RESEARCH TECHNICAL ASSISTANCE CENTER

Poverty and Malnutrition in Haiti

Findings from Sud and Grand'Anse Departments

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Acknowledgments

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Executive Summary

The 2019 Global Hunger Index, a composite measure of undernourishment, child wasting, child stunting, and child mortality, ranks Haiti 111th of 117 countries included in the index. Fifty percent of the country's population were found to be undernourished, while 21.9 percent of children under five years of age were stunted and 3.7 percent wasted. Based on the index, the level of hunger in the country was considered serious/alarming. In 2016 Hurricane Matthew battered the south of the country, leaving lasting effects on health and livelihoods. These problems are likely to be exacerbated by the COVID-19 pandemic.

The main purpose of this Food Security Desk Review and Data Analysis report is to provide an overview and synthesis of the poverty and food security situation in Haiti, with a particular focus on two of the country's ten administrative departments, Sud and Grand'Anse, both in the southwest. Grand'Anse is the poorest department of the country, with 70 percent of the population living in the bottom two quintiles of asset distribution, compared to 50 percent in Sud.

Section 0 of the report primarily relies on desk research (i.e., review of academic literature, project documents, and policy reports) and to some extent, stakeholder consultations. Section 2 quantitatively explores determinants of poverty and malnutrition using the 2017 round of the Haiti Demographic and Health Survey (HDHS).

Key findings (also summarized in Table 1) are:

Politics: After the 29-year autocratic dynasty of the Duvalier family fell in 1986, Haiti underwent a cycle of ill-fated presidencies and coups. In recent years, political leaders have attempted to establish a more democratic political system. Those efforts have been partly derailed by natural disasters, including the 2010 earthquake and Hurricane Matthew in 2016, and social unrest driven by corruption scandals and rising prices of fuel and other key commodities.

Socioeconomics: Key pillars of the Haitian economy, and thus sources of income for households (HHs), are: agriculture (as high as 51 percent in rural areas), commerce and petty trade (27 percent), tourism and travel (14 percent), and construction (8 percent). In Sud, about 17 percent of HHs engage in professional/clerical jobs, 44 percent in sales, and 16 percent in agriculture. Twenty percent are unemployed. In Grand'Anse, about 16 percent of HHs engage in professional/clerical jobs, 54 percent in sales, and 14 percent in agriculture. Another 14 percent are unemployed.

The nationwide unemployment rate of 13.5 percent continues to drive migration by a substantial part of the Haitian population, particularly from the areas of interest (AOIs). Internal migration from Sud and Grand'Anse significantly exceeds the national average. This is not surprising, given the significant distance between the AOIs and the border with the Dominican Republic. Twenty percent of migrants from Sud move to other communes, 69 percent to other departments, four percent to the Dominican Republic, two percent to Latin America, and two percent to the United States. Twenty percent of migrants from Grand'Anse move to other communes, 58 percent to other departments, three percent to the Dominican Republic, five percent to Latin America, and 12 percent to the US.

Land, Environment, Climate Change, and Natural Disasters: With 30 percent of Haitian HHs engaged in farming activities, access to land for cultivation and productive purposes is key. At the national level, 61 percent of HHs own or have access to agricultural land—37 percent in urban areas and 77 percent in rural areas. Eighty percent of HHs in Sud and 84 percent in Grand'Anse have access to land usable for

agriculture. The southern region of Haiti is particularly prone to natural disasters, such as droughts, floods, hurricanes, and earthquakes. These volatile agroclimatic events have been linked to the El Niño phenomenon in several areas of the country, particularly the AOIs.

Gender: About 41 percent of HHs in Sud and 39 percent in Grand'Anse are headed by women. At the national level, 12 percent of women reported having experienced domestic violence at least once in their lives. Among women in Sud, 17.6 percent have experienced physical violence from their husbands. In Grand'Anse 18.2 percent have experienced such violence.

Youth: In Haiti, 54 percent of the population is under 25, with 31 percent between 10 and 24 years old. Of women between the ages of 15 and 19, 84.2 percent have not worked (likely for pay) in the last 12 months, while 60 percent of men have. Among women between the ages of 20 and 24, 58.4 percent have not worked, while 34.6 percent of men have not.

Food security context: Most of our analysis utilizes the livelihood zones classification established by the Famine Early Warning Systems Network (FEWS NET) created by USAID in 1985. As established by FEWS NET, livelihood zones are geographic areas of a country where people generally share similar options for obtaining food and income and similar access to markets. In Haiti, the zones are numbered on the FEWS NET map from HT01 (dry coastal maize and charcoal) to HT09 (urban). Three of those livelihood zones cover the AOIs in this report. Both Sud and Grand'Anse contain zones designated as HT07 (South beans, bananas, and petty trade) and HT08 (Southwestern coast maize, manioc, and bush products). Most of the northern and western coasts of the two departments are designated as HT08. The eastern part of Sud is classified as HT01 (dry coastal maize and charcoal).

Agricultural production: The Sud HT01 zone produces maize and charcoal. The HT07 zones in both departments produce beans and bananas and are also marked by petty trade. Farming in both departments is mostly traditional, with very little production of cash crops. The HT08 zones in both departments produce maize, cassava, and bush products. Fisheries in those areas produce conch and lobster.

Market and food access: Trade networks in HT07 areas are characterized by departmental and local supply centers. Members of poor HHs are unable or barely able to meet minimal energy needs, possibly due to weak production capacity. As a consequence, 60 to 70 percent of HHs resort to purchasing food, although there is some evidence wealthier HHs consume dairy products from their own animals. In HT08 areas, imported food prices are the highest in the country. This is likely because those areas are isolated and access is hindered by inadequate roads.

Staple foods: In HT01 zones the main staple foods are maize, pearl millet, beans, rice, and flour. In HT07 zones, staple foods are rice, maize, and beans. In HT08 zones, staple foods are rice, maize, and beans.

Food insecurity: Based on the Consolidated Approach to Reporting Indicators approach established by the World Food Programme (WFP), 50.7 percent of Haiti's population is food insecure, either moderately or severely. In Sud, 46.4 percent of the population is food insecure, compared to 77.9 percent of the population in Grand'Anse. This also translates into low food diversity, low intake of vitamin A, and low iron-rich food consumption.

Lessons from food security and nutrition programs: A diverse set of actors, both local and international, are conducting a range of interventions, among them are agricultural insurance, cash transfers, job training, and school feeding programs. Collectively, their findings offer insights into effectively designing

interventions in Haiti. Main lessons learned stress the importance of building government capacity, preparing for disasters, being ready to target and reach beneficiaries (e.g., rosters and financial inclusion/access through bank accounts or mobile wallets), engaging the community, being gender responsive, and enhancing coordination between all actors, stakeholders, and partners.

Poverty analysis: Households defined as poor fall in the bottom quintile of the wealth-index distribution within a department, based on the 2017 HDHS. Results from the econometric analysis suggest that:

- In Sud, HHs who own radios or mobile phones or have a fixed or mobile place for handwashing are less likely to be poor. Those who live in houses with cane/palm or dirt/mud walls are more likely to be poor. HHs who own sheep are more likely to be poor, whereas HHs who own chickens are less likely to be poor.

- Similar to Sud, in Grand'Anse, HHs who own radios or mobile phones and those who have access to solar energy are less likely to be poor. Those who access drinking water through (protected or unprotected) springs or live in houses with cement floors are more likely to be poor.

Child malnutrition analysis: A child is considered stunted (wasted) if the z-score of height-for-age (weight-for-height) is below -2 standard deviations (SD), based on the 2012 and 2017 HDHS. Results from the econometric analysis suggest that:

Stunting: In both departments, children living in HHs with a large number of members under 15 years of age are more likely to be stunted. Stunting decreases with the size of the child at birth. Children whose mothers are fully literate are significantly less likely to be stunted. Additionally, in Sud, both children in HHs headed by women and children whose pregnancy was unwanted are less likely to be stunted. Stunting is generally more prevalent in HHs with a larger number of members older than 65.

Wasting: Wasting is less prevalent among girls, children whose pregnancy was unwanted, and children whose mothers are divorced, separated, or widowed. Children who were very small at birth, recently had a cough, or live in HHs headed by their maternal grandparent are more likely to be wasted. Wasting also decreases with the mother's education. In Sud, children whose mothers are married or fully literate are less wasted. Wasting increases with the number of dependents in a HH under 15 years of age.

Table 1. Summary of Findings

Theme	Grand'Anse	Sud	Source
Poverty rate (HHs in lowest two quintiles)	70 percent	50 percent	2017 HDHS
Stunting	21.6 percent	22 percent	2017 HDHS
Wasting	3.6 percent	2.1 percent	2017 HDHS
Migration destination	Other communes (13 percent), other departments (30 percent), Dominican Republic (58 percent), Latin America (5 percent), United States (12 percent)	Other communes (20 percent), other departments (69 percent), Dominican Republic (4 percent), Latin America (2 percent), United States (2 percent)	CNSA (2019)

Theme	Grand'Anse	Sud	Source
Access to land usable for agriculture	84 percent	80 percent	DHS (2017)
Main production	HT07: beans, bananas, HT08: maize, cassava, bush products	HT01: maize, HT07: beans, bananas, HT08: maize, cassava, bush products	FEWS NET (2015) and CNSA (2019)
Staple foods	HT07 and HT08: rice, maize, and beans.	HT01 zones: maize and pearl millet, beans, and rice and flour, HT07 and HT08: rice, maize, and beans.	FEWS NET (2015) and CNSA (2019)
Food insecure	77.9 percent	46.4 percent	CNSA (2019)
Food diversity and nutrition	Low food diversity Low intake of vitamin A Low iron-rich food consumption	Low food diversity Low intake of vitamin A Low iron-rich food consumption	CNSA (2019)
Poverty determinants	Radios, mobile phones (-), drinking water through (protected or unprotected) springs (+), solar energy (-), cement floors (+)	Radios, mobile phones or have a fixed/mobile place for handwashing (-), houses with cane/palm or dirt/mud walls (+) sheep (+), chickens (-)	2017 HDHS
Child malnutrition determinants: stunting	Number of HH members under 15 (+), Size at birth (-), mother fully literate (-), Sud only: Mother is HHH (-), pregnancy unwanted (-), number of HH members over 65 (+)		2017 HDHS
Child malnutrition determinants: wasting	Girls (-), pregnancy unwanted (-), mother is divorced, separated or widowed (-), child was very small at birth (+), child recently had a cough (+), mother's education (-), Sud only: mother is married (-), fully literate (-), number of HH members under 15 (+)		2017 HDHS

Note: HT07 stands for South beans, bananas, and petty trade; HT08 stands for Southwestern coast maize, manioc, and bush products; and HT01 for Dry coastal maize and charcoal.

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ACF	Action Contre La Faim International
AOI	area of interest
AVSF	Agronomes et Vétérinaires Sans Frontières
CLM	Chemen Lavi Miyò
CNSA	Coordination Nationale de la Sécurité Alimentaire
CRS	Catholic Relief Services
DHS (2017)	Report for the 2017 Demographic and Health Survey for Haiti (see reference list)
EFSA	Emergency Food Security Assessment
FAO	Food and Agriculture Organization
FDI	Industrial Development Fund
FEWS NET	Famine Early Warning Systems Network
FFP	Food for Peace
FTF	Feed the Future
GHI	Global Hunger Index
GII	Gender Inequality Index
GoH	Government of Haiti
2017 HDHS	Analysis based on the 2017 Demographic and Health Survey Data for Haiti
HH	household
HHH	head of household
HT	FEWS NET livelihood zone for Haiti
IFAD	International Fund for Agricultural Development
IFRC	International Federation of Red Cross
ILO	International Labor Organization
in	inches
IPC	The Integrated Food Security Phase Classification
KL	Kore Lavi
LOKAL	Limyè ak Organizasyon pu Kolekyivite yo Ale Lwen
MARNDR	Ministère de l'Agriculture des Ressources Naturelles et du Développement Rural
MBEP	Market-Based Emergency Program
MAST	Ministry of Social Affairs and Labor (*Ministère des Affaires Sociales et du Travail*)
Mt	metric ton
NGO	non-governmental organization

OLS	Ordinary Least Squares
PP	percentage point(s)
SD	standard deviation
SYFAAH	System of Financing and Agricultural Insurance
UCT	Unconditional Cash Transfer
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
US	United States of America
USAID	United States Agency for International Development
VAC	Village Assistance Committee
WASH	water, sanitation, and hygiene
WFP	World Food Programme

1. Desk Review

1.1 Country and Regional Context

1.1.1 Overview and Politics

Haiti is a Caribbean country that shares the island of Hispaniola with the Dominican Republic. With an approximate population of 11.5 million people, Haiti is often lauded as the first country to abolish slavery and the only nation in history established as a result of a successful slave revolt (e.g., Matthewson 1996). In fact, the Haitian revolution (1791–1804) has been credited with spurring political activism in several other Caribbean nations around that time (e.g., Geggus 2001). Despite its successful beginnings in 1804 as an independent nation led by Black people, Haiti has struggled politically and economically, particularly in recent decades (e.g., Hauge 2018). For example:

- After the 29-year autocratic dynasty of the Duvalier family, characterized by state-sanctioned violence, fell in 1986, Haiti underwent a cycle of ill-fated presidencies and coups. Since then, Haiti has attempted to establish a more democratic political system; however, such efforts have partly been derailed by natural disasters including the 2010 earthquake and Hurricane Matthew in 2016, and by coup d'états in 1991 and 2004. Between 2011 and 2017, three presidents and ten prime ministers succeeded each other, creating political instability. In 2018–2019, protests related to corruption and misuse of public funds, particularly the PetroCaribe scandal, threatened the stability of President Jovenel Moise. Further exacerbated by rising petrol prices, high cost of living, and corruption allegations, the events known as "Pays lock" (i.e., country lockdown) led to interrupted water supplies, food price increases, decrease in daily incomes, and disrupted operations by hospitals, schools, humanitarian organizations, businesses, and government institutions, according to a 2019 report by the International Federation of Red Cross and Red Crescent Societies. Moise's government failed to hold scheduled parliamentary elections in October 2019, and the President has been ruling by decree with no seated parliament since January 2020. Now, the country faces potentially damaging consequences from the spread of the COVID-19 virus.
- With a Gross Domestic Product per capita of US$756 in 2019, Haiti is classified as the poorest country in the Western Hemisphere, according to the World Bank.[1] It ranked 111th of 117 countries included in the 2019 Global Hunger Index, jointly published by the International Food Policy Research Institute, Concern Worldwide, and Welthungerhilfe. According to the Global Hunger Index, almost 50 percent of the population is undernourished, 21.9 percent of children under five are stunted, and 3.7 percent of children under five are wasted. Haiti's level of hunger is classified as serious/alarming. This has led to significant migration, both from rural to urban areas and across international borders, in particular to the Dominican Republic and other Caribbean countries, the United States of America, and Latin America.

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[1] See overview at https://bit.ly/31dTHyD. Accessed on August 3, 2020.

According to Léon (2019), local governments were formally established in Haiti between 1987 (with a Constitutional change) and 1996 (through additional laws), although there are still movements in that direction (e.g., Laurent and Pierre 2012 and Hauge 2018). The country has 10 departments (Artibonite, Centre, Grand'Anse, Nippes, Nord, Nord-Est, Nord-Ouest, Ouest, Sud-Ouest, and Sud), distributed over 42 arrondissements and 140 communes/municipalities. A representative is appointed by the government in each department, and a mayor is elected in each municipality. Municipal councils are elected every four years. Figure 1 indicates the AOIs, which for this report are Sud and Grand'Anse. Sud has an approximate population of 720,443, according to the 2019 Integrated Food Security Phase Classification (IPC), with 50 percent

Source: OpenStreetMap (2020).

living in the two lowest quintiles of the asset distribution (own calculations based on 2017 HDHS). It has five arrondissements: Aquin, Chardonnières, Côteaux, Les Cayes, and Port-Salut. Grand'Anse has an approximate population of 421,504 (IPC 2019), with 70 percent living in the two lowest quintiles of the asset distribution (2017 HDHS). It has three arrondissements: Anse d'Hainault, Corail, and Jérémie.

