
IEC	information, education, and communication
IFAD	International Fund for Agricultural Development
INSTAT	*Institut National de la Statistique* (National Institute of Statistics)
ITN	insecticide-treated bednet
IYCF	infant and young child feeding
LLIN	long-lasting insecticidal net
LOL	Land O'Lakes
MAHEFA	Malagasy Healthy Families Project
MCHN	maternal and child health and nutrition
MCHIP	Maternal and Child Health Integrated Program
MDG	Millennium Development Goal
mm	millimeter(s)
MOPH	Ministry of Public Health
MT	metric ton(s)
MYAP	multi-year assistance program
NGO	nongovernmental organization
ODR	*Observatoire de Riz* (Rice Observatory)
ONN	*Office National de Nutrition* (National Nutrition Office)
PASSOBA	*Projet d'appui aux secteurs sociaux de base*
PHC	Primary Health Care Project
PM2A	Prevention of Malnutrition in Children under 2 Approach
PNAN	*Plan National d'Action pour la Nutrition* (National Nutrition Action Plan)
PNNC	*Program National de Nutrition Communautaire* (National Community Nutrition Program)
PSI	Population Services International
RANO HP	Rural Access to New Opportunities for Health and Prosperity Project
RANO N'ALA	Rural Access to New Opportunities for Health and Water Resource Management
ROR	Rural Observatory Network
SADC	Southern African Development Community
SALOHI	Strengthening and Accessing Livelihood Opportunities for Household Impacts Project
SAP	*Système d'Alerte Précoce* (Early Warning System)
SBCC	social and behavior change communication
SIFPO	Support for International Family Planning Organizations program
sq. mi.	square mile(s)
SRI	*Système de Riziculture Intensifiée* (Intensified Rice Production System)
TOT	training of trainers
U.N.	United Nations
USAID	U.S. Agency for International Development
USG	United States Government
VSL	village savings and loan
WASH	water, sanitation, and hygiene
WFP	World Food Programme
WHO	World Health Organization

Executive Summary

Introduction

The goal of the U.S. Agency for International Development Office of Food for Peace (USAID/FFP) Food Security Country Framework (FSCF) for Madagascar is to provide a valuable food security analysis study of Madagascar for current and potential USAID food security partners for Title II development programs for FY 2014–FY 2019. To achieve this goal, the FSCF summarizes data on the causes and distribution of chronic food insecurity in Madagascar; identifies the most at-risk population groups; describes existing policies, strategies, and programs; and presents key program objectives, priority activity areas, and considerations for program design to sustainably reduce food insecurity and strengthen resilience in targeted areas of Madagascar.

Country Context

The current Madagascar Title II development program operates in a context of enormous political and economic uncertainty, which may continue into the next phase of the program. In 2009, Antananarivo Mayor Andry Rajoelina led an army-supported coup that removed President Marc Ravalomanana from power and forced him into exile, and it is not certain whether free and fair presidential and parliamentary elections will take place in 2013 as planned. Governance, particularly at the national level, has declined sharply since 2008, including in food security, education, and health. Economic growth has stalled, and an astonishing 92% of the country's population now lives on less than US$2 per day (World Bank 2013).Chances of achieving the country's Millennium Development Goals (MDGs) are now slim. But until the political crisis ends and constitutional rule resumes, the United States Government (USG) is expected to continue the suspension of all non-humanitarian assistance as well as direct assistance to the GOM. The Title II development program continues to be justified because both emergency and development Title II programs are considered to have life-saving, humanitarian objectives.

Food Security Context

Since the 2009 coup d'état, food security has been worsening in Madagascar. Governance and state investment failures, broad economic deterioration, and degradation of the natural resource base are undermining the Malagasy people's ability to prevent, mitigate, adapt to, and recover from the shocks that they frequently face (e.g., cyclones, droughts, floods, price and production shocks). Over half (53%) of children under 5 years of age are stunted, and chronic food insecurity is widespread. Important factors contributing to food insecurity in Madagascar include: annual cyclones, flooding and drought; limited access to agricultural inputs and credit; poor post-harvest techniques; soil degradation and poor natural resources management; lack of access of smallholder farmers to markets and market information; limited off-farm employment opportunities; inadequate water and sanitation coverage and poor hygiene practices; high rates of childhood illness; lack of access to quality health care; and inappropriate infant and young child feeding practices. Available data highlight regional differences in the determinants of food insecurity, whereby behavioral determinants play a greater role in the highlands, and poor food access and frequent shocks play a relatively greater role in the south, southeast and southwest.

Considerations for Title II Programs in Madagascar

Geographic Priorities

The chronic food insecurity and the malnutrition so entrenched in Madagascar comprise very different problems in different parts of the island. For example, the populations that are facing the worst levels of food access and poverty (indicating chronic food insecurity) are often different than those with the highest

levels of stunting. Available data indicate that four geographic areas are hardest hit by chronic food insecurity:

- The deep south (Anosy and Androy regions)
- The southern highlands (Haute Matsiatra, Amoron'i Mania, and Ihorombe regions)
- The east and southeast (Atsimo Atsinanana, Atsinanana, and Vatovavy Fitovinany regions)
- The southwest (Atsimo Andrefana region)

To consolidate USAID resources and for maximum impact on the development of beneficiary communities, applicants may wish to focus on regions also targeted by USAID-funded health activities, which include:

- The southern highlands (Haute Matsiatra, Amoron'i Mania, and Ihorombe regions)
- The east and southeast (Atsinanana and Vatovavy Fitovinany regions)
- The southwest (Atsimo Andrefana region)

Applicants should consider proposing program activities for one of these areas. Applicants that propose working in more than one of these areas should be able to demonstrate how the proposed program is tailored to the unique local context, determinants of malnutrition and food insecurity, and programmatic opportunities and constraints across the different areas. Applicants should consider proposing targeting contiguous districts and regions to: increase program exposure by beneficiaries and intensify community impact; increase scale of (and linkages among) transportation infrastructure investments (e.g., market feeder roads, roads to health clinics and schools); foster labor and trade relationships among neighboring communities for staple foods and priority value chains; promote social cohesion and trust (and thereby reduce risk of conflict); allow for overlapping and saturation of social and behavioral change messaging among program components tailored to the local sociocultural context; and capitalize on economies of scale. Within proposed target areas, communes may be also selected based on food security and nutritional data, as well as other programmatic factors that determine program feasibility. In addition, applicants should aim to complement and work with existing programs such as the USAID health portfolio (for example, the CBIHP/MAHEFA and PHC projects).

Program Priorities

It is suggested that the overall goal of the Title II development program in Madagascar be as follows: "to achieve sustainable reductions in food insecurity and chronic malnutrition and increases in resilience among chronically food-insecure households." It is suggested that the program encompass a portfolio of activities designed to synergistically achieve program priorities, which are key to addressing food security and achieving the overall program goal in the geographic areas listed above. Under each of the three program priorities, four priority activity areas are suggested, and under each priority activity area, an array of illustrative program options is discussed. Applicants are encouraged to be creative in laying out the results they would like to achieve and propose a strategic plan to achieve those results. The USAID/FFP Country Guidance on Madagascar and the Madagascar BEST study should also be taken into account in Title II non-emergency program application planning.

Strategic Partnerships

The FSCF identifies Government of Madagascar (GOM), national, and international organizations that applicants may wish to consider for potential partnerships within a proposed project. With regard to GOM partners, applicants are encouraged to consult with the U.S. Department of State and USAID regarding how USG-funded projects are to engage with GOM actors, particularly until the political crisis is resolved. The political situation complicates partnerships with GOM institutions, and until a constitutional election resolves the ongoing crisis, USG sanctions preclude funding or capacity

strengthening of these institutions. When the political situation is resolved, key GOM institutions to consider for partnership include the National Nutrition Office and Ministry of Public Health at national, district, and local levels; the Ministry of Agriculture, the Ministry of Livestock, and the Ministry of Fishing and Fisheries; the National Risk and Disaster Management Bureau and Early Warning System; the Permanent Pilot Team for the Rural Development Action Plan and the Rural Observatory Network for monitoring; and the Agricultural Service Centers for linking producers to service providers and market actors in agriculture.

Table A. Suggested USAID/FFP Title II Development Program Priorities and Activities in Madagascar

<table>
<tr><td colspan="3">Overall Goal: To achieve sustainable reductions in food insecurity and chronic malnutrition and increases in resilience among chronically-food insecure households</td></tr>
<tr><td>Program Priority 1:
To reduce chronic malnutrition among children under 5</td><td>Program Priority 2:
To increase on-farm production generated by households</td><td>Program Priority 3:
To increase income generated by households</td></tr>
<tr><td>Priority Activity Area 1.1:
Chronic malnutrition among children under 2 is prevented and children under 2 are fed appropriately for their age</td><td>Priority Activity Area 2.1:
Households increase and diversify agricultural (crop) production</td><td>Priority Activity Area 3.1:
Households strengthen marketing of their production</td></tr>
<tr><td>Priority Activity Area 1.2:
Pregnant women and mothers of children under 2 seek preventive care and treatment for illness</td><td>Priority Activity Area 2.2:
Households increase livestock, fishing/aquaculture, and other production</td><td>Priority Activity Area 3.2:
Households strengthen value-added processing and storage of their production</td></tr>
<tr><td>Priority Activity Area 1.3:
Households have access to improved water and sanitation and practice appropriate hygiene behaviors</td><td>Priority Activity Area 2.3:
Mechanisms are put in place to sustainably establish, protect, and manage essential natural assets</td><td>Priority Activity Area 3.3:
Households increase income generated by off-farm activities</td></tr>
<tr><td colspan="3">Priority Activity Area 1.4/2.4/3.4:
Households increase access to credit and/or savings</td></tr>
<tr><td colspan="3">Design and Implementation Considerations:
Integrated programming; geographic and vulnerable group targeting; gender equality; development approach; sustainability and exit strategy; surge capacity, early warning and disaster risk reduction; capacity strengthening; social and behavioral change communication; operations research; formative research; governance and conflict prevention; and strategic partnerships.</td></tr>
</table>

1. Introduction

Since the 2009 coup d'état, food insecurity has been worsening in Madagascar. Governance and state investment failures, broad economic deterioration, and degradation of the natural resource base are undermining the Malagasy people's ability to prevent, mitigate, adapt to, and recover from the shocks that they frequently face (e.g., cyclones, droughts, floods, locusts, and price and production shocks). Globally, the objectives of the U.S. Agency for International Development Office of Food for Peace (USAID/FFP) Title II development food assistance programs are to target the underlying causes of hunger and malnutrition, reduce chronic malnutrition (stunting) among children under 5 years of age and pregnant and lactating women, increase and diversify household income, and strengthen and diversify agricultural production and productivity (USAID 2013).

The goal of the USAID/FFP Food Security Country Framework (FSCF) for Madagascar is to provide a valuable food security analysis study of Madagascar for current and potential USAID food security partners for Title II-funded development programs for FY 2014–FY 2019 in Madagascar.[1]

The FSCF identifies the key constraints to food security that the Madagascar Title II development program aims to address, and the broad objectives and program strategies that applicants may consider to address those constraints. The USAID definition of food insecurity (see **Box 1**) underpins this FSCF and includes nutrition (food utilization/consumption). Therefore, the term "food security," when used in this document, includes nutrition.

Box 2 presents USAID's definition of resilience, and **Figure 1** presents the conceptual framework that structures the FSCF's analysis of resilience to food insecurity in Madagascar. Each applicant may identify and develop a set of specific project activities that would be most appropriate and effective for the context of their proposed project area, based on their local assessments, research, and internal project development process. The USAID/FFP Country Guidance on Madagascar and the Madagascar BEST study should also be taken into account in Title II non-emergency program application planning.[2] **Appendix 1** presents a map of Madagascar, for reference.

[1] The FSCF was developed through a comprehensive desk review; interviews conducted with key stakeholders from multilateral, bilateral, United Nations (U.N.), humanitarian, and development institutions, as well as the Government of Madagascar (GOM); field interviews with current Title II development program implementing partners; and field visits to communities identified as potential target zones for the next phase of the Title II development program. The document underwent review by USAID/FFP, USAID/Madagascar, and the broader community of stakeholders via a public review process. All comments were considered for the revision of the FSCF, which was finalized in October 2013.

[2] Citations to come; documents in development.

Box 1. USAID Definition of Food Security

In 1992, USAID's Policy Determination 19 established the following definition for food security: "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."

The definition of food security used in the FSCF focuses on three distinct but interrelated elements, all three of which are essential to achieving food security:

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

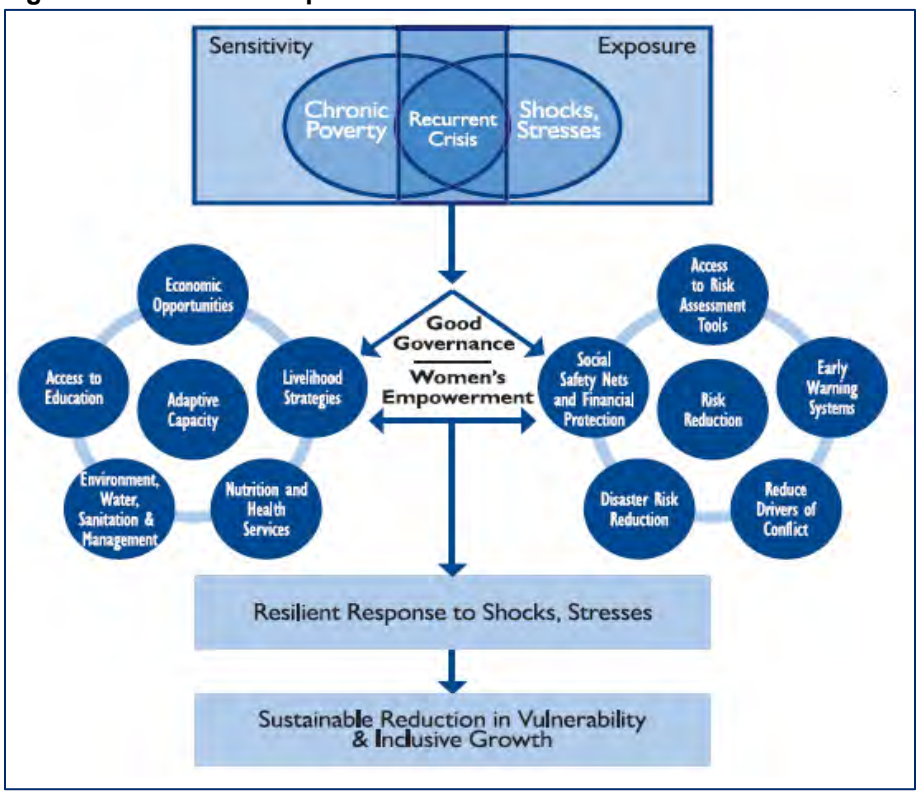
Sources: USAID 1992; USAID 2005.

Box 2. USAID Definition of Resilience

For USAID, resilience is 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.

Source: USAID 2012a.

Figure 1. USAID Conceptual Framework of Resilience



Source: USAID 2012a.

2. Country Context

The current Madagascar Title II development program operates in a context of enormous political and economic uncertainty, which may continue into the next phase of the program. Chances of achieving the country's Millennium Development Goals (MDGs) are now slim. But until the political crisis ends and constitutional rule resumes, the USG is expected to continue the suspension of all non-humanitarian assistance as well as direct assistance to the GOM. The Title II development program continues to be justified because both emergency and development Title II programs are considered to have life-saving, humanitarian objectives.

2.1 Political and Governance Context

In 2009, Antananarivo Mayor Andry Rajoelina led an army-supported coup that removed President Marc Ravalomanana from power and forced him into exile. Rajoelina took the title of President of the High Authority of the Transition (HAT). Crisis mediation efforts in 2009 supported by the African Union (AU), the Southern African Development Community (SADC), the United Nations (U.N.), and the International Francophone Organization were agreed on but failed to be implemented by the HAT, leading to international sanctions. In 2010, a civil society organization-led effort resulted in the organization of a national conference and adoption of a new constitution that November. Throughout 2012 the AU brokered a mediation process, and presidential and parliamentary elections are scheduled for 2013. However, it is unclear to what extent elections can address Malagasy corruption, patronage, and social exclusion, or the long-standing ethnic tensions between the *Merina* (highland residents) and *Cotiers* (coastal residents), as well as tensions among *Merina* subgroups (World Bank 2012a). Governance, particularly at the national level, has declined sharply since 2008, including in food security, education, and health. Institutional reform has been curtailed by lack of financing. Humanitarian response is increasingly coordinated by external operational actors (e.g., through the U.N. cluster system) with the state role marginalized, particularly at the national level. Governance is hampered by lack of civil society development. In the remote deep south, for example, rural farmers reported not knowing that an election was planned for 2013. Civil insecurity is also generated by armed cattle rustlers (*dahalo*) across a broad mountainous swath of the south and southeast.

2.2 Economic Trends and Poverty

From 2009 to 2012, economic growth stalled, public revenues from growth declined US$1.5 billion, and the GOM lost US$2.3 billion worth of aid (World Bank 2012b). Poverty has been entrenched in Madagascar since the 1970s due to poor governance and economic mismanagement. Political crises in 1991, 2002, and 2009 further reduced human welfare indices and curtailed international investment in Madagascar's development. Poverty is increasing in Madagascar: from 2005 to 2010, urban poverty increased by 2.2 percentage points while rural poverty increased by 8.7 percentage points as measured by the national poverty line (GOM 2011a). The 2010 National Periodic Household Survey found that more than three-quarters (77%) of households fell below the national poverty line (ibid.), and an estimated 92% of the country's population now lives on less than US$2 per day (World Bank 2013). See **Appendix 2** for more data related to select economic and poverty indicators for Madagascar.

2.3 Urbanization

Most of Madagascar's population lives in the countryside on less than US$1 per day. However, Madagascar's high rate of urbanization (3.9% annually, higher than the national annual population growth rate of 2.9% means that more than half of the population may reside in an urban center in the next 10 years (World Bank 2011b). The largest cities include Antananarivo, Antsirabe, Toamasina, Mahajanga,

Fianarantsoa, and Toliara. Rural-to-urban migration is fueled by rural-urban disparities in poverty, health, and education (see **Table 1**).

Table 1. Rural-Urban Disparities in Madagascar

	Rural	Urban	National average
% children 6–59 months of age stunted	50.9	43.4	50.1
% HH* with access to improved water source	33.1	86.6	41.3
% HH with access to improved sanitation	1.3	11.1	2.7
Percentage of households that are headed by females	21.0	29.3	22.3
Percentage of women who are literate	70.6	94.1	74.7
Percentage of population in top two quintiles of wealth	31.4	92.8	40.0
Percentage of women who are exposed to no media or exposed to media less than once per week	47.7	12.1	41.5
Percentage of women who deliver at a health facility	32.3	60.2	35.3
Neonatal mortality rate (per 1,000 live births)	24	26	24
Under-5 mortality rate (per 1,000 live births)	84	63	72

* HH = households.
Source: INSTAT and ICF Macro 2010.

These statistics belie an alarming reality: Madagascar's growing urban centers face enormous challenges, including a lack of education or economic opportunities, a physical infrastructure woefully ill-equipped to handle current urban population burdens, and a lack of a social protection system. Development strategies and efforts in Madagascar have predominantly focused on rural areas, and neither reliable data nor sound development policies are yet available for urban areas. Families relocating to urban areas, many of which are female-headed households (FHHs), lack access to the social support and redistribution mechanisms present in rural communities (World Bank 2011b). Employment opportunities center around petty trade, employment in free trade zones, urban and peri-urban agriculture, and unskilled informal work.

2.4 Land, Agriculture, and Rural Development Context

Nearly 80% of the Madagascar population currently lives in rural areas, where 78% of the economically active population is engaged in agriculture (World Bank 2011a). Although agriculture employs around four-fifths of the population, it accounts for only 26% of the national gross domestic product (GDP) (ibid.). The World Bank estimated that in 2010, almost three-fourths (70%) of Madagascar's land was farmed, and over a fifth (22%) was forested (World Bank 2010).

The land tenure situation is rife with discrepancies among overlapping land claims (Perrine et al. 2011). The GOM has repeatedly agreed to lease and/or sell "unused" land—which often has competing claims—to foreign interests. Led by the GOM *l'Observatoire Foncier* (Land Tenure Observatory), the GOM National Land Tenure Reform Program aims to resolve these discrepancies and provide for secure tenure for smallholders and private interests. By 2011, the GOM had established 406 *guichets fonciers* (land offices) and 56 land tenure and resource information centers (Durand, J.M. et al. 2011). However, a minority of households have land tenure certification or title deeds because they are too costly and *guichets fonciers* have not reached some rural locations. The loss of international aid (most importantly, the Millennium Challenge Corporation's Land Tenure Project program) has curtailed land reform progress (World Bank 2010). Issues related to gender and land tenure are discussed in **Section 2.6**.

In addition to land tenure, agriculture challenges include low soil quality and limited access to water or irrigation infrastructure; poor productivity due to limited availability and access to quality seeds and inputs; limited use of improved agriculture techniques, such as fallow periods, cover crops, minimum soil disturbance, crop rotation (or intercropping), compost and organic fertilizer, terracing, and construction of wind walls to prevent wind erosion; absence of functioning public or private agricultural extension services, such as through *Centre de Services Agricoles* (CSAs) (Agricultural Service Centers); and poor quality of transport infrastructure and very high cost of transport.

Despite investments in public infrastructure made before 2008, rural development suffers from the almost total cessation of investment in public infrastructure and the loss of development aid resulting from the political crisis. Although the Madagascar Action Plan, the country's national development plan, expired in 2012 and has remained largely unimplemented since 2009, it remains the de facto GOM development framework for both rural and urban areas.

2.5 Health and Nutrition Context

Since the pullout of the international donor community after the 2009 crisis, progress toward achieving the MDGs has stagnated or been reversed. The infant mortality rate is 48/1,000 live births, and the under-5 mortality rate is 72/1,000—the 48th highest rate in the world (INSTAT and ICF Macro 2010; UNICEF 2012). Across the 22 regions of the country, the prevalence of wasting (an indicator of global acute malnutrition) is 6%, which is considered medium according the World Health Organization (WHO) classification. However, the prevalence of stunting is 53% (very high), with the prevalence in some regions reaching 72% (in the Amoron'i Mania region) and the prevalence of severe stunting reaching 22% (INSTAT and World Bank, 2012). The 2008–2009 Demographic and Health Survey (DHS) showed that 27% of women of child-bearing age suffer from undernutrition (body mass index [BMI] < 18.5), with the prevalence being highest in the Amoron'i Mania region at 42% (INSTAT and ICF Macro 2010). With a fertility rate of 4.7 children per woman, 36% of Malagasy women are pregnant or have had a live birth before the age of 19 years. The maternal mortality rate is 440 deaths/100,000 live births (UNFPA 2011).

2.6 Gender and Youth Context

Although many Malagasy echo the view that men and women have equal (but different) rights, the reality is that gender inequality is deeply entrenched in Madagascar. Of 15 SADC countries, Madagascar ranks the fifth worst in terms of the overall SADC Gender and Development Index (SADC Southern Africa Gender Protocol Alliance 2012). Madagascar compares particularly poorly with regard to gender indicators related to participation in the media, sexual and reproductive health, representation in governance, and HIV and AIDS (ibid.). A National Action Plan on Gender and Development was in place from 2004 to 2008. The SADC is taking the lead on establishing policy and strategy frameworks for reducing gender inequality in Madagascar, under the umbrella of the SADC Protocol on Gender and Development (SADC Southern Africa Gender Protocol Alliance 2013). The GOM has signed but not yet ratified this protocol.

Women's household decision making and access to resources is inequitable in Madagascar. The 2008–2009 DHS found that, among married and employed women, 33% of women had primary control over their earnings. A third of women (32%) thought that a husband is justified in beating his wife for at least one of the following reasons: she burns the food, she argues with him, she goes out without telling him, she neglects the children, or she refuses to have sexual intercourse with him. The rate of agreement is higher in the capital region (46%) than in rural areas (31%). In comparison to women, a slightly lower percentage of Malagasy men (29%) believed that a husband is justified in beating his wife for one of the reasons mentioned above. In addition, there are indications that GBV is on the rise since the political and economic crisis began (INSTAT and ICF Macro 2010). There are no national data on GBV, but some

regional reports have estimated the prevalence of women having experienced GBV at 80% in Antsiranana Region and at 65% in the capital (SADC 2012).

In community interviews conducted for this FSCF, women stated that "men and women *discuss* how to spend money, and men *decide*." The extent to which this household discussion allows for women's views to be considered in negotiating decisions varies by household and by community, and can only be understood through local formative research. Men's control over expenditure is highest for all expenses beyond small routine household expenses. Women tend to have more control over income that they earn from petty trade, poultry sales, or gardening, while income from livestock and agriculture (cash crops and food crops, particularly irrigated) falls more under the control of men. Customary inheritance practices generally dictate that women who lose their husbands (widowed or left by the husband) also lose their land, which returns to the control of the husband's family. The woman, who often retains the children, must somehow earn a livelihood without land, or seek access to a small piece of marginalized land through negotiation with village leaders.

