Promoting Nutrition Security in Haiti
An Assessment of Pre- and Post-Earthquake Conditions and Recommendations for the Way Forward

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World Bank

September 2010
Acknowledgements

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### Acronyms and Abbreviations

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACF</td>
<td><em>Action Contre la Faim</em> (Action Against Hunger)</td>
</tr>
<tr>
<td>AIDS</td>
<td>Acquired Immune Deficiency Syndrome</td>
</tr>
<tr>
<td>ARI</td>
<td>Acute Respiratory Infection</td>
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<tr>
<td>BCC</td>
<td>Behavior Change Communication</td>
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<tr>
<td>BMI</td>
<td>Body Mass Index</td>
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<tr>
<td>CCN</td>
<td><em>Comité Consultatif de Nutrition</em> (Consultative Nutrition Committee)</td>
</tr>
<tr>
<td>CEPAM</td>
<td><em>Centre pour la Promotion de l’Allaitement Maternel</em> (Center for Breastfeeding Promotion)</td>
</tr>
<tr>
<td>CHW</td>
<td>Community Health Worker (<em>Agent de Santé</em>)</td>
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<tr>
<td>CIDA</td>
<td>Canadian International Development Agency</td>
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<tr>
<td>CMAM</td>
<td>Community-based Management of Acute Malnutrition</td>
</tr>
<tr>
<td>CNSA</td>
<td><em>Coordination National de la Sécurité Alimentaire</em> (National Food Security Committee)</td>
</tr>
<tr>
<td>CRS</td>
<td>Catholic Relief Services</td>
</tr>
<tr>
<td>CTN</td>
<td><em>Comité Technique de Nutrition</em> (Technical Committee on Nutrition)</td>
</tr>
<tr>
<td>DHS</td>
<td>Demographic and Health Survey</td>
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<tr>
<td>ECHO</td>
<td>European Commission on Humanitarian Aid</td>
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<tr>
<td>EMMUS</td>
<td><em>Enquête de Mortalité, Morbidité et Utilisation des Services</em></td>
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<tr>
<td>EU</td>
<td>European Union</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<tr>
<td>FEWS NET</td>
<td>Famine and Early Warning System Network</td>
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<tr>
<td>GMP</td>
<td>Growth Monitoring and Promotion</td>
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<tr>
<td>HAS</td>
<td><em>Hôpital Albert Schweitzer</em> (Albert Schweitzer Hospital)</td>
</tr>
<tr>
<td>HDA</td>
<td>Household Development Agent</td>
</tr>
<tr>
<td>HDI</td>
<td>Human Development Index</td>
</tr>
<tr>
<td>HHF</td>
<td>Haitian Health Foundation</td>
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<tr>
<td>HIV</td>
<td>Human Immunodeficiency Virus</td>
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<tr>
<td>HLCS</td>
<td>Haiti Living Conditions Survey</td>
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<tr>
<td>IDB</td>
<td>Inter-American Development Bank</td>
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<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<tr>
<td>IHE</td>
<td><em>Institut Haïtien de l’Enfance</em> (Haitian Institute for Children)</td>
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<tr>
<td>IHSI</td>
<td><em>Institut Haïtien de Statistique et d’Informatique</em> (Haitian Institute of Statistics and Information)</td>
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<tr>
<td>IMCI</td>
<td>Integrated Management of Childhood Illness</td>
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<tr>
<td>INHSAC</td>
<td>Institute for Health and Community Action</td>
</tr>
<tr>
<td>IYCF</td>
<td>Infant and Young Child Feeding</td>
</tr>
<tr>
<td>IYCN</td>
<td>Infant and Young Child Nutrition</td>
</tr>
<tr>
<td>MDG</td>
<td>Millennium Development Goals</td>
</tr>
<tr>
<td>MFK</td>
<td>Meds and Food for Kids</td>
</tr>
<tr>
<td>MI</td>
<td>Micronutrient Initiative</td>
</tr>
<tr>
<td>MINUSTAH</td>
<td><em>Mission des Nations Unies pour la Stabilisation en Haïti</em></td>
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<tr>
<td>MSH</td>
<td>Management Sciences for Health</td>
</tr>
<tr>
<td>MSPP</td>
<td><em>Ministère de la Santé Publique et de la Population</em> (Haitian Ministry of Health)</td>
</tr>
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</table>
Executive Summary

Introduction

Children in Haiti are born into some of the harshest conditions on the planet, and are left at a disadvantage in terms of growth, development, and potential to thrive. Malnutrition rates in Haiti are among the worst in the Latin America and Caribbean region. Nearly one-third of all children under five suffer from stunted growth and three-quarters of children 6-24 months of age are anemic.\(^1\) Malnutrition takes a serious and irreversible toll, making children more susceptible to disease and death and compromising their cognitive and physical development, which results in low human capital and diminished lifetime earnings. The economic costs of malnutrition are substantial. Annually, Haiti loses over US$56 million in GDP due to lost productivity resulting from physical and intellectual impairments caused by micronutrient deficiencies.\(^2\)

The situation in Haiti was dire before the devastating earthquake of January 12, 2010 and now conditions are even worse. Lack of access to food, shelter, clean water, and medical services has put many more children at risk of malnutrition. There is now a critical need not only to rebuild what was lost, but also to resolve pre-existing problems and to transform the country’s capacity to enhance the human capital of its children.

The aim of the paper is to analyze the pre- and post-earthquake nutritional situation in Haiti and identify promising strategies and innovative tools to prevent malnutrition and promote nutrition security in Haiti. Most of the available data describes conditions in Haiti before the earthquake; however, data from a post-earthquake nutritional survey conducted in earthquake-affected areas is included wherever possible. This assessment interprets available data to provide an explanation of the underlying determinants of nutrition security in Haiti and provides practical recommendations for improving nutrition security in the context of the country’s reconstruction.

Two key points of focus are: (1) the concept of nutrition security, which is more comprehensive than nutritional status alone, including food consumption, environment, health, and caring practices, and (2) the importance of the narrow “window of opportunity”—from conception to two years of age—during which malnutrition can and should be prevented. During this period, nutrition requirements, in terms of caloric and micronutrient needs, are substantial since children are experiencing dramatic growth and development, and children are extremely vulnerable to poor caring behaviors, inadequate access to health services, and inappropriate feeding practices.

<table>
<thead>
<tr>
<th>Nutrition Security</th>
<th>Window of Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing access to the basic elements of good nutrition: nutritious diet, safe environment, adequate health care, and proper child care practices.</td>
<td>The period between conception and age two when the irreversible damage caused by malnutrition can and should be prevented.</td>
</tr>
</tbody>
</table>

\(^1\) DHS 2005.  
Methodology

This report draws on a range of sources of information including nutrition survey data, documentation of nutrition programs and policies, and observations from field visits to several programs demonstrating promising approaches to protecting and promoting nutrition security. The conclusions and recommendations in this paper are based on an analysis of several case studies illustrating promising approaches to protecting nutrition security (see Annex) and the following scientifically proven best-practices and cost-effective interventions:\(^3\):

- Exclusive breastfeeding for six months and continued breastfeeding for at least two years.
- Adequate complementary feeding from 6 to 24 months.
- Appropriate nutritional care of sick and severely malnourished children.
- Adequate intake of vitamin A for women and children.
- Adequate intake of iron for women and children.
- Adequate intake of iodine by all members of the household.
- Proper management and treatment of diarrhea with oral rehydration solutions and zinc.

Pre-earthquake Nutrition Situation

Before the earthquake, threats to nutrition security in Haiti were already widespread.

- Insufficient food consumption: Nearly 60 percent of the population was undernourished, with a dietary energy intake below that needed for maintaining a healthy and active life.\(^4\) Dietary diversity was poor, with most families consuming mostly starches and oils, but little protein, fruits or vegetables.
- Poor healthcare: 40 percent of the population lacked access to healthcare services.\(^5\)
- Dreadful environmental conditions: 40 percent of the population did not have access to an improved water source and 80 percent had no access to sanitation facilities.\(^6\)
- Inadequate caring practices for young children: Only 40 percent of children 0-6 months were exclusively breastfed and only 32 percent of children 6-24 months benefited from appropriate complementary feeding practices (dietary diversity, frequency, breast milk/milk consumption).\(^7\) These behaviors imperil children’s nutritional status during the “window of opportunity.”

Poor diet, limited access to healthcare, an unsanitary environment, and improper caring practices for young children contribute to alarming rates of malnutrition in Haiti:

- 30 percent of children under 5 suffered from chronic malnutrition.\(^8\)
- 10 percent of children under 5 suffered from acute malnutrition, the highest rate in the region.\(^9\)

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\(^3\) These best practices are based on Lancet series and WHO recommendations.
\(^4\) FAO 2008.
\(^5\) PAHO 2007.
\(^6\) World Bank 2009b.
\(^7\) DHS 2005: Addendum on Infant and Young Child Feeding (IYCF) Practices.
\(^8\) Using WHO 2006 standards.
\(^9\) Using WHO 2006 standards.
Also, harmful deficiencies in key micronutrients cause a range of cognitive and physical problems, including mental retardation, blindness, and reduced physical productivity:

- 73 percent of children 6-24 months and 60 percent of pregnant women were anemic.\(^\text{10}\)
- 59 percent of school-aged children were iodine deficient and an estimated 29,000 children are born mentally impaired due to iodine deficiency annually.\(^\text{11}\)
- 32 percent of preschool aged children were deficient in vitamin A and an estimated 3,200 deaths are precipitated by this deficiency annually.\(^\text{12}\)

**Post-Earthquake Nutrition Situation**

The impact of the earthquake on nutrition security, although still not yet well documented, will undoubtedly be dramatic. Food insecurity has increased, the health system was badly weakened and precarious health and sanitary conditions put children at higher risk for malnutrition.

The underlying threats to nutrition security pre- and post-earthquake have remained the same: poor food availability, health care, environment, and caring practices. However, conditions are now much worse, putting more women and children at risk of irreversible damage due to malnutrition. Chronic malnutrition and micronutrient deficiencies are still the major underlying problems and will likely worsen under ongoing perilous conditions. Acute malnutrition has increased slightly in earthquake-affected areas due to poor health conditions, lack of health services, and food insecurity. Nutrition security conditions for adolescent girls and pregnant and lactating women will likely also worsen, which would cause increased malnutrition in the next generation.

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\(^\text{10}\) DHS 2005.  
\(^\text{11}\) MSPP et al. 2005.  
Determinants of Nutrition Security in Haiti

Multiple factors threaten nutrition security in Haiti. A basic cause of malnutrition is poverty, which is embedded in underlying social, economic, and political conditions. Poverty, in turn, contributes to underlying causes, including household food insecurity, inadequate caring practices, and a lack of health services and unhealthy environment. Immediate causes of malnutrition include inadequate food consumption and the presence of disease during the first few years of life. Often, the underlying causes are conceptualized as three categories: food, health, and care.

Food
In Haiti, both food production and consumption are limited. Poor agricultural production leads to Food availability in Haiti is insufficient due to poor agricultural production, which translates into dependence on purchased foods that are often unaffordable and/or inaccessible in rural areas. According to the Food and Agriculture Organization’s food security statistics, 58 percent of Haiti’s population is considered undernourished, meaning their dietary energy intake is below that needed for maintaining a healthy and active life. In addition to insufficient daily caloric intake, dietary diversity is limited: a typical diet in Haiti is mainly made up of starches and oil-based foods, and consumption of fruits, vegetables, and protein is limited.

Health
Poor access to basic services compromises health conditions in Haiti. Forty percent of the population does not have access to an improved water source, and 80 percent does not have access to sanitation facilities. Skilled attention for women during pregnancy and delivery, which can reduce health risks for mother and child and affect long-term nutrition status, is insufficient in Haiti and immunization rates for children are also relatively low. Haiti has the highest rates of infant, under five and maternal mortality in the Western hemisphere.

Care
The lack of appropriate knowledge about nutrition practices contributes to inappropriate caring and feeding practices, especially for young children. Poor families typically eat only one meal per day, a practice that is insufficient for young children and pregnant or lactating women, who need to eat more regularly to meet their daily nutritional requirements for healthy development. Cultural norms can also have a negative impact on the nutritional status of infants, young children, and pregnant and lactating women. For example, in Haiti, taboos about bringing babies out in public or into the sun, and common practices of leaving young children in the care of family or neighbors make it difficult for mothers to exclusively breastfeed their infants.