While some indicators suggest local governance across Haiti has improved or at least has the potential to improve (e.g., Hauge et al. 2015) as a result of programs such as the USAID-funded Limyè ak Organizasyon pu Kolekyivite yo Ale Lwen (LOKAL) program implemented by Tetra Tech ARD, which sought to strengthen local governments, previously mentioned developments have likely slowed such progress (e.g., Laurent and Pierre 2012; also see Section 1.3). For example, Hauge et al. (2015) report that the 2010 Haitian elections were marred by violence and irregularities. In Sud, 7.9 percent of ballots were untallied in election results (see their figure 1, p. 276). In Grand'Anse, 5.3 percent of ballots were uncounted. And when it comes to disaster preparedness, management, and risk reduction, local governments have not always been up to the task. Interviews and focus groups in eight communes of Grand'Anse conducted one week after Hurricane Matthew (Marcelin, et. al. 2016) found that local governments did not always apply integrated strategies to preparation efforts.

1.1.2 Socioeconomics, Migration, and Remittances

According to CNSA (2019), key pillars of the Haitian economy, and thus sources of income for HHs, are: agriculture (as high as 51 percent if rural), commerce and petty trade (27 percent), tourism and travel (14 percent), and construction (8 percent). For urban HHs, 39 percent rely on petty trade, followed by salaried work at 29 percent. Only two percent of urban HHs appear to rely on agriculture. For rural HHs, agriculture is the main source of income (51 percent), followed by petty trade (33 percent). HHs also borrow quite significantly. Around one-third needed to borrow money in the year before the survey (CNSA 2019) and among those, 87 percent were able to borrow. They borrowed from: friends and family (36 percent), local traders (24 percent), credit unions and informal groups (11 percent), banks (5 percent), and other formal financial institutions (13 percent). This seems consistent
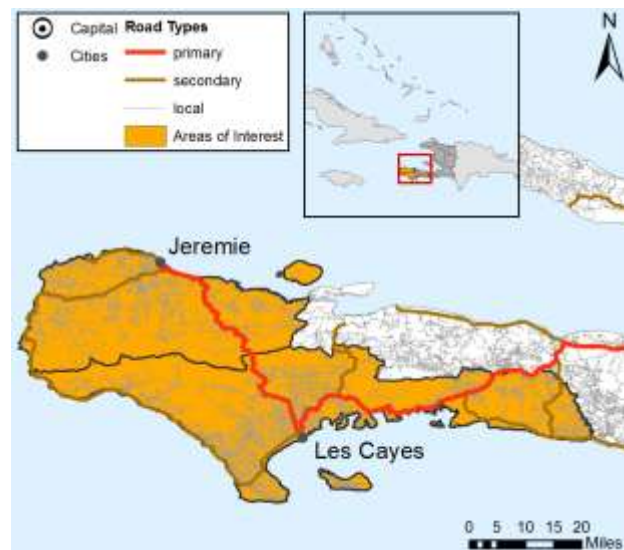
with Ministère de l'Agriculture des Ressources Naturelles et du Développement Rural (MARNDR) (2012a), which found that many communes have relatively high loan approval rates (greater than 50 percent), except for some parts of Grand'Anse.

While the unemployment rate in Haiti has decreased in recent years to about 13.5 percent (World Bank, https://bit.ly/3agYL9z), concerns remain about labor-market prospects and economic security. As a result, a substantial part of the Haitian population continues to migrate, particularly from the AOIs:

- Based on the 2010 Census, the Haitian diaspora comprised approximately 20 percent of the country's population, primarily living in the United States, the Dominican Republic, and other Caribbean/Latin American countries, although evidence suggests this increased significantly after the 2010 earthquake (e.g., https://bit.ly/3hCq0NT). At the national level, about 66.2 percent of migrants move to other communes within the same department or to different departments. Others cross international borders, primarily to the Dominican Republic (19.2 percent), the United States (9.2 percent), and Latin America (5.7 percent). The main reasons cited for such migration are work/labor (40 percent), education (26 percent), security (4.6 percent), and health (3.9 percent).
- For the AOIs, people migrate internally significantly more than the national average. This is not surprising given the significant distance between the AOIs and the border with the Dominican Republic (recall Figure 1). Twenty percent of migrants in Sud migrate to other communes, 69 percent to other departments, four percent to the Dominican Republic, two percent to Latin America, and two percent to the United States. Twenty percent of migrants in Grand'Anse migrate to other communes, 58 percent to other departments, three percent to the Dominican Republic, five percent to Latin America, and 12 percent to the United States.
- The main reasons cited for migration in Sud are work/labor (61 percent), education (10 percent), and security (8–9 percent). For Grand'Anse, the main reasons cited are work/labor (52 percent) and education (36 percent).

A key consequence of, and thus reason for, migration is the ability to send resources to support family and friends, a.k.a. remittances (e.g., Torero and Viceisza 2015). In fact, Amuedo-Dorantes et al. (2010) find positive effects of remittances on children's education in Haiti. There is also a substantial body of literature documenting the potentially positive effects of remittances on key development outcomes (e.g., Yang 2011 and the references within). According to CNSA (2019):

- Eighteen percent of HHs in Haiti had received remittances in the six months prior to August 2019. Remittances are the main source of income for 20 percent of urban HHs and 13 percent of rural HHs. In Sud, urban HHs constitute 17 percent and rural constitute 83 percent. In Grand'Anse, urban HHs constitute 25 percent and rural constitute 75 percent. Also see discussion further below related to COVID-19.
- For urban HHs, remittances from outside Haiti are sent primarily from North America (43 percent), Latin America (13 percent), and the Dominican Republic (10 percent). Internal remittances primarily come from the capital, Port-Au-Prince (18 percent), and other areas (12 percent). These remittances are used to pay for food (65 percent), education (11 percent), rent (five percent), and other basic needs (10 percent).
- For rural HHs, remittances from outside Haiti are sent primarily from North America (35 percent), Latin America (14 percent), and the Dominican Republic (14 percent). Internal remittances primarily come from Port-Au-Prince (21 percent) and other areas (12 percent). These remittances are mainly

used to pay for food (66 percent), education (14 percent), rent (two percent), and other basic needs (nine percent).

Particularly in light of COVID-19, there are several concerns for the economic security of Haitian HHs:

- The World Bank has estimated that certain countries may see declines of as much as 30 percent relative to their typical remittance receipts. In fact, the value of remittances to Haiti in March 2020 was 18 percent smaller than in the same month the year before (https://bit.ly/3hgEW3T). Jewers and Orozco (2020) further indicate that host countries with an elevated number of COVID-19 cases are home to the majority of migrants from Latin America and the Caribbean. The case counts in the United States and the Dominican Republic are of particular concern for Haiti, since those two countries host more than 70 percent of its migrants (Jewers and Orozco, Table 6).
- While operational, the agricultural sector has been impacted by government restrictions limiting group gatherings to no more than five people, in place from March to mid-July (Cledo 2020). For example, in Grand'Anse informal labor organizations are founded on group collaboration. The group can work on the land of members who may not pay in cash, but instead by feeding them, for example. Clearly, such constructs and practices continue to be at risk due to the pandemic.
- Similar concerns regarding the effect of limiting group size apply to other key industries such as construction.
- As is the case for most Caribbean countries, international travel restrictions have led to marked decline in tourism and travel.

These developments are in addition to pre-existing concerns with regard to potential political instability, climate change and natural disasters, and food insecurity.

1.1.3   Land, Environment, Climate Change, and Natural Disasters

According to CNSA (2019), the major forms of land access in Haiti are: inheritance (35.3 percent), purchasing (24.1 percent), leasing (17.3 percent), and sharecropping/metayage (15.5 percent). Overall, male HHHs tend to engage more in sharecropping (17 percent versus 12 percent of women), whereas female HHHs tend to dominate when it comes to inherited plots (40 percent versus 33 percent of men). Despite this and the fact that formal law treats daughters and sons equally with respect to land property, Kelly et al. (2019) find that women feel relatively tenure-insecure on inherited land relative to men. Concerns about land tenure and property rights are further confirmed by initiatives such as "Securing Land Rights in Haiti: A Practical Guide" prepared by the Haiti Property Law Working Group in 2014 (https://bit.ly/2DLVH9w).

Given that close to 30 percent of Haitian HHs engage in farming activities (https://bit.ly/2FfpNTj), access to land for cultivation/productive purposes is key. At the national level, 61.1 percent of HHs own or have access to agricultural land, with 36.7 percent in urban areas and 77.4 percent in rural areas (DHS 2017 and CNSA 2019). Based on the 2017 HDHS, 80 percent of HHs in Sud and 84 percent in Grand'Anse have access to land usable for agriculture. According to MARNDR (2012a), with the exception of some parts of Grand'Anse and Sud, less than one *carreau* (1.3 hectares) of agricultural land is available per farmer. This is consistent with an average farm size of 0.5 hectares across the country (e.g., World Bank 2017) and other developing countries—as suggested by, for example, Foster and Rosenzweig (2017), who argue that most farms/land plots around the world are too small to be efficient.

Environment and climate change drives the potential for natural disasters and further threatens livelihoods and economic security (also see Section 1.2.1). This occurs both directly (e.g., through displacement or destruction of property) and indirectly via degraded land and land erosion. For example:

- Major natural disasters have affected the country over the years, with the two most recent being the 2010 earthquake and Hurricane Matthew in 2016. As is the case for most Northern Caribbean islands, hurricanes and tropical storms also remain an annual threat during the Atlantic hurricane season, which tends to occur between August and October.

- The southern region of Haiti is particularly prone to natural disasters such as droughts, floods, hurricanes, and earthquakes. According to Schwartz (2018), Hurricane Matthew had a significant impact on assets, reducing phone access by 16 percentage points, radio access by 30 percentage points, and ownership of livestock by as much as 39 percentage points.

Figure 2. Flood Risk for Sud and Grand'Anse

Source: Integrated Context Analysis (2017).

- In 2018, Haiti suffered several natural disasters all at once: a period of severe drought, significant floods, and an earthquake (Food and Agriculture Organization, https://bit.ly/3fZgDHj). According to IPC (2019), 568,000 people live in areas at risk of being affected by such natural disasters, and 333,000 people are estimated to be affected by cholera.

- These volatile climatic events have been linked to the El Niño phenomenon in several areas of the country, particularly the AOIs, Sud and Grand'Anse. Figure 2 indicates that Sud is considered at medium risk of flooding relative to Grand'Anse, which is at low risk. A more detailed map of 2012 agroecological zones is also available through MARNDR at https://bit.ly/2Hfw7v7.

- While volatile weather is not unique to Haiti, the country's pre-existing conditions make it particularly vulnerable. Back-to-back crises have contributed to the degradation of livelihoods and living conditions of the most vulnerable populations, who are often the same people affected by several emergencies at once or in succession. In addition, Haiti retains less than one percent of its original primary forest, making it among the most deforested countries in the world (Hedges et al. 2018). This in turn threatens the country's biodiversity.

- From an agricultural and food security standpoint, the potential for environmental degradation and natural disasters is further exacerbated by limited irrigation in the AOIs (MARNDR, 2012a). In all communes of Grand'Anse, less than five percent of agricultural land is irrigated. In Sud, more than 50 percent of the agricultural land in Chantal is irrigated. Communes bordering Chantal on the East, e.g., Torbeck, Cayes, Maniche, also seem to be more irrigated. But in the remainder, irrigation is limited.
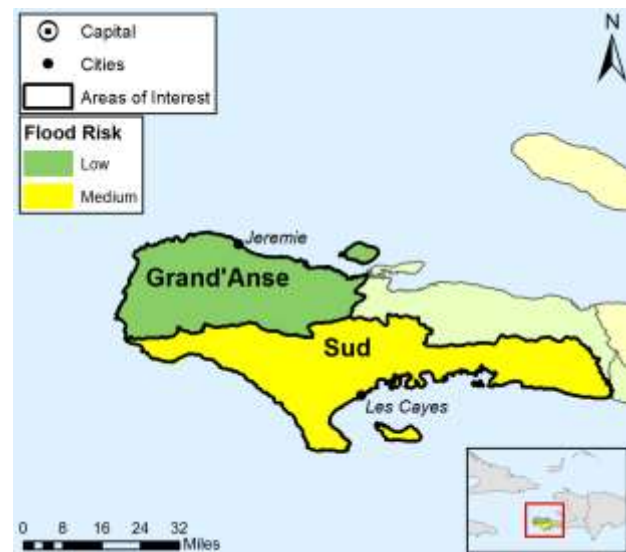
As Abel et al. (2019) argue, climate change can serve as a driver of conflict, further exacerbating economic and physical insecurity and migration. Continued exposure to negative shocks could impede Haiti's development and undermine potential benefits from social programs. According to CNSA (2019), 37 percent of HHs have experienced a negative shock in the last six months, either related to climate

(e.g. drought and earthquakes), food and agriculture (e.g., rising food or input prices and livestock diseases), or other adverse events (e.g., deaths, accidents, and loss of income). Almost twice as many urban HHs (42 percent) as rural HHs (22 percent) have experienced such shocks. While the government of Haiti has attempted to institute a weather index insurance system (World Bank 2013, https://bit.ly/2DLxSP6), it is unclear that this mechanism is functioning at scale (also see Section 1.3).

1.1.4 Gender

Based on the 2017 HDHS, about 40 percent of HHs in Sud and 39 percent of HHs in Grand'Anse are headed by women. According to the United Nations Development Programme (UNDP, https://bit.ly/31Le5HF), Haiti ranked 150 out of 162 countries on the 2018 Gender Inequality Index, which measures gender-based inequalities on three dimensions: reproductive health (based on maternal mortality and adolescent birth rates), empowerment (based on the share of parliamentary seats held by women and attainment in secondary and higher education), and economic activity (based on the labor market participation rate of women and men). Based on these and other measures, there are some concerning trends with respect to gender:

- About three percent of the parliamentary seats in Haiti are held by women (https://bit.ly/3bUiXP7).
- The percentage of women without any level of education is 13 percent and for men, it is nine percent. Six percent of men and only four percent of women have completed secondary school (DHS 2017).
- In 2012, Haiti's female labor force participation rate was about 47 percent, while its male labor force participation rate was about 60 percent (https://bit.ly/2E0reom and https://bit.ly/33oCrYz). A 2015 World Bank study found wages among women to be 32 percent lower than wages among men.
- According to MARNDR (2012b), 25 percent of plots representing 20 percent of land in Haiti belong to women. This suggests a relatively small representation of women in agriculture and that women's plots are smaller on average than those of men (0.75 versus 1 ha). About 40 percent of plot owners produce principally for their own consumption, on plots that represent 32.7 percent of all plots. As expected, women are overrepresented among plot owners who produce primarily for their own consumption (28 percent) compared to the share of the plots they own.
- Women struggle to gain access to credit, extension services, and inputs (World Bank 2015). Also, they often do not meet the criteria for enrollment into microfinance programs, which in turn prevents them from obtaining funds to help their small businesses thrive. Furthermore, government extension services fail to include women and thus, they are unable to obtain the same agricultural knowledge or inputs as men (Venort and Calixte 2019).
- Forty percent of girls older than five have received no formal education, relative to 34.5 percent of boys (IHSI 2019, https://bit.ly/3fOEiKp).
- At the national level, 12 percent of women between the ages of 15 and 49 have experienced domestic violence at least once in their life (DHS 2017). In Sud, this number is 10.5 percent and in Grand'Anse, it is 9.6 percent.
- Based on DHS (2017):
  - 17.6 percent of women in Sud had been beaten by their husbands versus 18.2 percent in Grand'Anse.
  - 33.6 percent of women in Sud had control over their own earnings versus 31.8 percent in Grand'Anse.
  - 5.4 percent of women in Sud independently own a house versus 3.1 percent in Grand'Anse.

- 14.1 percent of women in Sud use a bank account versus 9.3 percent in Grand'Anse.
- 7.1 percent of women in Sud were not involved in major HH decisions versus 7.2 percent in Grand'Anse.
- 56.6 percent of women in Sud own a cell phone versus 48.6 percent in Grand'Anse.