Forced labor of women and youth, sex trafficking, and sex tourism are reported to have increased since 2009 due to the economic crisis and the decline in the rule of law (USAID/Madagascar 2012). Girls are increasingly turning to sex work to afford food and school fees, and it is often reported that between a quarter and a half of sex workers are girls between 10 and 17 years of age (IRIN 2013b). Many children are recruited in urban areas under the guise of employment as wait staff, masseuses, and domestic servants. Communities are sometimes complicit. For example, a practice known as *Tsenan'Ampela* or "girls market" in southern Madagascar involves sending girls to markets where they must prostitute themselves to earn money to purchase groceries. A practice known as *Miletra* entails parents in the northeast forcing their daughters into prostitution, directly negotiating the price and duration in advance. The main clients of prostituted girls and boys are Malagasy men, but sex tourists include French, German, and Italian nationals (USAID/Madagascar 2012). Barriers to protection of these youth include a lack of public understanding and GOM policies that restrict services for sex workers under 18 years of age, for whom sex work is illegal.

It is estimated that one-third (33%) of Madagascar's population falls between the ages of 10 and 24 (Population Reference Bureau 2013). Youth face diminishing educational access and quality under the current crisis, and impacts on nutritional status and well-being are evident in the nutritional trends discussed below. Facing lack of opportunity, youth and young adults have played an active role in political unrest as they strive for more accountability in government and better schooling and economic prospects for young people.

2.7 Environment and Climate Change Context

Renowned for its biodiversity, Madagascar exhibits extraordinary climatic diversity as well. The semi-arid south and southwest receive less than 1,100 mm of rain per year, which supports drought-resistant baobab trees and other scrubby plant life. As one moves east and north, the environment changes to tropical forest and high rainfall levels are boosted by annual cyclones. Unregulated exploitation of forest resources for firewood and charcoal, logging for construction, and slash and burn for agriculture has devastated Madagascar's forest cover. Deforested land is unprotected and eroded, leading to acute flooding during cyclones and extreme rainfall. Climate change modeling projects that rainfall levels will increase in much of the country, tropical storms will be more frequent, and three to five tropical cyclones per year will increase in intensity (GOM 2011b). The political crisis lessens the capacity of the GOM to mitigate these threats by cutting regulatory and enforcement capacity, stalling land reform, and robbing local government offices of the resources to provide climate-sensitive guidance and extension services to smallholders.

The GOM has identified a number of likely adverse environmental trends related to climate change and poor natural resource management techniques. Agricultural productivity is projected to decline due to the loss in soil fertility, flooding, and drought. Livestock health may decline because of the increasing parasite burden, a difficulty finding forage, malnutrition, overstressed water resources, and increasing migration. Among the Malagasy people, the incidence of malaria, diarrhea, and respiratory infections is expected to grow. Madagascar's coastlines will gradually degrade and shift inland, and deforestation will erode wild animal populations through loss of habitat.

2.8 Humanitarian Context

In addition to the large-scale political shocks discussed elsewhere in this document, Madagascar is highly prone to rapid-onset environmental shocks. Tropical cyclones strike Madagascar annually, with the highest intensity from January through March. Storm frequency and intensity are highest on the eastern coast, and the mountain ridge that tracks north to south along the eastern side of the island intensifies flood damage (WFP and UNICEF 2011). Impacts of extreme rainfall events like cyclones differ by context. For example, when Cyclone Haruna struck southwest Madagascar in February 2013, it flooded and silted fields and rice paddies, destroyed irrigation infrastructure, destroyed up to three-quarters of crops (e.g., maize, cassava, groundnuts, lima beans, and cowpeas), destroyed livestock, triggered distress sales of livestock, led to looting of crops and livestock, damaged fishing equipment for fishing families, fueled a sharp rise in the price of rice, promoted locust infestation, necessitated increased debt by food-insecure families, and led to decreased food consumption and meal frequency (Madagascar Food Security and Livelihoods Cluster 2013). In contrast, by the time the cyclone reached drought-prone Androy Region, farmers had replanted maize and other crops to take advantage of the cyclone-related rainfall. Following Haruna, funding was being sought for a 3-year locust control plan to address the locust crisis threatening to engulf two-thirds of the island by September 2013 (UN OCHA ROSA 2013).

At the other end of the rainfall spectrum, droughts are also a common occurrence and have been increasing as rainfall variability increases (WFP and UNICEF 2011). As a broad generalization, rainfall is lowest in the south and southwest (< 1,100 mm/year) and increases as one moves toward the northeast, where it can reach 2,100 mm/year. The impact of drought varies depending on the vulnerability of the principal crops grown in the area to the effects of low rainfall (e.g., cassava is generally less vulnerable to drought than maize, beans (legumes), or vegetables), as well as the timing of the drought vis-à-vis stages of crop development.

The National Risk and Disaster Management Bureau provides leadership on preparedness, prevention, mitigation, response, and recovery to emergencies and disasters (GOM 2013a). The bureau supports Risk and Disaster Management committees from the national level to the local level, although the lack of a budget for emergency response (in the absence of a national declaration of emergency) limits the effectiveness of the local-level committees. The cluster system provides interagency forums for coordination of humanitarian response across these levels. Existing clusters include the food security and livelihoods; nutrition; health; water, sanitation and hygiene (WASH); logistics; protection; education; and shelter clusters (U.N. 2013).

2.9 Food Security Information Context

There is limited availability of reliable and population-representative food security, nutrition, and development data in Madagascar. Population estimates are derived from assumptions imposed on very outdated census data. National agricultural statistics are collected by the *Institut National de la Statistique* (INSTAT) (National Institute of Statistics) from the Ministry of Agriculture, but are not considered credible. A Food and Agriculture Organization of the United Nations/World Food Programme (FAO/WFP) Crop and Food Supply Assessment Mission is planned for 2013, and the Country Food

Security and Vulnerability Assessment Plus Nutrition (CFSVA+N) will be updated in 2013 as part of the MDG update exercise.

Data on the availability of market prices for agricultural commodities is somewhat better. The GOM reports Consumption Price Indices monthly, including for rice, energy, food products, clothing, basic utilities and housing, health care, and other categories of expenses, for seven major cities in Madagascar: Antananarivo, Fianarantsoa, Toamasina, Mahajanga, Toliara, Antsiranana, and Antsirabe (GOM 2013b). The *Réseau d'Observatoires Ruraux* (ROR) (Rural Observatory Network) and notably the *Observatoire de Riz* (ODR) (Rice Observatory) collect market price data from throughout the country. Additionally, WFP publishes early warning and market price information for Madagascar in two quarterly global documents, *The Global Food Security Update* and *The Market Monitor*. The GOM Permanent Pilot Team for the Rural Development Action Plan (EPP-PADR) conducts national household surveys on a range of variables, including work/employment, agriculture, off-farm activities, remittances/transfers, health, education, consumption/expenditure, poverty, vulnerability, and opinions/beliefs (GOM 2011a). The GOM Locust Control Center is underfunded, plagued by governance issues, and unable to manage the massive response required to respond to locust swarms like those seen in 2013 (ReliefWeb 2013).

The effectiveness of the national *Système d'Alerte Précoce* (SAP) (Early Warning System) is limited due to lack of funding, and because local transmissions of early warning information to district-level SAP offices and above often reportedly fail to elicit an acknowledgment or response. The USAID-funded Famine Early Warning Systems Network (FEWS NET) aims to establish a remote monitoring system for early warning in Madagascar, starting with a desk review and a livelihood zoning workshop in 2013 (FEWS NET 2013). WFP collaborates with the USAID-funded Strengthening and Accessing Livelihood Opportunities for Household Impacts (SALOHI) Project to implement a community-based early warning system in project communes. WFP also periodically produces a Food Security Monitoring System Bulletin for Madagascar.

UNICEF/Madagascar supports the *Office National de Nutrition* (ONN) (National Nutrition Office) in managing an intermittent nutrition surveillance program, which is active during humanitarian emergencies such as cyclones. Routine surveillance occurs in the communities where the *Program National de Nutrition Communautaire* (PNNC) (National Community Nutrition Program) and other programs conducting growth monitoring and promotion (GMP) are active. Current coverage of the PNNC is inadequate to consider the GMP reporting system a surveillance system, and the GMP results of other nongovernmental organization (NGO)-led projects are often not reported beyond the local level.

3. Food Security Context in Madagascar

3.1 Food Availability

3.1.1 Land Availability and Access

Land access is first and foremost limited by the land tenure issues discussed previously (see **Section 2.4**). Hilly topography, household labor constraints, traditional cultivation techniques, population growth, land inheritance practices, and competing land claims all lead to small and fragmented smallholder plots. Half (52%) of farming households cultivate less than 1 ha, and the average household plot size is 1.2 ha (WFP and UNICEF 2011). Parcel sizes are greatest in the southwest and the south, although land quality is poorer in those areas. Parcels are smallest in the highlands and the east (ibid.). In the highlands, most farmers express dissatisfaction with their land access, a constraint imposed by the hilly topography and high population density (ibid.). Demand is highest for lowlands that allow irrigation and/or flood recession agriculture, which can allow for extended and even multiple cropping seasons, whereas rain-fed and upland areas are restricted to a single season. Grazing lands are generally held communally. The dominant method of getting produce to market in Madagascar is still carrying it manually. Poor physical and economic access to markets, combined with poor rural storage facilities, is a disincentive to rural producers to produce a surplus. Estimates for land quality and use vary widely, hampered by lack of reliable assessments compounded by the practice of shifting cultivation (i.e., cultivation of a tract of land temporarily until fertility declines, then allowing the land to lay fallow while the producer shifts to another tract of land). **Appendix 3** illustrates regional variation in land ownership, irrigation, and crop planting diversity.

3.1.2 Production Systems, Levels, and Trends

Madagascar aims to be self-sufficient in rice production and to export excess rice production to the Indian Ocean market. The country produces around four-fifths of its domestic cereal needs in an average year, and needs to import around 200,000 MT of rice. The principal food crops (*vivriers*) for Madagascar are rice, cassava, maize, potatoes, beans, and sweet potatoes (see **Table 2**). Reliable agricultural production data are not available for Madagascar, and because crop assessment systems are underfunded due to the political crisis, it is not possible to evaluate the veracity of the rising production trend suggested by GOM data in **Table 3**.

Rice dominates Madagascar's agricultural production. Around 70% of cultivated land is sown in rice (WFP and UNICEF 2011), or around 1.9 million ha in 2011 (FAO 2013b). The GOM estimates that national rice production averaged around 4.3 million MT from 2007 to 2012 (see **Table 3**). Regions where rice production exceeded 500,000 MT in a year include Vakinankaratra and Alaotra Mangoro (GOM and INSTAT 2013). More than four-fifths of households report cultivating rice as their main crop (52% of households in the first season, and 30% of households in the second season) (ibid.).

The second most important crop is cassava, which is cultivated by three-quarters (74%) of households, but assumes predominance as a food crop in the semi-arid south where limited rainfall prevents widespread rice production (although cassava's long growing period over a short rainy season presents drought risk as well) (ibid.). Maize is grown throughout Madagascar and assumes the greatest contribution to the diet in the west and northwest part of the country, despite the fact that high water requirements for growing maize increase the likelihood of drought-related production shocks, particularly in the west and south.

Table 2. National Agricultural Production in Madagascar

Crop	Production (2007) (MT)	Production (2008) (MT)	Production (2009) (MT)	Production (2010) (MT)	Production (2011) (MT)	Production (2012) (MT)	Average (2007–2012) (MT)
Rice	*3,595,755	*3,914,175	*4,540,435	*4,737,965	*4,300,185	*4,550,649	4,273,194
Cassava	*2,993,585	*3,021,080	*3,048,290	*3,008,895	–	–	–
Maize	*453,385	*546,835	*505,154	*443,474	–	–	–
Potatoes	*894,555	*902,665	*910,845	*919,130	–	–	–
Beans (dry)	*79,854	*80,613	*82,118	*82,153	*99,418	–	–
Sweet potatoes	*894,553	*902,665	*910,857	*919,127	*860,041	–	–
Sugar cane	^2,600,000	^2,500,000	^3,000,000	^3,000,000	^3,000,000	–	–
Bananas	^325,000	^305,675	^352,252	^361,391	^314,979	–	–
Total	11,836,687	12,173,708	13,349,951	13,472,135	–	–	–

Sources: *GOM 2012b, ^FAO 2013b.

Table 3. Regional Population and Rice Production in Madagascar

Region	Population (est.) (2011)	Production (2007) (MT)	Production (2008) (MT)	Production (2009) (MT)	Production (2010) (MT)	Production (2011) (MT)	Production (2012) (MT)
Central Highlands							
Analamanga	3,173,077	295,010	252,325	292,700	289,965	234,315	281,178
Itasy	694,381	216,210	227,025	263,350	272,910	299,825	346,081
Bongolava	433,369	131,440	138,010	160,090	165,910	199,090	238,908
Southern Highlands							
Haute Matsiatra	1,136,260	250,980	307,690	356,920	392,575	331,315	366,517
Amoron'i Mania	677,508	108,400	131,680	152,750	167,340	148,585	162,462
Ihorombe	295,920	47,190	41,830	48,530	47,540	42,790	41,125
Vakinankaratra	1,708,685	295,290	416,180	485,980	552,335	487,755	585,306
East-Southeast							
Atsimo Atsinanana	851,545	123,090	116,935	135,640	127,825	90,765	86,264
Vatovavy Fitovinany	1,342,135	198,860	189,880	236,700	209,315	129,615	143,653
Atsinanana	1,204,006	124,535	130,760	171,970	169,895	112,185	99,396
Analanjirofo	980,817	101,280	106,350	124,510	130,315	105,395	119,018
Alaotra Mangoro	973,216	461,320	470,900	504,900	520,740	425,350	506,810
West							
Boeny	757,714	180,925	217,110	261,850	272,880	334,000	247,689
Sofia	1,181,603	299,410	344,320	416,410	426,670	392,070	383,522
Betsiboka	278,120	96,100	110,520	131,270	136,945	141,200	141,200
Melaky	274,399	55,775	64,140	74,405	79,370	65,445	75,474
Menabe	561,043	90,750	104,370	121,070	129,330	139,120	149,736
Southwest							
Atsimo Andrefana	1,247,663	159,470	183,390	212,730	217,060	196,300	158,947

Region	Population (est.) (2011)	Production (2007) (MT)	Production (2008) (MT)	Production (2009) (MT)	Production (2010) (MT)	Production (2011) (MT)	Production (2012) (MT)
Deep South							
Androy	695,423	26,190	27,400	31,780	32,900	40,710	40,122
Anosy	636,554	62,060	74,470	86,390	93,310	134,375	94,063
North							
Diana	663,289	110,780	99,710	115,660	113,860	94,910	105,792
Sava	929,342	160,690	159,180	154,830	188,975	155,070	177,387
National	20,696,069	3,595,755	3,914,175	4,540,435	4,737,965	4,300,185	4,550,649

Source: GOM and INSTAT 2013.

An estimated 40% of farmland is irrigated, but the quality and maintenance of irrigation infrastructure is often quite poor. Irrigation is least common in the south (World Bank 2006). On the surface, the extent of irrigation infrastructure may seem impressive, particularly by African standards, however most irrigation infrastructure fails to distribute water effectively and fairly to lowland fields. Irrigation is a GOM policy and investment priority and will likely be emphasized for funding under the Comprehensive Africa Agriculture Development Programme (CAADP) as the political situation normalizes. The weak capacity of water user associations, and the low motivation or willingness to pay for water maintenance or canal rehabilitation costs, undermine maintenance. In addition, water is a key flash point for conflict.

Public and private distribution systems for agricultural inputs (especially fertilizers, pesticides, and improved varieties) are weak, hampered by general underdevelopment of the private sector and high transport costs that make retail costs unaffordable for smallholders (World Bank 2010). A network of agriculture training centers exists, but the centers are very poorly funded and are focused on high production regions; 20% of these centers are in the public sector, 34% are in the private sector, and the remainder (46%) belongs to voluntary organizations, projects, and programs (GOM 2012a). The National Center for Applied Research and Rural Development is the GOM's focal point for agricultural research and development (FAO [ASTI Initiative] 2013).

Crop yields on smallholder farms are significantly lower than potential yields. The average yield for paddy rice is 2.63 MT/ha, while yields could approach or exceed 4 MT/ha with investment into improved techniques, inputs, and water management as seen in southeast Asia (FAO 2013b). The main constraints to agricultural productivity include:

- Access to water
- Land tenure insecurity
- Land degradation
- Limited access to water or irrigation infrastructure and poor quality of management of water where irrigation infrastructure exists
- Limited availability and access to quality seeds and inputs
- Limited use of improved agriculture techniques, such as fallow periods, cover crops, minimum soil disturbance, crop rotation (or intercropping), compost and organic fertilizer, terracing, and construction of wind walls to prevent wind erosion
- Absence of functioning public or private agricultural extension services, such as through CSAs
- Absence of drying, processing, and storage infrastructure
- Poor quality of transport infrastructure and very high cost of transport
- Lack of access to credit
- Low educational level, especially of rural producers
- Population migration due to physical (e.g., in the south) or economic insecurity

In Madagascar there are many enduring beliefs and taboos (*fady*) that have unfortunate food security and nutrition implications and would warrant examination in a multiyear food security program. For example, despite their high livestock holdings, many southern communities have taboos against handling manure, which has prevented its use as organic fertilizer. In addition, livestock herds belonging to different social groups and families are not supposed to mix. Fortunately, the collection and use of manure on fields and the mixing of unrelated families' herds are becoming more common where sensitization (including by SALOHI) has been conducted. Sensitization is also needed to address pasture-management practices. In some communities in the south, cultural norms prevent people from drying sweet potatoes, which exacerbates losses and curtails marketing—although there is no taboo against purchasing dried sweet potatoes in the market.

There are four broad categories of cultivated land in rural areas: land used for kitchen gardens, rain-fed/ upland plots, land used for flood recession agriculture, and lowland/irrigated plots. Managed by women, kitchen gardens are small gardens near homesteads designed to provide foods such as sweet potatoes for meals. Non-irrigated staples—particularly maize and cassava—are planted in upland plots. Flood recession agriculture (*bahiboho*) is conducted during the second season (*contre-saison)* and provides an important period of vegetable cultivation. Lowland and irrigated plots are typically planted with rice—two seasons of rice (water permitting) or rice followed by potatoes, beans, or vegetables (Ramaroson et al. 2011). Many rice-producing areas benefit from two seasons. Geographic variability notwithstanding, most of Madagascar plants for the main season in October through December, and harvests from March through May. The second season is planted in June and July and harvested September through November. See **Appendix 4** for an overall seasonal agricultural calendar for Madagascar.

3.1.3 Gender and Agricultural Production

While specific customs differ among ethnicities in Madagascar, many broad generalities can be drawn. Typically, a family's land in Madagascar is principally under the control of the man, who is responsible for social obligations related to family tombs (an important and expensive obligation in Madagascar) and who bears overall responsibility for the family's agricultural production. Because of the labor requirements of establishing and maintaining an irrigation system, irrigated land tends to be controlled by men. The main fields for food and cash crops tend to be primarily the responsibility of men. If a woman maintains a backyard garden (e.g., to diversify household consumption and grow items for the "sauce," such as tomatoes and onions), then that is under the woman's control. Women generally are responsible for poultry/fowl (chickens, ducks, and geese) and can manage small livestock (e.g., goats, sheep, and pigs), while men manage the cattle and often the small livestock.

Information on time management by sex in Madagascar indicates that women are almost solely responsible for household duties like child care, food production, water collection, and cleaning. These duties, combined with agricultural responsibilities, result in women having less time to sleep and rest than men for most of the year, underscoring the need to be sensitive toward the implications of programming strategies on the labor and time burden of women.

FHHs are greatly disadvantaged in the area of agricultural production. FHHs are less likely to own their land (i.e., where ownership is dictated by customary or formal/legal mechanisms) and more likely to rent their land (i.e., through sharecropping or "*mettayage"*) than non-FHHs. FHHs have a lower overall crop production, lower diversity of crops planted, a lower duration of food stocks to take them through the lean season, a higher likelihood of being net consumers of staple foods, a lower ability to hire labor to cultivate, lower livestock holdings, and less access to credit. These inequities seem to persist regardless of whether the husband died, moved away searching for work, or left the woman.

3.1.4 Livestock

Livestock is the backbone of the household economy for agropastoralists in the south of the country. In contrast, in the highlands animal herding constitutes a complementary income source (and diversification strategy) for farmers. Other than milk sales, livestock are generally kept as "household savings" and sold when cash is needed. Livestock population estimates are notoriously unreliable. Available data place the number of livestock in Madagascar at about 10 million cattle; 1.5 million pigs and goats; and 827,000 sheep. See **Appendix 5** for more details on livestock production.

3.1.5 Fishing and Aquaculture

For the small percentage of households who make their living through fishing (around 3%, according to WFP and UNICEF 2011), it is an economic lifeline. About half of the value of the fishing sector is derived from the shrimp subsector, which originates as both shrimp farming and wild-caught shrimp fishing. The fishing sector has suffered from a lack of policy frameworks and investment, but hopefully this will change under the newly established Ministry of Fishing and Fisheries.

3.1.6 Cereal Availability, Agricultural Trade, and National Food Stocks

Over four-fifths of Madagascar's cereal equivalent needs (80%–90%) are provided through domestic production, and an average of around 212,000 MT of imports were required over the period of 2007–2010 WFP and UNICEF 2011). Supply calculations take into account production, imports, exports, and stock changes, and it is alarming that food supply, fat supply, and protein supply have actually decreased in Madagascar compared to 1992 (FAO 2013b). Both agricultural exports and imports have declined since 2008. Unfortunately, comprehensive agricultural market performance studies are lacking in Madagascar, but several observations can be made. Imported rice tends to flow to major urban markets during the lean season (from October through March, peaking in March) to supplement the availability of domestically produced rice on local markets. Rice prices in domestic markets are more associated with domestic supply and demand than world market prices. Markets in surplus-producing zones tend to affect prices in deficit areas. Generally markets in the large central farming areas (surplus zones) tend to affect prices in the west, upper eastern coast and the southern highlands (demand destinations whose markets are closely integrated with those in the large central farming areas). These latter markets then tend to determine prices in the south and lower east coast, both of which are the most isolated in terms of markets in the country. The markets of Ambositra (Amoron'i Mania Region), Fianarantsoa (Haute Matsiatra Region), Avaradrano (Analamanga Region), Ambatondrazaka (Alaotra Mangoro Region), Ambato Boeny (Boeny Region), and Antananarivo and Atsimondrano (both in Analamanga Region) seem to play the greatest role in forecasting prices and organizing trade flows throughout Madagascar. It is worth noting that six of these seven markets are found in the highlands of the country. See **Appendix 6** for a list of the most important markets in Madagascar as well as the markets whose prices they are most likely to affect (based on a Granger causality analysis).

3.2 Food Access

3.2.1 Distribution of Food Insecurity

Tables 4 and 5 below present available food security data by region. FAO estimates that the prevalence of undernourishment has increased in Madagascar from 28% in 2004–2006 to 33% in 2010–2012 (FAO 2013b). In relative terms, food insecurity and poverty are worse in rural areas than urban. Among rural areas, existing population representative household surveys suggest that food insecurity is worst in the south, southwest, southeast, southern highlands, and east coast, as well as in Sofia Region in the northwest. The regions with the highest prevalence of rural food-insecure households ranked according to a composite indicator (based on a wealth index, food consumption score, coping strategy index, and per

capita monthly expenditures, in decreasing order, starting with the highest, which is the worst) are Atsimo Andrefana, Atsimo Atsinanana, Sofia, Androy, Anosy, Haute Matsiatra, and Vatovavy Fitovinany regions (WFP and UNICEF 2011). The regions with the worst mean household food consumption scores (in increasing order, starting with the lowest, which is the worst) are Atsimo Andrefana, Androy, Vatovavy Fitovinany, Itasy, Sofia, Atsimo Atsinanana, Anosy, Haute Matsiatra, and Analanjirofo regions (ibid.). In 2011, WFP found that the south had the highest prevalence of households facing food insecurity whether measured by food consumption, coping strategies, or food or cash access.

Both the 2010 GOM periodic household survey (GOM 2011a) and the CFSVA+N (WFP and UNICEF 2011) identified variables correlated to household food insecurity or poor household food consumption, which include poverty, location of residence, household demographics, labor categories, educational status, assets, coping strategies, and staple food purchase.

Temporal distribution of food insecurity has two main components: interannual fluctuation and seasonality. Food insecurity varies interannually with global food prices (although Madagascar's low dependence on global imports provides some buffering effect against world food price volatility); domestic production and domestic prices of rice, maize and cassava; and the severity of major shocks (especially cyclones). Food insecurity also follows a clear pattern of seasonality, with the period of October through March constituting the lean season for most of Madagascar. The issue of seasonality is discussed further in **Section 3.2.7.**

3.2.2 Food Consumption and Poverty

Poverty is a major determinant of food insecurity. In 2011, WFP and UNICEF found that food-insecure households have the lowest monthly per capita expenditures, the highest likelihood of falling into the poorest wealth quintile, the lowest food consumption score, and a high likelihood of employing stressful coping mechanisms in order to access food.