Review of Nutrition Programs in Haiti

To date there is no comprehensive analysis of nutrition programs and policies in Haiti. To help fill the gap, this report draws on two existing resources from before the earthquake—a 2008 UNICEF inventory of nutrition programs and a 2009 World Bank-funded nutrition assessment, including several case studies—to compile lessons about programs and policies that have been addressing nutrition security in Haiti before the earthquake and generate ideas for how improve nutrition security in the post-earthquake landscape.
The following key features characterized the response to nutrition insecurity before the earthquake:

- There were a growing number of programs addressing child nutrition, but no structure in place to address nutrition security comprehensively. The approach was patchwork, with small, mostly donor- and NGO-run programs operating in distinct areas and little coordination across programs or country-wide efforts.
- While some programs made efforts to coordinate with local or regional governments and/or other program implementers, there was little institutionalized communication across implementers or with government.
- Some programs were experimenting with multisectoral programs (e.g. nutrition and agriculture), but coordination across sectors remained rare and an enormous challenge.
- The health system had serious coverage gaps and was not oriented, nor endowed with the human and material resources, to address nutrition issues.
- The large majority of nutrition programs in Haiti focused on treating malnutrition, and especially severe acute malnutrition. There was, however, little focus on preventing malnutrition, especially chronic malnutrition and micronutrient deficiencies, even though prevention has been proven to be more cost-effective than treatment, both internationally and in Haiti.
- Despite increasing attention to nutrition, investment in improving nutrition security was not sufficient to meet country needs.

A review of nutritional programs and consultations with international actors addressing nutrition security before the earthquake highlighted the need to collectively shift the focus of programming to address nutrition security more effectively in Haiti. The following actions were recommended:

- Focus on prevention—and treatment, when needed—of all types of malnutrition, but particularly chronic malnutrition and key micronutrient deficiencies.
- Base interventions on international best practices, such as the “window of opportunity” for intervention (conception to 24 months) and proven interventions not yet systematically adopted in Haiti (e.g. multiple micronutrient powders to reduce anemia, zinc supplements to manage diarrhea, etc.).
- Continue effective and nationwide promotion of healthy nutrition habits, including the promotion of exclusive breastfeeding for 6 months and continued breastfeeding to 24 months, adequate and responsive complementary feeding practices, and the provision of nutritionally rich foods for all nutritionally vulnerable groups.
- Enhance coordination across partners and within government.
- Build capacity and leadership in government to set, promote, and implement nutrition security programs and policies.
- Continue to encourage and support the local production of nutritionally rich foods.
The Way Forward

Since the earthquake, a participatory needs assessment led to the development of a vision and set of actions to rebuild the country over the course of 18 months. The Post Disaster Needs Assessment (PDNA) was led by government and conducted in partnership with numerous international organizations in March 2010, and resulted in a National Action Plan for Recovery and Redevelopment of Haiti. There is a general consensus that in order to protect and promote long-term nutrition security in Haiti, the following priorities and actions are essential:

To achieve nutrition security, Haiti should act to:

- **Reduce chronic malnutrition** through improved exclusive breastfeeding and complementary feeding practices.
- **Reduce anemia** among pregnant and lactating women and children by providing supplements containing iron and deworming treatments.
- **Reduce iodine deficiency** through supplementation and salt iodization.
- **Reduce vitamin A deficiency** through supplementation.
- **Reduce chronic food insecurity** through improved agriculture, investment in agribusinesses, and multisectoral collaboration.
- **Improve the coverage of basic health and nutrition services** by ensuring proper attention to pregnant and lactating women and children under two.

The first steps to accomplish this include:

- **Promoting behavior change** via community education- and household-level outreach.
- **Providing routine micronutrient supplements** (iron, iodine, and vitamin A) to pregnant and lactating women and children under two.
- **Investing in agriculture and agribusiness** to increase access to nutrient-rich foods and promote the production of fortified complementary food for children 6-24 months.
- **Investing in basic health services** to expand access and quality and include a basic nutrition package, for the most vulnerable.
- **Supporting government capacity and leadership** to set, promote and implement nutrition security programs and policies.

It is important that these recommendations be coupled with the following broader elements, which involve additional information gathering, engagement of a wider range of sectors, and strategic collaboration, to ensure comprehensive, sustainable, and long-term progress:

- **An updated understanding of the post-earthquake nutrition security situation**, including migration patterns, region-specific needs, and service availability.
- **Better information systems** to track nutrition trends, programming, and beneficiary needs.
- **Clear consensus among partners** about priority actions for the medium to long run, responsibilities of each actor, and coordination mechanisms.
- **Enhanced government capacity and leadership** to design, promote, implement, and supervise nutrition security programs and policies.
- **An estimate of the costs to reach the common vision of protecting nutrition security.**
- **A commitment to scale-up nutrition security activities** to address the needs of the population.
Conclusions

Chronic malnutrition and micronutrient deficiencies resulting from poor nutrition security are widespread, insidious problems in Haiti, causing the erosion of human capital and generating high economic and social costs. Although data on nutrition in Haiti continues to be scarce, this report brings into focus the predominant nutrition security challenges in Haiti, while providing a snapshot of how these problems are being addressed and recommendations for the way forward. The severity of the nutrition security situation in Haiti, especially in the wake of the January 12th earthquake, calls for urgent action to address pre-existing and emerging nutrition security problems.

A key conclusion from this report is that despite the lack of a comprehensive approach to addressing nutrition security in Haiti, there are a number of promising approaches in place. If partners come together with a common set of priority actions that focus on preventing malnutrition during the “window of opportunity” using internationally recognized cost-effective interventions, important impacts could be achieved. It is also important to note that unlike other countries in the region, Haiti faces the challenge of both addressing chronic and acute malnutrition. Therefore, the response may be more complex and require both behavioral change and food-based interventions. The involvement of multiple sectors would be beneficial to address the range of determinants of nutrition security.

<table>
<thead>
<tr>
<th>Priority Actions to Promote Nutrition Security in Haiti</th>
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</thead>
<tbody>
<tr>
<td>1. Reduce chronic malnutrition.</td>
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<tr>
<td>2. Reduce micronutrient deficiencies in iron, iodine, and vitamin A.</td>
</tr>
<tr>
<td>3. Reduce chronic food insecurity.</td>
</tr>
<tr>
<td>4. Improve the health system and include nutrition services.</td>
</tr>
</tbody>
</table>

Forging a common vision and commitment to protect nutrition security, and securing the necessary investment to meet the nutrition security needs in Haiti will help effectively enhance the human capital of Haiti’s children and build a healthier, stronger, and more productive next generation.
Introduction

Children in Haiti are born into some of the harshest conditions on the planet, and are left at a disadvantage in terms of growth, development, and potential to thrive. Malnutrition rates in Haiti are among the worst in the Latin America and Caribbean region. Nearly one-third of all children under five suffer from stunted growth and three-quarters of children 6-24 months of age are anemic.\textsuperscript{13} Malnutrition takes a serious and irreversible toll, making children more susceptible to disease and death and compromising their cognitive and physical development, which results in low human capital and diminished lifetime earnings.\textsuperscript{14} The economic costs of malnutrition are substantial. Annually, Haiti loses over US$56 million in GDP due to lost productivity resulting from physical and intellectual impairments caused by micronutrient deficiencies.\textsuperscript{15}

The situation in Haiti was dire before the earthquake on January 12\textsuperscript{th} 2010 and now conditions are even worse. Lack of access to food, shelter, clean water, and medical services put many more children at risk of malnutrition and the damage to infrastructure and institutions hampered the government’s ability to deal with the crisis. There is now a critical need not only to rebuild what was lost, but also to resolve pre-existing problems and to transform the country’s capacity to enhance the human capital of its children.

The aim of this paper is to analyze the pre- and post-earthquake nutritional situation in Haiti and to identify promising strategies and innovative tools to prevent malnutrition and promote nutrition security in Haiti. The paper interprets available data to provide an explanation of the underlying determinants of nutrition security in Haiti and provides practical recommendations for improving nutrition security in the context of the country’s reconstruction. Most of the available data describes conditions in Haiti before the earthquake; however, newer data is included wherever possible.

Two key points of focus in the paper are: (1) the concept of nutrition security, which includes food consumption, environment, health, and caring practices, and is therefore more comprehensive than nutritional status alone, and (2) the importance of the narrow “window of opportunity”—from conception to two years of age—during which malnutrition can and should be prevented. This is a critical period during which damage to physical growth, brain development, and human capital formation—due to undernutrition and micronutrient deficiencies—is extensive and largely irreversible.

<table>
<thead>
<tr>
<th>Nutrition Security</th>
<th>Window of Opportunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ongoing access to the basic elements of good nutrition: nutritious diet, safe environment, adequate health care, and proper child care practices.</td>
<td>The period between conception and age two when the irreversible damage caused by malnutrition can and should be prevented.</td>
</tr>
</tbody>
</table>

\textsuperscript{13} DHS 2005.  
\textsuperscript{14} The Lancet Series on Maternal and Child Undernutrition 2008.  
Methodology

This report draws on a range of sources of information including nutrition survey data, documentation of nutrition programs and policies, and observations from field visits to several programs demonstrating promising approaches to protecting and promoting nutrition security. The nutrition data come from the following surveys: the 1995, 2000, and 2005 Demographic Health Survey (DHS), the 2005 Survey of the Prevalence of Vitamin A and Iodine Deficiency (by IHE, MI, UNICEF and MSPP and cited as MSPP et al. 2005), the 2009 National Nutrition Survey (by MSPP, Action Contre la Faim, EU, UNICEF, cited as MSPP et al. 2009), and the 2010 Nutrition Survey in Earthquake-Affected Regions (by MSPP, UNICEF, Action Contre la Faim, Medecins du Monde Switzerland, and Terre des Hommes, cited as MSPP et al. 2010). The DHS and MSPP/UNICEF surveys are nationally representative, whereas the MSPP et al. 2009 survey provides only department-level prevalence figures and the MSPP et al. 2010 survey covers only earthquake-affected areas. The surveys use distinct methodologies for data collection and analysis, so comparisons across surveys cannot be drawn.

<table>
<thead>
<tr>
<th>Chronic vs. Acute Malnutrition</th>
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<tbody>
<tr>
<td><strong>Chronic malnutrition (stunting):</strong></td>
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<tr>
<td>• Long-term measure of undernutrition and poor health.</td>
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<tr>
<td>• Reflects a failure to reach linear growth potential.</td>
</tr>
<tr>
<td>• Measured as height-for-age &lt; -2 z-scores below the international reference.</td>
</tr>
<tr>
<td>• Leads to higher risk of morbidity and mortality and lower earnings.</td>
</tr>
<tr>
<td>• Often a nearly invisible problem.</td>
</tr>
<tr>
<td><strong>Acute malnutrition (wasting):</strong></td>
</tr>
<tr>
<td>• Short-term measure of undernutrition and poor health.</td>
</tr>
<tr>
<td>• Reflects recent or current significant weight loss, often in emergencies.</td>
</tr>
<tr>
<td>• Measured as weight-for-height &lt; -2 z-scores below the international reference.</td>
</tr>
<tr>
<td>• Implies increased risk of mortality.</td>
</tr>
<tr>
<td>• More visible than chronic malnutrition.</td>
</tr>
</tbody>
</table>

In these surveys, the prevalence of the different forms of child malnutrition are presented using z-scores based on the National Center for Health Statistics (NCHS)/WHO international reference population (called the NCHS reference). In 2006, a new WHO standard, which is a better tool to monitor the rapid and changing rate of growth in early infancy, was introduced. This standard is being adopted worldwide and is considered the preferred form for reporting nutrition data. Differences between the WHO standard and the NCHS reference are substantial, especially during infancy, and vary by age group, growth indicator, specific z-score curve, and the nutritional status of the index population. This paper reports data using the old reference (reflected in the surveys), but also mentions the prevalence using the WHO standard. Malnutrition rates using the NCHS reference should not be compared to those calculated using the new standard.