Youth

In Haiti, 54 percent of the population is under 25, with 31 percent between the ages of 10 and 24 (CNSA, 2019). Based on DHS (2017), 84.2 percent of women and 60 percent of men between the ages of 15 and 19 have not worked (likely for pay) in the last 12 months. For Haitians between the ages of 20 and 24, 58.4 percent of women and 34.6 percent of men have not worked. These numbers compare to a range from 14.6 to 18.9 percent for women in the 35–49 age group and a range from 2.9 to 5.4 percent for men in the same age category. This is consistent with arguments made previously. For example, Justesen and Verner (2007) found that female youth in Haiti need special attention because they are more likely than their male peers to drop out of school and be unemployed or inactive. The difference seems to be due to potential risk factors such as lack of role models, guidance, and expectations, early marriage and/or pregnancy, and domestic violence.

An August 2019 poll by U-Report (https://haiti.ureport.in), a digital tool that allows for the anonymous and free collection of people's views (particularly of young people), found 44 percent of youth in Haiti believe their opinion is not considered in their community, 26 percent believe that they are discriminated against or excluded from decision-making, and 44 percent are concerned about unemployment (https://bit.ly/2UjwYyz). This is consistent with Eustache et al. (2017), who find a high mental health burden among Haiti's youth, with many not accessing mental health care.

Since a substantial part of the Haitian population is relatively young and more likely than their elders to migrate, many development programs emphasize investing in and creating opportunities for young people (e.g., Pluim 2014 on participation). Some examples include (also see Section 1.3):

- Rural development programs, particularly focused on young people. Consistent with Feed the Future and International Labor Organization guidelines (e.g., https://bit.ly/31X1C3L), Food and Agriculture Organization, International Fund for Agricultural Development, and WFP seem to be implementing such initiatives (https://bit.ly/2Y1qICJ).
- Skill-building programs, particularly focused on digital jobs and women. Consistent with this, the Ayitic Goes Global program sought to enhance participation among young Haitian women in the global economy (https://bit.ly/33ZAfsb).
- Ad hoc forums on adolescent and youth employability, e.g. by UNICEF (https://bit.ly/2UjwYyz).

1.2   Food Security Context

1.2.1   Agricultural Production

Agriculture is a main source of income for rural HHs who, not surprisingly, are among the poorest in Haiti. At the national level, the main risks to agricultural production are drought, lack of seed supply, predatory birds/pests for crops, diseases and lack of veterinary services for livestock and other animals, and rising prices, e.g., of imported rice, which affect food security and people's ability to engage in agricultural activities. According to Oxfam (2012) and World Bank (2015), the main constraints

inhibiting growth of the agricultural sector are neglected rural infrastructure, weak research and extension, poorly defined land tenure, limited access to credit and technical training, soil erosion, under-investment in human capital, and climate change. Fifty to 90 percent of HHs in Sud, and 75 to 95 percent of HHs in Grand'Anse are engaged in agriculture. In Sud, anywhere from 1 to 19 percent of HHs participate in fisheries. In Grand'Anse, the range is from 1 to 13 percent.

Figure 3 shows the livelihood zones (and their corresponding key crops) for the AOIs. Based on FEWS NET's 2015 livelihood classification, Sud falls into three zones and Grand'Anse into two zones. Producers in the HT01 zone, Dry coastal maize and charcoal – found only in Sud, grow maize. Producers in the HT07 zone, which spreads across both departments, cultivate beans and bananas and engage in petty trade. Their farming is mostly traditional, with very few cash crops. The HT08 zone, named Southwestern coast maize, manioc, and bush products, also spreads across both departments. This zone is also marked by fisheries focusing on conch and lobster.

The HT01 dry coastal maize and charcoal zones can further be described as:

- About 13 miles from the coast.
- Coastal plain areas, dry bushes, and savanna grass-covered plateaus.
- Little rainfall (16 to 40 inches per year), with rainy season in April, May, and November.
- Agriculture primarily rainfed and concentrated in rainiest areas.

The HT07 South beans, bananas, and petty trade zones can further be described as:

- Moderately fertile area.
- Rainy season from April to November, with rainfall of 35 inches per year.
- Limited access to land, although landless HHs practice sharecropping.
- Lean season and farming from March to August. HHs tend to offer labor to the agricultural market during this time at low wages (likely due to oversupply).
- Harvesting in June and few activities from November to January.
- Engagement with other activities such as trade, selling charcoal, and livestock rearing.

The HT08 Southwestern coast maize, manioc, and bush products zones can further be described as:

- Plains, foothills, and semi-humid plateaus.
- Two rainy seasons, from April to June, and from September to November, with rainfall of 60–80 inches (in) per year.
- Traditional fishing possible year-round, depending on winds.
- Engagement with other activities such as trade, selling charcoal, and livestock rearing.

Figure 3. Main Livelihood Zones in Sud and Grand'Anse

Source: FEWS NET (2015).

In Grand'Anse, Schwartz (2018) reports that:

- 53 percent of HHs engage in agricultural labor, 44 percent in trade, 23 percent in fisheries, and 17 percent in charcoal production. Some HHs perform more than one activity.
- Average landholding size is relatively large at 1.78 hectares per HH.
- More than 60 percent of HHs own chickens and more than 40 percent own goats.

1.2.2 Market and Food Access

As discussed in Section 1.2.1, Sud consists of HT01, HT07, and HT08 zones, and Grand'Anse of HT07 and HT08 zones. Market access depends on these livelihood classifications. In HT07 areas, trade networks are characterized by departmental and local supply centers. Poor HHs are unable or barely able to meet their minimal energy needs, possibly due to weak production capacity. As such, 60 to 70 percent of HHs resort to purchasing food, although there is some evidence wealthier HHs consume dairy products from their own animals. In HT08 areas, the prices of imported foods are the highest in the country. This is likely because the area is isolated and infrastructure is poor. Indeed, poor road conditions make market access difficult across the country (Figure 4), particularly during rainy season. While local markets and collection sites for local crops do exist, traveling to a major market such as Port-au-Prince can take from 24 to 48 hours (Figure 5).

Based on FEWS NET 2015, the main staple foods in HT01 zones are: maize and pearl millet (own production from September to October and from March to June), beans (own production from mid-July to November and from March to mid-May), and rice and flour (purchased year-round). The main staple foods in HT07 zones are: 1) rice (purchased year-round), maize (own production from July to August and purchased otherwise), and beans (own production from mid-September to mid-October and mid-April to mid-May and purchased otherwise). The main staple foods

Figure 4. Primary and Secondary Roads in Haiti and AOIs

Source: OpenStreetMap (2020).

Figure 5. Market Accessibility
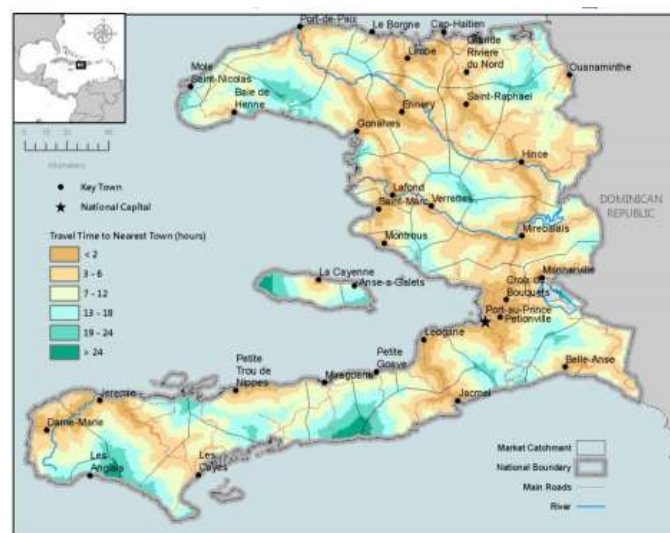
Source: WFP (2016).

in HT08 zones are rice (purchased year-round), maize (own production from August to January and purchased otherwise), and beans (own production in December and purchased otherwise).

Based on CNSA (2019), 89 percent of food at the national level is purchased (about 10 percent on credit) and seven percent is from own production. The majority of purchased food comes from local markets (68 percent) and 28 percent from other markets, i.e., markets or stores outside of the AOI. The main reasons cited as barriers for getting to markets are robbery (66 percent), weapon assaults (39 percent), physical assaults (19 percent), accidents during transport (14 percent), health risks (six percent), and sexual aggressions (one percent). In rural areas, the cited barriers are robbery (65 percent), weapon assaults (23 percent), physical assaults (30 percent), accidents during transport (17 percent), health risks (eight percent), and sexual aggressions (three percent). Urban residents cite weapon assaults (64 percent) as the most common barrier for accessing markets. The most common modes of transportation are walking (60 percent), public transport (20 percent), or some combination (10 percent).

In Sud HT01, 94 percent of food is sourced from purchases, while three percent is from own production. Fifty-four percent of purchased food comes from local markets and 41 percent from other markets. The most common modes of transportation are walking (35 percent), public transport (21 percent), some combination (25 percent), rented transport (11 percent), and owned vehicle (eight percent). In Sud HT07, 78 percent of food is sourced from purchases, while three percent is from own production. The most common modes of transportation are walking (21 percent), public transport (48 percent), some combination (12 percent), rented transport (15 percent), and owned vehicle (three percent). In Sud HT08, 87 percent of food is sourced from purchases while 10 percent is from own production. Seventy-two percent of purchased food comes from local markets and 28 percent from other markets. The most common modes of transportation are walking (66 percent), public transport (15 percent), some combination (seven percent), and rented transport (10 percent).

In Grand'Anse HT07, 59 percent of food is sourced from purchases while 27 percent is from own production. Forty-one percent of purchased food comes from local markets, and 55 percent comes from other markets. The most common modes of transportation are walking (93 percent), public transport (two percent), and some combination (two percent). In Grand'Anse HT08, 79 percent of food is sourced from purchases while 16 percent is from own production. Fifty-one percent of purchased food comes from local markets and 33 percent comes from other markets. The most common modes of transportation are walking (74 percent), public transport (eight percent), some combination (five percent), rented transport (three percent), and animal-led transport (nine percent). These statistics are further captured by Figure 6.

Haitian HHs are highly susceptible to both global and local food price fluctuations (Latino et al. 2016, Table 2), given their high dependence on purchases to meet basic food needs and the large share of food imports they consume (70 percent). Moreover, the country lacks strong resilience structures and is vulnerable to other shocks, particularly natural disasters, which often lead to a rise in local food prices due to low production

Figure 6. Mode of Accessing Food in Sud and Grand'Anse by Livelihood Zone

Source: CNSA (2019).

or rising transport and fuel prices (Glaeser et al. 2011). These shocks often impact HHs' livelihoods due to their dependence on agriculture, for income or direct consumption. All of this has an impact on food security. For instance, El Niño's dry spells negatively impacted both food availability and food access. Drought reduced domestic production and increased the country's dependence on imports and the poor's dependence on markets. At the same time, crop losses and increasing input costs compromised the livelihoods of agricultural wage workers, those who rely on subsistence farming, and local food traders. Income losses and the increases in food prices ultimately put stress on the purchasing power of HHs, in turn reducing purchases of both local and imported foods. According to the 2015 Emergency Food Security Assessment, HHs resorted to negative consumption-based coping strategies. Eighty-one percent reduced meal portions, 78 percent reduced the number of meals, and 83 percent secured cheaper food items.

Table 2. Surplus/Deficit of Food Production by Food Group and AOI

Cereals					Pulses				Tubers			
Dept.	Prod. ('000 Mt)	Demand ('000 Mt)	Surplus/ Deficit ('000 Mt)	% demand covered by production	Prod. ('000 Mt)	Demand ('000 Mt)	Surplus/ Deficit ('000 Mt)	% demand covered by production	Prod. ('000 Mt)	Demand ('000 Mt)	Surplus/ Deficit ('000 Mt)	% demand covered by production
Artibonite	89.0	141.1	-52.1	63%	15.3	39.1	-23.8	39%	21.8	226.5	-204.8	10%
Centre	19.2	61.0	-41.8	31%	36.5	16.9	19.6	216%	21.9	97.9	-76.0	22%
Grand Anse	6.7	38.3	-31.5	18%	11.6	10.6	1.0	109%	87.1	61.4	25.7	142%
Nippes	7.5	28.0	-20.5	27%	5.0	7.8	-2.8	64%	8.3	44.9	-36.6	18%
Nord	5.6	87.2	-81.6	6%	8.9	24.2	-15.3	37%	86.2	139.9	-53.7	62%
Nord-Ouest	5.9	32.2	-26.3	18%	11.1	8.9	2.2	125%	41.1	51.7	-10.5	80%
Nord-Est	6.6	59.5	-53.0	11%	8.8	16.5	-7.7	53%	24.4	95.6	-71.2	26%
Ouest	20.5	329.2	-308.7	6%	25.6	91.2	-65.6	28%	35.3	528.4	-493.1	7%
Sud	27.1	63.3	-36.3	43%	12.8	17.5	-4.8	73%	34.0	101.6	-67.7	33%
Sud Est	7.1	51.7	-44.6	14%	8.6	14.3	-5.7	60%	7.0	83.0	-75.9	8%
Total	**195.3**	**891.5**	**-696.3**	**22%**	**144.1**	**247.0**	**-102.9**	**58%**	**367.2**	**1430.9**	**-1063.7**	**26%**

Source: Latino et al. (2016).

A review of the impact of 2008 food crisis on the poor found that high food prices increased malnutrition (especially in young children) and poverty (Compton et al. 2010). Poor net food importing countries such as Haiti were among the first to feel the effects of rising world food prices. The poorest HHs—including many female-headed HHs and those with a large proportion of dependents—were worst hit everywhere. These HHs spend a higher proportion of their income on food and have less access to credit and savings. Increase in prices thus leads to negative behavioral changes. During the 2008 crisis, HHs resorted to eating less preferred food (reducing dietary diversity, reducing meat/fish/milk consumption, substituting the main staple, etc.) cutting back quantities of food eaten, increasing consumption of street food, buying food on credit or getting credit in cash to buy food (more than a quarter of HHs in Haiti also reported using savings to buy food), and cutting spending on health and education. WFP uses the Food Consumption Score to measure the diversity and frequency of food consumed within a 7-day recall period (Brinkman et al. 2010). After examining the correlation between food prices and the Food Consumption Score, Brinkman et al. (2010) found that rising food prices correlated with a 23 percent decline in food security among HHs in Haiti. That was the steepest such reduction among three countries examined in the study, Haiti, Nepal, and Niger.

According to CNSA's assessment, the price of the food basket grew from 1,698 gourde in December of 2018 to 1,928 gourdes in December 2019, an increase of 40 percent. The central, western, and southern geographic regions of Haiti were the main drivers of that food-price inflation. During the first quarter of 2020, the price of a food basket rose by 25 percent, surpassing 1,960 gourdes by March 2020. In addition, social unrest as well as political and economic instability have caused the value of the gourde to go down over the years. This loss of value has become sharper since 2016: One US dollar was worth 59.45 gourde on January 31, 2016. By June 30, 2020, its worth was 113.31 gourde, a significant devaluation. This is important to note because WFP (2016) found that despite the gourde's deprecation against the US dollar and the Dominican peso, import prices played a marginal role in driving food-price inflation. At the time, WFP concluded that the price in gourde of the main US import, rice, had remained stable across all markets due to a favorable international environment. While that may have been the case in 2016, the current international environment is quite unfavorable, raising concerns about the potential negative impacts of continued gourde devaluation on food prices and food insecurity.

1.2.3   Food Utilization and Nutrition

According to the Consolidated Approach to Reporting Indicators approach established by the WFP, 50.7 percent of Haiti's population is food insecure, either moderately or severely (reported in CNSA, 2019). Based on intake and frequency in a seven-days recall period, 51.5 percent of HHs in the country can be classified as having an inadequate level of food consumption, 20 percent have severely inadequate food consumption, and 31 percent have moderately inadequate food consumption. Twenty-nine percent of HHs report never consuming food rich in Vitamin A, 46 percent report sometimes, and 25 percent report such intake on a daily basis. As for iron-rich foods, 32 percent never consume them, 58 percent consume them sometimes, and 10 percent consume them on a daily basis. Food security increases with education. Just three percent of HHHs with post-secondary education experience food insecurity. But 21 percent of HHHs with no education are food insecure. Table 3 shows that while food insecurity does not vary much by sex, food diversity does.

