



MADAGASCAR

ENHANCED MARKET ANALYSIS

SEPTEMBER 2018



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Created in response to the 1984 famines in East and West Africa, the Famine Early Warning Systems Network (FEWS NET) provides early warning and integrated, forward-looking analysis of the many factors that contribute to food insecurity. FEWS NET aims to inform decision makers and contribute to their emergency response planning; support partners in conducting early warning analysis and forecasting; and provide technical assistance to partner-led initiatives.

To learn more about the FEWS NET project, please visit www.fews.net.

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Acronyms and Abbreviations

AOI	Areas of interest
BNGRC	National Office of Risk and Catastrophe Management
CDP	Central distribution point
CFA	Cash-for-assets
CFSAM	Crop and Food Security Assessment Mission
CFW	Cash-for-work
CRS	Catholic Relief Services
CSB	Corn Soya Blend
DFSA	Development Food Security Activity
DHS	Demographic and Health Survey
EDP	End distribution point
EMA	Enhanced Market Analysis
FDP	Final Distribution Points
FEWS NET	Famine Early Warning Systems Network
FFA	Food-for-assets
FFW	Food-for-work
FFP	Food for Peace
FID	Development Intervention Fund
FSP	Financial service provider
GoM	Government of Madagascar
ILO	International Labour Organization
IPC	Integrated Phase Classification
Kcal	Kilocalorie
Kg	Kilogram
LRP	Local and regional procurement
L	Liter
MFI	Microfinance institution
MPPSPF	Ministry of Population, Social Protection and Women Empowerment
MGA	Madagascar ariary
MT	Metric ton
NGO	Nongovernmental organization
OdR	The Rice Observatory
SCP	Structure, Conduct, and Performance
SHF	small holder farmers
UN	United Nations
USD	United States dollar
USAID	United States Agency for International Development
WFP	World Food Programme

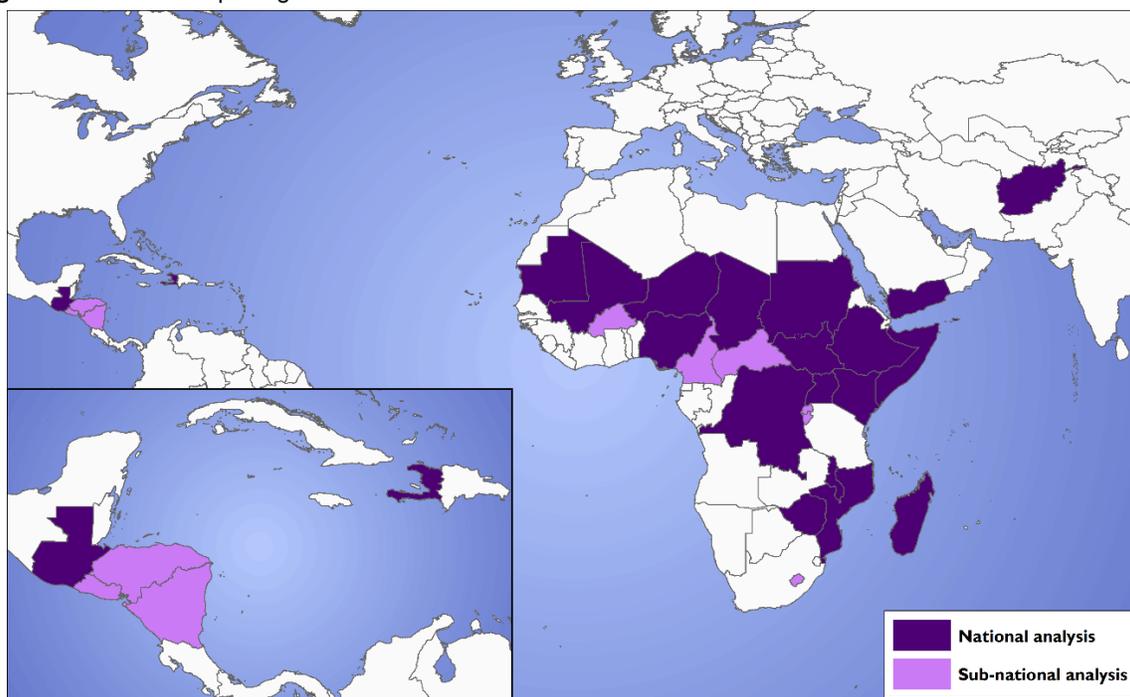
Preface

The Famine Early Warning Systems Network (FEWS NET) is a leading provider of objective, evidence-based food security analysis. Based on in-depth understanding of local livelihoods, FEWS NET analysts monitor information and data related to weather and climate, crops, pasture conditions, markets and trade, nutrition, and other factors that influence acute and chronic food insecurity in several countries (Figure 1). Along with monthly reports and alerts, FEWS NET produces specialized research products on food security drivers and cross-cutting issues such as climate change and resilience.

In an effort to understand current and to foresee future market anomalies, FEWS NET relies on a broadly defined Markets and Trade Knowledge base that includes Market Fundamentals reports (or context documents), special reports, and databases of historical market information including production, food balance sheets, and prices. The Markets and Trade Knowledge base largely serves as a baseline for the assessment of existence and extent of market-based anomalies that could contribute to food insecurity. The Market Fundamentals reports likewise serve as starting points for providing efficient and effective market-based response decision support for groups developing both emergency programs, including cash and voucher interventions as well as local and regional procurement (LRP), and development programs, including support to food security and nutrition through improving the availability of and access to food and value chain development.

In 2016, FEWS NET's core analytical activities were augmented to include Enhanced Market Analysis (EMA). Under EMA, FEWS NET provides market-based response decision support, including but not limited to assessing the feasibility and potential impacts of food assistance programs (emergency and development) on a given country's local economy through Congressionally mandated analyses. Such support is often referred to as a Bellmon analysis. EMA reporting is progressive in nature, and, when possible, builds on FEWS NET's existing in-depth knowledge of agroclimatology, livelihoods, markets, nutrition, and institutions and networks in support of food security monitoring and analysis in presence and remote monitoring countries.

Figure 1. FEWS NET reporting countries



Note: National-level reporting takes place in presence countries, while subnational reporting takes place in remote monitoring countries.

Source: FEWS NET

Executive Summary

- This FEWS NET Enhanced Market Analysis (EMA) report presents findings to inform regular market monitoring and analysis in southern Madagascar. The information can be used to support the design of food security programs, including but not limited to informing a United States Agency for International Development (USAID) Bellmon determination in advance of an FY 2019 USAID Funded activity.
- The Madagascar EMA involved a mixed-method approach, combining the collection, review, and analysis of primary and secondary data from various stakeholders. Primary data were collected through a field assessment between June 24 and July 8, 2018, by a team of FEWS NET staff and international and local consultants, supported by local guides. The team met with stakeholders in Antananarivo, Fianarantsoa, and the prioritized areas of interest (AOI) in Atsimo-Andrefana and Androy Regions (“Grand Sud”) and Vatovavy Fitovinany and Atsimo-Atsinanana Regions (“Sud Est”) (Figure 2). The EMA assessment was done in the context of longstanding arid drought conditions in the Grand Sud and at least one cyclone per year in the Sud Est.
- The EMA analyses five main commodities; rice, sorghum, pulses, edible oil, and Corn Soya Blend (CSB), henceforth referred to as the focus commodities. A relatively coarser analysis was undertaken for other staple foods and wild foods, as relevant by region. Livestock (meat and milk) markets were analyzed in Androy and Atsimo-Andrefana regions and fish markets were analyzed in Vatovavy Fitovinany, Atsimo-Atsinanana, and Androy regions.
- The findings indicate that several modalities are likely feasible at scale as part of a future program across the AOI in Madagascar. These include: In-kind Title II assistance in the form of rice, pulses, edible oil, and Corn Soya Blend; cash transfers (including vouchers) in areas with easily accessible and well-supplied markets, adequate beneficiary (vendor) capacity, and access to financial services; and food-for-assets (FFA)/cash-for-assets (CFA) in areas where community asset needs can be met through such activities.
- Crop sales and casual agricultural labor are among the most prominent income sources among poor and very poor households across the AOI. Agricultural production in the Grand Sud is composed mainly of staple food production (e.g., cassava and maize), while agricultural production in the Sud Est is more diverse and includes cash crops (e.g., banana, coffee, litchi, cloves, vanilla). More regular and diverse casual labor opportunities exist in the Sud Est, contributing up to 30–50 percent of annual cash income there, versus 15–30 percent in the Grand Sud.
- Household expenditures follow seasonal patterns and are similar across the AOI. Food purchases are highest during the lean period from October to March (August to March for the poorest households) and account for 50–80 percent of average annual expenditures in the AOI. Health expenses are notable from February to June, when malaria and waterborne diseases are more common. Social ceremonies such as funerals take place throughout the year but are most common September and October in the Grand Sud. Circumcisions, another important social ceremony, typically take place between June and August.
- Rice is the main staple food in Madagascar, but actual household consumption varies across the AOI based on accessibility and/or availability. Important localized consumption patterns arise based on local production and price trends. In the Grand Sud, households typically consume yellow maize, dried cassava, sweet potato, and cowpeas. Beef (zebu) and goat meat are the most consumed animal protein, although eaten in small quantities and on rare occasions. Households in the

Figure 2. Madagascar EMA focus regions



Sud Est consume local rice (including red and white varieties), substituting imported rice when local rice is scarce and relatively more expensive; fresh cassava (available year-round); and white beans (substituted with cowpeas when prices increase). Fish is the most consumed animal protein according to household surveys.

- The self-sufficiency status of the AOI varies by commodity and by region. The entire AOI is structurally deficit in terms of rice, relying on imports from other areas of the country and international markets to fill local gaps. Maize and cassava production from both southern and central Madagascar (Ambovombe, Ambalavao, and Ankaramena in Haute Matsiatra Region) supply the Grand Sud. Sorghum production is minimal, and very limited quantities are sold on markets. Many varieties of pulses are produced and consumed in the AOI, such as white and red beans, mung beans, black-eyed peas, and cowpeas, among others, with minor localized preferences for one variety over another depending on the area. In general, cowpeas and black-eyed peas are more consumed in the Grand Sud whereas different varieties of pulses are consumed in the Sud Est. Local pulse production in the AOI is complemented by supplies from Toliara and Morondava in the Sud Est and Bekily and Toliara in the Grand Sud. Most households purchase imported, refined edible oil that is readily available on markets but not fortified.
- A range of wild foods are commonly consumed by poor and very poor households in the AOI, providing between one to two months of total annual food consumption. In the Grand Sud, yellow cactus fruit is consumed in February and March, at the end of the lean season, contributing up to 30 percent of consumption during those specific months. Red cactus fruit and cactus leaves are consumed only as a coping mechanism. In the southeast, poor and very poor households consume both wild and cultivated breadfruit between January and June.
- Artisanal, small-scale fishing takes place from September to March in the Sud Est. Lower-quality fish are consumed domestically either fresh, smoked, or dried and salted. Fish and seafood purchases account for, on average, 7 percent of annual household expenditure. Fish consumption in the Grand Sud is very limited as fishing is not common due to strong winds, cultural tendencies, and distance from the ocean in inland areas. Culturally, zebu are raised for breeding rather than consumption, as wealth is displayed by the number of cattle owned, particularly in the Grand Sud. Zebu are often the target of banditry in Madagascar, causing insecurity. Some poor households own zebu for manual labor (e.g., pulling carts and plowing fields). Many poor and very poor households raise goats, sheep, and chickens mainly as a source of income rather than for their own consumption. Few households in the AOI raise pigs. Households in the AOI spend up to 5 percent of annual expenditures on meat consumption, typically only for special occasions.
- The Grand Sud and Sud Est face distinctly different hazards that result in food insecurity. Households in the Grand Sud report prolonged dryness for the past 10 to 12 years, resulting in consecutive years of poor production. The Grand Sud has been classified as IPC Phase 2 (Stressed) or higher in more than 90 percent of FEWS NET analysis cycles in the past three years. The Sud Est suffers from cyclones from January to April, resulting in yearly flooding and destruction of infrastructure.
- The availability of infrastructure and other supporting services necessary for the management and distribution of in-kind commodities is generally a challenge. Three main ports serve the AOI: Toamasina, serving the Sud Est, and Toliara and Taolagnaro, serving the Grand Sud. The Sud Est is also regularly served by the Port of Taolagnaro and in exceptional circumstances by Toliara. Delayed and lengthy berthing procedures are challenges faced at the Ports of Toamasina and Toliara. Insecurity is an issue on a few roads in the Grand Sud, particularly the RN 13. Road conditions deteriorate rapidly during the rainy season (November–March). Internal transport costs are high throughout the country, particularly in the Grand Sud and remote areas of the Sud Est. Insufficient trucking capacity and in-transit commodity losses due to poorly adapted packing were cited as common challenges in the Grand Sud. Implementing partners in Madagascar have a network of quality central delivery point (CDP) storage warehouses. Storage losses caused by pests and heat are common; and humidity is an issue in the Sud Est specifically.
- Financial service providers (FSPs) including commercial banks, microfinance institutions (MFI), and mobile money operators are present in the main towns of the AOI. Airtel money, Orange money, and Telma mVola are the main mobile carriers and money operators and have the greatest rural FSP presence, but often face connectivity and liquidity constraints in remote locations. The national post office (Paositra Malagasy) offers savings and money transfer services.
- Madagascar lacks a current central food security policy, and the most up to date National Action Plan for Food Security dates to 2005. Cognizant that rice has far-reaching consequences for food access, imported rice has been VAT-exempt since 2005. The Government of Madagascar (GoM) establishes price limits for imported rice in consultation with the private sector, but they are not frequently enforced beyond urban areas. Specific government ministries and bodies involved in the implementation of food assistance activities include: The National Office of Risk and Catastrophe

Management for emergency programs; the Ministry of Population, Social Protection and Women Empowerment for cash transfer and social protection activities; and the Ministry of Agriculture, Livestock and Fisheries for agriculture-related programs. The Action Plan for Rural Development (PADR), the National Office of Nutrition (ONN), and the Development Intervention Fund (FID) are involved in development food assistance programs.

- The range of modality experiences in the AOI is wide, suggesting many opportunities and constraints for consideration in future program design (Table 1). Regardless of modality, there is a perceived need for implementing partners to: (1) better communicate and plan for distributions and food-for-work (FFW)/cash-for-work (CFW) or FFA/CFA projects; (2) consider the very wide range of related activities ongoing in the AOI, their program components/objectives, and transfer values (cash especially, but rations as well); (3) account for the size of the household, sharing practices (inter- and intrahousehold), and effort expended for CFA/FFA projects when setting ration sizes and transfer values; (4) consider the strong rice preference throughout the AOI; (5) take account of community solidarity practices, which can influence beneficiary targeting and distributions programs; and (6) recognize other facets of local customs and norms (such as the practice of women not coming forth at the start of a pregnancy, which can influence programs targeted at pregnant and lactating women and children; or the importance of local ceremonies that can interfere with planning and implementation of program distributions).

Table 1. Summary of Madagascar DFSA program modality considerations identified through EMA research (2018)

	Opportunities	Constraints
In-kind Title II Assistance	<ul style="list-style-type: none"> • Partners and beneficiaries are familiar with this modality. • Some beneficiaries prefer in-kind transfers rather than cash, citing security concerns with cash and price increases following distributions, affecting purchasing power. • Some women prefer in-kind assistance to cash, citing that men may use cash to buy nonfood items. • Some US commodities are perceived as very high quality (edible oil) and highly appreciated by beneficiaries. • The AOI is structurally deficit in focus commodities. Import gaps are filled through supplies from other areas of the country and international imports. • Supporting infrastructure exists, but availability and reliability vary by region. 	<ul style="list-style-type: none"> • Commodity appropriateness: US Title II split peas are perceived as hard and difficult to cook. Sorghum was recently re-introduced in the Grand Sud by some organizations and development partners for its drought-resistant characteristics. However, several examples exist of it not being accepted by beneficiaries. Sorghum is not a known commodity in the Sud Est. • Commodity self-monetization: Title II edible oil is perceived as higher quality than what is available on markets (it is fortified and does not harden) and is therefore sold/exchanged as a higher valued good. Title II split peas are less preferred and can be sold or exchanged for other commodities. • Logistics and commodity management: High levels of humidity in the Sud Est make long-term storage of grains, pulses, and CSB problematic. Delayed and lengthy berthing procedures are challenges faced at the Ports of Toamasina and Toliara. Very high internal transportation costs, long lead times, and limited transportation options (especially in the Grand Sud), create logistical/planning challenges once commodities do arrive in country. Some transporters complained of lengthy USAID payment processes but remained willing to transport for implementing partners.
Cash (including vouchers)	<ul style="list-style-type: none"> • Cash is increasingly used by implementing organizations, even in hard-to-reach places. It is widely used for emergency response across the country, including in the Grand Sud and Sud Est. • Established money transfer systems exist. • Staple foods are available and markets operational year-round in medium and large reference markets (Figure 12), including district capital markets in the AOI. There is believed to be a high degree of variability in supply on markets in more isolated areas of the AOI (Table 12) (WFP 2017; FEWS NET 2018) where supply typically decreases during the lean season and/or if production is low in a given year. • Beneficiaries appreciate flexibility of cash. • Voucher-specific: Vouchers help to ensure that beneficiaries purchase nutritious foods; Vouchers are used in programs to deliver high-quality inputs, small stock, and tools. 	<ul style="list-style-type: none"> • Commodity availability: Market availability is most diverse on specific market days, especially for perishable goods (fresh food vouchers). CSB products sold on some markets, but not among foodstuffs typically purchased by poor households. Market access is constrained in more isolated areas (however, some partners have determined that households would still be better off with cash, despite the high level of isolation). • Supporting services: Availability and liquidity of FSPs is constrained outside of major towns.

	Opportunities	Constraints
FFA/CFA	<ul style="list-style-type: none"> Productive community assets are important for long-term development and growth in the AOI. Beneficiaries appreciate contributing to local development activities. There is a clear and persistent need for infrastructure improvements, developments, and rehabilitation in the AOI. Large-scale CFW programs also run in partnership with international agencies, with an institutional emphasis on CFW interventions. 	<ul style="list-style-type: none"> Appropriate assets: The appropriateness, sustainability, and management of productive assets developed to local community needs must be ensured. Coordination/overlap: Many FFW/A and CFA/W activities are underway in the AOI and implemented by many organizations. The GoM seeks to prevent duplication of effort and overlap of FFW/A with other interventions at the <i>fokontany</i> (sub commune administrative units) level. Transfer size and frequency: Beneficiaries cited lack of clarity about the rationale behind DFSA ration size relative to intensity of work required and relative to transfer sizes of other organizations operating nearby. Poor households cite challenges with requirements to work 10 days before receiving the ration as well as unanticipated additional delays in distributions.

Source: FEWS NET 2018

Introduction

In early 2018, the Famine Early Warning Systems Network (FEWS NET) was asked to carry out Enhanced Market Analysis (EMA) and reporting in Madagascar. Among other uses, the information presented in EMA products can be used to support the design of food security programs, including but not limited to informing USAID's Bellmon determination in advance of an FY 2019 USAID funded activity.

FEWS NET's research aimed to gather evidence for the USAID/FFP design team's analysis of modality appropriateness, feasibility, and decision making for in-kind Title II commodity distributions and cash programs (including vouchers). The EMA results will be integrated directly into the [FFP Modality Decision Tool](#) to inform its first two tiers of questions around appropriateness and feasibility (Table 2), providing an analysis of the operating environment in a specific subnational area of an FFP country of interest, rather than modality recommendations.

The areas of interest (AOI) prioritized in the FEWS NET Scope of Work include Atsimo-Andrefana and Androy Regions ("Grand Sud") and Vavovavy Fitovinany and Atsimo-Atsinanana Regions ("Sud Est"). The specific research questions centered on five broad themes: (1) household livelihoods, income, and expenditure patterns in the AOI; (2) Market Structure, Conduct, and Performance (SCP) for selected focus commodities (rice, pulses, edible oil, sorghum, and Corn Soya Blend [CSB]); (3) the food assistance context; (4) the availability and state of infrastructure and supporting services required for success of a range of modality options; and (5) the experiences of stakeholders with different modalities, opportunities, and notable risks.

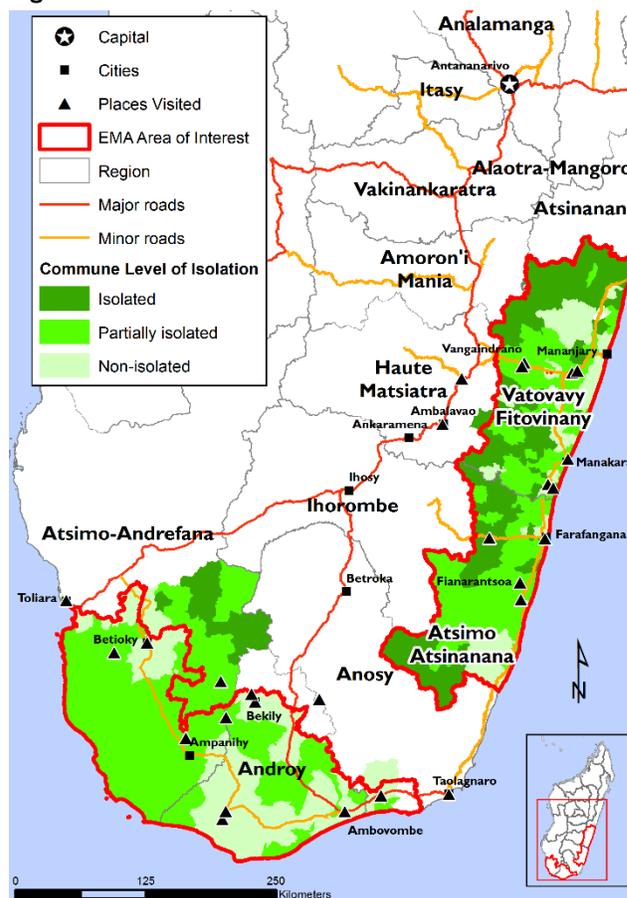
The Madagascar EMA involved a mixed-method approach, combining the collection, review, and analysis of both primary and secondary data from various stakeholders. Field work took place between June 24 and July 8, 2018, by a team of FEWS NET staff and international and local consultants, supported by local guides with contextual knowledge of the assessment areas. The assessment team met with a range of stakeholders in Antananarivo, Fianarantsoa, and five focus regions in the AOI, including but not limited to local authorities, representatives of government ministries, current DFSA grant holders, UN organizations, nongovernmental organizations (NGOs), financial service providers (FSPs), food assistance beneficiary households, traders, transporters, and storage warehouse managers. Locations for household and market focus groups were purposefully selected in both easily accessible and isolated areas within the AOI (Figure 3).

Table 2. Features of the FFP Modality Decision Tool

1.	Appropriateness: Is the modality appropriate for the sector given the market context?
2.	Feasibility: Does the proposed modality and delivery mechanism have a reasonable chance of success considering the context, infrastructure, and programming risk?
3.	Objectives: Is the modality best suited to meet programming objectives?
4.	Cost: Is the modality cost-efficient or cost-effective relative to others?

Source: USAID FFP 2018

Figure 3. EMA assessment areas visited and isolated areas



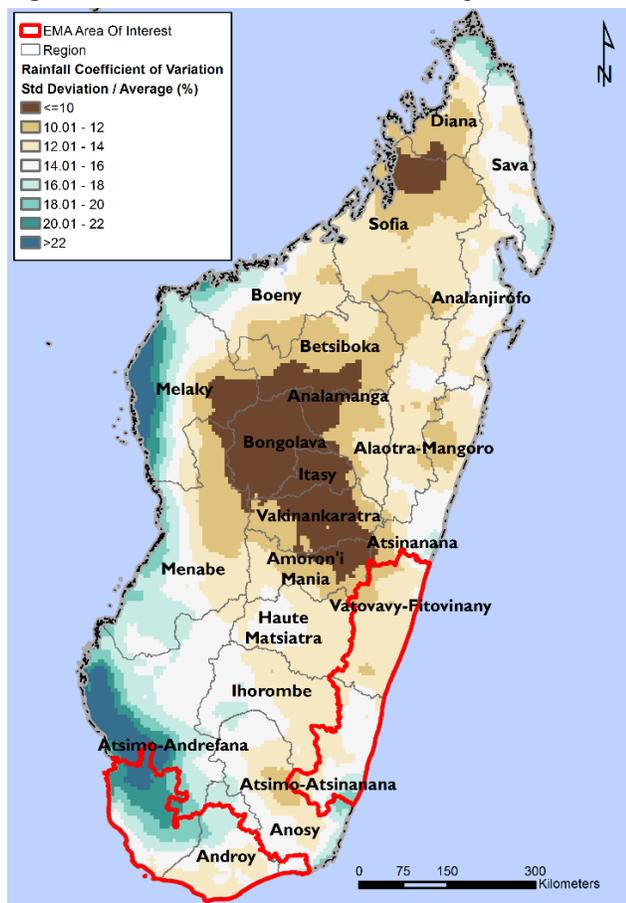
Source: FEWS NET 2018

Context

Environmental Context

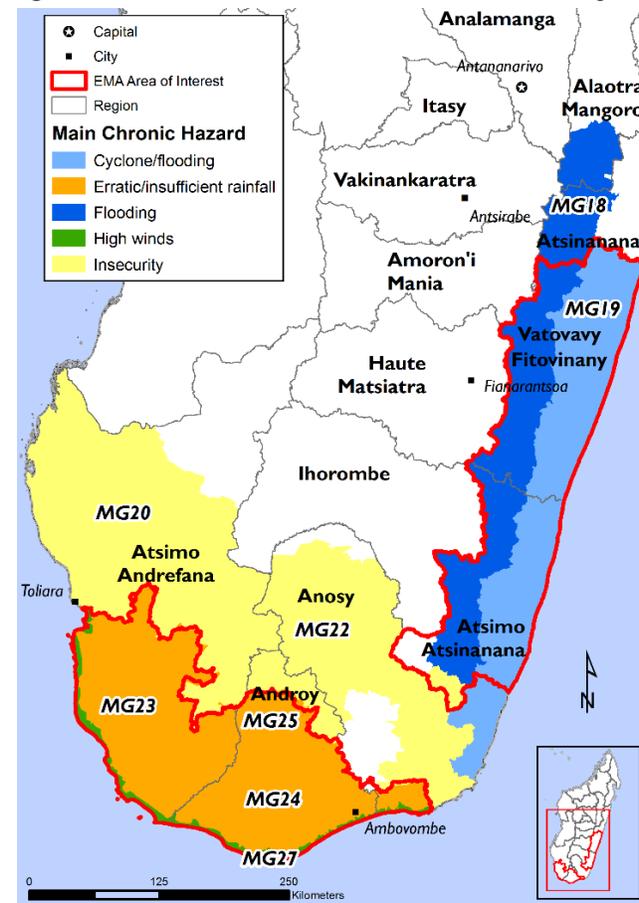
Madagascar, the fourth largest island globally, is located off the southeast coast of the African continent in the Indian Ocean. The AOI covers a total area of just less than 80,000 square kilometers, split almost equally between the Sud Est, and the Grand Sud. Regional variations in climate arise, but the country has two distinct seasons: a hot, rainy season from November to April and a dry season from May to October. Agroclimatology in the AOI varies greatly between the Grand Sud and the Sud Est.

Figure 4. Interannual rainfall variation in Madagascar



Source: USGS/EROS data from 1981-2018

Figure 5. Extreme weather-related hazards, southern Madagascar



Source: FEWS NET

Table 3. Agroclimatology characteristics in the Grand Sud and Sud Est

Grand Sud	Sud Est
<p>Characterized as arid and semi-arid with sandy soils and sparse vegetation. Land cover consists of forest, grassland, and shrubland. Annual average rainfall does not exceed 1,000 mm, typically between the end of November and early March. The area has been affected by a prolonged dry spell in recent years. Rainfall variability is notable in the Grand Sud, particularly livelihood zone MG23 in Atsimo-Andrefana, where the coefficient of variation ranges from 10 percent to more than 22 percent (Figure 4).</p>	<p>Characterized as humid throughout the calendar year, receiving 1,900–2,800 mm of average annual rainfall. Land cover consists primarily of cropland and forest. The area’s fertile soil and climate favor a variety of cash crops such as vanilla, coffee, pepper, bananas, and cloves, supporting local livelihoods (World Bank 2018). Madagascar’s entire east coast experiences at least one cyclone per year (often more) between January and March (Figure 5). Heavy rainfall, up to 700 mm in a few days, causes flooding and damage to infrastructure and crops.</p>

Source: Authors’ elaboration based on World Bank 2018, USGS/EROS 2016, and WFP 2018

Social Context

Demographics: The basic demographic structure of the Malagasy population reflects a tendency toward larger family sizes, with an average household comprising 4.6 people, and commonly as many as 6 people (Table 4) (INSTAT and ICF 2010). Households in the Grand Sud, however, are believed to be larger than the data in Table 4 suggest. On average, households in MG23 and MG24 have between 8 and 10 members (FEWS NET 2017). Just over one-third of the Malagasy population is between the age of 10–24 years (Mathys and Zeina 2013). Rural populations, which comprise nearly 80 percent of the country's population, are poorer than urban ones and less educated (World Bank 2018), although schooling rates in the Sud Est are higher than in the Grand Sud (INSTAT 2013). The 2008–2009 Demographic and Health Survey (DHS) indicates that just below 25 percent of households are adult female/no adult male households. These remain at a disadvantage in rural areas and are more vulnerable to poverty as they are less likely to own land, produce fewer crops, maintain smaller food reserves, and less frequently access credit (INSTAT and ICF 2010). Polygamy is not legal but is practiced in the AOI; it is most prominent in Androy Region (18 percent of wives share a home with at least one other co-wife) (INSTAT and ICF 2010).