**Comparison of malnutrition prevalence in Haiti: 1977 NCHS reference vs. 2006 WHO standard**

<table>
<thead>
<tr>
<th></th>
<th>NCHS: 23.8%</th>
<th>WHO: 30.1%</th>
</tr>
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<tbody>
<tr>
<td>Chronic malnutrition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NCHS: 9.1%</td>
<td></td>
<td>WHO: 10.3%</td>
</tr>
<tr>
<td>Underweight</td>
<td>NCHS: 22.2%</td>
<td>WHO: 19.2%</td>
</tr>
</tbody>
</table>

The information on nutrition programs is based on several documents: a UNICEF-produced inventory of nutrition programs (2008) and a World Bank-funded assessment of nutrition programs (2009).\(^\text{16}\) The UNICEF inventory collected information on nutrition programs targeting children under five and pregnant and lactating women. Because the inventory requested information on a voluntary basis, it includes information only on organizations that responded to UNICEF’s query (in total, 15 major organizations).\(^\text{17}\) These organizations provide a variety of services including growth monitoring, food distribution and supplementation, treatment and rehabilitation of children with severe acute malnutrition (SAM), and prenatal and maternal care services. The World Bank-funded nutrition assessment followed up with select programs included in the UNICEF inventory, which focus on pregnant and lactating women and/or children 0–2 years of age; address undernutrition (especially chronic and acute malnutrition and micronutrient deficiencies) and nutrition security more broadly; demonstrate promising approaches with the potential for replication and scale-up; and use evidence-based programming.

The conclusions and recommendations in this paper are derived from the sources described above as well as on the analysis of several case studies illustrating promising approaches to protecting nutrition security (see Annex). The following scientifically proven best-practices and cost-effective interventions\(^\text{18}\) also provide a foundation for the recommendations in this paper:

- Exclusive breastfeeding for six months and continued breastfeeding for at least two years.
- Adequate complementary feeding from 6–24 months.
- Appropriate nutritional care of sick and severely malnourished children.
- Adequate intake of vitamin A for women and children.
- Adequate intake of iron for women and children.
- Adequate intake of iodine by all members of the household.
- Proper management and treatment of diarrhea with oral rehydration solutions and zinc.

**Pre-Earthquake Nutrition Situation**

This section examines nutritional status and micronutrient deficiencies among children and women of childbearing age. While many health indicators for women and children in Haiti have improved since 1995, key nutrition indicators—child stunting, underweight, and wasting as well as maternal underweight—barely improved from 1995 to 2000, and subsequently stagnated or worsened from 2000 to 2005 (see Figure 1).

\(^{16}\) This assessment was conducted by the Manoff Group.

\(^{17}\) The inventory is being revised to include additional nutrition programs, but this information was not available at the time this report was completed.

\(^{18}\) These best practices are based on Lancet series and WHO recommendations.
Haiti’s stunting rate is among the highest in Latin America and its wasting rate is nearly five times that of the rest of the region (see Figure 2).

Figure 1: Trends in nutrition indicators in Haiti for children under five and women 15-49 years

Figure 2: Prevalence of chronic and acute malnutrition in Latin America

Note: Data are from the most recent national surveys (ranging from 2003-2008).
Haiti’s under-five anemia rate is the highest in the region (see Figure 3), and equivalent to that of many extremely poor countries (e.g. Afghanistan, Madagascar, and Zambia).

**Figure 3: Prevalence of anemia among children under five in Latin America**

![Figure 3: Prevalence of anemia among children under five in Latin America](image)

Note: Data from the most recent survey in each country.

**Maternal Nutrition**

Poor maternal nutritional status has adverse effects on pregnancy outcomes, which, in turn, affect child growth and development. Maternal nutritional status is measured using body mass index (BMI), a measure of body weight in kilograms divided by height in meters squared. Low BMI (less than 18.5) indicates underweight status and high BMI (greater than 25 kg/m$^2$) indicates overweight status, which is further categorized as overweight (BMI greater than 25) and obesity (BMI greater than 30). BMI is not an accurate measure of nutritional status during pregnancy, but should be used as a pre-pregnancy baseline to estimate weight gain needed during pregnancy. For example, a woman who has a low pre-pregnancy BMI will need to gain more weight than a woman with a normal or high pre-pregnancy BMI.

The data from Haiti covers all women of childbearing age (15-49 years of age), not just pregnant women and mothers. From 1995 to 2000, underweight rates among women of childbearing age fell from 18.4 to 11.5 percent, and subsequently rose to 15.5 percent in 2005, with the highest rate in the Artibonite department (nearly one in four women, see Figure 4).$^{19}$

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$^{19}$ DHS 2005.
Poor maternal nutrition (as well as anemia, diarrhea, and some diseases) contributes to low-birthweight children, who are born weighing less than 2500 grams. In Haiti, 25 percent of children are born with low birthweight, a rate among the highest in the world.\textsuperscript{20} Only several countries, among them Sudan, India, Pakistan, Yemen, Mauritania, and Niger, have higher rates of low birthweight.\textsuperscript{21} Low birthweight children start life at a disadvantage. They are at increased risk of mortality, developmental problems, and childhood morbidities such as cerebral palsy and hearing and visual impairments, and they rarely catch up in growth.\textsuperscript{22} It is also well documented that children born with low birthweight, due to maternal undernutrition, or who are nutritionally stunted in the first two years of life, face a higher risk of developing obesity (essentially being “programmed” to conserve fat and thus oxidizing fat poorly) and are more likely to suffer from chronic non-communicable diseases in adulthood.\textsuperscript{23}

Data on overweight and obesity for women of reproductive age in Haiti show fairly constant rates from 2000 to 2005 (25.5 and 21.2 percent, respectively).\textsuperscript{24} In 2005, up to 30 percent of women in metropolitan areas were overweight and rates of nearly 15 percent were present in at least four departments (see Figure 5).\textsuperscript{25} There is no data on overweight and obesity from the 2009 survey.

\textsuperscript{20} UNICEF website, data from DHS 2003-2008.
\textsuperscript{21} UNICEF 2009.
\textsuperscript{22} World Bank 2006; Institute of Health Economics 2008.
\textsuperscript{23} Forsdal 1977; Barker 1992 and 1994; Branca and Ferrari 2002.
\textsuperscript{24} DHS 2000 and 2005.
\textsuperscript{25} DHS 2005.
The prevalence of overweight and obesity in Haiti is low compared to the rest of Latin America (see Figure 6); however, given the correlation between maternal overweight and child overweight, Haiti’s rates are still cause for concern.\textsuperscript{26}

\textsuperscript{26} World Bank 2006
Child Nutrition

Chronic malnutrition
Chronic malnutrition, or stunting, (measured as height-for-age less than 2 z-scores below the international reference) reflects a long-term failure to grow, and is associated with reduced physiological capacity and work output, reduced physical growth, and poor educational achievement, all of which have negative consequences for a child’s future.\(^{27}\) This damage occurs predominantly before 22 months of age, after which recovery is minimal (see Figure 7).\(^{28}\)

Figure 7: Timing of onset of chronic malnutrition among children under five in Haiti

![Graph showing timing of onset of chronic malnutrition among children under five in Haiti](source: PAHO 2008)

From 1995 to 2000, the national stunting rate for children under five fell dramatically from 31.9 to 22.7 percent, after which it rose slightly to 23.8 percent in 2005.\(^{29}\) According to the 2009 national nutrition survey, stunting prevalence ranged from 18 percent in Port-au-Prince to approximately 32 percent in the Center and Grand-Anse departments (see Figure 8) among children under five.\(^{30}\)

Using the 2006 WHO growth standards, chronic malnutrition is estimated at 30.1 percent.\(^{31}\) The widespread stunting in Haiti ranks among the worst in the region, following only a few cases, such as Guatemala, and compares to African countries with similar income levels (see Figure 9).\(^{32}\) Furthermore, the prevalence in all departments surpasses the international threshold of 20-29 percent, which indicates a problem of public health significance.\(^{33}\)

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\(^{28}\) DHS 2005.


\(^{30}\) MSPP et al. 2009.

\(^{31}\) PAHO 2008.

\(^{32}\) Guatemala is a unique case in the region with stunting rates reaching more than 70 percent in remote, indigenous communities.

Figure 8: Prevalence of chronic malnutrition among children 6-59 months (2009)

Note: Population density highest to lowest (left to right), moderate chronic malnutrition refers to height-for-age z-score ≤ -2, and severe chronic malnutrition refers to height-for-age z-score ≤ -3.

Figure 9: Country comparison of chronic malnutrition rates (children under 5)


Looking at the absolute number of stunted children along with the prevalence shows a slightly different picture. As evidenced in Figure 10, a few departments demonstrate a strong correlation between prevalence and absolute numbers: they have both high prevalence of stunted children and high absolute numbers of stunted children under five (Artibonite, West, and, to a lesser
extent, North). The three departments with the highest absolute numbers of stunted children (Port au Prince, Artibonite, and West) are also the departments with the largest concentration of children under five. A number of departments, however, with high prevalence of stunting have moderate numbers of stunted children, which indicates an increased severity of the problem. Therefore, the departments of Grand Anse and the Northeast, for example, have a serious stunting problem, as they have the smallest numbers of stunted children and the highest prevalence of stunting. Assessing both prevalence and absolute numbers provides information that can inform targeting and resource allocation.

Figure 10: Prevalence and number of chronically malnourished children 6-59 mos (2009)

![Chart showing prevalence and number of chronically malnourished children 6-59 mos (2009)](chart.png)

Note: Population density highest to lowest (left to right).

Acute malnutrition
Acute malnutrition, or wasting, (measured as weight-for-height less than 2 z-scores below the international reference), is a measure of short-term malnutrition and health problems and has been a major concern in Haiti in the past due to its strong correlation with increased mortality. Although the national prevalence of wasting in Haiti fell from 1995 to 2000 (from 7.8 to 4.5 percent), it then doubled to 9.1 percent in 2005, an increase that can be traced to the heightened political unrest and tropical storms during that time period. Using the 2006 WHO growth standards applied to the 2005 data, acute malnutrition is estimated at 10.3 percent. As with stunting, there is significant variation in prevalence by department, which can be explained by differences in availability and access to food, environment and access to health services, and caring practices. According to 2009 data, wasting prevalence ranged from 2.8 to 6.2 percent. In all but two departments the prevalence falls below the international threshold of 5 percent, signifying a public health problem (see Figure 11).

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35 PAHO 2008.
Severe acute malnutrition (measured as weight-for-height less than 3 standard deviations below the international reference) is a problem associated with an even greater risk of mortality. A child with severe acute malnutrition has a risk of death that is nine times higher than a child with mild acute malnutrition (weight-for-height less than one standard deviation below the mean). In Haiti, SAM fell from 1.5 percent in 1995 to 0.6 percent in 2000, but then increased fourfold in the next five years, reaching 2.2 percent in 2005, again attributable to political unrest and tropical storms during this time period. In 2009, department-level prevalence was below 2 percent in all but two departments (see Figure 11). Cases of severe acute malnutrition were found predominately in the most remote areas (more than four hours’ walk to the nearest health post) characterized by poor agricultural production due to mountainous terrain and suboptimal hygienic conditions, or on the outskirts of larger cities that lack access to health services. Rates of moderate and severe acute malnutrition in all of the departments in Haiti are well below both the emergency threshold of 15 percent and the severity threshold of 10 percent, as defined by WHO.

Figure 11: Prevalence of acute malnutrition among children 6-59 mos (2009)

Note: NCHS reference. Population density highest to lowest (left to right). North and South departments were estimated to have no severe wasting.

These data likely mask some intra-departmental pockets of undernutrition. Also, given Haiti’s vulnerability to hurricanes and natural disasters, geographic and seasonal factors may increase the risk for severe acute malnutrition in some areas at certain times of the year.

The distribution of the absolute number of children affected by acute malnutrition mirrors the distribution of stunting. More children are affected in the most populated departments of the country (see Figure 12) and there is imperfect correlation between prevalence and absolute numbers.