Table 3. Food Security and Food Diversity by Sex of the Household Head

Food security related indicators	HHH's sex	
	Female	**Male**
Food security		
Severely insecure	21	20
Moderately insecure	31	31
(Marginally) food secure	48	49
Food-group consumption		
2 food groups	8	7
3-4 food groups	27	26
5 or more food groups	65	67
Vitamin A intake consumption		
Never consume	31	28
Consume sometimes	45	46
Consume daily	24	26

Source: CNSA (2019).

In Sud, 46.4 percent of the population is (severely or moderately) food insecure:

- In HT01 areas, 15 percent of HHs consume only two food groups, 15 percent consume 3–4 food groups, and 43 percent consume five or more food groups. Forty-two percent of HHs never consume Vitamin A-rich foods, 41 percent sometimes, and 17 percent consume foods rich in Vitamin A on a daily basis. As for iron-rich foods, 41 percent never consume them, 53 percent consume them sometimes, and seven percent consume them daily.
- In HT07 areas, five percent of HHs consume only two food groups, 14 percent consume 3–4 food groups, and eight percent consume five or more food groups. Fifty-one percent of HHs never consume foods rich in Vitamin A, 38 percent sometimes, and 11 percent consume on a daily basis. As for iron-rich foods, 34 percent never consume them, 45 percent consume them sometimes, and 21 percent consume them daily.
- In HT08 areas, one percent of HHs consume only two food groups, 26 percent consume 3–4 food groups, and 73 percent consume five or more food groups. Twenty-one percent of HHs never consume foods rich in Vitamin A, 48 percent sometimes consume such foods, and 31 percent consume Vitamin A-rich foods daily. As for iron-rich foods, 29 percent never consume them, 59 percent consume them sometimes, and 12 percent consume them daily.

In Grand'Anse, 77.9 percent of the population is severely or moderately food insecure:

- In HT07 areas, fewer than one percent of HHs consume only two food groups, 29 percent consume 3–4 food groups, and 70-71 percent consume five or more food groups. Seventeen percent never consume foods rich in Vitamin A, 57 percent sometimes consume such foods, and 26 percent

consume foods rich in Vitamin A daily. As for iron-rich foods, 63 percent never consume them, 36 percent consume them sometimes, and two percent consume them on a daily basis.

- In HT08 areas, 13 percent of HHs consume only two food groups, 36 percent consume 3–4 food groups, and 51 percent consume five or more food groups. Twenty-six percent of HHs never consume foods rich in vitamin A, 58 percent sometimes consume such foods, and 15 percent consume such foods daily. As for iron-rich foods, 34 percent never consume them, 59 percent consume them sometimes, and seven percent consume them on a daily basis.

The above statistics are further captured by Figure 7, Figure 8, and Figure 9 (CNSA, 2019).

Figure 7. Food Diversity in Southern Departments by Livelihood Zone (# of food groups)
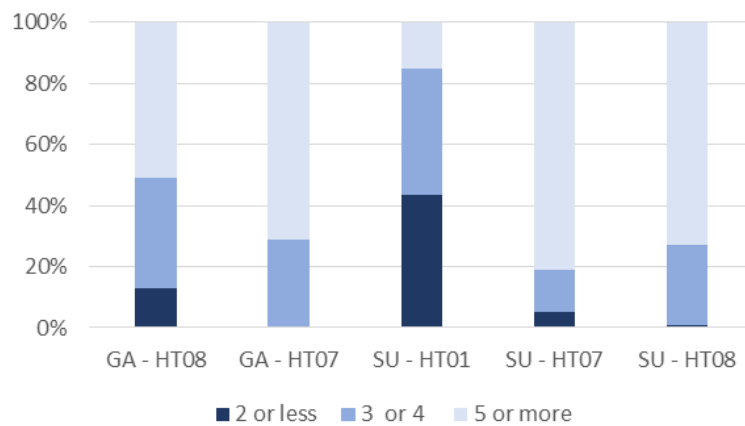
Note: GA stands for Grand'Anse and SU for Sud

Figure 8. Frequency of Vitamin A Intake in Southern Departments by Livelihood Zone
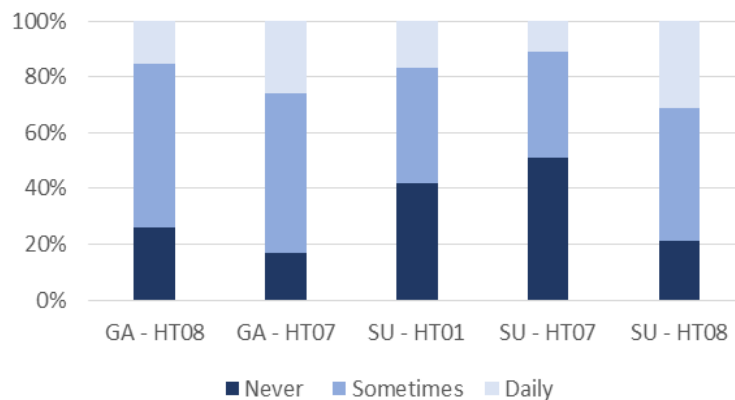
Note: GA stands for Grand'Anse and SO for Sud

Figure 9. Frequency of Iron-fortified Food Consumption in Southern Departments by Livelihood Zone
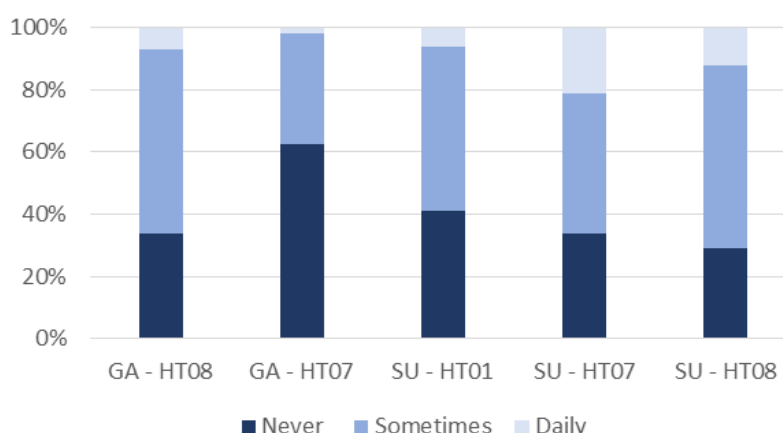
Note: GA stands for Grand'Anse and SO for Sud

The IPC (2019) projected that 1.14 million people in Sud and Grand'Anse combined would be food insecure by June 2019—720,443 in Sud and 421,504 in Grand'Anse. In Sud and Grand'Anse respectively, 31 percent and 45 percent of the population are considered to be either in food-security crisis or emergency.

1.3   Lessons Learned: Programs and Initiatives

This section reviews the main objectives and activities associated with select implemented programs and initiatives, and assesses key lessons learned. Most programs were implemented across the country and thus apply to several departments as opposed to just the AOIs.

1.3.1   Programs and Initiatives: Overview

This section is organized according to the main outcome targeted. However, most programs tend to span multiple outcomes. In other words, the sections below are not mutually exclusive per se.

1.3.1.1 Food Security and Nutrition

The Government of Haiti (GoH) is developing social safety nets to ensure the poor can meet basic needs for food security and nutrition. However, implementation still relies heavily on the support of donors and partners (WFP 2017). For example, WFP is one of the main actors implementing both emergency and non-emergency programs, coordinating with the government to achieve long-lasting policy changes. By 2030, GoH aims to build a strong public school system together with a nationally owned, funded, and managed school feeding program linked to local agriculture. To this end, WFP has supported development and advocacy of the National Policy and Strategy of School Feeding approved by GoH in 2016. Under its National School Feeding Program and in accordance with the government's objectives, WFP provided nutrition-sensitive school meals in nine out of ten departments. The Home-Grown School Feeding model, which used locally produced food such as fresh vegetables bought directly from smallholder farmers, fed 13,500 children in 2017.

1.3.1.2 Emergency Assistance

As discussed earlier in the report, Haiti's proneness to natural disasters and volatile weather conditions combined with its pre-existing economic conditions has contributed to continued degradation of the livelihoods of the most vulnerable. Hence, a number of relief operations, emergency assistance initiatives, and resilience and preparedness building activities have been implemented over the years.

World Vision, in its response to the 2010 earthquake, assisted two million people during the 90 days following the disaster by providing food assistance, shelter, and water, sanitation and hygiene (WASH) services, school kits, school feeding programs, and cholera prevention and treatment services (World Vision 2014).

UNDP launched a cash transfer intervention in Ouest and Grand'Anse in October 2016 to respond to Hurricane Matthew (Díaz 2017). Several other organizations also responded to emergency needs, and by April 2017, 53 organizations had conducted post-Matthew cash activities in Grand'Anse and Sud. UNDP's intervention had two objectives: to immediately stabilize livelihoods by rebuilding useful and sustainable community assets and assisting populations most affected and to strengthen the capacity of local authorities. To achieve the second objective, UNDP transferred 10 percent of the total program costs in each municipality to local authorities.

Catholic Relief Services (CRS) also implemented programs in over 22 communes of Grand'Anse and Sud (Ward 2018). The programs included cash-for-work transfers, large-scale unconditional cash transfers, agricultural input vouchers, electronic vouchers, and complex shelter support projects that combined the skills of architects, engineers, and construction material vendors. Under its Emergency Food Security Project, CRS provided seed vouchers to more than 19,000 HHs. These were complemented by unconditional cash transfers to support basic pre-harvest needs. The project also organized seed fairs to mitigate access issues for some rural communities and to facilitate seed quality inspection and controls.

From March to December 2016, WFP implemented an Emergency Response to Drought Operation that complemented GoH's Drought Emergency Response and Recovery Plan which targeted one million people (WFP 2016). WFP provided general food assistance through cash transfers using an innovative targeting approach that involved the community, nutrition support to prevent acute malnutrition, and food assistance for assets through activities such as restoration of agricultural land through watershed management. In Grand'Anse and Sud, distribution activities were postponed for several months due to Hurricane Matthew (and the resulting collapse of infrastructure), security and access constraints, and political instability during the election period.

Several other programs have been implemented in Haiti to provide food and other forms of assistance to vulnerable HHs in times of emergency (Cuellar et al. 2018). These include programs funded under the Emergency Food Security Program such as Action Contre La Faim International cash for work and agricultural vouchers, World Vision food vouchers, and cash for assets and unconditional cash transfers provided by CARE in response to the extended drought. A cash working group was created post-Matthew to coordinate interventions by the large number of organizations who stepped in to help in the affected areas, to provide technical guidance to different implementing partners, and to standardize different aspects of the interventions.

1.3.1.3 Gender

Two primary initiatives have had a particular focus on gender. First, Fonkoze, one of Haiti's leading microfinance institutions, initiated a multi-pronged livelihoods protection and promotion scheme, called Chemen Lavi Miyò (CLM), to help extremely poor women in rural Haiti rise out of poverty. CLM is an 18-month graduation program that combines livelihoods support (asset transfer, training, veterinary services, value chain support), social protection (cash stipend, health, social network development, insurance etc.), financial inclusion (savings and credit), and the guidance of regular case-manager visits (Shoaf et al. 2019). CLM is the first of a four-step poverty alleviation program that Fonkoze has dubbed Staircase out of Poverty (https://bit.ly/2QFMRgp). CLM is followed by 1) Little Credit - a 3-month microfinance program, 2) Solidarity - a core microfinance program, and 3) Business Development. Fonkoze also provides education and health services and business skills training to support women during their ascent out of poverty. Its health program, Boutik Sante, trains microfinance clients to become Community Health Entrepreneurs. They learn to conduct basic health screenings (including screening children for malnutrition), deliver health education sessions, and procure health products from Fonkoze, which they resell in the community.

Second, Ayitic Goes Global was a program aimed at enabling youth to gain employment in the digital economy (Simpson et al. 2019). Specifically, it taught technology skills to 316 young women, facilitating their placement in remote digital and data-related jobs, i.e., in overseas markets.

Aside from the above-mentioned programs specifically designed for women, few other programs discussed in this report had a gender component. This said, in its emergency response to drought, WFP and its partners systematically put in place requirements to increase gender-balance in management committees. This was an effort to promote women's participation and leadership as well as to ensure women would be, when possible, the primary recipients of cash transfers. In addition, UNDP, in its post-Matthew cash intervention, encouraged all municipalities to enroll women within the list of beneficiaries by suggesting a desirable female quota of 40 percent. In the municipality of Abricot, UNDP carried out a social experiment by targeting only women. In its 2017 report of the National School Feeding Program, WFP noted that since women primarily harvest, process, store, transport, and sell products as well as prepare and cook food, the 2018 school feeding program would make a greater use of women's expertise in its supply chain (WFP 2017).

1.3.1.4 Governance

While capacity building efforts have been a part of the food security and emergency assistance programs of the international community, the Limiyè ak Òganizasyon pou Kolektivite yo Ale Lwen (LOKAL) project was at the forefront of these efforts. LOKAL was a four-year program specifically designed to improve local governance and decentralization in Haiti (Laurent et al. 2012). LOKAL worked closely with the Ministry of Interior and Local Government to finalize the legal framework on decentralization, accepted by GoH and submitted to Parliament. It also facilitated municipal decision making, increased the capacity of elected municipal authorities through training and technical assistance, helped re-establish authority of local governments, increased municipal revenue bases, and designed and implemented a model for communal development. LOKAL benefitted from the emphasis placed by Prime Minister Michèle Duvivier Pierre-Louis on decentralization reform as a major public policy priority and the growing role of the Ministry of Interior and Local Government in coordinating local government reforms and capacity building.

1.3.1.5 Agriculture and Insurance

While food security, nutrition, and livelihood protection programs are much needed, Haiti's agricultural sector also requires attention. After the Emergency Food Security Assessment in December 2015, WFP Haiti found that in Centre, Artibonite, and Nippes, 56-80 percent of traders lacked capacity to handle an increase in demand (Latino et al. 2016). Small retailers—e.g. itinerant vendors and madam sara (a local term for women traders)—expressed concerns about their response capacity, as lack of financial resources and higher producer prices would limit their possibility to replenish stocks. In fact, among all traders interviewed, only 21 percent were confident that re-stocking would take less than a week. Twenty percent said it could take as long as a month. This was particularly the case in Sud-Est, Nippes, and Nord-Est. It has been suggested that in case of emergencies, in-kind food transfers complement cash-based transfers to mitigate pressure on local prices.

Poor infrastructure, in particular road accessibility, and restrictions on movements due to political instability also appear to be key constraints to trade. In fact, the majority of traders in earthquake-affected areas and the southern peninsula ranked transportation and poor road conditions as their two major constraints. In the medium and long run, improvements in infrastructure and production capacity are needed to be prepared for emergencies.

Agronomes et Vétérinaires Sans Frontières has been working in Haiti to support production and trade by smallholders (https://bit.ly/32CwLtn). It supports smallholder irrigation in the plains and mountain regions and has created innovative methods for the development and participative reforesting of drainage basins, which are often highly degraded. It also works with smallholder organizations involved in fair trade export chains (for coffee, cocoa, and fruit) and local supply chains (for plant and animal food products, milk, etc.), local smallholder dairy producers and organizations of associated livestock farmers, and young smallholders.

The infrastructural bottlenecks faced by Haitian farmers are exacerbated by their limited access to formal financial services. The agricultural sector receives a small proportion of formal credit – 0.78 percent of outstanding loans according to the Credit Information Office database (2018). Moreover, financial services offered are not diversified and despite high exposure to risks, only 1.6 percent of adults in rural areas have insurance (World Bank 2019).

The program that could potentially impact agricultural financing in Haiti is the System of Financing and Agricultural Insurance, a project financed by the Canadian Cooperation. It developed a comprehensive approach for strengthening expertise and reducing risk in agricultural finance. By establishing an agricultural loan insurance fund and an index insurance pilot project, it mitigates farmer credit risk and risk of loss. However, the program remains a small-scale project with limited replicability.

