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USAID OFFICE OF FOOD FOR PEACE FOOD SECURITY DESK REVIEW FOR KATANGA, NORTH KIVU, AND SOUTH KIVU, DEMOCRATIC REPUBLIC OF CONGO

NOVEMBER 2015

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CONTENTS

ACRONYMS AND ABBREVIATIONS

ADRA	Adventist Development Relief Agency
BBTV	Banana Bunchy Top Virus
BMI	body mass index
BXW	Banana Xanthomonas Wilt
CARG	Conseil Agricole Rural de Gestion (Agricultural Council of Rural Management)
CDC	Commités de Developpement Communautaires (Community Development Committee)
CFW	cash for work
CHW	community health worker
CMD	cassava mosaic disease
CSI	Coping Strategy Index
DHS	Demographic and Health Survey
dL	deciliter
DRC	Democratic Republic of Congo
F2F	farmer-to-farmer
FAO	Food and Agriculture Organization of the United Nations
FARDC	Forces Armées de la République Démocratique du Congo (Armed Forces of the Democratic Republic of Congo)
FDLR	Forces Démocratiques de Libération du Rwanda (Democratic Forces for the Liberation of Rwanda)
FEWS NET	Famine Early Warning Systems Network
FFP	USAID Office of Food for Peace
FFS	farmer field school
FFW	food for work
FNL	Forces pour la Libéralisation Nationale (National Forces of Liberation)
FY	fiscal year
g	gram(s)
HIV	human immunodeficiency virus
IDP	internally displaced person
INERA	Institute National pour l'Etude et la Recherche Agronomiques (National Institution for Agricultural Research)
INS	Institut National de la Statistique (National Statistics Institute)
IPAPEL	Inspection provinciale de l'agriculture, pêche et élevage (Agriculture, Fish, and Livestock Inspection)
km	kilometer(s)
MAM	moderate acute malnutrition
MCHN	maternal and child health and nutrition
MICS	Multiple Indicator Cluster Survey
MINAGRI	Ministère de l'Agriculture et du Développement Rural (Ministry of Agriculture)

MPSMRM	Ministère du Plan et Suivi de la Mise en œuvre de la Révolution de la Modernité
MT	metric tons
NGO	nongovernmental organization
PM2A	prevention of malnutrition in children under 2 approach
PRONANUT	Programme National de Nutrition (National Nutrition Program)
SAM	severe acute malnutrition
SBCC	social and behavior change communication
SD	standard deviation
	National Seed Certification Agency)
UN	United Nations
UNHCR	UN High Commission for Refugees
USAID	U.S. Agency for International Development
WASH	water, sanitation, and hygiene
WFP	World Food Programme

EXECUTIVE SUMMARY

This food security desk review for North Kivu and South Kivu provinces and the Tanganyika territory in the northern part of Katanga province in the Democratic Republic of Congo (DRC) was requested by the U.S. Agency for International Development Office of Food for Peace (USAID/FFP) in order to help guide both FFP and FFP project applicants design projects to address food security needs in the three provinces. The review draws from secondary resources to understand the history, politics, economy, and food security situation, as well as Congolese government programs relevant to the region. The review team also interviewed and collected documentation from current FFP development project implementers in eastern DRC, specifically Adventist Development Relief Agency (ADRA), Food for the Hungry, and Mercy Corps to compile lessons learned. The review analyzes the food security situation in eastern DRC through the lens of availability, accessibility, and utilization and presents current ground realities that could promote or constrain food security programming in the next few years, especially given challenges inherent in a region that has been affected by conflict on a nearly ongoing basis since the mid-1990s.

Malnutrition and food insecurity affect a significant portion of the population in the Kivus and Katanga provinces. A 2014 nationwide *Comprehensive Food Security and Vulnerability Analysis* by the World Food Programme (WFP) found that South Kivu has the highest percentage of food insecure households in DRC (64%) of which 14% are considered severely food insecure. In North Kivu, 49% of households were food insecure and 13% were severely food insecure. In Katanga, 57% of households were food insecure and 16% were severely food insecure, the second highest figure for this category in the country. The DRC Demographic and Health Survey (DHS) for 2013-2014 indicates that the prevalence of stunting in North Kivu (52%), South Kivu (53%), and Katanga (45%) are higher than the national average (43%). From 2007 to 2013-14, the DHS indicates that the total fertility rate increased in DRC from 6.3 to 6.6; similarly the total fertility rate for Katanga increased from 5.9 to 7.8, and for South Kivu from 7.4 to 7.7. Although it has gone down in North Kivu, it still remains high at 6.5. The provinces' health infrastructure is inadequate and does not meet the population's needs.

Most households in the Kivus and Katanga rely upon agriculture as their primary livelihood, but conflict, crop disease, and access to land are significant constraints. Less than 60% of households in the war-torn provinces of North and South Kivu cultivated farms in 2011-12, compared to 87% in Katanga (WFP 2014). Farmers primarily grow cassava, maize, and beans in eastern DRC, as well as sweet potatoes and bananas depending on the agro-ecological zone. Crop diseases such as cassava mosaic virus and Banana Xanthomonas Wilt have had a devastating impact on crop yields of these economically important crops. Land access is a problem in the Kivus due to high population density and the fact that a few landowners own much of the most fertile land, a factor that fuels resentment and ongoing armed conflict. Land is more readily available in the larger Katanga province, but land ownership is problematic due to contradictory customary and formal law, as well as competing mining interests assigned by the national government. Poor road conditions, insecurity due to conflict, and illegal taxation by state personnel thwarts farmers' ability to buy and sell food in traditional markets.

In addition to USAID/FFP's efforts to improve food security in eastern DRC, USAID/DRC's Country Development Cooperation Strategy 2015–2019 Transition Objective intends to work with the government to: identify drivers of conflict to create a basis for peace, improve governance, and economic development; support models which mitigate drivers of conflict, improve living conditions, and strengthen the social compact; and guarantee access to basic services for citizens.

1. INTRODUCTION

1.1 HISTORY

Pygmies were the earliest inhabitants of the Congo who first came to the region 5,000 years ago, some of which, such as the Batwa tribe, can still be found throughout eastern parts of the current Democratic Republic of Congo (DRC). They lived by hunting and gathering in Congo's dense and game-rich forests. Roughly 2,000 years ago Bantu-speaking horticulturalists settled in the area, ushering in an era of settled cultivation (Edgerton 2002). The Congo's rich mineral deposits prompted King Leopold II of Belgium to establish Belgian Congo in 1891 (Hochschild 1998). During his brutal reign, the population was reduced from an estimated 20 million to just 6 million people (Edgerton 2002).

After Leopold, the first Belgian minister of the colonies, Jules Renkin, sought to improve conditions and give Congolese chiefs greater power. His so-called "native policy" provided education to local chiefs who represented their people and served as intermediaries with the colonial government. He divided Belgian Congo into chiefdoms (*chefferies*) and sub-chiefdoms (*sous-chefferies*) giving Congolese chiefs authority to carry out administrative and police duties (Edgerton 2002). This arrangement was ultimately flawed as the appointed "chiefs" were not always recognized by their tribes. The state apparatus was carried out by mostly European state officials (*chef de poste*), most of whom had held a similar role during Leopold's reign and were generally incompetent. The administrative structure and posts used currently in DRC, such as *chefferies* and *chef de poste*, are historical remnants of the structure created by Renkin over 100 years ago. The Belgian colonial administration also considered some tribes such as the Luba of Kasai and Hutu of Rwanda to be hard workers and recruited many of them to work in the copper mines in Katanga. Similarly, they also transferred families from resource-poor Rwanda, which was part of the Belgian Congo during this period, to more productive areas in eastern Congo. These significant movements of people during the colonial era continue to fuel ethnic division and conflict in the region (Turner 2007).

Katanga. During the Belgian colonial period, Katanga played an important role in the colony's economic fortunes. Large mining concessions were granted to Belgian companies and the railroad project begun by Leopold continued. Shortly after securing independence from Belgium in 1960, Moise Tshombe proclaimed Katanga's independence from the Congo.[1] Many Europeans in Katanga supported secession given their economic interests in the province. Prior to their secession, Katanga's sizable copper reserves and plantations comprised 80% of the Congo's wealth. Unable to secure support from the United States or United Nations to quell the secession movement in Katanga, newly-elected Prime Minister Patrice Lumumba turned to the Soviet Union, unwittingly leading to a CIA-financed coup led by Colonel Joseph Mobutu and Lumumba's execution in 1961. Conflict between UN troops and those loyal to Tshombe and his bid for independence continued until early 1963 when his secession movement was finally put to rest at the cost of thousands of Congolese and European lives (Edgerton 2002).

During this same period, another group loyal to Lumumba called the Balubakat party opposed Tshombe, and launched the "Simba Rebellion." The movement was partly led by the socialist-leaning Laurent Kabila, a native of Katanga (Prunier 2009). Following Tshombe's defeat and self-exile, the Simba Rebellion also sought independence for Eastern Congo and opposed the U.S.-backed Mobutu (Edgerton 2002). The campaign was eventually defeated in 1965 and Kabila decamped to South Kivu and then Dar

[1] The "Belgian Congo" was renamed "Congo" at the time of independence (1960). President Mobutu renamed the country "Zaire" in 1971. In 1997, President Laurent Kabila renamed the country "Democratic Republic of Congo." Apart from historical references, this review refers to the country by its current name, "Democratic Republic of Congo," or simply "DRC."

es Salaam until he was "reactivated" by the Ugandans and Rwandans to overthrow Mobutu in 1997 (Prunier 2009).

North and South Kivu. Given the relative remoteness of the Kivus, the Great Lakes region was not fully explored until the 1870s by British explorer Henry Morton Stanley (Hochschild 1998). The colonial authorities established Goma at the northern tip of Lake Kivu and Bukavu at the southern end as government posts and both towns became thriving commercial centers by the 1940s. Congolese identity in the Kivus has long been fraught by the large presence of "settler" populations, such as the Tutsi and Hutu, who had been at odds with "indigenous" peoples over land rights. Historians note that the Great Lakes region has long been characterized by fluctuating migration patterns (Jourdan 2005). During the colonial period, many large pyretheum plantations relied on Hutu labor from Rwanda (Carr 1999). Following Congo's independence in 1960, Prime Minister Patrice Lumumba sent the Congolese army to the Kivu province to quell unrest, leading to land seizures and a mass migration of whites and other ethnic groups such as Banyaruandans from Goma, Bukavu, and its environs (Devlin 2007). UN Peacekeepers were active in the Kivus in the early 1960's and would return in the mid-1990s, responding to a broader humanitarian crisis.

Following the Rwanda genocide in 1994, there were roughly 850,000 Rwandan refugees in North Kivu and 650,000 in South Kivu with a toxic mix of former Rwandan military and ordinary civilians who had committed genocide in Rwanda (Prunier 2008). Mobutu was sympathetic to the fallen Rwandan regime, allowing former military men and politicians free movement in the country (ibid). These Rwandan military men and politicians formed the core of the Democratic Forces for the Liberation of Rwanda (FDLR). The FDLR still exists and has prompted Rwandan President Paul Kagame to invade DRC on several occasions to combat the FDLR and back Congolese Tutsi armed groups.

1.2 CONFLICT

Issues associated with land rights, ethnicity, and the significant presence of valuable mineral resources fueled much of the fighting during the 1996-1997 and 1998-2003 wars and simmering conflicts that linger to the present day. Historian Gerard Prunier described the ongoing conflict in eastern DRC which partly evolved out of the Rwandan genocide in the early 90s and Mobutu's ouster by Laurent Kabila as "… the disintegration of 'rational' war into myriad 'privatized', socially and economically motivated sub-conflicts" (Prunier 2009).

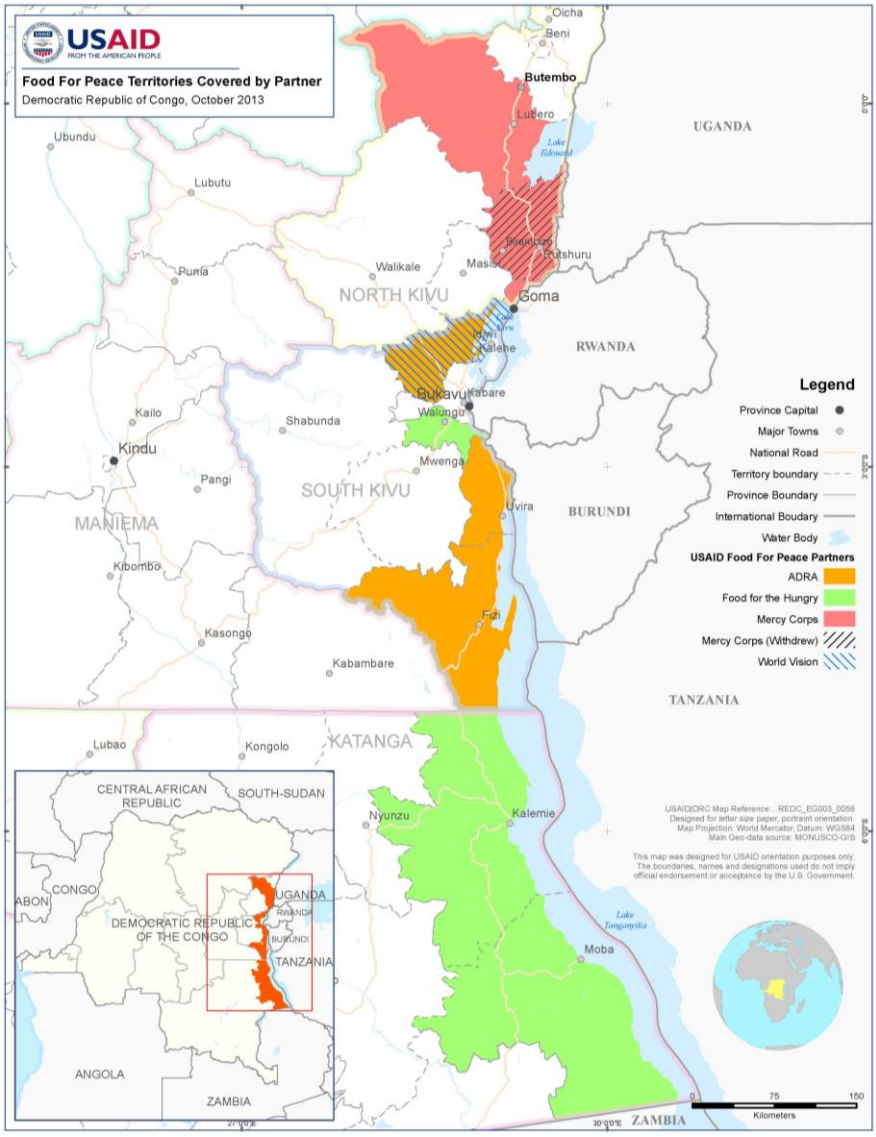
Myriad rebel groups backing various causes vie for control of the Kivus. The Congolese Tutsi-led M23 rebel group briefly overtook the city of Goma in late 2012, then withdrew a month later to convene peace talks with the government. However, they continued to have a presence in Kiwanja and Rutshuru, North Kivu until October 2013, around which time they officially ended their rebellion with the surrender of the rebel commander, Bosco Ntaganda, to the International Criminal Court in the Hague. At the same time, roughly 1,500 M23 troops surrendered after crossing the Ugandan border. Elements of the various militias collectively known as *Mai Mai* and foreign (FDLR and FNL)[2] armed groups are also active in South Kivu, especially in Shabunda, Fizi, and Uvira. As of late 2013, nearly 600,000 people had fled the zone due to the armed conflicts (ADRA 2014). In response, the armed forces (FARDC) undertook an anti-rebel operation in Uvira in 2014 (IRIN 2015). The UN High Commission for Refugees (UNHCR) estimates that there were 2.7 million internally displacement persons (IDPs) within DRC in 2014, primarily in the east, and another 430,000 Congolese refugees in Burundi, Rwanda, Tanzania, and Uganda. Youth are at greatest risk of joining or supporting armed groups because of a breakdown in the education system and a

[2] FNL (National Forces of Liberation) is a Burundian rebel group originally formed in 1985 as the military wing of a political group led by the majority Hutu ethnic group. They have been active in the Uvira area of South Kivu.

lack of employment opportunities and other ways to earn a living. As a result, many young people enter a vicious cycle of violence that is difficult to break, even if they participate in donor-funded demobilization programs (Rudolf 2014).

Conflict in this region has affected implementation of the current U.S. Agency for International Development Office of Food for Peace (USAID/FFP) development projects (see Map 1). In 2013, Mercy Corps was forced to change geographic coverage areas due to insecurity as a result of M23 rebel activities in the Rutshuru territory of North Kivu (Mercy Corps 2013). Parts of Rutshuru have since experienced sporadic fighting and insecurity, which led to numerous temporary suspensions of project activities. The ongoing insecurity led Mercy Corps' partner, Helen Keller International, to withdraw from the project's consortium in November 2012 (ibid). From November 2012 to February 2013, all of Food for the Hungry staff in Mubumbano, South Kivu were evacuated to Bukavu due to heightened rebel activity in the catchment area (Food for the Hungry 2013). Insecurity has also affected the Adventist Development Relief Agency's (ADRA) efforts in Fizi, Uvira, and Kalehe territories of South Kivu, particularly during government military operations in 2014 (ADRA 2014). In May 2015, many refugees from Burundi crossed the Burundi/DRC border to Uvira following political violence in Bujumbura.

Map 1. FFP Activities in Eastern DRC



1.3 NORTH KIVU OVERVIEW

The volcanic highlands of North Kivu rest atop Lake Kivu in the vast corridor of the Rift Valley stretching from the Zambezi River to the Red Sea. The province is dominated by the Rwenzori Mountain range and there are narrow plains along rivers and active volcanoes. Lava from the 2002 eruption of the Nyiragongo volcano destroyed 15% of the town of Goma and caused 147 deaths.[3] The eastern part of the province includes the majestic Virunga National Park, one of Africa's oldest and most biologically diverse national parks.[4] Outside of the park, North Kivu has diverse agro-ecological zones that can support growth of a wide array of crops suitable to more temperate zones compared to the rest of DRC. As a result, agriculture is the most important livelihood in this area, with 91% of the population engaged in this activity (Keita 2012). A complicated mix of colonial and Mobutu-era land claims and customary land tenure have created a significant degree of land displacement (Rudolf 2014). The province's valuable mineral deposits (e.g., coltan) and land disputes contribute to a chronic crisis fueled by a high recurrence of multiple displacements.

North Kivu at a Glance

Population: 6,034,208
Land area: 59,631 km²
Elevation: 558–5,119 meters
Main languages: Swahili and French
Territories: Beni, Lubero, Masisi, Nyiragongo, Rutshuru, and Walikale
Capital: Goma
Food insecurity: 49%
Infant mortality: 41/1,000 live births
Total fertility rate: 6.5
Improved water source: 77%
Children under 5 stunted: 52%
Children under 5 wasted: 5%
Women's literacy: 64%
Source: DHS 2013-14 (MPSMRM et al. 2014)

North Kivu has six territories and 97 groupings (*groupements*). According to the proposed plan to create new provinces (see Annex A), the central government would retain the current borders of North Kivu and would not divide it into new provinces. Territories are populated by the following tribes:

Territories	Tribes
Beni	Wanande, Bambuba, Balese, Watalinga, and Batwa (Pygmy)
Lubero	Wanande, Bapere, and Batwa
Rutshuru	Hutu, Tutsi, Hunde, and Nande
Masisi	Hunde, Hutu, Batembo, Tutsi, and Batwa
Walikale	Nyanga, Bakano, Bakusu, Bakumu, and Batembo
Nyiragongo	Bakumu, Hunde, Hutu, Tutsi, and Batwa[5]

Fluctuating migration patterns over the past several decades linked to both economic opportunities and conflict have increased competition for fertile land and are a contributing factor to North Kivu's general insecurity and food insecurity. The population is young, unemployed, and poor, factors which force many to turn to the "market of violence." A staggering 35% of the province's population have never attended school as indicated in the Demographic and Health Survey (DHS) for 2013-14. Successive displacements have forced over a million people to migrate to urban areas or IDP camps, as indicated by a 45% increase in the population of Goma between 2012 and 2014 (a high birth rate also contributes to the increased population in the capital) (Rudolf 2014). IDPs in Goma have found work in the informal economy working in markets, casual labor, and petty trade. Young women often resort to prostitution.

[3] "Nyiragongo Volcano," http://nyiragongo.com/2002.html.
[4] "Virunga National Park," https://virunga.org/the-park/.
[5] "Nord-Kivu," *Tourisme RDC Congo*, http://www.congo-tourisme.org/visiter-la-rdc/nord-kivu/.

Nearly half of households in North Kivu were moderately or severely food insecure according to analysis by the World Food Programme (WFP 2014). A baseline carried out in five health zones of Mercy Corps' FFP-funded project areas in 2012 found that 51% of children under 5 years were stunted (Keita 2012). Major constraints to improving household production and marketing include: lack of access to arable land; large pre- and post-harvest losses; crop disease; inability to access credit; long distances to market centers; and taxation (informal and formal) on products going to markets. Within health and nutrition, households exhibit: poor dietary diversity and hygiene and sanitation practices; lack of water and sanitation infrastructure; poor understanding of optimal nutrition actions; and underutilization of de-worming medicines and iron and vitamin A supplementation. Stock-outs of medicines are common and health staff have limited knowledge beyond basic training. The ongoing conflict and displacement maintains instability in the province and this has meant that men and women cannot consistently farm on their land, and at times the land they have been allocated is usurped by others. In this context sexual and physical gender-based violence perpetrated by the rebels, the army, and within households remains a significant threat to women and children, both resulting from and causing displacement (Oxfam 2015; Slegh et al. 2012).