37 Black et al. 2008.
40 Bausson 2007.
However, the pattern for severe acute malnutrition (SAM) is different. As Figure 13 shows, the numbers of children affected by SAM in the Center, Northwest, and, to a lesser degree, Grand-Anse departments far outnumber those in the other departments. More than 50 percent of cases are found in these areas, despite the fact that less than 17 percent of children under five live in these departments. There is no clear explanation of why these pockets exist; however the Northwest and Grand-Anse departments are both remote departments with little access to services.
Underweight
Underweight (measured as weight-for-age more than 2 standard deviations below the mean) is a composite measure that captures both stunting and wasting. It is the most commonly used nutrition indicator due to the ease of collecting weight and age data (compared to height). However, the interpretation of underweight is difficult because it conflates stunting and wasting. For that reason, this paper focuses on stunting and wasting, rather than underweight.

According to the 2005 DHS, 22.2 percent of children in Haiti were underweight, with the 18-23 month age group most affected. Rates were higher in rural areas (25.5 percent) compared to urban areas (15.4 percent).\(^{41}\) Using the 2006 WHO growth standards applied to the 2005 data, underweight prevalence is 19.2 percent.\(^{42}\) Haiti is not on track to meet the first Millennium Development Goal (MDG) of halving the 1990 rate of child underweight by 2015 (see Figure 14).

Figure 14: Underweight among children 0-5 and the MDG 1 target

![Graph showing underweight prevalence over time](image)


Overall, as noted in Figure 15, undernutrition rates for boys and girls are quite similar. Unfortunately, we do not have sufficient information to determine whether the difference in rates of chronic malnutrition between boys and girls is statistically significant.

\(^{41}\) DHS 2005.
\(^{42}\) PAHO 2008.
Overweight
The most recent data available on childhood overweight and obesity rates in Haiti shows that 16.1 percent of children fall above the 3 standard deviation cut-off that defines excess weight. Although the 2009 data did not include obesity rates, it is clear that the nutritional challenges in Haiti not only lie in the prevention and management of undernutrition (chronic and acute malnutrition), but also in the response to child overweight. Indeed, many countries in the developing world, including Latin America, are undergoing a nutrition transition, in which the problem of child overweight is growing at an alarming rate. Furthermore, underweight and overweight often co-exist in the same country, and even in the same household, creating a “double burden” of malnutrition. Overweight and related non-communicable diseases, such as heart disease, hypertension, and diabetes, account for about 46 percent of the global burden of disease and about 60 percent of total global deaths.

Micronutrient Deficiencies
Deficiencies in key vitamins and minerals—particularly iron, iodine, and vitamin A—are associated with adverse health outcomes including heightened disease prevalence and severity, poor cognitive function, and increased risk of mortality. Micronutrients contribute to immune function, brain and nervous system development, skeletal development and growth, as well as psychomotor development and cognition. Individuals can be vulnerable to micronutrient deficiencies throughout the life cycle, but consequences are greatest for pregnant and lactating women and young children.

In Haiti, data on micronutrient deficiencies are limited. While there are some surveys with information on micronutrient status, much of the information is based on coverage rates (e.g. vitamin A supplementation and consumption of iodized salt), and food consumption data (e.g. percentage of households consuming nutrient-rich foods), rather than micronutrient status per se. Still, this information can help to paint a picture of micronutrient deficiencies in Haiti.


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43 PAHO 2008.
44 World Bank 2006.
Iron
Adequate iron levels are essential to maintain good health at all ages. Iron deficiency interferes with normal brain development and learning among children. Among pregnant women, iron deficiency is associated with increased risks in childbirth, causing more than 20 percent of maternal deaths.45

Data on anemia provides the best information on iron-deficiency. Most of the anemia in Haiti is caused by iron deficiency, although in areas with high levels of parasite infection46 and malaria anemia can also be affected by these conditions.47 There is no data on anemia from 1995 or 2009, but data from 2000 to 2005 show that the national prevalence of anemia among children 6-59 months fell only slightly from 65.3 percent to a still unacceptably high 60.6 percent. In 2005, rates of anemia reached or surpassed 60 percent in 8 of the 10 departments (see Figure 16).

Figure 16: Anemia prevalence among children 6-59 months (2005)

Note: Population density highest to lowest (left to right). Anemia defined as hemoglobin <11g/dl.

Anemia rates are highly variable depending on the age of the child, household income level, mother’s education, and residence (urban/rural). The prevalence was highest for children between 6 and 23 months of age, ranging from 73.7 to 77.2 percent depending on the age group (highest among children 12-17 months) and for children living in urban (66.9 percent) rather than rural (57.5 percent) areas.48 This regional distribution suggests the importance of addressing anemia in urban populations.

Haiti has the highest rates of anemia among children under five in the region, with a national average nearly twenty percentage points higher than the regional average of 46 percent.49 The thresholds for the classification of anemia as a problem of public health significance are: 5.0-19.9

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46 PAHO 2007. WHO estimates that approximately one third of school-aged children are infected with soil-transmitted helminths and that most school-aged children live in areas where the prevalence is at 20 percent or greater (based on a national survey).
47 DHS 2005.
48 DHS 2005.
49 Caulfield et al.2006.
percent representing a mild public health problem, 20.0-39.9 percent representing a moderate public health problem, and 40 percent or higher representing a severe public health problem. The anemia rate in Haiti is, therefore, a severe public health problem. Other countries in the region have anemia rates of severe public health significance (e.g. Brazil, Bolivia, Peru, Guyana, and Jamaica), yet Haiti is the only country among those with a rate higher than 60 percent.

Anemia rates for women 15-49 years of age are also problematic in Haiti. Anemia prevalence fell from 55.1 percent in 2000 to 45.8 percent 2005, but remained consistently high across departments (no data was available in 1995 or 2009). In 2005, fifty percent of pregnant women and 47 percent of breastfeeding women suffered from moderate anemia, which translates into deleterious impacts on young children, including reduced fetal iron stores that may last well into the first year of life. This phenomenon is particularly strong in Haiti, where almost three quarters (72 percent) of children with anemic mothers suffer from anemia themselves.

Mirroring the pattern in child anemia rates, the prevalence of maternal anemia was higher in urban areas compared to rural areas (50.9 and 41.2 percent, respectively), even though more mothers in urban areas (33.8 percent urban versus 22.6 percent rural) consumed the recommended 90 or more iron supplements. Food consumption patterns also illustrate that despite the higher percentage of women that consume animal-based foods on a regular basis (61.3 percent in urban areas versus 42 percent in rural areas) anemia is still higher in urban areas. The higher prevalence of anemia in urban areas could be explained by a number of factors, including: a higher consumption of nutritionally inadequate foods (typically processed foods such as hot dogs, Coca-Cola, and deep fried street foods) that are not only poor sources of iron, but also may inhibit iron absorption (e.g. because they contain compounds like phytates and tannins, which are iron inhibitors); a lower consumption of foods that facilitate iron absorption (e.g. foods containing vitamin C); or non-diet-related causes of anemia.

Vitamin A
Vitamin A plays a crucial role in visual and immunological systems, so a deficiency in vitamin A makes children more susceptible to morbidity and mortality. Severe deficiency can result in irreversible eye problems including blindness. In 2005, sub-clinical vitamin A deficiency was estimated to affect almost one third (32 percent) of children 6-59 months, or about 378,000 children in Haiti. This figure is significantly higher than the threshold of 20 percent generally used to signify a severe public health problem. It is estimated that 3,200 child deaths in Haiti are precipitated annually as a result of vitamin A deficiency.

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50 De Benoist et al. 2008.
51 WFP 2007.
52 Allen 2000.
53 DHS 2005.
54 DHS 2005. Anemia defined as hemoglobin <11g/dl.
55 DHS 2005. Data refers to consumption in 24 hours prior to survey.
56 Calculation uses 2005 population estimates.
57 World Bank 2006.
Poor vitamin A status is a result of limited consumption of vitamin A-rich foods (animal source foods and a variety of fruits and vegetables) and poor supplementation coverage. Vitamin A supplementation for children 6-59 months every six months is one of the international best practices in nutrition interventions and the primary intervention to tackle vitamin A deficiency in Haiti. The coverage of vitamin A capsule distribution among children under five decreased from 37.2 percent in 1995 to 31.6 percent in 2000, and again to 28.7 percent in 2005. In 2005, coverage ranged from about 15 to 45 percent across the departments, with the highest coverage in Artibonite. According to the 2009 nutrition survey, only two departments came close to reaching the target vitamin A coverage rate of 80 percent that is needed to obtain the mortality-reducing effect of vitamin A supplementation. Coverage in the other departments ranged from about 40 to 65 percent (see Figure 17).

Figure 17: Vitamin A coverage for children 6-59 mos by department (2009)

Note: Population density highest to lowest (left to right). No information is available on Port-au-Prince.

Iodine
Iodine deficiency disorders can cause irreversible mental retardation (cretinism), goiter, reproductive failure such as spontaneous abortions, and increased child mortality. Even slight iodine deficiency, which does not manifest itself as visibly as goiter, affects individuals’ mental development and productivity. Consuming foods that are grown in iodine-rich soil contributes to adequate iodine intake, but in most countries sufficient intake must be ensured via consumption of adequately iodized salt.

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59 DHS 1995, 2000, 2005. Note: the 1995 DHS measured vitamin A distribution over the previous 12 months, whereas the 2000 and 2005 DHS measured distribution over the previous 6 months.
60 MSPP et al. 2009; World Bank 2006. In numerous countries 80% coverage of vitamin A supplementation has had mortality-reducing effects and it is a widely accepted target rate.
61 Given the deteriorating soil content in Haiti due to deforestation, it is likely that most Haitian soil is depleted of natural iodine.
According to the 2000 and 2005 DHS (no data was available in 1995) the percentage of households consuming adequately iodized salt in Haiti plummeted from 11.9 in 2000 to 3.1 percent in 2005,\textsuperscript{62} levels that are far from the ideal salt iodization coverage rate of 90 percent defined by UNICEF.\textsuperscript{63} The increased consumption of iodized salt recorded in the 2000 DHS survey can be traced back to the multi-partner support and commercialization of a national iodized salt supply based in Gonaïves (Flamenco Salt). Just a few years later, however, the program was halted due to lack of funding and rises in salt prices, at which point consumption levels of iodized salt went back down to rates of 3 percent in 2005. The rates from both 2000 and 2005 are dramatically lower than the regional average consumption rate of 89 percent, and are lower than most countries in the region, including Guatemala (67 percent), Bolivia (90 percent), Colombia (92 percent), Honduras (80 percent), and Peru (91 percent).\textsuperscript{64}

The Micronutrient Initiative, using data from the \textit{Institut Haitien de l’Enfance} (IHE), reported that in 2005, 58.9 percent of children 6-12 years of age in Haiti, or close to 1 million children, were iodine deficient.\textsuperscript{65} This rate is significantly higher than the regional and global prevalence of 10 and 35 percent, respectively.\textsuperscript{66} In rural areas of Haiti, nearly three-quarters (72.5 percent) of children 6-12 are iodine deficient.\textsuperscript{67} The most current estimate on goiter incidence, cited in the National Nutrition Policy 2001, is 13.3 percent of women affected by goiter.\textsuperscript{68} At present, no national data exists on these conditions nor is there a mapping of endemic iodine-deficient regions within Haiti.

\textit{Infant and Young Child Feeding Practices}

Appropriate feeding and caring practices for young children during the first two years of life have been demonstrated to be the most important determinants of proper child growth and development during this period.\textsuperscript{69} Breast milk is considered to be the most nutritionally adequate and sustainable method of feeding an infant during the first six months of life, giving the child all of the nutrients and calories needed for proper growth and development. Partial breastfeeding practices (including the provision of other liquids and juices) alter children’s normal intestinal environment and expose them to pathogens, increasing their risk of infection and morbidity, particularly related to diarrhea. Furthermore, partial breastfeeding can interrupt the mother’s regular milk production, compromising her ability to meet the child’s nutritional and caloric needs, and forcing her to supplement with nutritionally inadequate and unsafe liquids and/or foods. Therefore, international best practices support exclusive breastfeeding that is initiated immediately after birth and continues for six months, at which point it is combined with adequate and nutritious complementary foods until at least 24 months.