In addition, the Microinsurance Catastrophe Risk Organization – a reinsurance company specializing in the design of risk transfer solutions for natural catastrophes to the unserved and underserved population – was founded by Mercy Corps and Fonkoze after the 2010 Haiti earthquake (GIZ 2018). From 2012 to 2015, it operated as a reinsurer for its insurance program in Haiti, providing an innovative structure aimed at minimizing basis risk for Fonkoze's policyholder/borrowers. Between 2011 and 2013, around 36,700 clients received US$ 8.8 million in insurance benefits as a result of various climatic events.

1.3.2 Programs and Initiatives: Challenges and Lessons Learned

1.3.2.1 Government Capacity Building

Deep challenges remain to building government capacity in Haiti. LOKAL identified several, including lack of municipal capacity in enforcing ordinances, collecting fees and taxes, and addressing local safety and security needs, lack of harmony between central and local governments over the extent of decentralization, competing perceptions between local officials and the public of the role of local authorities, and lack of municipal-level law enforcement mechanisms (Laurent et al. 2012). LOKAL recommended increased support for local government functions and processes, in particular, resource mobilization, capacity building, information management, and improved service delivery.

1.3.2.2 Disaster Preparedness, Resilience, and Pre-Positioning

There is agreement across the previously discussed programs and organizations that Haiti lacks the required level of disaster preparedness and resilience. A 2018 review of Food for Peace Market-Based Emergency Programs found the lack of a disaster preparedness law in Haiti to be a significant obstacle to food assistance programming. The government is taking steps to improve institutional and legal frameworks to address this challenge (Cuellar et al. 2018). In its Hurricane Matthew response, Catholic Relief Services (CRS) faced challenges due to inefficient functioning of local systems such as Comité de Protection Civile and their lack of training on cash-based programming (Ward 2018). In order to improve preparedness, CRS recommended developing a local focal point for emergency response. In its response to the 2010 earthquake, World Vision found that the capacity of GoH to respond to a crisis of such magnitude was extremely low (World Vision 2014). In fact, the earthquake caused large-scale destruction of official records and infrastructure, leading to a lack of clarity on policies and strategies for coordination between government agencies and non-governmental organizations. This problem was exacerbated by the fact that more than 1,000 non-governmental organizations and private initiatives responded to the earthquake.

Investments in preparedness and pre-positioning on the part of humanitarian actors are also important. For example, through its Hurricane Matthew response, WFP learned that pre-existing ties to the private sector regarding local and regional purchases facilitate quick availability of commodities for emergency response (WFP 2017). It introduced a new modality in 2017 based on standby contracts. Cuellar et al. (2018) suggested continued investments in pre-positioned assistance and supply chains for multiple food assistance modalities in order to ensure timely response mechanisms. In addition, market assessments conducted before emergencies to prevent delays in implementation immediately after are necessary, including at sub-national levels.

1.3.2.3 Targeting of Beneficiaries

Most development and emergency programs in Haiti have faced some type of challenge in effective targeting of the most vulnerable. UNDP's post-Matthew cash intervention lacked objective criteria to measure which municipalities were most affected and in need of the most immediate help (Díaz 2017). Targeting done by local authorities was based mostly on subjective criteria and proved highly captive to local interests. CRS also faced challenges in specifying targeting criteria and beneficiary selection, the

system to identify the most affected population by engaging with local leaders was flawed and needed adjustment.[2]

Effective targeting is particularly important in the case of Haiti because of the scale of poverty and unmet needs. Most evaluations recommend developing some form of national identification list/database of the most vulnerable and strengthening links between humanitarian relief and development activities. Cuellar et al. (2018) note that such a registry should be flexible enough to accommodate changing circumstances as HHs' vulnerability status changes over time. In 2015, MAST's social safety net information system (SIMAST), supported by WFP under the Kore Lavi program, was used to target households in the Kore Lavi project areas. It proved useful as a targeting mechanism in slow-onset disasters (Genequand et al. 2016). WFP has started using its beneficiary data management platform, SCOPE, for its cash-based interventions (WFP 2017). SCOPE is a digital tool that helps WFP manage beneficiary lists and payments and facilitate reconciliation of beneficiary payments. With their consent, beneficiaries also receive individual cards with their photo to facilitate identification. SCOPE informs WFP who the beneficiaries are and to what they are entitled, issues instructions to banks and service providers, and receives feedback about assistance given.

1.3.2.4 Financial Inclusion

Several cash transfer programs discussed previously used different modalities for different components based on the preferences of beneficiaries and available infrastructure. However, most found lack of financial inclusion and mobile money to be a challenge. According to the 2017 HDHS, about 20 percent of HHs in Sud and 13 percent in Grand'Anse have a bank account. Ward (2018) reports that in case of larger cash transfer programs such as the one implemented by CRS, which reached over 100,000 HHs, electronic transfers are an obvious choice. Yet they still pose a significant challenge due to lack of the wide presence of digital financial services, financial inclusion, community trust, familiarity with mobile money providers, and phone ownership and SIM-card reliability. In fact, the 2017 HDHS suggests not owning a mobile phone is positively associated with poverty. This suggests mobile money would not be a meaningful way to target or access those who are poor, i.e., program beneficiaries. Ward (2018) recommended a process for framework agreements and coverage/service mapping that would allow for a better understanding of where and when mobile options are viable. Cuellar et al. (2018) also recommended continued efforts for improving digital distribution mechanisms through partnerships with the private sector (i.e., mobile service providers) and investments in digital literacy and mobile coverage, particularly in rural areas.

Another aspect of financial inclusion, as highlighted by the evaluation of Fonkoze's CLM program, is the lack of sustainable savings behavior, particularly among Haitian women (Huda et al. 2010). In fact, the program's pilot was unsuccessful at establishing a formal savings culture and increasing cash deposits in a savings account. This was partly due to external factors such as food price increases and internal factors such as logistical issues with accessing and depositing savings. A study of CLM by Institute of Development Studies found that savings were an important means for women to cope with negative

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[2] Prior work in other contexts has found that community targeting can result in higher satisfaction than say proxy means tests or hybrid approaches (Alatas et al. 2012). Also see Hanna and Olken (2018).

shocks (Shoaf et al. 2019). Among surveyed women, levels of cash savings were very low and levels of asset savings through livestock were much higher.

1.3.2.5 Participation of Civil Society Groups and Community Engagement

Varying levels of community engagement and involvement of civil society groups have either hindered or contributed to the progress of various programs. LOKAL found that civil society advocacy for decentralization is virtually nonexistent and political will for decentralization, consequently, limited. Participation of civil society groups is important to inform and mobilize public opinion and support the efforts of local leaders to lobby the central government.

For example, Fonkoze's CLM benefited from Village Assistance Committees which, comprised of leaders and local elite, provided additional resources, support, and buy-in from local communities. The pilot evaluation recommended Village Assistance Committees be sustained post CLM as well. The LOKAL program also recommended higher citizen engagement in decision-making to empower citizens, promote responsiveness, facilitate local buy-in, and help ensure programs are locally owned. LOKAL further recommended building political support for and ensuring the economic sustainability of Fédération Nationale des Associations des Maires d'Haiti and strengthening the capacity of civil society organizations. Finally, the Food for Peace Review (Cuellar et al. 2018) recommended continued partnerships with local community groups (including community-based organizations and faith-based groups) to ensure programming is community-driven, responsive, accountable to the most vulnerable, and reflects idiosyncrasies of Haiti's socio-political environment and culture.

1.3.2.6 Gender Responsiveness

As previously discussed, some programs have addressed gender issues in their design and implementation, either through direct targeting or by increasing female representation. But there is more to be done. Women in Haiti remain more vulnerable than men, especially in situations of natural calamities. They therefore need more support and resources. WFP (2016) found that male HHHs had better ways of coping with food insecurity and recovering from drought than female HHHs. The findings of the first two rounds of the Ayitic Goes Global program showcase that deep-seated gender perceptions and restrictive gender norms in Haiti contribute to inequitable access for women to education and employment opportunities in the field of digital technologies. Finally, Fonkoze's CLM implementation suspected that sustaining positive change might be challenging in the context of extreme vulnerability of CLM members.

According to Cuellar et al. (2018), there has been little monitoring of the impact of Market Based Emergency Programs on women's overall well-being. UNDP's report of its post-Matthew intervention highlighted that breaking the access barrier is important (Díaz 2017). It recommended implementing day care strategies to ensure single HHHs are able to participate and increasing women's wages to signal the desirability of their participation.

Fonkoze's CLM is a notable example that programs targeting women can bring positive change (Huda et al. 2010). The activity noticed two major cognitive changes—increased self-confidence and knowledge/skills of managing an enterprise—and behavioral changes such as sending children to school and engaging in family planning. Survey results also found that women with cooperative partners did significantly better on outcome indicators than women with no partners. Another example is Ayitic Goes Global. In its third training round, the program took a gender transformative approach. The

findings indicate that digital training and gender workshops enabled graduates to challenge gender inequalities and exercise transformative agency. Over the course of the program, trainees experienced gradual improvements in knowledge, self-perception, behavior, gender roles, and relationships with friends and family members.

1.3.2.7 Support to Local Organizations and Producers

Development and emergency programs that provide support to local producers are important in Haiti. A disaster that affects agriculture directly affects livelihoods of the rural population. In its 2016 market analysis, WFP noted that in the medium term, reprise of agriculture is required to restore HHs' livelihoods and incomes (Latino et al. 2016). This process includes facilitating farmers' economic access to scarcely available inputs such as seeds.

Cuellar et al. (2018) also argued for continued investment in the capacity of a network of vendors and suppliers to support local markets' ability to respond to emergencies. They also recommended promotion of local food production in program design, especially since local market-based actors are often responsive immediately after disasters in Haiti.

1.3.2.8 Enhanced Coordination

Given the large number of humanitarian actors working in Haiti, coordination among them and between them and GoH is crucial to prevent duplication of efforts and ensure efficient use of resources. Linking development programs to emergency assistance is also necessary. WFP's drought response in 2016 benefited from partnerships that contributed to decentralizing services and allowed for a transparent and open dialogue with administrative authorities and local communities (WFP 2016). Cooperating partners' previous work in communities also brought a more in-depth understanding of local dynamics.

CRS faced challenges in communicating with local government officials around cash-based initiative messages and systems. It also noted that the cash working group created to coordinate efforts among various organizations during the post-Matthew intervention lacked a system of technical leadership. There were challenges and delays in coordination around setting the transfer amounts and regionally located working groups were not linked with each other or the national level discussions. CRS recommended a more structured system for emergencies.

Cuellar et al. (2018) suggested more efforts between USAID and other donors that provide emergency assistance in Haiti to strengthen national-level management of programs. They also suggested implementing partners layer and sequence development and emergency interventions following the onset of a disaster to meet the changing needs of the population over time. This is particularly necessary in Haiti, where coherence between various programs will mitigate the risk that people are worse off after a disaster. CRS also recommended focused efforts to share resources and learning at the local and national levels, both with those who work in humanitarian response and those who work in development and food security.

2. Data Analysis

2.1 Poverty in Sud

In this analysis, poverty is defined as a HH in the bottom quintile of the wealth-index distribution within a specific department based on the 2017 HDHS.[3] Since wealth index is defined at the country level, but the bottom quintile is within each department, 20 percent of HHs by definition are poor. A review of the literature on poverty determinants—in particular for Haiti (e.g., Jadotte 2010 and Échevin 2014)—suggests the following characteristics may be associated with HH poverty: 1) characteristics of the HH (including those of the HHH); 2) characteristics of individuals within the HH; and 3) characteristics of the place of residence.

The poverty analysis for Sud is based on survey data for 1,133 HHs. For brevity, only key tables are presented in this report. Other tables can be generated based on the source code, the Stata .do file, available from RTAC or the authors upon request. All tables other than those reporting regressions present pairwise comparisons. For example, the first row in Table 4 should be read as follows: "On average, 39.57 percent of HHs own a radio, 46.44 percent of nonpoor HHs own a radio while 12.11 percent of poor HHs do. 29.11 percent of HHs without a radio are poor while 6.13 percent of HHs with a radio are. The p-value in the last column tests whether HHs with and without a certain characteristic are equal in terms of poverty. According to typical thresholds, a p-value below 0.10 indicates a statistically significant difference."

2.1.1 Comparing Poor and Non-Poor HHs

2.1.1.1 *Assets/Animals, House Materials, and Water/Sanitation/Hygiene*

Table 4 suggests poor and nonpoor HHs differ significantly in terms of their asset ownership. For example, poor HHs are less likely to have modes of communication (e.g., radios, TVs, mobile phones, land-lines/house phones, computers, and Internet), modes of transportation (e.g., cars, motorcycles, and bicycles), and other assets such as fridges, gas or petrol lamps, watches, and bank accounts. Interestingly, while poor HHs are more likely to own horses, goats, sheep, and chickens (the latter two are not shown), they do not seem to differ in ownership of or access to agricultural assets such as animal-drawn carts and land or cows and livestock more generally.

Table 5 compares poor and nonpoor HHs with regard to the house construction materials and characteristics. The poor are more likely to reside in houses with walls made from cane/palm, dirt/mud, or other materials, sand floors, and metal or leaf roofs. They are also more likely to access drinking water via unprotected springs, and less likely to have access to a toilet (e.g., flushed to septic tank or latrine with slab) and a dedicated place for handwashing (Table 6).

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[3] The analysis has also been conducted for the 2012 HDHS and the results are robust, unless otherwise noted. Also see select tables in the annex, which combine the two waves.

Table 4. HH Assets and Poverty in Sud (2017 HDHS)

HH has ...	All	Nonpoor	Poor	HH without	HH with	p
Radio	39.57	46.44	12.11	29.11	6.13	0.00
TV	17.16	21.22	0.92	23.94	1.07	0.00
Mobile phone	77.29	85.92	42.79	50.41	11.08	0.00
Land-line	0.61	0.76	0.00	20.14	0.00	0.01
Computer	3.79	4.74	0.00	20.80	0.00	0.00
Fridge	6.92	8.52	0.51	21.39	1.49	0.00
Internet	16.54	19.94	2.96	23.27	3.58	0.00
Cuisiniere	5.35	6.68	0.00	21.14	0.00	0.00
Gas or petrol lamp	74.78	73.50	79.91	15.94	21.39	0.04
Solar energy	22.38	25.98	8.02	23.72	7.17	0.00
Bicycle	6.64	7.78	2.10	20.99	6.34	0.00
Motorcycle	15.91	19.31	2.29	23.25	2.88	0.00
Car	2.64	3.31	0.00	20.56	0.00	0.00
Boat, no motor	1.33	1.26	1.61	19.96	24.25	0.73
Boat	0.45	0.43	0.54	20.00	23.66	0.86
Animal-drawn cart	0.22	0.27	0.00	20.06	0.00	0.17
Watch	14.89	18.09	2.10	23.02	2.83	0.00
Bank account	19.60	23.71	3.18	24.10	3.25	0.00
Land usable for agriculture	79.64	79.04	82.04	17.65	20.62	0.32
Livestock	73.48	74.51	69.34	23.13	18.89	0.16
Cows	35.27	35.68	33.62	20.52	19.08	0.60
Horses	14.33	15.28	10.54	20.90	14.72	0.06
Goats	35.53	37.24	28.70	22.13	16.17	0.02

Source: Authors' calculations.

Table 5. House Materials and Poverty in Sud (2017 HDHS)

House has ...	All	Nonpoor	Poor	HH without	HH with	p
Cane/palm walls	8.37	4.13	25.30	16.31	60.52	0.00
Dirt or mud walls	11.78	7.35	29.50	15.99	50.12	0.00
Cement walls	49.57	57.77	16.80	33.02	6.78	0.00
Stone walls	15.14	16.96	7.87	21.73	10.41	0.00
Other types of walls	15.15	13.80	20.53	18.74	27.12	0.03
Sand floor, or other materials	38.34	28.77	76.57	7.60	39.97	0.00
Cement floor	57.18	65.62	23.43	35.79	8.20	0.00
Ceramic floor	4.48	5.61	0.00	20.95	0.00	0.00
Leaf roof	6.31	2.25	22.53	16.55	71.52	0.00
Roof: tents	4.59	3.78	7.83	19.33	34.13	0.08
Metal roof	77.30	80.07	66.23	29.78	17.15	0.00
Cement roof	10.50	13.12	0.00	22.36	0.00	0.00
Other types of roofs	5.90	4.56	11.24	18.88	38.13	0.01

Source: Authors' calculations.