The regions where poverty is highest roughly correspond to those with the highest prevalence of food insecurity. See **Table 4** for the regions with the highest poverty and the highest expenditure on food, and see **Table 5** for the food consumption status and food security status of rural households in Madagascar.

3.2.3 Agricultural Trade and Smallholder Marketing

Most smallholders produce for household consumption and sell only what is required to earn income when needed. The majority of domestically produced rice that is produced specifically for commercialization originates in relatively few high-potential sites such as around Lac Alaotra (in Alaotra Mangoro Region) and the Marovoay Plains (in Boeny Region). Maize and wheat are often processed into flour, and barley and sugar cane are often used for beer/alcohol production. Most fruits and vegetables are simply harvested, cleaned, and sold fresh at local markets. Tree fruits and wild fruits tend to be harvested and sold within a short period of time. Beans, seeds, roots, and tubers (e.g., cowpeas, oilseeds, cassava, potato, sweet potato, and taro) are generally dried, minimally processed, and sold or consumed locally.

In terms of seasonality of sales and purchase, large-scale producers demonstrate peak rice sales around June, after the harvest is dried and threshed. Maize sales peak in June following a March–May harvest, and cassava is sold later (peaking in August/September) (WFP and UNICEF 2011). In the south and southwest, net purchasing households prefer to purchase rice in June when a market glut makes prices plummet. In the east and the highlands, households prefer to purchase rice when household stocks run low (e.g., between August and October). Cassava tends to be harvested in May–July, so cassava purchase peaks nationally in August when prices are lowest.

Except in the case of cyclones, market prices of staple food commodities exhibit relative stability in Madagascar. The consumption price index (CPI) has risen by around 10% per year, although the rise in non-food prices was much higher than the rise in food prices (WFP and UNICEF 2011). Rice prices have remained relatively stable (except following Cyclone Haruna), although the massive locust outbreak in the country is cause for concern for supply and price trends for the rest of the consumption year as well as prospects for production during the 2013–2014 production year (WFP 2013). Price monitoring is critical, as domestic rice prices are affected by domestic shortfalls as well as the price of imports from world markets.

The major constraints to agricultural commercialization include:

- Low prices earned by producers, which in turn discourages investment.
- Lack of social organization for production or sale, resulting in many producers selling simultaneously at very small scale.
- Lack of contracts or agreements between sellers and buyers, which would boost productivity and reduce uncertainty of profits.
- Lack of information about buyers or markets among producers, as well as education, literacy, and numeracy constraints.
- Lack of household or communal food storage facilities in most areas, which then imposes the need to sell at harvest and glut the market.
- Cultural tendencies toward individualism, social distrust within and among cultural/ethnic groups, and a tendency to await external solutions or assistance when problems arise, all of which discourage local social organization for community-led solutions.
- Poor and expensive transportation conditions, in which year-round passability of market feeder roads is rare. Walking with one's produce is the dominant method of transport to market, and drawn carts or motorized vehicles are few and far between.
- Lack of well-run and well-maintained processing and warehousing facilities. (WFP and UNICEF 2011; GOM 2004).

Cattle—particularly zebu cattle—are culturally important and preferred in the diet, as are sheep and goats. Yet commercialization of these animals suffers from organizational and capacity constraints of producers (as with agriculture); the tendency among smallholders to sell only in case of emergency; insufficiency of modern slaughterhouses; the need for animals to travel long distances to market or slaughter; seasonal fluctuations in grazing availability (and lack of alternative year-found fodder sources); and lack of well-functioning or affordable private sector veterinary services to combat disease (GOM 2004).

Underdevelopment of the dairy sub-sector derives from poor conditions of livestock and forage; poor quality and availability of local milk; high costs of shipping and collection; and lack of organization among suppliers. Dairy plants often use imported milk powder rather than local milk for these reasons; nevertheless, they often can't compete with small-scale local producers who produce small amounts of yogurt and cheese under unhygienic conditions. Most poultry are sold alive by smallholders and are slaughtered at the point of consumption. The fishing and aquaculture subsector includes wild-caught and farmed fish and shrimp. These commodities are primarily destined for export to France and Japan. Domestic sales are mainly fresh fish, although some aquaculture enterprises have been established.

Table 4. Regional Poverty and Food Purchase in Madagascar

Region	% HH in poverty			% HH expenditure spent on food	% HH food consumption from purchase
	Urban (2010)	Rural (2010)	Total (2010)		
Central Highlands					
Analamanga	44.2	61.7	54.5	52.1	67.5
Itasy	73.0	80.6	79.9	70.1	50.2
Bongolava	55.2	80.1	76.8	69.0	59.6
Southern Highlands					
Haute Matsiatra	55.5	91.1	84.7	65.0	49.7
Amoron'i Mania	61.0	88.2	85.2	70.1	51.3
Ihorombe	72.0	82.6	80.7	69.9	72.0
Vakinankaratra	59.5	80.1	75.8	65.8	51.8
East-Southeast					
Atsimo Atsinanana	63.1	97.5	94.5	74.3	63.9
Vatovavy Fitovinany	71.1	92.8	90.0	75.0	53.2
Atsinanana	60.2	88.7	82.1	69.5	54.5
Analanjirofo	59.4	89.1	83.5	63.9	51.7
Alaotra Mangoro	47.5	72.2	68.2	68.9	57.3
West					
Boeny	45.2	69.9	62.6	67.1	58.5
Sofia	52.8	73.8	71.5	68.4	51.2
Betsiboka	66.4	84.7	82.2	73.8	54.4
Melaky	60.5	85.8	80.2	72.5	53.0
Menabe	38.9	72.5	64.2	67.0	64.4
Southwest					
Atsimo Andrefana	65.9	87.4	82.1	68.7	77.5
Deep South					
Androy	94.4	94.3	94.4	72.8	53.8
Anosy	55.1	87.6	83.5	70.3	58.4
North					
Diana	31.7	69.2	54.4	60.0	67.9
Sava	38.9	78.7	74.9	69.6	55.7
National	54.2	82.2	76.5	65.5	58.9

Source: GOM 2011a.

Table 5. Food Consumption Status and Food Security Status of Rural Households in Madagascar (2011)

Region	Mean HH food consumption score (FCS)	HH by food security classification status (%)		% HH net consumers of staple food (%)			% HH in each livelihood group (%)			
		Food insecure	Vulnerable to food insecurity	Rice	Maize	Cassava	Small farmers	Informal sector workers	Casual laborers	Other
Central Highlands										
Analamanga	50.17	16.0	41.2	49.4	52.4	53.2	6.6	24.0	14.9	54.5
Itasy	31.43	3.7	92.0	39.7	14.5	10.7	16.7	14.2	47.5	21.6
Bongolava	44.77	11.1	59.3	19.0	4.3	15.6	28.1	7.5	5.0	59.4
Southern Highlands										
Haute Matsiatra	35.16	52.8	34.5	51.4	20.5	25.0	25.0	21.5	11.8	41.7
Amoron'i Mania	41.33	13.6	68.8	61.8	50.8	60.7	14.5	37.1	21.8	26.6
Ihorombe	46.80	22.1	44.8	72.4	28.0	46.7	12.1	9.7	13.3	64.9
Vakinankaratra	44.54	20.6	57.3	57.5	43.5	42.7	7.1	32.3	17.3	43.3
East-Southeast										
Atsimo Atsinanana	33.61	71.3	21.6	75.9	0.0	64.4	9.7	18.3	33.1	38.9
Vatovavy Fitovinany	28.17	47.3	51.4	71.6	0.0	61.5	31.1	16.2	24.8	27.9
Atsinanana	38.26	30.5	55.2	52.2	12.1	32.3	11.8	20.8	12.7	54.7
Analanjirofo	35.30	13.6	76.7	60.1	11.1	4.6	25.4	12.7	20.8	41.1
Alaotra Mangoro	40.72	9.3	73.9	38.1	1.9	11.9	6.2	24.2	21.1	48.5
West										
Boeny	47.03	8.1	64.1	41.7	31.1	27.8	23.7	20.1	12.9	43.3
Sofia	31.95	65.9	30.4	31.4	28.3	26.8	25.1	19.6	9.6	45.7
Betsiboka	44.22	22.9	57.6	42.5	19.0	29.4	9.5	29.5	7.1	53.9
Melaky	44.91	12.8	73.2	54.5	22.8	27.5	8.8	18.1	9.3	63.8
Menabe	49.02	29.2	42.9	35.9	35.1	61.7	27.9	8.4	5.1	58.6
Southwest										
Atsimo Andrefana	20.90	75.9	17.4	42.9	82.1	89.3	42.3	12.2	11.2	34.3
Deep South										
Androy	27.13	63.4	26.5	63.2	62.3	86.7	12.3	20.8	17.5	49.4
Anosy	34.27	53.4	26.7	61.2	37.5	76.0	19.0	22.4	8.4	50.2
North										
Diana	40.63	31.6	23.6	62.0	22.7	47.6	21.6	11.6	2.6	64.2
Sava	32.01	34.9	53.1	70.2	0.0	25.0	22.3	28.5	11.2	38.0
Rural Madagascar	37.12	35.2	47.9	53.6	34.3	44.0	19.6	20.2	16.0	44.2

Source: WFP and UNICEF 2011.

3.2.4 Livelihoods and Off-Farm Income Generation

At national level, the agriculture sector is not expanding sufficiently to absorb the population seeking work, a factor which fuels rural-to-urban migration (World Bank 2010). The locust outbreak may also drastically reduce production during the 2013-2014 season if the national response plan is not fully funded and implemented, further forcing households to seek off-farm income for survival. Off-farm income opportunities are insufficient to fill in the gap, for a number of reasons. In 2010, the U.S. terminated Madagascar's duty free access to U.S. markets under the African Growth and Opportunities Act due to the political crisis. As a result, formal employment in the free trade (export processing) zones, including the agroprocessing and textile industries, declined sharply as the reintroduction of import duties to the U.S. made factories unprofitable. Economic and job trends have put enormous pressure on the urban and periurban informal job market, which is saturated. The GOM is no longer able to fund the publically funded construction and public works that provided large-scale employment previously. Political uncertainty has reduced tourism and tourism-related profits from goods and services (e.g., handicrafts). Reduced investment and economic decline dampens demand for timber for construction. And while the mining sector continues to expand in terms of overall value and contribution to GDP, mining-related job creation remains localized to mining sites.

In rural areas, income groups have been identified based upon households' stated main income source (WFP and UNICEF 2011). The income groups, and the percentage of households in each group, include:

- **Smallholder farmers (20% of households).** Small farming households, which cultivate less than 1 hectare and earn the large majority of their income from agriculture, spend a third (33%) of their expenditure on rice/cereals and 11% on tubers.
- **Informal sector workers (20% of households).** Informal sector workers tend to perform a lot of agricultural labor, but unlike casual laborers, they work without a contract. This group spends more than a third (36%) of their expenditure on rice/cereals and 7% on tubers.
- **Medium- and large-scale farmers (19% of households).** Defined as farmers who cultivate 1 ha or more of land, medium- and large-scale farmers spend a little over a quarter (27%) of their expenditure on rice/cereals and only 3% on tubers.
- **Casual laborers (16% of households)**. Casual laborers work in both on-farm and off-farm activities, under contract with their employers. They spend almost half (44%) of their expenditure on rice/cereals and another 9% on tubers. Agricultural labor peaks during the cultivation and harvest period, but off-farm labor (e.g., driving, serving as a guard, engaging in petty trade) remains fairly constant throughout the year.
- **Agropastoralists (7% of households)**. Agropastoralists spend a quarter (24%) of their expenditure on rice/cereals and another 14% on tubers.
- **Households receiving public salaries and/or remittances (5% of households)**. These households collectively spend a little over a third of their expenditure on rice/cereals (31%) and tubers (4%).
- **Households primarily earning their income through fishing (3% of households)**. These households collectively spend almost half of their expenditure on rice/cereals (37%) and tubers (11%).
- **Households receiving a private salary (3% of households)**. These households collectively spend a little over a third of their expenditure on rice/cereals (31%) and tubers (4%).
- **Agricultural laborers (2% of households)**. These households spend 39% of their expenditure on rice/cereals and another 15% on tubers.
- **Other activities (6% of households)**. The small percentage of households whose main income source does not fall under the above categories spends an average of 37% of their expenditure on rice/cereals and 6% on tubers.

Four income groups—smallholder farmers, informal sector workers, medium- and large-scale farmers, and casual laborers—account for the majority (75%) of Madagascar's rural population. The poorest livelihood groups (as defined by asset ownership) are the casual laborers and the smallholder farmers. Similarly, food insecurity is most pervasive among these two groups. A large percentage of smallholder farmers (47%), casual laborers (43%), and informal sector workers (47%) are food insecure.

3.2.5 Food Purchase

Poor rural households spend two thirds (66%) of their expenditure on food, and the percentage of expenditure allocated to food is 65% nationally (see **Table 4**). Several factors influence variation in food purchase:

- There is a significant rural-urban difference: Rural households (who tend to be cash-poor) spend 72% of their expenditure on food, and urban households spend 52% of their expenditure on food (GOM 2011a).
- Rates of household expenditure on food are highest in Vatovavy Fitovinany (75%), Atsimo Atsinanana (74%), Betsiboka (74%), Melaky (73%), Androy (73%), Anosy (70%), Amoron'i Mania (70%), and Itasy (70%) regions (GOM 2011a).
- Rates of household expenditure on food also vary by income group. Relative expenditure on food is highest among casual laborers (74%), fisher folk (68%), agricultural laborers (68%), smallholder farmers (67%), and informal laborers (67%) (WFP and UNICEF 2011).
- The regions in which residents are the most dependent on the market for food (i.e., where the percentage of food consumption obtained via market purchase is highest) are: Diana (83%), Atsimo Andrefana (80%), Menabe and Boeny (76% each), and Ihorombe (75%).

3.2.6 Coping Strategies

Half (50%) of Malagasy households faced a significant food security shock in 2010. More alarming, it is estimated that over two-thirds of Madagascar may be affected by locusts by the 2013–2014 season's planting period, and exposure to locusts will be widespread in Madagascar if the control program is not fully funded and implemented to scale. Households that are extremely poor reported facing shocks more often (59% of households) than poor households (46%), who in turn faced shocks more often than non-poor households (40%) (GOM 2011a). More rural households reported facing shock than urban households (53% vs. 41%, respectively). Environmental or climatic shocks (e.g., drought, flooding, locusts, cyclone, crop diseases, and late rains) are reported to account for two-thirds (67%) of shocks, while economic shocks accounted for another 15%, followed by insecurity (9%) and illness or death (8%). Urban households reported economic shocks more frequently than rural households, while rural households reported environmental/climatic shocks more frequently than their urban counterparts. The four regions with the largest percentage of households affected by shocks were located in the east, south, and southern highlands: Androy (98%), Vatovavy Fitovinany (91%), Anosy (85%), and Haute Matsiatra (72%). Among households affected by shocks, the majority (83%) reported losing income as a result, while only a fourth (25%) reported losing assets. When asked how long it would take for them to recover from the shock, almost three-quarters (72%) said it would take more than 1 year or they would never recover (GOM 2011a).

Coping strategies that Malagasy households regularly use to manage shocks they routinely face include reducing the daily food ration (consumption), switching to less preferred foods, reducing the number of meals eaten per day, reducing adult food intake, borrowing food or cash to purchase food (or "receiving gifts"), working more, and selling assets (WFP and UNICEF 2011; GOM 2011a). Just over half of rural households always or often reduce rations and switch to less preferred foods to cope (WFP and UNICEF 2011).

The south has the highest coping strategies index, an indicator for the extent/severity of coping strategies used. The south also reported the highest frequency of using each of the above mentioned coping strategies, followed by the east and the west/southwest (ibid.). Agricultural laborers, smallholder farmers, and casual laborers reported the greatest extent of coping among all income groups.

3.2.7 Seasonality of Food Insecurity

As noted in **Sections 2.7 and 2.8**, most shocks affecting the Malagasy population are environmental/climatic. The ongoing locust crisis threatens to infest two-thirds of the country by September 2013 when planting should occur, and more than 630,000 MT of rice may be lost (FAO 2013a). Cyclones and flooding most frequently occur between January and March, with the east coast at greatest risk. Drought tends to strike the south and southwest most frequently. The agricultural sector employs the majority of Madagascar's population, and production and income follow a seasonal pattern that varies somewhat by agroecological zone (see **Appendix 4**). The lean season for most of the country is from October through March, with prices typically peaking in March. For the southern and southwestern cassava-producing zones, the lack of food and cash reportedly reaches its maximum around September, prior to the first season harvest, and then it declines thereafter.

3.3 Food Utilization/Consumption

3.3.1 Trends in Child Health and Nutritional Status

Anthropometric Status

Low birth weight (<2.5 kg) is a risk factor for stunting, morbidity, and mortality. National data estimate the prevalence of low birth weight at 13% in Madagascar. In a healthy population, only 3% of newborns are expected to weigh < 2.5 kg.

The national prevalence of stunting in children under 5 years, 53%, indicates a very high level of chronic and likely intergenerational nutritional deficiencies (see **Table 6**). The national prevalence of underweight in children under 5 is 30%, which is considered very high. Wasting, an indicator of acute malnutrition, has been recently estimated to be prevalent in 6% of Malagasy children, which is an improvement from the 13% prevalence estimate of 2003–2004. (INSTAT and World Bank 2012; INSTAT and ORC Macro 2005).

Regionally, the areas with the highest prevalence of both rural and urban stunting are the regions of Haute Matsiatra and Amoron'i Mania in the southern highlands, with stunting prevalences of 72% and 69%, respectively. The regional distribution of underweight follows similar patterns, with the highest prevalence of underweight in rural areas of Amoron'i Mania, Itasy, and Vakinankaratra (44%, 42%, and 37%, respectively).

Wasting prevalence in rural areas of Madagascar follows a slightly different pattern, with highest levels in the regions of Vatovavy Fitovinany, Atsimo Andrefana, Diana, and Sofia (9%, 8%, 8%, and 8%, respectively) (WFP and UNICEF 2011). The geographical dispersion of these regions—across the east coast, the southwest, and the north— might be related to recent shocks that these regions experienced prior to the administration of the survey, since wasting is an indicator of acute malnutrition.

The 1,000-day period from conception to age 2 is the crucial period of children's linear growth and development. By 6 months of age, 24% of Malagasy children are stunted, with the prevalence reaching a plateau of around 50% at 18–23 months of age (INSTAT and ICF Macro 2010). Boys have a higher prevalence of stunting than girls nationally (53% vs. 47%), and the same sex-difference is seen in rural

Madagascar for wasting (6% vs. 5%). This pattern is commonly observed in undernutrition, with boys tending to be more vulnerable to becoming malnourished.

Micronutrient Status

Iron is required for adequate development and growth, and children in Madagascar do not consume enough foods rich in this key micronutrient, which is typically found in animal-source food. The situation is a little better for vitamin A, a micronutrient found in green- and orange-colored fruits and vegetables and animal-source foods, also key for child development and growth.

Iodine deficiency can lead to pregnancy complications, mental retardation, and even mortality in children. The 2008–2009 DHS found that less than half of Malagasy children lived in households with adequately iodized salt (INSTAT and ICF Macro 2010). Iodine deficiency is associated with stunting, as well as various cognitive and developmental impairments. See **Table 6** for regional data on child health related to micronutrients.

Infant and Young Child Feeding

Appropriate feeding practices in infancy are critical for ensuring adequate nutritional status throughout a child's life. These practices include early initiation of breastfeeding (within 1 hour of birth), exclusive breastfeeding throughout the child's first 6 months of life, and continued breastfeeding up to 24 months and beyond, as breastfeeding confers numerous nutritional, immunological, and developmental benefits for the child.

Breastfeeding practices vary by the child's sex: although 74% of girls and 71% of boys are put to the breast within 1 hour of birth, respectively, the median duration of breastfeeding is 3 months for girls and 2 months for boys; and in 2011, in rural areas, a significantly lower proportion of boys (68%) than girls (82%) were exclusively breastfed (WFP and UNICEF, 2011). Note that the national breastfeeding indicators from the 2008–2009 DHS are not comparable to the 2011 rural Madagascar indicators form the CFSVA+N, as different definitions of the indicators were used.

In Madagascar, complementary feeding practices in children 6–23 months are largely suboptimal, with rural areas faring worse than urban areas. There's an extremely low prevalence of children fed with the minimum recommended frequency of meals (4% nationally), which with a 63% prevalence of minimum dietary diversity, leads to a very low prevalence of children 6–23 months with a minimum acceptable diet (3%). See **Table 6** for regional data on infant and young child feeding.

Health

Anemia is widely prevalent in Malagasy children. Data from the 2008–2009 DHS show the national prevalence at 50%, which is considered indicative of a very serious public health problem. The national prevalence of malaria in children under 5 was 9% (INSTAT and ICF Macro 2010). This varied by location, with prevalence in rural areas (9%) four times that of the prevalence in urban areas (2%). This prevalence is also substantially lower in the areas of the central highlands covered by the national Indoor Residual Spraying campaign (4%), compared with other areas not covered by the campaign (13%). See **Table 6** for regional data on child health.

3.3.2 Trends in Maternal Health and Nutritional Status

Maternal anthropometry and nutritional status are important predictors of child malnutrition. Reflective of the intergenerational prevalence of malnutrition, undernutrition in women of childbearing age (BMI <18.5), is widely prevalent in Madagascar. The national prevalence of undernutrition among women ages 15–49 is 27%. In the lowest wealth quintile, the prevalence is even higher at 33%. The undernutrition rate

among women ages 15–19 is 28%. There are particularly high prevalences of undernutrition in women of childbearing age in Amoron'i Mania (42%) and Haute Matsiatra (38%). Anemia in women of childbearing age is also prevalent, with a prevalence of 35% nationally and higher rates in the regions of Boeny (57%) and Atsimo Atsinanana (53%).

Care-seeking and preventive services during pregnancy and childbirth are far from optimal in Madagascar. In pregnancy, a little less than half of women received intermittent preventive treatment for malaria during pregnancy, and a little less than half slept under an ITN the night before the interview. In addition, more than half of mothers of children born in the last 5 years did not take iron/folic acid supplements during their last pregnancy, and only 44% of births were attended by skilled personnel. Iron/folic acid supplementation coverage during pregnancy also varied by region, with only 39% of women in the region of Androy taking the supplements, compared to 74% in the Analamanga region. Birth attendance by skilled personnel also varied by region: 12% of births in the east coast region of Vatovavy Fitovinany were attended by skilled personnel, compared to 74% in Analamanga. See **Table 7** for related indicators for maternal health and nutrition and reproductive health in Madagascar.

3.3.3 Water, Hygiene, and Sanitation

Access to clean and safe water and food sources, latrines, a clean household environment, and good handwashing and hygiene practices are key to ensuring a low level of infections and an adequate environment for the growth and development of children. Even if an optimal diet were provided, recurring infections can lead to a loss of nutrients, and a chronic state of infection can lead to impaired absorption of nutrients and stunting in children (Humphrey 2009). According to the 2011 CSFVA+N survey, only 26% of rural households have access to a safe water source in the dry season (see **Appendix 7**). This varies from 10% in the regions of Sofia and Androy to 60% in Itasy. The percentage of rural households with access to safe sanitation is 2%.

Table 6. Trends in Child Health and Nutritional Status

Location	Prevalence of Malnutrition			Micronutrient Nutrition[c]				Infant and Young Child Feeding		Complementary Feeding Practices among Children 6–23 Months[c, d]			Illness Prevalence and Prevention[c]		
	% of children under 5 stunted[a]	% of children 6–59 months underweight[a]	% of children 6–59 months wasted (in rural areas)[b]	Percentage of children 6–35 months consuming iron-rich foods in the past 24 hours	Percent of children 6–35 months consuming vitamin A-rich foods in the past 24 hours	Percentage of children 6–59 months living in a house with adequately iodized salt	Percentage of children 6–59 months who have received a vitamin A supplement in the past 6 months	% of children born in the last 5 y who were put to the breast within 1 hour of birth[c]	Median duration (months) of exclusive breastfeeding[c]	Percentage of children with minimum diet diversity	Percentage with minimum feeding frequency	Percentage with minimum acceptable diet	Percentage of children 6–59 months who are anemic	Percentage of children 6–59 months who received deworming treatment in the past 6 months	Percentage of children under 5 who have slept under an ITN the past night
Central Highlands															
Analamanga	57	31	3	64	83	75	81	70	2	80	11	8	36	76	30
Itasy	63	42	5	52	79	68	84	72	3	80	1	1	39	78	5
Bongolava	65	33	6	53	87	83	68	75	3	78	0	0	40	68	46
Southern Highlands															
Haute Matsiatra	72	36	4	36	85	5	85	73	4	80	2	2	48	76	27
Amoron'i Mania	69	44	4	40	86	20	82	82	3	75	2	1	39	76	12
Ihorombe	47	24	5	54	88	4	67	54	2	60	1	0	50	65	46
Vakinankaratra	66	37	5	34	73	18	75	84	4	55	7	5	35	71	11
East-Southeast															
Atsimo Atsinanana	52	31	5	25	72	19	64	65	4	35	1	1	64	66	49
Vatovavy Fitovinany	55	28	9	32	78	59	69	61	2	63	3	2	67	68	66
Atsinanana	42	24	3	40	82	83	76	89	4	57	7	6	55	75	71
Analanjirofo	55	36	3	40	76	75	74	89	3	67	0	0	62	81	78
Alaotra Mangoro	54	29	5	48	84	85	83	70	3	69	1	0	50	77	61
West															
Boeny	38	19	5	66	85	69	67	65	1	66	2	1	65	61	60
Sofia	43	29	8	62	90	81	72	76	1	80	11	10	49	73	70
Betsiboka	53	34	6	62	86	79	69	64	1	67	1	0	25	73	64
Melaky	33	21	5	65	88	19	56	69	2	67	4	0	47	46	67
Menabe	34	13	3	61	79	26	66	62	2	33	0	0	67	58	60
Southwest															
Atsimo Andrefana	39	20	8	43	54	2	63	62	1	37	1	1	56	57	51
Deep South															
Androy	45	24	5	16	65	1	51	82	1	39	2	0	65	43	44
Anosy	58	31	6	38	75	7	53	66	1	47	3	1	61	57	49
North															
Diana	19	15	8	72	85	86	63	76	1	59	2	2	70	62	84
Sava	47	27	2	32	75	48	60	68	1	57	0	0	56	61	72
National	53	30	6[a]	46	88	47	72	72	2	63	4	3	50	69	47
Rural	50.9[b]	28[b]	5	43	72	44	72	73	2	61	3	2	51	69	45
Urban	43.4[c]	n/a	n/a	69	82	68	78	71	3	82	11	8	48	74	57

Sources: a: INSTAT and World Bank 2012. b: WFP and UNICEF 2011. c: INSTAT and ICF Macro 2010. d: National-level data.