Poverty: Madagascar is among the poorest countries in Sub-Saharan Africa (World Bank 2016), ranking 158 out of 188 in the 2016 Human Development Indicators. Larger households experience relatively higher levels of poverty (Figure 6); households with 7 or more members have a poverty rate of almost 90 percent (Celada 2017). Poverty is persistent and partially explained by a lack of progress in generating sustainable income-earning opportunities outside of the agriculture sector (World Bank 2016). Extreme poverty (living on less than USD 1.90/day) is pervasive in the AOI. In the Grand Sud, the poverty rate is roughly 80.1 percent across both Atsimo-Andrefana and Androy Regions (Figure 7), while in the Sud Est, the rate ranges from 79.6 percent in Vatovavy Fitovinany to 93.1 percent in Atsimo-Atsinanana (IMF 2017). Recent macroeconomic gains have not translated to improved household economies locally. This is especially the case among rural populations, who remain highly dependent on the agriculture sector, which stagnated and then most recently contracted between 2014–2017. Recent extreme weather events in the AOI (cyclones, drought, and other seasonal irregularities) have had a profound impact on agricultural production and infrastructure (marketing) conditions. Current poverty rates in the AOI may therefore be underestimated, as assets and livelihoods have eroded, particularly in the Grand Sud.

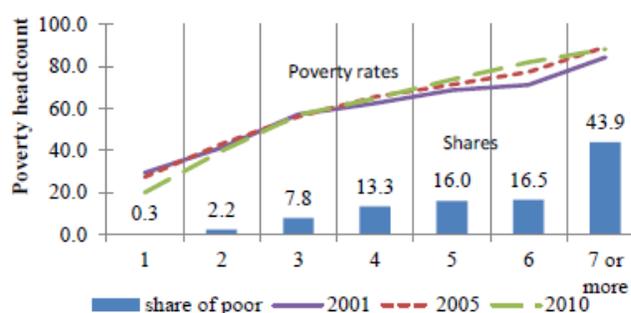
Gender: Gender inequality is deeply entrenched in Malagasy social norms, despite policy and legal efforts to mainstream gender equality nationwide. Madagascar ranks 158 out of 188 on the United Nations Development Programme's (UNDP) Gender Development Index (UNDP 2018) and is among the lowest in the Southern African Development Community (SADC) region (SADC Southern Africa Gender Protocol Alliance 2012, cited in Mathys and Zeina 2013). Women do not have an equitable voice in household decision making or access to resources and assets. Men retain significant influence over the management of household resources and cash expenditures outside of petty expenses, whereas women garner slightly more

Table 4. Average household size by region in AOI

Region	Average household size
Atsimo-Andrefana	4.8
Androy	5.6
Vatovavy Fitovinany	5.6
Atsimo-Atsinanana	5.8

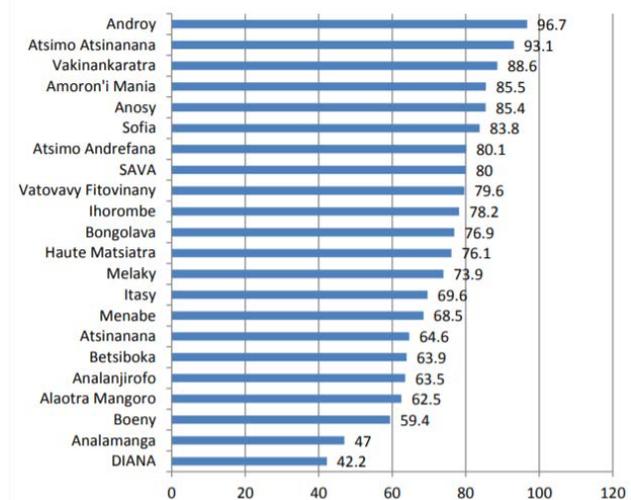
Source: INSTAT and ICF 2010

Figure 6. Poverty rates and share of poor by household size



Source: World Bank, 2014

Figure 7. Distribution of poverty by region



Source: INSTAT 2013 cited in IMF 2017

influence over income that they earn themselves from activities such as small trade, poultry sales, or gardening (FEWS NET 2018). However, the 2008–2009 DHS found that among married and employed women, just 33 percent had primary control over their earnings. Typically, income derived from cattle and cash crop sales is managed by men (Mathys and Zeina 2013). However, women may be involved in crop sales, representing the household on rural markets (FEWS NET 2018). Small ruminants including poultry are raised and sold by both men and women, whereas fish are largely caught by men and sold by women. Other gendered divisions are observed in the management and ownership of assets. Land is the domain of men, who accordingly are responsible for agricultural production and enhancements, such as irrigation. Women maintain smaller-scale production, such as kitchen gardens for vegetables, and manage fowl and small ruminants (Mathys and Zeina 2013).

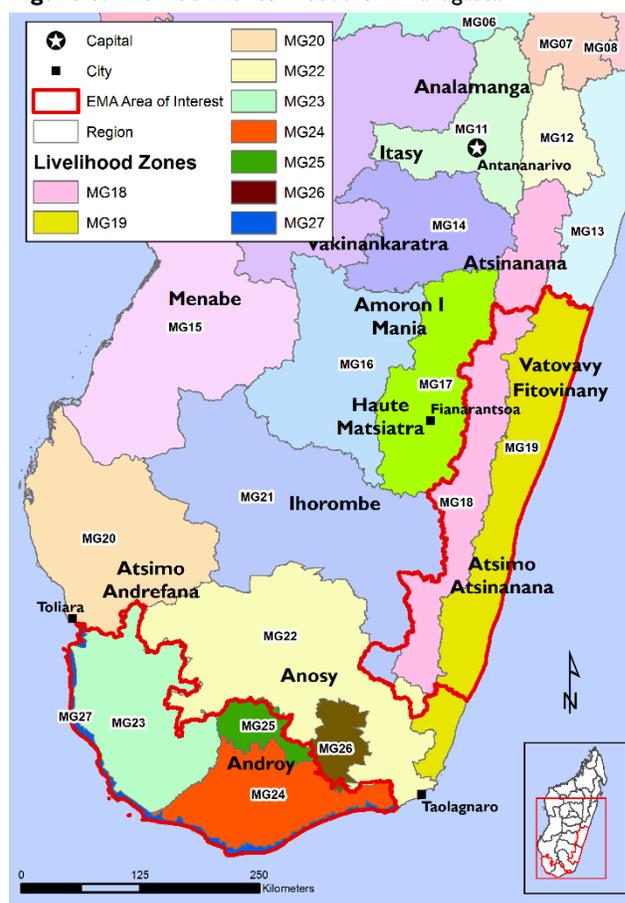
Social solidarity: Social solidarity systems within families and cultural/ethnic groups are strong in Madagascar and at times contradictory and persist as an important consideration for assistance programming. The prevailing solidarity system, known as *fihavanana*, imports multiple meanings, the most important of which is a moral obligation to consider those close to you as relatives. This concept also translates into benevolent gestures, fraternity, mutual respect, cordiality, consensus seeking, and solidarity during hard times (Nordman and Vaillant 2014). Though it may seem contradictory, cultural tendencies toward individualism, social distrust among different cultural/ethnic groups, and a relative expectation for external solutions or assistance can also discourage local social organization for community-led solutions (Mathys and Zeina 2013).

Social norms and taboos: The ubiquitous and diverse nature of social and food taboos is reflected in locally understood rules or guidelines that direct social interaction, food consumption, and household asset management. Local social norms also influence socioeconomic practices around livestock and animals as fungible assets versus food resources. For example, livestock within the Grand Sud are used specifically for wealth accumulation and gifting, typically acting as a source of wealth and prestige rather than a key food source, a perception that also carries over to some livestock products (eggs) (ICF 2016). Local social norms can become a burden for poor households, specifically funerary customs when there are obligations to provide food to entire villages for several days of mourning and visitation. At times, poor households must sell their assets or borrow money to meet these customs.

Livelihoods Systems

Income Sources: Throughout the livelihood zones in the AOI, the most important sources of income among poor households are crop or food product sales, both local and migrant agricultural labor and, specifically in the Grand Sud, mining labor. Cash crops include most fruits and vegetables, which are cleaned, and sold fresh at local markets, as well as beans, grains, roots, and tubers, which are generally dried, minimally processed, and sold or consumed locally. In livelihood zone MG19 (“Southeast: coffee, litchi, cassava”), located in the Sud Est, a unique selection of cash crops is also tendered for sale, including: coffee, clove, litchi, vanilla, and, especially in the north, pepper, with the potential to expand currently small-scale cinnamon and cocoa production. The December to February peak lean season coincides with the main period of migratory labor, whereas income from firewood and charcoal occurs throughout the year but decreases during the rainy season, which coincides with the peak lean season. Agricultural labor, with weeding as the most common activity, also peaks during the rainy season from December to March. Less important and often supplementary are poultry sales and forms of self-

Figure 8. Livelihood zones in southern Madagascar



Source: Authors' elaboration based on FEWS NET 2013, and FEWS NET 2017

employment and petty trade, such as firewood sales, handicrafts, gathering of wild foods, and some small business activity.

Food Sources: Across the AOI, poorer households source up to 25–50 percent of their staple food needs through own-production (FEWS NET 2018). The cereal harvest starts in March/April, marking the end of the lean season, with market purchase intensifying steadily throughout the year to compensate for depleted household stocks. Among the very poor and poor in the Grand Sud and Sud Est, a significant portion of annual food needs are obtained through market purchases (ranging from 25–60 percent of total food needs for poorer households, zone-dependent). The remainder is supplemented by small amounts of food aid, wild food collection or gifts, and payment in-kind. Wild foods (including yellow cactus in the Grand Sud and breadfruit in the Sud Est) play a prominent role during lean season months (see the Markets section of the report for more details).

Expenditures: Food is a significant financial outlay for poorer rural households. The assessment found that households in the AOI spend 50–70 percent of annual cash resources on food (FEWS NET 2018), a range consistent with previous research (GoM 2011a). Nevertheless, important seasonal variations arise in expenditures, which vary in timing across the AOI based largely on the local agroclimatology context. While food purchases reach their height during the lean season (FEWS NET 2013, 2017, 2018), other important expenditures throughout the year include annual celebrations and ceremonies, education (especially in October and November, at the beginning of the school year), and health expenditures (typically highest following the rainy season, between the months of April and September).

Food Gaps: Households in the AOI experience annual food gaps (Table 5). The annual household food gap for poor and very poor households within the AOI ranges from 14–18 percent of caloric needs (based on a per capita daily requirement of 2,400 kcal) (FEWS NET 2017).¹ This gap widens during years of poor production or in the case of shocks that erode household livelihoods.

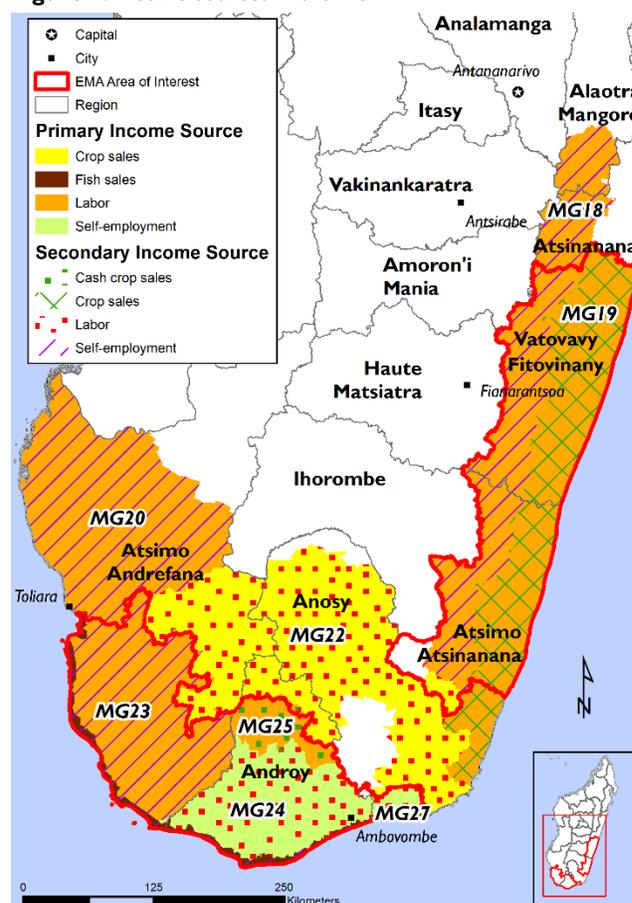
Infrastructure and Supporting Services in the AOI

This section provides a broad overview of the infrastructure and supporting services available in the AOI. Annex 6 provides further details.

Physical infrastructure

In general, road conditions are poor in Madagascar and the roads in the AOI are in relatively worse condition compared to other national roads. According to the Autorité Routière de Madagascar (ARM), of all paved roads, 43 percent are in good condition, 50 percent are in medium condition, and 7 percent are in poor condition. Of the paved roads in the AOI, all are in medium or poor condition and are otherwise unpaved (Figure 10). Compared to paved roads, the nationwide condition of unpaved roads are worse:

Figure 9. Income sources in the AOI



Source: Authors' elaboration based on FEWS NET 2013, and FEWS NET 2017

Table 5. Household consumption gap (MGA/month)

Region	Estimated consumption gap
Androy	115,807
Atsimo-Atsinanana	112,616
Atsimo-Andrefana	106,864
Vatovavy Fitovinany	73,149
National average	93,895

Source: Celada 2017

¹ For the purpose of non-emergency, multiyear interventions response planning, calorie requirements are set at 2,400 kcal/per person/per day. This contrasts with emergency planning, which typically considers 2,100 kcal/per person/per day.

zero percent are good, 22 percent are medium, and 78 percent are bad.

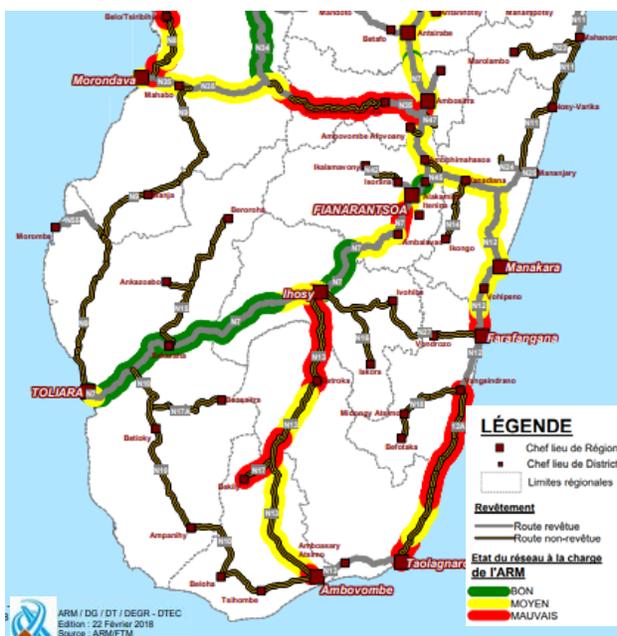
Three main paved road networks serve the AOI, creating links to key reference markets and ports. In the Grand Sud, the *route nationale* (RN) 13 links Ihoisy with Ambovombe and continues to Taolagnaro. The RN 10, an unpaved, mostly sand road, links Andranovory to Ambovombe. The Sud Est’s RN 12 is paved and spans the length of Vatovavy Fitovinany and Atsimo-Atsinanana Regions. The RN 7 is one of the most important roads in Madagascar for commercial purposes as it links the port town of Toliara to Antananarivo, passing through large cities such as Antsirabe and Fianarantsoa. Multiple unpaved rural feeder roads are also present in the AOI.

Trucking capacity in the AOI, especially in the Grand Sud, is insufficient, with a short supply of adapted, all-terrain heavy vehicles. Average truck speed is between 5–25 km per hour in the AOI, but does not reach over 10 km per hour on the RN 10. The state of transportation regularly leads to delays in the execution of transport contracts.

The Port of Toamasina on the east coast is the largest port in Madagascar. Traffic at the port is estimated to be 1.7 million metric tons (MT) per year or 80 percent of all imports and exports, of which 70 percent is containerized. Containers are unloaded with an average productivity of 20 to 24 containers per hour (WFP 2017). The Port of Toamasina serves the Sud Est, with goods transiting by road through Antananarivo. Due to high internal transportation costs, commodities destined for the Grand Sud enter the country either through the Port of Toliara, the second largest port in Madagascar, or the Port of Taolagnaro. These two ports, located in the south, have less capacity and the Port of Taolagnaro is privately owned by Rio Tinto, so operations can be slowed by strict security controls. Port costs are relatively high, around USD 35 per MT. The cost includes customs clearance, transit, and transport fees from the port to the next available warehouse outside the port (FEWS NET 2018).

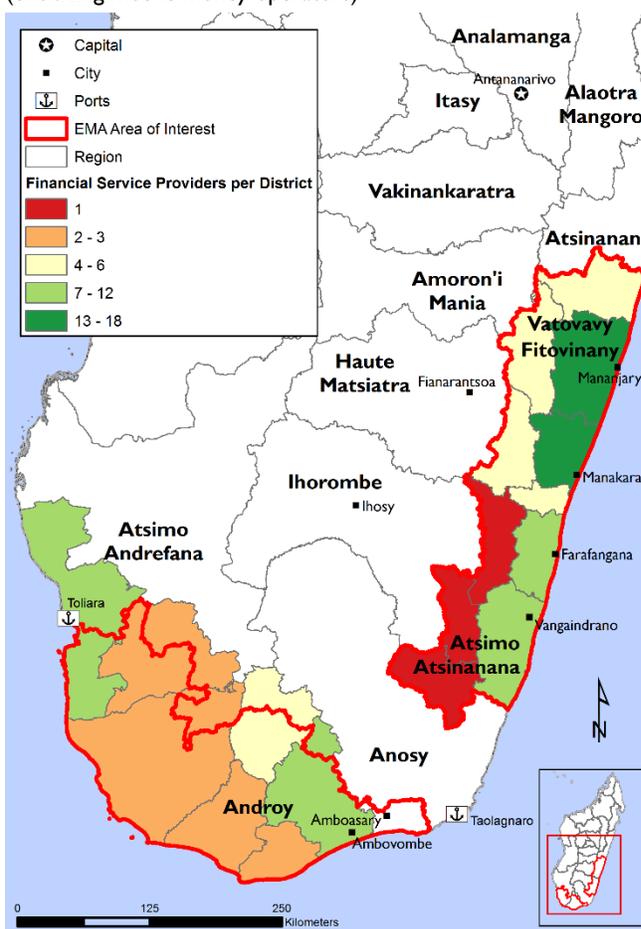
A variety of actors are involved in storage in the AOI including the World Food Programme (WFP), DFSA implementing partners, and the private sector. The network of quality central delivery point (CDP) storage warehouses in strategic locations is considered adequate to meet current and future needs (Table 38, Annex 6). However, extended delivery point (EDP) warehouses in the AOI do not all meet technical standards. Pests, heat, and storage losses caused by humidity, especially in the Sud Est, are common. WFP and implementing partner warehouse

Figure 10. State of roads in the AOI, 2018



Source: Autorité Routière de Madagascar 2018

Figure 11. Financial service provider presence by district (excluding mobile money operators)



Source: Ministère des Finances et du Budget 2017

staff attempt to mitigate losses by fumigating on a regular basis. The assessment team in the Sud Est found no evidence that warehouse capacity reduced significantly during cash crop harvests (FEWS NET 2018).

Supporting services

The financial system in Madagascar is composed of four types of institutions: microfinance institutions (MFIs), commercial banks, the post office, and mobile money operators. In general, mobile money operators are the most prevalent throughout the country and within the AOI. Commercial banks and MFIs are more present in the Sud Est whereas they are only located in regional capitals in the Grand Sud. Androy Region is serviced by a single commercial bank, Bank of Africa (BOA) in Ambovombe (Figure 11).

Bank penetration levels in Madagascar are amongst the lowest in Africa. Among the contributing factors, banks typically charge account fees and require costly identification documents. Rapid expansion of mobile money, however, has offered an opportunity for financial inclusion of poor and rural populations (World Bank 2018); the number of mobile money agents per thousand inhabitants increased from 7 to 92 between 2010 and 2016. Each of the three main mobile network providers in Madagascar (Telma, Orange, and Airtel) are operational in the AOI and have their own mobile money services: mVola, Orange Money, and Airtel Money, respectively. Coverage is generally stronger in larger towns and along roads.

Markets

This section summarizes the Market Structure, Conduct, and Performance (SCP) for the key commodities within the AOI. The focus regions of southern Madagascar are structurally deficit and broadly characterized as having a high incidence of poverty and food insecurity. Nonetheless, the local marketing system is vibrant, with many markets and trading centers (Figure 12), and responsive to market signals when physical access constraints are not present. Markets across the AOI are fairly well integrated with key reference markets in central Madagascar for locally produced crops, dynamics supported by primary road infrastructure linking the main towns. Markets in the Grand Sud are closely connected through trade with the port towns of Toilara and Taolagnaro for imported commodities, while the Sud Est relies more on imported commodities through Toamasina. Limited commodity trade flows between the Grand Sud and the Sud Est, as each distinct part of the AOI is located in a different marketing basin (Annex 5). Price trends reflect the underlying marketing system structure and level of coordination, which are unique to each individual commodity market studied.

Figure 12. Main reference markets in and serving the AOI of Madagascar visited during EMA assessment



Source: FEWS NET 2018

Table 6. Preferences by staple and contribution to total kilocalories by staple in the Grand Sud

Commodity	Preference	Contribution to kilocalories			
		Very Poor	Poor	Middle	Better Off
Rice	75%	2%	3%	4%	7%
Maize	4%	5%	7%	14%	17%
Dried Cassava	21%	23%	34%	29%	41%
Fresh Cassava		4%	5%	5%	0%

Note: Household food preference information (presented in the column "Preference") is summarized from CFSAM July 2018 data, averaging randomly sampled households across all wealth groups in 9 districts in the Grand Sud. Disaggregated data are presented in Annex 7.

Source: FAO, WFP, Ministry of Agriculture, BNGRC 2017a, 2017b, 2018a, 2018b, FEWS NET 2017

Market Structure

Food preferences in EMA focus areas

Local rice is preferred by households across Madagascar, and imported rice is available year-round in medium and large reference markets as a complement to local production (Annex 4). Local edible oil production and consumption are negligible and refined, non-fortified, imported edible oil (sourced from Malaysia and Indonesia through larger importing firms located in port towns or Antananarivo) is regularly available in boutiques and retail outlets for purchase across the AOI. A wide variety of locally produced pulses are grown and consumed, including cowpeas, white and red beans, mung beans, and local varieties such as *tsiatsia*, *voanjobory*, and *kabaro* among others, with minor localized preferences for one variety over another depending on the area. A range of wild foods are consumed during the lean season in typical years, but consumption may intensify or shift to less preferred wild food options during crisis periods. Aside from these commonalities, other aspects of food consumption patterns vary considerably across the two main areas of the AOI (Table 7).

In the Grand Sud, poor and very poor households typically consume dried cassava and yellow maize through both own-production and market purchases (FEWS NET 2017; FEWS NET 2018). There is a difference between stated preferences and actual consumption (Table 6 and Annex 7); rice is overwhelmingly the preferred staple but makes up only two to seven percent of total kilocalories. There is a certain degree of flexibility, but what remains common is the fact that rice, maize, and cassava are all considered acceptable staples and substitutes. Although rice makes up less than 10 percent of the total annual contribution to kilocalories in the Grand Sud, it remains the preferred staple (Table 6). Interviewed households indicated that one-half of food expenditures in the Grand Sud are dedicated to cassava purchases (FEWS NET 2017;). While sorghum has recently been re-introduced to the area as a drought-tolerant crop, production remains very limited as sorghum inputs are not widely available nor is the grain available for purchase in local markets. On retail markets where both maize and sorghum are available (Beloha, for example), price differences between the two cereals remained between 7 and 20 percent. In this context, households have not fully adopted sorghum as part of local consumption patterns (Table 7) (FEWS NET 2018). Yellow cactus fruit (prickly pear) is among the most commonly gathered wild foods in the Grand Sud, with consumption reaching up to 30 percent of household requirements during the September to January peak of the lean season months (FEWS NET 2017 and FEWS NET 2018). Participants in a 2016 ICF baseline study expressed local belief that cacti have nutritious value and provide an alternative to water. Cactus fruit is consumed fresh. Cactus leaves and relatively sour red cactus fruit are only consumed during crisis years, a phenomenon locally known as “*Kere*.” Animal protein consumption includes purchased beef, followed by goat and chicken, and, to a lesser extent, pork and dried fish.

Table 7. Commonly consumed foods in the AOI

Commodity Group	Grand Sud	Sud Est
Cereals and tubers	Dried cassava, yellow maize	Local red rice
Substitutes	Local and imported rice, sweet potatoes	Imported rice, fresh cassava, yellow maize
Pulses	Cowpeas, white and red beans, mung beans	White or red beans, cowpeas, mung beans
Animal protein	Beef, goats, sheep, poultry	Fish (dried), small amounts of beef and poultry
Wild foods	Yellow cactus fruit, wild yam, mango, ambarella, tamarind, baobab fruit, Madagascar plum	Breadfruit, wild yam, jackfruit
Edible oil	Refined imported edible oil	Refined imported edible oil

Note: Please refer to Table 8 for further details on wild and cultivated breadfruit.

Source: FEWS NET 2018

In the Sud Est, poor and very poor households typically consume local rice through both own-production and market purchases (FEWS NET 2013). Interviewed households indicated that between 30–75 percent of food expenditures in the Grand Sud were dedicated to rice purchases, including both local and imported rice (FEWS NET 2018). Households interviewed as part of the FEWS NET assessment were not familiar with sorghum, having neither produced nor consumed it (FEWS NET 2018). Breadfruit is a starchy tree fruit that was historically considered a wild food but is increasingly cultivated by households across wealth groups in the Sud Est part of the AOI. Poor households rely primarily on breadfruit consumption

during the months of April and May, with consumption reaching up to 75 percent of household requirements during those months. The duration of breadfruit consumption increases during crisis years. Breadfruit is typically cooked prior to consumption, either boiled, fried, or as a puree with rice. Animal protein consumption includes purchased fish (both dried and fresh) and purchased beef, followed by chicken and, to a much lesser extent, pork.

Figure 13. Variety of pulses sold on markets



Source: FEWS NET 2018

Figure 14. Variety of rice sold on markets



Source: FEWS NET 2018

Figure 15. Yellow maize sold on markets



Source: FEWS NET 2018

Figure 16. Piles of dried cassava sold on markets



Source: FEWS NET 2018

Food supply in EMA focus areas

Southern Madagascar, including both parts of the AOI, is structurally deficit in terms of aggregate staple food production (Table 8 and Annex 8). This is driven in large part by less favorable staple crop production conditions in the Grand Sud and a heavy focus on cash crops (for domestic consumption and export) in the Sud Est. The production status of other foodstuffs varies considerably within the AOI (Table 9). The AOI depends on market linkages, supplies, and prices on markets within the broader national context (see Annex 4 and Annex 5). The structural deficit status for most commodities within the focus districts means that prices and availability are heavily influenced by those in key source markets (located either within the AOI or elsewhere in the country) and by transportation costs. The degree of interannual variation in local production (coefficient of variation) is greatest in the Grand Sud (Table 8).

Table 8. Average production (kg/ per capita) and coefficient of variation

Region	Production (kg/pc)			Coefficient of variation in production			Self sufficiency		
	Rice	Maize	Cassava	Rice	Maize	Cassava	Rice	Maize	Cassava
Androy	17.34	17.58	156.00	0.86	0.88	0.76	0.17	0.57	1.33
Anosy	52.53	11.25	102.09	0.61	0.57	0.55	0.50	0.36	0.87
Atsimo Andrefana	61.75	18.00	37.60	0.25	N/A	0.47	0.59	0.58	0.32
Atsimo Atsinanana	35.77	1.02	33.24	0.46	0.12	0.08	0.31	0.05	0.28
Vatovavy Fitovinany	60.81	0.84	45.49	0.12	0.18	0.21	0.53	0.04	0.39

Note: Self-sufficiency is the ratio of local production to requirements. Rice and cassava are expressed in cereals equivalent. Please see Annex 8 for further details for the district-level commodity balances for rice, maize, and cassava.

Source: Authors' estimates based on FAO data 2018; FAO Stat 2018

Table 9. Commodity production status in AOI

Commodity	Grand Sud	Sud Est
Pulses	Deficit	Atsimo-Atsinanana is surplus-producing while Vatovavy Fitovinany is deficit.
Sorghum	Minor production. Volumes sold on markets are minimal, as very little arrives onto markets.	Not cultivated or present on markets. Commodity can be considered unknown to the AOI.
Fish	Deficit	Surplus-producing
Livestock	Surplus-producing	Deficit
Edible oil	Deficit. Imports available from international markets, transiting through major ports.	