1.4 SOUTH KIVU OVERVIEW

South Kivu boasts rich soil, enviable rainfall, significant mineral deposits, and lake access. The climate is quite temperate due to its high elevation and enjoys nine months of rainfall. Vegetation includes forest, grassland, woodland bamboo, and dense forests which are also home to endangered gorillas and chimpanzees in *Parc National de Kahuzi-Biega*.[6] The province borders both lakes Kivu and Tanganyika which provide livelihoods for fishermen along its banks. The province is at risk from an array of natural disasters such as landslides, flooding near lakes and rivers, earthquakes, and poisonous methane gas leaks from Lake Kivu.

Agriculture is a primary livelihood for many households in South Kivu, and there are commercial plantations of cash crops such as cinchona, coffee, sugar cane, tea, etc. The province also has enormous mineral deposits (Hayes et al. 2010). Artisanal miners work in seven mining zones in South Kivu (two in Kalehe, two in Mwenga, and three in Shabunda) (IRIN 2011). Efforts are under way to improve the traceability of traded minerals in South Kivu to ensure that profits do not fund armed groups (see Section 2.2 for additional information on mining in the study areas).

South Kivu at a Glance

Population: 4,883,599
Land area: 64,851 km²
Elevation: 530–3,464 meters
Languages: Swahili and French
Districts:

Capital: Bukavu
Food insecurity: 64%
Infant mortality: 92/1,000 live births
Total fertility rate: 7.7
Improved water source: 61%
Children under 5 stunted: 53%
Children under 5 wasted: 7%
Women's literacy: 60%
Sources: DHS 2013-14 (MPSMRM et al. 2014)

South Kivu has eight territories and 184 groupings. According to the proposed plan to create new provinces (see Annex A), the central government would retain the current borders of South Kivu and would not divide it into new provinces. Territories are populated by the following tribes:

[6] "Sud-Kivu," *Tourisme RDC Congo*, http://www.congo-tourisme.org/visiter-la-rdc/sud-kivu/.

Territories	Tribes
Fizi	Barega and Babembe
Idjwi	Bahavu and Batwa
Kabare	Bashi and Batwa
Kalehe	Bahavu, Bashi, and Batwa
Mwenga	Bashi, Barega, and Banyindu
Shabunda	Barega
Uvira	Bavira, Bafulero, and Barundi
Walungu	Bashi and Banyindu[7]

Prior to the start of the conflict in 1996, South Kivu's favorable environment, proximity to East African markets, and developed commercial network contributed to a higher standard of living compared to more remote and dry regions of eastern DRC (Fermon 2008). Food security has deteriorated remarkably in the last twenty years despite some improvement in the security situation since 2005. The province now has the highest level of food insecurity in DRC, with 64% considered food insecure (WFP 2014). Many displaced households lost assets such as grain, seeds, tools, and livestock due to conflict. More importantly the conflict has eroded the province's social fabric. Many have migrated to urban areas, IDP camps, or have become refugees in neighboring Rwanda, Burundi, Tanzania, and Uganda. The conflict has shown no sign of abating and significant population movements were registered following FARDC's military operations in 2014 and there was a more recent influx of refugees due to political instability in neighboring Burundi. For some IDPs who returned to their homes, they have been unable to get their land back (Fermon 2008). Years of conflict have taken a toll on the education system reflected by the fact that 37% reported having never attended school (MPSMRM et al. 2014). The second highest illiteracy rate in DRC is in South Kivu (36%). In addition, at a national level, female heads of household are more likely to be illiterate (53%) than male heads of household (25%), and, in aggregate, South Kivu has a comparatively large proportion of female-headed households (33%) (WFP 2014; FEWS NET 2015).

Most of the province's population depend on livestock and agriculture as their primary livelihood. Important subsistence crops such as banana and cassava have been significantly affected by Banana Xanthomonas Wilt (BXW), which has cut banana production by half, and cassava mosaic disease (ADRA 2012). Many farmers have switched to other crops such as beans, maize, and sweet potato in an effort to mitigate the negative impacts of these blights. Farmers also report a significant drop in rainfall and erratic weather patterns compared to the past. Poor road conditions and the near absence of a functioning government have further worsened the situation. As in North Kivu, the health system suffers from frequent stock-outs of medicines and lack of qualification of health staff in areas such as nutrition beyond basic training. Sexual and physical gender-based violence both within and outside the home are also common (Oxfam 2015).

[7] "Sud-Kivu," *Tourisme RDC Congo*, http://www.congo-tourisme.org/visiter-la-rdc/sud-kivu/.

1.5 KATANGA OVERVIEW

Katanga is a vast province, larger than many countries, and the source of one of the world's greatest rivers—the Congo. The province has high plateaus covered with dense bush and scattered forests, which once had a variety of wildlife. As previously noted, Katanga has some of the world's largest deposits of copper, cobalt, and zinc, as well as other precious minerals. The Tanganyika territory, which is the focus of this document, is 1,000 kilometers north of Lubumbashi and has a vastly different ecosystem than the rest of the province.[8] Kalemie, previously named Albertvilles, lies in a dry plateau surrounded by tropical forest (Butcher 2008). The Kalemie rail line at Lake Tanganyika which once served as a vital link to the Lubumbashi–Kindu line used for copper exports has been in disrepair for years and was further vandalized/looted by rebels during the conflict in the 1990s. Nonetheless, Kalemie Port continues to serve as an important logistics hub for UN-MONUSCO (the UN Stabilization Mission in Congo) and WFP's humanitarian operations for cargo crossing Lake Tanganyika from the Tanzanian coastline. In the Tanganyika territory, agriculture, fishing, and livestock are the primary livelihoods. There is also some small scale artisanal mining of gold and other precious minerals.

Katanga at a Glance

Population: 5,608,683
Land area: 496,877 km²
Elevation: 504–2,710 meters (Tanganyika only)
Languages: Swahili and French
Districts: Haut Katanga, Haut Lomami, Kolwezi, Lualaba, and Tanganika
Capital: Lubumbashi
Food insecurity: 57%
Infant mortality: 72/1,000 live births
Total fertility rate: 7.8
Improved water source: 48%
Children under 5 stunted: 45%
Children under 5 wasted: 8%
Women's literacy: 54%
Sources: DHS 2013-14 (et al. 2014)

The most dominant tribe along the banks of Lake Tanganyika are the Balunda. In the forested, inland areas west of Kalemie, there are numerous Pygmy tribes such as the Batwa.[9] In Tanganyika, the Banyamulenge tribe (descended from Rwanda) faced significant persecution from the beginning of the conflict in the late 1990s. The area saw substantial fighting during the 1996-1997 and 1998-2003 wars and as recently as 2013 when FARDC troops battled Mai in the forested areas around Kalemie (Food for the Hungry 2013). In 2014, there were interethnic clashes between pygmies (Batwa) and other Bantu tribes (e.g., Balunda) in Moba and Kalemie (UNHCR 2014).

At present, Katanga has 22 territories and 504 groupings (*groupements*), making it one of the largest provinces in the country. According to the proposed plan to create new provinces (see Annex A), the central government would split Katanga into four new provinces which are currently categorized as districts, including: Tanganyika (134,940 km²), Haut Lomami (108,204 km²), Haut Katanga (132,425 km²), and Lualaba (121,308 km²).

Sixteen percent of households in Katanga face severe food insecurity (WFP 2014). This was the second worst rate in the country after Equateur province. For areas assessed by the 2012 baseline for Food for the Hungry's FFP development project, rates of severe acute malnutrition (SAM) were determined to be 2.6% and 3.4% in Moba and Kalemie, respectively. Roughly half of children under 2 years were found to be stunted and about a quarter were underweight in both regions. The health system in Katanga is somewhat weak in vitamin A supplementation, deworming, and treatment of SAM (MPSMRM et al. 2014; Food for the Hungry 2014b). Another significant problem in the province is the fact that 16% of women have never gone to school, compared to 2% of men (WFP 2014). In addition, conflict over land remains a widespread

[8] For the purpose of this study, the analysis focuses on the Tanganyika territory, i.e., the lakeside region from Moba to Kalemie.
[9] "Population & langues," *Katanga Tourisme*, http://www.katanga-tourisme.org/cultures-traditions.

problem in Katanga, and this has important implications from a gender perspective as local skirmishes between the rebels and the army has continued to fuel gender-based sexual and physical violence against women—both within and outside the home (FAO 2008). Conflict over land appears to be partly due to contradictions between who manages the land, the state or local chiefs. This is further compounded by the fact that Katanga is rich in mineral resources, and an increasing number of mining exploration permits have been issued by the state, resulting in many families being displaced and unable to farm. Farmers have also noted that seasonal and climate variability have curtailed the growing season and reduced crop production significantly, according to a comprehensive seed security assessment undertaken in Tanganyika territory. In response, farmers are abandoning crops such as maize, beans, and groundnuts and switching to sweet potatoes more broadly and planting rice and horticultural crops in valley bottoms (Sperling 2012).

2. FOOD SECURITY CONTEXT

2.1 FOOD AVAILABILITY

2.1.1 PRODUCTION SYSTEMS, LEVELS, AND TRENDS

Agriculture is an important livelihood for most households in the Kivus and North Katanga. In North and South Kivu ample rainfall and fertile volcanic soils present some of the greatest opportunities for the production of food and cash crops. However the prolonged conflict has had a critical impact on the ability of households to farm, due in part to displacement. In areas such as Masisi and Rutshuru in North Kivu, land is scarce and poor households must rent from landowners. A similar dynamic exists in South Kivu where an ongoing cycle of violence since the late 1960s has limited farmers' capacity to produce food and contributes to food insecurity (Cox 2011). High population density in the Kivus, as indicated in Table 1, also contributes particularly to land scarcity and disputes. In response, many men have moved to urban areas to undertake a variety of paid labor leaving agriculture to relatively more vulnerable groups such as children, women, elders, and disabled people (Sadiki 2011). In contrast, land availability and population density are less of a problem in North Katanga and sporadic conflict has created only temporary displacements; nothing close to the scale of the neighboring Kivus (see Table 1).

Table 1. Farming Household Characteristics

Parameter	Tanganyika, Katanga	North Kivu	South Kivu	National Average
Average household size	6.6	6.4	7	6.8
Population density	11 per km^2	97 per km^2	71 per km^2	33 per km^2
Land ownership/long-term access	39.2%	46.4%	70.1%*	75%

Sources: WFP 2014; ADRA 2012/13; Food for the Hungry 2012; Mercy Corps 2012
* This baseline figure likely includes both land ownership and long-term rental access due to the respondents' misunderstanding of the question.

Evidence suggests that access to land and control of resources have been driving factors in the conflict in Eastern Congo. Lack of land ownership also affects broader agricultural production. Since the majority of men and women do not own their farmland and may become displaced, there is little incentive for them to adopt improved practices. Presently, customary law exists alongside and often contrary to formal law (USAID/DRC 2010). Land rights are rarely documented, leading to disagreements and contributing to land seizure. Traditionally, all land was allocated by chiefs throughout the Congo. This changed during the colonial period when the Belgian authorities issued land titles to European settlers for plantations. The Kivus had a significant concentration of plantations and settlers given the region's good soil, moderate temperature, and relatively good road connections to the East African coastal ports and rail lines. During the Mobutu era, the government legally took control of all natural resources such as land, water, forests, and minerals under the General Property Law of 1973, though individuals and entities could be granted rights to use this land (ibid). Mobutu's regime exacerbated existing land problems due to the allocation of valuable land assets, such as cash crop plantations, to political cronies. In the chaos following Mobutu's ouster, the Kivus were particularly affected given longstanding, contentious land rights disputes and an influx of immigrants with ethnic ties to the region who bought land through informal transactions with individuals or chiefs, which often supplanted resident communities (ibid). For example, the increase in cattle ranches in Masisi, North Kivu owned by Tutsi "patrons" displaced farmers and fostered resentment and occasionally armed conflict (Rudolf 2014). Despite the contradictions between formal and customary land tenure systems, traditional leaders continue to have authority in rural areas. In remote areas, traditional leaders represent or work with government authorities to arbitrate land disputes. Such arrangements are not formal and tend toward political fealty (USAID/DRC 2010). Given the presence of

minerals in the Kivus, the government has some local representatives who collect taxes on artisanal miners and businesses (ibid).

Perched in the highlands, the Kivus are heavily forested and enjoy some of the highest average rainfall and lowest temperatures in DRC, while the savannas in Tanganyika lakeshore region are dryer and hotter (see Table 2). There are more inhabited zones in Tanganyika and North Kivu compared to South Kivu. Active and dormant volcanoes in the Kivus have blessed the region with high quality andosol and vertisol soil rich in calcium, magnesium, and aluminum, thus ideal for agricultural production (MINAGRI 2009). Soil in Tanganyika is primarily clay-heavy, ferrisol soil with scattered deposits of sand, especially on the banks of the lake (ibid). Although the soil is poorer quality than that of the Kivus, inhabitants of the region produce an array of crops.

Table 2. Provincial Characteristics

Rainfall/land type	Tanganyika (Katanga)	North Kivu	South Kivu
Average rainfall (milliliter/year)	1,083	1,553	1,631
Prairie	3%	12%	12%
Agriculture/herbaceous savanna	40%	6%	7%
Forest savanna mosaic		2%	4%
Savanna	32%	1%	4%
Dense/humid forest	1%	42%	29%
Dense forest (Miombo)	12%		
Secondary forest		6%	9%
Forest foothills		15%	17%
Mountainous forest		3%	7%
Inhabited zone	8%	10%	3%
Water	8%	3%	8%

Source: MINAGRI 2009

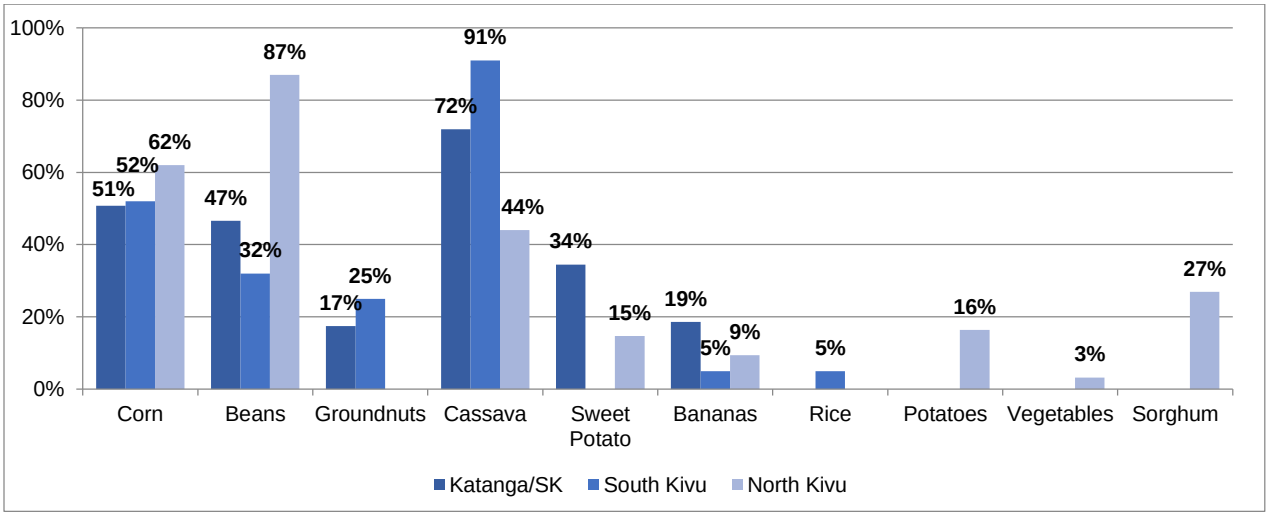
Although a diverse range of crops can be grown in the fertile Kivu region, smallholders tend to intercrop a few subsistence crops for home consumption with easily marketable crops. Fewer crop varieties can be grown in the dryer Tanganyika region, although this may also be a reflection of poorer soil, longer distances to markets, and a greater reliance on fishing along Lake Tanganyika (see Table 3). Based on data from the various FFP development project baselines completed in 2012, the predominant smallholder crops grown in project areas are cassava, maize, and beans (see Figure 1). The data also reveal that farmers grow a wide variety of crops based on varying agro-ecological zones in the surveyed area. A good example of this is the fact that only 1% and 9.4% of households in Karisimbi and Rwanguba health zones in North Kivu, respectively, grew cassava and had a higher production of beans, potatoes, vegetables, sorghum, and maize (Mercy Corps 2012). Other important livelihoods by order of importance reported for North Kivu included: animal husbandry, small business, transformation of agricultural products, and transportation (ibid). Trade maps reveal that South Kivu and Katanga's most important intra-regionally traded commodity is fish while North Kivu dominates the bean market (Mathys and Remancus 2010). Areas in Katanga that border the Kasais trade maize and cassava, though this is unlikely to originate from the Tanganyika region given the distance and poor road conditions.

Table 3. Percentage of Households Cultivating and Citing Each Agricultural Activity as One of Three Main Livelihood Activities Undertaken (2011-12 by Province)

Livelihood	Katanga	North Kivu	South Kivu	National Average
Cultivated in 2011-12	87%	54%	59%	72%
Cultivate < 2 hectares	80%	41%	41%	53%
Cultivate > 2 hectares	7%	13%	18%	19%
Food crop production	86%	56%	55%	69%
Cash crop production	1%	11%	4%	5%
Livestock	3%	7%	9%	9%
Fishing/aquaculture	12%	0%	4%	7%
Forestry resources	8%	3%	5%	7%

Source: WFP 2014

Figure 1. Smallholder Crop Production in Kivus and Tanganyika (Katanga Province)



Source: ADRA 2012/13; Food for the Hungry 2012; Mercy Corps 2012

Ongoing conflict in the region has severely affected agricultural production, but years of neglect from the central government alongside challenges such as poor planting practices, access to improved seeds, markets, and crop disease/pests have also turned an otherwise breadbasket into one that relies heavily on imported foodstuffs and emergency food aid. Crop diseases such as cassava mosaic disease (CMD), Banana Xanthomonas Wilt (BXW), Black Sigatoka and Fusarium Wilt, and Banana Bunchy Top Virus (BBTV) have decimated production of these crops since they were first identified. ADRA's baseline survey indicated that more than half of farmers surveyed in the South Kivu region were affected by CMD in the 2011/12 agricultural season and two-thirds of those affected took no action to prevent or contain the disease through use of CMD-resistant varieties or removal of infected plants (ADRA 2012). An even greater number of farmers in this region were affected by BXW (70.4%), although 43.9% took action to address it, such as by removing diseased banana plants (ibid). A similar baseline in North Kivu revealed that 25% of farmers had pre-harvest losses due to disease, pests, and insects and over half of farmers surveyed had post-harvest losses caused by rodents, poor storage conditions, theft, and straying livestock (Keita 2012). In order to control these vectors effectively, farmers must adopt specific practices and replace diseased plants with improved, resistant varieties which must be tested, multiplied, and disseminated to break the disease cycle. All current FFP projects have interventions to reduce the prevalence of crop diseases in conjunction with the Ministry of Agriculture's National Institution for Agricultural Research (INERA). There is a near absence of government extension services, which is

evident by the fact that only 7.4% of farmers in South Kivu/Tanganyika received agricultural extension services, mostly from nongovernmental organizations (NGOs); a mere 0.9% cited assistance from government personnel (ADRA 2012).

FFP baseline evaluations revealed limited usage of improved seeds and inputs. In South Kivu, less than 10% of farmers who cultivated staple crops used improved varieties (Food for the Hungry 2012). The rate was slightly higher in North Kivu where 19.3% used improved seeds in the last planting season (Keita 2012). A comprehensive seed security assessment undertaken in North Katanga (Kalemie and Nyunzu territories) in 2012 revealed that 23% of farmers in this region accessed a new variety in the last 5 years (Sperling 2012). CMD-resistant cuttings comprised the most significant component of this effort (41%) largely driven by NGOs. Both resident and IDP communities found it relatively easy to access traditional seed from local channels such as local markets, friends, and family. Maize and groundnut seeds appeared to be declining in quality, and fertilizer use or improved storage were practically negligible (ibid). The seed security assessment further indicated that the seed system value chain remains static and interventions had not made a significant dent in improving broader access to improved seeds in a sustainable, market-driven fashion.

All provinces in DRC are slated to receive agriculture support through domestic and external funds via the government's National Agricultural Investment Plan. The plan accounts for the agriculture sector's strengths, needs, achievements, and investment and operational gaps from 2013–2020 (MINAGRI 2013). The plan includes elements to improve agricultural production through extension services, research, and profitable value chains for smallholder farmers. Out of the projected, partially funded budget of $5.7 billion over 8 years, North Kivu, South Kivu, and Katanga were allocated $458.5 million, $389.7 million, and $790.9 million, respectively, or 28.6% of the national budget (ibid).

2.1.2 LIVESTOCK

The Kivus and Katanga have ideal terrain and pasturage for livestock but multiple displacements of populations due to the conflict have significantly depleted these assets. According to a livestock census carried out by the Ministry of Agriculture in 2006, Katanga and South Kivu provinces had roughly a quarter of DRC's total cattle, sheep, and goat population (MINAGRI 2009). Despite its small geographic size, North Kivu had roughly a tenth of all types of livestock apart from cows (ibid). Nonetheless, the large cattle ranches owned by wealthy landowners make up much of the arable pasture land in this province and exacerbates the tension between farmers and herders. As in other parts of the country, there is a critical absence of animal vaccines, veterinarians, and improved breeds and forage. Much of the research efforts undertaken by the Office of Livestock Development in the Kivus had to be abandoned due to security problems. The conflict compounded an already stressed livestock sector which has been in decline for decades. Recent and ongoing FFP projects have given returned IDPs small ruminants such as rabbits and guinea pigs to replenish their household assets. Some critics argue that aid-funded cattle-restocking programs in the Masisi territory of North Kivu in the mid-1990s unwittingly aided wealthy elites who converted large tracts of fertile land to cattle ranches, which is responsible for the lack of land available for farming and one of the sources of armed conflict.