Table 7. Select Indicators for Maternal Health and Nutrition and Reproductive Health in Madagascar

Location	Maternal Health and Nutrition		Reproductive Health			
	% of women 15–49 with BMI < 18.5	% of women 15–49 who are anemic	% of pregnant women 15–49 years of age who slept under an ITN the night before the interview	% of mothers of children 0–23 months who received intermittent preventative treatment for malaria during pregnancy	% of mothers of children born in last 5 y who took iron/folic acid supplements while pregnant with youngest child	% of children born in last 5 y whose births were attended by skilled personnel
Central Highlands						
Analamanga	20	26	19	52	74	74
Itasy	29	30	2	30	65	73
Bongolava	5	33	26	60	65	53
Southern Highlands						
Haute Matsiatra	38	29	19	39	53	38
Amoron'i Mania	42	22	12	42	58	44
Ihorombe	25	38	53	43	61	30
Vakinankaratra	26	23	9	39	51	32
East-Southeast						
Atsimo Atsinanana	37	53	51	44	47	22
Vatovavy Fitovinany	36	52	71	44	50	12
Atsinanana	30	38	69	64	66	48
Analanjirofo	37	42	83	61	61	24
Alaotra Mangoro	22	28	62	60	72	64
West						
Boeny	28	57	45	48	58	60
Sofia	23	37	73	66	67	41
Betsiboka	20	29	62	38	58	51
Melaky	19	37	57	40	40	33
Menabe	23	41	52	51	47	41
Southwest						
Atsimo Andrefana	27	35	48	41	61	35
Deep South						
Androy	30	46	51	42	39	25
Anosy	24	51	39	53	49	36
North						
Diana	26	49	86	55	58	46
Sava	22	39	81	54	44	50
National	27	35	47	48	59	44
Rural	28	36	46	47	57	39
Urban	21	31	51	61	72	82

Source: INSTAT and ICF Macro 2010.

3.3.4 Gender and Nutrition

Women in Madagascar have a key role in the nutrition and food security status of their families and households. They are the principal meal preparers and caregivers for their children, and they have responsibility for acquiring and/or producing food.

Women's control over income is associated with better household nutritional status. Among married women ages 15–49, 33% controlled their own income, while 63% shared control with their spouse (INSTAT and ICF Macro 2010). Interestingly, although girls 15–19 years of age usually have the least decision-making power in developing countries relative to their older peers, in Madagascar, 40% of this group controls their own income. **Table 8** illustrates the differences in decision making within the household among women in a committed union with a male partner.

Table 8. Gender and Household Decision-Making in Madagascar

	Principally the woman (%)	Principally the man (%)	Both woman and man together (%)	Other (%)
Women's personal health care	40	11	48	1
Gross household expenses	19	13	67	1
Daily household purchases	65	5	29	1
Visiting her relatives/parents	16	10	73	0

Source: INSTAT and ICF Macro 2010.

3.3.5 HIV

Madagascar has a low prevalence of HIV infections, estimated in 2010 by UNAIDS to affect 0.37% of the population (Republic of Madagascar 2012b). While this is a very low prevalence, it has increased from 0.02% in 1989 and 0.13% in 2007. The group at highest risk for transmission is men who have sex with men, with 1 in 7 infected. Despite a nearly universal practice of male circumcision, risk factors such as multiple partners in men and the sex trade in urban centers have prompted the GOM to devise a response plan to reverse the trend in rising HIV infection rates and reduce the impact of the epidemic.

3.4 Regions and Populations Vulnerable to Food Insecurity

USAID/FFP advises that Title II development programs target regions and population groups at greatest risk of chronic food insecurity, based upon an understanding of the food security shocks they face, their sources of vulnerability, and their capacity to mitigate the effects of those shocks.

The USAID conceptual framework for resilience (see **Figure 1 in Section 1**) provides a structure in which the following principal contributors to chronic food insecurity and chronic malnutrition can be examined:

- **Chronic poverty.** Poverty is becoming both more prevalent and deeper due to the ongoing political crisis, which has stalled economic development efforts and cut access to GOM services and internationally funded development efforts.
- **Exposure to shocks and stresses.** Climate change is aggravating the frequency of cyclones, flooding, and drought. Market price fluctuations remain a shock to smallholders and consumers. And perhaps most importantly, the political crisis remains unresolved.
- **Adaptive capacity.** Adaptive capacity among the Malagasy people is undermined by factors related to nutrition and health, livelihood strategies, economic opportunities, environment, WASH, and access to education. Chronic malnutrition rates are very high, especially in the highland regions of Amoron'i Mania and Haute Matsiatra. Potential causes include suboptimal infant and

young child feeding (IYCF) practices and low dietary quality. In the south, southeast, and southwest, dietary insufficiency is also a contributor to chronic malnutrition. Regarding livelihoods, constraints include the predominance of low-productivity smallholder agriculture with insecure land tenure, low access to inputs, low knowledge of improved techniques, lack of social organization, slow rollout of land tenure offices to remote areas, and inadequate land access for FHH. The food marketing environment is marked by poor access to rural markets, high transport costs, limited processing and storage capacity, weak bargaining power among producers, loss of off-farm jobs during political crisis, and low education attainment. In the area of environment and WASH, widespread environmental degradation and very low access to improved water and sanitation undermine adaptive capacity. Finally, under the political crisis, school enrollment rates are declining, and most people work in agriculture or informal sectors without job security.

- **Risk reduction.** People's ability to reduce risk through risk assessment, early warning and response, disaster risk reduction, social protection and safety nets, and conflict prevention and mitigation is very poor at the individual, community, and state levels. The national early warning and response system is very weak due to the political crisis and low technical and financial capacity for risk assessment and response. In SALOHI areas, people are beginning to understand vulnerability in a way that can underpin a rapid response program; however, most people think of vulnerability as exposure to cyclones and lack of access to irrigation. Social protection and safety net systems do not exist. Conflict is related to the political crisis but is also rooted in sociocultural and regional competition and endemic corruption. An election may signal the return to sufficient stability for resumption of development, but an election in itself is insufficient to address endemic roots of corruption.
- **Governance.** Governance is poor from the central to community levels. Inter-ethnic and socioeconomic conflict is endemic, and land tenure insecurity is normative.
- **Gender equality.** A false sense of gender equality exists that can make it difficult to generate genuine public discussion about challenges that women face economically and socially.[3]
- **Climate change.** Climate change is increasing the projected frequency of intense rainfall events in Madagascar, with consequent flooding, displacement, loss of herds and assets, and loss of crops.

There are regional differences in determinants of food insecurity. In general, in the highlands, behaviors are much more the major determinant of chronic malnutrition, whereas in the south, southeast, and southwest, poor food access and frequent shocks are the major causes.

Based upon this analysis as well as the review of secondary data, the following household- and individual-level variables are correlated at the national level to higher risk of acute food insecurity or poor household food consumption:

- **Region of residence.** People are at greatest risk of food insecurity if living in rural areas, in the arid south, or in the cyclone-prone east coast.
- **Livelihood activity and income source.** Households are at greatest risk if they fall into the category of smallholder farmers, casual laborers, or informal sector workers.

[3] For USAID, gender equality is a broad concept and a goal for development. It is achieved when men and women have equal rights, freedoms, conditions, and opportunities for realizing their full potential and for contributing to and benefiting from economic, social, cultural, and political development. It means society values men and women equally for their similarities and differences and the diverse roles they play. It signifies the outcomes that result from gender equity strategies and processes. USAID defines gender equity as the process of being fair to women and men. To ensure fairness, measures must often be available to compensate for historical and social disadvantages that prevent women and men from otherwise operating on a level playing field. Equity leads to equality.

- **Household demographics.** Households are at greatest risk if they are FHH, have a larger number of members, have a higher percentage of dependents (particularly children under 5), are headed by a young adult or elderly adult, or suffer the death of a household member.
- **Educational status.** Lower educational attainment of the household head is associated with household food insecurity.
- **Assets.** Food insecurity is associated with lower access to livestock, lack of access to potable water, cultivation of less land, cultivation of a lower variety of crops, lower overall cereal production, and a longer lean season.
- **Coping strategies.** Households that rely on receiving gifts and/or hunting and gathering are more likely to be food insecure.
- **Household staple food access.** Households that are net consumers (i.e., in deficit) rather than net producers (i.e., with surplus) are more likely to be food insecure.
- **Pregnant and lactating women and children under 2.** Poor IYCF and sanitation and hygiene practices in all regions of the country, as well as increased nutrient needs during this critical period of life, place these demographic groups under increased risk of chronic malnutrition.

3.5 Coping Capacities and Strategies of Populations Vulnerable to Food Insecurity

Malagasy households have various ways of coping with the shocks they frequently face. Those in more remote, rural areas can rely on hunting and gathering, although expansion of cultivated land has sharply reduced wildlife availability in non-park lands. It is commonplace for the rural poor to spend money after harvest on assets (especially radios and kitchen implements), which they then resell during the lean season. Households rely on social and familial networks to request assistance. In the south and southwest, the most frequent strategy is to reduce the number of meals consumed during the day. In the southwest, people also reduce their portion sizes and switch to less preferred foods. In Anosy and Androy regions, portion size reduction and switching to less preferred foods is not as much of an option because the bulk of their diet is provided by cassava already (rather than rice, which is more preferred), and the diet is generally the most marginal in the country.

4. Current Policies, Strategies, and Programs

Momentum behind policy and strategy development and implementation in Madagascar has withered because of the political crisis, and investment into large-scale food security programs has plummeted. However, several programs remain, which are mentioned briefly in this section (see **Appendix 8** for a list of policies, strategies, and programs).

4.1 GOM Policies, Strategies, and Programs

Since 2009, the HAT Government has undertaken a reorganization that has affected ministries directly engaged in food security and nutrition in Madagascar, including the Ministry of Public Health (MOPH); Ministry of Agriculture; Ministry of Environment and Forests; Ministry of Livestock; Ministry of Water; and Ministry of Fishing and Fisheries. Madagascar has made strides in implementing agriculture and rural development strategies, despite the funding paralysis the political crisis has imposed. Several strategies and plans were in place prior to the crisis, most notably the Madagascar Action Plan (2007–2012), which provided the vision for the country's development. The Rural Development Action Plan and Regional Action Plans for Rural Development provided the foundation for rural development investments at the national and regional levels, as well as a springboard for the Rural Development Working Group. The EPP-PADR is the coordinating committee for the national rural development program. Agricultural development funds are programmed through the Regional Agricultural Development Funds. The ROR aims to conduct surveillance of production and prices, and the ODR monitors rice prices. The National Risk and Disaster Management Bureau manages the response to disasters from national to local levels, and SAP helps communicate early warning information from national to local levels in case of an impending crisis.

The CAADP process is ongoing in Madagascar, and it is hoped that successful elections will allow the signing of a CAADP Compact, which would provide the overall agricultural and rural development strategy for the country. Many additional strategies exist regarding irrigation, riziculture (rice farming), pisciculture (fish farming), agricultural training, and other specific sub-sectors. A *Programme de Secteur Agricole* (Agriculture Sector Program) document is in draft and is expected to be completed, validated, and perhaps adopted in 2013.

In health and nutrition, the 2005 National Health Policy lays out the GOM's vision for the decentralization of its health system and the services it will provide. The National Community Health Policy, published in 2009, encourages communities to take charge of their own health and to become further engaged in the hygiene and sanitation domains of the development of their communities. The MOPH put in place an interim strategy for the development of the health sector for 2012–2013, as well as a strategic plan for malaria control and a national HIV prevention and control action plan. The National Nutrition Policy (2004) highlights the importance of the GOM's leadership on nutrition and its contribution to development, with the National Nutrition Action Plan (currently in phase II for 2012–2015) defining the main activities that should be implemented to make this policy functional. The Office National de Nutrition (ONN) is the entity in charge of the implementation of the National Nutrition Policy and the National Nutrition Action Plan. It is currently doing so mainly through its flagship nutrition and food security program, the PNNC. In addition to GMP, PNNC's community health workers conduct SBCC sessions on maternal and child health and nutrition topics, including breastfeeding and complementary feeding. The PNNC's relatively small budget does not allow it to provide adequate coverage throughout the country. Madagascar joined the Scaling Up Nutrition (SUN) movement in October 2012, under the coordination of the ONN.

4.2 USG and Other Strategies and Programs

Before the crisis, the donor community contributed about US$627 million per year (of which 16% was direct budget support) and provided well over two-thirds of the financing for social sectors and infrastructure (World Bank 2012a). While some donors and multilateral agencies have partially resumed funding to help buffer the Malagasy population from the effects of the crisis, the USG continued to operate under sanctions in 2013 that precluded funding for non-emergency programs and prohibited direct engagement with or support to GOM institutions (in 2012, the USG allocated US$67.6 million in foreign assistance through USAID to Madagascar).

Key multilateral stakeholders implementing large-scale food security and nutrition projects include the World Bank, the International Fund for Agricultural Development (IFAD), the African Development Bank (AFDB), and U.N. agencies (e.g., FAO, WFP, UNICEF). Key bilateral stakeholders implementing large-scale food security and nutrition projects include the European Union (EU), the *Agence Française de Développement* (AFD) (French Development Agency), the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ) (German Society for International Cooperation), and the Japan International Cooperation Agency.

There is one Title II Development Program in Madagascar. SALOHI is a 5-year (FY 2010–FY 2014), US$85 million project implemented by Catholic Relief Services (CRS) in consortium with the Adventist Development and Relief Agency (ADRA), the Cooperative for Assistance and Relief Everywhere (CARE), and Land O'Lakes (LOL). More details about SALOHI are available in **Appendix 9**.

5. Considerations for Title II Development Programs in Madagascar

5.1 Objectives and Desired Outcomes

This FSCF aims to help guide targeting and programming of Title II resources to strengthen the food security and economic status of poor and vulnerable populations while also investing to connect producers to markets, strengthen national government and private sector institutions, and improve governance related to food security. The Title II development program in Madagascar will complement bilateral and multilateral development resources in Madagascar that promote development through growth-oriented infrastructure and governance investments.

The program will contribute to improving food availability, access, and utilization/consumption and to reducing the vulnerability to food insecurity of individuals, households, and communities. It will also enhance resilience among food-insecure households by increasing their skills and assets, diversifying their livelihoods, and expanding beneficiaries' ability to deal with and recover from the shocks that most frequently compromise their food security and fuel the vicious cycle that leads to persistently high levels of chronic malnutrition.

The program priorities and priority activity areas in this FSCF represent a broad suggested road map to achieving sustainable reductions in food insecurity and malnutrition in target communities. It is not expected that applicants will simply adopt the structure of the FSCF's suggestions for their applications. Rather, applicants may use the FSCF as a starting point for analyzing how a Title II multi-year development program can most effectively reduce chronic food insecurity and malnutrition in a given context. The three program priorities and ten priority activity areas (one cross cutting) discussed below can be organized into a range of different results frameworks depending upon how the applicant chooses to organize project activities and based on local assessment and analysis. The FSCF discusses numerous interventions which may or may not be appropriate for a given application.

5.2 Suggested Geographic Priorities

The chronic food insecurity and malnutrition so entrenched in Madagascar constitute a very different problem across different parts of the island. In Madagascar, those populations facing the worst levels of food access and poverty (indicating chronic food insecurity) are often different than those with the highest levels of stunting (chronic malnutrition) (see **Section 3.4**). Regions are grouped by geographic proximity and similarities in the main local determinants of food insecurity and chronic malnutrition. **Table 9** below summarizes key nutrition and food security indicators for the suggested regions.

Four geographic areas are hardest hit by chronic food insecurity:

- The deep south (Anosy and Androy regions)
- The southern highlands (Haute Matsiatra, Amoron'i Mania, and Ihorombe regions)
- The east and southeast (Atsimo Atsinanana, Atsinanana, and Vatovavy Fitovinany regions)
- The southwest (Atsimo Andrefana region)

To consolidate USAID resources and for maximum impact on the development of beneficiary communities, applicants may wish to focus on regions also targeted by USAID-funded health activities, which include:

- The southern highlands (Haute Matsiatra, Amoron'i Mania, and Ihorombe regions)

- The east and southeast (Atsinanana and Vatovavy Fitovinany regions)
- The southwest (Atsimo Andrefana region)

The deep south (Anosy and Androy) has high levels of poverty (84% and 94% respectively); food insecurity and vulnerability to food insecurity (80% for Anosy and 90% for Androy), and a high percentage of household expenditure on food (84% and 94% respectively) (WFP and UNICEF 2011). The deep south resembles many Title II development program target areas in Sub-Saharan Africa, in which food insecurity is fueled by frequent droughts and poor water access, very low agricultural productivity and infrastructure, low educational attainment and poor market connectedness. Subsistence livestock herding dominates livelihoods, and constraints to food access drive food insecurity.

The southern highlands (Haute Matsiatra, Amoron'i Mania, and Ihorombe) also have high levels of poverty (85%, 85%, and 81%, respectively) and food insecurity and vulnerability to food insecurity (87%, 82%, and 67%, respectively); however, the southern highlands demonstrate a lower percentage of household expenditure on food than other areas of the country (50%, 51%, and 72%, respectively) (WFP and UNICEF 2011). The densely-populated highlands benefit from relatively high agricultural productivity given the climate conditions, although structural issues like poor potable water access and human capacity underdevelopment persist. A key observation about chronic food insecurity in the southern highlands is that widespread stunting (72%, 69%, and 47% in Haute Matsiatra, Amoron'i Mania, and Ihorombe, respectively) has remained entrenched, likely due to factors related to food utilization, such as poor infant and young child feeding and care practices, and alcohol consumption, including among pregnant women. In the southern highlands, constraints to food utilization drive food insecurity, compounded by constraints to food access.

The east and southeast (Atsimo Atsinanana, Atsinanana, and Vatovavy Fitovinany) have high levels of poverty (95%, 82%, and 90%, respectively); high levels of food insecurity and vulnerability to food insecurity (92.9%, 86%, and 99%, respectively); and a high percentage of household expenditure on food (74%, 70%, and 75%, respectively) (WFP and UNICEF 2011). Like the southern highlands, the east and southeast benefit from a more forgiving climate than other areas of the country, although poor households have limited access to capital such as land, livestock, credit, and labor, and labor migration is not uncommon. While chronic malnutrition rates might be lower than in other regions of the country, rates of acute malnutrition (estimated in the latest available data in Vatovavy Fitovinany to be at 9%) can be quite high, and the nutritional shocks that these regions experience can be acute. Cyclones and flooding occur annually, threatening lives and livelihoods. In the east and southeast, constraints to food access play a greater role than food utilization in driving food insecurity (although both must be considered), although the types of hazards and shocks that households face differs from the other two areas.

The southwest (Atsimo Andrefana) also has high levels of poverty and underdevelopment. The region experiences relatively high rates of acute malnutrition (measured at 8% in the last round of data collection) and poor infant and young child feeding and care practices. Atsimo Andrefana region faces a high risk of cyclones, but does not benefit from the high rainfall levels also seen on the east coast. Atsimo Andrefana has not had a history of development programs focused on disaster prevention and mitigation, and flood prevention infrastructures and systems are far weaker than on the east coast. Atsimo Andrefana has some of the highest rates of household food insecurity in the country.

Applicants are encouraged to focus proposed program activities on one of these areas. Applicants that propose working in more than one of these areas should be able to demonstrate how the proposed program is tailored to the unique local context, determinants of malnutrition and food insecurity, and programmatic opportunities and constraints across the different areas. Applicants are strongly

encouraged to propose targeting contiguous districts and regions to increase program exposure by beneficiaries and intensify community impact; increase scale of (and linkages among) transportation infrastructure investments (e.g., market feeder roads, roads to health clinics and schools); foster labor and trade relationships among neighboring communities for staple foods and priority value chains; promote social cohesion and trust (and thereby reduce risk of conflict); allow for overlapping and saturation of social and behavioral change messaging among program components tailored to the local sociocultural context; and capitalize on economies of scale. Within proposed target areas, communes may be also selected based on food security and nutritional data, as well as other programmatic factors that determine program feasibility. In addition, applicants should aim to complement and work with existing programs such as the USAID health portfolio (for example the CBIHP/MAHEFA and PHC projects). The MAHEFA project has activities in the regions of (from the northeast to the southwest): Sava, Diana, Sofia, Alaotra Mangoro, Betsiboka, Boeny, Melaky, Bongolava, and Menabe. These are not recommended as priority regions for the next round of Title II programs. The PHC project has activities planned in (from the northeast to the southwest): Alaotra Mangoro, Atsinanana, Amoron'I Mania, Haute Matsiatra, Vatovavy Fitovinany, Ihorombe, and Atsimo Andrefana. With the exception of the region of Alaotra Mangoro, all of these regions are suggested as priority regions for the next Title II development program in Madagascar.

Table 9. Food Security Indicators for Regions Suggested for Targeting by Title II Program

Region	% of children under 5 stunted[a]	% of children 6–59 months wasted[b]	Median duration (months) of exclusive breastfeeding	% of women 15–49 with BMI < 18.5	% of households in poverty	% of households with access to safe water (rural areas, dry season)	%of households with access to safe sanitation (rural areas)	% of households that are food insecure	% of households that are vulnerable to food insecurity
Southern Highlands									
Haute Matsiatra	72	4	4	38	85	18	0	53	35
Amoron'i Mania	69	4	3	42	85	18	1	14	69
Ihorombe	47	5	2	25	81	37	1	22	45
East-Southeast									
Atsimo Atsinanana	52	5	4	37	95	16	0	72	22
Vatovavy Fitovinany	55	9	2	36	90	27	5	47	51
Atsinanana	42	3	4	30	82	28	0	31	55
Southwest									
Atsimo Andrefana	39	8	1	27	82	14	0	76	17
Deep South									
Androy	45	5	1	30	94	10	0	63	27
Anosy	58	5	1	24	84	27	1	53	27
National	53	6	2	27	77	26 (Rural)	2 (Rural)	35 (Rural)	48 (Rural)

Sources:

a – Rates of stunting ≥ 40% are considered indicative of very high chronic malnutrition

b – Rates of wasting ≥ 5% are considered indicative of medium to very high acute malnutrition

5.3 Suggested Program Priorities

It is suggested that the overall goal of the Title II development program in Madagascar be as follows: "to achieve sustainable reductions in food insecurity and chronic malnutrition and increases in resilience among chronically food-insecure households." It is suggested that the Title II development program in Madagascar encompass activities designed to synergistically achieve three key program priorities (**Table 10**), although as noted above, applicants do not need to directly use this structure when developing their results framework:

- Program Priority 1: To reduce chronic malnutrition among children under 5
- Program Priority 2: To increase the on-farm production generated by households
- Program Priority 3: To increase the income generated by households

Table 10. Suggested USAID/FFP Title II Development Program Priorities and Activities in Madagascar

Overall Goal: To achieve sustainable reductions in food insecurity and chronic malnutrition and increases in resilience among chronically-food insecure households		
Program Priority 1: To reduce chronic malnutrition among children under 5	**Program Priority 2:** To increase the on-farm production generated by households	**Program Priority 3:** To increase the income generated by households
Priority Activity Area 1.1: Chronic malnutrition among children under 2 is prevented and children under 2 are fed appropriately for their age	**Priority Activity Area 2.1:** Households increase and diversify agricultural (crop) production	**Priority Activity Area 3.1:** Households strengthen marketing of their production
Priority Activity Area 1.2: Pregnant women and mothers of children under 2 seek preventive care and treatment for illness	**Priority Activity Area 2.2:** Households increase livestock, fishing/aquaculture, and other production	**Priority Activity Area 3.2:** Households strengthen value-added processing and storage of their production
Priority Activity Area 1.3: Households have access to improved water and sanitation and practice appropriate hygiene behaviors	**Priority Activity Area 2.3:** Mechanisms are put in place to sustainably establish, protect, and manage essential natural assets	**Priority Activity Area 3.3:** Households increase income generated by off-farm activities
Priority Activity Area 1.4/2.4/3.4: Households increase access to credit and/or savings		
Design and Implementation Considerations: Integrated programming; targeting; gender equality; development approach, sustainability and exit strategy; capacity strengthening; social and behavioral change; balance of food and cash inputs; good governance; applied, operations and formative research; and disaster risk reduction		

The FSCF team developed recommendations for the next phase of the Title II development program based on interviews with a range of GOM, bilateral, multilateral, U.N., and NGO stakeholders; semi-structured group interviews with community members and beneficiaries of the current multi-year assistance program (MYAP); and a systematic review of GOM, international public organization, NGO, and other program documentation, sector studies, policy papers and population surveys. Suggested program priorities and priority activity areas were also identified in the context of the USAID and GOM strategies and priorities for the country. Finally, the illustrative activities discussed below reflect the observations and expertise of the authors and the accumulated experiences of current Title II development program partners in Madagascar. Additionally, a final evaluation will be conducted of the current Title II program, SALOHI, which will assist in describing intervention approaches that proved effective in program areas.