Source: FEWS NET 2018

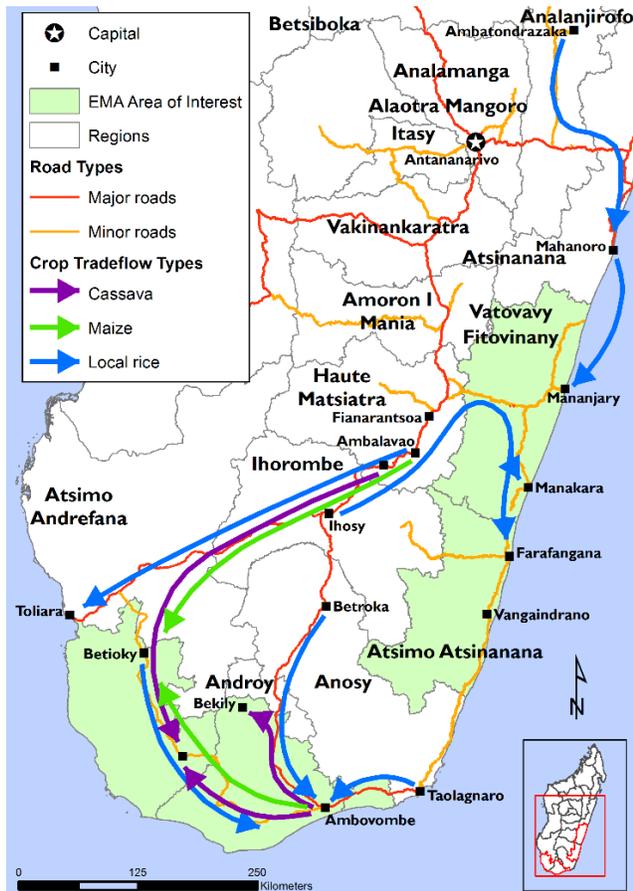
Table 10. Key characteristics of commodity markets in the AOI

Commodity	Key Characteristics
Rice	The main local rice harvest lasts from April–June and supplies start to diminish around October. An off-season harvest, <i>vary hony</i> occurs in December in some areas of the Sud Est. Imported rice fills the demand from November to March, particularly in the Sud Est. Large importers are well connected with international markets. Despite attempts to control rice prices (particularly imported rice), local and national supply and demand determine prices, which vary seasonally.
Pulses	Many varieties are sold and consumed. Markets are competitive, with many actors of varying size. Local and national supply and demand determine prices and direction of trade. Traders in the AOI source from different areas of the country/region depending on the season.
Edible oil	Imported refined non-fortified edible oil is available throughout the AOI and distributed through well-organized marketing networks. Prices are consistent (after accounting for variations in transportation costs) across the AOI. Locally produced edible oil is available in negligible quantities.
Sorghum	Sorghum was produced in Madagascar in the 1970s and 80s but there had been negligible production since 1991. The GoM and humanitarian actors have worked to reintroduce and promote the crop throughout the past 10 years (Ratsiazo 2008). Very low volumes reach markets in the Grand Sud as it is not part of consumption habits. Sorghum is not a known commodity in the Sud Est, where growing conditions are more humid. Producing households typically consume sorghum from own-production and purchase maize and cassava.
Cassava	Local and regional supply and demand determine prices and direction of trade. In the Grand Sud, fresh cassava is harvested between April and August and then dried and stored. In the Sud Est, fresh cassava is present on markets year-round and is not dried. While the Grand Sud historically was self-sufficient or produced a cassava surplus, recent sequential drought years have led to limited local production and supply. Markets in central Madagascar, where growing conditions are more favorable, have responded to these marketing conditions and currently play a key role in serving the Grand Sud.
Maize	The main maize harvest takes place in March and April. An off-season harvest occurs in December. Local supply determines prices, which follow seasonal trends; decrease with the arrival of the harvest on markets and increase with the onset of the lean season. Maize is consumed at greater quantities in the Grand Sud compared to the national average.
Sweet potato	Sweet potatoes are typically marketed fresh and consumed near their areas of production (and not transported over long distances).
CSB	Local variety by Nutri'zaza is sold throughout Madagascar, concentrated in larger towns. Quantity supplied is not adequate to meet national demand from various nutrition, humanitarian, and development programs.

Commodity	Key Characteristics
Livestock	In the Grand Sud in particular, zebu are used for manual labor and to demonstrate wealth. Zebu are consumed in small quantities and for special occasions. Insecurity from local armed groups (<i>dahalo</i> or <i>malaso</i>) threatens the livestock sector. Poor populations prefer to sell small ruminants rather than consume them, often selling during the lean season to purchase food (at a time when livestock prices are lowest). Small ruminants and poultry are reared for commercial purposes and for consumption on special occasions.
Fish	Many fresh- and saltwater varieties of fish are available on markets, especially in the Sud Est. Local fishermen (predominantly artisanal) serve the AOIs, mainly with lower-quality fish. They also sell higher quality fish and shellfish to traders for consumption in larger cities within Madagascar and to export- oriented international companies, particularly in the Grand Sud. Fish quality is determined by size, species, and the state of preservation. The main ocean fishing season runs from September–March, when fresh fish availability on markets peaks. Dried and salted fish are available year-round and are a more accessible animal protein than meat in the Sud Est.
Cactus	Cactus grows wild in the Grand Sud, but leaves are transplanted as fences around farms. Fruit is collected for consumption by poor and very poor households or to sell to relatively better-off households from June to October. Yellow cactus fruit is commonly consumed during the lean season months (reaching up to 30 percent of requirements, and up to 12 percent of annual food needs), while red cactus and cactus leaves are only consumed during years of exceptionally poor crop production.
Breadfruit	Breadfruit is the fruit of a perennial tree that grows in the Sud Est of the AOI. The tree bears fruit twice per year, first between February–April and again between June–August. Historically a wild food, consumption has increased recently across wealth groups and the trees, in groups of 1 to 10, are now cultivated on personal land surrounding houses for own-consumption and some sales on markets. It is estimated that 60 to 70 percent of breadfruit is cultivated and 30 to 40 percent is wild. Breadfruit can contribute between 12–25 percent of requirements during lean season months.

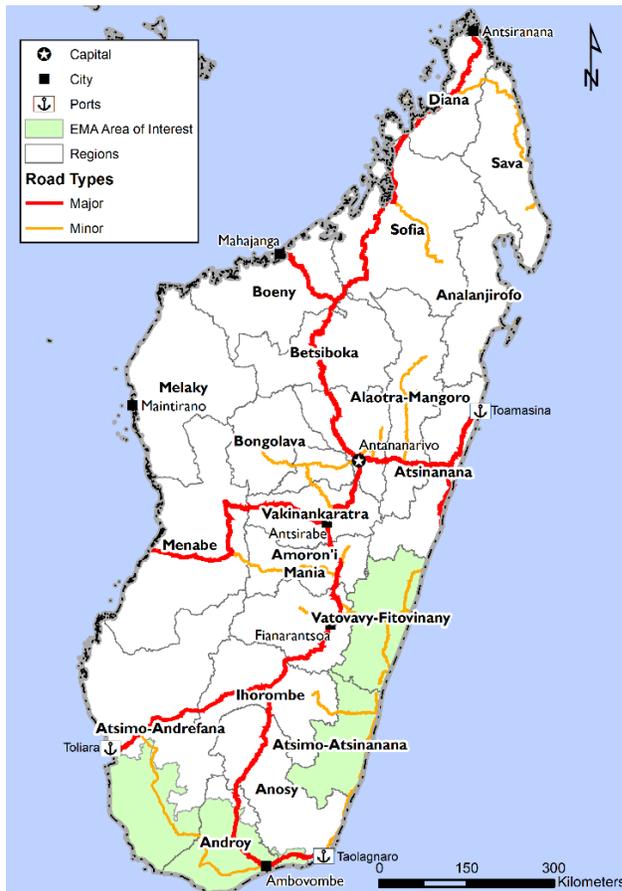
Source: FEWS NET 2018

Figure 17. Locally produced commodity trade flows into the AOI



Source: FEWS NET 2018

Figure 18. Ports serving the AOI



Source: FEWS NET 2018

Key reference markets and marketing basins

The AOI districts within southern Madagascar are part of a broader marketing system linked with surplus-producing areas of the country and key ports. The direction of trade (including seasonality) and strength of linkages between distant markets depend on the commodities traded (Figure 17 and Figure 18; Annex 5 and Annex 9). Several important reference markets operate in and serve the AOI (Figure 12). Key reference markets serve multiple roles (assembly, wholesale, retail). The most important reference markets are located within regional capitals and along major roads, and operate daily, with at least one main market day during the week when sales are most vibrant. The largest livestock markets serving the AOI include Ambalavao and Fotadrevo.

Market Conduct

Price setting and price discovery

The price-setting and price-discovery process depends on the level of coordination (localized or more general) for a given commodity. Edible oil and imported rice are traded through relatively larger and better-organized distribution networks. Otherwise, for locally produced crops as well as fish, the FEWS NET assessment found that prices are largely determined by the cost in the source market, the cost of transportation, and local community taxes. The importance of transportation costs in determining prices was heavily cited and stressed in the Grand Sud. The assessment confirmed that formal commodity trading groups and associations do not play an important role in Madagascar, although market-level coordination occurs among traders to establish daily market prices as a function of the key considerations listed above. The assessment found that at the retail level, foods are sold by volume (either by cup or heap, Table 11) and sometimes by weight.

Table 11. Common units of measure practiced in the AOI

	Wholesale	Retail
Grain	50-kg bag	Kg or kapoaka (3.5 kapoaka equals 1 kg)
Tubers	Kg	Pile/heap
Pulses	50-kg bag	Kg or kapoaka (3.5 kapoaka equals 1 kg)
Edible oil	20-liter drum	Local cup (<i>meza</i>), sachets, and bottles of varying sizes
Fish (small)	5-liter bucket	Heaps of varying sizes
Meat (beef, goat mutton, and pork)	N/A	Meat sold in heaps of varying sizes; also sold by weight (kg) or by piece
Cactus	N/A	Pile/heap
Breadfruit	N/A	Pile or piece

Source: FEWS NET 2018

Gender dynamics

Women play an important role in agricultural production and marketing in Madagascar in general and within the AOI. No specific restrictions are imposed on women's role in marketing of commodities. Women are more numerous than men as retailers of cereals, tubers, pulses, vegetables, fruits, and poultry. Wholesale companies are typically family-run; however, the main transactions and decisions are made by men. Men also dominate transport and livestock trading. Women are involved in most aspects of livestock, small ruminant, and poultry rearing, while men are more heavily involved in all aspects of livestock marketing, including butcher activities.

Market Performance

Markets in southern Madagascar are thin. The private sector is responsive to market signals as long as infrastructure is in sufficient condition to support basic trading activities, resulting in strong seasonal variation in the quantities traded on markets (Table 13) and in prices (Figure 19). Liquidity challenges (access to capital), source market prices, and market availability (especially following extreme weather events) were cited among the dominant factors influencing constraints to increasing market capacity in response to increased demand. Several factors influence household food access in focus areas. These include distance to markets, which reached up to 15 km in the Sud Est (3 hours on foot) and 25 km in the Grand Sud (5 hours on foot) among households interviewed. Isolation in some areas during the rainy season creates additional physical market access issues, which are exacerbated when cyclones hit. Table 12 presents an estimate of the isolated proportion of the population in AOI. Seasonal price swings affect household purchasing power and food access.

Table 12. Population and isolation level by commune in AOI

	Non-isolated	Partially isolated	Isolated
Grand Sud	839,890	826,901	67,294
	48%	48%	4%
Sud Est	530,162	1,215,128	1,079,313
	19%	43%	38%

Note: Isolation was determined by distance to nearest market and physical accessibility of a location, accounting for differences between dry and rainy season.

Source: FEWS NET estimates based on discussions with local partners and government officials; World Bank 2007 data

The degree of market integration varies in Madagascar, as high transportation costs can mute the effects of strong price signals. The strength of integration (strong price signals and trade linkages) declines in more isolated/distant areas (Table 12) due to relatively high transportation and marketing costs, especially during the rainy season. Rice markets (both local and imported) are relatively well integrated over long distances compared to those of maize and cassava, which are typically traded over shorter distances (Figure 20 through Figure 23, Annex 9). The focus commodity markets are integrated through two main pathways: (1) long-distance trade, with traders from southern Madagascar traveling to key source and aggregation markets to make purchases, and (2) coordinated distribution networks, which apply primarily for processed/manufactured goods, but also for individual traders in larger markets working through a network of smaller traders.

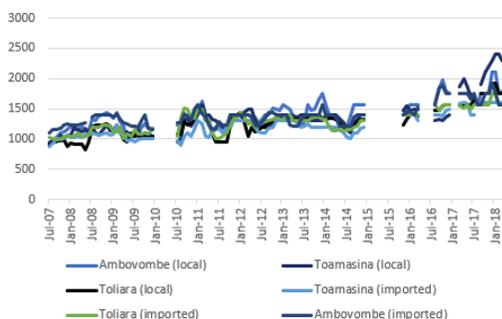
Table 13. Summary of trends in quantities traded on markets in the AOI, southern Madagascar

	Postharvest	Lean season
Local rice	High	Low
Imported rice	Low	High
Maize	High	Low
Cassava	Low	High
Pulses	Low	High
Fish	High	Low
Livestock	High	Low

Note: This table summarizes the EMA findings and does not reflect some specific localized dynamics.

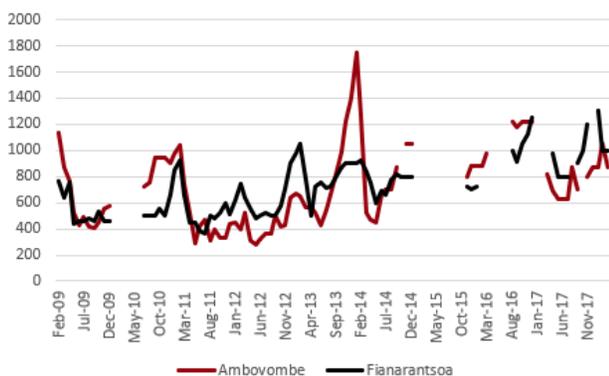
Source: Authors' compilation based on FEWS NET 2018

Figure 20. Rice prices in key reference markets in and serving the AOI, MGA/kg, 2007–2018



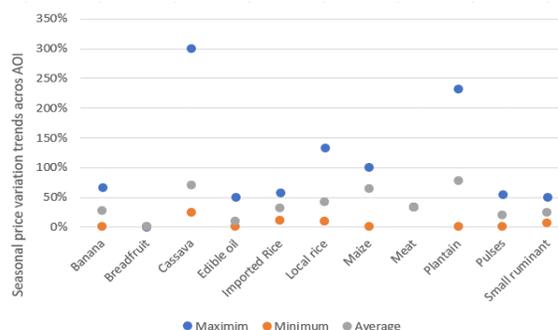
Source: FEWS NET estimates based on Odr 2018 data

Figure 22. Maize prices in key reference markets in and serving the AOI, MGA/kg, 2009–2018



Source: FEWS NET estimates based on Odr 2018 data

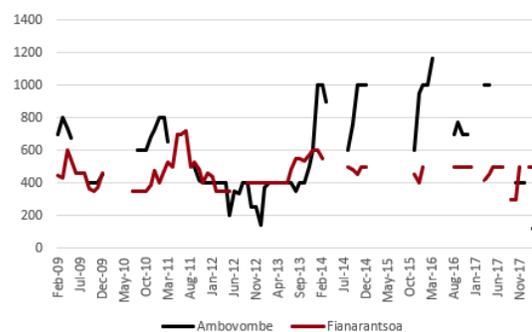
Figure 19. Intra-annual (seasonal) price variation on selected markets in the AOI, southern Madagascar



Note: The percentage change between the harvest and the peak of lean season retail prices in markets visited during EMA assessment (2018)

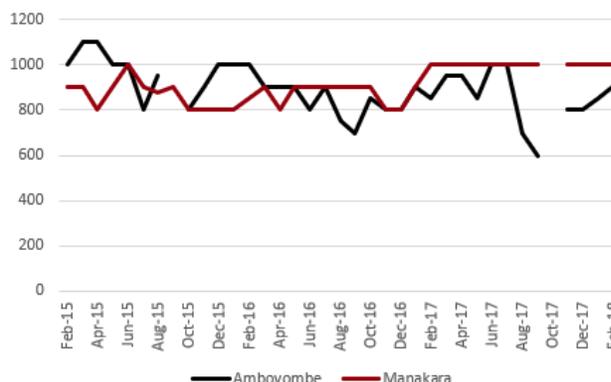
Source: Authors' compilation based on FEWS NET 2018

Figure 21. Cassava prices in key reference markets in and serving the AOI, MGA/kg, 2009–2018



Source: FEWS NET estimates based on Odr 2018 data

Figure 23. Dry beans prices in key reference markets in and serving the AOI, MGA/kg, 2015–2018



Source: FEWS NET estimates based on Odr 2018 data

Food Security and Assistance

Food Security

The lean season in an average year in southern Madagascar spans from December to March. In the past four years, though, the lean season has started three to four months earlier for poor households, whose ability to either produce their own food or partake in labor opportunities that provide income to purchase food on markets are relatively more affected by the consequences of drought and cyclones. As a result, poor households utilize atypical coping strategies, including unusual livestock sales, consumption of seeds for the next planting season, and consumption of atypical wild foods such as red cactus fruit and leaves. Figure 25 and Figure 26 presents recent trends in food consumption scores from 2012–2017.

Since 2013, when FEWS NET began monitoring food insecurity in Madagascar, many areas of southern Madagascar have experienced Stressed (IPC Phase 2) or higher phases of acute food insecurity in over 90 percent of analysis cycles (Figure 24). Many of those areas have experienced Crisis (IPC Phase 3) or higher acute food insecurity outcomes annually. Poor conditions in the south were exacerbated by the El Niño-induced drought that affected southern Africa from 2015–2017, where some regions reached IPC phase 4.

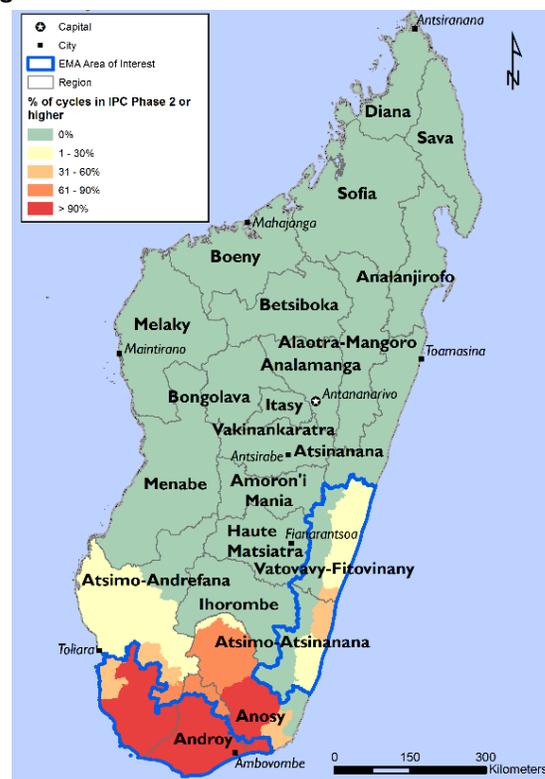
In recent years, the prevalence rate of acute malnutrition has remained between poor (5–9 percent) and serious (10–14 percent). The most recent Standardized Monitoring and Assessment of Relief and Transitions survey in southern Madagascar, however, registered a moderate prevalence of chronic malnutrition, ranging from 9–15 percent (UNICEF 2017b). This represents a likely decrease in the rate of stunting since the 2008/09 DHS (Table 14).

Access to both adequate quantity and diversity of food are limiting factors to nutrition in southern Madagascar. According to the 2008/09 DHS report, 65.3 percent of children aged 6–59 months suffer from anemia in Androy Region; as do 55.6 percent in Atsimo-Andrefana Region; 60.9 percent in Anosy Region; 67.0 percent in Vatovavy Fitovinany Region; and 64.0 percent in Atsimo-Atsinanana Region. Also, according to the 2008/09 DHS report, only 33.2 percent of rural households throughout Madagascar have access to water from improved sources. According to UNICEF (2017a), salinity of boreholes is a significant problem in the far south of Madagascar. Throughout Androy Region, 36 percent of boreholes provide saline water; in Tsihombe district, 68 percent of boreholes are unproductive.

Policy: Building Momentum

In the setting of annual cyclones, extended drought, and environmental or structural constraints to sustainable

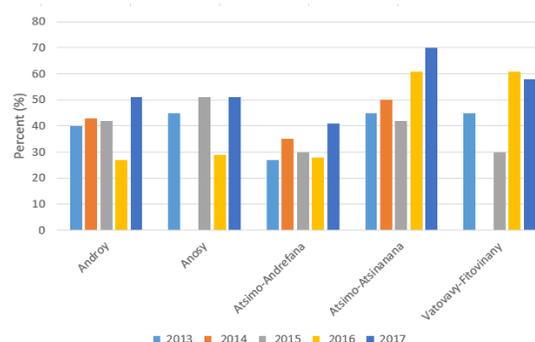
Figure 24. Historical IPC classification



Note: Based on FEWS NET reporting cycles between 2013 and 2017.

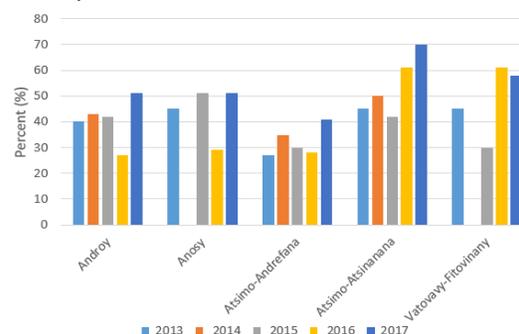
Source: Authors' calculations based on FEWS NET 2017

Figure 25. Percentage of households with poor or borderline food consumption scores



Source: Authors' compilation based on CFSAM 2012–2017 data

Figure 26. Percentage of households with borderline food consumption scores



Source: Authors' compilation based on CFSAM 2012–2017 data

agriculture-based livelihoods, the GoM is actively attempting to galvanize policy and practice to better plan for and manage disasters. The policy framework supporting aid and development has evolved in this context, compounded by frequent political instability as well as decreasing funds and resources for food assistance (Mathys and Zeina 2013). Though some momentum is driving the consolidation of a national assistance policy framework, the implementation of existing policies and strategies is limited (WFP 2018) as the GoM lacks an actionable food security policy through which to administer and regulate food assistance; the last National Action Plan for Food Security (PANSA) dates from 2005. While considerable investments have been made for preparedness and risk mitigation related to cyclones, other facets are lacking at a national level. Current legislation provides for disaster risk management (DRM) bodies at all levels of government, but resource constraints limit the functionality and effectiveness of these entities. Early warning systems and local capacity building for risk reduction efforts are ongoing, but these efforts are not consistently or effectively supported by legislative mandate (IFRC 2014). An early warning system (EWS) committee, led by the National Office of Risk and Catastrophe Management (BNGRC), is currently launching a national EWS, funded by the Japanese Government and managed by UNDP and WFP.

The specific government ministries/bodies involved in food assistance include: BNGRC, as the lead agency overseeing emergency response and programming; the Ministry of Population, Social Protection and Women Empowerment (MPPSPF) for cash transfer and social protection activities; and the Ministry of Agriculture, Livestock and Fishery (MAEP) for agriculture-linked activities. Development food assistance programs are somewhat governed by policy

efforts, such as the Action Plan for Rural Development unit (PADR), the National Office of Nutrition (ONN), and the Development Intervention Fund (FID), all of which are administered directly or indirectly by the Officer of the Prime Minister. While the overarching policy framework for assistance remains under development, several key initiatives and supporting plans provide context and guidelines for assistance efforts and the associated ministries and implementing agencies.

National Development Plan: The National Development Plan of Madagascar 2015–2019 focuses on: (1) food and nutrition security; (2) infrastructure development and environmental management, protection, and conservation; (3) nutrition policy and legislation; and (4) improved social services and the eradication of poverty through human capital development (WFP 2018). The National Development Plan prioritizes decreasing malnutrition rates, improving health care and education systems, enhancing community resilience to shocks and natural disasters, and promoting gender equality. Food security and nutrition fall broadly under the plan’s strategic pillar 4 “adequate human capital for the development process” (WFP 2018).

National Nutrition Plan (NNP): Through the NNP, the GoM provides leadership on nutrition and its contribution to development, with the National Nutrition Action Plan (NNAP) defining the main activities that ultimately support a functional policy. The ONN oversees the implementation of the NNP and the NNAP, primarily demonstrated via the prominent nutrition and food security program, the Programme National de la Nutrition Communautaire (Mathys and Zeina 2013). The recently approved third iteration of the NNAP, which runs from 2017–2020, renews the commitment of the GoM to address undernutrition (USAID 2018).

Table 14. Prevalence (%) of global acute malnutrition, severe acute malnutrition, and stunting rates in the AOI

District, Region	GAM	SAM	Stunting
Ambovombe, Androy	9.7	1.9	14.6
Bekily, Androy	10.8	1.2	8.3
Ampanihy, Atsimo-Andrefana	8.5	1	9.1
Betioky, Atsimo-Andrefana	8.4	1	9.6

Source: UNICEF 2017b

Figure 27. National Social Protection Framework



Source: Celada, 2016

Figure 28. Axis I-Safety Net Activities

- Conditional cash transfers for human development
- Productive safety nets (high intensity of labor force - HIMO works)
- Unconditional cash transfers or CFW to respond to emergencies
- In-kind transfers to respond to emergencies
- Graduation mechanisms (income-generating activity [IGA], vocational training, access to microfinance)

Source: Celeda 2017

Social Protection Policy and Programming: The formal social protection policy was elaborated in 2015, followed by a declaration to establish a coordinating structure in 2017 (Figure 27). The National Office for Coordination of Social Protection Actions led by the MPPSPF coordinates implementation of the national policy across sectors (Celeda 2017). The policy is based on four axes: (1) increasing the incomes of the poorest; (2) improving access to basic social services, (3) protecting and promoting specific groups at risk, and (4) progressively consolidating the contributory scheme. Noncontributory social safety net activities (cash-based or in-kind) fall under Axis 1 (Figure 28) (Celeda 2017).

Humanitarian Assistance Policy: Madagascar is vulnerable to a range of hazards, including cyclones, droughts, earthquakes, floods, locust invasions, and Fall Armyworm, all of which destroy infrastructure and productive assets, resulting in economic losses (GFDRR 2018). In this context, policies guiding humanitarian assistance planning and implementation do not appear to be well articulated or coordinated. The existing legal framework provides for three key national DRM institutions: The National Disaster Risk Management Council; the BNGRC; and the Unit for the Prevention and Management of Emergencies (Cellule de Prévention et de Gestion des Urgences (CPGU) (IFRC 2014). The National Contingency Plan on Cyclone and Flood articulates processes to be followed during cyclone events, while the Ministry of Environment's decree for environmental issues and climate change resilience (Décret MECIE) ensures that economic activities and development are not detrimental to the environment (GFDRR 2018). The GoM is shifting focus from post-disaster relief operations to DRM and climate change resilience strategies (GFDRR 2018). The BNGRC serves as the authority for the management, coordination, and monitoring of all activities related to DRM and disaster risk reduction.

Assistance

Responding to the chronic and acute nature of food insecurity across southern Madagascar, agencies and consortia are using mixed approaches to restore and strengthen food security through social protection, long-term development initiatives and resilience building, and emergency response activities. The programs described below are not exhaustive but represent prominent examples of ongoing or recent efforts to integrate transfer modalities into various programs in the AOI within the last five years.

Social Protection Programming

The current social protection system includes a range of assistance initiatives, including the retirement fund, pension and insurance plans, access to basic social services, and social assistance programs for specific vulnerable groups including the elderly, the disabled, women, and children (IMF 2017). Of relevance to food assistance and emergency response activities are two components of the program, specifically: (1) a conditional cash transfer program known as TMDH/LUL (Cash Transfer for Human Development/Let Us Learn) related to primary and secondary school attendance; and (2) a Productive Safety Net (PSN) cash transfer program (Celeda 2017). Funding and technical assistance for the implementation of these initiatives are largely provided by multilateral donors (including UNICEF and the World Bank). The FID and MPPSPF oversee implementation of these programs to ensure coherence with the objectives of the National Social Protection Policy and integration with the government's other sectoral priorities and with support from other relevant agencies (Celeda 2017). Geographical coverage is currently limited to selected *fokontany* and communes in 10 percent of districts, with either component reaching only 11 out of 114 total districts across 5 of 22 regions (Table 15). Program coverage in the selected areas includes 71,500 households (360,000 individuals) that receive either TMDH/LUL benefits or cash transfers through the PSN initiative (Celeda 2017).

Table 15. Social protection caseload by province

PROVINCE	REGION	DISTRICT	COMPONENT	# HOUSEHOLDS
Toamasina	Atsinanana	Toamasina II	TMDH/LUL	4,350/490 ⁽⁵⁾
		Mahanoro	TMDH/LUL	3,100/725
		Vatomandry	PSN	5,524
Tuléar	Atsimo Andrefana	Betioky Atsimo	TMDH/LUL	2,000/249
Fianarantsoa	Vatovavy Fitovinany	Vohipeno	TMDH/LUL	7,650/886
		Ankazoabo	PSN	2,500
		Manakara	PSN	7,586
	Haute Matsiatra	Ambohimahaso	TMDH/LUL	6,200/871
		Isandra	PSN	6,140
Antananarivo	Vakinankaratra	Faratsiho	TMDH/LUL	15,700/1,229
		Antanifotsy	PSN	10,750
Total				71,500

Source: Celeda 2017

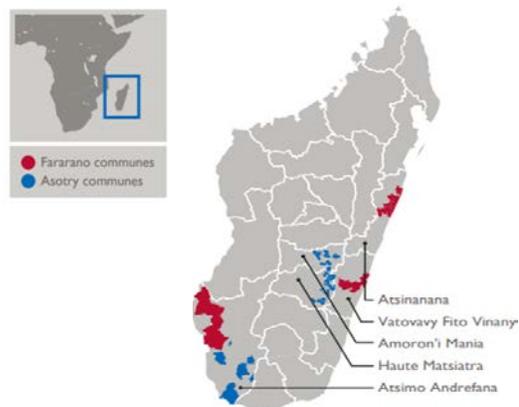
Program	Implementing Agency	Brief Description	Modalities
Cash Transfer for Human Development / Let Us Learn	Ministry of Population, Social Protection, and Women (MPPSPF) with support from UNICEF and the World Bank	39,000 households receive a cash allocation that varies according to household composition, ranging from MGA120,000 per year for households without school-aged children to MGA 480,000 for households with two children in primary school and two in secondary school.	Monthly cash transfer

Cash Transfer– Productive Safety Net	FID with support from UNICEF and the World Bank	32,500 households within and beyond the AOI receive MGA 240,000 per year for three years, equating to 16% of the consumption of households in extreme poverty (Table 15).	Cash transfer for labor days
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USAID/FFP Development Food Security Activities

USAID/FFP currently funds two DFSA programs in southern Madagascar (Figure 29): the ASOTRY program implemented by ADRA (Adventist Development and Relief Agency) and a consortium of implementing partners, and the Fararano program, led by Catholic Relief Services (CRS) and its consortium. Together, these programs are valued at US\$ 75 million. Generally, transfer modalities for these five-year development initiatives include supplementary food in kind, specifically targeting pregnant/lactating women and children under five years of age. FFA is widely applied as a means of supporting resilience-based infrastructure and environmental projects, as well as agricultural production. The ASOTRY and Fararano programs also incorporate vouchers to provide households with selected seeds and animals, also described as “subsidies” in the ASOTRY program. Of note, both programs were confronted with the challenge of meeting emergency assistance requirements during the first year of implementation, requiring a transfer of program resources to respond to humanitarian needs resulting from Cyclone Enawo and persistent drought in the south. Emergency response activities occurring under the DFSA programs included in-kind distributions, CFA/FFA/CFW, and cash distributions. Table 16 presents an overview of the size of the food assistance components for the current DFSA programs.