2.1.3 FISHING AND AQUACULTURE

DRC claims nearly half of Lake Tanganyika (14,800 km^2) as its territory. It has over 250 species of cichlids, which are sought after as aquarium fish. Water levels fluctuate due to evaporation and rainfall levels and off flow to the Lukuga River, which joins the Congo River. The lake is also fed by Lake Kivu via the Ruzizi River and other rivers in the Malagarasi watershed. Lake Tanganyika provides livelihoods for 10 million people along its banks and lakeside populations have been rising significantly since the

1960s (Fermon 2008). There are six primary species that fishermen seek for marketing purposes—two types of sardines (*ndagala*) and four types of larger predator Latidae fish known locally as *mukeke* (ibid). Industrial fishermen operate within 5 kilometers of the shore with larger boats, outboard motors, etc. However, this practice has diminished significantly in the northern part of the lake since fish production reached its peak in the early 1980s. Artisanal fisherman use catamarans or pirogues with 4–8 fisherman onboard who fish as their primary livelihood. Subsistence fisherman fish very close to shore with motorless pirogues as a means to supplement income from farming. A number of elements affect the lake in the long term. Deforestation near the lake and in its watershed contributes to soil erosion, which has a negative impact on littoral fish stocks. The lake is also negatively affected by the removal of rocks and reeds for construction, pollution from human and agro-chemical waste, and overfishing in certain zones. Although the ongoing FFP projects have not been actively supporting fishermen, ACF International has been working in this sector for the past decade to provide materials to fishermen displaced by conflict in Fizi and Uvira, South Kivu.

Lake Kivu is 2,370 km² and 240 meters at its deepest point and borders DRC and Rwanda. Compared to Lake Tanganyika, it has a more modest 18 species of cichlids fish, and the ever popular and marketable tilapia. The lake also includes Idjwi Island, the world's tenth largest inland island and home to nearly 200,000 people who have their own dialect, Kihavu. The number of fishermen working on Lake Kivu has seen a sharp decline since the onset of the Rwandan genocide and ongoing conflict in the Kivus. Many fishermen lost their equipment due to displacement. Additionally, existing fishing techniques, equipment, and conservation methods are poor, thus production of fresh and dried fish is low. The presence of both methane and carbon dioxide gas trapped in the lake caused by volcanic interaction in the lake's bottom water presents both an economic opportunity and potential catastrophe. For example, Rwanda is in the process of harnessing methane gas as a significant power source and it currently powers the Bralirwa brewery in Gisenyi, the border town of Goma, using methane from the lake. However, the inhabitants surrounding Kivu are under a low threat of a massive methane explosion which could release carbon dioxide and subsequently suffocate hundreds of thousands of people around the lake and on Idjwi Island.

2.1.4 GENDER AND LAND ACCESS

As in other parts of DRC, women are very active in the agricultural sector in the study areas—63.4% participate in agriculture in North Kivu, 70.7% in South Kivu, and 60.4% in Katanga—but few are able to own or inherit land (MPSMRM et al. 2014). Although the DRC's constitution espouses equality for women, many of the country's laws do not reflect this. For example, previous studies indicate that a married woman is unable to purchase or lease land, or open a bank account without her husband's permission (USAID/DRC 2010). Although women are expected to grow food for the family's consumption on land provided by their husbands, they do not own the land. Since the conflict began in this area 20 years ago, women have found it increasingly difficult to access land due to the presence of armed militias, which contribute to their displacement and sexual violence against them.

Recent survey data from Katanga and the Kivus suggests that access to land and asset ownership by men and women remains a widespread problem (FAO 2008; Oxfam 2015; Slegh et al. 2012). As mentioned previously, persistent instability as a result of skirmishes between rebels and the army have resulted in men and women losing access to land and their homesteads. This is compounded by the fact that land is managed by chiefs in these regions and land is not titled to men or women. Continuing rebel activity has resulted in men and women having to make payments to rebels, chiefs, and others to retain access to their land; at the same time, lack of land titling and temporary displacement adversely impact food production. Women in particular are affected because they depend on their husbands or male family members to access land. Because of the limited access to land more broadly in this context, women may only be able to farm on land allocated or leased to men. The reality is that while women provide the predominant farm

labor, they are a lower priority in terms of the social hierarchy for land allocation. As a result of this, land that is allocated to women (if at all) may be rented or leased for shorter periods of time, and is often of poorer quality and smaller in size, limiting the extent to which women can produce food compared to men.

2.2 FOOD ACCESSIBILITY

2.2.1 HOUSEHOLD FOOD ACCESS DETERMINANTS, TRENDS, AND VARIATION

As noted previously, the majority of households in the Kivus and Katanga engage in crop and/or livestock production as a primary livelihood. In Katanga, 86% of households reported food crop production as one of three primary livelihood activities. This figure drops to 56% and 55% in North and South Kivu, respectively (see Table 3), where, despite relatively more favorable production conditions (e.g., more fertile soil, stronger market linkages), widespread and persistent conflict and resultant displacement (which also affects Katanga province) limit households' capacities to consistently engage in these activities, in terms of their ability to access plots and adequate labor for production (WFP 2014). In all three areas reviewed, agricultural production faces several constraints that prevent households from optimizing yields and income gains. As previously noted, these constraints include limited access to land, improved seed and other inputs, and government extension services. Crop diseases and pest infestations further inhibit production. In terms of land access, in a recent survey from Katanga, 80% of households who reported cultivating crops did so on less than 2 hectares of land (WFP 2014). The majority of farming households in North and South Kivu also reported producing on limited landholdings. For example, in North Kivu, 54% of the population reported engaging in production. Of this 54%, 41% produced on less than 2 hectares of land and the remaining 13% produced on more than 2 hectares (see Table 3) (ibid). Similarly in South Kivu, 59% of the population reported cultivating crops (ibid). Of this, 41% cultivated on less than 2 hectares of land and 18% produced on more than 2 hectares. With regard to livestock production, cattle ranching is common along DRC's eastern border, though this activity is typically reserved for wealthier households. Those smallholder farmers who own animals typically raise smallstock (e.g., goats, guinea pigs, rabbits), in part because of limited access to the inputs and services needed to support larger livestock, and in part because persistent conflict in these areas increases the risk (theft, inability to access needed inputs, significant asset loss if forced to flee) of large livestock production (Fintrac 2010). Together these constraints lead to high production costs, low farm incomes, and ultimately, low levels of production. As a result, the majority of what is produced in North and South Kivu and Katanga provinces is consumed and/or sold locally to generate income for the purchase of additional food and/or non-food essentials.

As an example, cassava is a primary source of food and income across DRC. According to a MINAGRI agricultural sector study, cassava accounts for more than 50% of the total cropped area in the country and nearly 70% of the total national demand for food products (MINAGRI 2009). This is also true in the Kivus and Katanga, where cassava and other tubers, such as sweet potatoes, provide a relatively cheap and risk-tolerant source of dietary energy (tubers are more tolerant of environmental stresses and produce relatively better yields in marginal soil). That said, poor growing conditions (limited land access and persistent conflict), the limited application of improved practices, and the prevalence of crop-specific diseases, such as CMD, contribute to suboptimal yields of this crop among smallholders. In addition, the deteriorated state of the socioeconomic environment and physical infrastructure in these production areas increases transaction costs (and ultimately, prices) associated with the crop. These increased costs and prices lead to shifts in production and consumption patterns, and cause relatively ubiquitous cassava products to be comparatively expensive (ibid). As a result, consumers who can access cheaply processed and imported foods, such as rice, wheat, and maize flour substitute these for "local" cassava products.

This limits the profitability of cassava production and goes some way toward explaining farmers' low input use and traders' lack of incentive to invest in value-added technologies for the crop.[10]

While cassava dominates cropped area and energy intake, banana plays an important role in income generation among smallholders in some of the reviewed areas, such as South Kivu, where the crop provides about 80% of income through sale in either its raw or processed (banana beer) form (Food for the Hungry 2013). That said, local trade of this crop also suffers from a lack of production efficiencies (e.g., rudimentary production techniques, its extended crop cycle compared to other crops, and limited coordination among supply chain actors) and widespread disease outbreaks, such as BXW and BBTV.

In some FFP implementation areas groundnuts are the predominant cash crop (in Mubumbano, South Kivu and Kalemie, north Katanga), while in other areas wheat is the primary cash crop (in Moba, north Katanga). While groundnuts predominate in Kalemie (followed by rice and cassava), the Food for the Hungry 2013 value chain analysis indicated that farmers in this area make more overall profit from rice production, followed by groundnut and palm oil production. In Moba, wheat is the largest cash crop, followed by groundnuts and palm oil, which are more profitable according to the research. In Mubumbano, where the main cash crops are groundnuts (followed by maize, then cassava and potatoes), the value chain analysis showed that bananas turned the highest profit, followed by sweet potatoes, groundnuts, cassava, and then maize.

Another constraint to income generation from crop production is that the majority of people in eastern DRC do not have access to formal or informal financial services (Mathys and Remancus 2010; WFP 2014). Such access is important, as it can facilitate household investments in productive activities and offset and/or mitigate associated risks and potential unforeseen hazards, in addition to smoothing households' access to basic family needs during lean periods.

Given the importance of agricultural production for food and income and constraints to the production and sale of crops, it is not surprising that significant portions of the population in these areas are food insecure (57% of households in Katanga, 49% of households in North Kivu, and 64% of households in South Kivu) (WFP 2014). In terms of sources of food, 68% and 66% of households in South and North Kivu, respectively, reported sourcing their food primarily at the market. Households in Katanga rank second to last in their reliance on the market as a primary source of food (33%) (ibid). However, Katanga has high annual yields of cassava and maize, with an average production of 2.8 million metric tons per year. As such, about 62% of food consumed in Katanga is sourced from households' own production (ibid). The relatively high reliance on markets as food sources in the Kivus is somewhat attributable to the lower number of households cultivating in these areas and their relatively better access to regional markets, as discussed more later. In addition, frequent exposure to conflict can significantly disrupt production cycles, leading to higher reliance on markets for food. Furthermore, conflict can act as a disincentive to engage beyond subsistence production (e.g., many households reported perceiving that "profit attracts insecurity)" (Fintrac 2010; Rudolf 2014). As a 2014 study on the effects of the conflict in North Kivu province found, "The continuous experience of expropriation and extortion has diminished the readiness [of local populations] to plan or work for the long-term, and has led the affected population to hide [or, in some cases, minimize] their capital in order to avoid being exposed. Production in rural areas is often diminished to the minimum to avoid burglary and robbery" (Rudolf 2014, p. 32).

[10] Most crops produced in the review areas—and by smallholder farmers in general—are minimally processed. Cassava, maize, and wheat (where grown) are processed into flour and palm fruits are pressed into oil. Groundnut, rice, and sweet potatoes are not processed, due in part to a lack of awareness of processing options for these products. Constraints to processing include lack of materials and credit and market access to sell processed goods for an adequate return (Food for the Hungry 2013).

The impact of civil conflict on the current livelihoods and likely future income-earning potential of populations in the reviewed areas is nearly ubiquitous and cannot be overstated. These impacts are further worsened by reduced educational attainment in these areas (which is also affected by conflict).

2.2.2 MINERAL RESOURCES

The Kivus and Katanga are some of the most mineral-rich areas of DRC (see Table 4). Mining sector studies in these areas estimate that more than 300,000 people engage in artisanal mining as a primary livelihood, with another 100,000 people contributing seasonally to these efforts (PACT 2010). Income from mining can be appreciably higher than earnings from other livelihood activities,[11] however, the revenues from artisanal mining are thwarted by several factors, including poor or nonexistent processing facilities, limited sector organization (e.g., cooperatives), and safety risks (e.g., lack of protective equipment and mining of hazardous substances using limited protective measures). Revenue is also thwarted by conflict due to: clashes over concession land, in particular in Katanga, where new and larger scale copper and cobalt mines are coming online; militarization and associated extortion of mining zones; and the need to ensure transparency and traceability of minerals to facilitate their market access (PACT 2010).[12] All of these factors prevent mined minerals from contributing their full potential to household and, indeed, national economic growth in DRC. While the food security conditions among this subset of the population are not specifically disaggregated in the available literature, WFP's 2014 assessment indicates that at a national level the prevalence of food insecurity among people who engage in artisanal work and/or unskilled labor—both of which may encompass artisanal mining activities—is about 55%, with about 15% of this manifesting as severe food insecurity. This is not hard to imagine given the transaction costs of engaging in this livelihood, particularly if it is undertaken in a conflict area. In addition, the draw of household members to mining represents a loss of labor for other productive household activities (such as cultivation).

In addition to the production-level challenges that restrict income from mining activities, the sector also faces gender equity challenges. While the physically intensive nature of the work poses its own challenges to women's participation, many miners noted a belief (superstition) that the presence of women in the mines will cause minerals to disappear (PACT 2010). As such, women are almost entirely absent from this form of income generation, and, as noted previously, are often left to balance mining men's other productive activities for the household (e.g., agriculture, livestock) in addition to their own production and domestic responsibilities.

Table 4. Mineral Resources Available in Katanga and North and South Kivu Provinces, DRC

Katanga	Copper, cobalt, germanium, zinc, gold, silver, tantalite, cassiterite, manganese, platinum, palladium, limestone, uranium, coal
North Kivu	Gold, niobium, tantalite, cassiterite, beryl, tungsten, monzanite, platinum, diamond, tourmaline, amethyst, quartz, semi-precious gemstones
South Kivu	Gold, niobium, tantalite, cassiterite, tungsten, platinum, sapphire, tourmaline, amethyst, quartz, semi-precious gemstones

Source: PACT 2010

[11] A 2010 mining sector study indicated that for alternative income-earning opportunities to be attractive to miners in northern areas of Katanga, employers would have to pay around US$5 per day, in addition to other benefits. On average, copper and cobalt diggers in Katanga earn US$100–120 per month. In parts of South Kivu, US$4 per day needs to be offered to be attractive (PACT 2010).

[12] As connections between conflict and minerals have become clearer, growing international pressure led the United States and other governments to institute legislation requiring all companies to prove that the minerals they purchase at any point in the supply chain have not come from areas in conflict. Such pressures have forced the withdrawal of some large buyers, significantly impacting the artisanal mining and trading economy of the areas that compose this review, particularly the Kivus. Several initiatives have been launched in response to improve traceability and certification of minerals and to promote demilitarization of mining areas (PACT 2010).

2.2.3 MARKET FUNCTIONALITY AND INTEGRATION

For most smallholder-produced goods in rural DRC the supply chain is relatively short. Smallholder farmers typically sell to rural assemblers either at the farm gate or at local markets (where they may also sell directly to consumers). Rural assemblers in turn sell this product either to transporters (who are often hired by urban wholesalers, the latter of which distribute transported goods to urban retailers or commercial entities such as restaurants and hotels, or sell the produce directly to consumers) or rural retailers (who tend to sell products directly to rural consumers) (Food for the Hungry 2013).

The major market in Katanga Province is the border market of Lubumbashi; in Tanganyika Province specifically, Kalemie and Moba are important trade hubs (Murphy et al. 2004). The major markets in North Kivu are the border market of Goma and the interior market of Butembo, and the major market in South Kivu is the border market of Bukavu (ibid). Despite their size, limited transport infrastructure and high levels of taxation/graft prevent the integration of these markets with those in other parts of DRC, beyond those within relatively close geographic proximity. Instead, markets in Katanga Province tend to be more closely linked to regional markets in Tanzania and Zambia; markets in North Kivu Province tend toward integration with those in Rwanda and Uganda, and markets in South Kivu Province tend to be more aligned with those in Burundi, Rwanda, and Tanzania, though transport options between the study areas and these regional markets are limited, as discussed below (FEWS NET 2015a). Markets in the reviewed areas face other significant constraints that contribute to their fractured nature, including civil insecurity. As previously noted, this amalgamation of constraints not only negatively impacts access to food in the short term, it acts as a disincentive to production, which limits food availability and access in the longer term as well. For example, despite the increasing demand for rice in the country (consumption of which rose 260% from 1975 to 2000), in particular in Kinshasa and environs, domestic rice from areas in eastern DRC where this crop is grown, rarely reaches markets in Kinshasa or other western parts of the country (Fintrac 2010; World Bank 2010). Instead, demand for this crop is filled through more easily accessible (and cheaper) imports.

In addition to the poor condition of available transport infrastructure in eastern DRC, which makes moving commodities within and between regions time consuming and expensive, the transport infrastructure that is available is, itself, highly limited. In Katanga, for example, while several sections of railway run through the province, only the section running from the Zambian border at Sakania to central Katanga (at Kamina) appears to be in passable condition (Log Cluster 2013). About half of the section running from Kalemie on Lake Tanganyika to Kamina is passable, and the remaining railway sections are in “poor condition or complete disrepair” (ibid). While no functional railway runs through North or South Kivu, part of the railway from Dar es Salaam to Kagoma, Tanzania, can serve portions of North and South Kivu and Katanga, though this requires several additional hours of overland travel from Tanzania into these areas (Log Cluster 2013; Murphy et al. 2004). Boat transport across and along Lake Tanganyika, including among Molira, Moba, and Kalemie ports in Katanga and Mushimbake and Kulundu ports in South Kivu, is also possible and some of these transport routes have been used by WFP (Log Cluster 2013; FEWS NET 2015a; Murphy et al. 2004). Onward transport from these South Kivu ports to Bukavu (or vice versa) is also facilitated by relatively good road infrastructure (FEWS NET 2015a). In addition, boat transport along Lake Kivu facilitates the movement of goods between North and South Kivu, though port and overall transport facilities in North Kivu are in poorer condition relative to those of South Kivu (ibid). Security risks (e.g., hijackings and theft) along roads also pose challenges, though roads remain the primary (and sometimes only) method of transport for agricultural products in the country, despite the fact that they are also limited and are often in a state of disrepair. For example, North and South Kivu contain less than 5% of the paved and unpaved roads available across the country (Observatoire National des Transports 2011). In Katanga, the roads outside of the area immediately

surrounding Lubumbashi are in poor condition and sometimes entirely impassable (FEWS NET 2015a). The overall lack of infrastructure, its limited reliability, and high resultant transaction costs restrict the scope of formal trade between and among the areas that compose this review and the rest of DRC. Known formal agricultural trade flows are presented in Annex B.

While formal trade is limited, evidence indicates that informal inter-provincial and cross-border trade is an important supplier of markets in these locations (Food for the Hungry 2013). Anecdotal evidence suggests that thousands of tons of maize in its whole or processed form arrive in Katanga Province from Zambia via informal channels annually.[13] Dynamic informal trade of rice and beans (also from Zambia) is also evident, though levels of informal trade fluctuate significantly, depending in part on factors such as production levels, prevailing trade policy, and level of enforcement of police controls and border crossings (FEWS NET and WFP 2012).[14] Furthermore, DRC is infamous for its abundance of tax collecting agencies. For example, nine state agencies tax agricultural products. There are formal taxes collected by a road maintenance fund (*Fond Entretien Routier* or FONER). Informal taxes are collected by the national army (FARDC); the national intelligence agency (*Agence Nationale du Renseignement)*; the traffic police (*Police Circulation Routière)*; Transcom (the DRC's transport authority); tourism authorities; and the border police. In such an environment it is difficult for farmers and others in the value chain to make a profit from the sale of their goods. Prohibitive taxation on off-farm income-generating activities (many of which target women) has also impeded gains in this intervention area across the current FFP development projects in eastern DRC.

2.2.4 GENDER, INCOME, AND ASSET OWNERSHIP

The majority of women across DRC and in the Kivus and Katanga reported earning less than their spouses, according to the most recent DHS (see Table 5). In addition, less than 30% of women nationally and 25% in the Kivus and Katanga reported having control over how to use their income. Importantly, while 34% of women nationally reported participating in household decisions, less than 25% of women in Katanga reported participating in household decisions in contrast with 45% in North Kivu and 51% in South Kivu. Women's decision-making power in Katanga is among the lowest of all the provinces, indicating the extent to which gender inequality is entrenched in this province. While women in North and South Kivu reported greater decision-making authority, even higher than the national average, overall this still accounts for only half of all women in these two provinces. Women's limited control over their own income, their lack of participation in household decisions, and the extremely high fertility rate directly impacts women's control over food access and subsequently undermines their capacity to provide optimal care to prevent stunting and other poor outcomes in their children.

While there is limited information on actual asset ownership by men and women, and the situation is constantly changing due to instability, the 2013-14 DRC DHS survey provides some useful insights in terms of reported asset ownership. At least half of women and men interviewed reported not owning a house or land (see Table 5). In addition, the pattern of asset ownership at the national level is age-related,

[13] The Famine Early Warning Systems Network's (FEWS NET's) Cross Border Trade Report for August 2012 reported cross-border trade figures for maize from Zambia into DRC of close to 10,000 MT, with an additional estimated 1,900 MT devoted to maize meal in the 2009/10 season. These figures increased to nearly 13,000 MT for maize and 1,500 MT for maize meal in 2010/11, and decreased to 9,700 MT for maize and 1,500 MT for maize meal in 2011/12. However, these figures are based on trade seen at official border posts during specific times of day. It is assumed that actual trade flows are much greater (FEWS NET 2012; WFP 2014).