Each priority activity area contributes strategically to achieving a program priority. For each of these priority activity areas, the FSCF highlights illustrative project activities that applicants may consider, as well as key considerations for implementing the activities effectively in Madagascar. Suggestions on how activities can be implemented in both rural and urban chronically food-insecure communities are included. However, this FSCF does not address in detail the full range of project activities that may be conducted in every potential target zone in the country; nor are applicants advised to propose every program option discussed below in a given application. Applicants should be selective and choose those essential to achieving (and not diluting) impact. Based on their local assessments, applicants may identify, prioritize, and design project activities (with a corresponding results framework) that they believe will most effectively reduce chronic food insecurity and malnutrition in a specific setting.

Each priority activity area should strengthen resilience for sustainable impact. **Table 11** summarizes ways in which each of the program priorities is designed to strengthen resilience, including by reducing exposure to shocks and stresses, reducing sensitivity to shocks and stresses, increasing adaptive capacity, strengthening risk reduction, and improving governance. Cross-cutting design and implementation considerations are discussed in **Section 5.4.**

Table 11. USAID/FFP Title II Development Program: Madagascar Program Priorities and Illustrative Links to Resilience Strengthening

Component of Resilience Strengthening	Program Priority 1: To reduce chronic malnutrition among children under 5	Program Priority 2: To increase the on-farm production generated by households	Program Priority 3: To increase the income generated by households
Reduce exposure to shocks and stresses	• Reduce exposure to epidemics through WASH interventions	• Natural resource management reduces risk of flooding, silting • Vaccinations prevent veterinary morbidity • Wind walls prevent wind damage to fields	• Expanded savings available to households for food purchase even during high prices
Reduce sensitivity to shocks and stresses	• Strengthen underlying health and nutrition status to reduce likelihood of mortality in case of nutrition or health shock	• Diversification of assets, income, and livelihoods • Reduction of poverty • Drought-resistant and short-cycle crop and animal selection	• Diversification of assets, income, and livelihoods • Producer-trader contracts to reduce vulnerability to price shocks, support sales • Reduction of poverty
Increase adaptive capacity	• WASH • Improved underlying health status • Better MCHN practices, especially hygiene (e.g., handwashing) and sanitation (e.g., household latrines)	• Access to credit • Increased food stocks • Reduced lean season • Literacy and numeracy training • Water access for people and livestock • Food storage	• Increased savings and credit access • Links to markets and government actors • Links to household level income management • Food storage
Strengthen risk reduction	• Community understanding of improved MCHN practices • Community investment into risk identification and preparedness measures	• Community risk analysis • Context-specific, production-focused early warning systems, community messaging, and local budget for response	• Market information systems • Addressing community management of theft as resources are accrued • Protection of assets

Component of Resilience Strengthening	Program Priority 1: To reduce chronic malnutrition among children under 5	Program Priority 2: To increase the on-farm production generated by households	Program Priority 3: To increase the income generated by households
Improve governance	• Health system strengthening and capacity building of health system staff	• Governance training • Conflict-sensitive land and water resource programming • Engaging key community leaders • Establish self-financing models for infrastructure maintenance	• Engaging key community leaders • Conflict sensitive management, dealing with theft and distrust • Transparency
Increase gender equality and women's empowerment	• Engaging men in SBCC • Refer people to family planning services • Support to adolescents, including pregnant and lactating adolescents	• Gender equality in beneficiaries • Gender-sensitive risk and time availability analysis • Advocacy for women and FHH for land access and other opportunities • Engaging men in gardening	• Advocacy for women and FHH for equal opportunity to participate in agribusiness and other economic activities often restricted to men
Undertake integrated programming	• Linking FFSs, other income-generating activities, and VSL with nutritional interventions	• Integrated risk analysis • Agriculture must address nutritional needs (diversification, consumption, and sale)	• Training for households on how to use income to optimize food security and nutrition outcomes
Strengthen local capacity	• Community project management • Capacity building of health staff • Training of mothers and caretakers	• Community project management • Trainings, training of trainers (TOT) • Links to FAO, SAP, etc.	• Community project management • Trainings, TOT • Links to FAO etc.
Achieve social and behavioral change	• Extensive SBCC efforts regarding IYCF, WASH practices and other behavioral determinants of malnutrition	• SBCC to promote adoption of improved production behaviors, including those that are taboo (e.g., manure handling)	• SBCC on household income management and planning, and purchase of nutrient-dense foods
Program for sustainability and exit strategies	• Linkages between household production activities (e.g., gardening) and nutrition/consumption messages	• Trainings, TOT • Formalization of status of producer groups to enable formal linkages with market and technical organizations	• Trainings, TOT • Formalization of status of producer groups to enable formal linkages with market and technical organizations
Establish partnerships	• Partnership with ONN (circumstances permitting)	• Agricultural research and extension • GOM and parastatal producer support and monitoring structures (e.g., CSA, SAP) • Public-private partnerships	• Processors, collectors, wholesalers • Public-private partnerships

Program Priority 1: To reduce chronic malnutrition among children under 5

Priority Activity Area 1.1: Chronic malnutrition among children under 2 is prevented and children under 2 are fed appropriately for their age

Focus on the 1,000 days. A life-cycle preventive approach to addressing malnutrition starts with ensuring adequate nutrition in the mother, prior to conception. Adolescent mothers are at an especially higher risk of malnutrition for themselves and their children, and at increased risk of adverse pregnancy outcomes. In mothers 25-49 years of age at the time of the interview in Madagascar, the median age at their first birth in the 2008–2009 DHS (INSTAT and ICF Macro 2010) was found to be 20.1 years, down from 20.4 years in 2003–2004 (INSTAT and ORC Macro 2005). In mothers 20–24 years of age at the time of the interview, the median age at their first birth was 19.4 years, down from 19.7 years in the previous DHS. The deteriorating political and economic situation in the country could be contributing to this decrease in the median age at first birth. Efforts by the Title II programs to educate the community on the importance of adequate pre-conception nutrition are therefore essential. The importance of pre-conception and pregnancy nutrition is highlighted by the relatively high prevalence of low birth weight.

Efforts to promote early breastfeeding initiation and exclusivity for the first 6 months of life are needed, especially since the median duration of exclusive breastfeeding in Madagascar is 2 months, a significant shortfall compared to the international recommendations of 6 months (INSTAT and ICF Macro 2010). One aspect that could be explored during the formative research stages of program development could be the reasons behind the lower breastfeeding rates in boys, as this is possibly reflected in the relatively higher rate of malnutrition in boys compared to girls.

Complementary feeding indicators show very poor feeding practices for infants and young children. According to the 2008–2009 DHS (INSTAT and ICF Macro 2010), only 2% of children 6–23 months have a minimum acceptable diet, mostly driven by a prevalence of 3% with minimum meal frequency. Dietary diversity is not universally adequate, and depending on the local feeding practices, it may be a contributor to the suboptimal diet of infants and young children. Title II programs, guided by local, formative research, are strongly encouraged to address complementary feeding of infants and young children through social and behavior change communication (SBCC).

In the community, it is envisioned that community health volunteers (CHVs) will deliver the SBCC strategy. Continued training and support for the CHVs, with special attention to adult education and interactive techniques, are needed. A recent assessment of CHVs in Madagascar was conducted by USAID and found that the recruitment and initial training of CHVs in the country was strong, with the need for continued training and support from supervisors (Wiskow et al. 2013). The mid-term evaluation of the SALOHI program also provided recommendations on how the CHVs' work could be more effective, which included an increase in the intensity of their supervision and deeper and broader training in the areas the CHVs work in.

Duplication of Title II activities with other health and nutrition programs (such as the PNNC and USAID's health projects) should be carefully avoided. Duplication can occur in activities such as GMP, SBCC, and WASH. These overlapping areas offer opportunities for improving efficiency of projects and increasing the impact of all projects through synergistic efforts. For example, CHVs of all projects intervening in a community can coordinate in conducting one monthly GMP per village, and can refer their beneficiaries to services and activities of another project. The strengthening of the local governance can facilitate such coordination.

Appropriate feeding of children under 2. More than half of children under 5 in Madagascar are stunted. This is indicative of chronic, intergenerational malnutrition, and has dire consequences for the child's and the community's development. It is well established that stunted children have a greater risk of morbidity, mortality, decreased schooling, and decreased earnings later in life (Black et al. 2013). The most immediate causes of malnutrition are inadequate dietary intake and disease. Inadequate dietary intake can stem from household food insecurity and/or inadequate care. Disease can be also caused by inadequate care, an unhealthy household environment, and/or a lack of access to health services. As the causes of malnutrition are multifaceted, integrated programming addressing its various determinants within the community has the greatest potential to improve the nutritional status of children.

Efforts to address the nutrition problem in Madagascar have been undertaken in a coordinated and evidence-based manner. Notably, the ONN— in collaboration with various government, NGO, bilateral, and multilateral actors—recently developed a National Nutrition Action Plan (PNAN 2012–2015) (Republic of Madagascar 2012a). The PNAN translates the national nutrition policy into concrete interventions and outlines the vision for scaling up the government's community nutrition program. The allocated budget for the PNAN is currently being evaluated with development partners, under the umbrella of the Scaling Up Nutrition initiative. Efforts to fully resource all programs related to this plan are underway.

Despite the ONN's and other major stakeholders' efforts to coordinate on nutrition, major constraints remain, including the scale of the problem and the lack of commensurate funding. Since the 2009 political crisis, the ONN has had difficulty ensuring adequate funding for its baseline survey, let alone funding for implementation of scaled-up activities. This is in part because major donors have withdrawn their financial support to the government, although some have partially resumed this support.

Title II development programs, with their coordinated multisectoral activities, have a large role to play in preventing malnutrition in the communities where they intervene. In addition to the agricultural and livelihoods activities, preventive maternal and child health and nutrition (MCHN) activities should be implemented.

The first 2 years of a child's life are critical for her or his growth and development. These are also the years in which significant growth faltering occurs in Madagascar, and after which the prevalence of stunting peaks at an alarming level. Therefore, efforts at preventing growth faltering and chronic malnutrition should be focused on the critical 1,000-day window of opportunity from conception through a child's second birthday, in addition to the pre-conception period.

Preventive measures have been used in Title II programs in Madagascar in the past; however, there is an opportunity to further strengthen and integrate such approaches. A preventive MCHN program would ideally include: SBCC; food aid; strengthening the use of health services; water and sanitation; antenatal care (ANC); immunizations; micronutrient supplementation; deworming; malaria prevention and control; and family planning services. Title II programs are not expected to deliver all of these interventions and messages themselves.

Local determinants of malnutrition. Before the Title II program is implemented in any commune, awardees are strongly encouraged to conduct formative research to better understand the causes of malnutrition in their areas of intervention. This research should include qualitative and quantitative data collection. Qualitative data collection could include interviews with key informants (community health workers, primary health center doctors and nurses) and potential beneficiaries, to understand attitudes

and behaviors that may help explain the prevalence of malnutrition in the targeted communities. Previous knowledge of the local determinants of malnutrition is helpful in guiding the formative research but should not replace an awardee's own efforts to conduct focused data collection to inform programming. For example, awardees might discover that the behavioral determinants of malnutrition vary widely from region to region, and are likely to require varying SBCC strategies and messages to address the appropriate determinants. To reduce duplication of efforts and increase programs' effectiveness, awardees are encouraged to coordinate with USAID/Madagascar programs that are also working on child health and malnutrition in similar geographic areas in understanding local determinants of malnutrition.

SBCC messages should consider addressing the local determinants of malnutrition in both women and children, and the ENA (discussed below) are a good guide on what actions could be done to address these determinants. The ENA include the promotion of optimal nutrition for women, including in the pre-conception period. The PNAN includes the promotion of women's nutrition as part of its recommended interventions. If women's nutritional status is found to be a local determinant of malnutrition, Title II programs should promote behaviors that help prevent malnutrition and improve the diets of women, such as those focused on dietary diversity and dietary quality, prevention of micronutrient deficiencies, use of health services, and proper water and sanitation practices. Adolescent women and newly-wed women should be included in SBCC activities so as to reach them at the crucial pre-conception period.

To ensure full impact of the SBCC strategy, approaches should include key community leaders (sometimes referred to as notables or kings). In addition, as Malagasy men do not always support or understand the importance of preventive nutrition measures, especially in children, there is a need for either targeted SBCC activities for men or inclusive approaches that include both parents. These recommendations for SBCC messages, audiences, and strategies are not exhaustive; awardees will need to adapt them to the local context and to the results of their formative research.

Essential Nutrition Actions. USAID and its partners have developed a series of seven ENA, which are proven interventions to reduce child malnutrition, centered around the 1,000-day window of opportunity (see **Box 3**). ONN's flagship community nutrition program, the PNNC, has adopted the ENA. It is suggested that Title II programs also adopt and promote the ENA.

Box 3. Essential Nutrition Actions

1. Promotion of optimal nutrition for women
2. Promotion of adequate intake of iron and folic acid and prevention and control of anemia for women and children
3. Promotion of adequate intake of iodine by all members of the household
4. Promotion of optimal breastfeeding during the first 6 months
5. Promotion of optimal complementary feeding starting at 6 months with continued breastfeeding to 2 years of age and beyond
6. Promotion of optimal nutritional care of sick and severely malnourished children
7. Prevention of vitamin A deficiency in women and children

Source: Guyon, A.B. and Quinn, V.J. 2011.

Food aid. In food-insecure environments with high prevalence of child malnutrition, there is evidence that preventive food aid rations can be an effective complement to preventive MCHN programming. This food-assisted approach to reducing the prevalence of child malnutrition involves targeting a package of health and nutrition interventions to all pregnant women, mothers of children 0–23 months, and children under 2 in food-insecure program areas, regardless of nutritional status. The package of three core services summarized below was first studied in the context of a Title II program in Haiti, and, compared to a recuperative approach where only children with malnutrition are given a food ration, this preventive approach was shown to be superior in reducing stunting (Ruel et al. 2008).

Three core services are provided to beneficiaries in a preventive approach:

- Food rations for all pregnant women, women until 6 months postpartum, and children 6–23 months, as well as for their household, conditional on the beneficiaries' participation in the SBCC activities and preventive and curative health and nutrition services
- Preventive and curative health and nutrition services for children and women, according to national protocols
- SBCC

It may not be possible to implement fully all of the three core services in some regions of Madagascar. For example, in many regions, with the recent crisis and reduced support for primary health care centers, a minimum package of maternal and child health services may not be available. In addition, the ONN favors local solutions for reducing malnutrition, and the distribution of rations year-round has not always been favorably received. There is a need to balance effectiveness of an intervention with its sustainability, and the provision of rations to all eligible beneficiaries throughout the year might reduce the communities' ability to self-sustain using locally available and produced foods. Therefore, there needs to be a well thought-out exit strategy for the program's food aid component. One possible strategy could be a plan for communities to graduate from food aid rations to other project components such as income-generation activities. That said, locally-based approaches to reducing stunting in children are long-term solutions. In the meantime, preventative food aid rations during the critical 1,000 days, coupled with successful SBCC activities, provide a balance of short- and medium-term interventions that aim to decrease the high stunting rates in Madagascar. Applicants should explain the rationale used for proposing a modified preventive intervention and how this preventive approach can still be ensured.

Priority Activity Area 1.2: Pregnant women and mothers of children under 2 seek preventive care and treatment for illness

Diarrhea, respiratory infections, and parasitic infections can impact children's growth, and their treatment requires access to health services. However, the use of these services is suboptimal in Madagascar, where, according to the 2008–2009 DHS, though 86% of women had access to ANC services, only 35% give birth in health facilities (INSTAT and ICF Macro 2010).

A major obstacle for the use of health services in rural Madagascar is access to transportation. Identifying solutions to this and other identified obstacles requires joint efforts with actors in various technical fields, and could include input from livelihoods activities (e.g., road rehabilitation) and SBCC interventions (e.g., to increase awareness among women and men on the importance of care-seeking for mothers and children).

Coordination with health programs. USAID's new Primary Health Care Project (PHC) has the mandate of increasing uptake of community-based primary health care services and the adoption of healthy behaviors. The objectives of the project are: 1) to sustainably develop local partners' systems,

capacity, and ownership, 2) to increase availability of and access to primary health care services in project-targeted communes, 3) to improve the quality of community-level primary health care services, and 4) to increase adoption of healthy behaviors and practices. The PHC will intervene in regions in the central, south, and east of Madagascar. Given similar geographical coverage, Title II programs may consider identifying opportunities to collaborate with the PHC.

One of the priority technical areas for the PHC is family planning and safe motherhood. The project is expected to strengthen access to and availability of family planning services by 1) cross-training Child Health CHVs in community-based family planning service provision (condoms, oral and injectable contraceptives); and 2) increased focus on information and referral for long-acting and permanent methods.

Focus on family planning. Title II awardees are encouraged to establish an effective referral system so women participating in the program activities can access family planning services through the PHC where it is present. Where the PHC is not present, title II awardees are encouraged to work with the government health system and other implementing partners so women can access these services. In addition to referrals, Title II programs are encouraged to implement a multilayered SBCC approach that targets both men and women with information regarding the use of family planning methods with the aim of improving knowledge of, and referrals to family planning methods and services. [4]

MOPH districts and local officials, in coordination with PNNC agents and with the support of UNICEF, have conducted successful national maternal and child health weeks across the country. Title II programs should consider coordinating with and supporting this effort, which provides immunization, deworming, and vitamin A services.

Growth monitoring and promotion. GMP has been a popular activity in Malagasy rural communities, since the predecessor of the PNNC (SEECALINE) was in place. In communities where actors are implementing GMP activities, Title II awardees should consider coordinating efforts, as these activities can provide a good platform and captive audiences for SBCC and other interventions. If GMP activities are not in place, Title II programs may choose to undertake them, recognizing that successful GMP is not limited to weighing children and reporting the data, but also involves effective counseling and follow-up of children identified as malnourished.

Rehabilitation of malnourished children. Despite preventive efforts, some children may become moderately or severely acutely malnourished. Given the prevalence of global acute malnutrition in Madagascar, alongside the GMP activities a program may implement, it will also be necessary to screen children for moderate and severe acute malnutrition. Children who are identified as severely acutely malnourished with complications should be referred and admitted for treatment in a facility that treats severely acutely malnourished children. Children who are severely acutely malnourished but do not have complications should be referred to a Community-based Management of Acute Malnutrition (CMAM) program, if available. Children with moderate acute malnutrition could be treated through supplementation with locally available foods if possible. Title II awardees may consider strengthening the capacity of these services, or addressing the needs of these children in the community through

[4] Food security programs in Madagascar are eligible to access USAID's Advancing Partnerships grants for improving family planning and community health services, that could potentially be available for areas where PHC is not working. Flex-Funds from USAID PRH has supported some successful supplementary funding to assist food security programs with family planning. See http://www.advancingpartners.org/ and FAFSA-2 http://www.usaid.gov/what-we-do/agriculture-and-food-security/food-assistance/resources/research-and-policy-papers.

collaboration with other health programs (such as the newly awarded USAID PHC program) or the local health centers for the establishment of a CMAM program in the community.

Priority Activity Area 1.3: Households have access to improved water and sanitation and practice appropriate hygiene behaviors

The 2011 CFSVA+N survey found that in rural Madagascar, only 26% of households had access to a safe water source, and only 2% to improved sanitation structures (WFP and UNICEF 2011). The next Title II development program in the country should consider using a community-based approach to improve households' access to safe water supplies, use of water treatment, and safe storage, as well as access to and use of sanitary facilities. Water point development plans for household and garden use should be established, to be managed by water management committees elected by communities. In addition, the program should work to improve handwashing behaviors at critical moments through SBCC activities. Awardees should consider partnering with other organizations intervening in this domain, such as WaterAid, and involving local partners and leaders for the construction of household latrines and installation and maintenance of sanitation infrastructure.

Program Priority 2: To increase the on-farm production generated by households

Priority Activity Area 2.1: Households increase and diversify their agricultural (crop) production

Program agricultural activities should address, to the extent possible, the main constraints to agricultural productivity in the country, including land tenure insecurity; land degradation; poor access to water and water resource management; lack of access to quality seeds and inputs; limited use of improved agriculture techniques; absence of GOM or private extension and support services; absence of drying, processing, and storage infrastructure; poor quality of transport infrastructure, high cost of transport; lack of access to credit/funds; and low human capital and organizational capacity (see **Section 3.1.2**). It is not feasible to address all of these constraints in all areas of operation. Applicants should consider focusing project resources on specific value chains based upon the factors discussed below. Applicants should consider focusing on specific value chains, based upon the comparative advantage of the zone of interventions and the characteristics of the target groups. Applicants are encouraged to select value chains that benefit different actors including producers, processors, transporters, and exporters along the system. This provides the advantages of strengthening food security among these different types of target groups, strengthening momentum behind economic development in the community, and investing in those better equipped to take risks and generate profitable enterprise in the community.

Integrated programming. Malagasy smallholders tend to prioritize the expansion and rehabilitation of irrigated rice production facilities as a development priority. Development programs should consider the community priority of sale of irrigated production when raised, but strive to ensure that rain-fed and upland plots are also strengthened, and that household gardening also receives priority as an agricultural and nutritional intervention. It would be best if project staff were recruited and trained to treat the agricultural interventions as having food access, income, and dietary quality/diversity objectives, to avoid stovepiping agricultural activities solely as surplus or income generators. It is vital that initial work with community leaders and groups be undertaken to develop a conceptual and cultural framework in which wellness objectives can be defined, so that community members understand in their own language that health, nutrition, food access, and income access should all be given appropriate weight in project planning and implementation, given the specific community context. Of equal importance, a market analysis of feasible, sustainable, and potentially profitable value chains would be invaluable if conducted early in the project.

Land management. Applicants should consider designing agricultural activities in the context of a sustainable environmental and natural resource management approach, and a comprehensive, sustainable, and transparent land use plan that includes irrigated land, rain-fed/upland plots, and household gardening. It is customary for Malagasy households to designate a portion of their land for consumption, a portion for sales, and a portion for seed. Awardees may build upon that custom by encouraging that land use planning consider a broader array of factors (notably increasing the dietary quality and diversity for pregnant and lactating women and children). This applies initially to land allocated to project activities, but the approach is relevant for communal and household land use planning as well. Applicants may also explore opportunities for advocacy on land tenure issues. As discussed in **Section 2.4**, the GOM is rolling out a land reform program that includes the establishment of land tenure offices (*guichets fonciers*). Where a land tenure office is not yet established, land allocation continues to follow customary practices and development projects may explore opportunities for sensitively advocating for land-poor individuals, such as widows, to receive a parcel of land if they wish to cultivate it. Madagascar urgently needs full scale-up and successful implementation of a decentralized and simplified land tenure system that resolves competing claims, takes customary claims into account, sustainably protects natural resources such as forests and watersheds, and encourages private (especially smallholder) investment (Durand, J.M. et al. 2011). Any initiatives that affect land access should consider not only the paramount importance of land as an economic asset, but the centrality of land to the Malagasy people's identity as the link between the living and their ancestors (Ramaroson, M. et al. 2011). Transparency and equity in community land use planning, as well as in planning by producer groups, is essential to reduce the potential for land conflict. Finally, to optimize sustainability and resilience, the Title II development program should consider adopting an overall approach based on conservation agriculture (CA) (see **Appendix 10**), environmental protection, and watershed management (see **Priority Activity Area 2.3** below).