Figure 29. Current USAID/FFP DFSA program areas



Source: USAID 2016

Table 16. Commodities distributed through current DFSA programs (MT/year)

Title II Commodities	2015	2016	2017
Great northern beans	70	120	60
CSB+	3,080	3,160	1,560
Edible oil	660	1,050	680
Split yellow peas	450	630	360
Milled rice	2,830	4,890	1,840

Source: Authors' compilation based on USAID/FFP 2018 data provided to FEWS NET.

Program	Implementing Agency	Brief Description	Modalities
ASOTRY	ADRA (Adventist Development and Relief Agency), Association Inter-Cooperation Madagascar (AIM), Land O'Lakes (LOL)	US Title II USAID/FFP Title II Development Food Assistance Program (DFAP) (2014–2019) USD 37 million and more than 8,500 MT of food to promote food security for 264,380 vulnerable people. The project aims to reduced food insecurity among targeted communities in the Amoron'i Mania, Haute Matsiatra, and Atsimo-Andrefana Regions of Madagascar.	In-kind rations (supplementary foods for maternal health child nutrition, integration of emergency rations), FFA, (land restoration, tree planting, build drainage, etc.), subsidies/vouchers for seeds and animals, fresh foods
Fararano	CRS (Catholic Relief Services), Caritas, CDD-U, ODDIT, BDEM, NCBA CLUSA	US Title II USAID/FFP Title II Development Food Assistance Program (DFAP) (2014–2019) USD 38 million for 364,000 vulnerable people. The project aims to reduce food insecurity and chronic undernutrition and increase resilience in Atsimo-Andrefana (Morombe, Sakaraha, Toliary II), Atsinanana (Brickaville, Toamasina II), and Vatovavy Fitovinany (Ifanadiana, Mananjary).	

Humanitarian Response

The national government plays a lead coordination role through BNGRC, the centralized agency for data collection and assessment and a key partner in developing the resulting response strategy. The presence and influence of WFP and UN agencies in Madagascar's assistance landscape are significant; 50–66 percent of resources from the emergency appeals for 2016–2017 were managed by WFP, largely food assistance through mixed-modality mechanisms.

Humanitarian response activities over the last several years have focused intently on addressing the impact of extended drought in southern Madagascar and the acute food security needs of populations impacted by cyclones, and particularly Enawo in 2017. Cash-based response modalities (transfers and CFW) have grown in importance across humanitarian partners and agencies in Madagascar since the initiation of the 2016 drought response in the south. However, as evidenced by the

Enawo response, a range of response modalities have depended on the nature of disaster, reflecting some flexibility in modality used based on the status of the enabling environment post shock. The 2016–2017 emergency response efforts also underscored opportunities to leverage existing social protection programming infrastructure and systems for humanitarian response efforts through both vertical and horizontal expansion.

Program	Implementing Agency	Brief Description	Modalities
Transitional Interim Country Strategic Plan (T-ICSP)	WFP	The 18-month T-ICSP (January 2018 – June 2019) aims to support the GoM in ensuring populations affected by natural disasters, school children in southern and central regions and malnourished populations have access to adequate food and nutrition. Additionally, that vulnerable communities and smallholder farmers have increased resilience to shocks.	General food distribution, FFA, unconditional cash transfer (equivalent to daily food ration), household protection rations.
Drought Food Relief in Madagascar (DFRM)	ADRA (under the umbrella of the ASOTRY DFAP program), with contributions from WFP (supplemental foods)	This emergency response initiative (August 2016 to February 2017) responded to food needs of 10,511 drought-affected households in Bekily and Ampanihy.	General food distributions, supplementary foods (plumpy sup), FFW
Households Averting Vulnerability by Expanding Livelihood Opportunities (HAVELO)	Catholic Relief Services (CRS) with CARE	HAVELO (August 2017 – January 2019) aims to prevent acute undernutrition by increasing access to and use of basic health and nutrition services and by improving households' access to food in sufficient quantity and quality. HAVELO supports 60,000 beneficiaries in Androy and Anosy Regions in the districts of Tsihombe, Amboasary, and Beloha.	The main activities include general food distribution, FFA, CFW, and promotion of essential nutrition actions including food diversification cooking demonstrations, and distribution of fresh food vouchers.
Fararano Plus	Catholic Relief Services (CRS)	From April to September 2016, Fararano redirected a total of 1442 MT of development commodities to the south to serve over 20,000 households with emergency food rations. In August 2016, Fararano was also awarded an emergency extension to support an additional 11,000 households in three of the most affected districts of the deep south for a response that will last 12 months (August 1, 2016 – July 30, 2017).	The main activities included general food distribution.

Modality Experience

A range of transfer modalities are used as part of food assistance programming in southern Madagascar to meet specific social protection, development, resilience-based, and humanitarian objectives. While market-based transfer modalities increasingly act as a “go-to” mechanism to deliver food assistance through much of the AOI in southern Madagascar, differences between the response strategies developed and implemented for drought-affected areas versus Cyclone Enawo-affected communities demonstrate opportunities for multiple, coexisting modalities to meet the needs of food insecure populations. Emergency food assistance programming, largely driven by cash-based mechanisms and direct food aid, has demonstrated the effectiveness and feasibility of cash transfers, CFW, and FFA. In-kind modalities require advanced planning and supply chain reinforcement to mitigate the impact of the relatively long duration of sea transportation, limited transportation options, insufficient storage facilities at EDPs, and poor road infrastructure, among others. Coordination, regardless of modality, remains a challenge.

Unrestricted Cash

Cash transfers evolved over the last decade as a prominent modality for delivering food assistance in Madagascar, especially during the drought response in the Grand Sud. To improve coordination at technical and strategic levels, an emergency cash group was formed in 2016 under the overall umbrella of the Social Protection Thematic Group, which was co-led by UNICEF and the MPPSPF (MPPSPF 2017). From this experience came guidelines for use in future emergency operations. Increasingly, direct cash transfers are used by implementing organizations, even in hard-to-reach places. Overall, cash is well received in target communities but not without some challenges. The Emergency Cash Working Group suggests several areas for improvement in the sector, including: the lack of principles of engagement, partner coordination, and reporting; the presence of differing objectives and transfer values (Table 17) among implementing agencies, despite GoM efforts to harmonize

standards; and a lack of a single beneficiary registry (CALP 2018). Cash transfers are also implemented by the FID, under ACT-P programming, for livestock purchase, to encourage flock or herd expansion. Some notable field assessment findings include:

- Many implementing organizations reverted back to cash-in-envelope from e-transfers due to uneven beneficiary experience with mobile money as well as liquidity and connectivity challenges among rural mobile money agents and beneficiaries.
- Cash transfers can have a short-term inflationary impact on prices due to increased demand. This was found to be especially the case especially for programs designed to encourage livestock purchases.
- Despite challenges with cash, WFP opted to use cash-in-envelope versus in-kind modalities in parts of the Sud Est because physical access is too difficult to implement in-kind distributions. This decision was made under the operating assumption (based on their knowledge of the area) that households would find a way to access markets through their own means (on foot or by boat, or otherwise). The accuracy of this operating assumption was not assessed by FEWS NET.

Table 17. Varying modality standards–Drought emergency response

	FID	WFP	CARE	MPPSPF
Targeting type	Categorical: mothers with children under 5 registered at ONN sites	Community + survey based on socio-economic well-being indicators	Households with children under 5, pregnant and breastfeeding women	Categorical: households with children over 18 in situation of exploitation (assessed through a social questionnaire)
Amount of transfer (emergency phase)	MGA 30,000/month (MGA 60,000/month initially)	MGA 60,000/month	MGA 3,000/day; MGA 60,000/month (20 days of work)	MGA 30,000/month
Duration	Categorical: mothers with children under 5 registered at ONN sites	Community + survey based on socio-economic well-being indicators	Households with children under 5, pregnant and breastfeeding women	8 months
Overall amount of transfer	MGA 360,000	MGA 360,000	MGA 120,000	MGA 240,000

Source: Celada 2017 citing CWG data

Furthermore, recent efforts to streamline cash transfers through the existing social protection platform and systems are evidenced through small-scale but successful activities to deliver cash assistance through the expansion of safety net beneficiaries (Table 18). These efforts occurred during both the El Niño and Cyclone Enawo responses. For example, the existing beneficiary roster of social protection program participants became the starting point for humanitarian agencies to distribute cash transfers in both a “horizontal” and “vertical” expansion of social program benefits. Reflecting the emphasis on social programs as a conduit for emergency funding and cash transfers, the social protection program received the second largest allocation of funding for adaptable emergency response in 2016–2017 and for facilitating assistance to disaster- and drought-affected households.

Table 18. Vertical and horizontal expansion of safety net activities for humanitarian response

Extention of the state-run social saftey net programme to respond to emergencies	
Horizontal Extension	<i>Drought in the South (2016)</i> : Inclusion of approximately 60,000 new beneficiaries (+150%) of the cash transfer programm through i) geographical extension of the program to drought-affected areas, 2) modification of the critiria of inclusion to ensure wider coverage within each beneficiariy village.
	<i>Cyclone Enawo (2017)</i> : Inclusion of 4,096 beneficiary households in the cyclone affected regions (CFW).
Vertical Extension	<i>Drought in the South</i> : Increase the transfer amount for an average of MGA 20,000/month to MGA 30,000/month during the 12 month emergency period.
	<i>Cyclone Enawo</i> : No change in CFW programme settings.

Source: Celada 2017

Restricted Cash (vouchers)

Vouchers are largely used to facilitate access to nutritious foods, agricultural inputs, and animals, with varying success. CRS implements a voucher system in the Fararano program to connect households with nutritious and fresh foods. The program successfully incorporates e-payments to vendors based in main trading centers and towns. The 2017 Joint Mid Term Review for the voucher component notes that enabling small-scale, sometimes home-based, vendors to sell fresh produce was well received and smoothly implemented (USAID 2017). While this activity shows promise in facilitating access to healthier foods, and ensures that beneficiaries can access high-quality inputs, small stock, and tools, considering the timing of market supply and availability remains an important planning element. Markets and vendors that support this activity should provide the degree of diversity and required quantity of desired foodstuffs or inputs frequently, which has proven difficult in some areas, and is the biggest challenge for perishable goods (FEWS NET 2018). In general, market access is constrained in more isolated, rural areas where market reach is less consistent. Some notable field assessment findings include:

- Due to challenges with ensuring vendor supplies through the program period, the Fararano program revised its food voucher program to allow beneficiaries to purchase commodities through restricted commodity vouchers on designated days, rather than at will. This allowed vendors to better plan their inventory.
- Overall, the format and structure of input voucher fairs has been appreciated. However, there were cases reported in the past of households selling the inputs that they acquired, or consuming the seeds purchased in fairs with vouchers.
- Vouchers designed to meet a specific nutrition objective may be scalable in communities with well-supplied markets and adequate financial services, as evidenced by a WFP e-voucher pilot in six *fokontany* of Amboasary Commune, which was scaled up from 2,600 to 35,000 beneficiaries with preselected vendors.

Food-and Cash-for-Assets

Remunerative food assistance programming is a conditional transfer where beneficiaries provide labor in exchange for payment in kind or in cash. GOM views FFA as a “resilience” activity and seeks to prevent duplication of effort and overlap of FFA with other types of “resilience” interventions at the *fokontany* level. This modality is widely used in longer-term development and resilience programming and is commonly integrated into emergency response strategies to encourage livelihood recovery, especially by WFP in Madagascar. Subsequently, this activity is subject to overlap and to inconsistent conditionality across projects, geographic areas, and populations. FFA/CFA/CFW activities in Madagascar would benefit from a more intensive effort to streamline standards, values, and conditionality associated with these activities in both emergency and resilience-based programs. The food assistance community notes that while many agencies implement these activities, some agencies assume a dominant role in establishing their own program plan; this is viewed as an obstacle to full standardization of key elements such as targeting, planning and prioritizing projects, and establishing consistent values for work performed. Lack of clarity regarding the terms of engagement also emerged as a consideration, with some communities in the AOI expressing confusion regarding the rationale of the DFSA ration size relative to the intensive work required, and the number of days worked before receiving a ration. Some notable field assessment findings include:

- The structure and objectives of FFA/CFA/CFW are well appreciated by community members, who favor their own contribution to local development activities, and buy in to the overall need for infrastructure improvements. While most projects offer a shared benefit, some additional consideration regarding the appropriateness and value of productive assets compared to community needs may enhance long term participation and stewardship of resources by communities. Water management assets were identified by stakeholders in the AOI as particularly useful (increasing water access in the Grand Sud and better managing large volumes of water throughout the year in the Sud Est).
- This modality tends to support the redevelopment, refurbishment, or construction of feeder roads and transportation infrastructure. Stakeholders noted that some beneficiary households had completed the same project in the same place multiple times to account for poor planning or poor-quality construction/engineering, resulting in unsustainable activities and eroding beneficiary morale.
- DFSA program beneficiaries felt that the size of rations received for FFA activities did not appropriately reflect the intensity of work performed. Beneficiaries also lamented the low transfer value relative to other work and asset-building activities in the AOI. The perceived low transfer value coupled with the common practice of distributing food to beneficiaries after 10 days of work is discouraging to households, resulting in some non-poor community members, who can afford to work for 10 days before receiving food, participating in the FFA activities instead.

In-Kind/Title II Assistance

Food distributions are a familiar and appropriate means of delivering food assistance within the AOI. Partners and beneficiaries are familiar with this modality, and prefer food in kind to cash, citing security concerns with cash and price increases following distributions affecting purchasing power. The AOI is structurally deficit in focus commodities, with gaps filled through supplies from other areas of the country and imports. Supporting infrastructure exists, but availability and reliability vary by region. High levels of humidity in the Sud Est make long-term storage of grains, pulses, and CSB problematic. Small port capacity requires making many small shipments, with very high internal transportation costs; long lead times are required; and limited transportation options (especially in the Grand Sud) create logistical/planning challenges once commodities do arrive in country. The private sector can be disincentivized during large-scale emergency response efforts (FEWS NET 2018c), particularly with respect to the imported rice sector. This does not apply to the current DFSA programs given their limited size/scale. Some notable field assessment findings include:

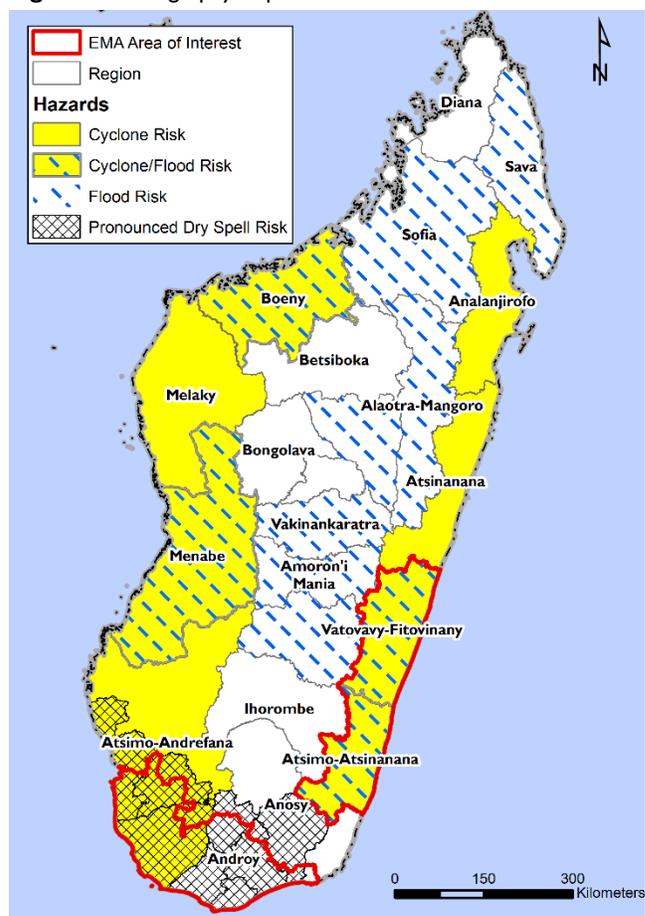
- Beneficiary preferences for in-kind assistance versus cash vary and are highly localized and context-specific. In general, women described a preference for in-kind assistance to decrease the likelihood that men direct externally provided resources toward non-food expenditures.
- In general, in-kind recipients perceive some US commodities as very high quality (especially edible oil, which does not harden and is fortified) and others as lower quality (pulses, for example, which are perceived to take too long to cook). Imported maize is less preferred to imported rice, while sorghum is not a preferred commodity to many households in the Grand Sud and is unknown in the Sud Est.
- In-kind shipment of Title II commodities can require an extended transit period and once in-country, commodities are subject to complex internal logistics and supply chain management.

Considerations for Program Design

Findings from this assessment identify several constraints to and opportunities in support of different modalities in the AOI. Based on the information reviewed, a wide range of modalities have contributed to improving food security conditions for the targeted populations in both emergency and longer-term development and resilience-focused activities. Several factors relevant for program design were identified through the analysis:

- Environmental factors, which either allow productive activities or restrict them over certain areas and determine the seasonality of livelihood activities.
- Social factors, including a wide range of localized social taboos, gender inequity, cattle-rustling-related insecurity, and strong community solidarity.
- Spatial distribution of infrastructure and services, which ensures coverage along the main roads/corridors, but presents weaknesses and challenges in more isolated areas (up to 52 percent of population in the Grand Sud and up to 81 percent of population in Sud Est, Table 12).
- The food assistance context, with a general trend toward cash-based programming supported by the market and policy context. However, in-kind assistance is still seen as relevant and even preferred by many households and in the aftermath of rapid-onset shocks, such as cyclones.

Figure 30. Geography of prominent hazards in the AOI



Source: WFP 2018

Environmental factors

Table 19. Key environmental considerations for program design and implementation

Element/aspect	Assessment findings
Water management	Insufficient and erratic rainfall and high-water salinity levels, coupled with low agricultural potential of soils, constrain productivity of crops, resulting in minimal food supply within the Grand Sud AOI. In the Sud Est, water management, namely the lack of water redirection infrastructure, presents a challenge to crop production, as well as postharvest food processing and storage.
Risk of adverse climatic events, particularly drought in the Grand Sud and cyclones in the Sud Est	Droughts and cyclones are recurrent risks to productive activities. Current DFSA experience indicated that progress toward future program goals are highly likely to be affected by weather-related hazards in the AOI (Figure 30).

Source: Authors' elaboration

Social factors

Table 190. Key social considerations for program design and implementation

Element/aspect	Assessment findings
Diverse household structure	Households in the AOI are heterogeneous, with monogamous, polygamous, adult female/no adult male and other types of households prevalent in the area.
Low level of literacy	The AOI presents a higher level of illiteracy relative to the national average, limiting the population's access to information, mobile banking and written training content and resource materials.
Casual labor and crop sales are key income sources	While livelihoods are underlying agricultural or pastoral, income derived from self-employment (sale of bush products, charcoal, construction materials and water fetching) and casual labor represent a considerable proportion of household income, for the poor and very poor. Livestock ownership is not necessarily linked to household income earned.
Security	Insecurity from <i>dahalo</i> or <i>malaso</i> (<i>cattle thieves and bandits</i>) threatens the livestock sector, a phenomenon that has increased in intensity in recent years. This has resulted in early market closures, especially in the Grand Sud.
Varied awareness about mobile technology and its applications	While many own a mobile phone or have access to mobile phone technology, a large part of the population in the AOI is still learning about these tools and their applications or is unable to use them due to illiteracy. Awareness of its use for financial transactions is limited to well-populated urban areas.

Source: Authors' elaboration

Availability of infrastructure and services

Table 201. Key infrastructure and service-related considerations for program design and implementation

Element/aspect	Assessment findings
Road availability and quality	Several primary roads with year-round access connect different points in the AOI with the rest of the country. However, accessibility to more remote locations is challenged by poor road conditions, limited network development, and rains.
Storage availability	Storage is available in the AOI. Implementing partner and private CDPs are in good condition but many remote EDPs do not meet technical standards for USAID programming and require rehabilitation. Humidity, especially in the Sud Est, is a constraint to longer-term (more than 3 months) storage. Other storage challenges faced on a regular basis are heat and pests. Although implementing organizations have storage facilities in the area, it is common practice to store product outside the AOI and ship it prior to distribution.
Port capacity	The Port of Toamasina, which serves the Sud Est, is the largest port in the country and has sufficient supply. The ports serving the Grand Sud, Toliara and Taolangaro have relatively small capacity, requiring more frequent, smaller shipments, and the resulting aggregation process presents additional supply chain management challenges prior to distribution.
Transport services	Transport services are available, but capacity is low, particularly in the Grand Sud. Transport costs are relatively expensive and increase in more remote areas. Transport trucks travel slowly, resulting in long travel times. The general time lag for in-kind commodity arrival means that sometimes goods arrive and/or are distributed beyond the "best by date." This challenge regularly arises in Madagascar and must be dealt with by the Department of Plant and Phytosanitary Protection within the Ministry of Agriculture, Livestock and Fishery.
Distance to market	Distance to markets reaches up to 15 km in the Sud Est (3 hours on foot) and 25 km in the Grand Sud (5 hours on foot) among households interviewed.

Element/aspect	Assessment findings
Mobile network coverage	All three main mobile operators, Telma, Orange, and Airtel, are present in the AOI. Coverage is best in large towns and along main roads, but it can be challenging to access the network in remote areas. Mobile money operators have a greater presence in the AOI compared to commercial banks and MFIs, especially in rural areas. However, they often face liquidity constraints, especially in rural areas, rendering them unable to complete money transfers for a few days.
Availability of financial service providers	Financial service agents/branches and mobile service agents are generally available in larger towns across the AOI. Mobile money operators have a greater presence in the AOI compared to commercial banks and MFIs, especially in rural areas.
Know-your-customer	A costly identification process is necessary for opening a bank account (or accessing certain banking services more generally), which also applies to money agents. Both processes are seen as costly and time-consuming.

Source: Authors' elaboration

National and international market dynamics

Table 212. Key macro-level market considerations for program design and implementation

Element/aspect	Assessment findings
Trade with central Madagascar in locally produced cereals supports food supply in the AOI	Higher prices in the AOI and shocks to domestic supply increase the dependency of the AOI on food imports and its attractiveness as a destination market in national trade dynamics.
Importance of imported commodities	Imported rice and edible oil are essential to national food supply and in the AOI.

Source: Authors' elaboration

Food assistance context

Table 223. Key food assistance-related considerations for program design and implementation

Element/aspect	Assessment findings
Government guidance and capacity	Policy guidance is nascent and in development, allowing for more dominant actors to take a leading role and reducing collaborative engagement among response agencies. Government capacity to oversee, coordinate, and standardize response programming is largely supported (technically and financially) and shaped by the international community; its capacity to implement stand-alone initiatives and policy objectives is low.
Synergies across programs	There is increasing emphasis on synergies between humanitarian programming and social protection systems and a growing reliance on cash-based modalities, specifically, horizontal and vertical expansion in areas where social protection initiatives are ongoing.
Cash	Cash is increasing in popularity and importance as a humanitarian response and food-assistance tool across the country but challenges remain in isolated and partially isolated parts of the AOI where access to markets and mobile money or banking services can be unavailable to poor households.
Beneficiary preferences	Beneficiary preferences are mixed, with a larger emphasis on in-kind transfers by women to help limit unintended uses.
Impacts on markets	Limited evidence is available regarding the market impacts (or lack thereof) of different assistance modalities. However, the information suggests that no long-term impacts on prices or incentives are observed.

Source: Authors' elaboration

Modality-specific opportunities and challenges

In relation to the different food assistance modalities considered in this analysis, the following opportunities and challenges were identified.

Table 23. Modality-specific considerations for program design and implementation

	Opportunities	Constraints
In-kind Title II Assistance	<ul style="list-style-type: none"> Partners and beneficiaries are familiar with this modality. Some beneficiaries prefer in-kind assistance rather than cash, citing security concerns with cash and price increases following distributions, affecting purchasing power. Some women prefer in-kind assistance to cash, citing that men may use cash to buy nonfood items. Some US commodities are perceived as very high quality (edible oil) and appreciated by beneficiaries. The AOI is structurally deficit in focus commodities; the gap is filled through supplies from other areas of the country and imports. Supporting infrastructure exists, but availability and reliability vary by region. 	<ul style="list-style-type: none"> Commodity appropriateness: US pulses are perceived as hard and difficult to cook. Sorghum is considered a newly introduced commodity; several examples exist of it not being accepted by beneficiaries. Commodity self-monetization: US edible oil is perceived as higher quality than what is available on markets (fortified does not harden). US pulses are less preferred so can be sold. Logistics and commodity management: High levels of humidity in the Sud Est make long-term storage of grains, pulses, and CSB problematic; small port capacity requires making many small shipments, with very high internal transportation costs; long lead times are required; limited transportation options exist (especially in the Grand Sud), which creates logistical/planning challenges once commodities do arrive in country. Procurement pipelines and lead times for shipment and distribution of commodities can be long and arduous and delay program impact. Phytosanitary restrictions: The GoM is still in the process of formalizing its phytosanitary policies. The guidance is that genetically modified organisms (GMOs) and whole grains (sorghum, whole dried maize) should be processed prior to arrival in country to prevent local propagation. Recent restrictions on imports from countries affected by Fall Armyworm have also created delays in handling of in-kind commodities (Ministère de l'Agriculture et l'Élevage 2017). Both dynamics should be monitored closely and followed up as necessary with relevant government ministries prior to importation.
Cash (including vouchers)	<ul style="list-style-type: none"> Cash is increasingly used by implementing organizations, even in hard-to-reach places. It is widely used for emergency response across the country, including in the Grand Sud and Sud Est. Significant overlap in emergency sector and social programming provides an additional platform for efficient cash distribution in acute food insecurity or humanitarian emergencies. Beneficiaries appreciate flexibility. Established money transfer systems exist in the AOI, however accessibility decreases in more isolated areas. Staple foods are available and markets operational year-round in medium and large reference markets in the AOI. There is believed to be a high degree of variability in supply on markets in more isolated areas of the AOI (Figure 3) (WFP 2017; FEWS NET 2018) where supply typically decreases during the lean season and/or if production is low in a given year. Fresh food voucher initiatives show promise but are still small scale; appropriate market assessments and capacity evaluations will help to determine entry points for larger-scale expansion. Voucher fairs for agricultural inputs are a well-received and are more frequently integrated with nonfood-specific programming. 	<ul style="list-style-type: none"> Commodity availability: Commodity availability is most diverse on specific market days. It is difficult to ensure vendors have all foodstuffs available every day of the week, especially for perishable goods (fresh food vouchers). CSB-type products are sold on some markets, but not among foodstuffs typically purchased by households. Market access is constrained in more isolated areas (however, some partners have determined that households would still be better off with cash, despite the high level of isolation). Commodity price variation: Seasonal price swings affect household food access in terms of purchasing power. Supporting services: Availability and liquidity of FSPs are constrained outside of major towns. Livestock programs: The threshold for a productive herd size can be a useful benchmark for determining a livestock pass-on program design. Herd size is unstable below the threshold, resulting in unsustainable herd sizes that limit the long-run earnings potential of beneficiary households.

	Opportunities	Constraints
FFW/CFW or FFA/CFA	<ul style="list-style-type: none"> Productive, sustainable community assets are important for long-term development and growth in the AOI. Beneficiaries appreciate contributing to local development activities. Infrastructure improvements and developments are needed in the AOI. Large-scale CFW programs also run in partnership with international agencies with an institutional emphasis on CFW interventions. 	<ul style="list-style-type: none"> Appropriate assets: The appropriateness, sustainability, and management of productive assets developed to local community needs must be ensured. Households indicated that water management is a key concern. Households indicated they felt that post-cyclone road repair activities were demoralizing and unsustainable (they were required to carry out tasks nearly every year). Coordination/overlap: Many FFW/A and CFA/W activities exist in the AOI, implemented by many organizations. Instances occur where activities overlap or are carried out in close proximity, but with varying wages (between the equivalent of MGA 3,000 and 5,000 per day). The Ministry of Population has recently adopted a firm stance against multiple actors conducting “resilience” activities (including FFW/A or CFW/A) in the same fokontany (sub commune administrative units). Transfer size: Beneficiaries cited lack of clarity about the rationale behind DFSA ration size relative to intensive work required; and difficulties with requirements to work 10 days before receiving the ration.

Source: FEWS NET 2018

Annex 1. Methodology

FEWS NET Enhanced Market Analysis Methodology²

The Bellmon Amendment requires assurance that a proposed food assistance program will not result in a significant disincentive to or interference with food production or marketing.^{3 4} Historically, the Bellmon Amendment was mostly applicable to in-kind US food aid that was either distributed or monetized as part of Food for Peace (FFP) Title II programs. Since 2016, with the increased flexibility in terms of the modality options available using US government funds via the 2014 Farm Bill and Food Aid Reform process, FFP has extended this application to include other assistance modalities including local, regional, and international commodity procurement, as well as cash transfer and voucher programs (USAID 2015).

The objective of FEWS NET Enhanced Market Analysis (EMA) is to provide sufficient evidence to relevant USAID policy decision makers and program managers on a range of topics to allow a determination of whether the design of a proposed food assistance program (Emergency or Development) is appropriate and feasible given the local context (Table 25). Local context includes but is not limited to the underlying livelihood and market systems and resulting food security outcomes, government policies and programs, local infrastructure and supporting services, and relevant food assistance experience in focus areas.

Each food assistance modality has the potential to negatively affect production and/or market incentives. An assessment of the likelihood of those negative impacts must therefore be completed to successfully determine the appropriateness of a given proposed modality and transfer distribution mechanisms.

FEWS NET analysts use a livelihoods-based convergence of evidence approach that typically draws on a range of primary and secondary data sources to provide the necessary evidence to inform the decision-making process. The sources, extent/detail, and quality of secondary data available for analysis vary widely from country to country. To this end, FEWS NET EMA builds from existing national-level FEWS NET Market Fundamentals Reports and market databases (production, prices, trade flows, commodity balances), livelihood reporting, agroclimatology information, and food security reporting and analysis with secondary data sources (food security and market reports, poverty mapping reports, income and expenditure studies, among others) and data gathered from stakeholders via a field assessment and stakeholder workshop.