\textsuperscript{62} DHS 2005. 
\textsuperscript{63} UNICEF 2009. 
\textsuperscript{64} UNICEF 2008. 
\textsuperscript{65} Iodine deficiency was defined as urinary iodine less than 100μg/L. Calculations based on 2005 population. 
\textsuperscript{66} West 2006. 
\textsuperscript{67} MSPP et al. 2005. 
\textsuperscript{68} MSPP 2001. 
\textsuperscript{69} World Bank 2006.
Haiti has exhibited poor breastfeeding indicators for the past 25 years. Early initiation of breastfeeding (the percentage of infants that are breastfed within one hour of birth) rose slightly from 35.7 in 1995 to 46.7 percent in 2000, but then fell slightly to 44.3 percent in 2005. In all departments, 93 percent or more of children under five received some breast milk regardless of maternal education level, institutional delivery, or poverty level. However, the national average exclusive breastfeeding rate remained at around 40 percent in 2000 and 2005. In 2005, 13.4 percent of Haitian children received other liquids or fruit juice before two months of age and 25 percent of children began receiving complementary foods between 2 and 3 months of age.

In 2009, exclusive breastfeeding rates were still low, ranging from just below 30 percent in the West department to nearly 70 percent in the Center department. There is no information available to explain this variation, but it may be due in part to the success of individual nutrition programs. In the other departments generally less than 40 percent of mothers exclusively breastfed their babies for six months (see Figure 18).

Figure 18: Prevalence of exclusive breastfeeding for 6 months (2009)

![Bar chart showing prevalence of exclusive breastfeeding for 6 months in different departments.]

Note: Population density highest to lowest (left to right).

Although the national average duration of exclusive breastfeeding increased steadily from 0.9 months in 1995 to 1.5 months in 2000 to 3.1 months in 2005, it remained far short of the recommended six months. According to the 2009 survey, in three departments (South, Southeast, and West, including Port-au-Prince), the average duration of exclusive breastfeeding was still less than one month. Among the other departments, the longest duration of exclusive breastfeeding occurred in the Center, North and Grand-Anse departments, but even in these departments exclusive breastfeeding was practiced for three months or less (see Figure 19).

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70 DHS 2005.
72 DHS 2005.
73 MSPP et al. 2009.
75 MSPP et al. 2009.
Data on breastfeeding patterns indicates that poor breastfeeding practices (particularly related to exclusive breastfeeding) result from a range of causes, including a lack of knowledge about proper infant feeding practices, insufficient breastfeeding support, and women’s need to work away from home (especially in urban areas), leaving the child to be fed by a caretaker other than the mother. In Haiti, some common cultural practices also inhibit breastfeeding. For example, families often give newborns traditional beverages other than breast milk during the first six months (such as ‘lok’, a natural laxative made of bitter tealeaves, juice, sugar cane syrup, and oil) to facilitate the first bowel movement.\(^76\)

At six months, when breast milk is no longer sufficient to meet the nutritional needs of the infant, complementary foods are needed to supplement the diet. The transition from exclusive breastfeeding to including family foods in the child’s diet typically occurs between 6 and 18-24 months of age, and is a period of high vulnerability when much of the malnutrition in infants begins. In order to best satisfy the needs of the infant, complementary feeding needs to be timely, adequate, and appropriate. Complementary foods of high nutritional quality should be given at 6 months. Consistency, quality and frequency of consumption are all critical for appropriate complementary feeding. According to the 2005 DHS, 68 percent of children aged 6-24 months were not fed according to the three recommended infant and young child feeding practices, including dietary diversity, adequate feeding frequency, and receiving breastfeeding or milk products.\(^77\)

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\(^{76}\) DHS 2005.

\(^{77}\) DHS 2005: Addendum on Infant and Young Child Feeding (IYCF) Practices.
An analysis of the consumption of highly nutritious complementary foods, namely iron- and vitamin A-rich foods, helps to explain some of the levels of micronutrient deficiencies that were discussed in the previous sections. Animal-source foods provide protein and energy, as well as the most bio-available forms of iron and vitamin A. In Haiti, children’s consumption of animal-based foods is limited: less than 20 percent of breastfed children 6-9 months and less than 50 percent of all children 12-36 months consume animal-source foods daily (see Figure 20). Vitamin A and iron needs are higher for children between 6 and 23 months, a period of significant growth, and for non-breastfed children.

**Figure 20: Consumption of animal-source foods**

![Bar chart showing consumption of animal-source foods](chart.png)

Note: This data refers to consumption during the 24 hours preceding the interview.
*Food consumption data was not available for the age group of 9-11 months for non-breastfed children.

The consumption of a variety of fruits and vegetables is also critical in order to maintain a sufficient intake of key micronutrients. For example, vitamin A can be found in orange-fleshed non-citrus fruits and vegetables such as carrots, pumpkin, orange-fleshed sweet potato, and dark green leaves. Data on consumption of vitamin A-rich foods from 2005 (see Figure 21) indicates that less than half of all children under 35 months, and only a quarter of breastfed children 6-9 months, were consuming vitamin A-rich foods on a daily basis. This consumption pattern is of particular concern for non-breastfed children whose consumption remains relatively constant over the first three years of life, and who have higher nutrient requirements since they do not benefit from the essential micronutrients present in breast milk.
The consumption of oil-based foods is also important because fat is necessary for the absorption of several key micronutrients, including vitamin A. The consumption of oil-based foods among children 6-9 months (just over 60 percent for breastfed children) is problematic and signifies that many children likely suffer from poor vitamin A absorption (see Figure 22).

For children 6 to 24 months, inappropriate feeding practices are often a more important determinant of inadequate nutritional status than the type of food consumed. Research has shown that caregivers require skilled support to adequately feed their infants, highlighting the need for an increased investment in this area in Haiti.

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79 WHO 2010.
Summary

The following is a summary of findings on the pre-earthquake nutrition situation:

- **Chronic malnutrition**, the cumulative effect of long-term deficits in food intake, poor caring practices, and illness, is one of the most significant nutrition problems in Haiti with 30 percent of children under five affected by moderate stunting and 10 percent suffering from severe stunting (using the new WHO standard). This persistent problem has serious repercussions: children who are moderately stunted have 1.6 times greater risk of death than non-stunted children, and in severely stunted children, the relative risk of death is 4.1 times greater. Addressing chronic malnutrition has significant benefits: an increase of one z-score in height is associated with an 8 percent increase in income, suggesting there is significant economic benefit to addressing chronic malnutrition.  

- **Acute malnutrition**, although not present at alarming rates, is a serious concern due its strong association with mortality. Also, given that 50 percent of the cases of stunting 'overlap' with wasting, the experience of wasting is thought to further limit the final stature of a child due to the severity of stalled growth momentum. Severe acute malnutrition appears to be concentrated in a few areas of the country—some of which have been heavily hit by natural disasters and others of which are remote and have poor access to services—rather than being a universal problem. Taking this geographic distribution into account could help to provide a basis for scaling-up targeted efforts to address SAM and allocating resources more efficiently.

- While **overweight and obesity** rates are not of the utmost concern in Haiti, they should be addressed before the problem becomes worse. This could involve attention to pregnant women to prevent low birthweight and counseling and productive activities to improve the quality of food consumed. Also, data is needed to track overweight and obesity trends over time to measure progress.

- **Micronutrient deficiencies** are widespread in Haiti, with serious consequences for health and child development as well as for national productivity. The problem is not limited to rural areas, as anemia prevalence among women and young children is higher in the urban areas. Ensuring regular, high-quality national-level data on micronutrient status (not just coverage of supplementation) will be an important step in developing effective strategies to address micronutrient deficiencies more comprehensively.

- **Infant and young child feeding practices** are quite poor in Haiti, in terms of early initiation, prevalence, and duration of exclusive breastfeeding, and complementary feeding practices. There is an urgent need to employ measures, such as education, breastfeeding support, and promotion of the production and consumption of nutritionally rich complementary foods, to improve these practices.

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80 Black et al. 2008.  
81 Victoria et al. 2008.  
82 Victoria et al. 2008.
Post-Earthquake Nutrition Situation

The impact of the earthquake on nutrition security, although still not yet well documented, will undoubtedly be dramatic. Food insecurity has increased, the health system was badly weakened and precarious health and sanitary conditions put children at higher risk for malnutrition.

A February 2010 food security assessment by the Coordination Nationale de la Sécurité Alimentaire (CNSA) found that 52 percent of households, equivalent to 1.3 million people in the earthquake-affected areas, were food insecure and needed support. Food security status was determined using food consumption indicators, food-related coping strategies, non-sustainable (non-food) coping strategies, food from unsustainable sources, and unsustainable income sources (see Figure 23). Households living full-time in camps were the most affected, and 14 percent of households that were wealthy prior to the earthquake had consumption patterns categorized as ‘poor and limited’ as a result of the earthquake and its consequences.

Figure 23: Food insecure household groups in earthquake-affected areas

Source: CNSA 2010.

In terms of health services, 30 of 49 hospitals were severely damaged or destroyed, significantly reducing the country’s capacity to care for those in need. Unsanitary and precarious conditions continue in temporary camps and could lead to dangerous epidemics. In all areas studied in the post-earthquake nutrition survey, 41 percent or more of children were reported as having had an illness in the two weeks preceding the survey, with symptoms ranging from watery and/or bloody diarrhea to acute respiratory infection and fever.

Of the 3 million people affected by the earthquake, many were at high nutritional risk:
- Roughly 63,000 pregnant women, 7,000 of whom delivered within one month of the earthquake.
- Up to 2 million children.

83 CNSA 2010.
84 CNSA 2010.
85 MSPP et al. 2010.
Immediately after the earthquake, food aid, vitamin A, and measles vaccines were provided in most of the disaster-stricken areas, although quantities of food were deemed inadequate by recipients. Vitamin A distribution reached an estimated 86-96 percent of children 6-59 months (depending on the region), and measles vaccines were given to approximately 56-67 percent of children 9-59 months in affected areas.\textsuperscript{86}

What’s different post-earthquake?  
- Worse sanitary/hygienic conditions.  
- Less accessibility of nutritious food (due to lack of income and poor road conditions).  
- Weaker and less accessible health services.  
- Increasing food insecurity.  
- Slightly higher acute malnutrition.  
- Intensifying micronutrient deficiencies.  
- Worsening chronic malnutrition, which likely remains the major underlying nutrition problem.  
- Even less government capacity to address the crisis.  
- Even more actors working on nutrition security.

In terms of nutritional status, the 2010 nutrition survey looked at households in earthquake-affected areas and in the department of Artibonite, where a large proportion of the affected population migrated. It was estimated that approximately 600,000 people from the Port-au-Prince area migrated to rural areas, including the department of Artibonite, causing rural households to grow from an average of 6 people to 10 or 11 people, resulting in a near doubling in household size. This put strong pressure on basic services, exhausted the food stocks of already chronically food insecure households, and resulted in increased demands for food. Furthermore, this strain on rural areas has limited the ability of these households to purchase seeds and tools needed for the first post-earthquake planting season.\textsuperscript{87}

The massive migration, which upset regular household patterns and behaviors, and the trauma for survivors, may explain the slight increase in malnutrition rates in the Artibonite department since the 2009 survey. Of the 3 areas surveyed, rates of malnutrition for children 6-59 months were highest in the Department of Artibonite, where 5 percent of children suffer from acute malnutrition, and 0.86 percent of them suffer from severe acute malnutrition. This reflects very small increases (0.72 percent for moderate acute malnutrition and of 0.46 percent for severe acute malnutrition) since 2009.

Results from this post-earthquake survey also indicate that, as expected, rates of moderate and severe acute malnutrition were highest among displaced children directly affected by the earthquake. The second highest prevalence of malnutrition is among displaced children in Port-au-Prince, with rates of moderate and severe acute malnutrition at 5 percent and 0.56 percent, respectively (see Figure 24).\textsuperscript{88}

\textsuperscript{86} MSPP et al. 2010.  
\textsuperscript{87} Chan 2010.  
\textsuperscript{88} MSPP et al. 2010.
Despite the observed rises in prevalence of acute malnutrition across earthquake-affected populations and Artibonite, these figures remain far below the emergency threshold of 10 percent. The relative containment of malnutrition is likely attributable to the significant and timely response from the international community in delivering food, water, shelter, and the promotion of sound infant and young child feeding practices. In the coming months and years, it will be crucial to monitor the nutritional status of highly vulnerable populations as living conditions evolve and reconstruction gets under way. The maintenance and promotion of growth for young children is essential in this phase to prevent chronic malnutrition in these children in the coming years.