Crop selection. A primary factor to consider when selecting crops and value chains to focus on is their ability to shorten the lean season for participants. The crops selected should enhance resilience by diversifying the household's production portfolio and reducing the level of overall vulnerability to shocks (especially climatic), through a combination of consumption and sale. Crop selection may be informed by assessments of: the comparative advantage of the zone of interventions in terms of production; production capacity (e.g., access to productive assets, labor and social capital) of target producers; social/cultural acceptability and food preferences; and levels of demand from domestic and export markets including private sector buyers. Existing regional studies and plans, such as the Regional Action Plans for Rural Development and the Regional Consultative Workshop reports for CAADP, should be consulted for crop varieties and value chains identified to have high local potential for production and marketing. The national agricultural research institution, FOFIFA, can also be of assistance, as can organizations working in seed production in other regions of the country (e.g., ANDRI-KO).

Irrigated production. Where water supplies allow for irrigation, the maintenance and/or establishment of irrigation infrastructure can dramatically boost rice production and shorten the lean season. AFD has extensive experience with rehabilitation of irrigation infrastructure through the Agricultural Infrastructure Rehabilitation Project in the southwest of Madagascar. Projects may investigate whether CA techniques (see **Appendix 10)**, including direct seeding, or intensified rice production (see **Appendix 11**) are locally appropriate. The *Système de Riziculture Intensifiée* (SRI) (Intensified Rice Production System) originated in Madagascar and has shown promise in large-scale commercial projects in high-potential areas of the country, such as Lake Alaotra. However, under field conditions, the increases in yields with adoption of SRI rarely approach the maximum yields reported, and, in fact,

the reported yield increases with SRI are in dispute. Irrigation may be considered for crops besides rice, such as high-value horticultural crops for private markets.

Rain-fed/upland production. Given lowland and water shortages in rural areas, irrigation is not the only answer to ensuring food security for vulnerable households. Households may have access to one or two rain-fed agricultural seasons per year, depending on the livelihood zone (see **Appendix 4**). Key components to boosting resilience through rain-fed cultivation are to stop slash and burn; implement CA techniques and complementary improved practices (e.g., wind break barriers to avoid wind damage and stabilize dunes, increasing soil organic matter, placement of limited fertilizer supplies in planting holes); and select crops that thrive under local environmental conditions. In the south and southwest, drought-resistant crops such as cassava and sweet potatoes are advisable. In flood-prone areas like the southeast, flood-resistant crops such as rice should be investigated. Short-cycle crops (such as Pull 16 maize) are also strongly advisable, as these can allow for grain filling and/or harvesting before drought, flooding, or cyclones hit. The *Groupement Semis Direct de Madagascar* (GDSM) (Madagascar Direct Seeding Group) and the *Centre de Coopération Internationale en Recherche Agronomique pour le Développement* (CIRAD) (Center for International Cooperation on Agricultural Research for Development) can advise on species to recommend for a given locale. Cassava contributes to household food security, functioning as a safety net and a substitute for rice. In addition, surpluses (when produced) can be sold on the domestic markets supplied mainly by southern producers. The NGO GRET works in rain-fed production for domestic and export markets in the south. Additionally micro-irrigation techniques can be explored to boost year-found cultivation of beans/legumes and vegetables. Vegetable cultivation is often restricted to planting only during the *contre-saison* in flood recession sites, and it is a common perception that vegetables can only be grown by a river or near a water source, although vegetable production at the homestead is possible with micro-irrigation.

Gardening. Household gardens are distinguished from rain-fed/upland plots by being designated for the "kitchen pot." As such, they are usually considered women's work and are used to grow foods to complement the staple (cassava, rice, and/or maize). Considerable potential exists for enhancement of household gardens to diversify the diet (principally) and to provide alternative income for women (secondarily). Building upon the customary land use planning approach, communities can designate the percentage of the garden for consumption and the percentage for sale, and with sensitization can plant quick-growing and drought-tolerant crops (especially vegetables, fruits, and legumes) successfully. Applicants are encouraged to consult field research on container gardening, keyhole gardening, and other gardening techniques that have shown success in drought-prone environments (e.g., the Sahel) for potential application in Madagascar. Keyhole or container gardening, if found to be appropriate in the proposed target areas, may be implemented to scale, starting with FHH, the elderly, pregnant and lactating women, and mothers with children under 5. Engaging men in gardening will further help to ensure buy-in for using time, land, and financial resources to improve dietary diversity and quality.

Organization and capacity strengthening of producers. A hybrid approach using farmer field schools (FFSs) and farmer leaders has been well-tested and successful in Madagascar, in terms of organizing producers for the dissemination and adoption of improved farming techniques. The inclusion of Farmer Leaders helped to compensate for low literacy, numeracy, and technical capacity levels among rural smallholders. Several factors should receive increased emphasis in the next Title II development program: formalization of the status of producer groups; enhanced training (including TOT) of producer groups; advocacy for equity, particularly regarding gender and FHH; and training in market analysis and commercialization. Groups that receive management training are better placed to successfully apply for formal certification from the GOM, which allows them to apply for loans and seek partnerships or contracts with input suppliers and/or small-scale processors. Producer groups may

not be ready to take advantage of these opportunities for several years, but certification by the GOM takes time and preparation and should be considered from the outset. Several large-scale producer training projects may provide opportunities for learning and perhaps accessing their services, notably IFAD's Vocational Training and Agricultural Productivity Improvement Programme and AFD's Project Support for the Diffusion Techniques Agro-Ecological. Partnerships may prove useful in procuring training and technical assistance for professional technical services for agricultural inputs, agricultural techniques, quality standards for commodities, and other production factors. The technique of farmer exchanges among different areas to share techniques and promote leadership has also shown promise in Madagascar. Organization and capacity strengthening must include literacy and numeracy to raise human capital and promote readiness for agribusiness.

Inputs, extension services, and mechanization. Input supply chains are poorly developed in Madagascar, and rural smallholders tend to use traditional seeds without the benefit of fertilizers or commercial pesticides. Private sector suppliers tend to be limited to high-potential areas, while GOM extension services are essentially non-functional after years of economic crisis. Farmers report compensating for the lack of pesticides by using traditional wild-harvested plant products with insecticidal properties, as well as keeping only the volume of produce that can be stored in the home above the kitchen fire (to reduce pests with smoke).

Applicants should consider incorporating an input supply activity in Title II development programs, possibly including partnership with (or transition to a partnership with) private vendors of improved seeds and pesticides. Such an activity will allow smallholders to access inputs on credit and repay with cash or in kind post-harvest. In terms of fertilizers, farmers can be encouraged to use manure (which is culturally taboo in some areas of the south) and household compost, two areas for SBCC. Seed multiplication activities, established as for-profit businesses, may be implemented to retain the relatively high profit margins of seed sales for communities. Seed multiplication could include food crops, trees (seedlings), cover crops, and cash crops. In terms of availability of extension services, Title II development programs should consider investigating capacity strengthening opportunities with the CSAs, the parastatal focal points for linking producers to service providers in Madagascar. It is expected that CSAs will receive considerable donor funding once the political crisis ends. Until GOM-associated organizations like CSA are more functionally supported, project models that train villagers to serve as crop extension agents and input suppliers can be explored. Finally, while mechanization is a national priority, it is unlikely to be financially viable for Title II target areas. CA calls for minimal soil disturbance, so use of the plow or mechanization tools should be carefully weighed for costs and benefits.

Drying, processing, and storage. Smallholders have limited drying and processing capacity, due to lack of knowledge (nationally), high humidity rates (east and southeast) or, in some cases, taboos (south). Harvested crops are often dried inadequately, resulting in high post-harvest losses and lack of marketability. Title II development programs may include a component that allows for local drying and processing (e.g., milling) of production. Storage is equally critical: many communities identified for targeting in this FSCF have no organized system for household, community, or producer group storage. Households tend to store limited stocks in the house, often above the cooking fire, and sell whatever does not fit there. Storage should emphasize reduction of losses and risks due to pests and aflatoxin, a common problem affecting maize and groundnuts in sub-Saharan Africa.

Urban and peri-urban agriculture. Like most major cities in low-income countries, agriculture is plentiful in Antananarivo, and USAID and FAO have implemented agriculture projects in urban and peri-urban Madagascar. Demand by urban citizens fuels most market flows of rice from production

areas to these urban centers, and there is a market around cities for rice and horticultural products that urban and peri-urban producers are well-poised to take advantage of given their proximity (and thus faster, lower cost transport). Urban commercialization often entails more stringent quality control standards than rural markets for staple foods, fruits, and flowers, therefore urban agriculture projects in Madagascar would need to work closely with municipal authorities on land and water access and other factors. Land negotiations can be particularly sensitive in urban environments because of the abundance of competing demands for land. The broad steps outlined under this Program Priority for establishing producer groups hold true for urban communities as well, but should be adapted as needed. Applicants should also take measures to prevent, and monitor the potential for, increasing rural-to-urban migration by programming in urban areas.

Governance. The ongoing political crisis imposes complex and difficult constraints on governance-related activities, particularly at the national level but also with sub-national GOM institutions. However, the inability to conduct formal governance or capacity strengthening activities with GOM partners does not prevent incorporating good governance practices into project management and collaboration with communities. Malagasy culture is marked with distrust, lack of social cohesion, and corruption. Title II development programs should capitalize on every opportunity to ensure transparency, democratic management principles, good will, community building, and good governance in project management and implementation. Water is often a potential conflict point, so transparent water management and active water users' committees are essential. Committees charged with managing irrigation canals, roads, land (especially lowland), and other community assets can be a flashpoint for conflict or a source of community building, depending upon the Title II development program's approach to project governance. The governance approach should also include encouraging an investment as opposed to an entitlement mentality, and the end users should be willing to pay for the recurring costs of all infrastructure investments, including irrigation systems.

Programming food commodities. Priority Activity Area 2.1 provides a number of opportunities to program food commodities through Food for Work, including construction of irrigation canals, construction of latrines at demonstration plots or collective gardens, reforestation, planting of wind break barriers, terracing on farmland, or construction of granaries. Water point development for small-scale irrigation and gardening and sustainable agro-forestry are discussed under Priority Activity Area 2.3.

Gender. The Title II development program's overall goal and corresponding priorities require that gender be considered and integrated throughout every phase of a development program (USAID 2012b). Advocacy may be considered on land access for women, especially FHHs and women without husbands (e.g., widows, women who have been left by their husbands, or women whose husbands live full-time outside the village for work reasons). Gender equality should be sought in hiring of project agriculture staff to the extent possible, and gender equality in remuneration between men and women is sought in participation. Gender considerations must be sufficiently addressed when assessing how program design and implementation will influence the time and work burdens for women and the steps that will be taken to reduce these burdens. Also, because of the cultural bias toward male-controlled irrigated rice production, deliberate effort is required to ensure agricultural interventions actually improve dietary quality and diversity for pregnant and lactating women and their children.

SBCC. A research-based and well-planned SBCC strategy is required to transform isolated production for subsistence into sustainable market-driven production. For example, SBCC will be required to influence household land use planning so that households give greater consideration to nutritional needs for vulnerable groups rather than just staple food production and income generation. SBCC will also

help to manage cultural taboos that govern how individuals (especially men and women), families, and communities work together and collectively manage assets. SBCC will be essential for addressing many of the gender equality-related issues above.

Priority Activity Area 2.2: Households increase their livestock, fishing, and other production

Livestock are key to reducing the length and severity of the lean season for millions of Malagasy households. The livestock sector is well-developed around Antananarivo (especially poultry) and in the "dairy triangle" (an area that includes Antananarivo and Antsirabe in the central highlands). Elsewhere, however, the sector has suffered from lack of a clear national strategy and investment plan. The fishing and aquaculture sector has also suffered neglect, and only the export-driven shrimp sub-sector is well-developed and structured. It is hoped that the establishment of the Ministry of Livestock and Ministry of Fishing and Fisheries will provide some institutional momentum for further development in these areas. The GOM is expected to release a new National Livestock Policy in 2013, which will guide investments in the sector, including in production systems and standards, inputs, veterinary service availability and standards, and domestic and export commercialization. Applicants should consider including activities in Title II development programs designed to increase livestock holdings, and fishing and aquaculture, where appropriate (e.g., fishing in communities in the east and southeast), to diversify and strengthen the household livelihood base. Income generating activities related to forest resources and off-farm activities are discussed under Priority Activity Area 3.3.

Holistic land and livestock management. A strategic, sustainable and holistic land and livestock management approach is encouraged to strengthen resilience by reducing land deterioration and boosting production of crops or forage. Holistic land and livestock management is analogous to conservation agriculture in that it teaches livestock management principles and practices that result in "ecologically regenerative, economically viable and socially sound management" (The Savory Institute 2013). Regional holistic management training and demonstration centers like the Zimbabwe-based Africa Centre for Holistic Management can advise on how holistic management techniques can be tailored to specific microclimates/environments in Madagascar (Africa Centre for Holistic Management 2013). The fishing sub-sector is also promoting techniques for sustainable and profitable fishing (i.e., sea fishing and fish farming), to protect biodiversity and habitat and avoid overfishing. Organizations such as APDRA *Pisciculture Paysanne* have experience implementing sustainable fishing projects in different regions of Madagascar, including Atsinanana, Haute Matsiatra, Itasy, and Vakinankaratra. Integrated rice-fish production systems have been tested in Madagascar and throughout Asia, and may be adaptable to Title II areas where water resources permit, although applicants are encouraged to consult with producer associations who have tried such models in the past to determine how to avoid loss of fish during seasonal or cyclone-related flooding (IRRI Rice Knowledge Bank 2013).

Integrated programming. Issues related to natural resource management-livestock-fishing linkages are discussed above. Additionally, livestock and fishing may be considered to feed into program nutrition and production objectives. Malagasy households traditionally produce yogurt and cheese at very small scale for local sale, presenting the opportunity to emphasize the need for consumption of these products by pregnant and lactating women and young children, where these products are known to be safe. Poultry-raising activities may emphasize the value of egg consumption to boost protein intake, particularly to the same demographic groups.

Animal selection. Applicants are encouraged to select animals through a resilience lens: species and types of animals should have short reproductive cycles and be marketable, and culturally acceptable (including for women to manage). For example, ducks and chickens are popular in the southern

highlands, east, and southeast. Chickens, goats, and sheep are popular in the south and southwest. Small stock and poultry are preferable to cattle because they reproduce more quickly (twice per year for goats, with twins possible) and are managed by women. However, a vital consideration is the availability of veterinary services, which are scarce in the suggested Title II target areas. Chickens are at greatest risk due to Newcastle Disease. *Agronomes et Vétérinaires Sans Frontières* (AVSF) (Agronomists and Veterinarians Without Borders) is implementing livestock projects in different regions of the country, and awardees should consider making an effort to connect and coordinate with this organization when possible). Fish selection should take into account sustainability of endemic fish populations (for fishing), local availability of fingerlings from fish farmers (for aquaculture), access to adequate drying/processing facilities, marketability (domestic and export markets), and cultural appropriateness.

Organization and capacity strengthening of producers. Similarly to Priority Activity Area 2.1, Applicants are encouraged to consider establishing producer groups in Title II development programs, emphasize good governance practices, build general human capacity (including literacy and numeracy), train extensively in improved production practices, and link with existing technical, extension and market actors for sustainability. Topics for training include breed selection, feeding (e.g., grazing and feed provision), uses of manure, zero-grazing for land recovery, basic veterinary care, slaughtering, and ensuring good hygiene and sanitation. Sanitation has been identified by the GOM as a major constraint to livestock commercialization. The National Livestock Policy (anticipated in 2013) will define the standards to which these trainings can refer.

Inputs and veterinary services. Where national or private veterinary services are non-existent or inaccessible, applicants may consider establishing such services, such as by employing and training local paravets, and/or by supporting project-affiliated retail outlets to offer key veterinary supplies. A fee-for-service model may be considered to ensure financial viability. Both AVSF and the *Institut Pasteur* currently work in animal health in Madagascar and may be good sources of additional information on these types of activities.

Forage, grazing, and feed production Traditionally, Malagasy smallholders and agropastoralists graze their animals on communal grazing lands. It is uncommon to keep animals in a *kraal* near the village and provide fodder. Where grazing lands are increasingly pressured by land degradation and population encroachment, applicants may wish to explore controlled grazing and/or feed provision. This promotes soil and grass restoration, reduces risk of theft, facilitates milk offtake, and protects young animals from predators. Applicants are encouraged to adopt a holistic approach to livestock management, including feeding. For example, both cassava and maize crops and residues can be marketed as livestock feed.

Processing and transformation. Most animals are sold to traders and rural consumers while still alive, leaving processing and transformation profits to traders and other private sector actors. Potential exists for production for meat and dairy, but these are currently constrained by lack of sanitary facilities for milk production and animal slaughter, lack of certification (particularly for export), and poor health and quality of animals, particularly after traveling long distances to livestock markets. LOL has experience professionalizing dairy production in the dairy triangle through the Dairy Value Chain Development Project. In the case of fish, drying and processing are key to profitability. Applicants should assess what markets may exist for strengthening drying (for fish), processing, and transformation to create value-added products.

SBCC. SBCC is needed to promote increased consumption of eggs and other animal products by pregnant and lactating women, young children, and malnourished individuals. SBCC is also needed to overcome sensitivities about handling manure in production, as well as maintaining adequate food and

personal hygiene. Keeping different families' livestock together in the same *kraal* also presents a cultural sensitivity in the south that SBCC can help to overcome.

Governance. Livestock are vital assets for Malagasy households, and theft and mismanagement of these assets are potential conflict flashpoints. Title II development programs should ensure transparency, good will, community building, and good governance in project management and implementation regarding livestock and fishing activities. Where good governance practices are implemented in Madagascar in the past, community livestock projects have been identified by participants as being a mechanism for community building.

Gender. Prospective applicants should bear in mind that women tend to control income earned from poultry and gardening, while men control income from other livestock and crop sales. Formative research about gender and access to animal resources is warranted from the outset, and this information can be incorporated into applications by integrating these gender considerations into program design and outlined activities.

Programming food commodities. Food for Work can be used for establishing livestock or fishing infrastructure. Water point development for livestock is discussed under Priority Activity Area 2.3.

Urban and peri-urban animal husbandry. Urban and peri-urban residents are well-positioned to supply animal products to urban consumption markets. Urban and peri-urban aviculture (poultry keeping) is expanding in Madagascar. Also important in certain regions of the country are apiculture (beekeeping for honey production) and sericulture (silk farming for weaving) (GOM 2008). Applicants may promote such activities if local conditions permit and assessments indicate the activity is likely to be economically viable.

Priority Activity Area 2.3: Mechanisms are put in place to establish, protect, and manage essential natural assets

The need for environmental protection and restoration measures in Madagascar cannot be overstated. Priority Activity Area 2.3 supports resilience and sustainable reductions in food insecurity by protecting the natural resource base on which the livelihoods of the Malagasy depend. This activity area does not aim to be a comprehensive environmental program, but rather to ensure that a Title II development program undertakes food security-related activities in accordance with environmental protection and restoration principles. Applicants are encouraged to integrate environmental and natural resource management considerations across all activity areas, to avoid this issue being 'stove-piped'.

Conservation agriculture, holistic management, watershed management, and reforestation. Applicants are encouraged to adopt a CA approach in agricultural activities, because of the urgency and geographic scale of environmental degradation in Madagascar. CA is discussed in detail in **Appendix 10**. Briefly, it encompasses three improved practices for agriculture: minimum soil disturbance (especially through direct seeding rather than plowing), permanent organic soil cover (especially through use of cover crops), and diversification of crop species (i.e., crop rotation and intercropping). Sensitization is required in this context to stop slash and burn activities. Other improved practices to be considered for inclusion in this program include use of improved seeds, use of organic fertilizer (especially compost and manure), and careful water management.

Holistic management of land and livestock is discussed above, under Priority Activity Area 2.2.

Watershed management is prioritized by the GOM under the National Program for Irrigation Development and Watershed Management, which focuses on rice production. Watershed protection is

relevant to the Title II development program in Madagascar because applicants should strive to avoid worsening the vicious cycle of agriculture, deforestation, land degradation, flooding, and food insecurity.

Applicants are also encouraged to include a sustainable agroforestry component in agricultural activities to address deforestation due to firewood demand. Use of productive, profitable agroforestry models to produce multiple products that have value, such as charcoal, poles, and fodder, is particularly recommended to help ensure sustainability of the investments. Applicants should note that road construction in Madagascar has been demonstrated to worsen deforestation, as newly accessible areas are often cleared of trees for charcoal production. Therefore, road construction activities may be accompanied by preventive reforestation on nearby communal lands. Tree selection can be undertaken in consultation with organizations like GSDM and CIRAD, and can emphasize species with economic value and those that do not place excessive labor burden on women. Qualitative research may be required to explore men and women's responsibilities in caring for trees.

Water point development. Access to water is a paramount constraint to food security throughout the Title II target zones. Communities lack water for drinking, bathing, cooking, irrigation, watering animals, and other uses. Suboptimal hygiene and sanitation practices result in contamination of surface water resources. Where water access is insufficient, applicants are encouraged to include the establishment and rehabilitation of water points in their proposals. Water points may include pumps with wells and rainwater catchment structures for human consumption, facilities for watering livestock, and water sources for small-scale irrigation. Appropriate fees should be charged directly to the end users to ensure that the recurring costs of the systems can be sustainably financed. The USAID-supported WASHPlus projects (RANO HP and RANO N'ALA) have implemented WASH projects across Madagascar and can serve as a resource on establishing viable and sustainable rainwater catchment and water provision systems in Madagascar.

Programming food commodities. Food for Work may be used to dig and rehabilitate wells, stabilize dunes, and conduct sustainable agroforestry activities.

SBCC. Rural communities without previous development project exposure have little appreciation for issues like CA, reforestation, and watershed management. As such, sensitization will be needed from the early stages when communities and development personnel are discussing and planning project activities. In the absence of sensitization, communities will probably prioritize irrigated rice production without explicit consideration for reducing vulnerability to environmental risks like flooding.

Governance. Water users' committees may be established to ensure transparent, good governance of water structures and resources. Visits to previous Title II development assistance program sites in Madagascar demonstrated that establishment of credible and well-run water users' committees, combined with a fee-for-use model, can ensure viability of water structures for years after the programs end. Governance is also of concern with 'wild' products such as bushmeat, honey, and forest plant products. In the southwest, residents are most habituated to consuming wild meat and plants, whereas these natural resources have been depleted elsewhere by overconsumption and encroachment on land by agriculture. It is believed that many taboos governing the use or avoidance of wild products serve as indigenous natural resource management systems (Resilience Alliance 2013). Thus, applicants are encouraged to research local cultural beliefs and taboos regarding wild resources to inform project activities and messages.

Program Priority 3: To increase the income generated by households

Priority Activity Area 3.1: Households strengthen the marketing of their production

Sustainable programming involves adopting a development approach to food security. This approach includes a market and private sector-driven program with the goal of getting the incentives right so farmers can and do make the proper, profitable investments to ensure sustainability. Experience in Madagascar suggests that income generation through agribusiness (commercialization of production) is the fuel that drives sustainability of agricultural projects, through incentivizing use of improved smallholder techniques. In addition to strengthening production (Priority Activity Area 2.1), key factors for increasing income include organizing and training producers for commercialization; investing in transformation and processing; strengthening quality control and introducing quality standards; and strengthening collection efforts and reducing transport costs. Madagascar is a net rice importer so there is a domestic rice market if local production is able to be competitively priced.

Integrated programming. As previously underscored, the cultural tendency of producers will be to prioritize income generation with little concern for use of revenue to improve health and nutritional status, despite the fact that Madagascar has one of the highest stunting rates in the world. Thus integration of health and nutrition into Priority Activity Area 3.1 is essential.

Organization and capacity strengthening of participants. Not all individuals and producer groups will be ready to engage in agribusiness, but groups should move toward agricultural commercialization as soon as possible, because sales effectively motivate participation. Communities in the highlands, east, and southeast are generally more market-ready and have greater volumes of cash in the local economy than those in the south. Key areas for training include literacy, numeracy, value chain analysis, cost of production and profit analysis, identification of markets and market analysis; establishing contacts (and where possible, contracts) with producers and market actors; and seeking formalization of group status for certification. It should be underscored that the initial market analysis to identify key value chains for agricultural project activities should primarily be the responsibility of the project, not of the beneficiary communities. Potential markets for products should expand beyond nearby urban centers to include private sector companies such as: mining companies for produce; cosmetics industry and laboratory buyers for essential oils and other botanical commodities; and regional and export markets for commodities for which unmet demand exists (e.g., beans, onions). Title II development programs may support establishment of links between agribusiness groups and other institutions that can help to provide technical services for production and marketing, such as CSAs and FAO. Organization of producers to assemble produce at a greater scale (volume) also reduces costs for assemblers (traders) to travel to rural areas to purchase local production, an important factor in a country where transport costs can easily account for half of a commodity's final retail price. Self-financing and self-transferring interventions should be prioritized, as a way to scale up impact to areas and people not counted among the program's direct beneficiaries.

Market information systems. Most smallholders have little knowledge of market prices, so Priority Activity Area 3.1 may include an emphasis on market information systems to address this gap. Feasibility and costs of SMS-based systems for transmittal of market prices may be investigated, to enable producers to earn higher unit prices by selecting when and where to market their production.