Table 24. Key EMA study questions

	Study focus area, typically a subnational geographic area targeted by FFP for future assistance programming	Other areas (national, regional, or international) where commodity procurement might take place for in-kind distributions or transfers
Appropriate	What are local livelihood systems, including key foods consumed, and food and income sources	
	What is the estimated food gap among poor and very poor households?	
	What is the size of local markets (quantities traded), who are the actors, and do they behave competitively?	What is the size of the market (quantities traded), who are the actors, and do they behave competitively?
	What are seasonal variations in supply, demand, and prices?	
	How well are local markets integrated with broader national, regional, and international marketing systems?	What is the size of markets and size of exportable surpluses?
	What are key constraints to expanding supply to local markets?	
Feasible	What existing food assistance programs are underway and what have been their experiences, including key challenges and successes?	What existing procurement efforts are underway and what have been their experiences, including key challenges and successes?
	What is the status of the local enabling environment for the food assistance modalities and transfer distribution mechanisms under consideration (for example, private and NGO storage and transportation capacity)?	What are constraints to the effective and timely procurement and distribution of commodities (for example, physical constraints, policies, storage, and transportation network capacity)?

Source: Authors and USAID/FFP 2016

² This section is informed by several key references including “Malawi Best Report 2013, Annex 6 “Methodology for Determining Impact of Distributed Food Aid,” Barrett and Maxwell 2009, “Food for Peace Modality Decision Tool” 2016, ECHO “The Use of Cash and Vouchers in Humanitarian Crises” 2013.

³ Bellmon Amendment.

⁴ The language in the Bellmon Amendment refers to “food aid” rather than “food assistance.” The language used in this report was updated to reflect the new and increased flexibility in terms of USAID FFP funding use, which now allows for a much wider range of procurement and distribution options.

FEWS NET EMA Analytical Approach

Step 1 CONSULTATION

Carry out consultations with USAID/FFP to understand and elaborate on their preliminary research questions, future program objectives (including geographic targeting and expected outcomes), and initial range of modalities and transfer distribution mechanisms under consideration. This consultative step is repeated in an iterative fashion, as necessary, as USAID's understanding of the study area and context improves and as its priorities are further refined. These consultations take place with key stakeholders within FFP Washington (country backstop officers and the FFP Markets Team) and in the field as well as with other relevant USAID staff (for example, Feed the Future).

Step 2 REVIEW OF EXISTING RESOURCES

The specific resources reviewed will be informed by the results of the consultation process (Step 1) and the depth and scope of existing FEWS NET resources and expert knowledge. In general, the secondary resources reviewed fall under a number of essential themes (Table 26). The review of secondary sources likewise usually takes an iterative approach that is flexible to changing information needs (Step 1) and the evolving nature of FEWS NET's understanding of key issues and topics.

Table 25. Key resources reviewed over the course of EMA studies

Theme	Key information	Useful resources
Livelihoods	Food and cash income sources, preferred foods, size and seasonality of food gap.	Livelihood zone descriptions, profiles, and baseline study reports by FEWS NET , Food Economy Group , Evidence for Development , Save the Children, and others).
Markets	Market structure, conduct, and performance (SCP) in study focus areas including: determinants and level of food availability, market actors and their behavior, price levels and trends (seasonal and interannual) in key reference markets, degree of market integration within broader national or regional context.	FEWS NET Market Fundamentals Reports FAO Crop and Food Security Assessment Mission (CFSAM) reports WFP Market assessments FAO Food Balance Sheets Cash and voucher feasibility studies Other market baseline reports
Food security outcomes	Food security assessment findings (CFSAM, Comprehensive Food Security and Vulnerability Analysis/CSFVA, Vulnerability Assessment Committee reports) and national Demographic and Health Surveys (DHS) and income and expenditure study results (ILO , World Bank , among others).	Demographic and Health Surveys (DHS) Income and expenditure study results (ILO , World Bank , among others)
Policy context	Existing government, United Nations Development Programme (UNDP), World Bank, and other development policies and programs.	National Poverty Reduction Strategy Papers UN Strategy papers
Food assistance program experience	The inventory includes, I/NGO or government agency, location (as specific as possible), modality, expected duration of activity, transfer composition and size.	Current FFP awardee annual reports, Development Experience Clearinghouse (DEC) and partner annual and evaluation reports
Infrastructure	Existing road networks, port capacity (if relevant), storage and transportation systems and capacity, availability of information technology (IT)	Previous Bellmon reports and analyses, Digital Logistics Capacity Assessments (DLCA), and National Ministry of Transportation Strategy Documents and Annual reports
Enabling environment	Availability of banking and mobile money services in focus areas.	Cell Mapper

Source: Authors' elaboration

Step 3 FIELD ASSESSMENT DESIGN AND PLANNING

The field assessment design and planning process is informed by Steps 1 and 2, which jointly orient the team to USAID priority research questions and geographic focus areas and reveal information gaps and inconsistencies in existing literature and reports that require clarification and triangulation. Each assessment is different, but nevertheless includes common elements

implemented in the context of a rapid assessment that includes in-depth interviews with selected key stakeholders (Table 27).

Table 26. Essential elements of FEWS NET EMA field assessment design and planning

Assessment planning element	Notes
Determine assessment team structure	This is informed by expertise required to successfully respond to USAID decision support needs and may include a combination of skills sets, including economists, livelihood specialists, logistics and supply chain analysts, food assistance programming experts, food security experts, and local specialists who are familiar with the study focus area and can help orient the team to local dynamics and facilitate meetings between the assessment team and stakeholders.
Identify markets to visit	This includes the commodity markets, and the physical markets, ports, and border points.
Identify stakeholders to interview	This should be as specific as possible, including stakeholders' institution, geographic location, and function.
Identify potential logistical issues and strategies	This includes but is not limited to security concerns to be discussed with local staff, partners, and hired facilitators/translators.
Design field assessment checklist	Checklists of key topics and questions to discuss are developed for each stakeholder group: private traders, food processors, transporters, implementing partners, farmers, food assistance beneficiaries, warehouse managers, local government officials, and extension agents.
Draft assessment roadmap	This includes a detailed itinerary, a daily agenda of planned interviews, and travel itinerary.
Plan stakeholder workshop	If the assessment includes a consultation workshop, this event (one to three days) must be planned.

Source: Authors' elaboration

Step 4 CONDUCT FIELD ASSESSMENT

The FEWS NET EMA field assessments involve filling in data gaps, triangulating secondary data, and holding discussions with identified key stakeholders to ensure a convergence of evidence. While in the field, the assessment team may split into separate groups to maximize geographic or thematic coverage. In principle, the division of responsibilities should happen as early as possible during the design and planning phase.

In some instances, inviting a cadre of stakeholders to a central location to discuss key assessment issues is deemed useful by FEWS NET staff. In those cases, the workshop typically follows the field assessment and serves an additional check on the accuracy of field assessment findings, particularly as they relate to market structure, conduct, and performance, and the experience with specific assistance modalities in a given geographic area.

Likewise, instances arise when physical field visits are not possible due to conflict or other constraints. While not ideal, in this case, FEWS NET staff may still be able to speak with key informants via phone calls to obtain relevant information to meet EMA decision support needs. FEWS NET staff may also hold the stakeholder workshop in a safe location rather than physically entering areas deemed unsafe.

Step 5 REPORT WRITING

FEWS NET reports assessment findings according to an outline agreed upon with inputs from FFP staff. The first complete draft is typically submitted within six weeks of completing the field assessment, as outlined in the original activity Scope of Work. FFP staff typically reply with comments, questions, and requests for clarification within two to three weeks of receipt of the initial draft. A final 508-compliant report must be submitted according to an agreed-upon timeline.

Annex 2. Assessment Itinerary

Table 27. Assessment Itinerary

Assessment team	Place	Date
Sud Est assessment team	Fianarantsoa	June 25, 26, and 28 2018
	Ambalavao	June 27, 2018
	Ifanadiana	June 29, 2018
	Mananjary	June 30, 2018
	Vohipeno	July 1, 2018
	Manakara	July 2, 2018
	Farafangana	July 3, 2018
	Vangaindrano	July 4, 2018
	Vondrozo	July 5, 2018
Grand Sud assessment team	Toliara	June 25, 2018
	Betioky	June 27-28, 2018
	Fotadrevo	June 29, 2018
	Bekily	June 30, 2018
	Ampanihy	July 2-3, 2018
	Beloha	July 4-5, 2018
	Ambvombe	July 6, 2018
Logistics assessment team	Toliara	July 3-4, 2018
	Ampanihy	July 5, 2018
	Amboasary	July 6, 2018
	Taolagnaro	July 7-8, 2018

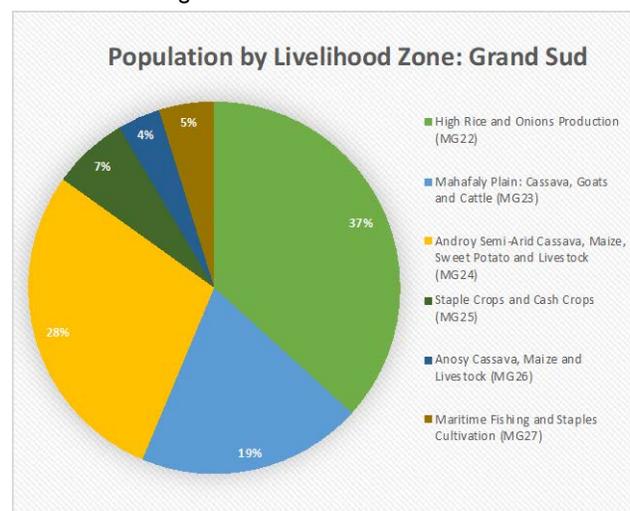
Table 28. Individuals Encountered

Location	Institution	Name
Fianarantsoa	Market focus group	Hanitra Marie Claudine
	Assistant Market Manager	Mrs. Clarisse
	Director of Rural Development	Mrs. Simona
	Fianarantsoa Chamber of Commerce	Fernando Rakotomalala
	Regional Directorate of Fisheries and Resources	Mr. Tantely
	ADRA	Mr. Tsarafidy
Ambalavao	Market focus group	Emerson Merline
	ADRA	Sendra
	Market manager	Madzy Ramala
	Livestock market	Ranoely Ramalaza
Ifanadiana	Household focus group	Florine Razaiarisoa
	Voucher vendor	Pauline Rasoananteina
	Village chief	Amanuel Rakotoson
	Bureau de Développement ECAR de Mananjary (BDEM)	Jean Claude
Mananjary	Household focus group	Eliane Saramahita
	Market focus group	Tombo Marcelin
Vohipeno	Deputy Mayor	Jean Paul
	Household focus group	Yvette Chantal Rasoanandradania
Manakara	Municipal post at market	Tsiafara Randrandrainy
	Market monitor	Hanta Manizanapitry
	Olivier import company	Josephine Rakotoanimalala
	Market focus group	Marie Yolande Parfait
	Regional Directorate of Fisheries	Marcelin Tsimivonto
	Regional Directorate of Agriculture and Livestock	Mrs. Gyslaine
Farafangana	Market focus group	Manimtoala Andriatsihoanara
	WFP	Theodore Mbainassen
Vangaindrano	Household focus group	Soanany Helene

Location	Institution	Name
Vondrozo	Market focus group	Zafibanoka Marolahy Emmanuel
Toliara	Land O'Lakes (LOL) International Development	Falihery Rabetaliana
	Catholic Relief Services (CRS)	Andry Ramamonjisoa
	Diocesan Development Council (CDD)	Eliane Rasomananjara
	Regional Service for Agriculture and Plant Protection	Brice Momaly
	WFP	Renald Elie
Betioky	Market manager	René Manarimbelo
	Association Intercooperation Madagascar (AIM)	Rado Rabetrena Rambakoarison
	LOL	Eddy Razafy
Fotadrevo	Livestock market manager	Mr. Fidelice
Bekily	WFP	Sarika Tatanarivo
	Market manager	Mr. Fanoriza
Beloha	Market manager	Mr. Sambo
Ampanihy	ADRA	Rado Ravonjarivelo
	Market manager	Mr. Faramasy
	WFP	Voadinirina Manoroosa
Ambovombe	Market focus group	Mr. Soja
Amboasary	WFP	Bruno Rakotoson
Taolagnaro	WeltHungerHilfe	Eginhard P. Daniel Meijering
	Bolloré Logistics	Zo Rabearivelo

1. MG22 – High rice and onions production – includes the majority of the Anosy region and an eastern part of the Atsimo-Andrefana region. This zone is the rice bowl of the south, complemented by other crops including the staples cassava, sweet potato, and maize. Market gardening - in particular onion production - is common and traded far and wide.
2. MG23 – Mahafaly plain: cassava, goats, and cattle – located in the southern half of Atsimo-Andrefana region. In this zone livestock raising is more widespread than agriculture and is dominated by small herds of goats, and, to a lesser extent, flocks of sheep. The crops found in this zone include maize, sweet potatoes, and groundnuts, as well as cowpeas, mung beans, and lima beans.
3. MG24 – Androy semi-arid cassava, maize, sweet potato, and livestock – This zone is in the southernmost part of the country and includes

Figure 32. Population for all six livelihood zones that make up the Grand Sud region



Source: FEWS NET 2017

- most of the Androy region. It is known as the country's driest area. Cassava is the staple crop and other significant crops include sweet potatoes, cowpeas, other legumes, groundnuts, and watermelons. Local livestock systems are extensive and involve an annual migration to Northern and Western zones between May/June and October.
4. MG25 – Staple crops and cash crops (groundnuts) - This zone lies largely within Bekily district in the north of Androy region. It achieves a surplus in cassava and groundnuts, both of which are marketed extensively helped by good road access. Rice and maize are also grown here.
5. MG26 – Anosy cassava, maize and livestock – located in the southwest of Anosy and characterized by low-lying topography, compared to zone MG22 which surrounds it. This zone has a very high dependence on cassava as the staple crop, with some reliance on maize and sweet potatoes, and cactus fruits during the lean season. Groundnuts, cowpeas, and voandzou are the main cash crops.
6. MG27 – Maritime fishing and staples cultivation – This zone includes a 500-600-kilometer coastal stretch from Toliary II district (Atsimo-Andrefana region) to Taolagnaro district (Atsimo-Atsinanana region). Local livelihoods depend on a mixture of sea fishing (using nets and canoes) and, to a greater or lesser extent, crop cultivation (including cassava, sweet potato, cowpeas, haricot beans, and watermelons).

Full baseline profiles exist for three livelihood zones only (zones MG23, MG24, and MG26) that cover the vast majority of the southern region. The following sections in this annex related to the Grand Sud will focus on these three livelihood zones.

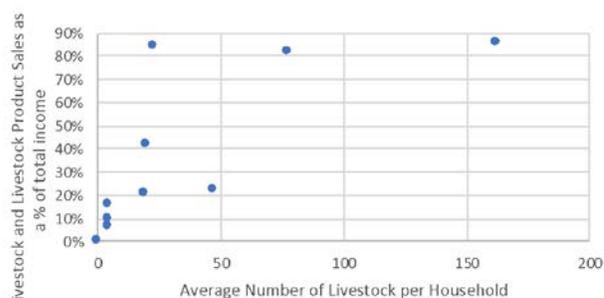
Most important sources of food and seasonality

Food is mostly obtained from own production and market purchases and supplemented by food assistance (present in all three baselines conducted in the *Grand Sud*). The cereal harvest starts in March/April, marking the end of the lean season. Market purchases increase steadily throughout the year as households' own stocks dwindle. Among the very poor and poor in the *Grand Sud*, the majority of food is sourced from purchases (ranging from 24 percent to 30 percent of total food needs for the very poor and 32 percent to 45 percent for the poor, depending on the zone), followed by their own crop production (ranging from 16 percent to 25 percent for the very poor and 24 percent to 36 percent for the poor, but only 4 percent for the very poor in zone MG26). The remainder is supplemented by food assistance (present in all three zones during the reference year), in-kind payments (except in zone MG26 where they are not typical), wild foods, and gifts of food. Somewhat starkly, middle, and better off households cover nearly twice as much of their food needs from own crop production compared to their poorer counterparts each the zone (ranging from 36 percent to 52 percent of annual food needs for middle households and 45 percent to 62 percent of food needs for the better off - depending on the zone), with the remainder coming from market purchase and own livestock (milk and meat). Food assistance was received by middle households during the reference year in zones MG24, while both middle and better off households benefited from school canteens (categorized as "food aid") in both MG23 and MG24.

Most important sources of income and seasonality

Throughout the livelihood zones in the Grand Sud, the most important sources of income among the poor and very poor households are agricultural and mining labor, both local and migrant, and crop or food product sales. Of secondary importance are poultry sales, and forms of self-employment and petty trade such as firewood sales, handicrafts, gathering of wild foods, and some small business activity. Fishing and fish sales is prevalent only in the Maritime Fishing and Staples livelihood zone (MG27). The December to February peak lean season coincides with the main period of migratory labor, whereas income from firewood and charcoal occur throughout the year but decrease during the rainy season. Agricultural labor, with weeding as the most common activity, also peaks during the rainy season from December to March. Milk yields are highest between January and March, and high levels of cattle and goat sales also coincide with the lean season when food purchases peak and cash needs are at their highest.

Figure 33. Correlation between livestock ownership and income from livestock and livestock product sales



Source: FEWS NET 2017

Table 29. Main sources of cash income and food crops for each of the livelihood zones in the Southern Region

Livelihood Zone	Reference Year	Dominant System	Main cash income sources	Main food crops consumed	Population
High Rice and Onions Production (MG22)	N/A	Agriculture	Crop sales, agricultural labor, poultry, self-employment, petty trade	Cassava, sweet potato, maize, rice, meat	784,421
Mahafaly Plain: Cassava, Goats and Cattle (MG23)	November 2016 - October 2017	Agro-Pastoral	Agricultural and mining labor, poultry, self-employment, petty trade	Cassava, maize, sweet potato, rice, wild plants, legumes, pumpkins	417,857
Androy Semi-Arid Cassava, Maize, Sweet Potato and Livestock (MG24)		Agro-Pastoral	Food products, local and migrant labor, poultry, self-employment, gathering	Cassava, maize, sweet potato, cactus, cowpea, rice	610,076
Staple Crops and Cash Crops (MG25)	N/A	Agriculture	Agricultural labor, groundnut sales, poultry, petty trade	Cassava, maize, rice	141,010
Anosy Cassava, Maize and Livestock (MG26)	Nov 2016 - Oct 2017	Agro-Pastoral	Paid labor, crop sales, poultry	Cassava, maize, cowpeas, sweet potatoes, rice	79,045
Maritime Fishing and Staples Cultivation (MG27)	N/A	Agriculture and Fishing	Fish, firewood sales, wild food sales, migrant labor	Cassava, sweet potato, maize, cowpeas, fish	102,657

Note: The main income sources and foods consumed apply to poor and very poor households. Full baselines do not exist for MG22, MG25 and MG27. Information for these zones is derived from the Zoning Report and does not include primary data collection.

Source: FEWS NET 2017, FEWS NET 2013. Population estimates based on Landscan 2016 data <https://web.ornl.gov/sci/landscan>

Main determinants of wealth

The main determinants of wealth throughout the region are the size of landholdings, livestock ownership, and ownership of other productive inputs such as oxcarts or ploughs. One of the major differences between wealth groups is livestock ownership, as the better off have large herds consisting of cattle, goats, and sheep, whereas middle households and poor households have comparatively smaller herds and the very poor own very little or no livestock. Better off households can generate much of their food and income from livestock sales and rental and crop production, as are middle households, to a

lesser extent. At the same time, across the Grand Sud, drought has contributed to the loss of productive assets and general impoverishment among all wealth groups, leading to a significant decrease in the differences between wealth groups. The trend is further exacerbated by the relocation of better off households to areas outside the region.

Many similarities exist between the very poor and poor, with a key difference being livestock ownership. The poor own small ruminants and poultry, whereas the very poor might own no livestock at all. Both poorer wealth groups may cultivate additional land through sharecropping (*metayage*). Overall, land and livestock assets owned by the very poor and poor generate only enough produce or meat for household consumption and are too low to bring in significant income from either crop or livestock sales.

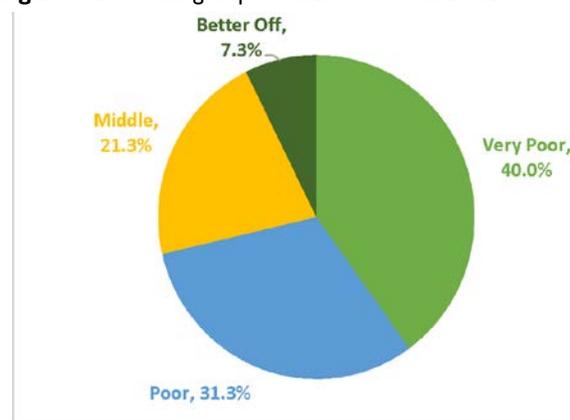
Summary of each zone

High Rice and Onions Production (MG22): Land along the rivers of this zone is fertile and suitable to growing rice in rotation with groundnuts. In addition, there are numerous locations with market gardening that produce a surplus of onions for trade. The zone is considered the rice bowl of the south, although production is not at the level reached in other parts of the country. The zone does not bring in large quantities of rice on the market, however imported rice is usually cheaper than local rice, and there is some demand from poorer people who cannot produce enough rice for themselves. Paid agricultural labor is the main source of income for poor households. Members of some poorer households also migrate for work, particularly to Tsimoty, Betroka, and Bekily. On the other hand, local sisal plantations attract labor from neighboring zones. Hazards include drought, insecurity and cattle raiding, and crop disease; and households cope by consuming wild foods, intensifying poultry sales, and selling household supplies and equipment.

Mahafaly Plain: Cassava, Goats and Cattle (MG23): This zone has difficult natural conditions and therefore has a low population density (7-10 inhabitants per km²). Farms are small due to the lack of good soil and problems with water access. Livestock raising is more widespread than agriculture and is dominated by small herds of goats, and, to a lesser extent, flocks of sheep. There are large herds of cattle (zebus) that are highly concentrated in the hands of the better off households. Cattle-keeping is practiced for economic as well as ceremonial purposes. In recent years the rise in cattle theft has not only depleted herds but has discouraged owners from investing in herds as before. Cassava is the main staple crop, but also cultivated are maize, sweet potatoes, and groundnuts as well as cowpeas, mung beans, and lima beans. Gathering of wild tubers and fruits contributes significantly to the diet and income of poor households. For extra income, people also migrate temporarily to work in rice paddies in the north and mining areas in the east, particularly from December to February. Households also sell poultry and goats as a coping strategy during the lean season.

Androy Semi-Arid Cassava, Maize, Sweet Potato and Livestock (MG24): Located in the southernmost part of the country and covering much of the Androy region, this zone supports a mixed farming economy of crops and livestock. Conditions in the humid northern part of the zone are conducive to farming cassava and sweet potatoes. Maize is also a staple crop but has struggled over the past several years due to water stress. Other significant crops are cowpeas, other legumes, groundnuts and watermelons. Crops generally are collected in markets in the southern commune's administrative centers to be sent to the district capitals and Fort Dauphin. Cactus plants serve as an important component of the household diet but also as a fodder resource for livestock, especially cattle. Livestock systems are extensive and involve an annual migration from the South to Northern and Western zones between May/June and October. Livestock, and particularly small ruminants and poultry, are raised for household consumption, to support agriculture, and for marketing. Demand for local labor is very limited because there is only one crop season. People travel outside the zone to work in artisanal mining of gemstones and work seasonally on industrial sisal plantations. Seasonal work migration is a common coping strategy for poor households during the lean season, as is increased consumption of wild foods and increased poultry sales.

Figure 34. Wealth group breakdown in Grand Sud



Source: FEWS NET 2017

Staple Crops and Cash Crops (Groundnuts) (MG25): This zone can be distinguished from others in the south by its higher rainfall and greater cassava productivity, and from the north by its lesser production of rice and dependence on a broader set of staples as well as its production of groundnuts as a cash crop. The zone achieves a surplus in cassava, which is closely rivaled by the volume of groundnut production. Maize is the main other staple grown, together with modest pulses production, and market gardening. This is the most “inland” zone of the Grand Sud, but its strategic position between north and south and good road access promotes market development. On the other hand, the zone is a relatively modest producer of livestock – goats, sheep, some cattle – which are nearly all marketed within the zone. There is a difference in the amount of land cultivated by poorer and wealthier households, and the poorer are not self-sufficient in cassava or other staples. To pay for the bulk of their food as well as other necessities, poorer households seek income beyond their own farms and find it primarily through agricultural labor. They also sometimes engage in construction or service work in local towns.

Anosy Cassava, Maize and Livestock (MG26): Pressure on productive land is high in this low-lying zone and the areas cultivated by poorer farmers are relatively small. This zone is differentiated from MG22 by the near absence of rice cultivation. Instead, there is a high dependence on cassava as the staple crop followed by maize and sweet potatoes, while groundnuts, cowpeas, and bambara nut are the main cash crops. Watermelons and pumpkins are secondary crops. Cactus fruit is gathered over half the year and is an important part of the diet, especially at the height of the lean season from December to February. Livestock raising, including of cattle, goats and sheep (only cows are milked), is a major income-earner for wealthier households. Poorer households typically own poultry. They depend on working on the fields of wealthier neighbors for cash income or payment-in-kind, and also engage in petty trade, firewood sales, river fishing, or other casual work within the zone. Road access to markets is relatively good in the dry season although becomes difficult during the rainy season.

Maritime Fishing and Staples Cultivation (MG27): This coastal zone is characterized by a mixture of sea fishing and staple crop cultivation. Villages and hamlets are usually situated within half a kilometer of the beach in an environment of sandy soils, low bush vegetation and coastal mangrove forests, with some lagoons. Few households achieve self-sufficiency in staples, although they do cultivate a variety of crops: cassava, sweet potatoes, cowpeas, beans, watermelons, cactus, and maize. Fishing is not affected by the hazards of crop cultivation and provides a buffer for households during times of drought, although hazards to fishing may include high winds and cyclones. Fishing is more oriented towards marketing rather than consumption, and fish are sold fresh inland, in towns, and even in Antananarivo or exported abroad. Poorer households also rely on income from cactus fruit, coconuts, or firewood sales, or seasonal migration to towns or artisanal mining locations.

Income sources and expenditure patterns

Despite being defined as agro-pastoral, very little household income in all three zones comes from crop sales and income sources vary greatly by zone. October/November to February is a time of high expenditure due to high staple food prices, peak human illness due to malaria and other water-borne diseases that accompany the rainy season, and festival spending in December and January. Lastly, school fees are due in September, which represents an additional expenditure during the beginning of the lean season.

- In MG23, the most important source of income for poorer households is local agricultural labor, including land preparation, weeding and harvesting. Livestock sales are the most important source of income for the middle and better off households, which is partially explained by drought conditions that have forced better-off households to sell cattle for cash. Self-employment such as firewood and charcoal sales, handicrafts, water fetching and laundry, is of secondary importance for the poor and middle households. Very poor and poor households will also sell wild foods (around 10 percent of income) and the poor will partake in some livestock sales (10–15 percent of income).
- In MG24, self-employment and firewood sales are the most important source of income for very poor, poor, and middle households, making up 50 percent of total cash income; whereas higher-profit petty trade dominates for better off households (47 percent). Casual labor is of secondary importance for very poor and poor households (25-30 percent of total cash income), including migratory labor which is an option for the poor. Livestock sales are of minor importance for very poor and poor households (less than 10 percent), but of moderate importance for middle and better off households (around 20 percent). The types of livestock sold vary by wealth group, as poor and very poor households sell poultry whereas middle and better off households sell poultry, goats, sheep, and/or cattle. The sale of wild food is of minor importance to very poor households. Lastly, aid transfers, including cash transfers, cash-for-work, and livelihood support, represented 8-14 percent of total annual cash income across wealth groups.

- In MG26, the difference in income sources across wealth groups is quite stark. The very poor rely heavily on self-employment and firewood sales supplemented by casual labor and wild food sales. The poor rely heavily on casual labor (including agricultural labor) supplemented by self-employment and wild food sales, and the middle and better off both rely primarily on livestock sales with some crop sales. In contrast to MG24, no income is sourced from aid or other cash transfers.
- In MG23 and MG26, the very poor and poor spend a substantial portion of total expenditures on staple foods, including cassava, maize, and rice. This proportion decreases as wealth increases, to 64 percent for poor households, 41 percent for middle, and 17 percent for the better off. Households in MG24 spend relatively less on staple foods, between 30 percent and 45 percent, depending on the wealth group, although this amount is highest among poor households. Overall, the two poorer wealth groups spend a very large share of total expenditures on the basic task of securing food, including non-staple food. The remainder of expenditures goes towards household items, social services, and clothing. In MG24, however, a substantial portion of spending for all wealth groups goes towards purchasing water (the zone is marked by water shortages particularly in Ambovombe District), and the amount spent on water increases with wealth. In fact, water constitutes the largest expenditure for better-off households. Middle households spend more on non-staple food, livelihood inputs, and “other” expenses, and allocate resources towards some household items and education and health services. The largest expense among better off households in MG23 is the “other” category, which consists of significant expenses for funerals, ceremonies and community gifts, followed by livelihood inputs, staple and non-staple foods, and social services.

Food sources

The main sources of food in the Grand Sud are crop production and market purchase, supplemented by food assistance (emergency distributions and school feeding), wild foods, payment-in kind among very poor households, and milk and meat among the middle and better off. Better-off and middle households cultivate more land, and therefore have a higher reliance on own crops; they also have more livestock, which gives them access to milk and meat. Poorer households, on the other hand, with less land and less livestock, rely more on market purchase. However, poorer households also face a lack of cash to cover basic food need and turn to the foraging of wild foods to make up for gaps in their capacity to produce. This is particularly true in MG24 and MG26, as wild foods are the most important source of food among the very poor, followed by own crop production in MG24 and market purchase in MG26, as well as school feeding in both zones. This is similar for poor households; however, poor households rely relatively less on wild foods and more on market purchase. In MG23, for very poor and poor households, market purchase is the most important source of food, followed by wild foods, own crop production, and school feeding and food assistance. In recent drought years, wild foods (especially wild mangoes and cactus fruit) became the principal source of food during the lean season for many very poor and poor households. Even in normal years, the list of wild plant products that are used as substitutes to basic foods during the lean season is substantial. Wild foods endemic to southern Madagascar withstand water stress relatively well and provide a reliable source of food when own stocks are low.