Table 6. Water Access, Sanitation, Hygiene, and Poverty in Sud (2017 HDHS)

HH has …	All	Nonpoor	Poor	HH without	HH with	p
Drinking water: piped water	11.01	11.79	7.88	20.72	14.33	0.07
Drinking water: public tap	26.26	30.58	8.99	24.70	6.85	0.00
Drinking water: protected spring	9.46	8.87	11.85	19.49	25.06	0.26
Drinking water: unprotected spring	22.02	14.58	51.77	12.38	47.04	0.00
Drinking water: wells	19.94	20.86	16.23	20.94	16.30	0.12
Drinking water: water selling kiosk	8.72	10.69	0.83	21.74	1.91	0.00
Drinking water: other sources	2.59	2.62	2.45	20.04	18.91	0.87
Toilet: flushed to septic tank	4.09	5.12	0.00	20.87	0.00	0.00
Toilet: ventilated improved pit	1.70	2.12	0.00	20.36	0.00	0.00
Toilet: pit latrine with slab	39.84	46.27	14.15	28.56	7.11	0.00
Toilet: open pit	18.09	20.76	7.44	22.62	8.23	0.00
Toilet: other	1.12	1.19	0.84	20.07	14.97	0.62

HH has …	All	Nonpoor	Poor	HH without	HH with	p
Toilet: none	35.16	24.55	77.58	6.92	44.16	0.00
Fixed place for hand washing	11.10	12.87	3.99	21.61	7.21	0.00
Mobile place for hand washing	63.81	65.95	55.27	24.74	17.33	0.01
No place for hand washing	25.09	21.18	40.74	15.83	32.49	0.00

Source: Authors' calculations.

2.1.1.2 Other Characteristics

Table 7 compares demographic characteristics of poor and nonpoor HHs. Poor HHs are more likely to be headed by men, and less educated. They also have a greater proportion of HH members younger than 15 years of age. Accordingly, poor HHs also have a higher dependency ratio. These demographic predictors appear to be consistent with findings from prior literature, in particular Jadotte (2010) and Échevin (2014).

Table 7. HHH Characteristics, HH Structure, and Poverty in Sud (2017 HDHS)

Characteristic	All	Nonpoor	Poor	HH without	HH with	p
HHH is a woman	41.18	42.55	35.70	21.88	17.35	0.07
HHH age	52.22	52.31	51.87	--	--	0.73
HHH education: no schooling	42.05	38.52	56.15	15.14	26.73	0.00
HHH education: primary	34.19	35.18	30.26	21.21	17.71	0.19
HHH education: secondary	19.88	21.45	13.59	21.58	13.68	0.01
HHH education: higher	3.81	4.76	0.00	20.81	0.00	0.00
HHH is single	5.74	6.55	2.53	20.70	8.81	0.00
HHH is married	66.54	65.54	70.57	17.60	21.23	0.16
HHH is widowed	18.80	18.96	18.18	20.17	19.35	0.80
HHH is divorced	8.91	8.96	8.71	20.06	19.58	0.91
HH size	4.61	4.64	4.49	--	--	0.40
# of HH members below 15 years	1.55	1.48	1.85	--	--	0.01
# of HH members above 65 years	0.45	0.45	0.43	--	--	0.75
Dependency ratio of the HH	0.41	0.40	0.48	--	--	0.00

Source: Authors' calculations.

2.1.2 Disaggregated Analysis by Rural and Urban Areas

For this disaggregated analysis, poverty is defined within rural and urban areas. For example, poor urban HHs are the 20 percent poorest in urban areas according to the wealth index, with a similar definition for poor rural HHs. Unless otherwise noted, characteristics are associated with poverty of urban and rural HHs in a similar way. The tables are not shown but available from the authors on request.

Gender and Other Characteristics. The share of female HHHs is higher in urban areas, but the gender of the HHH makes a significant difference in poverty only in rural areas, although the importance is qualitatively important in urban areas as well. In rural areas, 34 percent of poor HHHs are female, compared to 42 percent of nonpoor HHs. In urban areas, 34 percent of poor HHHs are female compared to 49 percent of nonpoor HHs. Marital status is also associated differently with poverty across urban and rural areas. Single HHHs (4 percent of all HHHs) in rural areas are significantly less poor, whereas marital status seems to make no difference in poverty prevalence in urban areas.

Assets. Ownership of or access to assets is higher among urban HHs, with the exception of land usable for agriculture. Eighty-five percent of HHs in rural areas have access to land usable for agriculture compared to 53 percent of HHs in urban areas. Rural HHs that own gas or petrol lamps are significantly more likely to be poor. Animal ownership is largely prevalent in rural areas, where 81 percent own an animal. Neither in rural nor urban areas is animal ownership significantly associated with poverty.

WASH. In rural areas, HHs with access to drinking water through pipes or public taps are less likely to be poor. There is no such association in urban areas. Similarly, access to drinking water through unprotected springs is associated with poverty, but only in rural areas. This could be linked to the fact that only one percent of HHs in urban areas primarily access drinking water through unprotected springs relative to 26 percent of rural HHs. HHs that have mobile handwashing stations are less likely to be poor, but this is only significant in rural areas.

2.1.3 Disaggregated Analysis by the Sex of the HHH

Male and female HHHs are about the same age on average (52). However, poor female HHHs are significantly younger on average (49 versus 53). Single male HHHs are significantly less poor, but there is no such difference for female HHHs. Male widowed HHHs are poorer, but there is no such difference for female HHHs. The dependency ratio, and in particular the share of members younger than 15, is associated with a higher prevalence of poverty, but only among male HHHs.

Assets. Male HHHs who own a gas lamp are more likely to be poor, but there is no such difference for female HHHs. Similarly, male HHHs who have access to land usable for agriculture are more likely to be poor. Male HHHs who own animals (i.e., horses, goats, and chickens) are less likely to be poor than male HHHs who do not, but there is no such association for female HHHs. Housing materials are not significantly associated with poverty for either male or female HHHs.

WASH. Access to drinking water through pipes is associated with being less poor only among male HHHs. Similarly, access through wells is associated with being less poor, but only among male HHHs. Finally, the presence of a mobile place for handwashing is associated with less poverty, but only for male HHHs.

2.1.4   Individual-level Characteristics and Poverty

The individual-level characteristics discussed here are based on men aged 15-54 and women aged 15-49. Among these individuals, 18 percent have no education, 41 percent have secondary education, and six percent hold a post-secondary degree. 10 percent are unemployed and for those working, the main occupations are sales (44 percent), professional occupations (17 percent), and agriculture (16 percent).

Gender does not seem to be correlated with poverty status. However, age does. On average poorer individuals are older (36 vs 34 years). Those who are less educated are significantly poorer. Poor individuals are less likely to be literate, read newspapers (although marginally), and watch TV.

2.1.5   Econometric Analysis of HH Poverty

Table 18 presents coefficients for an OLS regression of poverty on a full set of characteristics previously considered for pairwise comparisons, by department (Sud in column 1 and Grand'Anse in column 2) and pooled across both departments (column 3). In short, the following characteristics are predictive of poverty: HHs who own radios and mobile phones or have a fixed/mobile place for handwashing are less likely to be poor. Those who live in houses with cane/palm or dirt/mud walls are more likely to be poor. HHs who own sheep are more likely to be poor, whereas HHs who own chickens are less likely to be poor.

2.2   Poverty in Grand'Anse

The poverty analysis for Grand'Anse is based on survey data for 1,009 HHs. As previously indicated, all tables other than those reporting regressions present pairwise comparisons.

2.2.1   Comparing Poor and Non-Poor HHs

2.2.1.1   *Assets/Animals, House Materials, and Water/Sanitation/Hygiene*

Table 8 suggests poor and nonpoor HHs differ significantly in asset ownership. For example, poor HHs are less likely to have modes of communication (e.g., radios, TVs, mobile phones, computers, and Internet), modes of transportation (e.g., cars, motorcycles), and other assets such as fridges, watches, and bank accounts. In contrast to Sud, poor HHs do not seem to differ on any agricultural assets or ownership of animals.

Table 8. HH Assets and Poverty in Grand'Anse (2017 HDHS)

HH has ...	All	Nonpoor	Poor	HH without	HH with	p
Radio	33.94	38.11	17.31	25.08	10.22	0.00
TV	7.24	8.90	0.63	21.47	1.75	0.00
Mobile phone	66.84	72.14	45.70	32.81	13.70	0.00
Land-line	0.43	0.39	0.59	20.01	27.36	0.76
Computer	1.85	2.32	0.00	20.42	0.00	0.00
Fridge	2.92	3.66	0.00	20.64	0.00	0.00
Internet	9.04	10.11	4.78	20.98	10.58	0.01
Cuisiniere	1.58	1.98	0.00	20.36	0.00	0.00
Gas or petrol lamp	67.36	66.75	69.79	18.55	20.76	0.42
Solar energy	20.28	23.59	7.04	23.36	6.95	0.00
Bicycle	1.75	1.85	1.35	20.12	15.46	0.60
Motorcycle	9.81	11.28	3.95	21.34	8.07	0.00
Car	0.57	0.71	0.00	20.15	0.00	0.03
Boat, no motor	0.96	0.59	2.44	19.74	50.81	0.10
Watch	10.87	12.95	2.57	21.90	4.73	0.00
Bank account	12.56	14.96	2.98	22.23	4.76	0.00
Land usable for agriculture	84.30	84.96	81.71	23.35	19.42	0.29
Livestock	69.07	69.40	67.71	20.91	19.65	0.66
Cows	24.37	24.24	24.92	19.89	20.49	0.84
Horses	12.35	12.79	10.56	20.45	17.14	0.37
Goats	32.41	32.22	33.20	19.81	20.52	0.79

Source: Authors' calculations.

Table 9 compares poor and nonpoor HHs with regard to the house construction materials and characteristics. The poor are more likely to reside in houses with leaf roofs and less likely to live in houses with ceramic floors. Poor HHs are also more likely to access drinking water via unprotected springs, lack access to a proper toilet (e.g., flushed, ventilated improved pit, or latrine), and engage in mobile hand-washing (Table 10). Otherwise, poor HHs do not seem to differ on dwelling characteristics.

Table 9. House Materials and Poverty in Grand'Anse (2017 HDHS)

House has ...	All	Nonpoor	Poor	HH without	HH with	p
Cane/palm walls	28.25	27.14	32.71	18.79	23.20	0.12
Dirt or mud walls	11.76	12.13	10.30	20.37	17.54	0.45
Cement walls	28.85	29.79	25.11	21.09	17.44	0.19
Stone walls	12.28	11.28	16.30	19.12	26.58	0.09
Other types of walls	18.84	19.66	15.58	20.84	16.56	0.17
Sand floor, or other materials	57.27	57.36	56.90	20.21	19.91	0.91
Cement floor	41.34	40.90	43.10	19.44	20.89	0.58
Ceramic floor	1.39	1.74	0.00	20.32	0.00	0.00
Leaf roof	9.64	7.71	17.32	18.33	36.02	0.00
Roof: tents	13.26	11.11	21.82	18.06	32.98	0.00
Metal roof	67.18	69.26	58.89	25.10	17.56	0.01
Cement roof	8.81	10.89	0.50	21.86	1.14	0.00
Other types of roofs	14.38	12.14	23.29	17.95	32.46	0.00

Source: Authors' calculations.

Table 10. Water Access, Sanitation, Hygiene, and Poverty in Grand'Anse (2017 HDHS)

HH has ...	All	Nonpoor	Poor	HH without	HH with	p
Drinking water: piped water	7.67	7.20	9.55	19.63	24.93	0.35
Drinking water: public tap	15.10	15.73	12.58	20.63	16.69	0.27
Drinking water: protected spring	8.63	8.22	10.23	19.69	23.76	0.38
Drinking water: unprotected spring	45.36	41.79	59.61	14.81	26.33	0.00
Drinking water: wells	2.99	3.36	1.48	20.35	9.93	0.09
Drinking water: water selling kiosk	8.84	10.94	0.46	21.88	1.05	0.00
Drinking water: other sources	11.41	12.74	6.09	21.24	10.70	0.00
Toilet: flushed to septic tank	3.83	4.78	0.00	20.83	0.00	0.00
Toilet: ventilated improved pit	2.03	2.40	0.59	20.33	5.78	0.03
Toilet: pit latrine with slab	24.76	28.27	10.75	23.77	8.70	0.00

HH has …	All	Nonpoor	Poor	HH without	HH with	p
Toilet: open pit	19.14	20.30	14.53	21.18	15.21	0.05
Toilet: other	0.70	0.59	1.17	19.94	33.43	0.50
Toilet: none	49.53	43.66	72.96	10.74	29.52	0.00
Fixed place for hand washing	7.59	8.46	4.12	20.79	10.87	0.01
Mobile place for hand washing	74.76	73.49	79.82	16.02	21.40	0.05
No place for hand washing	17.66	18.06	16.06	20.43	18.23	0.49

Source: Authors' calculations.

2.2.1.2 Other Characteristics

Table 11 compares demographic characteristics of poor and nonpoor HHs. Contrary to Sud (as presented earlier), poor HHHs are neither more nor less likely to be men. While about the same age on average as nonpoor HHHs, poor HHHs are likely to be less educated and unmarried or widowed. Poor HHs also have a higher proportion of members younger than 15 years of age. As such, their dependency ratio is higher than that of nonpoor HHs.

Table 11. HHH Characteristics, HH Structure, and Poverty in Grand'Anse (2017 HDHS)

Characteristic	All	Nonpoor	Poor	HH without	HH with	p
HHH is a woman	39.03	38.09	42.78	18.81	21.96	0.24
HHH age	52.12	52.38	51.09	--	--	0.31
HHH education: no schooling	40.97	39.55	46.65	18.11	22.82	0.07
HHH education: primary	37.77	38.00	36.84	20.34	19.54	0.76
HHH education: secondary	17.32	17.80	15.38	20.51	17.80	0.41
HHH education: higher	3.84	4.64	0.63	20.71	3.28	0.00
HHH is single	3.32	3.54	2.44	20.22	14.73	0.39
HHH is married	70.75	72.40	64.16	24.55	18.17	0.03
HHH is widowed	17.50	16.12	22.99	18.70	26.32	0.04
HHH is divorced	8.43	7.93	10.42	19.60	24.75	0.30
HH size	4.72	4.74	4.61	--	--	0.50
# of HH members below 15 years	1.69	1.64	1.89	--	--	0.06
# of HH members above 65 years	0.40	0.42	0.34	--	--	0.12

Dependency ratio of the HH	0.43	0.42	0.47	--	--	0.03

Source: Authors' calculations.

2.2.2 Disaggregated Analysis by Rural and Urban Areas

For this disaggregated analysis, poverty is defined within rural and urban areas. Poor urban HHs are the 20 percent poorest in urban areas according to the wealth index, with a similar definition for poor rural HHs. Unless otherwise noted, similar characteristics are associated with poverty of urban and rural HHs. The tables are not shown but available from the authors on request.

Gender and Other Characteristics. The share of female HHHs is higher in urban areas (49 percent vs 36 percent), but the gender of the HHH seems to make no difference with respect to poverty prevalence in either area. In urban areas, poor HHHs are significantly older than non-poor HHHs, but not in rural areas. In rural areas, married HHHs are less likely to be poor and widowed HHHs are more likely to be poor.

Assets. Urban HHs own or have access to more assets than rural HHs, except for land usable for agriculture. As such, HHs that lack access to land usable for agriculture are significantly less poor in both rural and urban areas. A similar relationship holds for ownership of animals, since rural HHs are more likely to own them. Ownership of cows and goats makes no significant difference in poverty prevalence in rural areas, but the difference is significant in urban areas.