[14] FEWS NET's Staple Food Market Fundamentals for DRC indicates that, "the lack of infrastructure and capacity to prohibit flows to bypass the formal border checkpoint at Kasumbalesa [Zambia], have encouraged the informal, unregulated flow of almost all staple foods across the border, in small quantities (accounting for approximately 90 percent of all flows into the DRC at this border point)" (FEWS NET 2015a, p.64).

and the pattern is likely the same in Katanga and the Kivus. Among women 15–19 years, 90% reported they did not own a house and 88% reported they did not own land; by contrast, among women 45–49, 39% reported not owning a house and 47% reported not owning land. Similarly, for men 15–19 years, 95% reported not owning a house and 92% reported not owning land, while among men 45–49, 28% reported not owning a house and 34% reported not owning land.

Table 5. Key Gender Indicators

	National	Kinshasa	North Kivu	South Kivu	Katanga
Education					
Women 15–49 years					
% who report no education	15.4	0.8	23.6	28.0	18.6
% who report completing secondary school	8.5	27.1	5.4	5.5	5.6
Men 15-49 years					
% who report no education	4.1	0.3	11.1	9.3	2.7
% who report completing secondary school	16.2	23.5	8.5	10.6	13.5
Asset ownership					
Women 15–49 years					
% who report they do not own a house	62.7	89.0	64.4	54.8	56.3
% who report they do not own land	65.8	95.3	71.3	49.2	51.0
Men 15-49 years					
% who report they do not own a house	53.2	90.0	55.1	54.1	55.0
% who report they do not own land	57.0	94.0	53.9	50.7	54.8
Income					
Who decides on the use of women's income, as reported by women 15–49 years					
Woman	28.6	63.0	22.8	19.1	23.4
Woman and spouse	40.9	30.6	58.9	58.2	35.8
Spouse	29.6	6.2	18.2	22.0	40.2
% of women 15–49 years who report their income is less than their spouse's	71.9	67.6	53.9	72.0	80.3
Decision making					
% of women 15–49 years who report on all 3 decisions (woman's health, household purchases, visiting relatives)	33.5	43.3	44.8	51.2	24.9
Domestic violence					
% of women 15–49 years who report use of violence against women is acceptable	74.8	64.1	61.0	67.8	77.2
% of men 15–49 years who report use of violence against women is acceptable	59.5	52.5	44.2	56.0	62.9
% of women 15–49 years who report their partner/spouse exhibits at least 3 controlling behaviors	44.7	40.4	25.2	50.7	44.2
% of women 15–49 years who report having experienced acts of physical violence against them from the age of 15	51.8	57.4	25.6	47.5	49.0
% of women 15–49 years who report having experienced physical violence against them in the past 12 months	27.2	20.7	11.4	31.1	27.5
% of women 15–49 years who report experiencing sexual violence in the past 12 months	16.3	5.6	14.6	18.3	15.5
% of women 15–49 years who report physical or sexual violence committed by their partner/spouse in past 12 months	36.8	27.0	24.7	36.2	35.5
% of women 15–49 years who report experiencing any form of violence (physical, sexual, emotional)	57.4	57.1	46.9	57.5	57.8

Source: DRC DHS 2013–2014 (MPSMRM et al. 2014)

2.3 FOOD UTILIZATION AND HEALTH

2.3.1 CHILD HEALTH AND NUTRITIONAL STATUS

Trends in child health and nutritional status. The health and nutritional status of children in DRC have historically been poor, and despite public health efforts in recent years, child health in DRC remains suboptimal. (Table 6 provides data on child health and nutritional status nationally and in the three provinces from the DRC 2013/14 DHS). The mortality rate for children under 5 years is 104 per 1,000 (MPSMRM et al. 2014), and it is the eighth-worst globally (UNICEF 2014). The under-5 mortality rates in Katanga, South Kivu, and North Kivu are 121, 139, and 65 per 1,000, respectively (MPSMRM et al. 2014). The poor nutritional status of children under 5 is an important contributor to these high mortality rates.

The prevalence of stunting, underweight, and wasting nationally is 43%, 23%, and 8% respectively. In Katanga, South Kivu, and North Kivu, the prevalence of stunting exceeds national levels, at 45%, 53%, and 52%, respectively (MPSMRM et al. 2014). Katanga's wasting prevalence (8%) matches the national prevalence. The wasting prevalence in North Kivu (5%) and South Kivu (7%) are a little lower. Looking at historical trends, the prevalence of stunting in the Kivus has declined slightly from 2007 to 2013-14 and has remained the same in Katanga, while wasting has declined slightly in all three provinces (see Figure 2).

Malnutrition among children under 5 in DRC often begins in utero due to poor maternal nutritional status. At the national level, stunting and underweight begin to increase from 6–8 months, rising steadily until 2 years of age. This is also likely the case in the Kivus and Katanga provinces, suggesting that efforts to improve complementary feeding practices in the first 2 years of life are crucial to prevent stunting and underweight in this age range. In addition, the high infant mortality rates (41, 92, and 72 per 1,000, respectively in North Kivu, South Kivu, and Katanga) point to the need for improved exclusive breastfeeding practices in the first 6 months, a proven life-saving measure in infancy. The extent to which mothers can provide optimum care in terms of improved infant and young child feeding practices is a challenge in the Kivus and Katanga particularly given the exceedingly high total fertility rate (6.5 children per woman in North Kivu, 7.7 in South Kivu, and 7.8 in Katanga). These high rates leave women stretched in terms of household and caring responsibilities and result in limited time to provide children with optimum care and feeding. Inadequate hygiene practices and lack of sanitation facilities are also key contributors to stunting in this context. As such the three key determinants of stunting are the high fertility rates, poor infant and young child feeding practices, and inadequate hygiene practices and lack of sanitation facilities.

In 2002, DRC adopted a national nutrition policy to help end the deterioration of its nutritional situation. This policy, updated in 2013, provides broad guidelines to combat all forms of malnutrition. Based on the policy, the national nutrition program (Programme National de Nutrition or PRONANUT) first developed a 5-year nutrition plan (2001–2005), then a 3-year plan in 2006, and finally a 2009–2015 plan that outlines priority interventions, specific objectives, monitoring and evaluation indicators and targets, and a budget (PRONANUT 2008). The interventions in the latest plan are consistent with international recommendations for addressing malnutrition.

Summary of DRC's National Nutrition Policy

The goal of DRC's national nutrition policy is to guarantee a productive human capital through the population's adequate nutritional status, for the development of the country. The guiding principles of the plan include: leadership by the government, decentralization, the integration of nutrition-specific and nutrition-sensitive interventions, accountability by local communities, inter-sectoral collaboration, the principle of equity, ethical delivery and monitoring of services, gender consideration, management transparency, partnerships, coordination, and sustainability. It is built around two main axes: (1) nutrition-specific interventions, separately listed for infants 0-23 months and 24-59 months, children 6-19 years, women of reproductive age, and pregnant and lactating women, and (2) nutrition-sensitive interventions involving the sectors of food security; water, sanitation, and hygiene; education; and others. It outlines the institutions involved in operationalizing the policy with specific roles and responsibilities clearly defined.

Micronutrients. Anemia, which influences a child's brain development and school performance, is still highly prevalent in children under 5 in DRC (60%) and is alarmingly high among children 6–8 months of age (76.4%) (MPSMRM et al. 2014). Interestingly, in North and South Kivu, the anemia prevalence in children under 5 is not as high as in the rest of the country (34% and 36%, respectively), however it is high (60%) in Katanga. Iron deficiency is a major contributor to anemia in children under 5 and micronutrient supplements such as sprinkles do not appear to be available nationally nor within the Kivus and Katanga (MPSMRM et al. 2014). Malaria and hookworm, which are prevalent in the Kivus and Katanga, are also significant contributors to the anemia prevalence. In North and South Kivu, 66% and 74% of children under 5, respectively, received deworming tablets in the past 6 months, but only 43% of children in Katanga received them.

Coverage of vitamin A supplementation, an important public health measure to mitigate vitamin A deficiency, is 85%, 84%, and 65% in children under the age of 5 in North Kivu, South Kivu, and Katanga, respectively, compared to the national coverage of 70%. Earlier studies seem to suggest that while vitamin A deficiency is prevalent nationally (affecting approximately 10% of the population), it is not as prevalent in Katanga (affecting approximately 7% of the population) and is more prevalent in North and South Kivu (affecting approximately 12% and 15% of the population, respectively) (Ulimwengu et al. 2012). Nonetheless, children 6–23 months in all three provinces seem to consume vitamin A-rich foods at a relatively high rate, comparable to the national average of 82%.

The majority of children live in households consuming iodized salt. Based on this information alone, it is difficult to draw conclusions on the extent of iodine deficiency in children, as the quality of iodization in the salt consumed by these households is unknown and it is also unknown whether children consume adequate quantities.

Infant and young child feeding. While almost every child in DRC is breastfed (98%), only 48% of mothers exclusively breastfeed their children nationally, the median duration of exclusive breastfeeding is only 3.6 months, and just over half of infants (52%) are put to the breast within an hour of birth. Breastfeeding practices are not ideal in North Kivu, South Kivu, and especially in Katanga where the median durations of exclusive breastfeeding are 5.2 months, 3.6 months, and 1.1 months, respectively (MPSMRM et al. 2014). There is an alarmingly low prevalence of exclusive breastfeeding until 6 months of age in these provinces (58% in North Kivu, 39% in South Kivu, and only 31% in Katanga according to the 2010 Multiple Indicator Cluster Survey [MICS] [INS and UNICEF 2011]).

The diet quality of infants and young children in the three focus provinces is far from adequate. Nationally, 48% of children 6–23 months consume cereal-based foods, and 66% of children 6–23 months consume vitamin A-rich fruits and vegetables, but only 47% consume meat or fish, 9% consume eggs, and 1% consume dairy products, indicating a low protein intake (MPSMRM et al. 2014). In North Kivu, 24% of infants and young children have the minimum recommended diet diversity, 43% have the

minimum recommended feeding frequency, and only 14% have a minimally acceptable diet. In South Kivu, 15% have minimum diet diversity, 29% minimum feeding frequency, and 4% minimum acceptable diet. In Katanga, 20% have minimum diet diversity, 20% minimum feeding frequency, and 5% minimum acceptable diet. These suboptimal complementary feeding practices play a large role in the high stunting prevalence seen in the Kivus and Katanga, as children need optimal nutrition to grow (MPSMRM et al. 2014).

Childhood illnesses. The high prevalence of stunting in DRC is not only a result of poor infant and young child feeding practices but is also a consequence of high disease burden from repeated illnesses such as diarrhea, fever, and acute respiratory infections that particularly affect the youngest children. Children under 5 in North Kivu, South Kivu, and Katanga have high prevalence of diarrhea, fever, and to a lesser extent acute respiratory infections, which are comparable to the national prevalence. Among those with these illnesses in any of the three provinces, less than half sought treatment from a health facility or provider for their illness (with the exception of 53% of children with acute respiratory infection in Katanga). Inadequate hygiene practices and lack of sanitation facilities is likely one of the leading causes of repeated infections in infants and young children, as evidenced by the proportion of households reporting having handwashing stations, which in North Kivu, South Kivu, and Katanga is 3.2%, 13.3%, and 2.7%, respectively.

Malaria is prevalent in North Kivu (5%), South Kivu (10%), and especially in Katanga (32%) in children under 5. Malaria impedes a child's development and contributes to the high anemia rates seen in Katanga. In recent years, malaria prevention seems to have been a priority public health action. In fact, 60%, 73%, and 81% of households in North Kivu, South Kivu, and Katanga, respectively, own at least one bed net and the majority of the nets are long-lasting insecticide-treated nets. The proportion of children under 5 who reported sleeping under a long-lasting insecticide-treated bed net in North Kivu, South Kivu, and Katanga is 39%, 58%, and 60% respectively (MPSMRM et al. 2014).

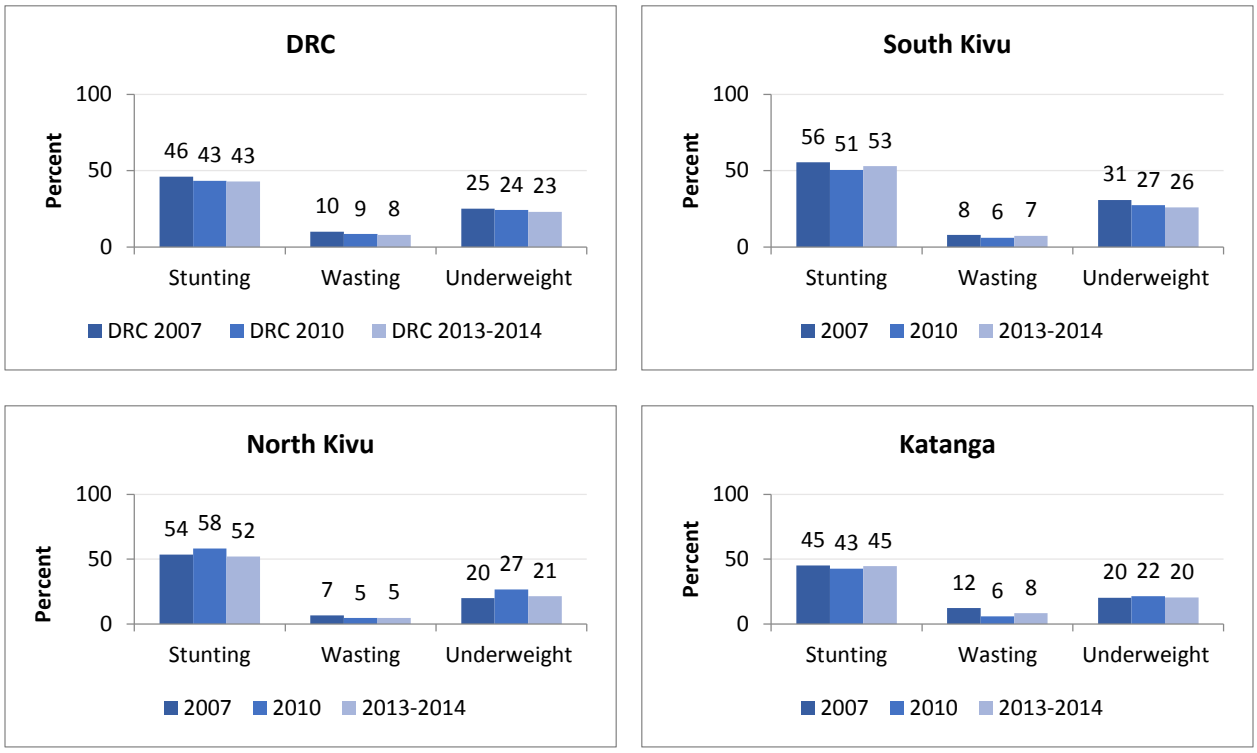
Table 6. Child Health and Nutritional Status

	National	Kinshasa	North Kivu	South Kivu	Katanga
Prevalence of Malnutrition					
% of children under 5 stunted (< -2 standard deviations [SD])	42.7	17.3	52.0	53.0	44.5
% of children under 5 underweight (< -2 SD)	22.6	5.5	21.4	26.0	20.3
% of children under 5 wasted (< -2 SD)	7.9	3.5	4.7	7.2	8.2
Anemia and Micronutrient Nutrition					
Anemia (Hb < 11 g/dL) (6–59 months)	59.8	57.0	33.5	35.7	59.5
Received deworming treatment in the past 6 months (6–59 months)	60.6	84.7	66.2	74.2	42.9
Living in a house with iodized salt (6–59 months)	92.1	99.0	99.9	95.3	83.2
Received vitamin A supplement in the past 6 months (6–59 months)	70.4	90.6	84.9	83.5	65.3
Nutrient-Rich Food Consumption (6–23 months)					
% of children consuming iron-rich foods (6–23 months) in the past 24 hours	52.0	67.4	44.6	46.5	56.8
% of children consuming vitamin A-rich foods in the past 24 hours (6–23 months)	81.8	77.3	75.8	77.9	82.2
Breastfeeding Practices					
% of exclusive breastfeeding through 6 months	48.0	—	—	—	—
Median duration (months) of exclusive breastfeeding	3.6	1.3	5.2	3.6	1.1

	National	Kinshasa	North Kivu	South Kivu	Katanga
Among children born in the 2 years preceding the survey					
% who were breastfed	98.2	98.4	99.9	97.2	98.4
% who were put to the breast within 1 hour of birth	51.9	51.3	72.1	54.0	39.0
Among children born in the 2 years preceding the survey who were breastfed, % who received pre-lacteal feeds	10.5	20.8	3.8	9.8	11.7
Complementary Feeding Practices among All Children 6–23 Months (Breastfed and Non-Breastfed)					
% with minimum diet diversity	19.9	31.8	23.6	15.2	20.1
% with minimum feeding frequency	34.6	29.5	43.1	28.7	20.0
% with minimum acceptable diet	8.4	11.3	13.8	3.6	5.3
Illness Prevalence and Prevention					
% of children 12–23 months who received immunizations	45.3	67.7	70.6	62.3	40.2
% of children under 5 who had diarrhea in the 2 weeks preceding the survey	16.8	18.8	13.7	21.9	18.9
% of children under 5 with diarrhea; advice or treatment was sought from a health facility or provider	39.0	37.9	41.5	46.1	35.5
Among children under 5 who had diarrhea in the 2 weeks preceding the survey, % who received oral rehydration therapy	39.1	39.4	38.7	38.5	38.3
Among children under 5 who had diarrhea in the 2 weeks preceding the survey, % who received zinc supplements	2.4	3.0	1.3	11.2	0.9
% of children under 5 who had a fever in the 2 weeks preceding the survey	29.5	19.4	22.4	37.7	32.2
% of children under 5 with fever; advice or treatment was sought from a health facility or provider	39.9	48.7	39.2	37.2	39.0
% of children under 5 who had an acute respiratory infection in the 2 weeks preceding the survey	6.8	2.5	12.3	8.2	5.0
% of children under 5 with acute respiratory infection; advice or treatment was sought from a health facility or provider	41.6	—	29.9	42.3	52.7
% of children 6–59 months who tested positive for malaria, diagnosed by blood smear	22.6	18.1	5.0	9.9	31.7
% of children under 5 who slept under a long-lasting insecticidal net the previous night before the interview	55.4	46.2	38.7	58.0	59.7
Infant and Child Mortality (per 1,000 live births)					
Under-5 child mortality	104	83	65	139	121
Child mortality (13–59 months)	49	36	25	51	53
Infant mortality (under 12 months)	58	50	41	92	72
Post-neonatal mortality (difference between neonatal mortality and infant mortality)	30	34	16	46	38
Neonatal mortality (within the first 28 days)	28	16	25	47	35

Source: DRC DHS 2013-14 (MPSMRM et al. 2014)

Figure 2. Trends of Nutritional Status of Children under 5



Adapted from MPSMRM et al. 2014 and UNICEF 2014.

2.3.2 MATERNAL HEALTH AND NUTRITIONAL STATUS

Poor maternal nutrition, which is prevalent in DRC, contributes significantly to an intergenerational cycle of malnutrition and poverty. (Table 7 provides data on maternal health and nutritional status nationally and in the three provinces from the DRC 2013-14 DHS) The nutritional status of women in Katanga is especially poor: 17% of women of childbearing age in the province are underweight (body mass index [BMI] < 18.5) and 43% are anemic. Moreover, only 36% reported receiving deworming tablets during their last pregnancy, and just 3% took iron supplements for 90 days or more (MPSMRM et al. 2014). The situation for women in North Kivu and South Kivu, though a little better, is far from ideal. Poor nutritional and reproductive health status of women not only affects the women themselves, but also their children. Poor maternal nutritional status pre-pregnancy, and inadequate nutrient intake and weight gain during pregnancy affect fetal development and growth, birth outcomes, infant and child nutritional status, and growth and development.

In addition, 51% of women 15–19 years have begun childbearing by age 19 (MPSMRM et al. 2014). Adolescent pregnancy is associated with a 50% increased risk of stillbirths and neonatal deaths and an increased risk of low birth weight, premature birth, asphyxia, and maternal mortality (Bhutta et al. 2013; World Health Organization 2007). Reducing the adolescent fertility rate and delaying first pregnancies beyond adolescence reduces the risk of low birth weight and stunting in their children and allows these girls to grow to their full potential, protecting their own nutritional status over the long term and improving their educational and economic status.

Nationally, the total fertility rate has increased from 6.3 in 2007 to 6.6 in 2013-14. In South Kivu and Katanga the fertility rate is higher than the national total fertility rate (7.7 and 7.8, respectively), while in North Kivu it is about the same. The implication of the high fertility rates in these provinces are manifold: they increase the risk of infant, child, and maternal mortality, decrease the schooling attainment of children, and, on a larger scale, reduce economic growth and place stress on the environment, contributing to climate change and food insecurity. Moreover, it is important to note that the ideal number of children that women want in these provinces (see Table 7) mirrors the current total fertility rate, suggesting that women perceive they are valued for having many children. Access to family planning is low nationally, in the Kivus, and in Katanga. Only 12% of women in North Kivu, 8% in South Kivu, and 4% in Katanga use a modern method for birth control (MPSMRM et al. 2014). The high fertility rate is likely outstripping households' ability to achieve food security.

HIV is not a widespread problem in DRC or in the Kivus where less than 1% of men and women tested positive (MPSMRM et al. 2014). It is slightly more prevalent in Katanga, with about 2% of women and over 1% of men testing positive (MPSMRM et al. 2014).