Among middle and better off households in all Grand Sud zones, crop production is the most important source of food, followed by market purchase, school feeding (except for MG26), and wild foods. At the same time, in 2016-2017, crop outcomes were very poor for maize, cowpeas, and groundnuts, which reduced the overall contribution of own crops to household annual food energy. School feeding and emergency food distributions were important food sources during the 2016-2017 reference year. Contributions from school feeding were most substantial in MG24, accounting for an average of 19 percent of food needs for poor and very poor households, and 14 percent for middle and better off households.

Most of the food energy consumed from own-crops came from staple foods such as cassava and maize, as well as legumes and groundnuts. The first crops ready for harvest in March are maize (green consumption), cowpeas and groundnuts. Cassava is eaten fresh starting from mid-June to mid-September with the peak harvest in August. Surplus cassava is dried and stored to be consumed and sold throughout the year. Sweet potatoes have a similarly long harvest period from mid-June to the end of September, depending on the time of planting. Sweet potatoes are only eaten fresh and consumption ends in October. The lean season begins in September once the tuber harvest is over and most households have consumed their own production, and the peak lean months are October-January. During this time, food prices rise and poor households

supplement food purchases by gathering wild tubers, mangoes, and fruit from cactus plants. These provide an important calorie supplement to households during the final months of the lean season.

Figure 35. Food sources by wealth group and livelihood zone for Grand Sud households



Food gaps

The total number of calories consumed by households varied by wealth, with better-off households meeting roughly 110 percent of their minimum needs in the reference year, and very poor households just barely covering 97 percent. In MG23, very poor and poor households face a food gap, despite supplementary food sources from food assistance and school feeding. Very poor households meet 97 percent of their food needs and poor households meet 99 percent of their food needs; however, without food assistance, these percentages would fall to 76 percent and 78 percent, respectively. While the overall food gap in MG24 is similar, without food assistance, very poor households meet 72 percent of their food needs and poor households meet 76 percent. Finally, the food gap in MG26 is the largest. Very poor households meet 94 percent of their food needs and poor households meet 97 percent. Without food assistance, this value drops to 73 percent for the very poor but remains the same for poor households who do not receive any food assistance.

Households employ a variety of coping strategies in response to hazards or in years with low production to meet their minimum food requirements. For very poor and poor households, they include increased consumption and sale of wild foods, increased seasonal labor migration, increased sale of firewood and charcoal, and increased purchase of staple foods. In MG24, households might also reduce expenditures on non-essential goods, consume cactus fruits, sell more household poultry, or sell productive and domestic assets. Many of these additional coping strategies are also seen in MG26. Middle income and better off households might reduce crop production and shift to herding, increase livestock sales, engage in multiple crop plantings, and reduce crop sales and use recycled seed for planting rather than purchasing seed inputs.

Risks

Water shortage is one of the most significant hazards present throughout the Grand Sud. The region is characterized by an arid climate with very little rainfall and periodic drought has become more frequent. Other chronic hazards include livestock disease, crop pests, and lack of access to seed, whereas periodic hazards include drought, insect infestation of crops, south wind and sand storms, and livestock theft. Livelihood zone MG24 was at the epicenter of the Grand Sud drought-related food crisis which lasted from late 2013 to June 2017.

Throughout much of the Grand Sud, transportation infrastructure is poor. One main road, National Route (RN) 10, connects the districts of Betioky in the north and Ampanihy in the south, and serves as a trade route north to Tulear and south to Fort Dauphin. Despite this major trade route, trade and market access is difficult at the village level due to the lack of well-maintained, all-season roads and the long distances between villages and trading centers. The rainy season is brief, however local many roads become impassable from January to March and trucks with staple goods cannot get through. This results in high transport costs for farmers and traders, even during the dry season, due to sandstorms and poor road conditions.

Livelihood systems in the Sud Est

This review includes the regions of Vatovavy Fitovinany and Atsimo-Atsinanana and is based largely on FEWS NET 2013.

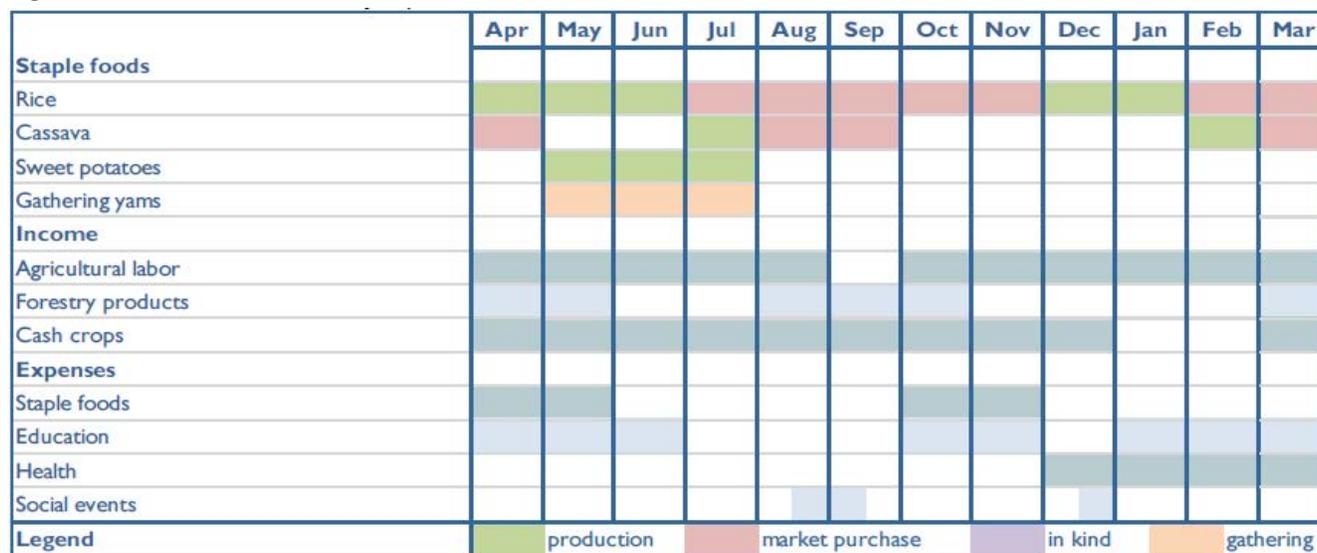
Zone 18: Corridor: Forest Products and Banana

The geography of the zone is characterized by highlands and cliffs, with several rivers traversing it. The vegetation consists of a natural forest and savannah. The zone has mineral resources (corundum and gold), fishery products (eel and crayfish), and forestry products (honey, firewood, timber, medicinal plants, etc.). Agriculture (both rainfed and irrigated) includes food crops (rice, cassava, and sweet potato), coffee, and fruits (banana, jackfruit, litchi, and sugar-apple). Rice is primarily produced in the lowlands where better-off households can use animal traction, while other rainfed crops are grown on the slopes. The area's topography limits the extent of rainfed crops. Annual rainfall ranges between 1,000 and 2,000 mm, with a rainy season lasting from November to May (Figure 35). Although weather conditions are suitable for intensive farming, the small size of farm parcels and the zone's isolation limit the possibilities to do it. Poor households engage in agricultural income generating activities such as gathering honey and raising poultry. They also sell their labor locally, particularly to rich households who need it for forestry activities. There is industrial gold mining in the zone that does not depend on unskilled labor. Local markets receive their supply primarily from Fianarantsoa, Ambala Vao, Ihosy, and Mahanoro. Products from major lumbering operations are delivered to Fianarantsoa and Fandriana. Poor households have limited assets that may include less than half an acre of cultivable land, a dugout canoe, poultry, and small tools. Coping strategies include: gathering more wild plants, increased sales of small animals, increased casual labor sales, and borrowing.

Zone 19: Coffee, Litchi, Cassava

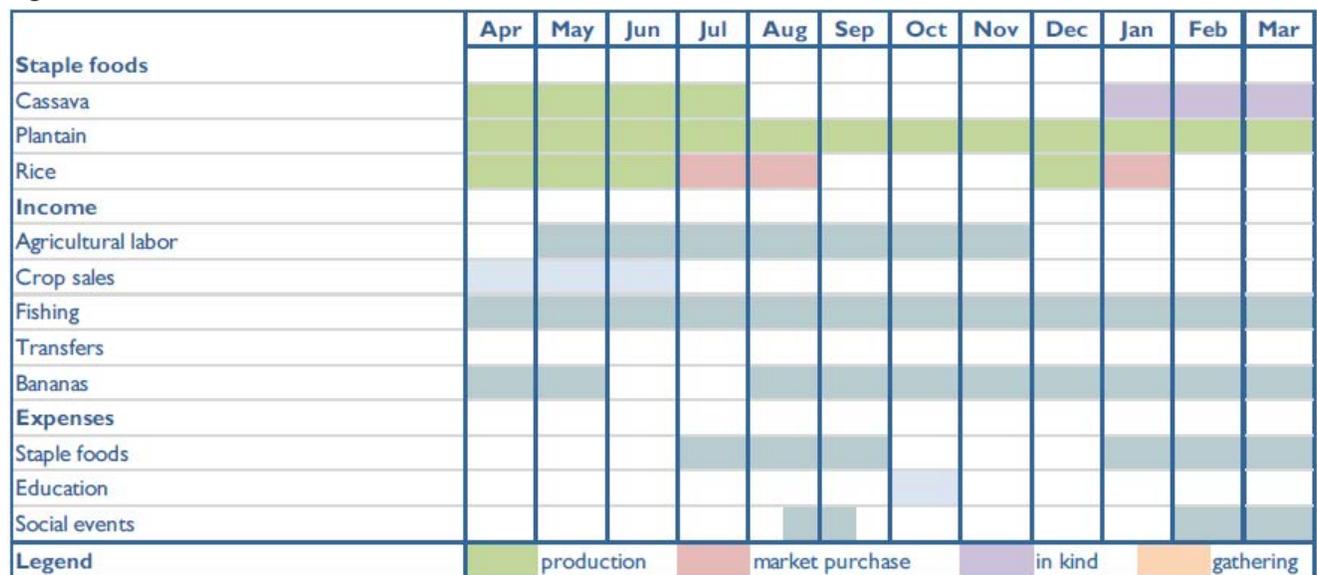
The zone covers the southeast coastal strip of Madagascar and steep mountains. Several rivers also cross the zone. The zone is rich in fishery resources, precious wood, and mineral resources (gold, gemstones, and ilmenite). Zone's uniqueness primarily lies in growing cash crops such as coffee, clove, litchi, vanilla, and pepper. These crops are grown on the land belonging to rich households with labor provided by poor households. Poor households grow crops on tavy (slash-and-burn plots) due to lack of farming leases and money to buy fertilizer. Rainfall ranges from 1,700 to 3,500 mm per year, largely during the November-March rainy season. The zone is characterized by two seasons, a hotter season called Vatomandry or Tsipala from December to May, and a drier Hosi season from June to November (Figure 36). Poor households may cultivate on less than .3 of an acre using small tools. They may raise poultry. Primary income sources for poor households include labor, own production, fishing, and money transfers. The agriculture sector uses the most labor. Rich households also rely on labor from outside the zone for rice cultivation. Depending on the season, poor households also migrate to export centers and production basins outside the zone for work. They also go to industrial production areas for sugar cane such as Namakia (western Madagascar) and Ambilobe (north of the country). Remuneration for labor is paid in day wages (approximately 2,500 MGA per day in 2013), based on a contract (locally called amparitra), or paid in kind. The zone is a net consumer of rice and relies on supplies from Upper Matsiatra and Amoron'i Mania as well as international imports.

Figure 36. Food Access Calendar, Poor HH Zone 18



Source: FEWS NET Livelihood Zone Profiles, 2013

Figure 37. Food Access Calendar, Poor HH Zone 19



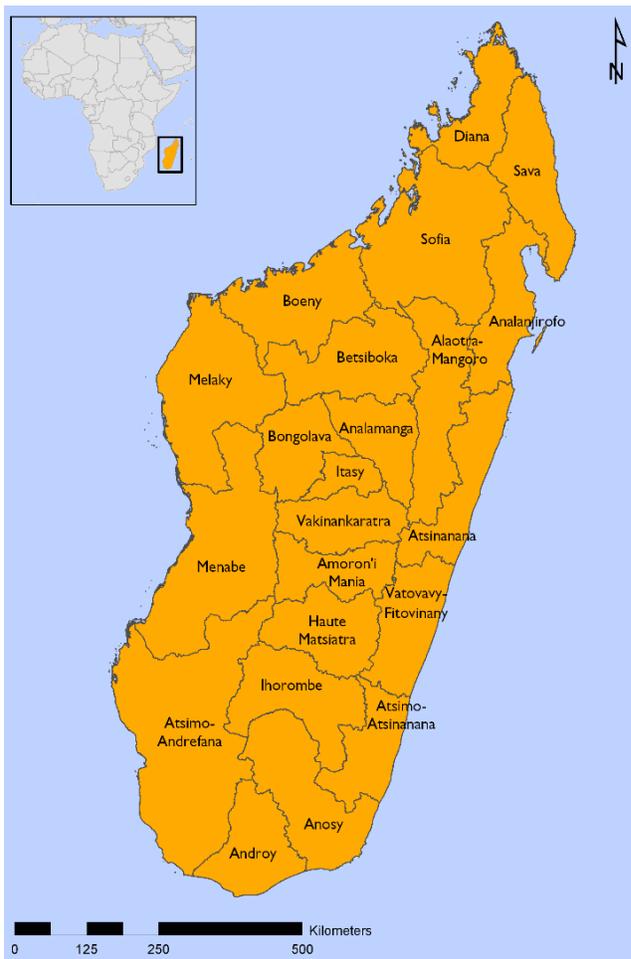
Source: FEWS NET Livelihood Zones 2013

Annex 4. National Market Context

INTRODUCTION

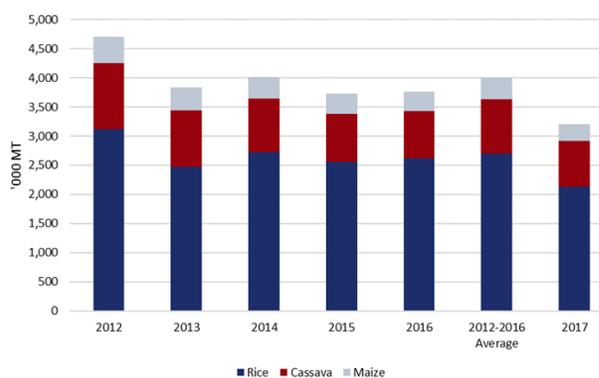
- Madagascar is an island nation off the coast of South East Africa made up of 22 regions (Figure 38). The island spans more than 580,000 square kilometers and is known for its natural diversity. The climate ranges from humid in the east to semi-arid and arid in the south and west. The central highlands running down the spine of the island divides the wet east and dry west. The diverse climates allow for a variety of crops to be produced.
- Madagascar's population is estimated to be around 25 million and increasing at a rate of 2.7 percent annually. As a result, food demand has increased, and the country has had a challenging time meeting demand with local production alone, rendering it reliant on imports of key staple commodities.
- The main staple cereals of interest in this summary are rice, maize, sorghum, millet, and CSB. Rice and maize are the main staple cereals produced and consumed in Madagascar. Sorghum, millet, and CSB have been promoted and distributed in recent years among particularly food insecure populations but are not part of common consumption habits. Cassava, sweet potato, pulses, and edible oil are key staple foods and contribute to food security throughout the island but especially for poor and very poor households.
- Madagascar is structurally deficit in rice, maize, sorghum, millet, CSB, and edible oil but typically has surplus production status of pulses, cassava, and sweet potato.
- The combined production of the three main staples: rice, maize, and cassava were previously around 6 million metric tons but production has trended downward since 2011, reaching around 4 million metric tons in 2017 (Figure 39).
- Harvesting and planting periods in Madagascar vary by area and crop. The main rice harvest takes place between April and June. Cassava harvest in the Grand Sud (where it is a main staple crop) take places between August and October (Figure 40).

Figure 38. Map of Madagascar



Source: FEWS NET

Figure 39. National Rice, maize, and cassava production, 2011-2017, 000s MT



Note: All values are in cereal equivalent terms using a conversion factor of 1.0238 for milled rice, 1.0266 for maize, and 0.3108 for cassava.

Source: Author's calculations based on Ministry of Agriculture data.

Figure 40. Seasonal calendar

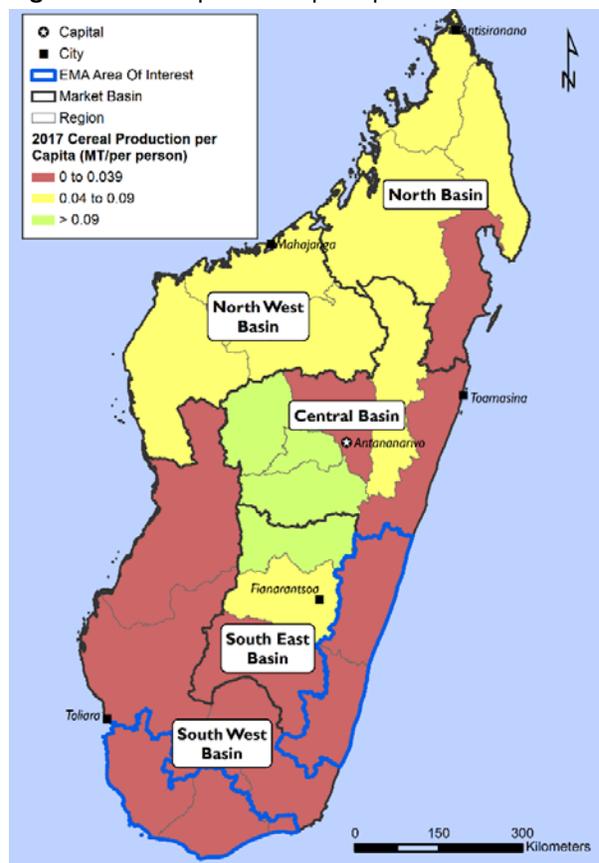


Source: FEWS NET 2013

CEREALS (rice, maize, sorghum, millet, CSB)

- Rice, the staple cereal in Madagascar, is of strategic importance for the Malagasy economy and the food security of the population. In recent years, two-thirds of cultivated land is designated for rice production (Ibrahima and Rakotonirainy 2016). Around 2,000,000 Malagasy households (87 percent), practice rice farming (Food and Agriculture Organization 2017). Major rice-producing regions include: Alaotra-Mangoro, Vakinankaritra, and Itasy, which combined account for about 40 percent of national production (Figure 41). Average paddy yields remain low at 2.6 MT/ha (World Bank 2015), limiting local rice production. For the past six years, rice production has trended downward recently to below-average rainfall in rice producing areas. Rice production in 2017 was 21 percent below five-year average levels (FEWS NET 2017).
- Yellow maize is another important cereal, though much less so than rice. Production occupies about 12 percent of cultivated land. Maize production is concentrated in the regions of Itasy, Vakinankatritra, Atsimo-Andrefana, and Boeny, together contributing to about 50 percent of production, on average. Similar to rice, maize production has trended downward in the past few years due to abnormal dryness.

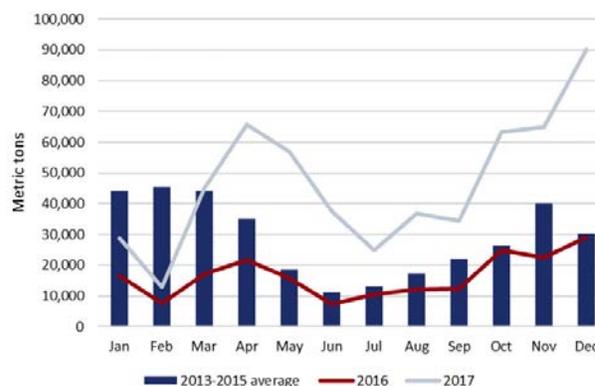
Figure 41. Cereal production per capita, 2017



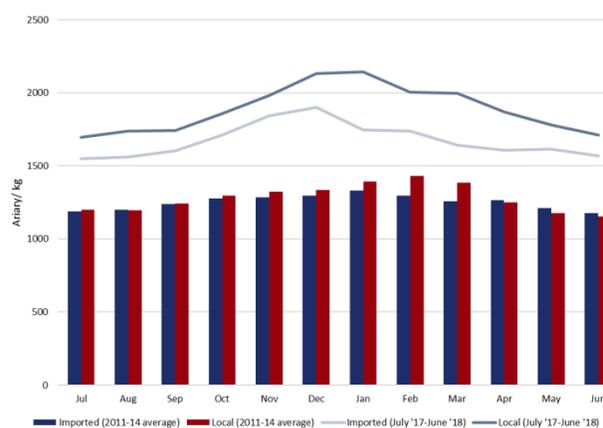
Source: FEWS NET 2017.

- Sorghum, millet, and CSB products are produced in Madagascar, though to a much smaller degree than rice and maize. Sorghum and millet have been introduced and promoted in the south by international organizations and the Ministry of Agriculture as well-adapted crops for the south and southwest parts of the island that have experienced prolonged dryness. Average annual production is about 1,200 MT (FAOSTAT). CSB is manufactured locally by Nutri'Zaza. The company makes four types of CSB: Koba Aina, Koba Tsinjo, Koba Pecmam, and Koba Hery. Each is created for a specific age group, its main ingredients include: maize flour, rice flour, soy flour, peanut flour, sugar, salt, minerals, vitamins, and calcium. Most ingredients are purchased locally; sugar, vitamins, and minerals are imported. Nutri'Zaza's production of local CSB is between 300 and 400 MT per year (Rakotonarivo 2018).

- Both imported and local rice are consumed in Madagascar, but local rice is preferred and consumed by more than 90 percent of households (MAEP 2004). It is estimated that per person, Malagasy consume 115 kg of rice per year (WFP, UNICEF 2010), accounting for 48 percent of caloric needs (World Bank 2014). During the lean season, when local rice supplies are at their lowest point and prices are high, local rice is substituted with imported rice by most households. Between 2012/13 and 2016/17, nearly 300,000 MT of rice was imported annually (Table 32). In 2017, 561,426 MT of rice were imported, indicative of the gap between supply and demand as a result of very poor production earlier that year (Figure 42) (L'Observatoire du Riz de Madagascar 2018). Madagascar is rice deficit as demand for rice cannot be met by local production (Table 31). As a result, rice supply is made available through imports from well-supplied international markets, namely Pakistan, India, and Thailand. Consumption patterns vary in the south where rice is the preferred staple, but maize and dried cassava are more commonly consumed, especially by poor and very poor households due to its their relative availability either through own production or market purchases.

Figure 42. Rice imports in Madagascar, 2013-2017, MT

Source: OdR, Malaagasy customs

Figure 43. Local and imported rice prices, average, and 2017-2018, MT

Source: OdR, FEWS NET

Table 30. National commodity balance, 2012/13-2016/17 average (MT)

	Rice (milled)	Maize	Cassava	Edible Oil
Production	2,699,512	377,176	930,663	5,000
Imports	293,672	10,443	-	100,000
Total Supply	2,992,908	384,515	930,663	105,000
Total Requirements	2,777,209	508,529	857,753	91,000
Exports	276	3,105	-	0
Domestic Balance	215,669	(124,014)	60	14,000
Import share of total supply	9.8%	3%	0%	95%

Note: All values are in cereal equivalent terms using a conversion factor of 1.0238 for milled rice, 1.0266 for maize, and 0.3108 for cassava.

Source: Authors' calculations using Ministry of Agriculture, Direction des Douanes, OdR, USAID BEST Analysis, and UN COMTRADE data.

- On a national level, maize is the second most consumed cereal, with the average Malagasy annually consuming 21 kg (WFP, UNICEF 2010). Maize plays an important role in food security, often consumed by poor households as a substitute for rice during the lean season. Maize plays an important role in the south, it is a staple cereal in Androy, Anosy, and Atsimo-Andrefana regions. On average, the population in the south consumes 31 kg per person per year (World Bank 2011). Demand for maize is met primarily through national production and secondarily through international trade, largely from South Africa.

- Sorghum, millet, and CSB are not yet consumed on a large-scale. Nutri'Zaza distributes its own product in all 22 regions of Madagascar but mainly to large towns and cities. They have established a network of *Hotelin'jazakely*, or small restaurants for children, where they serve ready-made CSB at a subsidized price. Sorghum and millet can be found in some markets in the Androy and Atsimo-Andrefana regions where it has been promoted and distributed, but in very small quantities.

- Local rice prices follow seasonal trends— increasing from August to January and decreasing beginning in January with the arrival of the first harvest rice in December. Prices reach their lowest point in May and June with the arrival of the main harvest. Market supplies are the highest at this time, as 70 percent of the national rice harvest takes place between April and June. Rice prices typically trend between MGA 1,200 and 2,400/kg depending on the time of year and the area. Prices are typically higher in bigger cities (Antananarivo, Antsiranana) and more remote areas (Ambovombe, Tsihombe). Imported rice prices follow similar seasonal trends as local rice but tends to be slightly less expensive (Figure 43).

- Maize prices also follow seasonal trends. The main harvest is between April and June and supply usually lasts until December when there is another smaller harvest. Average seasonal maize price variations are much less pronounced than those of local and imported rice.

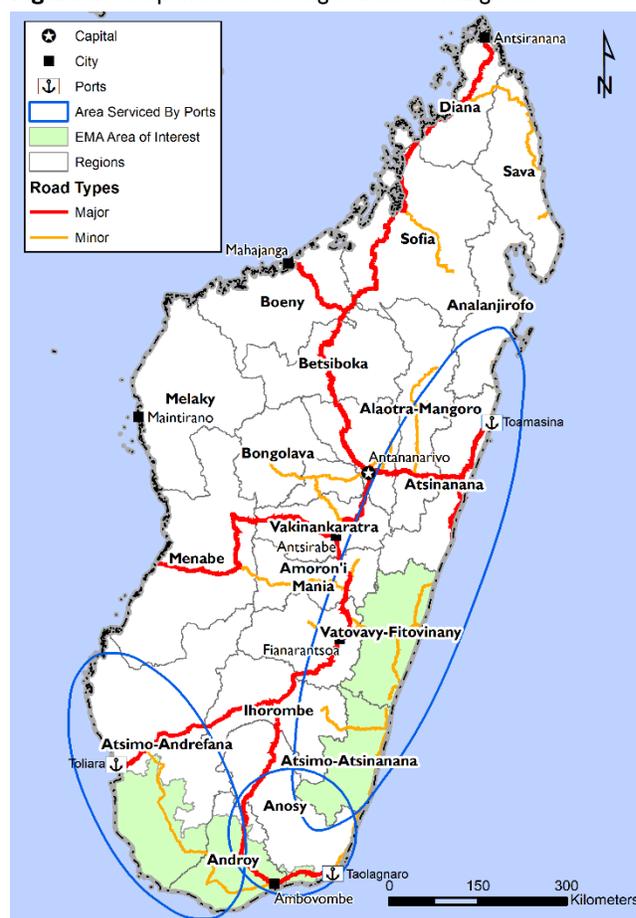
- Rice surplus-producing regions include Alaotra-Mangoro, Vakinankaratra, Itasy, and Haute Matsiatra. Imported rice, and food imports in general, enter the country primarily through the main port in Toamasina and, to a lesser degree, through ports in Antsiranana, Toliara, and Taolagnaro. A small number of companies, situated in main port cities, control rice importation and supply all markets through a distribution network of wholesalers and retailers. Rice is transported by road except in the east and southeast where it is transported by water with small boats when it is more affordable. Transportation costs are a main determinant of prices given the poor condition of roads across Madagascar.

Figure 44. Typical variety of pulses available in local markets



Source: FEWS NET

Figure 45. Map of Ports serving southern Madagascar



Source: TBD

ROOTS, TUBERS (cassava and sweet potato), PULSES

- Cassava and sweet potato are the most consumed tubers in Madagascar, and both play an important role for food security in Madagascar. Southern Madagascar contributes more than half of the nation's sweet potato production (FEWS NET and MAEP data). Haute Matsiatra, Androy, and Anosy regions alone account for 40 percent of national production.
- The role of cassava in the food system varies geographically. Generally, cassava is consumed more by poor rural households. In the south, it is a substitute for rice. It is estimated that nationally, 117 kg of cassava is consumed annually per person (World Food Programme, UNICEF 2010). Cassava accounts for 27 percent of caloric intake in the south. Sweet potato also plays an important role in the south, the west, and the highlands. Annual consumption of sweet potato is 16 kg per person (WFP, UNICEF 2010). Due to its nutritional content (rich in vitamins A, B6, B2, C, copper, and manganese), sweet potato is a strategic product for food security and nutrition. The leaves, which are commonly eaten with rice, are rich in protein, beta-carotene, calcium, phosphorus, iron, and mineral salts.
- For the most part, sweet potato is traded and consumed at the district or regional level. Pulses, on the other hand are marketed more than any other staple food in Madagascar, with more than 50 percent of production ending up in markets. Collectors hold a position of strength in the marketing of pulses, they can monopolize prices and the level of supply in markets. This allows them to set prices without negotiation with producers.
- Pulses are an important source of affordable protein from Malagasy households. Commonly consumed varieties include red beans, white beans, butter beans, cowpea, and mung bean. Pulse cultivation generates additional income for households.
- There are wide variety of pulses produced in Madagascar (Figure 44). The average annual production between 2012 and 2016 was 85,952 MT (FAOSTAT). Production is concentrated in Antananarivo and Fianarantsoa provinces, which combined account for more than 75 percent of national production. There is also important production on the west coast in areas surrounding Toliara, Morombe, and in Boeny region. Pulses are one of the few crops in Madagascar with increasing production levels in recent years due largely to improved yields.
- Exports of pulses have steadily increased over the past ten years, currently reaching a level of around 30,000 MT per year, compared to a volume of 5 MT in 2008. Exports are primarily *lojy* or black-eyed peas. Major destinations include India, Turkey, United Arab Emirates, Pakistan, and France (CNUCED 2017).