2.2.3 Disaggregated Analysis by the Sex of the HHH

Female and male HHs are about the same age (52 years). Poor male HHHs are significantly younger on average. Poor female HHHs are older, but the difference is not statistically significant. Single female HHHs are less poor, although they represent only 2.5 percent of female HHHs. Married female HHHs are less poor whereas widowed female HHHs are poorer. The number of dependents over 65 years in poor HHs is lower, but this is only significant among female HHHs.

Assets. Male HHHs living in houses with metal roofs are significantly less likely to be poor whereas no such difference is observed among female HHHs.

2.2.4 Individual-level Characteristics and Poverty

The individual-level characteristics discussed here are based on men aged 15-54 and women aged 15-49. Eighteen percent have no education, 38 percent have secondary education, and four percent hold a post-secondary degree. Also, 14 percent are unemployed, and the main occupation is sales at 55 percent.

Neither gender nor age differs across poor and non-poor individuals. Poverty is similar across those with and without education overall, although individual education categories are predictive of poverty (i.e., primary education positively and secondary education negatively). Those who read newspapers are less likely to be poor. An individual's occupation does not seem to be associated with poverty.

2.2.5 Econometric Analysis of HH Poverty

Returning to Table 18, the following characteristics are predictive of poverty. Similar to Sud, HHs who own radios and mobile phones are less likely to be poor. Moreover, those who access drinking water

through (protected or unprotected) springs and those who live in houses with cement floors are more likely to be poor.

2.3   Child Malnutrition

In this analysis, a child is considered stunted if the z-score of height-for-age is below -2 standard deviation. A child is considered wasted if the z-score of weight-for-height is below -2 standard deviation. The z-scores have been computed in terms of SD from the median of the World Health Organization reference population (see the 2017 HDHS documentation for additional detail). The datasets for child malnutrition are significantly smaller than those for poverty. There are 498 children for Sud and 516 children for Grand'Anse. Accordingly, the stunting and wasting analyses will pool across both departments. Even so, some of the regression results are globally insignificant (results not reported). To attempt to gain statistical power, data from the 2012 and 2017 HDHS were pooled. The results presented in this section are thus pooled across departments and waves of HDHS. The final sample sizes for the analysis are 779 children for Sud and 764 children for Grand'Anse, so 1,543 children in total for these departments. Even so, regressions for Grand'Anse are not significant (see results in Table 19 and Table 20). The findings discuss pairwise comparisons for both departments as well as the pooled regressions results.

2.3.1   Correlates of Stunting

Pairwise comparisons of the mother, father, and child characteristics with regard to stunting are presented in Table 12, Table 13, and Table 14 respectively. The findings suggest children are more likely to be stunted if either parent has no formal education or works in agriculture.[4] Mothers with no literacy skills are also more likely to have stunted children, as are mothers with manual occupation (although the latter represent only two percent of mothers). Children with fathers employed in sales are less likely to be stunted, but only marginally. Although not shown, children are also more likely to be stunted if the HHH has no formal education, drinking water comes from an unprotected spring, the HH has no access to a proper toilet (e.g., pit latrine with slab), and the house has cane/palm walls, stone walls, sand floors, or leaf roofs. Children are also less likely to be stunted if the house has a metal roof. Children who were very small at birth are more likely to be stunted, probably reflecting the chronic nature of stunting. Additionally, a larger size is associated with higher stunting prevalence. The sex of the child is not statistically associated with stunting.

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[4] Children are found to be more likely to be stunted if the mother is the HHH, but this holds only when the 2017 HDHS is used (results not show in this report).

Table 12. Mother's Characteristics and Stunting in Sud and Grand'Anse (Pooled) Departments

Characteristic	All	Non-stunted	Stunted	HH without	HH with	p
Mother is HHH	18.26	18.35	21.85	19.89	23.61	0.20
Mother is HHH's wife	42.05	43.43	39.78	21.64	19.20	0.29
Mother is HHH's daughter	20.45	20.48	21.54	20.38	21.44	0.70
Mother is HHH's daughter-in-law	6.28	6.12	5.97	20.63	20.18	0.92
Mother is HHH's sister	2.10	1.99	1.32	20.71	14.64	0.41
Mother and HHH: other relationship	4.92	5.05	4.86	20.63	19.97	0.90
Mother has no relationship with HHH	5.93	4.58	4.69	20.58	20.97	0.95
Mother's education: none	20.74	17.04	29.49	18.07	30.98	0.00
Mother's education: primary	48.36	47.86	51.08	19.58	21.68	0.35
Mother's education: secondary	28.10	31.61	17.90	23.75	12.81	0.00
Mother's education: post-secondary	2.80	3.48	1.53	20.93	10.21	0.05
Mother never married	74.26	74.71	73.29	21.50	20.29	0.64
Mother is married	12.13	11.26	13.30	20.22	23.45	0.35
Mother lives with partner	0.80	0.77	0.83	20.59	21.71	0.92
Mother is separated, divorced or widowed	5.47	4.76	6.03	20.38	24.75	0.45
Mother's occupation: none	36.39	34.86	37.94	19.82	22.02	0.35
Mother's occupation: professional or managerial	3.04	4.46	1.34	21.13	7.21	0.00
Mother's occupation: sales	47.41	49.12	45.65	21.70	19.43	0.31
Mother's occupation: agriculture	7.99	7.03	11.37	19.83	29.54	0.05
Mother's occupation: domestic	3.50	2.98	3.28	20.55	22.20	0.81
Mother's occupation: manual	1.66	1.54	0.43	20.78	6.81	0.07
Mother works all year	35.79	37.46	33.95	21.51	19.04	0.30
Mother works seasonally	12.75	12.99	13.72	20.46	21.51	0.75
Mother works occasionally	15.06	14.69	14.40	20.66	20.27	0.90
Mother's literacy: none	37.84	32.16	52.28	15.43	29.66	0.00
Mother's literacy: partial	12.65	13.30	12.82	20.69	20.01	0.83

Characteristic	All	Non-stunted	Stunted	HH without	HH with	p
Mother's literacy: fully	49.51	54.54	34.89	27.09	14.24	0.00

Source: Authors' calculations.

Table 13. Father's Characteristics and Stunting in Sud and Grand'Anse (Pooled) Departments

Characteristic	All	Non-stunted	Stunted	HH without	HH with	p
Father's education: none	23.61	21.54	31.10	18.72	27.46	0.00
Father's education level: primary	40.80	38.80	46.70	18.59	23.99	0.03
Father's education level: secondary	30.26	32.66	19.96	23.76	13.81	0.00
Father's education level: higher	5.33	7.00	2.24	21.61	7.75	0.00
Father's occupation: none	0.88	1.15	1.19	20.59	21.11	0.96
Father's occupation: professional or managerial	9.64	12.59	4.55	22.08	8.57	0.00
Father's occupation: sales	10.75	10.92	8.04	21.12	16.04	0.11
Father's occupation: agriculture	48.83	43.47	61.74	14.94	26.92	0.00
Father's occupation: domestic	1.12	1.30	0.91	20.66	15.40	0.50
Father's occupation: manual	18.50	19.06	13.14	21.78	15.17	0.01

Source: Authors' calculations.

Table 14. Child's Characteristics and Stunting in Sud and Grand'Anse (Pooled) Departments

Characteristic	All	Non-stunted	Stunted	HH without	HH with	p
Child is a girl	49.37	50.74	46.50	21.98	19.21	0.22
Pregnancy wanted then	46.98	45.67	48.50	19.74	21.60	0.41
Pregnancy wanted later	26.79	28.99	24.30	21.67	17.86	0.12
Pregnancy not wanted	26.17	25.28	27.20	20.18	21.82	0.53
Child at birth was very large	10.84	11.68	6.73	21.51	13.00	0.01
Child at birth was larger than average	19.12	19.66	16.67	21.20	18.03	0.28
Child at birth had average size	45.21	47.45	48.58	20.24	20.99	0.74
Child at birth was smaller than average	14.31	13.92	16.74	20.06	23.79	0.27
Child at birth was very small at birth	10.52	7.29	11.29	19.89	28.64	0.05
Vitamin A in last six months	34.57	36.88	32.19	21.80	18.46	0.15
Child had diarrhea recently	19.37	20.40	20.68	20.54	20.82	0.92
Child had fever recently	26.27	28.20	28.73	20.48	20.91	0.87
Child had cough recently	55.14	57.93	54.93	21.75	19.74	0.38
Child had shortness of breath recently	48.45	46.26	45.08	20.86	20.08	0.75

Source: Authors' calculations.

2.3.2   Econometric Analysis of Stunting

Results from the econometric analysis of stunting (Table 19) show that children living in HHs with a large number of members under 15 years of age are more likely to be stunted. Stunting decreases with the size at birth. This seems to denote the chronic dimension of malnutrition captured by stunting. Finally, children whose mothers are fully literate are significantly less likely to be stunted.

Results for Sud offer insights particular to that department. Children in HHs headed by women, be it their mother or not, are less likely to be stunted. A greater number of older dependents (members over 65 years of age) seems to be associated with a greater prevalence of stunting. Children whose pregnancy was unwanted are significantly less stunted.

2.3.3   Correlates of Wasting

Pairwise comparisons of the mother, father, and child characteristics with regard to wasting are presented in Table 15, Table 16, and Table 17. The findings suggest children are more likely to be wasted if the mother is the HHH, a widow, is separated, or the father has no education. Children with fathers who are farmers seem less likely to be wasted. Otherwise, most characteristics are not significantly associated with wasting. Although not shown, children are also more likely to be wasted if

the HHH is a woman, the HH lacks access to a proper toilet, the HH has no fixed place for hand washing, and the HH does not have piped drinking water. Based solely on 2017 HDHS, children are more likely to be wasted if the dwelling has cane/palm walls.

Table 15. Mother's Characteristics and Wasting in Sud and Grand'Anse (Pooled) Departments

Characteristic	All	Non-wasted	Wasted	HH without	HH with	p
Mother is HHH	18.26	18.59	28.96	3.59	6.24	0.09
Mother is HHH's wife	42.05	43.55	22.91	5.51	2.20	0.00
Mother is HHH's daughter	20.45	20.50	25.72	3.84	5.08	0.42
Mother is HHH's daughter-in-law	6.28	6.02	7.79	4.02	5.24	0.58
Mother is HHH's sister	2.10	1.85	1.94	4.09	4.30	0.96
Mother and HHH: other relationship	4.92	4.69	12.68	3.76	10.34	0.07
Mother has no relationship with HHH	5.93	4.80	0.00	4.29	0.00	0.00
Mother's education: none	20.74	19.43	24.12	3.86	5.03	0.39
Mother's education: primary	48.36	48.46	50.92	3.91	4.29	0.72
Mother's education: secondary	28.10	28.94	23.93	4.37	3.41	0.44
Mother's education: post-secondary	2.80	3.17	1.03	4.18	1.37	0.07
Mother never married	74.26	74.76	66.00	5.44	3.63	0.19
Mother is married	12.13	11.47	16.81	3.86	5.89	0.30
Mother lives with partner	0.80	0.82	0.00	4.13	0.00	0.00
Mother is separated, divorced or widowed	5.47	5.24	0.00	4.31	0.00	0.00
Mother's occupation: none	36.39	35.38	38.81	3.88	4.47	0.60
Mother's occupation: professional or managerial	3.04	3.87	2.64	4.14	2.83	0.64
Mother's occupation: sales	47.41	48.28	50.62	3.92	4.28	0.73
Mother's occupation: agriculture	7.99	8.03	5.56	4.20	2.87	0.37
Mother's occupation: domestic	3.50	3.07	2.38	4.12	3.21	0.69
Mother's occupation: manual	1.66	1.37	0.00	4.15	0.00	0.00
Mother works all year	35.79	36.84	33.22	4.32	3.71	0.59
Mother works seasonally	12.75	13.29	9.74	4.25	3.03	0.38

Characteristic	All	Non-wasted	Wasted	HH without	HH with	p
Mother works occasionally	15.06	14.49	18.23	3.92	5.10	0.43
Mother's literacy: none	37.84	36.18	39.88	3.87	4.49	0.57
Mother's literacy: partial	12.65	13.23	12.75	4.12	3.95	0.91
Mother's literacy: fully	49.51	50.59	47.38	4.35	3.84	0.64

Source: Authors' calculations.

Table 16. Father's Characteristics and Wasting in Sud and Grand'Anse (Pooled) Departments

Characteristic	All	Non-wasted	Wasted	HH without	HH with	p
Father's education: none	23.61	23.05	36.13	3.19	5.86	0.05
Father's education level: primary	40.80	40.62	34.68	4.18	3.28	0.40
Father's education level: secondary	30.26	30.37	21.71	4.27	2.76	0.13
Father's education level: higher	5.33	5.96	7.47	3.76	4.74	0.73
Father's occupation: none	0.88	1.21	0.00	4.14	0.00	0.00
Father's occupation: professional or managerial	9.64	10.84	13.43	3.98	5.02	0.59
Father's occupation: sales	10.75	10.22	13.00	3.97	5.15	0.54
Father's occupation: agriculture	48.83	47.78	35.42	5.01	3.07	0.05
Father's occupation: domestic	1.12	1.20	1.71	4.07	5.72	0.77
Father's occupation: manual	18.50	17.72	19.26	4.02	4.43	0.78

Source: Authors' calculations.

Table 17. Child's Characteristics and Wasting in Sud and Grand'Anse (Pooled) Departments

Characteristic	All	Non-wasted	Wasted	HH without	HH with	p
Child is a girl	51.04	51.41	32.73	4.61	2.17	0.04
Pregnancy wanted then	45.65	45.95	56.26	2.75	4.10	0.27
Pregnancy wanted later	27.72	27.27	29.43	3.28	3.63	0.80
Pregnancy not wanted	26.63	26.78	14.30	3.93	1.83	0.05
Child at birth was very large	7.39	7.16	14.32	3.12	6.52	0.25
Child at birth was larger than average	17.10	17.43	12.37	3.57	2.42	0.46
Child at birth had average size	49.37	50.49	36.15	5.22	2.97	0.03
Child at birth was smaller than average	46.98	45.95	54.08	3.50	4.78	0.23
Child at birth was very small at birth	26.79	27.76	33.00	3.81	4.83	0.42
Vitamin A in last six months	26.17	26.24	12.92	4.80	2.06	0.00
Child had diarrhea recently	10.84	10.58	12.86	3.99	4.93	0.61
Child had fever recently	19.12	19.48	9.17	4.59	1.97	0.01
Child had cough recently	45.21	48.09	37.07	4.92	3.19	0.08
Child had shortness of breath recently	14.31	14.28	19.95	3.83	5.63	0.29

Source: Authors' calculations.

2.3.4   Econometric Analysis of Wasting

Based on Table 20, girls have a lower wasting prevalence compared to boys, when all factors are held constant. Children whose pregnancy was unwanted are significantly less wasted. Children who were very small at birth are more likely to be wasted. So are children who recently had a cough. As the results are descriptive and not causal, this relationship could reflect the occurrence of multiple underlying conditions related to health and nutrition.

Children in HHs headed by their grandparents (where their mother is the daughter of the HHH) are more likely to be wasted. Wasting decreases with mother's education. Finally, children whose mothers are divorced, separated, or widowed are significantly less wasted than children with single mothers.

Results for Sud offer insights particular to that department. Children whose mothers are married are significantly less wasted than children whose mothers are single. Wasting increases with the number of dependents under 15 years of age. Finally, fully literate women have less stunted children.