Livestock and fishing sector considerations. Rural producers sell their livestock in local livestock markets, where animals are collected by livestock traders and transported to urban areas. Efforts to strengthen livestock marketing may include improving the health and quality of animals through improved feed, sanitation, and health services. Fish and shrimp marketing for domestic markets will

focus on drying and processing, with export markets imposing additional regulations in terms of certifications.

Governance and conflict prevention. Agribusiness generates significant revenue which must be managed in a transparent manner to avoid conflict. Smallholders also identify security of funds as an urgent concern.

Programming food as food for infrastructure. Food for Work can be used to construct or rehabilitate transportation infrastructure, in particular market feeder roads. Roads to be rehabilitated or built should be selected based on links to the targeted value chain and market needs. Applicants are encouraged to determine at the outset what the objective is of each rehabilitation or construction project, as well as how (and for whom) that infrastructural project will contribute to food security. Applicants are also encouraged to monitor the impact of road construction and rehabilitation on volumes taken to market, costs of production at market, and income earned by participating households.

Gender. Women tend to manage household income in Madagascar (although they do not often have the final say on household expenditures). Because of this, women are often welcomed into agribusiness activities and serve as treasurers of group leadership committees. However, SBCC will be required to enable women to move into committee chair positions or to interact directly with market or agency actors.

Priority Activity Area 3.2: Households strengthen the value-added processing and storage of their production

This important activity area is designed to support program activities targeted to households unable to participate in on-farm activities due to land, labor, or other constraints. Many of these beneficiaries will be female headed, chronically poor, and/or landless households. Livelihood activities may be established with vulnerable households that provide an ongoing and more reliable source of income for participants. This activity area will be implemented jointly with Priority Activity Area 3.4 (Households increase their access to credit and/or savings). For a given beneficiary group, income generating activities should be selected based upon regular market and production analyses, conducted by the project in conjunction with participants, to identify products and/or services that are locally profitable. Care should be taken to avoid training all local participants in one activity and glutting the market. Examples of possible activities include: prepared food production for roadside or urban centers, basket weaving, wood carving, silk weaving, bee keeping/honey production and horn-made products. Private sector markets should be served, and export markets should not be ruled out.

Organization and capacity strengthening of participants. Applicants should consider integrating processing and storage activities into ongoing training of producer and agribusiness groups. Applicants can explore options for local milling of paddy rice, as milled rice prices are higher and less volatile than paddy. Techniques for drying cassava and sweet potatoes may be strengthened through training. Local markets for value-added products may also be explored, such as cassava and maize flour as livestock feed or starch as an industrial input. Opportunities may be sought to establish contracts between producers and buyers in advance in which prices and volumes can be guaranteed, a practice found with larger-scale commercial producers in the central highlands.

Livestock and fishing sector considerations. Livestock and fishing transformation opportunities are more limited for remote rural areas. Urban and peri-urban options for dairy and meat production are greater, although investment is required into physical infrastructure to ensure adherence to minimum standards for production of healthier animals under more sanitary conditions. Applicants are

encouraged to consult the anticipated National Livestock Policy, when released, for production and marketing standards. Fish processing in rural areas primarily entails drying, but fish and shrimp processing for export is more intensive, so domestic markets present lower barriers to entry. Possibilities of producing locally manufactured fish feed for aquaculture activities could also be considered. Applicants considering working in areas with reasonable proximity to waterways and urban centers may wish to explore market opportunities for fish or shrimp production.

Priority Activity Area 3.3: Households increase the income generated by off-farm activities

This activity area is designed to support program activities targeted to households unable to participate in on-farm activities due to land, labor, or other constraints. Livelihood activities may be established with vulnerable households that provide an ongoing source of income for participants. As such, this activity area will be implemented jointly with Priority Activity Area 3.4 (Households increase their access to credit and/or savings).

Integrated programming. As with all other program priority activities, program design, implementation, and monitoring for Priority Activity Area 3.3 should ensure that participation results in concrete and measurable impacts on household food security and the nutritional status of children under 2.

Organization and capacity strengthening of participants. Criteria for participation are narrower for groups participating in this activity than for agricultural producer groups, and village savings and loan (VSL) is more readily adopted by marginalized or lower-capacity groups than producer groups. Numeracy and literacy levels may be lower among these groups than in the population as a whole. Madagascar's informal economy presents many options for income-generating activities, such as prepared food sales, honey production, or handicrafts or textiles, but Title II development programs are encouraged to undertake a market analysis to identify livelihood activities that are viable and for which unmet demand exists.

Gender. Because participants of Priority Activity Area 3.3 will frequently be female heads of households, time and labor requirements should take into account participants' other work and time obligations, as well as labor constraints. Applicants are encouraged to consider adopting a "life skills" approach in which the training package aims to build life skills, confidence, and self-esteem, in addition to a narrow package of income-generating skills, among these socially marginalized participants.

Cross-Cutting Priority Activity Area 1.4/2.4/3.4: Households increase their access to credit and/or savings

The SALOHI-implemented VSL model works well in Madagascar, and adoption is high. The model is spreading to non-SALOHI communities through locally trained individuals without project support. Experience in Madagascar suggests that savings and loan interventions complement FFSs because access to communal savings allows producers to secure inputs in a timely manner. Malagasy rural producers have shown a great willingness to establish VSL groups as part of FFSs, agribusiness groups, and groups linked with off-farm income-generating activities. VSL tends to be more sustainable than FFSs, because participants in the field reported that the ongoing benefits of continued participation in VSL (i.e., continued periodic access to a loan) were greater than the ongoing benefits of participation in a FFS (where the availability of new skills dwindles). VSL is showing momentum in new areas. Experience in Madagascar also shows that VSL can be a valuable add-on to MCHN programs, as it provides participants (mainly women) with resources to undertake MCHN-related activities such as the

purchase of vegetable or fruit seeds/seedlings for gardening. For this reason, increasing access to credit and/or savings is presented as a cross-cutting priority activity area.

Integrated programming. Savings, loan, credit, and microfinance activities offer the quintessential opportunity to conduct integrated programming. VSL, for example, can be linked to women's groups established for the purpose of disseminating best practices for prevention and rehabilitation of child malnutrition (e.g., PD Hearth). VSL can also be established with agricultural producers' groups (even before entering into formal agribusiness activities) and income-generating groups (e.g., for FHHs). The Malagasy people have demonstrated a readiness to adopt VSL and the model seems to be self-perpetuating in some cases, with current beneficiaries independently training nearby, non-project communities in starting VSL groups. However, when implementing this activity, it is essential that Title II development programs include SBCC on intrahousehold expenditure priorities (see **SBCC** below).

Organizing and capacity strengthening of participants. Microfinance institutions such as CECAM and TIAVO are present in rural Madagascar, but are usually far from communities and have application requirements too burdensome for rural smallholders to use. There may be opportunities to work with agricultural microfinance institutions to develop and pilot the very small-scale credit products that are appropriate for the rural producer groups that Title II development programs traditionally target. But as a generalization, VSL groups may often need to be established to pool and share internal resources, rather than linking to existing microfinance institutions such as those above.

SBCC. There are many issues around household cash management that are relevant to food security and warrant attention when designing SBCC messages. For example, cash reserves are often used to purchase cattle or household assets (e.g., radios), rather than to purchase productive capital like small stock or poultry that can be liquidated in smaller amounts, as needed. Knowledge about the need for a diverse and healthy diet is nearly non-existent in rural Madagascar, and nutritional education on purchasing nutrient-dense foods to address malnutrition will be starting from a basic level. In the highlands, many households spend the bulk of their year's savings to exhume their ancestors in the cultural ritual called exhumation. Expenditure on alcohol, including for women (including pregnant and lactating women) and children, is both a public health hazard and a tremendous economic expense. Formative research is essential for identifying priority messages about supporting health and nutrition status through household expenditure and investment.

Governance and conflict. Rural smallholders report that theft of accrued funds is a frequent occurrence, and for security reasons, many VSL groups prefer to keep their funds lent out rather than accrue them. Working with existing microfinance institutions may help resolve this security issue, but Title II development programs may identify other solutions to the security issue. Private microcredit and savings organizations do exist at commune level, solving the security issue, but efforts to develop less burdensome administrative procedures for rural producer entry into these organizations will need to be investigated. Governance efforts are working to reduce community distrust.

5.4 Design and Implementation Considerations

5.4.1 Integrated Programming

Successfully attaining the food security objectives of a Title II development program requires integrated programming that addresses food availability, food access, and food utilization issues in all geographic target areas, and sustainably strengthens resilience. The need for integration of program components aimed at increasing production, reducing vulnerability to food insecurity, and preventing chronic malnutrition has been emphasized throughout the FSCF. For example, household gardening aims to increase dietary quality and diversity with particular emphasis on women and children, while

vulnerability analysis and risk reduction should aim to reduce threats to both food access and the nutritional status of households and children in the community. Programming may be integrated at the community level, but not necessarily always at the level of household or beneficiary, as this level of integration can impose overwhelming time commitments for beneficiaries (especially women) who are urged to actively participate in all of the Title II development program's activities. The relative contribution of different determinants of malnutrition varies across the country, and integrated programming helps ensure that communities receive services that address the range of contributing factors.

Success at integrating programming involves applicants being adept at sharing information internally across technical sectors and encouraging joint field visits and the sharing of technical information. Only when the MCHN staff, for example, understand the objectives and approaches of the livelihoods team and the agronomists on staff, will efforts to integrate programming truly begin. Additionally, to successfully integrate a program, applicants should be able to demonstrate that they have enough field staff to be able to effectively conduct and monitor integrated program implementation.

5.4.2 Geographic and Vulnerable Group Targeting

The Title II development program targets resources for food security programming in the most food-insecure regions in selected countries. Given the scale of chronic food insecurity and stunting, strategic choices must be made for geographic targeting of the Title II development program in Madagascar. Four geographic areas are hardest hit by chronic food insecurity:

- The deep south (Anosy and Androy regions)
- The southern highlands (Haute Matsiatra, Amoron'i Mania, and Ihorombe regions)
- The east and southeast (Atsimo Atsinanana, Atsinanana, and Vatovavy Fitovinany regions)
- The southwest (Atsimo Andrefana region)

To consolidate USAID resources and for maximum impact on the development of beneficiary communities, applicants may wish to focus on regions also targeted by USAID-funded health activities, which include:

- The southern highlands (Haute Matsiatra, Amoron'i Mania, and Ihorombe regions)
- The east and southeast (Atsinanana and Vatovavy Fitovinany regions)
- The southwest (Atsimo Andrefana region)

Within selected target areas, all children under 2 and pregnant and lactating women and their households may be considered for prioritization for nutrition activities to improve food utilization to address the long-term negative effects of chronic child malnutrition. Applicants are encouraged to emphasize reaching poor and marginalized households, FHHs, women and adolescent girls, and households with pregnant and lactating women and/or children under 2 with livelihood interventions. In addition, applicants are encouraged to consider youth issues in design and monitoring, to ensure that program activities support and protect youth, prepare them for adulthood, and actively engage them to the extent feasible and practical within the proposed program framework (USAID 2012c).

5.4.3 Monitoring and Evaluation

As is the case for every Title II development program, applicants are expected to develop an effective monitoring and reporting system that is responsive to internal management needs, USAID's Evaluation Policy, and the reporting requirements of USAID/FFP, the Mission, and the U.S. Department of State. Program success at impact and higher-level outcome levels will be measured by the collection of baseline and final evaluation indicators. These will be collected either by awardees or by an external

contractor supervised by USAID/FFP (USAID/FFP will make a determination on who should collect the data for each award). Baseline and final evaluation indicators will examine changes in economic status and household access to food, as well as children's and women's nutritional status. Some of these indicators are contextual only. In addition, awardees must collect USAID/FFP annual monitoring indicators. Several of the annual monitoring indicators are "Required"; all programs must collect them. Others are "Required if Applicable" and must be collected by all programs implementing relevant program interventions. "Standard" indicators make up the third category. These are not required, but USAID/FFP strongly recommends their collection for programs implementing relevant interventions. Finally, awardees are responsible for planning and implementing a mid-term evaluation approximately halfway through the life of each program. Applicants should refer to the current set of USAID/FFP indicators for clarification on USAID/FFP baseline/final evaluation and annual monitoring **indicators.**

5.4.4 Gender Integration in Program Design and Implementation

The USAID Gender Policy clearly identifies gender integration as a mandatory consideration in all USAID programming. The USAID Gender Policy can be found at http://www.usaid.gov/what-we-do/gender-equality-and-womens-empowerment/addressing-gender-programming. Gender integration requires identifying and addressing, in all policies and programs, gender differences and inequalities, as well as the roles of women and men. The goal of gender integration is to promote gender equality and improve programming and policy outcomes. Applicants are required to explain explicitly how gender issues (such as identifying and understanding the causes of gender inequalities; the differences in roles, responsibilities, and needs of men and women; and the relationships between men and women, within the same sex, and between older and younger men and women) are linked to the three dimensions of food security and how gender will be integrated into all program elements.

A gender analysis must be completed within the first year of the new program and can be undertaken in tandem with the formative research that will be conducted to strengthen program design. Gender analysis refers to the systematic gathering and analysis of information on gender differences and social relations to identify and understand the different roles, divisions of labor, resources, constraints, needs, opportunities/capacities, and interests of men and women (and girls and boys) in a given context. The objective of the gender analysis is to provide a deeper understanding of current gender issues at the community and household levels in program target areas, and this analysis should extend beyond a review of aggregate national level data on gender. At the community level, gender issues are dynamic and can change in positive or negative ways—promoting or undermining gender equality. The gender analysis should seek an understanding of current issues and changing trends that may affect program implementation. A better understanding of the influence of gender in program target areas—particularly in the ways that gender issues affect access to program interventions, decision making, and behavior change or program uptake—is important for achieving program nutrition and food security objectives.

Title II development programs must ensure a gender-sensitive program design by including such approaches as providing women entrepreneurs with access to financial services; encouraging women's and girls' involvement in decision making at the community level; improving access and control over health care; and involving women in all conflict resolution and peace-building activities.

Integrating gender into a Title II development program does not mean that the program must be exclusively or even primarily focused on women. Integrating gender is about sufficiently understanding the social context in the program area to create an enabling environment at the community level so that men and women can dialogue, participate, and gain equitably from program efforts in nutrition and

food security. The program should focus on the dual roles of females and males in education activities to promote household nutrition and food security objectives.

The revised version of the Automated Directives System (ADS) 205, issued in July 2013,[5] provides guidance on how to implement USAID's gender equality and female empowerment policy. Applicants applying for the next Title II program in Madagascar should note the requirements in ADS 201, 202, 203, and 205 for integrating gender equality and women's empowerment into all phases of programming, budgeting, and reporting. ADS 205 defines what a gender analysis is and explains how program offices and technical teams must incorporate the findings of the gender analysis throughout the program cycle, including in country strategies and projects.

5.4.5 Development Approach, Sustainability, and Exit Strategy

USAID/FFP seeks to implement effective models, build capacity, and create an enabling environment adapted to the Madagascar context. Therefore, applicants must provide an overall development strategy that seeks to create, wherever possible, profitable, self-financing, and self-transferring models that will continue to spread under their own momentum both during and after the project. It is the expectation that these models will be adopted and adapted by a significant proportion of the population. Many examples of this type of intervention exist, but one particularly successful example of this type of model is the Farmer Managed Natural Regeneration system that is spreading in Niger. [6]

Sustainability of impact of the Title II development program in Madagascar is most likely to happen in areas where the following factors exist:

- Recognition by community members of activities' proven value and their visible outcomes
- Ownership and commitment to continue activities on the part of the community, community group, or government
- Empowerment of individuals, communities, and service providers to demand quality services
- Extent of transfer to community members, groups, and service providers of the skills and knowledge needed to generate desired outcomes
- Institutional capacity of community-based organizations and health facilities is strengthened, as is the capacity of key individuals in those organizations
- Adaptability of community-based organizations and health facilities in the face of unpredictable political, environmental, and social changes
- Explicit plans for resource generation when consumable supplies (e.g., medicines and immunizations, seeds and agrochemicals, food) are needed to sustain impact (Rogers, B.L. and Macías, K.E. 2004)

The sustainability of program results can be improved by well-implemented integrated programming, as well as through the use of community participatory approaches. Community participatory approaches focus on ensuring community ownership and responsibility from the beginning of program implementation, with communities helping to establish the program objectives and engaging in the program planning process. Ownership by end users of community structures, such as water point installations, will help to address issues of deterioration of community development structures.

Strengthening of groups and group activities can also help ensure sustainability of program results. For example, the introduction of community fields at health centers, where profits from harvest are split between individuals and health centers, can ensure sustainability by providing the resources to maintain

[5] ADS 205 can be found at http://www.usaid.gov/ads/policy/200/205.

[6] A paper describing this system can be found here: http://www.ifpri.org/publication/agroenvironmental-transformation-sahel.

improvements in health services. Ensuring long-term access to improved seed varieties through the use of associations or groups, particularly women's groups, can simultaneously sustain results related to the use of the improved varieties and strengthen groups' social capital, both of which can have tangible community benefits and can allow the groups to tackle other problems. Selection of self-financing and self-transferring interventions also serves to facilitate scale-up to new populations not counted among direct beneficiaries.

Part of a Title II development program's ability to achieve sustainability of program impacts depends on well thought out and implemented exit strategies. An exit strategy is a plan describing how the program intends to withdraw its resources while assuring that the achievement of development goals is not jeopardized and that progress toward these goals continues. An exit strategy may use graduation from specific project areas as steps toward the eventual total withdrawal of resources, or exit may take place at one time across the entire program area. In both cases, the underlying goal of an exit strategy is to ensure sustainability of program impacts after a program ends. Steps to help establish a successful exit strategy include:

- Establish a clear but flexible timeline linked to the program funding cycle.
- Incorporate exit plans from the beginning of program implementation.
- Implement exit plans in a gradual, phased manner.
- Consider an exit timetable that allows sequential graduation of communities and/or components.

5.4.6 Surge Capacity, Early Warning, and Disaster Risk Reduction

The centrality of resilience to the Madagascar Title II development program underscores the imperative that communities undertake a multidimensional analysis of the risks they face and their sources of resilience. This process builds community understanding of the causes and effects of acute and chronic food insecurity and malnutrition. This process also lays a foundation for informing and explaining Title II development food assistance program design, builds interest in participating in disaster risk reduction activities, clarifies the link between disaster risk reduction and other (e.g., agriculture and health) project activities, and helps lead to the establishment of locally managed response mechanisms to respond to local shocks.

The Madagascar Title II development program aims to embody disaster risk reduction by lessening people's exposure to food security shocks and reducing their vulnerability to the adverse effects of those shocks. Applicants may consider including activities to reduce risk in the following areas, based on their own local risk assessment: peace-building, conflict resolution and governance; gender (see **Section 5.4.4**); community and local government emergency response planning; and community sustainable natural resource management and land use planning.

Applicants may consider the variety of ways in which disaster risk reduction and early warning may be incorporated into program design and implementation. Under the previous Madagascar Title II development program, disaster risk reduction activities (including development of disaster prevention and mitigation plans) were allocated a discrete strategic objective and staff across most of the program. Alternatively, these activities may be incorporated in a cross-cutting manner across all strategic objectives and intermediate results. Each model presents advantages and disadvantages, and poses different challenges particularly regarding staff recruitment, training, and supervision, as well as ensuring linkages with other project components. Malagasy communities often demonstrate a readiness to engage on disaster preparedness with regard to cyclones, flooding, and drought, but concepts of vulnerability to other slow-onset, small-scale/idiosyncratic or socioeconomic shocks are not well understood. Experience in Madagascar suggests that effectively incorporating disaster risk reduction and early warning into Title II programs requires a continual intensive effort with repeated population

exposure and capacity strengthening, with the goal of ensuring that community members and representatives view all program activities through the lens of the question, "How does this activity affect the vulnerability of the community, and of different population groups, to the most important shocks they face?" Given limited time and resources, applicants are also encouraged to define the range of shocks and outcomes that the program aims to address, to avoid overreaching in the disaster risk reduction/early warning component of the program beyond the overall program focus.

5.4.7 Capacity Strengthening of Public and Private Institutions

Effective partnering and capacity strengthening can improve program implementation, effectiveness, scale, coverage, and sustainability. The process promotes cross-fertilization, transparency, and enhanced potential for a coordinated programming approach. For improved MCHN programming, building the capacity of health service providers, community leaders, community volunteers, traditional birth attendants, and leader mothers can all have a positive impact on IYCF practices, use of health services, and timely treatment-seeking action for pregnant women with danger signs and children with moderate acute malnutrition, severe acute malnutrition, and childhood illnesses. Capacity strengthening of local partners, community volunteers, and service providers is a high priority for ensuring that the program's food security objectives are achieved and maintained in Madagascar. Capacity strengthening includes activities designed to strengthen communities' abilities to organize, plan, and represent their own interests.

Applicants may also considering focusing on strengthening the capacities of their own staff and volunteers, providing them with on-going training and frequent, supportive supervision in which the supervisor provides constructive feedback to improve staff performance and enhance learning. This includes training staff to research and address gender issues as a part of their day-to-day activities to enhance program impact on food security and nutrition outcomes among women, children, and men.

5.4.8 Social and Behavior Change Communication

There is clearly a need for SBCC in Madagascar Title II development food assistance programs. As mentioned earlier, many suboptimal IYCF practices, dietary diversity and quality issues, and underutilization of health services can be addressed through a strong, integrated SBCC component. The development of an effective SBCC strategy depends on good planning, good formative research, and coverage of all target groups and others in a position to enable changes in behavior. For example, if a program wants to increase the dietary diversity of pregnant women, the women themselves must understand and accept the importance of making these changes, and their husbands, other household members, and the community must also buy into these new practices to make them feasible and sustainable.

5.4.9 Operations Research

Operations research enables programs to identify problems in service delivery and to test programmatic solutions to solve problems in program implementation, especially in countries with limited infrastructure and human resources, such as Madagascar. It also provides program managers and policy decision makers with the information they need to improve existing services. There are five basic steps in the operations research process: 1) identify the problem in service delivery or implementation, 2) identify a solution or strategy to address the problem, 3) test the solution, 4) evaluate and modify the solution as needed, and 5) integrate the solution at scale in the program.

By incorporating well-designed operations research as a key part of program activities, programs can continuously examine the quality of their implementation and identify constraints to delivery, access, and utilization of program activities, adjusting the program as necessary. Operations research is an

iterative process that may be conducted at the beginning of the project and repeated during the life of the activity to ensure continued quality in service delivery and program implementation. Done well, operations research can increase the likelihood that the project will attain its stated objectives.

5.4.10 Formative Research

Formative research is the foundation of an effective SBCC strategy and is a critical first step in implementing a new Title II development program. By assessing various health and nutrition practices, formative research helps the program design teams understand target group perspectives and the motivation and rationale for certain behaviors. Formative research can also help implementers select key audiences for behavior change, determine the most feasible and effective behaviors to promote, understand what influences those behaviors, and identify the best ways to deliver SBCC. In a Title II development program, formative research is necessary to better understand barriers, constraints, and facilitators to adoption of improved agricultural technologies and practices, both production and post-harvest; increased market access and use; improved IYCF and care practices; and improved nutrition and health practices for pregnant and lactating women, including adolescent girls. Examples of where formative research will be essential in Madagascar include: the introduction of improved crops such as yellow cassava or orange-fleshed sweet potatoes; determination of potential barriers to adopting new IYCF practices; and gender equality issues within households in different areas of the country. In addition to formative research, applicants are required to undertake a gender analysis and can undertake a vulnerability assessment to understand the current socio-cultural context in which they will operate.

5.4.11 Governance and Conflict Prevention

Title II development programs should aim to mitigate and reduce the risk of conflict at several levels. Applicants should strive to be as neutral as possible in the ongoing political conflict, the socio-economic roots of which will likely remain present even after elections bring in a new central government. While a single Title II development program may be able to do little to actively counter corruption and poor capacity at the national level, efforts can and should be made to ensure that project staff and communities collectively undertake and monitor project activities in accordance with good governance principles. Community management committee members should be selected by the community as a whole; committees should reflect gender balance as much as possible; operations should be transparent and accountable, as appropriate, to the community; and committee members should receive ongoing management training. In alignment with Malagasy customs, project staff should consult at key junctures with community leaders, including local government officials (district mayors and downward) and elders who continue to be key gatekeepers for project success or failure in rural Malagasy society. Local formative research into sources of conflict can identify flashpoints, such as control over irrigation water or efforts to increase women's control over income, and point to programmatic approaches to prevent conflict from arising from related activities. Opportunities to build partnerships with GOM institutions are encouraged, though will likely continue to be problematic due to the political crisis. The term "governance" is thus used broadly in this document, in recognition that opportunities to strengthen governance from national to community level will vary geographically and over the duration of the next Title II development program life of activity.

5.5 Strategic Partnerships

The Madagascar Title II development program places high priority on strategic partnerships. Partnerships in development can enhance sustainability, mobilize complementary areas of expertise and capacity to an activity, and enhance the breadth and reach of programs. Applicants may engage a range of partners in different roles in their programs, based on their own assessments of capabilities required to maximize program impact and sustainability.