**Determinants of Nutrition Security in Haiti**

A wide range of factors threaten nutrition security in volatile environments, since nutrition security encompasses not only access to safe, sufficient and nutritionally rich food, but also takes into account the much wider context that includes a safe environment, clean water, and adequate health care. A basic cause of malnutrition is poverty, which is embedded in underlying social, economic, and political conditions. Poverty, in turn, contributes to underlying causes, including household food insecurity, inadequate caring practices, and a lack of health services and unhealthy environment. Immediate causes of malnutrition include inadequate food consumption and the presence of disease during the first few years of life (see Figure 25). The underlying causes can be summarized in three categories: food, health, and care.
This section discusses these causes in more detail, beginning with the basic causes—an overview of the political and socioeconomic context and dynamics of poverty of Haiti—and working up the causal chain to the underlying causes (food, health, and care) and immediate causes (inadequate dietary intake and disease).

**Basic Causes**

An overview of the political and socio-economic context of Haiti sets the stage for a discussion of the basic causes of malnutrition in the country. Since its independence in 1804, Haiti has been plagued by over 30 military coups and a series of violent dictatorships. Today, despite increased efforts to keep the peace in Haiti, the political atmosphere remains fragile. Ongoing political turmoil and unrest following the departure of President Aristide in 2004 triggered security problems, especially in the capital of Port-au-Prince. A UN peacekeeping force (MINUSTAH) arrived in Haiti in 2004 and, with the Haitian National Police, launched direct operations against criminal gangs in the slums of Port-au-Prince. Despite the sharp reduction of kidnapping rates following the MINUSTAH’s arrival, persistent pockets of violence, poverty, and the crisis that followed the January earthquake, keep the political situation fragile and uncertain. This uncertainty, combined with ongoing violence, threatens livelihoods and reinforces poverty.

Haiti is the poorest country in the Western hemisphere, with three-quarters of the population (estimated at 10 million) living in poverty (under US$2 a day), and more than half (56 percent) living in extreme poverty (less than US$1 a day). \(^89\) In 2009 most of the approximately 4.5 million poor people (3.2 million or 66 percent), lived in rural areas while the remaining poor (1.3 million) lived in metropolitan and other urban areas.

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Haiti lags behind all Latin American countries and many Sub-Saharan African countries with its ranking of 149 out of 182 on the Human Development Index (HDI).\textsuperscript{90} Haiti’s rate of extreme poverty is five times the regional average in Latin America (see Figure 26).

Figure 26: Rate of extreme poverty in selected Latin American countries

![Figure 26: Rate of extreme poverty in selected Latin American countries](chart)

Source: Fosu 2010.
Note: Country data range from 2001-2007.

In Haiti, income is among the most unequally distributed in the world, as indicated by a Gini coefficient of 0.66. The incidence, gap, and severity of poverty are higher in urban and metropolitan areas, and among households headed by women: in Port-au-Prince, 26 percent of households with a female main provider are extremely poor, compared to 17 percent of households with a male main provider.\textsuperscript{91} Income sources also vary by poverty level, with the poorest relying on income from self-employment and remittances, both potentially erratic income flows.\textsuperscript{92}

Multidimensional poverty is also far-reaching, with poor social indicators. The under-five mortality rate was estimated at 76 per 1000 live births in 2007, twice the regional average, while the life expectancy of 60.7 years is about 18 years short of the regional average. According to the 2001 Household Living Condition Survey (HLCS),\textsuperscript{93} access to assets such as education and infrastructure is highly unequal and strongly correlated with poverty. Haiti records among the lowest school enrollment rates in the world, with 56 percent pre-school school enrollment, 76 percent primary school enrollment, and 22 percent secondary school enrollment.\textsuperscript{94} It is estimated that 400,000 children in Haiti do not attend school, equivalent to more than a quarter of all children 6-14 in the

\textsuperscript{90} UNDP 2009.
\textsuperscript{91} Sletten and Egset 2004.
\textsuperscript{92} Verner 2008. In 2008, the World Bank reported that up to 46.7 percent of household income for the poorest Haitians comes from self-employment, while 26 percent is from remittances.
\textsuperscript{93} IHSI 2001. This is the most recent national household survey conducted in 2001 by the Haitian Statistical Office (IHSI) which includes modules on income, labor and migration, health, education, production, and household assets.
\textsuperscript{94} Ministry of Education 2007.
poorest income quintile.\textsuperscript{95} Nearly half of all women and 40 percent of men are illiterate. Literacy rates are higher among youth (75 percent) than among people 60 and older (18 percent).\textsuperscript{96}

**Underlying Causes**

**Food**

In Haiti, both food production and consumption are limited. Food availability in Haiti is insufficient due to poor agricultural production. Erosion, frequent natural disasters and other environmental concerns, land ownership issues, and changing import and export markets contribute to low productivity. Haiti’s location makes it particularly vulnerable as it is exposed to various natural phenomena such as hurricanes, floods, earthquakes, landslides and drought. Deforestation has affected 98 percent of Haitian forests, leaving the soil exposed to erosion, particularly during rainy seasons and severe weather conditions. Over the last few years, natural disasters in Haiti have become both more frequent and more severe, which has caused a drastic fall in living conditions for the people in the affected areas and has longer-term impacts on production capacity and on people’s food security.

According to a 2005 study by USAID’s Famine and Early Warning Security System (FEWSNET) in collaboration with Haiti’s food security agency (the *Coordination Nationale de la Sécurité Alimentaire*, or CNSA), there are several reasons why national food production in Haiti does not satisfy demand. Key among these is the lack of arable land and the growing gap between the amount of food needed, which is increasing due to population growth, and the amount of food available, which is decreasing due to environmental degradation. Furthermore, the poor quality of the land allows staple food crops such as rice, corn, and sweet potato to be harvested only twice per year. More than half of Haiti’s food supply is imported. Local production and food aid account for 42 and 6 percent of the overall food supply, respectively.\textsuperscript{97}

The low levels of national agricultural production translate into a large proportion of Haitians depending on purchased foods, which in rural areas may not be affordable or accessible.\textsuperscript{98} Widespread poverty limits purchasing power and insufficient infrastructure—e.g. only 36 percent of farm-to-market roads were paved in 2000—hampers marketing and commercialization of food, which further limits overall access to food. Although agricultural production is higher in rural areas, the national production of staple foods is still insufficient.

The food security situation in Haiti is further exacerbated by cyclical food shortages caused by natural events (e.g. mudslides and floods) and/or changing economic conditions. In 2008, Haiti was hit by soaring world prices for food and fuel, and then battered by four tropical hurricanes.\textsuperscript{99} The storms killed several hundred people and created a humanitarian emergency, with an estimated 850,000 people (almost a tenth of the population) needing assistance. The storms and resulting floods seriously damaged infrastructure, including a section of the new main road north.

\textsuperscript{95} World Bank 2008.  
\textsuperscript{96} Institut Haitien de Statistique et Informatique 2001.  
\textsuperscript{97} USAID FEWS NET 2005.  
\textsuperscript{98} USAID FEWS NET 2005.  
\textsuperscript{99} Fay, Gustav, Hanna, and Ike.
Crops and fields were ruined which contributed to food shortages and added to the problem of inflation and environmental fragility.

In comparison to other countries in the region, Haiti has the lowest average caloric intake per person per day (see Figure 27). In Haiti, because inequality is so high, poor people are likely to have less access to food and therefore consume less than the national average.

Figure 27: Average calories per person per day for selected countries and regions

![Average calories per person per day](chart)


**Health**

Although the Haitian constitution calls for universal access to health care, in 2007 approximately 40 percent of the population lacked access to care, particularly in rural areas of the country.  

Poor access to basic services compromises health conditions, which affects the nutritional status of mothers and children. For example, 40 percent of the population does not have access to an improved water source, and 80 percent does not have access to sanitation facilities. This contributes to high risk of infection.

Skilled attention for women during pregnancy and delivery, which can reduce health risks for mothers and children and affect long-term nutrition status, is insufficient in Haiti. According to the 2005 DHS, only 54 percent of women attend the four recommended prenatal care visits during pregnancy, and of those that do attend, only 65 percent of them receive urinary and blood tests to identify risks (e.g. anemia and hypertension) during pregnancy. Nationally, approximately two thirds (64 percent) of women in Haiti did not receive any postnatal care; of the 46 percent that do, only 30 percent of them receive it within two days after delivery. 

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100 PAHO 2007. Lack of access has two dimensions: lack of physical access, as 13 percent of the population lives more than 15 kilometers away from the nearest health center, and lack of financial access, as cost-recovery policies in place in most institutions require fees for services that are unaffordable to a large proportion of the population (Crane et al. 2010).
101 World Bank 2009b.
102 DHS 2005.
103 DHS 2005.
gave birth in an institutional setting, and in rural areas this number is only 15 percent. Immunization rates for children are also relatively low, with only 41 percent of children between the ages of 12-23 months having received the recommended doses of BCG, measles, DTAP, and polio. As a result of the poor access to healthcare services, Haiti has the highest rates of infant, under-five and maternal mortality in the Western hemisphere, with prevalence rates of 54 per 1000, 72 per 1000, and 670 per 100,000 live births, respectively. Diarrhea, respiratory infections, malaria, tuberculosis and HIV/AIDS, all of which worsen nutritional status, are the leading causes of death among children.

Care
The lack of availability and access to food, appropriate knowledge about nutrition practices (including breastfeeding and other key complementary feeding practices), and mother’s time constraints all contribute to inappropriate caring and feeding practices, especially for young children. Poor families typically eat only one meal per day, a practice that is insufficient for young children and pregnant and lactating women, who need more regular food intake to meet their daily nutritional requirements for healthy development. Because many mothers have to return to work soon after their child is born, and they do not typically express breast milk, babies are often left with an older sibling or grandmother, who is unable to correctly attend to the child’s nutritional and caring needs.

Some cultural practices and beliefs have a negative impact on the nutritional status of infants, young children, and pregnant and lactating women. For example, in Haiti, taboos about bringing babies out in public or in the sun, and common practices of leaving young children in the care of family or neighbors make it difficult for mothers to exclusively breastfeed their infants. Furthermore, some families believe that evening meals are bad for children because they cause indigestion, or that children are capable of eating on the same schedule as the family (i.e. eating few meals per day) by 12 months of age, resulting in inadequate quantities of food for young children.

Immediate Causes
The basic and underlying causes discussed above contribute to the immediate causes of malnutrition: inadequate dietary intake and disease.

Inadequate dietary intake
According to the FAO food security statistics, 58 percent of Haiti’s population is considered undernourished, meaning their dietary energy intake is below that needed for maintaining a healthy and active life. The estimated per capita daily caloric intake in Haiti is 1,840kcal/day.
compared to the recommended 2,000kcal/day. In addition to insufficient daily caloric intake, dietary diversity in Haiti is limited: a typical diet is predominantly made up of starches and oil-based foods, and the consumption of fruits, vegetables, and protein is limited. Consumption of all food groups is higher in urban areas, but the trend is similar. There is low consumption of vitamin A-rich foods and animal-based products in both urban and rural areas.

Food consumption, dietary diversity, and dietary choices can be linked to behavioral factors, including the selection, purchase, and use of available foods at the household level, as well as socio-economic status. Both income and education have been associated with food consumption patterns. Among women 15-49 years of age, those who are the least educated and poorest are more likely to consume grains and oil-based foods and less likely to consume more nutritious foods, like animal-based and vitamin-A rich foods, compared to wealthier and more educated women (see Figure 28).

Figure 28: Consumption of important food groups in the previous 24-hours (women 15-49 years)

Disease
Insufficient food intake, a poor environment, and the lack of a functional and coordinated healthcare system in Haiti contribute to the spread of infectious diseases that aggravate the nutritional status of the population, particularly of women and young children. According to the 2005 DHS, among children under five, 9 percent experienced an acute respiratory infection, 28 percent had a fever, and 24 percent had diarrhea in the two weeks preceding the survey. The prevalence of each of these conditions was higher among children 6-36 months of age, when the effects of malnutrition are greatest.

112 FAO 2010.
113 DHS 2005.
114 DHS 2005.
115 DHS 2005.
Summary

The underlying threats to nutrition security pre- and post-earthquake have remained the same: poor food availability, health care, environment, and caring practices. However, conditions are now much worse, putting more women and children at risk of irreversible damage due to malnutrition. Chronic malnutrition and micronutrient deficiencies are still the major underlying problem and will likely worsen under ongoing perilous conditions, including poor health conditions, lack of health services, and food insecurity. Nutrition security among adolescent girls and pregnant and lactating women will cause increased malnutrition in the next generation.