Table 7. Maternal Health and Nutrition

	National	Kinshasa	North Kivu	South Kivu	Katanga
Maternal mortality ratio (per 100,000 live births)	846	—	—	—	—
Total fertility rate (children per women)	6.6	4.2	6.5	7.7	7.8
Number of ideal children as reported by women age 15–49 years	6.1	4.5	5.9	6.8	7.0
Median age at first union (of women 20–49 years)	18.8	—	—	18.3	18.2
% of women 15–49 years in polygamous unions	22.1	8.2	12.1	22.1	19.5
Median age at first birth (of women 20–49 years)	19.9	—	—	19.3	19.3
% of women 15–19 years who have begun childbearing by 19	50.8	—	—	—	—
% of women 15–19 years who have begun childbearing	27.2	12.7	18.0	20.7	31.4
% of women 15–49 years who are undernourished (BMI < 18.5)	14.4	7.4	5.6	7.2	17.1
% of women 15–49 who are anemic (non-pregnant < 12.0 g/dL; pregnant <11.0 g/dL)	38.4	46.7	20.7	22.7	43.1
% of women 15–49 years reporting having taken iron supplements for more than 90 days during their last pregnancy	4.7	18.0	10.6	4.2	3.1
% of women 15–49 years reporting having taken deworming tablets during their last pregnancy	55.9	86.3	58.1	54.9	36.2
% of women with a child born in the past 5 years given vitamin A supplements after birth of last child	26.6	39.8	39.2	19.1	23.0
% living in houses with iodized salt (among women with a child born in the previous 5 years)	92.3	99.0	99.9	95.2	84.2
% of pregnant women 15–49 years who slept under an long-lasting insecticidal net the previous night	59.7	38.4	46.2	61.9	64.1
% of women 15–49 years who gave birth in the preceding 2 years who reported receiving 2 doses of intermittent preventive treatment of malaria	14.3	15.1	16.1	6.9	9.2
Median number of months since preceding births (of women 15–49 years)	30.4	34.0	29.7	27.3	28.7
% of women 15–49 using any modern method of birth control	7.8	19.0	11.6	7.9	3.9
% of women in union reporting wanting to limit births	23.4	32.1	31.6	19.7	21.2

	National	Kinshasa	North Kivu	South Kivu	Katanga
% of women 15–49 receiving antenatal care from a medically trained provider*	99.1	96.4	97.4	95.8	78.6
% of births delivered by a medically trained provider	79.9	97.9	91.7	92.4	63.7

Source: DRC DHS 2013-14 (MPSMRM et al. 2014)

2.3.3 WATER, SANITATION, AND HYGIENE (WASH)

Only half the households in DRC (47%) have access to improved drinking water sources (INS and UNICEF 2011). Access to improved drinking water sources is also low in Katanga (48%), but are higher than the national average in North and South Kivu (see Table 8). Furthermore, access to improved sanitation facilities is low nationwide. For example, 6% of households have access to improved, non-shared sanitation facilities (INS and UNICEF 2011). The WASH situation is especially dire in North Kivu where only 4% of households have access to non-shared improved sanitation facilities, and in Katanga, where 18% of the population practices open defecation. Nationally only 14% of households have handwashing stations (only 3% in North Kivu and Katanga) and among them, only 24% had soap and water.

Table 8. Water Sanitation and Hygiene

	National	Kinshasa	North Kivu	South Kivu	Katanga
% of households with hand washing stations	13.7	32.3	3.2	13.3	2.7
Of those with a hand washing station, % of households with soap and water	24.2	45.8	22.1	26.3	56.9
% of households with access to improved water sources (in the house)*	46.5	88.8	77.3	60.9	47.8
% of households with open defecation*	14.5	1.3	6.9	13.1	17.8
% of households with improved toilets (non-shared)*	5.9	18.5	3.9	15.2	5.2

Source: DRC DHS 2013-14 (MPSMRM et al. 2014), unless indicated otherwise
* Source: MICS 2011 (INS and UNICEF 2011)

Ensuring that children have a hygienic environment to live and play in is critical as evidence suggests that improving children's diets can reduce stunting only by one-third and that other interventions, including those addressing water and sanitation issues, may be essential to reduce stunting further (Dewey and Adu-Afarwuah 2008). The unhygienic conditions in which children live, open defecation (which is particularly harmful in densely populated areas), and living near animals can lead to environmental enteric dysfunction (a subclinical disorder of the small intestine that creates inflammation in the gut and reduces absorption of nutrients), which is caused by ingesting large quantities of fecal bacteria (Humphrey 2009; Spears 2013). Effectively preventing malnutrition in children under 2 in this context will depend on continued efforts to work with communities to ensure access to safe drinking water, hygienic sanitation facilities, and hygienic environments for children to play in. However, improving access to water, sanitation, and hygiene facilities alone will not be sufficient as behavior change to improve handwashing behaviors, water treatment and storage, food hygiene behaviors, and use of latrines is also needed.

To contribute to achieving the Millennium Development Goals for WASH in DRC, the Ministry of Health and Ministry of Education are implementing the national program of Village Assainie and Ecole Assainie (Healthy Village, Healthy School). The program was started in 2006, and is being implemented in each province across the country, with support from UNICEF.

2.3.4 HEALTH CARE SYSTEM AND ACCESS

Addressing the pressing health needs of mothers and children in the Kivus and Katanga is a challenging task. According to the 2011–2015 national health plan, North Kivu is divided into four health districts, with a total of 34 health zones, South Kivu is divided into five health districts and a total of 34 health zones, while Katanga is divided into seven health districts and 67 health zones (Ministère de la Santé Publique 2010). Each health zone is further divided into *aires de santé*, which are each supposed to have a fully functioning primary health care center. However, the health system in the provinces suffers from major constraints, including a heavy disease and malnutrition burden, poor health infrastructure, frequent stock-outs of medicines and other pharmaceuticals (sometimes longer than 6 months) in public health facilities, a lack of health promotional materials, a lack of transportation and other logistics to reach rural populations, and health staff's need for training to bring them up to speed with the latest medical developments and to allow them to address the nutritional care needs of the population they are serving.

2.3.5 GENDER AND NUTRITION

Gender inequality is pervasive in DRC and is a significant underlying factor that exacerbates food insecurity and malnutrition. One of the clearest manifestations of this relationship is, as noted previously, the high fertility rate which reflects how women are valued, and the prevalence of early marriage and adolescent pregnancy among girls 15–19 years, all of which reflect prevailing gender norms that discriminate against women and girls and contribute significantly to chronic undernutrition in their children. Nationally, about 13% of women are married by the age of 19 compared to only 1% of men; however 51% of women begin childbearing by 19 years of age (MPSMRM et al. 2014). In many respects the gender issues that exist nationally are magnified further in the Kivus and Katanga; in almost every instance, gender indicators for Katanga are worse compared to other provinces and the whole nation (see Table 5).

Gender inequality is reflected in several other key indicators. Maternal education is a key indicator of women's empowerment and children are less likely to be stunted if their mother had secondary education or higher compared to no education. According to the 2013-14 DHS, 15% of women 15–49 years (compared to 4% of men 15–49) in DRC have no education. This is even more severe in North Kivu, South Kivu, and Katanga, where 24%, 28%, and 19% of women, respectively, have no education and only a very small proportion has secondary education (MPSMRM et al. 2014).

Domestic violence is widely prevalent in DRC. Over half of women 15–49 years of age (52%) have suffered physical violence at some point in their lives after the age of 15 and 27% in the past 12 months; in the majority of cases, the violence was perpetrated by their husbands/partners (MPSMRM et al. 2014). In North Kivu, 26% of women reported having been victims of physical violence, in South Kivu, 48%, and in Katanga, 49%. Sexual violence is also common, with 15% of women in North Kivu, 18% in South Kivu, and 16% of women in Katanga reported having experienced it in the past 12 months (MPSMRM et al. 2014). This reflects how deeply entrenched gender inequality and violence against women are across DRC. Many women have virtually no control over aspects of their lives such as sexuality, fertility, income, and household decision-making power—all of which affect the number of children they have, their ability to both provide and care for them well, and ultimately their children's nutritional status.

2.4 SHOCKS, COPING CAPACITY, AND RESILIENCE

While conflict is a predominating shock in the areas reviewed, it is by no means the only hazard to which populations are exposed. At a national level, the most common shocks reported by households were more idiosyncratic in nature, such as serious illness and death of a household member, which was reported by nearly 40% and 20% of households, respectively (WFP 2014). Following this were more covariate

shocks, such as irregular rains, crop pests and disease, low (farm gate) prices for crops, high (retail) prices for food, livestock disease, and insecurity/conflict and associated population displacement—each of which affected less than 10% of households nationally (ibid). Given the high prevalence of conflict and insecurity in the areas reviewed, their rankings of shock exposure vary from national trends, though many of the same non-conflict-related shocks are present (Fintrac 2010).

At a national level, households noted employing a number of strategies to deal with these shocks, including: consuming seed stock (about 32% of households), relying on income from casual labor to access food or going an entire day without eating (about 27%), harvesting more than usual and consuming crops intended to be saved for the following season (about 25%), and reducing expenditures on livelihood inputs (e.g., seeds, tools) (about 18%) (WFP 2014).

In addition to the shocks listed above, eastern DRC is at a high risk of other natural disasters, including geologic shocks such as earthquakes (reported in 2005 and 2008) and volcanic eruptions from mounts Nyiragongo and Nyamulagira (reported in 2002, 2006, 2010, 2011, and 2014), both of which have the potential to trigger the release of previously noted toxic gases from Lake Kivu (Mathys and Remancus 2010; Volcano Discovery). While such shocks would not necessarily directly impact the areas reviewed, at a significant enough magnitude, they have the potential to disrupt economic activities in and around major area trade hubs, such as Goma, further compromising food availability and access.

Household capacity to respond to shock varies between the Kivus and Katanga. WFP recently assessed nationwide coping strategies related to a household's ability to access food during times of stress (WFP 2014). The assessment's Coping Strategy Index (CSI) used weighted values to determine the severity of the coping strategies employed, such as reducing the number of meals per day, consuming seed stock for the following season, relying upon casual labor, etc. A high CSI score often reflects heightened exposure to food insecurity and limited resilience. Households in Katanga had the worst CSI scores in DRC. Households from North and South Kivu also showed relatively poor coping capacity, with CSI scores slightly worse than the national average for rural inhabitants.

3. LESSONS LEARNED

FFP supports three development food assistance projects in DRC. These projects started in 2011 and continue until 2016, and are implemented by ADRA, Food for the Hungry, and Mercy Corps in South Kivu, South Kivu and Katanga, and North Kivu provinces, respectively. Given the volatile and unpredictable security conditions in the Kivus, Mercy Corps was required to change a portion of their project intervention sites in North Kivu. ADRA and Food for the Hungry have occasionally withdrawn staff for extended periods due to insecurity in their intervention areas, however they have not been required to permanently cease work in any of their original intervention zones. The projects' strategic objectives and activities are summarized in Annex C.

ADRA's JENGA JAMAA II is a $50 million, 5-year FFP development food assistance project being implemented with consortium partners World Vision and Johns Hopkins University. JENGA II follows on from JENGA, which was implemented from 2008–2010 in Fizi and Uvira territories in South Kivu. The goal of JENGA II is to sustainably reduce food insecurity among vulnerable households in Fizi, Uvira, and Kalehe territories of South Kivu Province. JENGA II aims to reach over 250,000 people during the life of the project.

Budgeted at about $48 million, Food for the Hungry's 5-year FFP development project targets nearly 669,000 people in the territories of Kalémie and Moba in Katanga Province and Walungu in South Kivu Province. The project covers sectors including agriculture and natural resources management, health and nutrition, water and sanitation, and access to credit. Community capacity strengthening and gender mainstreaming are cross-cutting themes. The project's overall goal is to reduce food insecurity of vulnerable households in the targeted areas.

Mercy Corps, in partnership with Catholic Relief Services is implementing the 5-year Resources to Improve Food Security in Eastern DRC (RISE or *SIMAMA* in Swahili) FFP development project with an estimated budget of about $25 million. The project aims to ensure that 370,000 vulnerable households and communities in North Kivu build and sustain their food security by improving agricultural production, increasing household incomes, and preventing childhood malnutrition. *SIMAMA* will build communities' resilience to shocks by encouraging the adoption of sustainable coping mechanisms. The project includes a substantial focus on good governance to facilitate the likelihood that project results are sustained. *SIMAMA* originally targeted five Health Zones (HZ) in North Kivu, four in Rutshuru Territory (Rutshuru, Rwanguba, Binza, and Birambizo) and one in Nyiragongo Territory (Karisimbi). In 2013, insecurity as a result of M23 rebel activities in the Rutshuru area led Mercy Corps to scale down activities in Rwanguba, Binza, and Rutshuru HZs in Rutshuru Territory and Karisimbi HZ in Nyiragongo Territory. All activities in these areas were closed except for a final season of: seed multiplication, support to women and youth associations, and follow-up with village savings and loan associations.

Methods and structure for identifying key lessons learned. The lessons learned presented here are informed by a comprehensive review of each project's design, implementation, and monitoring documents, including project applications, annual reports, midterm evaluations, and complementary materials, as well as in-depth interviews with key headquarters and field staff from each project. These lessons are not exhaustive of the learning associated with each project, but rather emphasize key findings across the projects consulted. The lessons presented cover general project design, followed by specific intervention areas: availability/accessibility, maternal and child health and nutrition (MCHN)/WASH, and gender. Each set of lessons includes an overview of activities related to a specific topic synthesized from the three FFP projects assessed and a text box with pertinent lessons learned.

3.1 CROSS CUTTING PROJECT LESSONS

3.1.1 PROJECT SCALE AND FLEXIBILITY

Current FFP projects in eastern DRC all reported experiencing programming interruptions, due largely to the persistence of civil insecurity stemming both from the activities of armed groups as well as interethnic clashes over land and other resources. The magnitude, duration, and impacts of these disruptions varied, with activities being delayed by a few weeks in some instances, while in other instances activities were entirely dropped. In the most extreme case, civil insecurity led one project to close down all operations in a portion of its target area midway through implementation and introduce these same activities to new recipients in relatively more secure areas. Such disruptions reduce projects' abilities to achieve significant positive outcomes and impacts, especially on indicators that are hard to change in the short term, such as stunting. Given these experiences, realism in project scale and strategic selection of activities (discussed more in lesson 3.1.2) is paramount.

Lessons Learned: Project Scale and Flexibility

- Focus project design on key activities to be implemented in a relatively small geographic area, with due consideration of the distance between targeted communities (to facilitate regular project monitoring, as well as recipient access to project-sponsored activities).
- Consider an area's propensity for conflict (e.g., the presence of armed groups or valuable minerals) in project design and realistically evaluate project capacity to implement adequate contingencies for implementation disruptions in all target areas.
- Ensure project design includes a range of contingency plans to address implementation disruptions, for example, approaches that allow for continued, if slower, progress when escalations in insecurity require a temporary suspension of project support or approaches for the considered suspension of activities should more extreme insecurity conditions dictate the need to terminate project implementation.
- Integrate strong project monitoring, as well as regular monitoring of the broader implementation environment, into project design and implementation to ensure that benefits from project activities do not unwittingly make recipient populations targets for armed groups.

3.1.2 INTEGRATION OF PROJECT ACTIVITIES

The current FFP development projects in eastern DRC began implementation of most of their activities in a siloed fashion. All projects reported altering their project design to better integrate different sectors around the middle of the project timeline. They did this by incorporating staff from different sectors into the same teams and facilitating teams' abilities to work in the same offices, develop work plans together, conduct joint field visits, and participate in training on other sectors' messages and activities.

In addition to identifying a need to better integrate activities across sectors, the midterm evaluations of some of the projects indicated that different partners within a given project did not necessarily implement key project activities consistently (e.g., one partner implemented livelihood activities using one approach, while another partner implemented the same livelihood activities using a different approach). This complicated project monitoring and sometimes resulted in confusion and tension among project recipients in neighboring implementation areas. Discrepancies in how activities were implemented among different donor-funded projects sometimes also fueled confusion, competition, and tensions among targeted recipients and between recipients and implementers, in particular when different projects applied divergent approaches to work in a given sector in the same or neighboring geographic area.

Lessons Learned: Integration of Project Activities

- Train project team members on the theory of change that underlies all key activities to facilitate: staff identification of linkages, cross-enrollment, referrals, coordination across sectors, etc. For example, health agents should understand how use of improved agronomic practices links to improved health outcomes and agronomists should understand how a combination of production-focused and health-focused activities is intended to facilitate achievement of the project goal.
- Consider co-locating project field supervisors in targeted communities to facilitate coordination of activities in their respective zones.
- Ensure that project efforts to integrate activities include an awareness of recipients' time constraints; full integration may not be feasible for all target populations.
- Engage mobile and/or web-based applications that are capable of tracking recipient households participating in one or more than one strategic objective (in addition, see lessons in section 3.1.3)
- Ensure that proposed project activities are implemented at a scale that facilitates focused, internally cohesive interventions that can be closely monitored for their effectiveness while protecting recipients against unintended harm.
- Develop clear, easy-to-use implementation manuals for key project activities to ensure consistency in their implementation among project partners.
- Enact partnership agreements at the application submission stage that clearly define how organizations electing to work in a consortium will collaborate across geographic areas and technical sectors to achieve project outcomes (e.g., develop joint implementation strategies for all formative research or the roll-out of activities across strategic objectives).
- Collaborate with other governmental and nongovernmental entities working within and/or in neighboring implementation zones to coordinate activities (and associated incentives), to the extent possible.

3.1.3 HOUSEHOLD TARGETING

Ongoing FFP-funded development projects target highly food insecure populations in eastern DRC. These populations include chronically food insecure groups, as well as those who have been exposed to repeated shocks, such as smallholder farming households; women farmers and female-headed households; conflict-affected households; pregnant and lactating women; children under 2 years of age; adolescent girls; and victims of sexual or gender-based violence. Each project's midterm evaluation was critical of aspects of how households had been targeted in each strategic objective. For example, some implementing organizations lacked a methodology that clearly targeted the most vulnerable households across intervention areas, appearing instead to target larger population centers nearer to health posts or more accessible from peri-urban areas. In addition, the midterm evaluations found that not all partners within a given project appeared to apply the same targeting methodology when implementing similar interventions across targeted populations (e.g., one implementing partner targeted livelihood activities using one approach, while another implementing partner on the same project used a different targeting approach for the same livelihood activities). As mentioned previously, these divergent project practices, including those associated with targeting, resulted in confusion and, in some instances, unnecessarily created tension among recipients and between recipients and the project—two significant obstacles to achievement of outcomes and impacts in any intervention. This confusion and tension was sometimes also fueled by discrepancies in targeting methods between different donor-funded projects (e.g., one project targeted food for work or cash for work activities one way, while a project funded by another donor in a neighboring community targeted them differently).

Lessons Learned: Household Targeting

- Create and apply a clearly defined and transparent census methodology at project outset to identify project-eligible households and enable project teams to target (and more easily track the progress of) the same households for multiple project interventions, where appropriate.
- Apply mobile and web-based technology at project start-up to aid in comprehensive, systematic registration and tracking of recipients.
- Building on the implementation manuals noted in the lessons for section 3.1.2, develop standard protocols for targeting among partners within a given project, and, to the extent possible, between projects implementing similar activities within a broader geographic area to facilitate complementarity and mitigate confusion and tension.

3.1.4 STAFF RECRUITMENT AND RETENTION

In order for a well-designed and well-targeted project to function optimally, it must be consistently staffed with qualified and motivated people. Recruitment of qualified staff has been a challenge for the current FFP development projects both because of favoritism in hiring, which is reportedly common in the region, but also because of rampant falsification of professional documents. The persistence of conflict in the current target areas further exacerbates the challenges associated with identifying and maintaining qualified and motivated staff.

Lessons Learned: Staff Recruitment and Retention

- Design recruitment systems with built-in mechanisms to decrease recruitment bias, such as: rigorous interview processes, thorough background checks, performance-based annual contract renewals, etc.
- Encourage professional development and other incentives that support staff and affirm their value.
- Ensure all contingency plans provide clear and adequate protections for staff.

3.1.5 SOCIAL AND BEHAVIOR CHANGE COMMUNICATION (SBCC) AND PROJECT COMMUNICATION

Current FFP development project implementers in eastern DRC use a variety of materials to reach targeted audiences with SBCC related to improved health, agricultural, and other practices. That said, not all projects' outreach efforts appeared to include sufficient attention to or application of communication approaches that meaningfully engage recipient audiences. For example, one project's midterm evaluation noted that some project materials had been produced in French (not the language most commonly spoken among recipient populations) and included little imagery; these appeared to be less effective than materials that used local languages and pictures. Since materials such as posters and flip charts are key tools in the implementation of improved practices across several project activities, the importance of developing communications that engage recipient audiences cannot be overstated.

In addition to appropriate communication on project interventions, messaging about the goal, objectives, and approaches of the project itself also proved important, particularly in this implementation context. The Kivus and Katanga have been impacted by near-continuous conflict and displacement over the past 20 years. As a result, there is often an expectation among recipients that they will receive handouts from governmental and/or nongovernmental entities to respond to their needs, and some have refused to participate in activities if no incentives or inputs are provided. Ongoing FFP development projects were often challenged by this problem in their implementation areas.

Lessons Learned: SBCC and Project Communication

- Develop a project-wide SBCC strategy—working jointly with all project partners—that addresses the different technical sectors, audiences within each sector, and the various levels at which activities need to be undertaken (e.g., advocacy, social mobilization, and individual behavior change).
- Ensure that all printed project materials for a recipient audience (e.g., posters, flip charts, users' manuals) use pictures and, if necessary, a story line in the local language that is engaging, relatable, and facilitates information uptake among illiterate populations.
- Consider reinforcing dissemination of key project messages through radio programs, given high illiteracy rates in many project areas. These radio programs could include interviews with "local heroes" who are successfully implementing project-promoted improved practices.
- Sensitize communities to the longer-term nature of FFP development interventions prior to commencing and throughout activity implementation. Sensitization might include introducing and/or providing progress updates on project objectives to strengthen communities' capacities, project efforts to link communities with other public and private actors who can further facilitate community efforts at self-improvement, etc.