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4. Annexes

Table 18. Predictors of Poverty in Sud and Grand'Anse Departments Based on OLS Regression (2017 HDHS)

Characteristic	Sud (1)	Grand'Anse (2)	Both Departments (3)
HHH is a woman	-0.009	0.022	0.002
	(0.024)	(0.038)	(0.021)
HHH age	-0.001	-0.000	-0.001
	(0.001)	(0.002)	(0.001)
HHH education: primary	-0.018	0.001	-0.010
	(0.027)	(0.040)	(0.023)
HHH education: secondary	0.057	0.058	0.056
	(0.038)	(0.060)	(0.033)*
HHH education: higher	-0.012	0.110	0.039
	(0.069)	(0.121)	(0.061)
HHH is married	0.071	-0.002	0.053
	(0.049)	(0.099)	(0.046)
HHH is widowed	0.047	0.074	0.075
	(0.059)	(0.113)	(0.055)
HHH is divorced	0.060	0.024	0.059
	(0.059)	(0.113)	(0.055)
HH size	0.003	-0.002	-0.000
	(0.008)	(0.012)	(0.007)
# of HH members below 15 years	0.001	0.024	0.013
	(0.012)	(0.019)	(0.010)
# of HH members above 65 years	0.000	-0.047	-0.008
	(0.020)	(0.034)	(0.018)
Radio	-0.058	-0.072	-0.068
	(0.025)**	(0.038)*	(0.021)***
TV	-0.014	-0.041	-0.018
	(0.036)	(0.085)	(0.034)
Mobile phone	-0.193	-0.142	-0.156
	(0.029)***	(0.041)***	(0.024)***
Land-line	-0.210	-0.037	-0.077
	(0.135)	(0.255)	(0.125)
Computer	0.050	-0.074	0.016
	(0.069)	(0.164)	(0.066)
Fridge	0.013	0.046	0.016
	(0.056)	(0.136)	(0.054)
Internet	-0.021	0.023	0.003
	(0.033)	(0.067)	(0.031)
Cuisiniere	-0.042	-0.084	-0.042
	(0.053)	(0.142)	(0.052)
Gas or petrol lamp	0.008	0.024	0.018
	(0.025)	(0.036)	(0.021)
Solar energy	-0.028	-0.080	-0.046
	(0.027)	(0.045)*	(0.024)*
Bicycle	0.017	0.082	0.023
	(0.044)	(0.134)	(0.045)
Motorcycle	-0.008	-0.000	-0.006
	(0.032)	(0.065)	(0.030)

Characteristic	Sud (1)	Grand'Anse (2)	Both Departments (3)
Car	0.004	0.065	0.032
	(0.078)	(0.246)	(0.078)
Boat, no motor	0.083	0.252	0.142
	(0.098)	(0.171)	(0.088)
Boat	0.055		0.078
	(0.176)		(0.191)
Animal-drawn cart	-0.104		-0.176
	(0.255)		(0.278)
Watch	0.008	-0.029	-0.008
	(0.034)	(0.059)	(0.030)
Bank account	-0.024	-0.096	-0.037
	(0.033)	(0.061)	(0.030)
Land usable for agriculture	-0.009	-0.062	-0.037
	(0.028)	(0.049)	(0.025)
Cane/palm walls	0.184	0.002	0.005
	(0.047)***	(0.052)	(0.034)
Dirt or mud walls	0.151	-0.008	0.085
	(0.043)***	(0.063)	(0.036)**
Cement walls	-0.027	0.119	0.019
	(0.040)	(0.066)*	(0.035)
Stone walls	-0.065	0.097	-0.003
	(0.042)	(0.069)	(0.037)
Cement floor	-0.043	0.119	0.021
	(0.032)	(0.053)**	(0.028)
Ceramic floor	-0.016	0.213	0.031
	(0.068)	(0.171)	(0.066)
Leaf roof	0.121	0.056	0.065
	(0.100)	(0.162)	(0.088)
Roof: tents	-0.011	0.042	-0.041
	(0.105)	(0.160)	(0.088)
Metal roof	-0.039	-0.104	-0.120
	(0.093)	(0.154)	(0.082)
Cement roof	-0.097	-0.192	-0.176
	(0.102)	(0.169)	(0.090)*
Drinking water: piped water	0.018	0.162	0.120
	(0.072)	(0.081)**	(0.049)**
Drinking water: public tap	-0.115	0.033	0.002
	(0.067)*	(0.065)	(0.043)
Drinking water: protected spring	-0.021	0.134	0.119
	(0.073)	(0.074)*	(0.048)**
Drinking water: unprotected spring	0.089	0.133	0.167
	(0.069)	(0.055)**	(0.041)***
Drinking water: wells	-0.012	-0.054	0.075
	(0.069)	(0.105)	(0.045)*
Drinking water: water selling kiosk	-0.018	-0.046	0.040
	(0.076)	(0.093)	(0.054)
Toilet: flushed to septic tank	-0.072	-0.133	-0.074
	(0.116)	(0.229)	(0.107)
Toilet: ventilated improved pit	-0.139	-0.187	-0.122
	(0.128)	(0.231)	(0.115)
Toilet: pit latrine with slab	-0.083	-0.207	-0.116

Characteristic	Sud	Grand'Anse	Both Departments
	(1)	(2)	(3)
	(0.102)	(0.201)	(0.095)
Toilet: open pit	-0.159	-0.170	-0.146
	(0.105)	(0.202)	(0.097)
Toilet: none	0.014	-0.052	0.031
	(0.104)	(0.200)	(0.096)
Fixed place for hand washing	-0.098	0.039	-0.066
	(0.042)**	(0.080)	(0.039)*
Mobile place for hand washing	-0.086	0.062	-0.042
	(0.026)***	(0.045)	(0.023)*
Cows	-0.015	0.022	0.023
	(0.025)	(0.042)	(0.022)
Horses	-0.026	-0.032	-0.033
	(0.032)	(0.053)	(0.029)
Goats	-0.011	0.014	-0.019
	(0.025)	(0.041)	(0.022)
Sheep	0.047	0.039	0.057
	(0.027)*	(0.048)	(0.025)**
Chickens	-0.045	-0.046	-0.060
	(0.024)*	(0.037)	(0.021)***
Rabbits	-0.011	0.040	0.003
	(0.025)	(0.041)	(0.022)
R^2	0.42	0.22	0.27
Adjusted R^2	0.39	0.14	0.24
F-statistic	11.17	2.53	9.29
Global significance (p-value)	0.00	0.00	0.00
N	1,133	1,009	2,142

*$p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 19. Predictors of Stunting in Sud and Grand'Anse Departments Based on OLS Regression (2017 and 2012 HDHS)

Characteristic	Sud	Grand'Anse	Both Departments
	(1)	(2)	(3)
HHH is a woman	-0.102	0.061	-0.052
	(0.055)*	(0.078)	(0.044)
HHH age	-0.002	0.001	-0.001
	(0.002)	(0.003)	(0.002)
HHH education: primary	0.006	0.039	0.021
	(0.041)	(0.055)	(0.032)
HHH education: secondary	-0.087	0.097	-0.023
	(0.061)	(0.083)	(0.048)
HHH education: higher	0.098	0.076	0.126
	(0.097)	(0.198)	(0.085)
HHH is married	-0.094	-0.070	-0.051
	(0.112)	(0.293)	(0.103)
HHH is widowed	0.020	-0.113	0.008
	(0.122)	(0.306)	(0.112)
HHH is divorced	0.072	0.016	0.058
	(0.123)	(0.315)	(0.113)
HH size	-0.013	-0.016	-0.012
	(0.012)	(0.016)	(0.009)
# of HH members below 15	0.031	0.061	0.037
	(0.017)*	(0.024)**	(0.014)***
# of HH members above 65	0.060	0.000	0.038
	(0.034)*	(0.051)	(0.028)
Child is a girl	-0.016	-0.064	-0.033
	(0.031)	(0.042)	(0.024)
Pregnancy wanted later	-0.022	-0.047	-0.021
	(0.038)	(0.054)	(0.031)
Pregnancy not wanted	-0.094	0.005	-0.043
	(0.039)**	(0.055)	(0.032)
Child at birth was larger than average	0.042	0.080	0.052
	(0.058)	(0.081)	(0.047)
Child at birth had average size	0.089	0.072	0.074
	(0.053)*	(0.072)	(0.042)*
Child at birth was smaller than average	0.058	0.165	0.091
	(0.063)	(0.085)*	(0.050)*
Child at birth was very small at birth	0.093	0.283	0.151
	(0.070)	(0.099)***	(0.057)***
Vitamin A in last 6 months	0.014	-0.054	-0.005
	(0.033)	(0.044)	(0.026)
Child had diarrhea recently	0.061	-0.058	0.009
	(0.040)	(0.053)	(0.031)
Child had fever recently	-0.014	0.002	-0.001
	(0.038)	(0.053)	(0.030)
Child had cough recently	-0.029	0.047	-0.001
	(0.035)	(0.047)	(0.027)
Mother is HHH	0.072	-0.007	0.068
	(0.101)	(0.147)	(0.082)
Mother is HHH's wife	-0.017	-0.001	-0.002
	(0.090)	(0.128)	(0.073)

Mother is HHH's daughter	-0.012	0.102	0.046
	(0.081)	(0.111)	(0.064)
Mother is HHH's daughter-in-law	0.025	0.001	0.025
	(0.098)	(0.133)	(0.077)
Mother is HHH's sister	-0.064	-0.007	-0.043
	(0.135)	(0.228)	(0.115)
Mother and HHH: other relationship	-0.056	0.020	-0.006
	(0.097)	(0.150)	(0.080)
Mother's education: primary	-0.019	-0.057	-0.032
	(0.056)	(0.067)	(0.042)
Mother's education: secondary	0.002	-0.179	-0.058
	(0.074)	(0.097)*	(0.057)
Mother's education: post-secondary	-0.087	-0.157	-0.123
	(0.131)	(0.221)	(0.110)
Mother is married	-0.032	0.086	0.022
	(0.054)	(0.073)	(0.043)
Mother lives with partner	-0.144	0.099	-0.069
	(0.159)	(0.351)	(0.144)
Mother is separated, divorced or widowed	-0.002	-0.007	0.004
	(0.079)	(0.111)	(0.063)
Mother's occupation: professional or managerial	-0.027		-0.047
	(0.142)		(0.103)
Mother's occupation: sales	0.051	-0.006	0.009
	(0.112)	(0.138)	(0.074)
Mother's occupation: agriculture	0.143	0.067	0.076
	(0.129)	(0.156)	(0.086)
Mother's occupation: manual		-0.243	-0.068
		(0.370)	(0.129)
Mother's occupation: domestic	0.131	-0.054	
	(0.146)	(0.175)	
Mother works all year	-0.059	-0.046	-0.031
	(0.113)	(0.139)	(0.076)
Mother works seasonally	-0.081	-0.066	-0.053
	(0.124)	(0.155)	(0.082)
Mother works occasionally	-0.086	-0.042	-0.041
	(0.121)	(0.148)	(0.079)
Mother's literacy: Partial	-0.084	-0.041	-0.067
	(0.058)	(0.074)	(0.045)
Mother's literacy: Fully	-0.140	-0.007	-0.097
	(0.051)***	(0.065)	(0.039)**
Year: 2017 (base = 2012)	0.018	-0.006	0.011
	(0.032)	(0.046)	(0.026)
R^2	0.09	0.12	0.07
Adjusted R^2	0.03	0.02	0.03
F-statistic	1.50	1.19	1.72
Global significance (p-value)	0.02	0.20	0.00
N	779	764	1,543

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 20. Predictors of Wasting in Sud and Grand'Anse Departments Based on OLS Regression (2017 and 2012 HDHS)

Characteristic	Sud (1)	Grand'Anse (2)	Both Departments (3)
HHH is a woman	0.043	0.040	0.044
	(0.027)	(0.039)	(0.022)**
HHH age	-0.001	0.000	-0.001
	(0.001)	(0.001)	(0.001)
HHH education: primary	-0.007	-0.024	-0.007
	(0.020)	(0.028)	(0.016)
HHH education: secondary	-0.031	0.015	-0.011
	(0.030)	(0.042)	(0.024)
HHH education: higher	0.071	-0.031	0.051
	(0.047)	(0.099)	(0.042)
HHH is married	0.035	-0.006	0.015
	(0.055)	(0.147)	(0.051)
HHH is widowed	0.029	-0.036	-0.004
	(0.060)	(0.153)	(0.055)
HHH is divorced	0.022	-0.061	-0.002
	(0.060)	(0.158)	(0.056)
HH size	-0.009	0.005	-0.003
	(0.006)	(0.008)	(0.005)
# of HH members below 15	0.016	0.004	0.009
	(0.009)*	(0.012)	(0.007)
# of HH members above 65	0.022	-0.020	0.013
	(0.016)	(0.025)	(0.014)
Child is a girl	-0.007	-0.040	-0.021
	(0.015)	(0.021)*	(0.012)*
Pregnancy wanted later	-0.006	0.013	0.001
	(0.018)	(0.027)	(0.015)
Pregnancy not wanted	-0.025	-0.058	-0.034
	(0.019)	(0.028)**	(0.016)**
Child at birth was larger than average	-0.020	-0.044	-0.028
	(0.028)	(0.041)	(0.023)
Child at birth had average size	-0.024	-0.005	-0.020
	(0.026)	(0.036)	(0.021)
Child at birth was smaller than average	0.030	-0.021	0.007
	(0.031)	(0.043)	(0.024)
Child at birth was very small at birth	0.083	0.018	0.053
	(0.034)**	(0.049)	(0.028)*
Vitamin A in last 6 months	-0.003	0.008	-0.003
	(0.016)	(0.022)	(0.013)
Child had diarrhea recently	0.021	0.013	0.021
	(0.019)	(0.027)	(0.015)
Child had fever recently	-0.004	-0.004	-0.005
	(0.018)	(0.026)	(0.015)
Child had cough recently	0.025	0.021	0.024
	(0.017)	(0.024)	(0.014)*
Mother is HHH	0.032	0.053	0.033
	(0.050)	(0.074)	(0.040)
Mother is HHH's wife	-0.011	0.087	0.025
	(0.044)	(0.064)	(0.036)

Mother is HHH's daughter	0.047	0.053	0.053
	(0.039)	(0.056)	(0.032)*
Mother is HHH's daughter-in-law	0.041	0.078	0.051
	(0.048)	(0.066)	(0.038)
Mother is HHH's sister	0.050	0.012	0.039
	(0.066)	(0.114)	(0.057)
Mother and HHH: other relationship	0.079	0.106	0.094
	(0.047)*	(0.075)	(0.039)**
Mother's education: primary	-0.051	0.003	-0.027
	(0.027)*	(0.033)	(0.021)
Mother's education: secondary	-0.061	-0.044	-0.046
	(0.036)*	(0.049)	(0.028)
Mother's education: post-secondary	-0.158	-0.007	-0.093
	(0.064)**	(0.111)	(0.054)*
Mother is married	-0.058	0.048	-0.013
	(0.027)**	(0.036)	(0.021)
Mother lives with partner	-0.065	0.004	-0.042
	(0.078)	(0.176)	(0.071)
Mother is separated, divorced or widowed	-0.087	-0.023	-0.053
	(0.039)**	(0.055)	(0.031)*
Mother's occupation: professional or managerial	0.042		0.023
	(0.069)		(0.063)
Mother's occupation: sales	0.017	-0.014	0.015
	(0.055)	(0.069)	(0.053)
Mother's occupation: agriculture	-0.035	0.005	0.002
	(0.063)	(0.078)	(0.058)
Mother's occupation: manual		-0.001	
		(0.185)	
Mother's occupation: domestic	-0.026	0.050	0.010
	(0.071)	(0.088)	(0.063)
Mother works all year	-0.000	-0.033	-0.019
	(0.055)	(0.070)	(0.053)
Mother works seasonally	-0.003	-0.039	-0.025
	(0.061)	(0.077)	(0.057)
Mother works occasionally	-0.005	0.014	-0.003
	(0.059)	(0.074)	(0.056)
Mother's literacy: Partial	0.030	-0.024	0.007
	(0.028)	(0.037)	(0.022)
Mother's literacy: Fully	0.043	-0.021	0.013
	(0.025)*	(0.033)	(0.019)
Year: 2017 (base = 2012)	-0.024	-0.007	-0.017
	(0.016)	(0.023)	(0.013)
R^2	0.10	0.08	0.06
Adjusted R^2	0.04	-0.02	0.02
F-statistic	1.61	0.78	1.50
Global significance (p-value)	0.01	0.83	0.02
N	779	764	1,543

*p<0.1; ** p<0.05; *** p<0.01