EDIBLE OIL

- The edible oil market in Madagascar is dominated by non-fortified, refined imported varieties. Domestic production accounts for less than five percent of supply, with peanut oil, coconut oil, and palm oil, accounting for 30, 40, and 20 percent of national production respectively (FAOSTAT). Domestic producers are mainly small-scale and artisanal, often producing low quality oils. Average annual production is around 16,000 MT (Fintrac Inc 2013). There are a few industrial producers including: DRAMCO, la Société Industrielle du Boina, and INDOSUMA. Limited raw material (including peanuts and cottonseed) and lack of affordable and available energy are the primary challenges to producing at an industrial scale. The current average annual consumption per person of edible oils in Madagascar estimated at 3.5 kg, very low compared to international standard of 21 kg (Fintrac Inc 2013). Edible oil preferences are determined by purchasing power. Palm oil tends to be favored by poorer households because of its affordability.

Figure 46. Local measurement cup for edible oil



Source: FEWS NET 2018

- Due to limited and non-competitive national edible oil production, Madagascar depends heavily on imports of edible oil to supply markets. On average, 70,400 MT of edible oil are imported annually, accounting for more than 90 percent of average annual needs. Imports are made up of palm oil (68 percent) and soybean oil (28 percent). The main importers are: Malaysia and Indonesia for palm oil, and Argentina, Egypt, China, and the United States for soybean oil (Fintrac Inc 2013). The majority of edible oil enters Madagascar through the Port of Toamasina and to a lesser extent, through the Port of Toliara (Figure 44). Similar to rice, edible oil imports are controlled by a small number of companies that supply all domestic markets.
- Domestic small-scale production of peanut oil is marketed in rural markets near the production areas. The radius of distribution of imported oils is limited to urban and peri-urban centers. Importers sell pre-packaged, typically one or one-half liter bottles of oil as well as 20-liter barrels, which are sold by local measurement cup, a common method of purchasing among poor households (Figure 46).

LIVESTOCK AND LIVESTOCK PRODUCTS

- Livestock rearing is a complementary activity to agriculture that is widespread and plays an important socio-economic role in rural livelihoods, contributing notably to food supply and household income. There are two main production systems: extensive (more commonly practiced, mainly practiced by rural households), and intensive (mainly concentrated in peri-urban areas). Cattle and small ruminants are mainly used in extensive systems, where the breeding of these animals is not exclusively geared towards production and marketing, but where they provide important social and cultural roles. Cattle are also used for agricultural work, mainly for the plowing of rice fields, as well as for the transport of goods. Goat and sheep rearing is concentrated in southern Madagascar, pigs are most commonly reared in the central highlands and along the east coast, and cattle and poultry are raised throughout the country (Food and Agriculture Organization 2005).
- Despite generally favorable weather conditions for livestock and the availability of vast areas of natural pastures, the sector has shown relatively moderate growth, averaging two percent per year between 2013 and 2016. The livestock sector continues to experience limited growth (Food and Agriculture Organization 2017). Diseases are common and due to insufficient monitoring and control by local authorities, especially in remote areas, the risk of transmission remains high. However, herds near large towns benefit from veterinary services. According to an analysis of the CFSAM, more than 40 percent of the farmers surveyed indicated that the high prevalence of diseases was the factor that had most affected animal production in recent years and the general development of the sector. Insecurity is another key issue that has been affecting the livestock sector for several years and considered a main constraint to the sector's development. Theft of cattle, by gangs of thieves or *dahalo*, is becoming more and more common throughout the country. In addition, although pasture availability is generally favorable across the country, the impacts of cutting and burning practices and soil erosion resulting from deforestation have reduced the availability of pastures in some places.

- Regarding livestock products, milk production is mainly concentrated in the Vakinankaratra region, where the main dairy processors are also located. The production of fresh milk, however, is not sufficient to meet domestic demand and thus depends heavily on imports. A more intensive, modern poultry sector is also developing around the main cities, especially Antsirabe and Antananarivo.

Table 31. National livestock population estimates

	2005	2015	2016
Cattle	9,500,140	10,280,300	10,301,490
Goats and sheep	1,914,072	2,419,520	2,409,210
Pigs	1,247,041	1,625,200	1,669,000
Poultry	29,150,448	37,123,500	37,920,000

Note: 2005 numbers are from the livestock census, 2015 and 2016 figures are projections

Source: Ministry of Agriculture and Livestock, CFSAM 2017

- There is an absence of reliable and recent livestock statistics. Current official data are based on projections from the 2005 agricultural census and therefore do not accurately reflect the reality on the ground (Table 32).
- Wealthier households regularly purchase and consume meat. Poor households typically consume small quantities of meat for special occasions: New Year, Independence Day, and funerals. Livestock markets, for the sale of live animals, are typically separate from foodstuff market, poultry, which is sold in the regular market, is the exception. The two largest livestock markets in the country are in Tsiroanomandidy (200 km west of Antananarivo) and Ambalavao (475km south of Antananarivo). Trading takes place directly between livestock owners and buyers (other pastoralists or breeders,

small-scale butchers, families for a festive event or special occasion, and sometimes large-scale traders or “bosses” who can buy 20 to 30 cattle at a time and transport in large trucks to big cities for slaughter). Prices are negotiated between buyers and sellers based on the quality of the animal (plumage for poultry and weight for cattle and small ruminants).

FISH

- Madagascar has more than 5,000 km of coastline and multiple large lakes, which makes sea and fresh water fishing important to livelihoods (Randriamiarisoa and Rafidison 2014). Fishing is traditionally practiced by small-scale fishers, however the presence of large-scale fishing for export is becoming more common. Excluding production from aquaculture, industrial fishing production increased from 15 percent of production in 2010 to nearly 40 percent in 2016 (Table 34). Common varieties are tilapia, whiting, pony fish, tuna, and shrimp. Fish is eaten fresh but often dried, salted, or smoked due to the lack of a cold chain in rural areas. Typically, smaller seafood products remain in the local markets and higher quality products are transported to larger cities within Madagascar or to ports for export. Coastal, riverine, and urban populations consume the most fish. Madagascar exports around USD 130 million in fish and shellfish annually to markets in Asia and Europe, with prominent shrimp exports (FAO, WFP 2017).

Figure 47. Dried tilapia



Source: FEWS NET

- The Ministry of Fisheries establishes annual seasonal fishing closures to improve reproduction potential and protect marine life populations from depletion. The schedule is staggered by region and date between October and February. The regulation is respected for the most part by those in the fishing industry as violators are harshly fined if caught (Riana 2017).

Table 32. Production in the fishing sector by type (MT)

	2010	2011	2012	2013	2014	2015	2016
Seawater production	93,744	96,417	96,832	94,975	81,515	74,836	85,482
Industrial fishing	19,636	26,453	31,690	40,835	33,502	43,548	39,595
Traditional fishing	74,108	63,085	65,142	54,140	48,011	31,288	45,896
Aquaculture	5,600	8,577	6,351	8,937	10,228	18,848	21,597
Freshwater production	33,500	20,890	20,002	25,147	17,484	20,461	24,301
Traditional fishing	30,000	17,486	16,404	24,151	14,599	16,916	19,900
Aquaculture	3,500	3,404	3,598	996	2,885	3,545	4,400
Total production	129,244	117,307	123,186	129,059	109,228	114,147	131,381

Source: Ministry of Agriculture, direction of fishing and fisheries resources, CFSAM 2017

MARKET MONITORING PLAN

FEWS NET regularly monitors staple food and livestock market dynamics in both presence and remote monitoring countries. It is neither necessary nor possible for FEWS NET to effectively monitor all commodities markets all the time and/or outright. Thus, its markets and trade team focus on the monitoring of selected indicators for a given marketing year. These key indicators refer to market operations and major events liable to affect supply and demand dynamics and price levels and, thus, price variability on reference markets. FEWS NET also regularly monitors drivers of trade from surplus to deficit areas. Some of these indicators have upper thresholds, which are used together with other types of data to indicate/suggest at what point or threshold national or local food availability and/or access should start to raise concerns. The findings from this monitoring process are regularly presented in FEWS NET's Price Watch and Price Watch Annex. They are also used as basic inputs in integrated food security project analysis (Figure 48).

Figure 48. FEWS NET's approach to market monitoring and analysis

Source: FEWS NET

As indicated Table 34, there are a few market indicators used to regularly monitor markets across the country on a weekly, monthly, or annual basis. Different stakeholders are responsible for monitoring activities. Price data for crops, livestock, production, trade, and macroeconomic indicators are collected and disseminated by different market information systems. The Rice Observatory (OdR) is responsible for collecting and disseminating agricultural market information to support decision makers. Operational since 2005, OdR was created in 2004 by the Ministry of Agriculture, Livestock and Fisheries and has been supported technically and financially by the World Bank, WFP, FAO, European Union, and Agence Française de Développement. Currently, OdR publishes two market monitoring products: hoRIZon and Info Hebdo. The first provides an overview of international rice markets and rice imports. The second focuses mainly on local rice prices but includes main staple price data as well as price data for sugar, wheat flour, edible oil, and petrol. FAO's system d'information sur la sécurité alimentaire et la vulnérabilité (SISAV) also collect price data for main staples, livestock, and labor wage rates in 16 markets in the AOI in Madagascar on a monthly basis; seven markets in the Sud Est and eleven markets in the Grand Sud. Additionally, CRS monitors markets in the two regions in their Havelo project area (Anosy and Androy) on a monthly basis.

Table 33. Market monitoring systems in Madagascar

Monitoring indicators/data	Level	Frequency	Coverage	Monitoring agency/organization
Crop prices	National	Weekly	National	OdR
	16 markets	Monthly	Grand Sud and Sud Est	FAO SISAV
	10 markets	Monthly	Grand Sud	CRS
Livestock prices	16 markets	Monthly	Grand Sud and Sud Est	FAO SISAV
	10 markets	Monthly	Grand Sud	CRS
Volume of production	Regional	Annually	National	FAO-WFP CFSAM
Imports and exports	National	Monthly	National	OdR, Customs service
Consumer price index	National	Monthly	National	INSTAT

Source: FEWS NET

With respect to production data, the most reliable data is published annually in the CFSAM, based on surveys carried out by FAO and WFP in collaboration with the Ministry of Agriculture. The CFSAM report includes cropped areas, production and consumption estimates, yields, and livestock and fish production estimates. Import and export information is monitored by the Malagasy Customs and published by OdR bimonthly in the hoRIZon publication (Table 35).

Table 34. Market monitoring system actors and mechanisms

Actors	Publications	Mechanisms	Geographic coverage	Problems
OdR	hoRIZon, Info Hebdo	Monitor market prices by individual market monitors	National	Frequent missing data, common gaps in publication
WFP	CFSAM	Survey of cropped areas, production, yields, crop use, consumption, and food security	National	Annual, focuses on main cereal staples: rice, maize, and cassava
FAO	SISAV Bulletin	Monitor three communes per district through Centre de Service Agricole (CSA)	Grand Sud and Sud Est	
CRS	Havelo market monitoring report	Havelo project staff collect market monitoring indicators	Grand Sud	Not available publicly, shared upon request
INSTAT	Indice des prix à la consommation	Based on a set basket of goods	National	

Source: FEWS NET

The main constraint to market monitoring in Madagascar, as in many countries, is a lack of sustain funding, which results in data gaps and periods during which there are no regular publications. Additionally, coordination between the GoM, implementing partners, and international organizations should be improved to avoid duplicating market monitoring efforts, particularly in the AOI. Based on the existing systems, Table 36 provides a summary of the key areas to consider for monitoring markets in Madagascar.

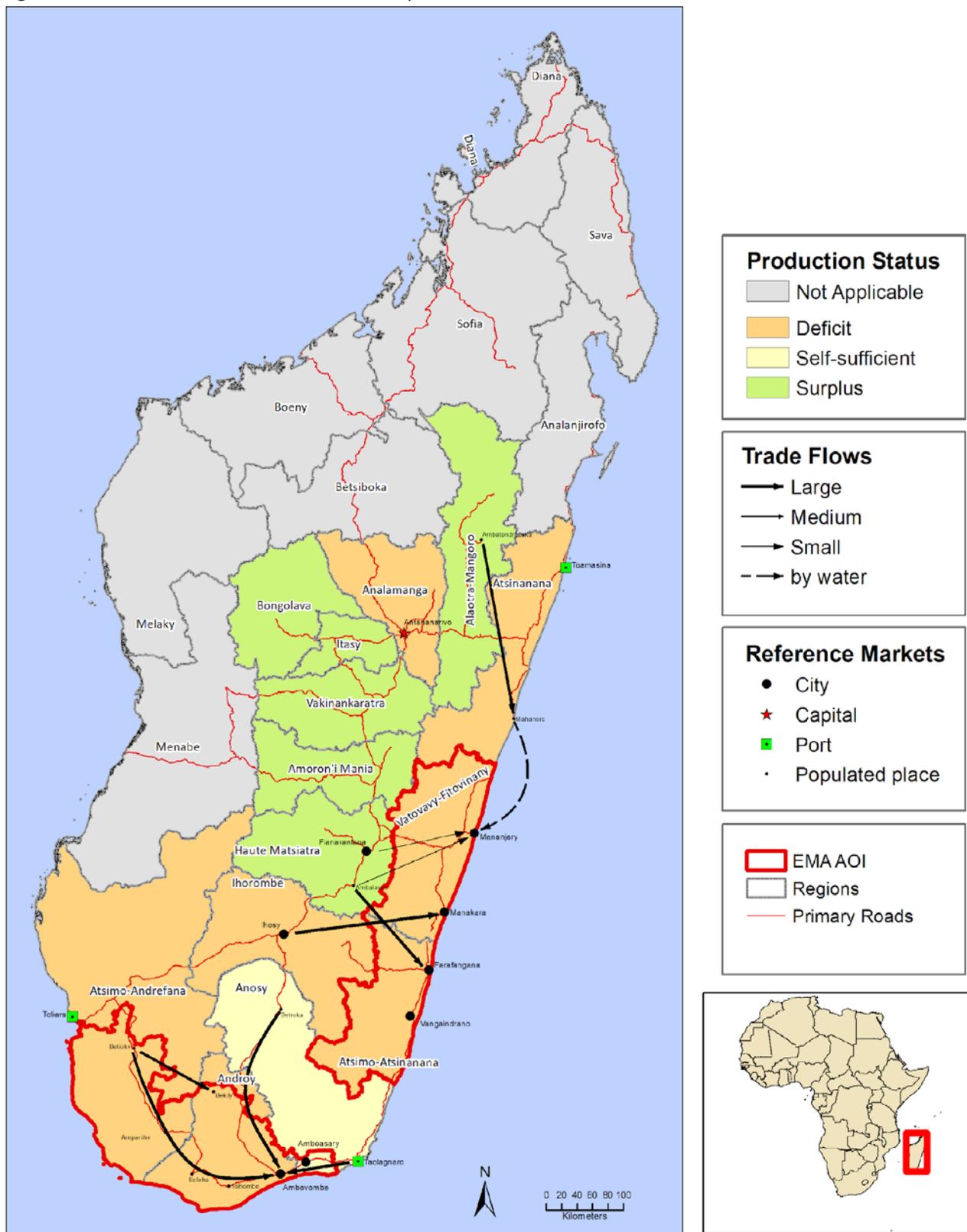
Table 35. Key staple food market areas to monitor in Madagascar

Topic	Areas to consider
Domestic production of key cereals, tubers, pulses, and cash crops	Climate indicators (ex. Rainfall) Area planted, harvests, yields Domestic production estimates by region Seasonal calendar
Price monitoring	Wholesale prices for key commodities Retail prices for key commodities International rice prices
Livestock/ Fisheries	Production estimates
Food balance	Characterization of household food consumption patterns
Trade Flows (quantities)	Imports figures for key commodities (rice) Export figures for key commodities (cash crops) Transport costs
Government policies	Policies or programs that affect production, trade, prices, or consumption of key commodities.
Food assistance	Level and modality of food assistance received Market-related impacts of food assistance
Macroeconomic context	Key international exchange rates (USD, Euro) Inflation Consumer price index Performance of cash crops

Source: Authors' elaboration

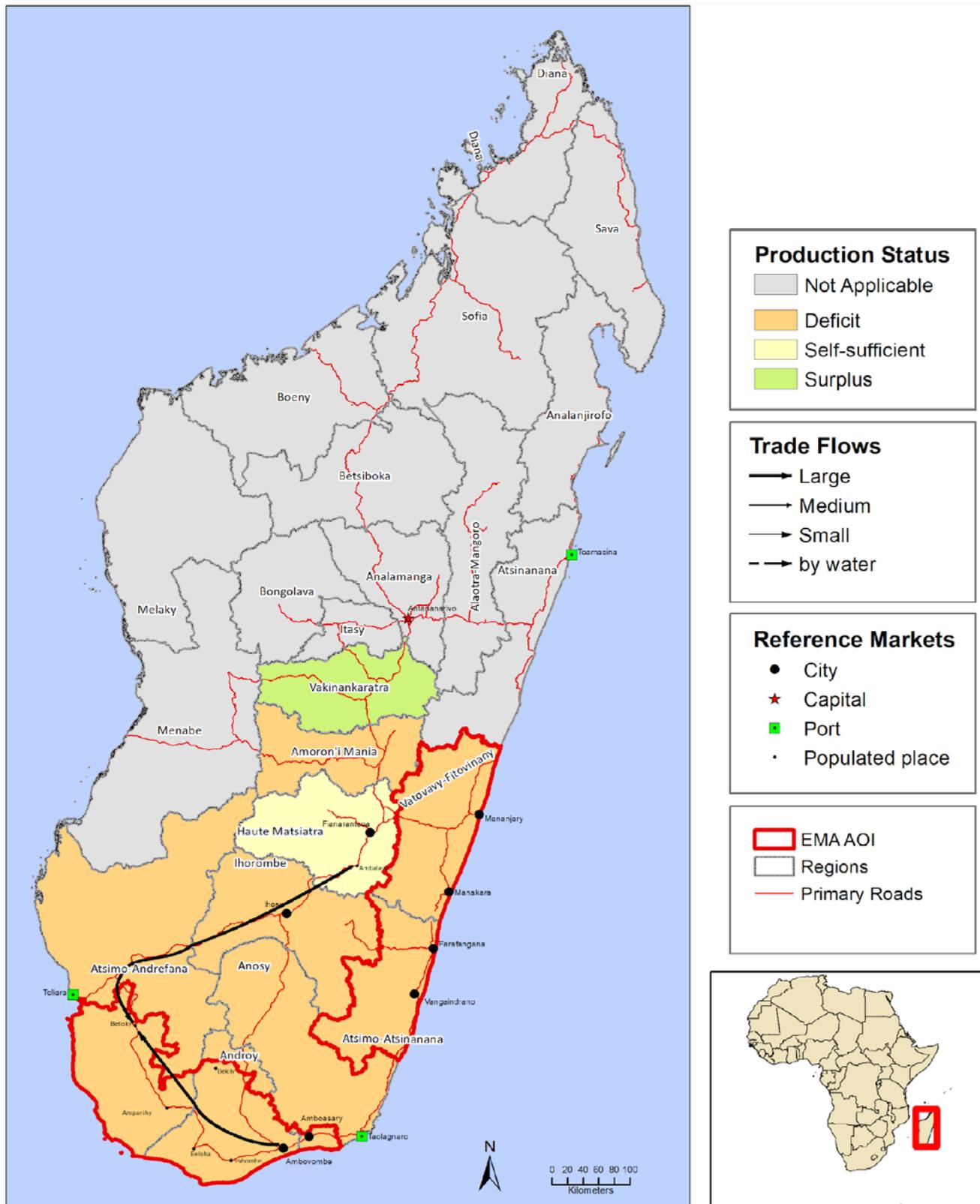
Annex 5. Marketing Basins Serving Southern Madagascar

Figure 49. Local Rice Production and Trade Flow Map



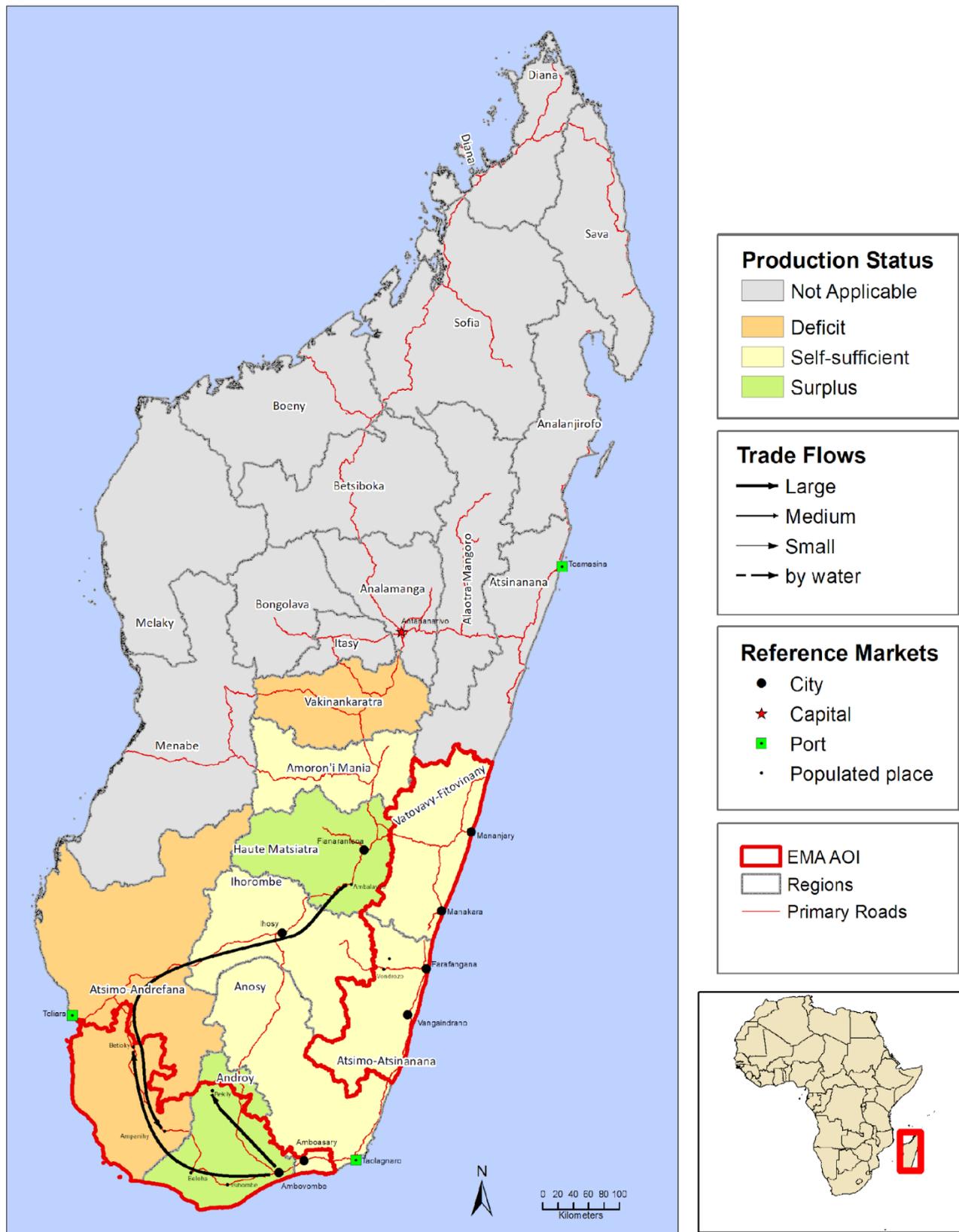
Source: FEWS NET 2018

Figure 50. Maize Production and Trade Flow Map



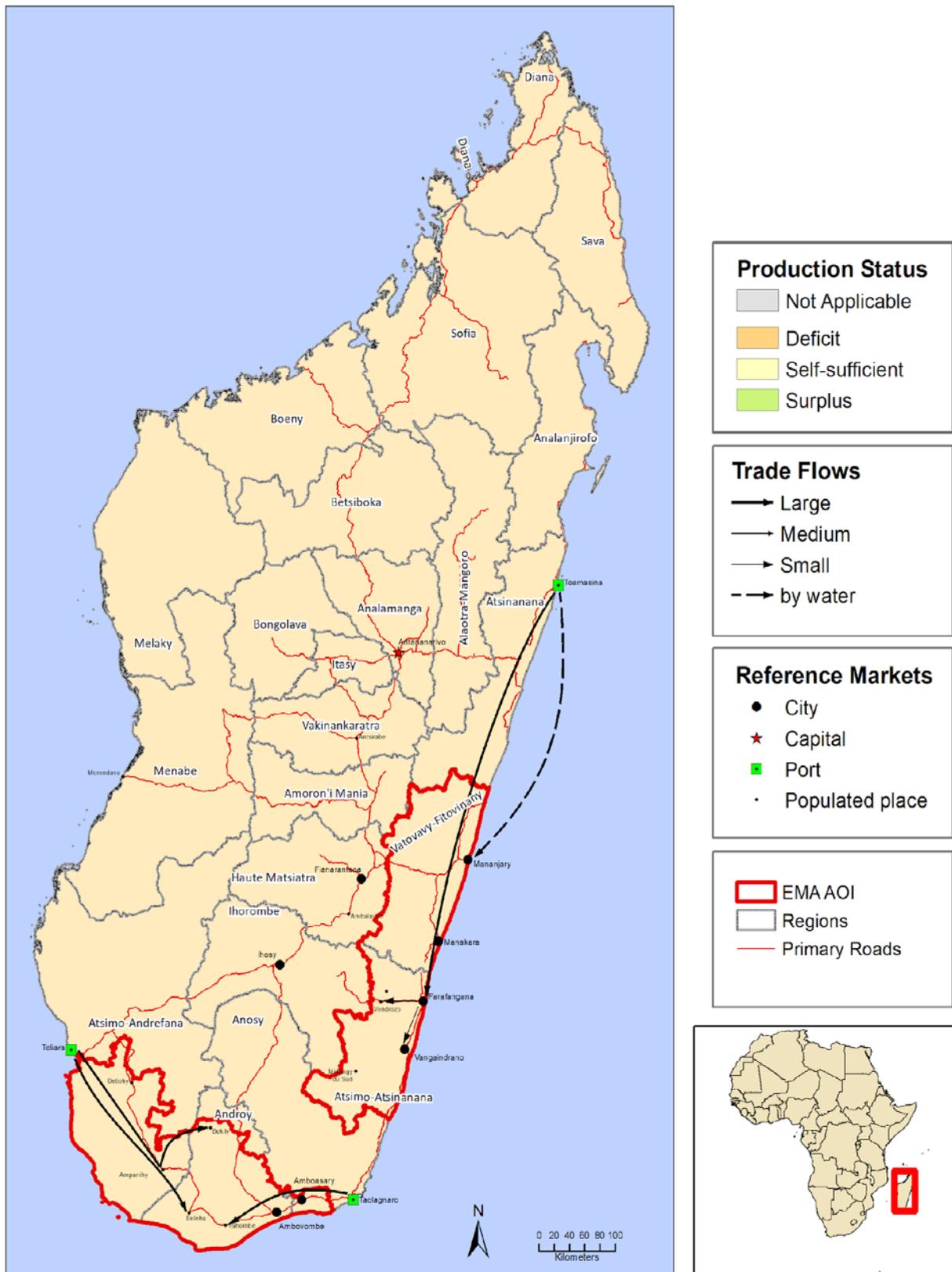
Source: FEWS NET 2018

Figure 52. Cassava Production and Trade Flow Map



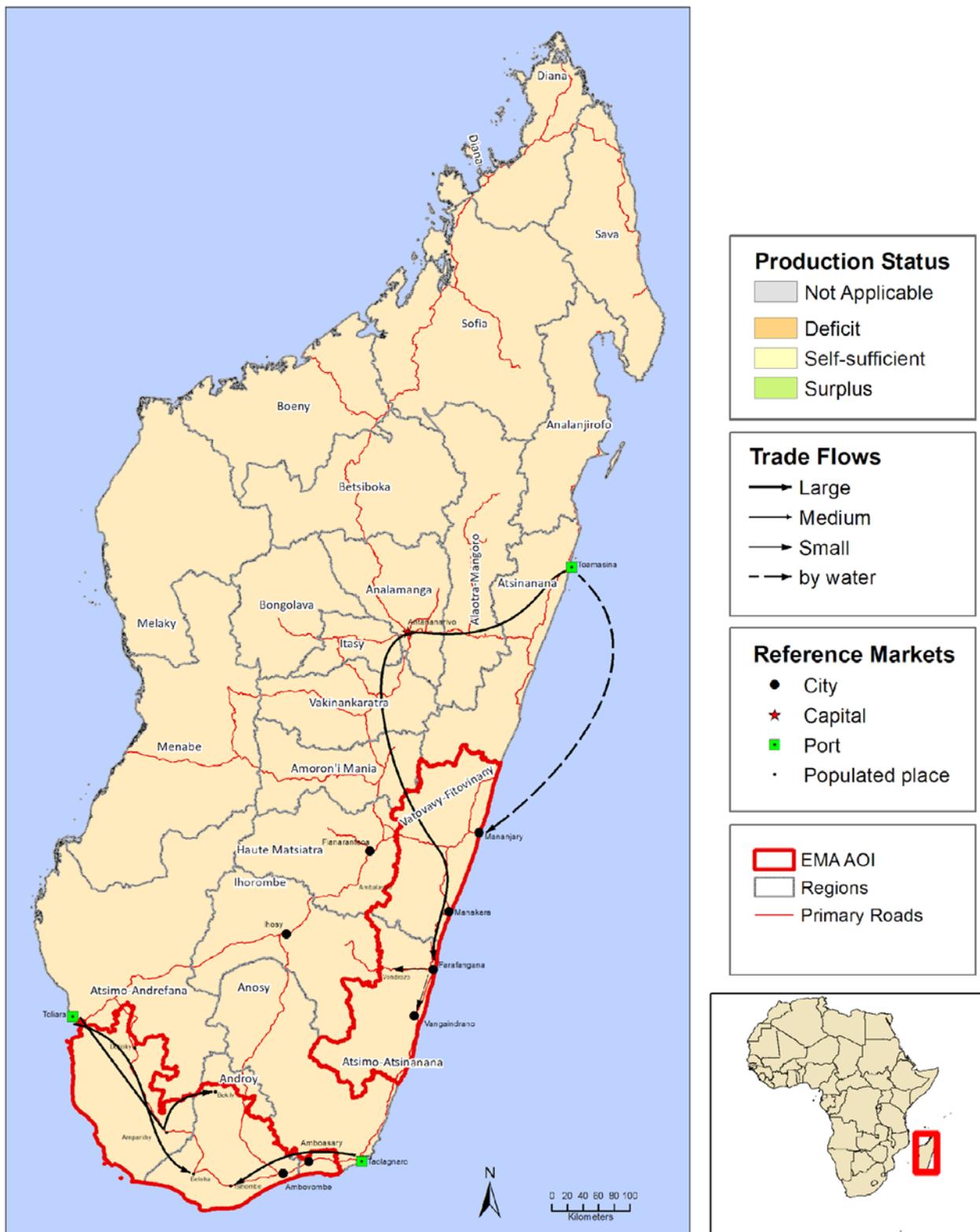
Source: FEWS NET 2018

Figure 53. Imported Rice Trade Flow Map



Source: FEWS NET 2018

Figure 54. Edible oil Trade Flow Map



Source: FEWS NET 2018

Annex 6. Ports, Storage, and Transportation

A preliminary review of key issues and findings that emerge from secondary information and literature (such as the WFP Logistics Capacity Assessment, LCA, November 2017), revealed significant information gaps on ports, transport, and inland storage capacity. This makes it difficult to conclude whether capacities and systems were indeed adequate to manage and distribute US in-kind Title II commodities at the current program scale. The following summarizes the findings from the FEWS NET assessment related to this specific theme. Considering the geography of the EMA AOI, the assessment and the logistics field mission focused on the two southern ports of Toliara (Tulear) and Taolagnaro (Fort Dauphin) as well as the intervention area in between. Meetings were organized with USAID implementing partners (CRS and ADRA), WFP offices in the field and Antananarivo, Bolloré Logistics (an international transport firm), port authorities, and transporters. This portion of the assessment team also visited local markets and conducted other individual key informant interviews.