3.1.6 SUSTAINABILITY CONSIDERATIONS

Working to increase the likelihood that project results are maintained following project closure is challenging in any environment. This is particularly true in eastern DRC, where government technical and management capacities and other resources (e.g., funding and availability of qualified staff) are exceedingly low, and where repeated shocks—in particular, civil conflict—lead to frequent emergency responses that habituate populations to a pattern where needed inputs are delivered externally and, if necessary, delivered again, without concerted efforts to build local capacities to obtain these inputs independently. All three current implementing partners noted the importance of having a document that clearly lays out the exit and sustainability strategies for each activity, along with steps and associated tasks, a timeline, responsible parties, and where applicable, the structure that will continue the activities after the end of the project, though the projects did not necessarily invest significant time or resources in the creation or revision of these documents as the project and implementing context evolved.

A recent FANTA study indicates that three factors are essential to ensure sustainability of project outcomes—resources, capacity (technical and managerial), and motivation. A fourth factor, linkages, is also important (Rogers and Coates 2015). Many of the current FFP projects' sustainability strategies for implemented activities in eastern DRC had a strong and important focus on capacity and linkages, but did not consistently sufficiently consider the motivation and resources also essential to create an environment in which project outcomes and impacts are likely to be sustained. For example, to ensure the sustainability of project-supported irrigation and drainage infrastructure, a current project intended to train point people in the communities in irrigation system maintenance, while also training farmers more broadly in appropriate irrigation infrastructure management. The project's sustainability plan states that the methods and inputs used to construct the irrigation systems and train farmers on them will ensure that targeted farmers engage in simple infrastructure maintenance as part of their regular work. However, the plan does not detail what will motivate farmers to maintain these structures, or how those appointed to maintenance positions are to access the resources needed for inputs when repairs are necessary.

On the other hand, community savings and loan activities—for which current partners report particularly high demand—have facilitated training of community volunteers to form and supervise associated community savings and loan groups. These volunteers receive decreasing project support as implementation continues so as to be able to support savings and loan groups independently before the project ends. The volunteers make direct remuneration arrangements with the groups they supervise without implementing partner involvement. This approach ensures that volunteers have the capacities

necessary to effectively continue savings and loan group activities, while the funds generated serve as a source of resources and motivation for the groups and their volunteer supervisors alike.

Lessons Learned: Sustainability Considerations

- Incorporate routine follow-up on project-sponsored activities (e.g., trainings) into project monitoring to ensure appropriate uptake of highlighted practices and facilitate exploration and resolution of unforeseen barriers.
- Develop clear, detailed exit strategies and sustainability plans—with measurable benchmarks of progress—for all activities, outcomes, and impacts that are to continue post-implementation. These plans should account for the motivation, resources, and capacity and, where necessary, linkage needs of all project efforts that are to be maintained.
- Account for the capacity strengthening needs of any governmental and/or nongovernmental linkage partners who are to play a supporting role during and following project implementation in any exit strategies and sustainability plans.
- Formalize partnerships (linkages) with governmental and/or nongovernmental entities to be responsible for providing continued support of activities post-project *before* engaging communities in these activities to the extent possible to facilitate a smooth eventual transition of activities to these entities.

3.2 AVAILABILITY, ACCESSIBILITY, AND DISASTER RISK REDUCTION LESSONS LEARNED

3.2.1 FARMER TRAINING AND OUTREACH

All FFP implementers in eastern DRC train local farmers in improved agricultural production techniques. The traditional farmer field school (FFS) model relies upon a lead farmer trained by a project agronomist or extension agent to impart their knowledge to others, often through training on demonstration plots. Of the projects reviewed here, one uses a farmer-to-farmer (F2F) training approach whereby selected farmers train three neighboring farmers—a requisite for participation in FFSs. The F2F training covers the same topics that farmers are trained in through the FFSs. The FFS project extension agent follows-up on subsequent F2F trainings and keeps records to make sure that each "adopted" farmer is trained consistently.

Another partner has created a hybrid "cascade" model to disseminate information on improved production techniques, based on the care group approach sometimes used in maternal and child health interventions. In the cascade model, households are grouped together to elect farmer leaders. Elected farmer leaders receive training from a project agronomist related to the technical and group management aspects of their work. Farmer leaders are trained on an agricultural curriculum (comprised of flip charts and lesson plans) that includes: the agriculture calendar; agroforestry; fruit tree, livestock, and staple crop production; post-harvest handling/storage; and other relevant topics. Farmer leaders relay agriculture messages to their neighbors twice per month

Impact of Farmer Field Schools

A recent study assessed the effectiveness and efficiency of the impacts of the farmer field school (FFS) and farmer-to-farmer (F2F) methodology related to technology adoption and the respective costs per farmer trained. Researchers used a pseudo-experimental approach that combines a difference-in-differences (DID) analysis with weighted regression models using the inverse of propensity score. The results of their study consistently suggest significant impacts of both FFS and F2F training on farmers' adoption of improved technologies. While FFS training is 30–40% more effective to foster technology adoption, dissemination of technologies promoted in FFSs can well be formalized through F2F training, which has proven to substantially alleviate a major constraint to the large-scale introduction of FFS as a training method—the high costs per farmer trained. The addition of the F2F training component to the traditional FFS extension system has proven to have a cost 25% lower than the cost of FFS to train an additional farmer (Santos Rocha and van den Berg 2015a).

using the flip charts. Cascade model farmer leaders visit farmer recipient fields to monitor whether recommended techniques and behaviors are being adopted and encourage the improved agricultural production behaviors highlighted during trainings. Data reported from the project implementing this approach supports the efficacy of the cascade model and its contribution to the adoption of improved farming practices. In particular, annual reporting for the project implementing this model shows that the percentage of individual farmers using at least four sustainable agriculture technologies is higher for farmers participating in the cascade model compared to standard FFSs. The cascade model also increases the number of participants who can be targeted, compared to the FFS model.

Lessons Learned: Farmer Training and Outreach

- Use appropriate training materials (e.g., manuals and flip charts) tailored to the targeted recipient groups (e.g., written in local languages, use of images for illiterate groups).
- Pre-test training material with the targeted communities and refine to facilitate effective communication.
- Farmer-to-farmer and cascade training methodologies reduce travel time for participants and cost of implementation while building social cohesion and cooperation.
- Community-based extension models increase the number of trained extension service agents in the communities through the farmer leaders, making up for the lack of government agricultural extension.
- Farmers prefer interventions that promote intercropping to reduce the risk of crop failure and given the small amount of land they have to farm.
- Farmers want to understand why crops fail and compare their experiences with other farmers.
- Transfer extension oversight to the Agricultural Council of Rural Management (known as CARG) and farmer business associates to build their capacity. Provide refresher training to farmers and progressively decrease support to farmer business associates.

3.2.2 CROP DISEASE

Banana Xanthomonas Wilt (BXW), banana bunchy top virus (BBTV), and cassava mosaic disease (CMD) are widespread crop diseases that reduce the yields of these subsistence crops in the Kivus and Katanga. A value chain analysis for South Kivu and Katanga shows that bananas are extremely profitable, though the crop cycle lasts 13–16 months, compared to 3–6 months for maize, for example (Food for the Hungry and IITA 2013). FFP implementers in eastern DRC work to mitigate the spread of these crop diseases through farmer training and cooperation with government-supported research stations such as INERA (National Institution for Agricultural Research) to secure disease-resistant planting material. In particular, implementers provide guidance on proper identification of infected plants and promote selected removal techniques to control the spread of these diseases. For cassava, CMD-resistant varietals must be identified, tested for agro-ecological zone appropriateness and taste preference with local communities, then multiplied for eventual dissemination to affected areas. For banana crops, macro and the micro-propagation (*in vitro* culture) are appropriate for the rapid multiplication of banana. However, there are no varieties resistant to BXW. Beyond multiplication and distribution of banana suckers, farmers must be trained in preventative control methods against BXW.

Rural Agricultural Management Councils, or CARGs, are structures designed to provide a forum for public institutions, civil society groups, private sector actors, community members, and others to express and advocate for their needs and priorities for development-related planning and interventions, in particular as they relate to agriculture. Initially established with external donor support during the reform of the DRC's Ministry of Agriculture, CARGs have been established at the national, provincial, and territorial levels and "local" administrators at each of these levels are responsible for maintaining them. CARGs were designed, in part, to provide a coordination mechanism that could facilitate economies of scale in the agriculture sector. To date, however, limited resources have been available to CARGs at all administrative levels (Mathys and Remancus 2010).

Lessons Learned: Crop Disease

- Macro-propagation is an effective technique in this environment to multiply clean banana suckers, though farmers must be trained in how to prevent BXW and BBTV.
- Micro-propagation can serve as another source of material, though suckers propagated this way must be sourced commercially and their availability is therefore more limited.
- Participation in wider dissemination of CMD-resistant cutting is critical, as well as demonstration plots and multiplication sites in rural areas.
- Implementers should consider mechanisms for farmer-led macro-propagation sites to be sustained through community-based funding, such as village savings and loan associations.
- Given that seed multipliers and agro-dealers lack financing, consider means to create a special loan window through localized financial institutions via partly collateralized loans.
- Involve CARGs and INERA in community-based macro-propagation and CMV-resistant cassava from the outset through meetings, trainings, and workshops to transfer oversight to these entities.
- Implementers should consider building capacity of INERA staff and consider including a provision for research grants to develop tissue culture and multiply disease-resistant varieties.
- Sensitization of provincial authorities about the economic impact of crop disease and relevant control mechanisms can help marshal human and financial resources for the long term.
- Cascade and farmer-to-farmer methods can be useful to pass broader messages of crop disease control methods to a wider array of affected farmers.
- Targeted training along with creation/enforcement of local ordinances to control BXW and CMV through fines can help ensure that farmers stay vigilant.

3.2.3 SEEDS

A variety of modalities have been employed to address the lack of improved seeds in FFP intervention areas in eastern DRC. One implementer provided a "seed starter kit" to farmer field school participants. This kit included CMD-resistant cuttings; improved maize, bean, and groundnut seeds; and a hoe, machete, and roll of rope to facilitate row planting. At a community level, implementers have selected seed multiplication sites to test and multiply varieties that perform well. In addition, farmers in proximity to government-led seed multiplication facilities managed by INERA receive tested, improved varieties. In some instances, farmer associations supported by FFP implementers have made bulk purchases of commercially available seeds on behalf of their members. For seed multiplied by communities, FFP implementers chose local associations to manage seed multiplication, often as a food for work activity. These associations received support from project agronomists. In some locations, the projects also constructed a seed storage depot at the sites.

According to agreements between implementers and the National Seed Certification Agency (SENASEM), seed multiplier associations are supposed to be monitored up to three times so that producers can get their seeds certified. A midterm evaluation for one of the programs found that inspection visits varied between location and in some cases, did not occur on time or at all. For one implementer (that did not continue seed multiplication in the third year of the program), the inability to secure certification status and the lack of technical assistance from SENASEM led the local seed multiplier association to abandon the multiplication site. Since the midterm evaluation, more associations have received certification, but one implementer notes that many SENASEM agents sought payment to secure certification, though this was not stipulated in any agreements between FFP implementers and SENASEM.

On a broader level, a seed security assessment prepared by the International Center for Agriculture (CIAT) et al. in 2012 in North Katanga found that seed multiplication projects by NGOs tended not to be sustainable because the seed value chain was not well understood and little was done to address farmer

demand for new seed varieties (see section 3.2.9 for additional information on the seed value chain). One of the implementers confirmed a need to strengthen farmer demand for improved seeds, as well as the quality of the seeds provided. The implementer stated it would pursue improved seed multiplication activities in the future, ensuring a "two-sided" approach that increases the supply of quality seeds (e.g., how to select, clean, and protect improved seeds), as well as farmer demand for them.

Another study in one FFP project implementation area related to the impact of smallholder farmer's adoption of yield-enhancing technologies following the receipt of improved inputs showed no long term impact on adoption of improved seeds (Santos Rocha and van den Berg 2015b). Using a randomized controlled trial methodology to compare farmers who had received seed starter packs compared to those who did not, the results show that the distribution of free inputs does not encourage long-term use of improved seeds or inputs, though the authors conceded that this may be a result of their limited supply in the marketplace. Nonetheless, their findings echo similar studies completed by MIT's Poverty Lab concerning the impact of seed distribution programs (Duflo et al. 2011).

Lessons Learned: Seeds

- Focus on farmer demand for improved seeds by undertaking seed value chain analysis at project outset.
- Support seed fairs to promote product and price discovery among farmers and create an opportunity for suppliers and farmers to meet and arrange for future seed orders.
- Secure a memorandum of understanding with INERA and SENASEM to provide capacity building, base seed material (to the extent possible), certification of the seeds produced, and ongoing technical support.
- Agree and articulate roles for INERA and SENASEM to ensure that seed multiplication centers and monitoring/certification remain operational post-project.
- Train farmers in post-harvest handling of seeds using improved and locally available materials.
- Encourage bulk purchase of improved seeds through commercial suppliers and that are agro-ecologically appropriate to the targeted zone.
- Develop a strategy to ensure that farmers continue to implement integrated pest management practices or are able to purchase pesticides for smallholder/farmer business associates seed multiplication efforts.
- Secure legally documented, long-term access agreements for seed multiplication and storage sites from community leaders or land owners prior to investment.
- Train farmers in market planning focused on crop varieties with high net production value per hectare as identified in project value chain analyses.

3.2.4 LAND TENURE

Those working in the agricultural sector in eastern DRC frequently confront issues related to land tenure, in particular for smallholder farmers. Current projects' experiences show that most of the land, especially in North and South Kivu, belongs to a few people and that the majority of the population either rents land or does not have access to land for cultivation. Although some implementers have attempted to reach consensus with the various stakeholders to organize community land access programs, land ownership remains a sensitive issue, which has occasionally contributed to violence. In the Tanganyika territory of North Katanga province, land is more readily available due in part to lower population densities and poor road infrastructure (the latter of which inhibits land access), but it is rare for farmers to possess land titles. Implementers noted that often when farmers become successful, chiefs who own the land levy higher taxes or even take the land back if it produces more than it had in the past. This confirmed the importance of negotiating the terms of the lease of farmland prior to engaging in associated project activities to avoid unlimited taxes levied on farmers. For reforestation efforts that work to create or reinforce a community good (see section 3.2.10 for more information on this set of activities), it proved advantageous for one implementer to sign a memorandum of understanding with the provincial Ministry of Lands and

Environment to lead a tenure agreement process so that reforestation efforts implemented on private lands can continue to benefit the targeted communities once the project is completed. The advocacy plan was finalized and is now being implemented. Representatives of the Ministry of Lands and Environment have appealed to the provincial parliament for a final decision so that it can be implemented at the community level.

Lessons Learned: Land Tenure

- Collaborate with state and non-state organizations, e.g., CARG, Justice and Peace Commission, NRCF (a land conflict resolution network), FPJ (Youth Peace Forum); CLPC (Permanent Local Conciliation Committees), and CRC (conflict resolution committees), to launch scalable land reform efforts in target intervention areas.
- Reinforce the capacities of local civil society organizations engaged in improving land tenure for smallholder farmers noted above.
- Harmonize existing land tenure policies and initiatives and strengthen coordination between different activities and stakeholders.
- Mobilize and reinforce local customary and state authorities in land security strategies.
- Create advocacy plans and appeal to the provincial parliament to ensure legal protections to protect land rights for smallholders and vulnerable households.
- Undertake formative research during project design and refinement to understand the breakdowns in relationships between private land owners and the farming communities using their land and design project activities for both sets of stakeholders.

3.2.5 POST-HARVEST HANDLING AND STORAGE

Post-harvest handling and storage of production in the FFP implementation areas of eastern DRC are poor and contribute substantially to overall yield losses. One FFP project's baseline survey found that 68% of households are affected by post-harvest losses. The main causes of these losses include rodent infestations, poor storage conditions, theft, and straying livestock. Various implementing project surveys showed that less than 10% of farmers use improved storage methods, such as containers, improved household granaries, community storage facilities, or other means. In order to address this shortfall, all implementers have included a training module to encourage improved post-harvest drying, handling, and storage methods; construction of storage baskets; and use of organic pesticides. Two of the three current projects have promoted PICS bags, an improved, reusable bag that reduces moisture and insect infestation, though this bag is not readily available in most markets in eastern DRC and must be procured in Rwanda or Burundi. Another approach has been to construct community-based warehouses, called agricultural collection centers, to store dried commodities in PICS bags for bulk sale. These centers are managed by farmer groups in proximity of the warehouses.

Lessons Learned: Post-Harvest Handling and Storage

- Emphasize the financial benefits of improved drying and storage techniques related to bulk sale of commodities.
- Promote improved local granaries and invest in community warehouses, as appropriate, which include inventory control, pest management, and grain moisture testing capacity.
- Catalog and disseminate local methods to improve grain handling, drying, and storage.
- Strengthen the capacity of farmer groups to manage and finance agricultural collection centers for long-term success.
- Assess the longer term efficacy of PICS bags to understand their availability and capacity of rural input dealers to access this product on an ongoing basis.

3.2.6 GOVERNMENT COLLABORATION IN AGRICULTURE

Without exception, FFP development projects in eastern DRC work closely with government representatives, in particular those tasked with agricultural development at the provincial level. All current implementers reported that it has been helpful to have memorandums of understanding with the provincial representatives of IPAPEL (Agriculture, Fish, and Livestock Inspection) to facilitate their involvement in project work and to work with INERA to access new seed varieties, and with SENASEM for official seed certification. However, these entities' remote posts are poorly funded, resulting in few agents who are able to reach farmers. In addition, those government agents in the field often lack transportation for travel to project areas. In many cases, government personnel have demanded payments from NGOs, including current FFP partners, to collaborate with projects. Given limited resources among these entities, current implementers have found it helpful to involve IPAPEL staff in project training sessions of lead farmers, which also builds their capacities. The projects have also engaged IPAPEL to participate in quarterly or semi-annual round tables to coordinate, review progress, share knowledge and best practices, and document project diffusion (adoption of project-encouraged practices by non-recipients). Despite these efforts, barring a massive improvement in the government's ability to provide broader agricultural extension to farmers in remote rural areas, a community-based farmer training model with well-trained farmer leaders will remain necessary to bridge the knowledge and outreach gap.

Collaboration with INERA at seed research stations to multiply and disseminate improved seed varieties, especially CMD- and BXW-resistant varieties, has been vital for all projects. However, the need for improved seed and the massive scale of crop diseases in the region both exceed INERA's response capacities. Nonetheless, there is a great deal that implementers can do to bolster this work through multiplication and dissemination of improved seed varieties, in particular through collaborative community seed multiplication initiatives (see lessons associated with section 3.2.3, previously).

Lessons Learned: Government Collaboration in Agriculture

- Establish memorandums of understanding with relevant government organizations involved in agriculture to ensure seed certification (SENASEM), to access improved seed varieties from government multiplication sites, as feasible (INERA), and to participate in farmer training and regular meetings (IPAPEL).
- Build capacity and identify roles and responsibilities of community development committees as a conduit between governmental and nongovernmental entities.
- Advocate with government entities to reduce predatory taxation on farmer-produced goods prior to activity implementation. Solicit assistance from IPAPEL to do this.

3.2.7 IMPROVED INFRASTRUCTURE (FOOD FOR WORK/CASH FOR WORK INTERVENTIONS)

In the current FFP development projects, implementers used food for work (FFW) to improve community infrastructure, such as roads, drainage canals, and irrigation. FFW participants engage in workday rotations of 22 days and work teams are drawn from members of community associations who manage FFW activities. Others from the surrounding area who are fit and willing to work can also participate. Specific FFW efforts in some areas were thwarted due to ethnic land disputes, which are rife in some implementation areas, particularly in the Kivus. Many of the FFW activities undertaken by the ongoing FFP development projects are designed to improve market access for farmers and open new land by improving drainage and irrigation systems for the cultivation of cassava, rice, and maize. Implementers felt strongly that there is a continuing need to organize community labor to enhance the commons for targeted communities' benefit.

Concerning FFW as a means of payment, projects reported that many laborers felt that the food they received was insufficient for the work accomplished. Moreover, implementers had trouble recruiting men to work for food which is viewed culturally as appropriate payment only for women. This is also compounded by the fact that many men migrate from their households to work in mines or as casual laborers. As a result, programs often recruit an abundance of women and older people, but found that the nature of the FFW activities can be quite burdensome for these groups. One implementer introduced cash for work (CFW) activities near mining areas to recruit more men. In communities where CFW was used as a payment mechanism, implementers noticed a marked increase in household assets, school attendance and purchasing power. The project reported that recipients used funds for school fees, food, hospital bills, building materials, etc. That said, the implementer did note challenges associated with delivering cash in their target areas, given the dearth of formal financial institutions in these areas and the logistical and security challenges associated with cash distributions.

Lessons Learned: Improved Infrastructure

- Use FFW during the lean season and CFW during other times of year to support local markets.
- Sensitize community about improved infrastructure to ensure community buy-in for its long-term maintenance so that they see benefits beyond direct payment for the work.
- Collaborate with the Division Provinciale des Voies de Desserte Agricole (Agricultural Division of Provincial Roads) on any road rehabilitation work to ensure ongoing maintenance.
- Involve women in efforts to improve and maintain infrastructure projects.
- Train community members on the technical and management aspects of infrastructure maintenance to enable future access to inputs needed for maintenance and repairs.
- Prioritize land at greatest risk of erosion when undertaking terracing interventions.
- Use locally available skilled labor and materials, as feasible, for ongoing maintenance of the infrastructure to enhance community buy-in and facilitate sustainability.
- Tap into traditional community labor mechanisms, such as *salongo*, whereby citizens oversee community assets and organize work when needed.
- Ensure proper monitoring for worker registration/attendance and quality control, and avoid repeat labor rotations.
- Identify vulnerable households to participate in FFW/CFW efforts to the extent possible.