Review of Nutrition Programs and Policies in Haiti

To date there is no comprehensive analysis of nutrition programs and policies in Haiti. To help fill the gap, this report draws on two existing resources from before the earthquake—a 2008 UNICEF inventory of nutrition programs and a 2009 World Bank-funded nutrition assessment, including several case studies—to compile lessons about programs and policies that have been addressing nutrition security in Haiti before the earthquake and generate ideas for how improve nutrition security in the post-earthquake landscape.

Unfortunately, no cost information for nutrition programs in Haiti was available from the 2008 inventory or 2009 assessment. However, this report presents back of the envelope calculations of an estimated cost of scaling up ten proven nutrition interventions to full coverage of the target population in Haiti.

<table>
<thead>
<tr>
<th>Information sources on nutrition programs and policies in Haiti</th>
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<tbody>
<tr>
<td><strong>2008 UNICEF nutrition program inventory</strong></td>
</tr>
<tr>
<td>• Includes information on nutrition programs providing a variety of services (e.g. growth promotion, food distribution, treatment and rehabilitation of children with severe acute malnutrition, prenatal and maternal care) and targeting children under five and pregnant and lactating women.</td>
</tr>
<tr>
<td>• Covers 15 major organizations, but an update is in progress.</td>
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</tbody>
</table>

| **2009 World Bank-funded nutrition assessment (conducted by the Manoff Group)** |
| • Reviewed selected nutrition programs that focus on pregnant and lactating women and/or children 0–2 years of age; address undernutrition (especially chronic and acute malnutrition and micronutrient deficiencies) and nutrition security more broadly; demonstrate promising approaches with the potential for replication and scale-up; and use evidence-based programming. |
| • Information was gathered via site visits, interviews, and a review of program documentation (e.g. program evaluations) and used to generate several case studies (see Annex). |

The following is a summary of findings about nutrition security programs and policies in Haiti before the earthquake.

*Nutrition policy*

- Participatory process to revise National Nutrition Policy in progress

Haiti’s first National Nutrition Policy was developed 2001 by the Nutrition Director of the Ministry of Health (MSPP). While quite comprehensive in its content, the document was not widely disseminated and therefore had limited influence. In 2009, the MSPP, with the support of the World Bank and WHO, began a revision of the policy with the aim of providing an up-to-date portrait of the nutrition situation in the country and updating the country priorities for nutrition. The policy revision process was interrupted by the 2010 earthquake, but resumed in late 2010. The revised policy emphasizes the problem of chronic malnutrition and micronutrient deficiencies (especially iron, vitamin A, iodine), the importance of a preventive approach that focuses on children 6-24 month (while continuing to treat those already malnourished), and the need for multisectoral coordination to achieve improved nutrition outcomes. It also takes into account new evidence on “best practices” in nutrition interventions, the importance of nutrition in emergencies, and increased nutrition visibility at the international level.

The goal is to follow the policy revision with a participatory process to develop a national strategic plan for nutrition, which will provide a framework for how to move toward achieving the goals outlined in the policy over about five years. This five-year plan will ideally include recommended interventions, expected costs, and responsible parties. Some of the key areas to be addressed in the strategic plan are: prevention of chronic malnutrition, promotion of good maternal nutrition, anemia control (addressing the range of causes: iron deficiency, infection, and parasites), food fortification (especially salt iodization), and multisectoral coordination.116

- Protocols increasingly in place to guide nutrition actions, but more needed

Haiti has several national protocols, which define acceptable approaches to address specific nutrition problems. All have been developed by the Nutrition Department of the Ministry of Health with the support of program partners that have worked to ensure that the protocols reflect best practices and have appropriate adaptations for the Haitian context. For example, in 2009, a national protocol for the management of acute malnutrition was developed by the MSPP with support from WHO, and in collaboration with the Nutrition Technical Committee, which is comprised of representatives of NGOs working on nutrition in Haiti. After a comprehensive training for nurses, physicians, and pharmacists, the protocol is being implemented across the country. National norms for HIV and nutrition were produced by the MSPP in 2006 and national norms for safe feeding of HIV-exposed infants and young children were finalized in 2009.

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116 Based on activities under World Bank’s Haiti Nutrition and Safety Nets Non-Lending Technical Assistance (NLTA).
Ratification on the International Code of Marketing of Breastmilk Substitutes was partly completed at the end of 2009, and there are currently five hospitals that have passed the certification requirements outlined by the Baby Friendly Hospital Initiative BFHI evaluation; two more are currently undergoing the certification process.\(^{117}\)

Nutrition protocols focusing on vitamin A, iodine, iron, and zinc are outdated or incomplete and need to be revised and/or produced to effectively address all children suffering from mild or severe micronutrient deficiencies.\(^{118}\)

**Program Coverage and Adequacy**

- **No comprehensive approach to nutrition security programming**

Although a growing number of programs focus on child nutrition in Haiti, there is no structure in place to address nutrition security comprehensively. The approach is patchwork, with small, mostly donor- and NGO-run programs operating in distinct geographical areas. It is estimated that over 3,000 NGOs were working in Haiti before the earthquake and up to 10,000 post-earthquake. Many of these organizations work in nutrition, especially those that came to Haiti in response to the 2008 hurricanes, 2008-2009 food crisis, and 2010 earthquake. However, the total number of active organizations is unknown as many of them are not registered with the government. Unfortunately, there is insufficient data available on program coverage. The UNICEF inventory gathered some information, but reporting was inconsistent (with some NGOs reporting numbers of families or individuals and others reporting regional coverage). Therefore information on the percentage of vulnerable groups covered by nutrition security interventions is unavailable.

**Program Focus**

- **Moving from treatment to prevention**

Overall, there is an emphasis on the treatment of malnutrition, and particularly acute malnutrition. According to the UNICEF inventory, many of the nutrition programs in Haiti concentrate on identifying and treating SAM. This focus may be due to the visibility and immediate life-threatening nature of severe acute malnutrition and the established human resource capacity and protocols to respond to it. However, the *number* of children who suffer from severe acute malnutrition is a small fraction of the number suffering from other forms of malnutrition. There are 6 times more children with moderate acute malnutrition and 37 times more children with from chronic malnutrition.\(^ {119}\) And, while the risk of death for a child with severe malnutrition is higher than for a child with moderate or mild acute malnutrition, a greater number of children die from mild and moderate malnutrition, or related causes, compared to severe malnutrition.\(^ {120}\)

Therefore, the prevention of chronic (and acute) malnutrition should be emphasized in Haiti.

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\(^{117}\) UNICEF 2002. USAID’s Infant and Young Child Nutrition (IYCN) program and the Center for Breastfeeding Promotion (CEPAM) are taking the lead on this initiative.

\(^{118}\) Manoff Group 2009.

\(^{119}\) Calculations using data from MSPP et al. 2009.

\(^{120}\) Pelletier et al, 1995; Reddy et al. 1986.
Indeed, focusing on preventing malnutrition by targeting efforts during the “window of opportunity” from conception to age two has been shown—internationally as well as in Haiti—not only to reduce the overall risk of mortality linked to malnutrition, but also to be among the most cost-effective nutrition interventions. It appears that programs in Haiti are increasingly moving toward prevention, with many US-funded programs targeting all children under two, not just children who are already malnourished.121 (See World Vision and Haitian Health Foundation case studies in the Annex.)

- Opportunity to build capacity to address nutrition security in emergencies

Emergency nutrition is an area of critical importance in Haiti. Many programs provide emergency nutrition services when disaster strikes and several have demonstrated track records. For example, Terre des Hommes is strong in emergency response, with capacity to detect and treat acute malnutrition through mobile clinic units, which bring care to children living in rural and hard-to-reach areas, and refer severe cases to temporary local stabilization centers. After the earthquake, the nutrition cluster, made up of various government officials, private, public, and non-governmental agencies and organizations, effectively coordinated information sharing, program mapping, and the promotion of existing policies and protocols, as well as best practices in infant and young child feeding in emergency contexts.122 Still, there is now an opportunity to build capacity in emergency nutrition response more broadly and institutionalize this within a strong policy framework.

Program Functioning

- Difficulties reaching beneficiaries

Reaching beneficiaries is challenging as poor families in Haiti are often dispersed and even those households with access to services may not choose to or be able to take advantage of such resources (e.g. due to lack of information or resources for transportation, etc.). Many programs, (including World Vision and Partners in Health) that operate in rural areas where services are inaccessible provide services at “rally posts.” These are regular informal community gatherings, usually held at a specified community location (either a physical structure or a spacious shaded area), where community health workers provide basic health services to mothers and their children. These services may include but are not limited to child growth monitoring, immunizations, distribution of contraceptives, and general health education.

While using rally posts has a low cost per beneficiary and brings people together for community learning experiences (with the potential for positive peer pressure effects in behavioral change), long distances and travel time for mothers, coupled with inconsistent follow-up at the household level jeopardize reliable contact with beneficiaries.

121 Menon et al. 2007. A recent evaluation comparing a preventive versus a recuperative approach found that the preventive approach had greater impacts on stunting, underweight, and wasting than the recuperative approach.

122 More specifically, the cluster contributed to the following: a geographical mapping of all nutrition partners and services, blanket supplementary feeding for at-risk populations, a baby tents program for affected populations, a joint statement on appropriate infant feeding practices, and government policies and protocols relating to the prevention and treatment of malnutrition.
The coverage of community health workers and the extent to which rally posts currently provide successful outreach across the country are undocumented; however, reports by some NGOs suggest that participation in rally posts is far below 100 percent, indicating that many families are likely not receiving services.\(^{123}\)

Given the problem of access, home visits can be an important tool for reaching Haiti’s vulnerable groups. Terre des Hommes runs a systematic home visit program for children with growth faltering. A community worker (who is given food, but no salary) provides targeted health and nutrition education and behavior change counseling to the family for six months using an established protocol. Even without providing supplementary food to the households, recovery rates have been notable. The recovery process for these children generally takes between 6 to 9 months of home visits and counseling, and recuperation rates throughout the year range from 79 to 92 percent, versus mortality rates of approximately 5-15 percent.\(^{124}\)

The challenge of isolated populations having little access to health facilities makes Haiti a good candidate for the Community-based Management of Acute Malnutrition (CMAM) approach, which treats children with SAM that have no medical complications through outpatient care using Ready-to-Use Therapeutic Food (RUTF). RUTF is a high-energy fortified, ready-to-eat food (usually a peanut-based paste) designed to provide all the key nutrients suitable for the treatment of children with severe acute malnutrition. This approach is increasingly being adopted (e.g. by World Vision, Save the Children, etc.) in Haiti.\(^{125}\)

- **Challenges tracking beneficiaries**

In the UNICEF inventory, few programs provided information on specific numbers of beneficiaries and it seems that few have information systems that allow them to track beneficiaries through key program processes (e.g. registration, service delivery, and follow-up). One example of a successful system is from the Haitian Health Foundation, whose computerized system of family registration allows for household, family and individual health and social information to be maintained over time. The information gathered in the registry—on vaccination status, prenatal care, and family planning—ensures the proper identification of need as well as adequate and targeted service provision.\(^{126}\)

- **Different strategies for behavioral change**

Because food consumption is only one of several factors contributing to malnutrition and nutrition insecurity, it is important that programs incorporate behavioral change via educational activities and counseling for critical behaviors like breastfeeding and hygiene. Most programs focus on group counseling, such as mothers’ groups and cooking demonstrations. Some group communication strategies have been shown to be quite useful. For example, Haitian Health Foundation’s broad breastfeeding campaign has encouraged the majority of beneficiary women in

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\(^{123}\) Manoff Group 2009.
\(^{124}\) Terre des Hommes 2008.
\(^{125}\) Manoff Group 2009.
\(^{126}\) Lewis and Gebrian 2009.
the intervention area to breastfeed exclusively. Everyone from the drivers to the local community leaders knows about the importance of breastfeeding and where a mother can go if she has breastfeeding problems. Few programs conduct individualized counseling with close follow-up (in part due to the cost and dispersion of households). Exceptions to this include Haitian Health Foundation and Terre des Hommes programs, which place emphasis on communicating individually with families via home visits on a regular basis.  