Summary of findings

Delays and/or partial arrivals encountered at the ports due to required transshipments can affect the delivery of Title II commodities. Accurate and timely arrival information on all shipments, whether as a whole or partial, is crucial for implementing partners. Such information gaps lead to additional transport costs and shortage of distribution. Therefore, coordination of timely arrivals of food commodities at destination and adherence to port allocations are essential. This entails advance negotiations with carriers and frequent reporting on the status of shipments to receivers. If delayed food arrivals are anticipated, USAID may consider deliveries from prepositioned stocks in Kenya or South Africa, unless the expiry date of such commodities is too short for successful and timely distribution in Madagascar. High costs of transport, inadequate transport options, and deteriorated infrastructure create challenges for commodity distribution activities. The heavily deteriorated road infrastructure, climatic events that frequently disrupt traffic, and the lack of sufficient/adapted trucking capacity can jointly create further bottlenecks in the proper supply chain of Title II commodities. To circumvent some of these challenges, WFP uses local food purchases to complement international arrivals. Pre-positioning can play a strategic role in the prevention of pipeline breaks. Procurement from small holder farmers (SHF) increases income at grass-root level and has a proven positive impact on the livelihood of farmers and their families. To further prevent pipeline breaks and cut down on lead-time, WFP earmarks supplies from the WFP Global Commodity Management Facility, where large quantities of commodities are held at suppliers' stocks or at a central location and delivered from there. The estimated saving on lead-times is between 20 to 30 days against most internationally procured food.

Table 36. Size of ports serving AOI

Port	Quantity	Type of Berth	Length (m)	Maximum Draft (m)
Toamasina	1	Conventional	180	7.5
	1	Container	286	7.5
	1	Silo	217	8.5
Toliara	1	Conventional	144	10.5
	1	Container	169	10
Taolagnaro	1	Conventional	75	8
	2	Container	185 & 275	8 & 12

Source: WFP 2017

Supply Chain Analysis

Up-stream pipeline – before arrival

International shipments

Traditionally 80 percent of all imports and exports in Madagascar pass through the port of Toamasina. However, to avoid additional high internal transport costs to EDPs mostly in the south, partners typically receive international shipments directly at Toliara and Fort Dauphin. With this shipping configuration, ocean carriers leverage transshipment hubs (South Africa, Mauritius Island). Consequently, loads are split, arrive only partially or late and sometimes with wrong port allocations. Also, accurate and up to date information on arrival dates and quantities shipped are missing or received late. Operationally, this situation leads to a complex shifting of food commodities between inland warehouses to ensure equal and timely food distribution. This also results in additional transport costs on the central corridor between the Port of Tamatave or Antananarivo, Toliara, and Amboasary. It is estimated that the Food Transport Costs presented by WFP include a contingency “mark-up” (up to 25 percent) to face such unforeseen costs.

Local purchase from traders/agro-industrials

Local purchases from traders/ agro-industrials have become strategically important for WFP. Between 20 percent of cereals (maize) and pulses (beans), amounting to about 10,000 MT, are purchased locally every year. Although they are seasonal and

result in large quantities delivered at the central EDP warehouse simultaneously, the crops purchased locally frequently count as prepositioned stocks to be used in the absence of international arrivals.

Local purchase from Small Holder Farmers (SHF)

WFP has purchased food from SHF since 2011. In 2017, WFP purchased 800 MT of maize and 400 MT of pulses through the SHF scheme. The long contracting process requires a relatively high level of human resources and a rather complex organizational structure at all levels. This is one of the reasons WFP also works in close cooperation with the Farmers Agricultural Service Organization (from AROPA project). Frequent business risks are linked to the Q&Q of the commodities delivered, mainly in respect of the food quality, but also in terms of quantity (short-delivery/contract breach). Still, local purchase from SHF is seen as an important source of income for small farmers and presents a major improvement of the agricultural value chain at household and market level. Very similar projects are managed in the South and South-East by GIZ, the German Agency for International Cooperation (Project “PraDah”) and by WHH (Welthungerhilfe, former German Agro Action), with an EU funded agriculture development project.

Down-stream pipeline - after arrival

Ports

Only five ports in Madagascar offer sufficient technical capacities. Two of them are in the North (Diego-Suarez and Vohemar). The others (Toamasina, Toliara and Fort Dauphin) receive US in-kind commodities, with Toamasina (Tamatave) being the country’s main port, as mentioned above. It is a modern port, which is currently being upgraded to increase its capacity and operational capability with support from a Japanese Grant (JICA).

The Port of Toliara has limited berthing space and, like Port Fort Dauphin, has no permanent container bridge installed. All vessels arriving, whether with break bulk or container, require onboard gears. There is sufficient modern port equipment available for container vessels, such as reach-stackers and forklifts.

Break bulk deliveries into Port of Ehoala/Fort Dauphin are nearly impossible since nearby storage outside of the port is unavailable. This results in long transit times when shuttling commodities between the port and the warehouses in town (Fort Dauphin). The operations are further slowed down by a very strict gate and movement control of the privately-owned port (Rio Tinto).

None of the ports allow for the emptying of containers inside the port. It is therefore important to negotiate sufficient “free-time” for customs clearance. All ports practice a rather costly but mandatory cargo scanning operation. The container scanning equipment is provided by a private operator associated to the internationally known inspection company SGS.

Road network & Road transport

One of the main objectives of the field assessment was to assess the availability and the capacity of the logistics and transport sector at decentralized level, which could potentially lead to difficulties related to the management and delivery of food assistance to the final destination and the distribution to beneficiaries. In support of the above, information was gathered from maps of the Autorité Routière de Madagascar, which record two road standards: paved and unpaved roads. The condition of both types of roads are rated on annual basis using simplified categories: Good, Medium or Bad. In 2017 paved roads were rated 43 percent (good), 50 percent (medium) and 7 percent (bad). For the unpaved roads 0 percent were considered “good,” 22 percent were “medium” and 78 percent of the unpaved road were considered in “bad” conditions. All sources indicated that, except for the paved portions of the primary roads, it is very difficult to travel on most of the network and it gets worse during the rainy season. Natural disasters and climatic events, like cyclones and resulting floods or landslides, cause major deterioration and destruction of the road network, heavily disrupting the traffic.

The field assessment confirmed the very poor road infrastructure, the nonexistence of rural feeder roads that would allow some regular transport to towns and villages, and a totally insufficient trucking capacity with short supply of adapted, all-terrain heavy vehicles. A road survey undertaken during the mission revealed an average speed of 28 km/h for a Nissan Patrol, 4WD. Trucks were seen moving at a very low speed, between 5 to 10 km/h.

This situation leads to regular (and at times substantial) delays in the execution of transport contracts. Also, the transport tariffs offered are high and an informal transport cartel applies a “waiting list,” and unilaterally sets the transport prices. To

avoid direct negotiations and price fluctuation in the South, WFP appoints a forwarding agent on annual basis. Still, during the emergency operation of 2016 for instance, trucks were simply not available. WFP had to charter 10 additional trucks on time-charter basis from the BNGRC/CPC (Corps de la Protection Civile) in Antananarivo to operate exclusively in the South. Meanwhile, other agencies contracted trucks “on the spot” at very high costs to circumvent the waiting list (Personal communication with CRS, July 2018) or used their own light vehicles and pick-ups, as necessary.

WFP’s planned Special Operation to improve the logistics and operational capacity of the BNGRC is partially funded by the EU. Once implemented, this should further support the BNGRC’s technical capacity. In addition to emergency preparedness, a program to repair crucial bridges, road sections, and local ferry passages would benefit the South—reducing costs of supplies and services and supporting general economic activities.

Extended Distribution Points (EDP) & Final Distribution Points (FDP)

In addition to the WFP EDP warehouses in Antananarivo and the Port of Tamatave, the EMA teams visited all below-mentioned warehouses (Table 38). WFP’s currently available storage capacity is around 20,000 MT (in up to 10 different locations, mainly in the South and South East).

Table 37. Indicative storage capacity at EDPs and FDPs

Location	Owner	Capacity (MT)	Notes
Grand Sud			
Amboasary	WFP	5,650	2 warehouses (fixed structures) and 8 Mobile Storage Unit (MSU)
	Commercial/ private sector	700	For rent
Ampanihy	WFP	1,000	Antenna of Toliara & Sub-Office
Bekily	WFP	250	Antenna of Amboasary & Sub-Office
	Commercial/ private sector	200	For rent
Toliara	CRS	500	For rent
	WFP	4,000	4 warehouses (fixed structure), 1 MSU, 8 MSU in stock
	Commercial / private sector	7,000	For rent
Tsihombe	WFP	800	
Taolagnaro	WFP	1,350	
	Commercial/ private sector	200	For rent
Sud Est			
Farafangana	WHH	600	Option for temporary rental under an agreement with WHH/Agro Action
	Commercial/ private sector	250	For rent
Manakara	WFP	1,500	Transferred in June 2018 from Farafangana to Manakara
Mananjary	Commercial/ private sector	1,120	For rent
Vangaindrano	Commercial/ private sector	800	For rent

Source: FEWS NET 2018.

WFP and USAID implementing partner warehouses visited by the logistics team in Toliara, Ampanihy and Amboasary were adequate, meeting normal technical standards and appear well managed (clean, stacks, security, up-to-date records). The WFP warehouse compound in Toliara suffers from dust and noise from a neighboring stone crushing factory and the outside surface requires repairs for better water drainage. WFP keeps a stock of 8 x 500 MT (capacity) mobile warehouses in Toliara that can be erected as needed. WFP EDP antennas are selected “strategic locations” and hold advance stocks in areas at risk of being cut off by storm-water and floods. Additional small, regional warehouses are sometimes rented through AROPA for SHF deliveries.

Secondary information and reports suggest that warehouses at FDP do not always meet technical standards. The stores range from classrooms to local stores at Caritas and churches. For this reason, several partners (ADRA/WHH) operate direct distribution from trucks or light-vehicle pick-ups in a so-called “pay-day” distribution mode for beneficiaries enrolled in FFW/FFA activities. Supplies for nutritional programs are delivered nearly exclusively by own light-vehicle pick-ups, and so are the supplies for school programs (some schools being as far away as 200 km).

Storage and transport losses occur at all levels of the supply chain and are mostly due to infestation, leakage of plastic edible oil containers (Figure 54), expiry date limitations, inadequate handling, and sometimes heat. CSB products attract rats, insects, and mice. Warehouse staff are well acquainted with stock-treatment techniques. WFP, as well as USAID implementing partners, have contracts with private companies for monthly fumigation of stocks when necessary.

Transport costs – Food Transport Costs

Road Transport costs in Madagascar vary significantly depending on the transportation route (primary, paved roads from the port to central warehouses/EDP, or on secondary legs such as inter-EDP or to distribution sites). Vehicles and trucks used in the country are categorized according to their respective capacity: Category 1 (<5 MT), Category 2 (5 – 10 MT), Category 3 (10 – 15 MT), and Category 4 (> 15 MT).

Irrespective of the quantity finally loaded, transport costs for the categories 1, 2, and 3 are quoted per truck (unit) and destination. Only category 4 vehicles (beyond 15 MT) used on major roads (paved and unpaved) can be contracted on metric-ton basis.

Figure 55. Plastic edible oil container



Source: FEWS NET 2018

This dynamic results in a relatively complex transport tariff system managed by operators and WFP/ NGO Logistics Officers. An analysis of the applied transport costs in the South shows costs of approximately US\$ 1.40 t/km, which is about twice the costs paid in West Africa for example. As reported, the actual transport tariff applied can be much higher, since the limited number of commercial trucks available often leaves no choice to WFP and NGOs but to hire larger trucks than required.

In addition to the relatively high inland costs, relative high port costs of around US\$ 530.00/20' need to be added for containers arriving at the sea-port. This includes customs clearance, transit, and transport fees from the port to the next available warehouse outside the port. This is US\$ 180.00 – 200.00 more expensive than ports considered expensive in West Africa (Abidjan, for example). On the other hand, EDP warehouse rent is relatively inexpensive. For the inland warehouses operated by WFP, the total monthly rent does not exceed US\$ 9500.00. Half of that goes toward the 3,000 MT warehouse in the port of Toamasina (Tamatave). Although WFP office did not share the applied program transport rate (matrix), the mission estimated the overall internal transport costs at US\$ 170.00/MT (Table 39).

Table 38. Inland transportation cost estimates

Component	Cost estimate (US\$/MT)
Port	35
Transport to EDP	45
Storage at EDP	5.00 (including costs for stock treatment)
EDP to FDP	25
Distribution	25 (logistics costs paid to partners)
Total costs	135
20-25 % mark-up	35
Total FTC	170

Source: Personal communication, WFP staff, July 2018

Reporting systems

Different systems are used by partners to report on beneficiary distribution. Frequently, quantities “dispatched” (released) are recorded as quantities “distributed” relative to the estimated number of beneficiaries.

- WFP operates two corporate systems: COMET and LESS. COMET records the planned number of beneficiaries to reach (list of beneficiaries) and the respective food requirements; LESS reports the actual deliveries. For the purpose of corporate reporting, both systems are interlinked, and delivery or beneficiary gaps are easily detected. The result is verified and corrected if needed and only then used for corporate reporting.
- ADRA equips all their project vehicles with GPS and distributions are accompanied by ADRA staff. A local committee oversees the distribution and an ADRA Monitoring Assistant verifies the overall distribution process. In the future ADRA plans to use beneficiary cards, scan-technology, and portable “tablets” to record beneficiaries and distributions data.

- CRS records food distribution at three levels: with the support of the “Food Log” data system, an excel sheet database (at central and decentralized level) and written records (“Livre Manuel” or stock register).

All USAID partners extensively deploy staff to monitor field activities. ADRA and WFP sends out technical teams (Food Aid Monitors); CRS appoints local volunteers at the diocese to control the distribution. Although some areas in the South and South East remain uncovered, the mobile telephone coverage allows timely control over transport and distribution activities whenever teams reach centrally located towns in the evening or while en route.

Annex 7. Staple Food Preferences and Consumption Patterns in AOI

Table 39. Stated preference (food secure households) within AOI

Region	District	CFSAM (2018)			CFSAM (2017)		
		Rice (%)	Maize (%)	Cassava (%)	Rice (%)	Maize (%)	Cassava (%)
Androy	Ambovombe	100	0	0	93.55	1.08	3.23
Androy	Bekily	96	0	4	N/A	N/A	N/A
Androy	Beloha	36.36	0	63.64	75.51	16.33	6.12
Androy	Tsihombe	11.11	3.7	85.19	67.14	8.57	18.57
Anosy	Amboasary	100	0	0	86.81	0.43	12.34
Atsimo-Andrefana	Ampanihy	80	12.86	7.14	65.91	1.14	32.95
Atsimo-Andrefana	Betioky	90.63	4.69	4.69	91.38	1.72	6.9
Atsimo-Atsinanana	Farafanga	100	0	0	100	0	0
Atsimo-Atsinanana	Vangaindrano	97.7	0	2.3	96.97	0	3.03
Vatovavy Fitovinany	Manakara	100	0	0	100	0	0
Vatovavy Fitovinany	Mananjary	100	0	0	99	0	0
Vatovavy Fitovinany	Vohipeno	100	0	0	100	0	0
	Mean	84.32	1.77	13.91	88.75	2.66	7.56
	Max	100	12.86	85.19	100	16.33	32.95
	Min	11.11	0	0	65.91	0	0

Note: Stated preference data presented in the above table were collected during the CFSAM assessment in 2017 and 2018. The question asked was "What food do you prefer to eat of the following: rice, maize, cassava, and sweet potato?" The questionnaire was administered to a random sample of households, representing all wealth groups but were organized into two groups: Food Secure Households and Food Insecure Households.

Source: Author's calculations based on the CFSAM reports

Table 40. Consumption patterns (food secure households) within AOI

Region	District	CFSAM (2018)			CFSAM (2017)		
		Rice (%)	Maize (%)	Cassava (%)	Rice (%)	Maize (%)	Cassava (%)
Androy	Ambovombe	0	8.33	91.67	1.08	7.53	79.57
Androy	Bekily	0	0	100	14.47	3.95	81.58
Androy	Beloha	6.06	0	66.67	8.16	24.49	63.27
Androy	Tsihombe	0	7.41	55.56	0	32.86	41.43
Anosy	Amboasary	73.85	7.69	18.46	24.68	7.79	61.04
Atsimo-Andrefana	Ampanihy	1.43	22.86	75.71	6.82	4.55	87.5
Atsimo-Andrefana	Betioky	29.69	4.69	65.63	24.14	6.9	68.97
Atsimo-Atsinanana	Farafanga	80.87	0	19.13	31.43	0	54.29
Atsimo-Atsinanana	Vangaindrano	74.71	0	24.14	39.39	0	54.55
Vatovavy Fitovinany	Manakara	88.39	0	11.61	86.21	0	13.79
Vatovavy Fitovinany	Mananjary	97.22	0	2.78	96	0	4
Vatovavy Fitovinany	Vohipeno	89.26	0	9.92	77.97	0	22.03
	Mean	45.12	4.25	45.11	34.20	7.34	52.67
	Max	97.22	22.86	100	96	32.86	87.5
	Min	0	0	2.78	0	0	4

Note: Stated preference data presented in the above table were collected during the CFSAM assessment in 2017 and 2018. The question asked was "What food do you consume on a daily basis from the following: rice, maize, cassava, sweet potato?" The questionnaire was administered to a random sample of households, representing all wealth groups but were organized into two groups: Food Secure Households and Food Insecure Households.

Source: Author's calculations based on the CFSAM reports

Table 41. State preference (food secure households) within AOI

Region	District	CFSAM (2018)			CFSAM (2017)		
		Rice (%)	Maize (%)	Cassava (%)	Rice (%)	Maize (%)	Cassava (%)
Androy	Ambovombe	92.2	1.83	5.96	66.2	1.41	28.87
Androy	Bekily	90.7	0	9.3	82.93	0	17.07
Androy	Beloha	35.1	1.44	63.46	77.96	6.45	6.45
Androy	Tsihombe	28.77	8.49	62.67	62.5	14.37	10.63
Anosy	Amboasary	89.14	3.43	7.43	81.01	0.63	17.72
Atsimo-Andrefana	Ampanihy	78.49	5.23	16.28	85.43	3.31	11.26
Atsimo-Andrefana	Betioky	86.74	1.1	12.15	96.7	0	3.3
Atsimo-Atsinanana	Farafanga	99.2	0	0.8	99.47	0	0.53
Atsimo-Atsinanana	Vangaindrano	100	0	0	100	0	0
Vatovavy Fitovinany	Manakara	98.41	0	1.59	99.35	0	0.65
Vatovavy Fitovinany	Mananjary	100	0	0	100	0	0
Vatovavy Fitovinany	Vohipeno	100	0	0	99.45	0	0.55
Mean		83.23	1.79	14.97	87.58	2.18	8.09
Max		100	8.49	63.46	100	14.37	28.87
Min		28.77	0	0	62.5	0	0

Note: Stated preference data presented in the above table were collected during the CFSAM assessment in 2017 and 2018. The question asked was "What food do you prefer to eat of the following: rice, maize, cassava, and sweet potato?" The questionnaire was administered to a random sample of households, representing all wealth groups but were organized into two groups: Food Secure Households and Food Insecure Households.

Source: Author's calculations based on the CFSAM reports

Table 42. Consumption patterns (food secure households) within AOI

Region	District	CFSAM (2018)			CFSAM (2017)		
		Rice (%)	Maize (%)	Cassava (%)	Rice (%)	Maize (%)	Cassava (%)
Androy	Ambovombe	2.75	1.38	95.41	0.7	2.82	85.21
Androy	Bekily	2.33	0.47	97.21	15.24	1.22	83.54
Androy	Beloha	4.33	4.33	82.21	0.54	23.12	49.46
Androy	Tsihombe	0.94	15.09	69.81	1.25	16.88	33.13
Anosy	Amboasary	18.29	7.43	74.29	13.92	6.96	69.62
Atsimo-Andrefana	Ampanihy	0	18.6	81.4	5.3	8.61	84.77
Atsimo-Andrefana	Betioky	17.68	4.42	76.8	6.59	2.2	89.01
Atsimo-Andrefana	Morombe	31.19	4.59	55.05	N/A	N/A	N/A
Atsimo-Atsinanana	Vangaindrano	56.29	0.66	41.06	22.73	0.57	65.34
Vatovavy Fitovinany	Manakara	83.33	0	15.08	69.68	0.65	29.03
Vatovavy Fitovinany	Mananjary	78.79	0	21.21	90	1.43	8.57
Vatovavy Fitovinany	Vohipeno	84.03	0	14.29	64.48	0	34.43
Mean		33.15	5.15	58.52	30.76	4.7	54.68
Max		84.03	18.6	97.21	90	23.12	89.01
Min		0	0	14.29	0.54	0	8.57

Note: Stated preference data presented in the above table were collected during the CFSAM assessment in 2017 and 2018. The question asked was "What food do you consume on a daily basis from the following: rice, maize, cassava, sweet potato?" The questionnaire was administered to a random sample of households, representing all wealth groups but were organized into two groups: Food Secure Households and Food Insecure Households.

Source: Author's calculations based on the CFSAM reports

Annex 8. Sub-national Food Balance Sheet

Regions	Commodity	2012/13-2016/17 Average				2017/18			
		Production (MT)	Total Requirements (MT)	Balance	Self-sufficiency	Production (MT)	Total requirements (MT)	Balance	Self-sufficiency
Androy	Rice (milled)	13,080	79,218	-66,138	17%	2,776.27	85,905.34	-83,129	3%
Anosy	Rice (milled)	36,277	72,512	-36,235	50%	13,526.95	78,633.33	-65,106	17%
Atsimo Andrefana	Rice (milled)	83,578	142,126	-58,548	59%	62,484.06	154,123.45	-91,639	41%
Atsimo Atsinanana	Rice (milled)	33,049	106,241	-73,192	31%	16,597.22	115,209.34	-98,612	14%
Vatovavy Fitovinany	Rice (milled)	88,539	167,448	-78,909	53%	38,421.75	181,583.35	-143,162	21%
Androy	Maize grain	13,261	23,388	-10,128	57%	1,183.39	25,362.53	-24,179	5%
Anosy	Maize grain	7,772	21,408	-13,636	36%	5,477.19	23,215.55	-17,738	24%
Atsimo Andrefana	Maize grain	24,361	41,961	-17,600	58%	1,954.56	45,503.11	-43,549	4%
Atsimo Atsinanana	Maize grain	940	19,401	-18,461	5%	925.37	21,038.23	-20,113	4%
Vatovavy Fitovinany	Maize grain	1,219	30,578	-29,359	4%	1,265.65	33,158.70	-31,893	4%
Androy	Cassava	117,693	88,272	29,421	133%	57,550.85	95,723.10	-38,172	60%
Anosy	Cassava	70,506	80,799	-10,293	87%	41,265.06	87,619.99	-46,355	47%
Atsimo Andrefana	Cassava	50,891	158,369	-107,478	32%	26,511.18	171,737.55	-145,226	15%
Atsimo Atsinanana	Cassava	30,707	108,089	-77,382	28%	16,636.93	117,212.98	-100,576	14%
Vatovavy Fitovinany	Cassava	66,237	170,361	-104,124	39%	50,315.23	184,741.32	-134,426	27%
Androy	Total staples	144,034	190,878	-46,844	75%	61,510.52	206,990.97	-145,480	30%
Anosy	Total staples	114,555	174,720	-60,165	66%	60,269.20	189,468.88	-129,200	32%
Atsimo Andrefana	Total staples	158,830	342,456	-183,626	46%	90,949.80	371,364.11	-280,414	24%
Atsimo Atsinanana	Total staples	64,695	233,731	-169,035	28%	34,159.51	253,460.55	-219,301	13%
Vatovavy Fitovinany	Total staples	155,995	368,387	-212,392	42%	90,002.63	399,483.37	-309,481	23%

All figures have been converted to cereal equivalent terms using the following conversions: 0.3108 for cassava, 1.0238 for rice, 1.0266 for maize. Total staples include rice, maize grain, and cassava. A milled rice equivalent conversion rate of 0.67 was used.

Source: Author's calculations based on Ministry of Agriculture, CFSAM, CFSVA+N data and UN population estimates.

Annex 9. Price Analysis in the AOI

In Madagascar, domestic rice and imported rice are substitutes. This results in strong cross-commodity price dynamics. Imported rice enters the country through just a few ports, therefore, one might expect markets to be well-integrated. Price analysis, however, shows that this may not be the case, perhaps because imported rice competes with local rice prices and due to high transportation costs.

A closer review of secondary price data indicates that changes in imported rice prices in the port city of Toamasina have an effect on the price of domestic rice in reference markets both within and outside of the AOI. On the other hand, the same changes in imported rice prices in the port city of Toliara do not affect domestic rice prices in a significant manner. This is likely due to the fact that Toamasina is the country's largest port, processes the greatest volume of imported rice, and is better connected to main reference markets through a network of distributors and relatively well-maintained roads. Of the markets for which there is sufficient data, Mananjary appears to be the most well-integrated with the port markets of Toliara and Toamasina, and the capital, Antananarivo (Table 44). Mananjary is a key reference market within the AOI for imported rice. Imported rice travels by boat to Mananjary from the Port of Toamasina and supplies Vatovavy Fitovinany region (Figure 53).

While rice consumed within the AOI is either imported or produced in other distant areas of the country, maize is produced and consumed in relatively closer proximity. The relatively strong effect of the previous month's price on current prices for markets in the AOI and limited impact of large national reference markets on focus market prices in the AOI suggest that maize markets are less likely to trade inter-regionally and are therefore not well integrated over space (Figure 50).

Table 44. Maize and cassava market integration

Commodity	Area	Focus markets' (within AOI) own effect	Large reference (outside AOI) markets' effect
Maize	Grand Sud	Moderate	Very weak
	Sud Est	Very Strong	Very weak
Cassava	Grand Sud	Strong	Weak
	Sud Est	Weak	Weak

Note: Grand Sud focus markets include Ambovombe, Amboasary, and Tsihombe. Sud Est focus market includes only Mananjary. Large Reference markets include: Antananarivo, Antsirabe, Fianarantsoa, Toamasina, and Toliara

Source: FEWS NET estimates

Cassava markets show patterns similar to maize markets (Table 45). The effect of a previous month's price in focus markets within the AOI on current prices is stronger than the effect of the previous month's price in a large reference market on the current price in the focus market. This trend is likely due to the fact that the majority of cassava production and trade is localized within the AOI. The exception is the supply from surplus-producing Haute Matsiatra, traded to meet demand in the Grand Sud. Price analysis data shows that Antsirabe and Fianarantsoa, main reference markets near and within Haute Matsiatra respectively, both have a fairly large effect on cassava prices in Tsihombe. This is observed in the cassava trade flows, which travel from Ankaramena, in southern Haute Matsiatra, further south to the AOI to supply Tsihombe and other nearby markets in the southwestern portion of the Grand Sud (Figure 52).

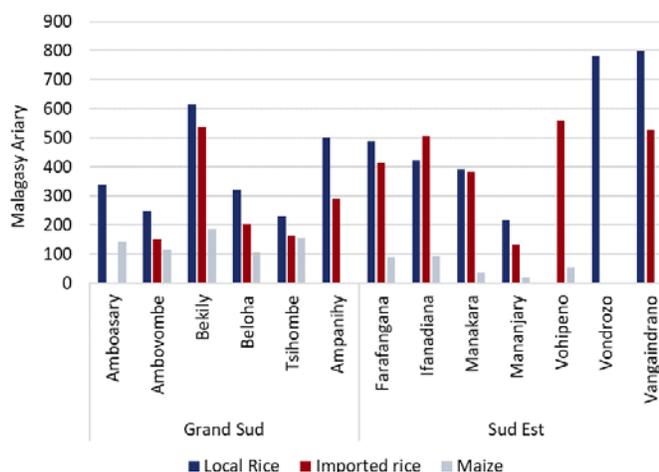
Table 43. Imported rice market integration

AOI	Focus market (within AOI)	Large markets' (outside of AOI) effect
Grand Sud	Ambovombe	Weak
	Tsihombe	Weak
Sud Est	Mananjary	Moderate

Note: Large markets consist of Antananarivo, Toliara, and Toamasina.

Source: FEWS NET estimates

Figure 56. Average price difference between high and low months for main staples, 2013-2018



Source: FEWS NET estimates

Figure 56 compares the three highest price months to the lowest three price months, based on the average real price for each month. In general, local rice prices differences between high and low months are greater than imported rice or maize. Vangaindrano and Vondrozo experience some of the largest seasonal price variation, nearly MGA 800. The differences in imported rice are less, though still statistically significant, and maize shows the smallest changes in price between high and low months.

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