3.2.8 LIVESTOCK/FISHING

All ongoing FFP development projects in eastern DRC are implementing some type of livestock intervention to improve the livelihoods of target recipients. These interventions concentrate on the provision and maintenance of small ruminants such as goats, guinea pigs, and rabbits. A focus on small ruminants in these intervention areas is important given the frequency of displacement due to repeated conflict and the lack of available pastureland. The Kivus, in particular, have many large cattle ranches owned by wealthy landowners. Project animal distribution programs have primarily targeted women's groups, each of which receive, for example, 8–11 goats to manage collectively. In some projects, community-based animal health workers support women's groups to care for the goats, provide vaccinations, and monitor overall animal health. Recipients are required to give offspring to new members in the group, though this may take between 2–3 years depending on the size of the group and the reproductive success of the distributed stock. Some projects reported that such a prolonged waiting period has occasionally affected group cohesion. Goats were appreciated for their cultural and economic value. They can also be easily sold to meet pressing needs in the household, such as school fees or emergency medical costs. Nonetheless, women noted that they have no influence on the decision to buy, sell, or slaughter a goat, as this is decided by the husband, regardless of how the animal was procured.

One implementer has focused on distribution of rabbits and guinea pigs and the construction of multiplication units stocked with breeding rabbits/guinea pigs at various locations. In order to scale up this approach, the implementer trains participants to build holding pens for groups of four households participating in MCHN activities (this also provides an example of integration of project activities). One mother raises the first batch of rabbits over a 6-month period, after which each female rabbit will have delivered an average of 5–6 offspring. These offspring are then divided among the other mothers. Such a strategy is intended to facilitate sustainability and increase targeted households' consumption of animal protein.

None of the current implementers are undertaking direct fishing interventions (though some project activities support training on fish drying as an income-generating activity), despite the proximity of many current project implementation areas to lakes Kivus and Tanganyika and numerous tributary waterways. The current projects indicated that fishing on its own may not be economically viable in these implementation areas, but that they could be considered as part of a package of expanded livelihood opportunities in future activities. However, given concerns that many of these water bodies are already over-fished, the approach to such activities would need to be carefully considered based on profitability, sustainability, and environmental concerns.

Lessons Learned: Livestock/Fishing

- Focus on smaller ruminants due to ease of transport, land constraints, and frequent theft/loss caused by displacement due to insecurity.
- Engage livestock specialists who can test a variety of animal types and breeds to identify those most adaptable to various implementation environments.
- Select recipients of initial breeding stock based on their capacity to oversee the reproduction of these animals, rather than the fact that they are vulnerable or a farmer/mother leader.
- Provide primary breeders with sufficient training and complementary support to ensure success.
- Boost animal survival rates by constructing adequate animal enclosures with local materials.
- Incorporate community-based savings and lending activities to increase the resource base available for livestock interventions and the likelihood of their post-project sustainability.
- Partner with government agents (IPAPEL), train paravets, and work collaboratively with international entities to address shortfalls in animal health and vaccine services.
- Ensure that the offspring revolving and reproduction process maximizes animal survival rates through training in animal health and ensure that participants give offspring to new participants on a timely basis. Replace and discourage consumption of deceased animals.
- Include fishing interventions on fishponds, lakes, and rivers in future projects (e.g., improve fish catch on a sustainable basis, improve environment-friendly smoking and drying techniques, improve marketing).
- Analyze potential environmental impacts and market viability of fishing and livestock activities to ensure that such activities do no harm.

3.2.9 VALUE CHAIN ANALYSIS AND MARKETING

All current FFP projects in eastern DRC have at least one set of activities associated with income generation. These activities focus on marketing of agricultural production or associated inputs (e.g., seeds from seed multiplication activities), sale of products from off-farm income-generating activities (e.g., soap making), or a combination of these. For income-generation activities associated with agricultural production, all FFP implementing partners noted having undertaken value chain analyses to understand and select the markets for at least some of the products they intended to promote or were promoting, though not all partners undertook this work in a timeframe and/or with a rigor that was conducive to optimizing returns on these investments.

In terms of implementation of value chain activities, projects found that when engaging smallholder farmers, clustering farmers into producer associations or other groupings to facilitate bulking allowed these groups to increase their marketability to larger processors and/or buyers. Such groupings also strengthened these producers' access to capital, increasing their capacities to engage in value-added activities, though current partners were quick to underscore that the equipment needed to transform harvested crops (e.g., grinders, washers, presses) tends to be costly, even for grouped small-scale producers/processors. Some projects highlighted that sustainability plans that consider the continued training and maintenance needs associated with this equipment are also necessary. In addition, though perhaps obvious, successful engagement in agricultural value chains is predicated on a number of other factors—including access to adequate land and consistent application of successful improved production practices—each of which brings its own challenge as was discussed previously.

Similar value chain and marketing considerations apply for small-scale off-farm income-generating activities, such as bread and brick making, tailoring, etc., although few such activities were implemented in the current projects. These activities often target vulnerable households that do not have access to land or the composition necessary to undertake physically demanding activities (e.g., field cropping, food for work, cash for work, or similar project interventions). Ensuring clear demand, returns that outweigh investments within the life of the project, and a basic recipient understanding of marketing is essential for both agricultural and non-agricultural production and marketing activities. Given the volatile security context of eastern DRC, consideration of how to protect recipients of successful production and marketing activities from the predatory practices of armed groups and/or ethnic clashes is also paramount.

Lessons Learned: Value Chain Analysis and Marketing

For the implementation of value chain analyses:

- Conduct analyses that examine the level of effective demand and the costs and benefits of engaging in various value chains for all agricultural and non-agricultural products to be marketed prior to engaging in project activities associated with these goods.
- Ensure value chain analyses are conducted at a level (e.g., provincial, territorial) sufficient to capture the market interventions of public and private sector groups external to the project.
- Establish a common platform (preferably one led by a government entity, with appropriate capacity strengthening) that involves all partners within a targeted value chain to establish quality standards and integrate market information, to the extent possible.

For the design and implementation of income-generating activities:

- Strengthen producers' capacities to engage in value-added activities (e.g., post-harvest handling and processing), including by facilitating access to equipment through loan mechanisms, training on local fabrication of equipment, etc.
- Consider project approaches that facilitate bulking of goods from smallholder producers to achieve quantities that are marketable to larger processors and/or buyers.
- Ensure value chain interventions are supported by adequate associated programming, for example, training to foster recipient understanding of marketing basics, such as commodity quality management, input procurement, calculating yields and their associated economics (inputs and outputs), and understanding the benefits of bulking (production and/or producing in groups) to facilitate sustainability.
- Anticipate and create contingency plans to address the possibility that marketing and/or other commercialization activities attract insecurity, as increased economic activity can attract the interest of armed groups and/or fuel ethnic and/or resource-based tensions.
- Support project value chain/marketing activities with interventions that attend to land tenure and farmer training and outreach issues (see sections 3.2.4 and 3.2.1, respectively).

3.2.10 COMMUNITY SAVINGS AND LOAN ACTIVITIES

Given the dearth of availability of formal and informal financial services in most implementing areas, the current FFP projects are engaged in community-based savings and lending activities wherein community members form small groups and contribute resources to a fund, the total of which is distributed in a rotating fashion among participants. The current projects strengthen recipient capacities to run these groups independently, such that most groups no longer require project support after the first couple of loan cycles. Some implementers also reported that these interventions have led to the diffusion of this activity (the formation of spin-off savings and lending groups among non-targeted community members). In addition, some of the current projects work to link more advanced community savings and loan participants to existing, established credit providers (in instances where these latter entities exist), grouping still others into federations in an effort to attract microfinance institutions to implementation areas to further grow recipients' access to financial services. According to project implementers, community savings and loan activity participants cited using funds from these community mechanisms to pay school fees, access medical care, procure food, and establish additional income-generating activities—including opening new or expanding existing farming fields. Projects reported that community savings and loan activities also improved community solidarity and social cohesion among group members.

Partners acknowledged the importance of not only helping participants to access basic savings and loan services, but also training interested groups on expanding their savings and lending capacities through engagement in income-generating activities such as masonry, sewing, baking, cash crop production, etc. (while heeding the lessons outlined previously in section 3.2.9). This expanded approach involves integrating project recipients into these other activities, where applicable, and/or developing technical capacity strengthening modules for such activities, in addition to the more common community savings and loan training modules on business development and management topics. Current implementers noted that, in some instances, community members have come together on their own to pursue an income-generating activity without direct training/skills development from the project. As a final consideration for implementing these types of activities, current projects noted that the lack of access to formal financial institutions in many target areas creates a potential risk for savings and lending groups' cash box holders—who store accumulated funds prior to share-out meetings—and that future projects may want to consider mobile options to reduce associated security risks for participating members.

Lessons Learned: Community Savings and Loan Activities

- Consider complementing savings and loan activities with training on income-generating activities among interested groups, where appropriate.
- Explore mobile banking options to link groups with available financial institutions (following research into mobile network coverage, the costs and benefits to local mobile providers of engaging in such activities, mapping the location of mobile agents, etc.).
- Continue applying an implementation approach that strengthens recipients' capacities to run community savings and loan groups independent of project support to facilitate sustainability.

3.2.11 REFORESTATION

Each ongoing FFP development project in eastern DRC includes a natural resources management/ disaster risk reduction element, one of the foci of which is reforestation activities. In some implementation areas, these activities are undertaken on private lands while in others they are undertaken on communal lands. Results from activities in this intervention area indicate that targeted communities preferred reforesting with trees that (1) grow (and/or, after harvesting, regenerate) rapidly, such as

eucalyptus, and (2) can be used for multiple purposes (eucalyptus can serve as a source of fuel, as a facilitator of land reclamation activities, as construction material, etc.). Some communities cited a preference for quinquina trees for reforestation activities, given their relatively rapid regeneration rate and the eventual utility of this tree's bark as a source of income.[15]

All current FFP projects in eastern DRC noted that with reforested land comes the increased risk of forest fires, which significantly threaten these activities. Some of this threat is offset by reforestation activities that utilize tree varietals that can generate income beyond their utility as fuel or as assistants in land reclamation (such as the aforementioned eucalyptus and quinquina)—which helps incentivize producers to protect these crops for their potential returns. In addition, implementers reported that local government implementation/enforcement of bylaws and fines to cover the cost of replacing areas destroyed by fire increased community efforts to prevent and fight forest fires at reforestation sites. Projects must also be aware of and work with communities to mitigate issues associated with the gains some communities may garner from engaging in this activity, as these gains have the potential to lead to tensions with non-targeted communities or targeted communities experiencing relatively less success in similar activities. For example, one implementer reported that neighboring community members set fire to one targeted community's reforestation sites because they were jealous of their seeming prosperity.

Lessons Learned: Reforestation

- Consider selecting trees for reforestation activities that regenerate quickly (to maintain reforestation efforts) and have value beyond a source of fuel and/or means of land reclamation (to motivate protection of this resource).
- Collaborate with local government counterparts to enact or enforce existing efforts to prevent and mitigate the impacts of forest fires.
- Ensure an activity design that regularly monitors the outcomes and impacts of reforestation activities in an effort to mitigate the potential for conflict between targeted and non-targeted communities.
- Train reforestation committee members on appropriate harvesting of trees and/or tree by-products, including harvesting at a scale that facilitates sustainable regeneration of the resource.
- Consider grouping reforestation site committee members to facilitate bargaining power when tree by-products become available for sale (following the lessons on marketing activities in section 3.2.9).

3.2.12 DISASTER RISK REDUCTION AND EARLY WARNING

While the majority of attention to eastern DRC focuses on the considerable number of externalities populations in this area face—in particular those related to civil insecurity—these populations' internal efforts to mitigate the negative impacts of many hazards is noteworthy. All current FFP implementing partners in eastern DRC included a project component to strengthen targeted communities' capacities to mitigate disaster risks, be this through broad efforts such as the development of disaster management plans or specific activities such as the aforementioned reforestation initiatives and efforts to organize communities to monitor for and provide early warning of the incidence of key hazards and specific shocks (e.g., crop pests and disease outbreaks, human health issues, and river levels). Given the level of exposure to shocks these populations face, efforts to reduce disaster risk and provide earlier warning of hazards is essential.

[15] Quinquina bark is a key ingredient in quinine, a common malarial prophylaxis; though the first harvest of this bark is not available until about 8 years after planting. If intercropping, there are a limited number of crops with which quinquina can be intercropped and, while the mature trees are relatively disease resistant, seedlings are prone to pest and disease attacks and must be carefully managed.

A key challenge, in particular for project-level early warning elements, centers around the fact that communities are more likely to continue implementing early warning efforts when they see benefits from them—either in the form of a crisis diverted or an effective response from the community (or an external entity when the magnitude of the shock surpasses the community's response capacity). Current FFP development project implementers acknowledged that while they work to reinforce communities' and community structures' capacities to respond to shocks, many of these efforts did not begin until midway through the project cycle, which has not afforded them sufficient time to achieve the desired results in most areas. In addition, they noted that there is a need for the development of complementary national disaster risk reduction policies and response frameworks to further support these interventions and increase the likelihood of their sustainability.

Lessons Learned: Disaster Risk Reduction and Early Warning

- Implement disaster risk reduction and early warning elements early (e.g., at the beginning of the project) and in such a way that communities play a leading role (to enhance their participation in and ultimate ownership of these efforts).
- Provide practical trainings on disaster risk reduction activities such as hazard mapping, indicator monitoring and analysis, etc., to the community-level structures that will govern these activities.
- Ensure inclusion of community-level capacity strengthening in shock response in the design of this project element while facilitating linkages with entities responsible for responding to larger (e.g., covariate) shocks.
- Consider partnering with other entities working to strengthen national-level capacities in disaster risk reduction, including FAO, UNICEF, WFP, and the European Commission.

3.3 MCHN AND WASH LESSONS LEARNED

3.3.1 PREVENTION OF MALNUTRITION

Given the high prevalence of stunting in children in Eastern DRC, FFP development projects are working to improve the diets and nutritional status of their recipient communities, with a focus on the 1,000-day period that covers pregnant and lactating mothers and children under 2 years of age. Two of the three implementing partners are distributing monthly food rations to pregnant and lactating women and children under 2 (individual rations) consisting of corn-soy blend and oil using the prevention of malnutrition in children under 2 approach (PM2A). The third implementing partner is not distributing food rations to either individuals or households (it is instead focusing on BCC messages to encourage the consumption of a nutritious and diverse diet, and promotes the production and consumption of micronutrient-rich vegetables and fruits).

A PM2A program is usually designed to provide both an individual ration and a protective household ration to prevent sharing of the individual ration; however in some cases implementing partners select to distribute only an individual ration, as in the case of these FFP projects. In some respects, the choice of providing only the individual ration is not surprising since, in contrast to the poor nutritional status at a provincial level, especially in Katanga, the baseline surveys in the project areas specifically did not reveal widespread maternal underweight, suggesting that mothers get adequate calories from staples. Nonetheless, the quality and diversity of the diet is poor. The other rationale for excluding protective rations seems to have been to avoid dependency on food assistance at the household level, given the ongoing aid families have received due to the conflict, despite the fact that households are highly food insecure and could benefit from the added rations. In at least one of these two projects, recipients reported running out of the rations within a week or two of their receipt.

PM2A usually follows an age-based targeting approach, targeting all pregnant and lactating women and their children under the age of 2 in the communities served. A review of project experiences suggests that good census data is a crucial starting point in the planning stage. Once ready to implement its activities, one partner was surprised by a larger than expected number of potential recipients in its target communities due to a high fertility rate. As a result, they were unable to serve all the pregnant and lactating women and children under 2 years in their project areas. The project decided to modify the enrollment criteria, identifying a subset of at-risk pregnant women. These at risk women included primiparas, women who had previously had a child with low birth weight, women who were pregnant with multiples, or women in an otherwise high risk pregnancy due to maternal underweight or high parity. While the modified enrollment criteria allowed the project to deliver its planned ration quantities, this has the potential to create conflict within the community, especially if the communities are involved in selecting the recipients of the rations. Given the challenges to provide rations to all pregnant and lactating women and children under 2 in the areas chosen, the project could have instead reduced the scale and size of the selected geographic area in order to serve all eligible mothers and children.

Usually, the receipt of rations in a PM2A program is conditional on the participation of mothers in the various SBCC and health care activities. Given the ongoing aid that communities have received due to the conflict, partners felt that enforcing the conditionality of receipt of rations on participation in such other activities would not be feasible or would risk the participation and trust of their recipients. In addition, enforcing such conditionality would pose complications with tracking participation and impose additional managerial burden on the projects.

Lessons Learned: Prevention of Malnutrition

- Conduct an accurate and realistic census before beginning the distribution of rations to adequately account for the needs of the communities and carefully plan and refine the coverage area.
- Lay out clear inclusion criteria for the distribution of rations at the outset of the project, and communicate them clearly to the target beneficiaries and the communities at large to prevent conflicts with and within the communities.
- Follow an age-based targeting approach by including all pregnant and lactating women and children under the age of 2 to aid in the prevention of conflicts and confusion and contribute to prevention of stunting.
- Distribute a household ration in addition to the individual ration to ensure that the target individual will consume his/her ration instead of sharing it with the household, and that the ration will last for the intended month.
- Establish a commodity management and recipient tracking system at the outset that allows an efficient distribution of rations.
- Ensure ongoing collaboration with other organizations implementing development and emergency programs in the same area to prevent the inclusion of recipients who are participating in other programs.
- Promote the production and consumption of micronutrient-rich foods over the long-term, while also taking into consideration the displacement of the population due to insecurity and conflict and lack of land tenure in the short and medium-term when considering the options available for the prevention of stunting.

3.3.2 TREATMENT OF MALNUTRITION, WASH, AND FAMILY PLANNING

Treatment of malnutrition. The treatment of severe acute malnutrition (SAM) requires intensive feeding with specialized, high-energy foods, and hospitalization for cases with complications. By design, the three current FFP projects planned to refer cases of SAM that they detected in the communities to government facilities for further assessment and treatment. However, the capacity of government facilities to treat malnutrition is very low, and all three projects have had to stop referring children identified with SAM since little or no therapeutic services are available in the project areas. Although SAM prevalence is not alarmingly high, cases in the communities exist and the children with SAM are at high risk.

One option for projects could be to screen children monthly to identify moderate acute malnutrition (MAM) cases to treat them before they become SAM. For this, projects could encourage the use of locally prepared fortified supplements, including a component to educate the community on the preparation of locally available and nutritious diets for children with MAM.

Lessons Learned: Treatment of Malnutrition

- Strengthen and support the health system through training and provision of supplies for the treatment of SAM to create the foundation for quality SAM treatment and to enable referral from FFP programs to the health facilities.
- Screen, prevent, and treat moderate acute malnutrition (MAM) and use locally available commodities. Identifying and treating MAM before it progresses may to reduce the overall burden of SAM treatment in government health facilities.

WASH. Lack of access to clean water and sanitation has a significant adverse impact on nutrition and such access is very low in eastern DRC. All three current FFP development projects include SBCC and messages around critical hygiene practices. Two projects have undertaken WASH infrastructure activities, including the construction of latrines and water wells, the capping of springs, and the rehabilitation of water systems. A third project limits its WASH activities to improving hygiene and teaching households to construct tippy taps—simple household washing stations.

In one project, the use of consultant/contract staff for WASH infrastructure activities under project staff supervision has allowed the completion of planned construction in a timely manner. It was also an opportunity for the project to support local associations and organizations, and thus to support the local economy. For the other project, the use of such mechanisms has not been of satisfactory quality. Using consultant/contract staff or using project staff each has advantages and disadvantages, but regardless of the approach a project choses, current projects agree that close supervision by project staff engineers hired specifically for that purpose is essential. A rigorous and unbiased selection process for awarding contracts was seen as important, along with an agreement on the payment plan before the work begins.

Lessons Learned: WASH

- Expand and improve WASH infrastructure as this is a prerequisite to preventing malnutrition. Projects can do so by constructing permanent infrastructure in the communities, as well as simple structures in the households (such as tippy taps), in addition to advocating for changed hygiene behaviors.
- Ensure project staff provide close supervision of water and sanitation construction.

Family planning. Working in a high fertility environment, the ability of food security projects to make an impact is limited without addressing family planning. As effective as food security interventions can be, if the population base is large and expanding, the ability of the project to have an impact becomes small and diluted. Current FFP project activities related to family planning are limited, with little SBCC and messages on the importance of birth spacing and family planning.

Lessons Learned: Family Planning

- Support and strengthen the health system to expand and deliver family planning services, particularly taking charge of distributing family planning commodities and related services, in addition to SBCC on family planning, as this helps projects achieve their food security objectives.
- Build on USAID efforts to collaborate, collocate, and coordinate to leverage and collaborate with other USAID-funded health projects that can focus on distributing family planning commodities, with FFP playing a more substantive role in the SBCC related to promoting the adoption of family planning (e.g., FFP projects through their focus on agriculture extension work extensively with men can reach this key audience to promote uptake of family planning, in addition to the MCHN audiences they reach).