The political situation complicates partnerships with GOM institutions, and until a constitutional election resolves the ongoing crisis, USG sanctions preclude capacity strengthening of these institutions. When the political situation is resolved, key GOM institutions to consider for partnership include the ONN and MOPH at national, district, and local levels; the Ministries of Agriculture, Livestock, and Fishing and Fisheries; the National Risk and Disaster Management Bureau and SAP on early warning and response; the EPP-PADR and ROR for monitoring; and the CSAs for linking producers to service providers and market actors in agriculture.

Key interagency partnerships include the *Groupe de Travail de Développement Rural* (GTDR) (Working Group for Rural Development) and the *Groupement de Bailleurs de Fonds de Madagascar* (Donor Group). Potential U.N. partners include WFP (for emergency response and early warning), FAO (for training and extension services for smallholder producers), and UNICEF (for nutrition). CIRAD, the International Livestock Research Institute, the Consultative Group on International Agricultural Research, GSDM, and GSRI are research and extension institutions that have an abundance of technical experience and resources to share.

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Appendix 1. Map of Madagascar

Source: http://reliefweb.int/sites/reliefweb.int/files/resources/FDA9242935F0BB1585257797005B1D22-map.pdf.

Appendix 2. Economic and Poverty Indicators for Madagascar

Indicator	Value	Source*
Population	21.32 million	WB 2011a
Gross Domestic Product (US$)	9.912 billion	WB 2011a
Poverty headcount ratio at national poverty line (% of population)	77%	GOM 2011a
Human development		
Gross national income (GNI) per capita, Atlas method (current US$)	$430	WB 2011a
Percentage of households with electricity	17%	INSTAT and ICF Macro 2010
Received no education (%)	M=15.9/F=18.5	INSTAT and ICF Macro 2010
Median years of schooling completed	M=3.4/F=3.3	INSTAT and ICF Macro 2010
Percentage age 15–49 who can read	M=78/F=75	INSTAT and ICF Macro 2010
Age at marriage and first birth		
Median age at first marriage for women age 25–49 (years)	18.9	INSTAT and ICF Macro 2010
Median age at first birth for women age 25–49 (years)	20.1	INSTAT and ICF Macro 2010
Life expectancy, fertility, and mortality		
Life expectancy at birth, total (years)	67 (F=68/M=65)	WB 2011a
Births per woman	4.36	CIA Factbook
Under-5 mortality (deaths per 1,000 live births)	72	INSTAT and ICF Macro 2010
Child mortality (deaths per 1,000 live births)	62	UNICEF 2012
Infant mortality (deaths per 1,000 live births)	48	INSTAT and ICF Macro 2010
Maternal mortality ratio	440	UNFPA 2011
Prevalence of stunting in children under 5 years of age (%)	53%	INSTAT and WB 2012
Prevalence of underweight children under 5 years of age (%)	30%	INSTAT and WB 2012
Undernourished population (children under 5) (wasted) (%)	6%	INSTAT and WB 2012
HIV		
Ever been tested for HIV and received results of the last test (%) (women/men)	F=13/M=8	INSTAT and ICF Macro 2010
Water and sanitation		
Improved water source, rural (% of rural population with access)	26%	WFP and UNICEF 2011
Improved sanitation (% of total population)	2%	WFP and UNICEF 2011

* WB = World Bank; CIA Factbook = United States Department of State. 2012. INSTAT = *Institut National de la Statistique,* National Institute of Statistics; WFP = World Food Programme; UNFPA = United Nations Population Fund

Appendix 3. Regional Household Land Cultivation

Region	Median HH farm size (ha) (INSTAT and ICF Macro 2010)	% HH that irrigate <25% of their land (%) (CFSVA+N)	Average # crops planted by HH (CFSVA+N)
Central Highlands			
Analamanga	0.5	25.5	3.06
Itasy	1.1	50.7	2.69
Bongolava	1.3	21.3	3.95
Southern Highlands			
Haute Matsiatra	0.9	21.3	3.46
Amoron'i Mania	0.4	82.0	3.46
Ihorombe	1.0	14.3	2.41
Vakinankaratra	0.4	46.0	4.30
East-Southeast			
Atsimo Atsinanana	0.6	35.9	2.79
Vatovavy Fitovinany	0.8	3.4	2.71
Atsinanana	0.9	16.7	3.61
Analanjirofo	1.1	24.2	3.50
Alaotra Mangoro	1.0	49.6	2.70
West			
Boeny	1.5	13.3	1.83
Sofia	1.0	9.5	2.39
Betsiboka	1.5	20.4	1.89
Melaky	1.5	10.2	1.75
Menabe	1.5	26.0	2.16
Southwest			
Atsimo Andrefana	1.2	4.3	1.82
Deep South			
Androy	1.5	75.1	2.31
Anosy	1.2	59.1	1.68
North			
Diana	1.3	57.9	1.11
Sava	1.0	34.2	3.01
Rural Madagascar	1.0		

Sources: WFP and UNICEF 2011, INSTAT and ICF Macro 2010.

Appendix 4. Agricultural Calendar for Madagascar

		Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Rice (rain-fed)													
Rice (irrigated)	Central-West												
	Northern Highlands												
	Southern Highlands												
	Mid-East												
	Mid-West												
	North												
	Northeast												
	Northwest: 1st season												
	Northwest: Intermediate												
	Northwest: 2nd season												
	Southwest												
Maize	Northwest												
	Northeast												
	Elsewhere												
Cassava	Upland (*tanety*)												
	Dry season planting in empty streambeds (*baiboho*)												
Lean season													

Source: GOM 2013d.

Planting

Harvesting

Lean season

Appendix 5. Livestock Production in Madagascar

Location	Cattle	Sheep	Goats	Pigs
Central Highlands				
Analamanga	365,900	6,450	940	209,800
Urban: Antananarivo	1,056,650	13,830	3,850	400,340
Itasy	301,350	7,380	-	111,300
Bongolava	389,400	-	2,910	79,240
Southern Highlands				
Haute Matsiatra	397,540	19,200	120	128,700
Urban: Fianarantsoa	820,540	19,320	1,370	252,740
Amoron'i Mania	276,600	5,750	-	138,500
Ihorombe	575,500	2,380	60	6,070
Vakinankaratra	498,500	9,440	1,500	230,200
Urban: Antsirabe	775,100	15,190	1,500	368,700
East-Southeast				
Atsimo Atsinanana	228,700	-	-	28,440
Vatovavy Fitovinany	194,300	120	1,250	95,600
Atsinanana	104,660	-	-	52,400
Urban: Toamasina	235,360	-	-	60,500
Analanjirofo	130,700	-	-	8,100
Urban: Alaotra Mangoro	355,600	33,000	280	52,600
West				
Boeny	645,400	22,300	18,100	26,900
Urban: Mahajanga	2,112,150	39,300	154,850	177,110
Sofia	1,128,050	7,900	132,850	58,510
Betsiboka	338,700	9,100	3,900	91,700
Melaky	607,300	-	8,560	5,700
Menabe	342,350	6,670	52,240	41,500
Urban: Morondava	949,650	6,670	60,800	47,200
Southwest				
Atsimo Andrefana	1,020,500	352,200	604,760	60,600
Urban: Toliara	1,596,00	354,580	604,820	66,670
Deep South				
Androy	733,500	272,830	471,500	13,800
Anosy	559,500	69,850	104,840	31,100
Urban: Tôlanaro	1,293,000	342,680	576,340	44,900
North				
Diana	367,250	2,450	60,000	26,520
Urban: Antsiranana	843,550	2,890	69,100	47,420
Sava	476,300	440	9,100	20,900
National	10,037,600	827,460	1,472,910	1,518,180

GOM 2013c cites these sources: SAIGS/DSI; DIREL: Direction régionale.

Appendix 6. Most Price-Influencing Markets

Market	Markets with Granger-Caused Price Fluctuations
Ambositra (Amoron'i Mania Region)	Antsiranana I, Avaradrano, Mahajanga I, Miarinarivo, Sambava, Tsiroanomandidy, Ambato Boeny, Ambatondrazaka, Antananarivo, Antsirabe I, Brickaville, Fianarantsoa I, Toamasina I, Toliara I
Fianarantsoa (Haute Matsiatra Region)	Farafangana, Sambava, Ambatondrazaka, Antsirabe I, Avaradrano, Brickaville, Fenoarivo Atsinanana, Mahajanga I, Miarinarivo, Tsiroanomandidy
Avaradrano (Analamanga Region)	Antsiranana I, Brickaville, Fenoarivo Atsinanana, Mahajanga I, Miarinarivo, Sambava, Ambato Boeny, Fianarantsoa I, Toamasina I, Tsiroanomandidy
Ambatondrazaka (Alaotra Mangoro Region)	Antananarivo, Antsiranana I, Avaradrano, Fenoarivo Atsinanana, Mahajanga I, Sambava, Toamasina I, Atsimondrano, Farafangana
Ambato Boeny (Boeny Region)	Mahajanga I, Sambava, Toamasina I, Brickaville, Fenoarivo Atsinanana, Fianarantsoa I, Antananarivo, Atsimondrano, Farafangana
Antananarivo (Analamanga Region)	Antsiranana I, Brickaville, Fenoarivo Atsinanana, Miarinarivo, Sambava, Tsiroanomandidy
Atsimondrano (Analamanga Region)	Antsiranana I, Ambatondrazaka, Brickaville, Fenoarivo Atsinanana, Fianarantsoa, Mahajanga I
Sambava (Sava Region)	Toamasina I, Ambato Boeny, Ambatondrazaka, Fianarantsoa I, Tsiroanomandidy
Antsirabe (Vakinankaratra Region)	Ambatondrazaka, Farafangana, Mahajanga I, Miarinarivo, Sambava
Mahajanga I (Boeny Region)	Toamasina I, Brickaville, Fenoarivo Atsinanana, Fianarantsoa I, Sambava
Tsiroanomandidy (Bongolava Region)	Brickaville, Mahajanga I, Miarinarivo, Sambava, Toamasina I
Miarinarivo (Itasy Region)	Mahajanga I, Farafangana, Toamasina I
Farafangana (Atsimo Atsinanana Region)	Brickaville, Fenoarivo Atsinanana, Sambava
Antsiranana (Diana Region)	Toamasina I, Fianarantsoa I, Sambava
Toamasina I (Atsinanana Region)	Sambava, Brickaville
Brickaville (Atsinanana Region)	Ambatondrazaka
Fenoarivo Atsinanana (Analanjirofo Region)	Antsirabe I
Toliara I (Atsimo Andrefana Region)	N/A

Source: WFP and UNICEF 2011.

Appendix 7. Water, Sanitation, and Hygiene

Location	Percentage of households with access to safe water (rural areas, dry season)	Percentage of households with access to safe sanitation (rural areas)
Central Highlands		
Analamanga	47	6
Itasy	60	1
Bongolava	51	1
Southern Highlands		
Haute Matsiatra	18	0
Amoron'i Mania	18	1
Ihorombe	37	1
Vakinankaratra	27	4
East-Southeast		
Atsimo Atsinanana	16	0
Vatovavy Fitovinany	27	5
Atsinanana	28	0
Analanjirofo	21	0
Alaotra Mangoro	19	3
West		
Boeny	42	3
Sofia	10	1
Betsiboka	23	8
Melaky	16	0
Menabe	24	4
Southwest		
Atsimo Andrefana	14	0
Deep South		
Androy	10	0
Anosy	27	1
North		
Diana	46	6
Sava	21	4
National	n/a	n/a
Rural	26	2
Urban	n/a	n/a

Source: WFP and UNICEF 2011.

Appendix 8. Current Policies, Strategies, and Programs

Government of Madagascar Policies, Strategies, and Programs			
Lead organization	**Dates**	**Sector**	**Policy, strategy, or program**
GOM	2007–2012	Development	Madagascar Action Plan
EPP-PADR	2001	Development	Rural Development Action Plan and Regional Action Plans for Rural Development
MAEP*	2008	Agriculture	Agricultural Policy
MAEP	2006	Agriculture	Watershed Irrigated Perimeter Policy
MAEP	2008	Agriculture	National Seed Strategy Document (DSNS)
Ministry of Agriculture	2013	Agriculture	National Strategy and Operational Plan for Riziculture Mechanization (draft)
Ministry of Agriculture	2012	Agriculture	National Agricultural and Rural Training Strategy
Ministry of Environment, Water and Forests	2006	Environment	National Action Plan for Climate Change Adaptation
Ministry of Interior, National Risk and Disaster Management Bureau	2012–2013	Humanitarian	National Contingency Plan: Cyclones and Flooding
EPP-PADR	2006	Food Security	National Food Security Action Plan
Ministry of Agriculture	2010	Agriculture	National Riziculture Development Strategy
MAEP	2007	Agriculture	Agriculture, Livestock and Fishing Sector Program
Ministry of Agriculture		Agriculture	Farmer Services Strategy
MOPH	2005	Health	National Health Policy
MOPH	2009	Health	National Community Health Policy
ONN	2004	Nutrition	National Nutrition Policy
MOPH	2012–2013	Health	Interim Plan for the Development of the Health Sector
ONN	2012–2015	Nutrition	National Nutrition Action Plan
MOPH	2013–2017	Health	Strategic Plan for Malaria Control
Sec. Ex. National Program against AIDS	2007–2012	HIV/AIDS	National HIV Strategic Plan
GOM	2004–2008	Gender	National Action Plan for Gender and Development
GOM	2000	Gender	National Policy for the Promotion of Women
GOM	2008	Protection	National Action Plan for the Fight Against Child Labor

* Ministry of Agriculture, Livestock and Fisheries (*Ministère de l'agriculture, de l'élevage et de la pêche*), which existed before the 2009 political crisis

U.S. Government and USAID Policies, Strategies, and Programs			
Lead organization	**Dates**	**Sector**	**Policy, strategy, or program**
USAID/Madagascar (Jhpiego)	2009–2013 (possibility of extending and renewing beyond 2013)	Health	Maternal and Child Health Integrated Program (MCHIP)
USAID/Madagascar (John Snow, Inc.)	2011–2016	Health	MAHEFA
USAID/Madagascar (Marie Stopes Madagascar)	2012–2015	Health	Support for International Family Planning Organizations
USAID/Madagascar	2013–2018	Health	Primary Health Care (PHC) Project
USAID/Madagascar		Health	DELIVER project
USAID/FFP (FEWS NET)	2013	Early Warning	FEWS NET Project: Livelihood Zoning Plus

Other Policies, Strategies, and Programs			
Lead organization	**Dates**	**Sector**	**Policy, strategy, or program**
EU	2008–2013	Development	Country Strategy Document and Illustrative National Program
EU	2013	Food Security	Strengthening Food Security and Increasing Agricultural Income (ASARA)
EU	2012–2016	Food Security	Southwest Fanantenana Project
EU	2012–2016	Nutrition	Prevention of Malnutrition in Five Communes of Betioky Atsimo District, Atsimo Andrefana Region
EU	2008–2013	Development	Improvement of the Social and Hygiene Environment in Poor Quarters of Antananarivo and the Periphery
EU	2008–2013	WASH	Support to Coordination of Non-state Actors and Local Authorities, with Neighborhood Communities, in a Local Potable Water Supply and Sanitation Development Program
EU	2011–2013	WASH	Capacity Strengthening for Communes and User Committees
EU	2012–2015	Health	Primary Social Sectors Support Project
EU	2012–2015	Nutrition and Food Security	Nutrition and Food Integrated Actions
EU	2012–2016	Nutrition and Food Security	Prevention of malnutrition in 5 communes in the region of Atsimo Andrefana, by intervening on the underlying causes of food security and malnutrition
AFD	2009–2015	Health	Health Sector Support Program
AFD	2008	Agriculture	Agroecological Technique Diffusion Support Project
AFD		Agriculture and Water	Lac Alaotra Watershed Development and Protection Project
AFD		Pisciculture	Support to Development of Pisciculture in 4 Regions
World Bank	2011	Development	Interim Strategy Note for the Republic of Madagascar
World Bank	2008–2013	Emergency Recovery	Emergency Food Security and Reconstruction Project

World Bank	2012–2016	Health, Education	Emergency Support to Critical Education, Health and Nutrition Services Project
World Bank	2012–2014	HIV/AIDS	Second Multisectoral STI/HIV/AIDS Prevention Project
World Bank	2008–2014	Agriculture, Water, Environment	Irrigation and Watershed Management Project
Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM)	2005-2014	Health	Scaling up successful malaria treatment and prevention initiatives in Madagascar
IFAD	2006	Development	Country Strategic Opportunities Programme
IFAD	2011	Agriculture	Vocational Training and Agricultural Productivity Improvement Programme
IFAD		Development	Rural Income Promotion Programme
IFAD		Development	Programme of Support for Rural Microenterprise Poles and Regional Economies
IFAD		Agriculture	Support Project for Farmers' Organizations and Agricultural Service Centers
AFDB	2006-2009	Development	Republic of Madagascar Country Strategies Paper
African Development Bank		Agriculture	Agricultural Infrastructure Rehabilitation Project in the Southwest Region
IRD and GRET	1994–present	Nutrition	NutriMad
GTZ / GIZ			Disaster Prevention and Resilience Strengthening for the Rural Population of the South of Madagascar
GTZ / GIZ			German-Madagascan environmental programme
Japan International Cooperation Agency	2012–2017	Rural Development, Environment	Integrated approach Development for Environmental Restoration and Rural Development
U.N.	2008–2013	Development	United Nations Development Assistance Framework
WFP	2009-2013 (Extended)	Food Security	Country Programme
WFP	2010-2012 (Extended)	Food Security	PRRO

Appendix 9. USAID Title II Development Program in Madagascar (FY 2010–FY 2014)

Implementing partners: CRS, ADRA, CARE, and LOL

MYAP name: Strengthening and Accessing Livelihood Opportunities for Household Impacts (SALOHI)

Strategic Objective 1: Health and nutritional status of children under 5 improved.

- Growth monitoring and promotion (GMP)
- PD Hearth (FARN)
- Pregnant Women Support Groups (SAMBAIKA)
- Essential Nutrition Actions (ENAs) integrated into GMP, FARN, SAMBAIKA, information, education, and communication (IEC), and C-IMCI household visits
- Integrated management of childhood illnesses (C-IMCI) using community health volunteers (CHVs) and home visits (promoted during GMP, FARN, SAMBAIKA, IEC, and household visits)
- Training of CHVs
- IEC and social and behavior change communication (SBCC) campaigns
- Direct food distribution

Strategic Objective 2: Livelihoods of food-insecure households improved (for smallholder farmers and about 3,000 pastoralists).

- Creation of farmer field schools and Farmer Leaders
- Agribusiness promotion and cooperatives/groups/farmers' associations promotion
- Market surveys
- Development of business plans
- Links with agriculture service providers
- Creation of VSL associations

Strategic Objective 3: Community resilience to food security shocks increased.

- Disaster prevention and mitigation: training in disaster risk reduction, irrigation, training in natural resource management; establishment of community disaster prevention and mitigation plans (DPMPs); improved management of land, water, and roads
- Establishment of community-based early warning systems
- Sustainable land use plans (part of the DPMPs)
- Targeting urban households: social protection center; training; support to accessing critical essential services
- Promotion of good governance through community groups
- Direct food distribution through Food for Work, Food for Assets/Food for Training (under DPMP)

Cross-cutting: Gender, environmental management, governance, partnership.

SALOHI is implemented in 7 of Madagascar's 22 regions. While a single nongovernmental organization (one of the four consortium partners, or one of CRS's implementing partners) leads implementation in each district, there is varying cross-fertilization and seconding across the project.

Areas of implementation of SALOHI include:

- Analanjirofo Region in the north: Districts of Mananara Avaratra, Fenoarivo Atsinanana, and Vavatenina (CRS)
- Amoron'i Mania Region in the highlands: Districts of Ambositra, Fandriana, and Manandriana (ADRA)
- Atsinanana Region on the east coast: Districts of Vatomandry and Mahanoro (CARE)
- Vatovavy Fitovinany Region on the east coast: Districts of Ifanadiana, Nosy-Varika, and Mananjary (ADRA and CRS), Ikongo (CRS), and Manakara Atsimo and Vohipeno (LOL)
- Atsimo Atsinanana Region in the southeast: Districts of Farafangana and Vangaindrano (LOL)
- Anosy Region in the south: Amboasary-Atsimo District (CARE)
- Androy Region in the south: Districts of Bekily, Beloha, Ambovombe, and Tshombe (CRS)
- Urban protection centers in Antananarivo, Toamasina, and Fianarantsoa (CRS)

SALOHI built upon the experience of the consortium members during the preceding development assistance programs (DAPs):

- DAP1 (FY 2000–FY 2004) covered Antananarivo and Mahajanga regions, as well as the northwest, the highlands, and east coast.
- DAP2 (FY 2005–FY 2009) had a narrower geographic focus on the east coast and Antsirabe Region.

Source: CRS et al. 2012.

Appendix 10. Conservation Agriculture

Conservation agriculture (CA) encompasses a set of agricultural practices identified to preserve soil structure and composition and prevent the processes leading to soil degradation and erosion. These "better practices" aim to promote agricultural productivity and intensification sustainably. CA embodies three main components: minimum mechanical soil disturbance (e.g., direct seeding is used rather than tillage or plowing, which is used in traditional agriculture to prepare a seedbed); permanent organic soil cover (e.g., use of cover crops, crop residues, or mulch to protect soil); and diversification of crop species grown in sequences and/or associations (i.e., crop rotation). CA techniques should be integrated with other known better practices, such as use of improved seeds, use of organic fertilizer (e.g., manure, compost), and careful water management. Local cover crops include *vohem, vinya, mukuna, niebe,* and *dolicose*.

CA presents advantages:

- Reduced tillage and direct seeding use less fossil fuels, reduce water run-off, reduce soil erosion, reverse the loss of soil organic matter, allow the retention of soil cover (e.g., crop residues), and reduce disturbance to beneficial soil micro-organisms and fauna.
- Crop rotation helps reduce problems associated with crop diseases and pests.
- CA techniques can be applied to degraded land to restore soil quality and productivity. For example, under SALOHI, pastoralists applied zero-grazing techniques to collect manure for application to degraded land for 7 days, after which the land was suitable for grazing or agricultural production.

CA presents disadvantages:

- CA doesn't necessarily improve yields over traditional cultivation in the short term, and where household financial and labor resources don't allow for the full set of CA techniques to be adopted, a drop in yields may occur.
- Initially after adoption of CA, soil compaction can be a problem (in the absence of tillage, and before worms and other fauna populations recover). Controlling weeds in the absence of fertilizers can increase labor requirements significantly.
- In the African setting, shifting from plowing to CA techniques tends to shift the burden of agricultural labor further toward women.
- Mulch availability is often poor for use as a crop cover, because smallholders prefer to use crop residues as a feed for livestock.

The *Groupement Semis Direct de Madagascar* (GSDM) provides a platform for a range of institutions involved in research, training, and extension/diffusion of CA techniques in Madagascar. CA techniques can be applied to the range of food and cash crops grown in Madagascar, including paddy and upland rice.

Sources:

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Appendix 11. Intensified Rice Production in Madagascar

The *Système de Riziculture Intensifiée* (Intensified Rice Production System), widely known as SRI, was developed in Madagascar in the 1980s. International researchers, notably with Cornell University, have assisted in promoting SRI worldwide. Although SRI has been slow to take off in Madagascar and many concerns remain unanswered about SRI effectiveness in the field, some of the rice production in Madagascar is currently produced using SRI methods. SRI was included in the 2011 National Rice Production Strategy. The association Tefy Saina works to promote SRI nationwide.

SRI entails the following components: Seeds are planted in a small nursery where they germinate. Very young individual seedlings (at the two-leaf stage) are then transplanted to the main field, where they enter the stage of tillering and grain production. They are planted in rows or a grid, with more space than traditional rice production. The field is moist but not flooded, and strict water management systems are used in irrigation to ensure saturated fields while avoiding water stress (if the rice paddies dry out excessively) or excessive water usage (in case of flooding). Paddy rice, with its husk in place, is then dried and stored until it is milled.

SRI presents advantages:

- Fewer seeds are required because seedlings are transplanted in a grid pattern individually rather than in groups.
- Because seedlings are transplanted young, they enter the stage of tillering in the main (irrigated) field where they are supposed to better achieve their tillering potential.
- Increased yields.
- Reduced water requirements (because the fields are not flooded, they are just moist) also could reduce conflict over water, an enormous social benefit.
- Because rice field flooding is not required, there is a reduction in methane gas production.

SRI presents disadvantages:

- It is time-intensive to replant seedlings individually in rows.
- Early and regular weeding requirements boost labor requirements.
- The boost in productivity with SRI is not well-established in literature. Cornell's Norman Uphoff believed that yields had increased from 2 to 8 tons/hectare in Madagascar, but this is in dispute, so actual yield increases in Madagascar may be less.

Established in 2008 with help from the Better U Foundation, *Groupement SRI de Madagascar* (GSRI) aims to provide a platform for information sharing, dissemination of techniques, planning, and sensitization to a global audience about the value of SRI.

Sources:

Better U Foundation website: http://betterufoundation.org/. Accessed June 11, 2013.

GSRI website: http://groupementsrimada.org. Accessed June 11, 2013.

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