3.3.3 COMMUNITY HEALTH WORKERS AND SBCC

Projects have trained mothers (and sometimes fathers) to act as volunteer community health workers—calling them leader mothers or leader fathers—who conduct many of the project MCHN activities in the communities. In most projects, these leaders were not found to be highly motivated, especially when other leader mothers used in the same areas by other organizations are provided with material gifts. This is likely due to the fact that leader mothers cannot afford to work for free. Projects have learned that some compensation such as the provision of seeds, T-shirts, or bags to the leader mothers could help increase their motivation. They can also benefit from project-led literacy and numeracy activities. One potential motivation seems to be the integration of project volunteers, such as leader mothers, into the public health system. They already often perform duties similar to the public health system community health workers, and are trained to fulfill their roles. Projects could negotiate with the Ministry of Health for them to be trained and/or recognized as community health workers (CHWs) either during the life of the project, or when the project ends. Interestingly, some men were interested in training and performing the duties of leader fathers, and were encouraged by the projects to do so. This is an important step toward gender integration, but more can be done to encourage men as leader fathers. Engagement of men in the broader health system is important to improve their engagement and understanding of women and children's health and nutrition needs.

All three projects use the care group model for the majority of their SBCC. Cascade training is led by the project health promoters. The promoters train leader mothers, who in turn train recipient mothers. From the project directors' and managers' points of view, this model seems to work well for MCHN activities, although data on the effectiveness of this model on changes in behavior is not yet available. Based on qualitative data in more than one project, radio messages seem to be popular and effective in producing behavior change, especially among men. An interview with a father who was not initially supportive of his wife's participation in the care groups illustrates this behavioral and attitude change as a result of radio messages. After hearing a radio spot about the importance of prenatal and postnatal care and nutrition, he became supportive and helped his wife manage her time and household tasks so that she would be able to attend antenatal care and care group meetings.

Lessons Learned: CHWs and SBCC

- Collaborate with other projects working in target areas to ensure provision of uniform compensation for volunteer CHWs to help improve their motivation and performance.
- Train the public health system CHWs, or integrate the project-trained CHWs into the public health system during the project period, as this provides an opportunity to support the government health services.
- Encourage men to serve as CHWs to improve gender integration in an area where it is needed.
- Use mass media approaches, such as radio spots, as a means to reach the community at large but also target men as a key audience of SBCC activities to both engage men to improve gender integration and support the adoption of improved nutrition and health behaviors at the household level, which ultimately improves the project's impact on nutrition-related behaviors and outcomes.

3.3.4 SUSTAINABILITY CONSIDERATIONS IN MCHN ACTIVITIES

From a review of project documents and discussion with project staff, it is clear that the three FFP projects in eastern DRC have learned that working with local authorities increases the likelihood that project MCHN activities will be sustainable. Additionally, working through local government bodies has enabled the projects to access communities more easily, as they have built a rapport and trust with these institutions as partners. This partnership has been key in ensuring the safety and security of project staff and commodities in this volatile region. Projects have also found that having a system for community feedback or complaint and a response mechanism allows them to be aware of and respond to communities' needs, as well as any rumors, and to address them in a timely manner so that long-term repercussions can be avoided. Working closely with government health center staff helps the projects increase the chances of its activities' and impacts' sustainability. Projects have done so by setting up joint supervision of project volunteers; joint field visits; joint training on the Essential Nutrition Actions, Essential Health Actions, and infant and young child feeding; and refresher training on nutrition and the implementation of the national nutrition policy, among other activities. One lesson that was learned after setting up a parallel structure of mother and father leaders was that perhaps, for sustainability purposes, it would be better for projects to work with existing government CHWs (as mentioned in section 3.3.3). In that case however, it is important for the project to set up performance expectations for the CHWs, and to provide the same kind of training and supervision as they would for mother and father leaders. Care should be taken to ensure a reasonable workload for these CHWs, and if they become overloaded, projects could support the hiring of additional CHWs.

Projects have worked on improving the sustainability of their activities by building the capacity of community structures such as Commités de Developpement Communautaires (CDCs) and WASH committees (who themselves are under the supervision of CDCs). The challenge with this approach is ensuring funding and availability of outside inputs, such as serviceable parts for WASH infrastructure. Projects are also working on improving the links of these community structures to government services and entities at the local level. Another contribution to the sustainability of the projects' impact is the hiring of local staff as much as possible. It is interesting to note that although preventing children from becoming stunted in the first 2 years of life is a sustainable effect that will impact a whole generation, and would have potential effects on their offspring, none of the projects expressed that as part of their sustainability strategy.

Lessons Learned: MCHN Sustainability

- Collaborate closely with local and national government health sector entities from the inception of the project, as this can ease the project's access to the communities and increase the likelihood of the sustainability of the project activities and impact after the exit of the project.
- Implement a system for community feedback or complaint and a response mechanism for health service and conditional transfer activities related to MCHN.
- Establish joint training and supervision with the local and provincial health authorities.
- Integrate project CHWs into the government health system, or employ the government CHWs.
- Develop the capacity of local community structures to support health service delivery and referral.

3.4 GENDER LESSONS LEARNED

3.4.1 PROGRAMMATIC GENDER INTEGRATION

While gender integration was expected of all ongoing projects in eastern DRC, the extent to which projects have been successful in integrating gender has varied. However, even the most successful efforts have not fully addressed the gender issues that affect the communities where the projects operate. In part this is due to where the projects are located in DRC, where the transition to a post-conflict setting faces frequent setbacks. Each of the projects has been affected by insecurity, which has impeded project implementation to varying degrees. In some cases, insecurity has meant changing the geographic focus of activities, in other cases, it has meant narrowing the focus of programming to a more limited area, and in other cases still both strategies have been applied. But this is also partly a result of projects themselves not adequately integrating gender in their program design and implementation activities.

All current FFP development projects in eastern DRC sought to address gender issues. However, in two projects staff to support these efforts were brought on after midterm evaluations, at which point there is not enough time to fully address gender issues and/or reorient program implementation to integrate gender. While two of the three projects conducted gender assessments early in the life of their projects, only one of the projects, which had a partner with expertise on gender, was able to use the results of the assessment to help guide programming early on. Some key benefits included: training and sensitization on gender issues for project staff at all levels in the first year of operation, incorporating insights gained from the gender assessment into project activities, and designing effective program approaches based on the partner's experience in gender dynamics and social change.

The focus on gender dynamics and social change is an important one because in the conflict-heavy context of eastern DRC, men and women's roles evolve particularly rapidly, and understanding what changes are underway and how to promote positive changes in how men and women relate is essential—both for social stability and to support food security programming objectives. It is important to note that just as the three projects have had varying success with integrating gender, the approaches they used were also different. The two projects that sought to integrate gender after their midterm evaluations used a "women in development" approach, whereas the project that sought to integrate gender from the beginning adopted a "gender and development" approach. The difference is an important one. In the projects that used the women in development approach, the emphasis of activities was to target women and provide them with additional skills and capabilities. The perceived benefit was that women could do more for themselves by learning these additional skills and that, as a result, they would need to depend less on men. The problem in the eastern DRC context however, is that men already do little to support farming and livelihood activities for fear of losing their lives as a result of insecurity. This has resulted more broadly in women taking on greater household and farming responsibilities while putting

themselves at great risk of sexual violence on the way to their farms, all while still remaining subservient to men.

In contrast, the project that used the gender and development approach engaged men and women, and sought to transform how they relate to one another. In this approach, men have been engaged to play a more active role in supporting women, and have been made aware of the need to resolve conflict using different approaches such as dialogue and collaboration rather than resorting to violence. This has resulted in more effective pooling and managing of household resources toward the shared objective of improving the well-being of their children. While the project has not achieved transformation of all relations between men and women, their approach has led men and women to be more introspective about the value of greater cooperation and management of resources at the household level. Even so, some men and women in this project area continue to perceive that there is something to lose by promoting gender equality. Some men perceive this as men relinquishing power and taking on more submissive roles, and some women perceive that it is inappropriate for men to take on women's roles. That said, the project's results to date suggest that change is possible, if challenging. This suggests that, going forward, emphasizing what men and women can gain by promoting gender equality is important for projects to articulate so that gains are not only perceived in terms of what women gain, but also in terms of what men gain.

Even though one of the three projects has been more able to integrate gender, it is important to note that gender integration has been uneven across the project strategic objectives. Efforts to promote social change and improve gender relations did not permeate across all aspects of the project. The next two sets of lessons illustrate this point, examining constraints to gender integration in the availability/accessibility and MCHN objectives.

Finally, gender, family planning, and sexual and gender-based violence are intimately linked in this region of DRC. Despite the widespread prevalence of sexual and gender-based violence, ongoing project partners noted that they do not feel well equipped to deal with such issues and future projects will need to consider how to address this issue. Although some of the projects have been effective at engaging in community-level dialogues to change social norms and values, given the deeply entrenched gender discrimination against women in these areas, it will take a significant amount of time and effort to engender change.

Lessons Learned: Programmatic Gender Integration

- Integrate gender from the inception of the project and undertake a robust gender analysis during the first year of implementation. Integrating gender any later is too late, because how the project is implemented depends on a sound understanding of and approach to addressing gender issues that affect men and women's participation in program activities.
- Train staff on gender in the first year of the project so they gain a better understanding of gender issues in the project context and appreciate why these issues are important to address through their daily work responsibilities.
- Hire staff with expertise in gender at the start of the project to ensure and oversee the integration of gender across the project. These staff serve as stewards of gender integration in a project, but are not solely responsible for its effective integration. Establishing a gender-focused position at a high enough level is also important to provide the authority to direct and oversee how gender is integrated, and hold staff accountable. Investing in such staff also reflects the commitment of the project to addressing gender issues.
- Adopt a gender and development approach that engages men and women to promote gender equality and transform gender relations in eastern DRC. Using a win-win approach in which men and women perceive gains in shifting gender norms is also important to support sustainable change.
- Integrate gender evenly and consistently across all project objectives to achieve the intended impact of promoting gender equality and improving household food security.
- Include gender in the development and implementation of an SBCC strategy to ensure that the relevant audiences are engaged to shift normative beliefs and support the adoption of improved practices. Efforts to engage the community through radio spots have been particularly successful. Key audiences that need to be targeted include community gatekeepers and religious leaders.
- Develop a project-wide plan aimed at anticipating and addressing sexual and gender-based violence and protection issues as they are likely to arise over the life of a project.

3.4.2 GENDER IN AGRICULTURE, LIVELIHOODS, AND DISASTER RISK REDUCTION

Agriculture. Access to land for farming for men and women in eastern DRC is a particularly complex issue as has been discussed throughout this report. Recent surveys for this region and partner experiences suggest that access to land and land tenure are significant problems due to insecurity and instability, resulting in disrupted food production. Women's access to land is even more constrained than men's because they depend on men to gain access to land. Despite these challenges to land access, which were evident in all cases even at the time of the ongoing projects' baseline surveys, the projects have emphasized improving farming practices over the life of these awards. It is important to note that under the agriculture objective particularly, while men and women participated in these activities, the monitoring indicators were not sex-disaggregated so it is difficult to measure the extent to which women and men benefited relative to one another.

Livelihoods. Another important lesson learned is that challenges related to land access, particularly for women, and the general instability in this region point to the need for a greater future emphasis on productive off-farm livelihood activities. This diversification is important to sustain families during periods of shocks and when they are unable to farm. Even from the efforts some partners made to introduce village savings and loan activities targeted to women, partners noted that more needs to be done in the area of skill-building (e.g., technical skills as well as managerial skills) so that recipients could maximize the use of their loans and be more successful in their income-generation efforts. The current projects have not included these activities and it is clear that, for both men and women, more support is needed to make the most of this capital.

Disaster risk reduction. All of the ongoing projects implemented activities in disaster risk reduction, which were intended to be implemented at the community level. No efforts were made to address the specific vulnerabilities of men and women in disaster situations. This was an important gap, as men and

women in these communities experience disasters and shocks differently based on their resource access, age, and social responsibilities. This suggests that future implementing partners should seek to implement disaster risk reduction activities taking gendered vulnerabilities into account so that even community-level activities can be tailored to meet the needs of men and women.

Lessons Learned: Gender in Agriculture, Livelihoods, and Disaster Risk Reduction

- Negotiate the terms of land leases, taxes, and payments with chiefs, local leaders, and large landowners prior to the start of agricultural activities. This is essential to protect both male and female farmers' investments to gain the most from their efforts to produce food and cash crops.
- Adopt more sex-disaggregated indicators in these technical sectors to be able to track how well male and female beneficiaries are doing over the course of the project.
- Develop an explicit approach for off-farm income-generation activities that provides male and female beneficiaries with associated necessary technical and managerial skills.
- Integrate gender into disaster risk reduction activities, including by planning activities to address men's and women's specific vulnerabilities during disasters.

3.4.3 GENDER IN MATERNAL AND CHILD HEALTH AND NUTRITION

Across the three projects, MCHN objectives predominantly engage women. Two of the projects have sought to engage men as leader fathers on a very limited scale, primarily as a result of men asking to participate in health and nutrition activities or because it was identified as a gap in the project midterm evaluation, but this was not part of the original design. Male engagement in this aspect of programming is important to enable and support women to adopt improved health and nutrition practices. Without the support of men, the degree of change in practices is likely to be smaller and less sustained. One important lesson learned from these interventions is that men (1) want to be engaged in health and nutrition activities and (2) need to be engaged to ensure a strong enabling environment in which women feel supported to adopt improved practices. In addition, male engagement is essential to mitigate the risks and consequences related to sexual and gender-based violence and to expand and promote the uptake of family planning. As noted previously, current partners feel that family planning is needed in these areas, but any efforts to integrate family planning will need to engage men as key players in promoting the adoption of modern family planning methods.

Lessons Learned: Gender in Maternal and Child Health and Nutrition

- Develop an approach from the inception of a project to engage men, such as having leader fathers to work with **men** to promote the adoption of family planning practices, improved nutrition practices, and efforts to mitigate the risk of sexual and gender-based violence within and outside the home.

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ANNEX A. NEW PROVINCES BASED ON THE 2006 CONSTITUTION

LES 26 NOUVELLES PROVINCES DE LA RDC SELON LA CONSTITUTION DE 2006					
	*superficie		**population 2005		capitale
1. KINSHASA	9 965	km2	6 700 000	hab.	Kinshasa
2. KONGO-CENTRAL	53 920	km2	2 760 000	hab.	Matadi
3. KWANGO	89 974	km2	1 428 000	hab.	Kenge
4. KWILU	78 441	km2	3 637 000	hab.	Kikwit
5. MAÏ-NDOMBE	127 243	km2	1 261 000	hab.	Inongo
TOTAL ex-BANDUNDU	*295 658*	*km2*	*6 326 000*	*hab.*	*Bandundu*
6. EQUATEUR	103 902	km2	1 138 000	hab.	Mbandaka
7. TSHUAPA	132 957	km2	921 000	hab.	Boende
8. MONGALA	58 141	km2	1 255 000	hab.	Lisala
9. NORD-UBANGI	56 644	km2	1 037 000	hab.	Gbadolite
10. SUD-UBANGI	51 648	km2	1 920 000	hab.	Gemena
TOTAL ex-EQUATEUR	*403 292*	*km2*	*6 271 000*	*hab.*	*Mbandaka*
11. TSHOPO	199 567	km2	1 622 000	hab.	Kisangani
12. BAS-UELE	148 331	km2	686 000	hab.	Buta
13. HAUT-UELE	89 683	km2	1 198 000	hab.	Isiro
14. ITURI	65 658	km2	2 617 000	hab.	Bunia
TOTAL ex-PROVINCE ORIENTALE	*503 239*	*km2*	*6 123 000*	*hab.*	*Kisangani*
15. NORD-KIVU	59 483	km2	5 416 000	hab.	Goma
16. SUD-KIVU	65 130	km2	3 667 000	hab.	Bukavu
17. MANIEMA	132 250	km2	1 386 000	hab.	Kindu
18. TANGANIKA	134 940	km2	1 835 000	hab.	Kalemie
19. HAUT-LOMAMI	108 204	km2	1 878 000	hab.	Kamina
20. HAUT-KATANGA	132 425	km2	2 928 000	hab.	Lubumbashi
21. LUALABA	121 308	km2	1 240 000	hab.	Kolwezi
TOTAL ex-KATANGA	*496 877*	*km2*	*7 881 000*	*hab.*	*Lubumbashi*
22. KASAÏ-ORIENTAL	9 545	km2	1 980 000	hab.	Mbuji-Mayi
23. LOMAMI	56 426	km2	1 501 000	hab.	Kabinda
24. SANKURU	104 331	km2	1 007 000	hab.	Lodja
TOTAL ex-KASAÏ-ORIENTAL	*170 302*	*km2*	*4 488 000*	*hab.*	*Mbuji-Mayi*
25. KASAÏ-CENTRAL	59 111	km2	2 053 000	hab.	Kananga
26. KASAÏ	95 631	km2	2 218 000	hab.	Luebo
TOTAL ex-KASAÏ-OCCIDENTAL	*154 742*	*km2*	*4 271 000*	*hab.*	*Kananga*
RÉP. DÉMOCR. DU CONGO	2 344 858	km2	55 289 000	hab.	Kinshasa

ANNEX B. INTER-PROVINCIAL TRADE OF AGRICULTURAL GOODS IN DRC

Commodity	Commodity Origin	Commodity Destination
Palm oil, maize	Bandundu	**Katanga**
Cassava, maize, palm oil, groundnuts, rice	Maniema	**Katanga**
Groundnuts, beans, bananas, palm oil	Kasai Occidental	**Katanga**
Bananas, beans, palm oil	Kasai Oriental	**Katanga**
Sugar	South Kivu	**Katanga**
Fish	**Katanga**	Maniema
Fish	**Katanga**	Kinshasa
Fish, cassava, maize, meat	**Katanga**	Kasai Oriental
Fish, cassava, maize	**Katanga**	Kasai Occidental
Rice, palm oil, groundnuts	Maniema	**North Kivu**
Palm oil, rice	Orientale	**North Kivu**
Sugar	South Kivu	**North Kivu**
Meat, potatoes, vegetables, beans	**North Kivu**	Kinshasa
Beans, potatoes	**North Kivu**	Maniema
Meat, vegetables, spices	**North Kivu**	Kasai Oriental
Beans	**North Kivu**	Equateur
Beans, potatoes	**North Kivu**	South Kivu
Beans	**North Kivu**	Bandundu
Beans	**North Kivu**	Orientale
Rice, palm oil, groundnuts	Maniema	**South Kivu**
Beans, potatoes	Orientale	**South Kivu**
Beans, potatoes	North Kivu	**South Kivu**
Fish, sugar	**South Kivu**	Maniema
Sugar	**South Kivu**	Katanga
Fish	**South Kivu**	Kasai Oriental
Fish	**South Kivu**	Kasai Occidental
Sugar	**South Kivu**	North Kivu
Beans	**South Kivu**	Orientale

Source: WFP, Ministère du Plan, Institut National de la Statistique. 2008. *République Démocratique du Congo: Analyse globale de la sécurité alimentaire et de la vulnérabilité (CFSVA)*.

ANNEX C. STRATEGIC OBJECTIVES AND ACTIVITIES OF FFP-SUPPORTED PROGRAMS IN EASTERN DRC

Summary of Strategic Objectives and Activities for ADRA's Development Food Assistance Project in South Kivu Province, DRC

Strategic Objective (SO) 1: Increased incomes of food insecure farming households
- Intermediate Result (IR) 1.1: Increased agricultural productivity and diversified production of smallholder farmers
- IR 1.2: Enhanced commercialization of agricultural products of smallholder farmers

SO2: Improved health and nutritional status of children under 5 years of age
- IR 2.1: Improved maternal health status
- IR 2.2: Improved infant and young child feeding practices
- IR 2.3: Improved management of childhood illnesses

SO3: Increased women's socio-economic empowerment in food insecure communities
- IR 3.1: Increased women's control over households resources
- IR 3.2: Reduced gender-based violence in communities
- IR 3.3: Increased participation of women in community leadership

SO4: Strengthened community resilience to food security shocks
- IR 4.1: Improved capacity of communities to respond to disasters
- IR 4.2: Strengthened food security related local governance entities

Source: ADRA

Summary of Strategic Objectives and Activities for Food for the Hungry's Development Food Assistance Project in South Kivu and Katanga Provinces, DRC

SO 1: Improved livelihood capacities of vulnerable households
- IR 1.1: Increased agricultural production
- IR 1.2: Improved land management and natural resource conservation
- IR 1.3: Increased household income from agricultural production

SO 2: Improved health and nutrition of individuals within vulnerable households
- IR 2.1: Improved use of essential nutrition behaviors
- IR 2.2: Increased diversity and consumption of nutritious food
- IR 2.3: Improved household and community management of conditions and diseases that exacerbate malnutrition
- IR 2.4: Improved use of clean water, sanitation facilities, and hygiene behaviors

Cross-Cutting Objective (CC) 1: Improved gender equity in decision making and labor sharing
- CC 2: Increased access to credit
- CC 3: Improved community capacity and resilience to shocks

Source: Food for the Hungry

Summary of Strategic Objectives and Activities for Mercy Corps' Development Food Assistance Project in North Kivu Province, DRC

SO 1: Smallholder farming households in target areas have increased and diversified production and profit

- IR 1.1: Smallholder farmers demonstrate increased productivity
- IR 1.2: Smallholder farmers and other value chain actors have improved processing, storage, and market access
- IR 1.3: Smallholder farmers and other value chain actors improve integration into markets

SO 2: Improved nutritional status among pregnant and lactating women and children under 5 years of age in target areas

- IR 2.1: Pregnant and lactating women and caregivers of children under 5 years of age have increased their utilization of counseling and health services in accordance with host-government standards
- IR 2.2: Pregnant and lactating women and children under 5 years of age have adopted improved nutrition hygiene behaviors
- IR 2.3: Pregnant and lactating women and children under 5 years of age consume more diverse foods

SO3: Strengthened community governance of food security in target areas

- IR 3.1: Community leaders and members work together to address community food security concerns
- IR 3.2: Communities have increased capacity to anticipate and mitigate food security risks
- IR 3.3: Communities have improved linkages with territory and provincial food security structures

Source: Mercy Corps