- Varied approaches to program communication, supervision, and monitoring

Good management is critical for program performance. Although the UNICEF inventory did not capture this dimension of programs, the World Bank-funded assessment identified some effective management elements in the case studies. Several organizations have developed effective communication channels among staff and between staff and communities, such as feedback and supervision meetings, within their programs. For example, Haitian Health Foundation brings staff and volunteers together regularly, and also supports community meetings twice a year. These meetings are an opportunity to review progress, re-evaluate program activities, and involve the community in future planning. Terre des Hommes brings staff and community volunteers together on a regular basis to update record keeping, interpret data together, and decide on next steps for individual cases. This opportunity to review progress together has been reported to have positively affected the outcomes of home visits. World Vision follows a similar approach by bringing staff together on a monthly basis to share lessons learned, plan activities and provide refresher training.

- Multiple training protocols, but lack of standardization

Training materials for nutrition exist in Haiti, but are usually tied to specific NGO interventions, rather than part of a standardized national approach. A set of nutrition training booklets, developed in 1981 by the Director of Nutrition at the MSPP, provide general guidance on a wide range of topics related to nutrition (hygiene, maternal health, community workers, diarrhea, malaria and other diseases), but require updating.  

- Information Availability

- Lack of surveillance of nutritional status

In Haiti, surveillance systems are in place for both health and food security, but not nutritional status. The health surveillance system uses 52 sentinel sites to monitor vaccine-preventable diseases. The food security surveillance system uses 4 observatories (in the Northeast, South, Southeast, and Grand Anse) to measure food security status. This information, however, only

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127 Manoff Group 2009.
128 Manoff Group 2009. The booklets cover the following topics: community health worker responsibilities, community mapping, community mobilization, hygiene and the environment, nutrition, maternal health, home visits, family planning, tuberculosis, malaria, first aid, and diarrhea.
129 PAHO 2010.
130 CNSA website 2010.
captures part of the nutrition security picture. It is essential to include nutrition surveillance through the ongoing monitoring of basic nutrition indicators, such as middle-upper arm circumference (MUAC), in order to track malnutrition patterns and areas that are in immediate need of assistance.

- Limited program data

There is also a general lack of data on nutrition programs and beneficiaries in Haiti. Knowledge about coverage—in terms of the geographical location of nutrition programs, numbers of beneficiaries, and service provision—is incomplete due to a lack of reliable departmental or national data and meager data-collection and monitoring at the program level. Some NGOs collect data on beneficiaries, but have difficulty interpreting the information due to a lack of capacity among staff members.\(^{131}\) Low-cost but potentially effective data-collection methods are being used successfully by a few organizations (e.g. Haitian Health Foundation and Terre des Hommes, see Annex). The organizations that have developed such tools have succeeded in creating their own databases, which allows them to collect information on beneficiaries and analyze and use this information to better serve their communities.

Beyond the simple data on who is doing what in which areas, there is a paucity of rigorous program evaluations to illustrate program impacts. Although international experience and impact evaluations provide useful guidance on best practices and promising interventions, the lack of evaluation results from Haiti make it challenging to modify programs to improve outcomes.\(^{132}\)

- Lack of cost data, but preliminary estimates available

There is a growing body of knowledge about the cost, and cost-effectiveness, of nutrition interventions internationally. The Copenhagen Consensus, a summary of recommendations by distinguished economists, concluded that the returns to nutrition interventions are among the highest compared to many other possible development interventions. Indeed, investments in micronutrients were ranked above malaria control, water and sanitation projects, and trade liberalization.\(^{133}\) However, there are no published estimates specific to Haiti and few programs in the country seem to have cost information for discrete nutrition security activities readily available.

Back of the envelope calculations of the cost of scaling up ten proven nutrition interventions in Haiti by the World Bank represent a first, if somewhat rough, step in determining the order of magnitude of investment needed to prevent malnutrition in Haiti. The estimates were calculated using a methodology outlined in the World Bank publication *Scaling Up Nutrition: What will it cost?* based on pre-established unit costs from other countries that were tailored to Haiti. Because comprehensive and reliable data that quantify the effects of the earthquake on nutrition are not yet available, these cost calculations utilized pre-earthquake data and, therefore, undoubtedly underestimate the overall financing requirements. The preliminary, rough estimate of the cost of

\(^{131}\) Manoff Group 2009.
\(^{132}\) Manoff Group 2009.
\(^{133}\) Horton et al. 2008.
scaling up ten proven nutrition interventions (see Table 1) to full coverage of the target population gives an idea of the lower bound of cost for addressing malnutrition in Haiti. The estimated cost amounts to US$46.5 million per year, not including money already spent, which is considered to be minimal in reaching the goal of full coverage. This is less than the estimated loss of GDP associated with micronutrient deficiencies alone (estimated at $56 million/year)\textsuperscript{134} in Haiti and surely less than the full losses attributable to malnutrition in Haiti.\textsuperscript{135}

Several caveats are critical when considering this estimate. First, this estimate uses a regional conversion factor to determine costs rather than actual costs determined from Haiti. Second, while the estimate focuses on full coverage, this is a tall order in Haiti where many interventions have little to no foundation at present (e.g. infrastructure and delivery systems, human resources to manage program operations, training, etc.). Third, the calculations did not factor in a number of relevant factors such as the increased difficulty of program delivery following the earthquake, the difference in costs due to regional variability within the country, different delivery mechanisms, etc. Fourth, this estimate does not include the costs of broader multisectoral efforts (e.g. in agricultural production, development and marketing of a fortified complementary food, etc.), which could also have an important impact on nutrition security. Finally, the estimate is not a budget for nutrition activities. More detailed comprehensive analyses of costing and feasibility, incorporating costs of investment, recurrent costs, and capacity, all specific to Haiti, are necessary to get a more accurate and usable sense of the needs in Haiti.

Table 1: Ten proven nutrition interventions to scale up in Haiti

<table>
<thead>
<tr>
<th>Intervention</th>
<th>Target Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Community nutrition programs for behavior change, including the promotion of optimal breastfeeding, appropriate complementary feeding, and proper hygiene, specifically hand washing.</td>
<td>All children &lt;5</td>
</tr>
<tr>
<td>2. Vitamin A supplements.</td>
<td>All children 6-59 mo</td>
</tr>
<tr>
<td>3. Therapeutic zinc supplements as part of diarrhea management.</td>
<td>All children 6-59 mo</td>
</tr>
<tr>
<td>4. Micronutrient powders for home fortification of complementary foods.</td>
<td>Children 6-23 mo</td>
</tr>
<tr>
<td>5. Deworming medication.</td>
<td>Pre-school aged children</td>
</tr>
<tr>
<td>6. Iron-folic acid supplementation.</td>
<td>All pregnant and lactating women</td>
</tr>
<tr>
<td>7. Iron fortification of staple foods (wheat flour).</td>
<td>Total population</td>
</tr>
<tr>
<td>8. Salt iodization for the general population and the provision of iodized oil capsules.</td>
<td>Total population (salt iodization); pregnant/lactating women and children 6-59 mo (iodized oil capsules)</td>
</tr>
<tr>
<td>9. Prevention or treatment of moderate malnutrition involving the provision of a small amount of complementary food.</td>
<td>Underweight (or at risk of underweight) children 6-23 mo</td>
</tr>
<tr>
<td>10. Community-based management of severe acute malnutrition (SAM).</td>
<td>Children 6-59 mo with SAM</td>
</tr>
</tbody>
</table>


\textsuperscript{134} World Bank 2010a, using data from Micronutrient Initiative/UNICEF 2004 and World Bank, 2009a.

\textsuperscript{135} Preliminary estimates by World Bank (2010b) based on methodology described in Horton et al. 2010, unpublished.
Coordination across Partners and Sectors

- Weak government and stakeholder coordination

Because of the fragmentation of nutrition activities in Haiti and the presence of parallel structures, stronger linkages between NGOs and government (e.g. in the form of training, partnership in service delivery, etc.) are needed. Several programs have demonstrated efforts in this domain. Partners in Health (PIH) has worked with other non-governmental organizations and the Haitian Ministry of Health to rebuild or refurbish existing clinics and hospitals, facilitate access to essential drugs, establish laboratories, train and pay community health workers, and complement Ministry of Health personnel with PIH-trained staff. Terre des Hommes also coordinates with the MSPP at the local health center level.\(^{136}\)

Also, in the past few years the Haitian government (via the Nutrition Department) has been increasingly coordinating with donors and NGOs working in nutrition. Two coordination mechanisms have been formed: a committee focused on high-level government-donor coordination and a committee focused on NGO coordination. The former, known as the Consultative Nutrition Committee (CCN, for its acronym in French), was formed in 2009 and meets on an ad-hoc basis. It is chaired by the Minister of Health and the Director of Nutrition acts as permanent secretary. The following donor organizations working in nutrition are members of this committee: World Bank, Inter-American Development Bank, WFP, UNICEF, WHO, and USAID.\(^{137}\) The purpose is to develop a strategic vision for nutrition, share information, plan and conduct joint activities (both analytic and operational), and arrange co-financing.

The second coordination mechanism, the Comité Technique de Nutrition (CTN), is comprised of the Director of Nutrition, NGOs, and other partners working in nutrition nationwide. It was formed in 2001 by the Minister of Health and functioned actively until 2004 when President Aristide was forced out. Between 2004 and 2007, the CTN had limited activity due to political unrest, but became active again in 2007. The CTN meets monthly to share information, coordinate efforts, and prepare contingency plans.\(^{138}\)

- Few multisectoral efforts, but some promise linking nutrition and agriculture

Given the multiple determinants of nutrition security, a multisectoral approach is critical. Some organizations have begun to link nutrition programming with agricultural and educational initiatives. Partners in Health’s health program Zanmi Lasante is complemented by Zanmi Agrikol (“Partners in Agriculture” in Creole), which aims to address an underlying cause of malnutrition. Under Zanmi Agrikol, community agricultural workers assess family circumstances and then teach families how to improve their agricultural yield to improve food security.

\(^{136}\) Manoff Group 2009.
\(^{137}\) Additional donors may be added in 2010.
\(^{138}\) Interviews with Dr. Marhone, Director of Nutrition MSPP.
World Vision has a program (called the Program Development Zone) that links nutrition activities with agriculture or income-generating small businesses and agricultural programs, which cover soil protection, tree planting, field planting, livestock, and small business. Although results are not yet available, the linkage itself is promising. It would be useful to test, improve, and eventually institutionalize these approaches, as well as secure the support and coordination of multiple ministries at the central level.¹³⁹

Several programs aim to use locally produced foods, which can create employment for local farmers, while also improving nutrition security among target groups. One commonly used local food in Haiti is called AKA-1000 or Akamil (pronounced “akameel”). It is a high protein cereal-bean mix, consumed in porridge form, which was designed in the 1960s as a nutritional supplement for children under five. AKA-1000 is simple to prepare, inexpensive, and has been well accepted by Haitian families. Because it uses local commodities (beans and rice, beans and corn, or beans and millet), AKA-1000 can be manufactured at the village-level and can create employment opportunities for local farmers.¹⁴⁰

However, AKA-1000 has some disadvantages, including its long cooking time and incomplete nutritional formulation—in terms of essential vitamins and minerals, caloric density, and fatty acids—to meet the needs of infants and young children.¹⁴¹ Some proposed remedies include designing a pre-cooked AKA-1000 that would reduce preparation time and fortifying AKA-1000 with a micronutrient pre-mix; however additional changes in composition are necessary to best meet the needs of young children.¹⁴²

Two organizations in Haiti have begun producing Ready-to-Use Therapeutic Food (RUTF). Meds and Food for Kids (MFK), based in Cap Haitien, produces Medika Mamba and Partners in Health, based in the plateau region of the Center department, produces Nourimanba. Both products are locally-produced alternatives to Plumpy’nut, the form of RUTF most commonly used internationally.¹⁴³ Although local production has great potential for boosting local income generation and reduced dependency on exports, supply does not yet satisfy demand for these products and issues of standardization of recipes and product approval continue to limit the potential of nationwide use and distribution.

¹³⁹ Manoff Group 2009.
¹⁴⁰ Manoff Group 2009.
¹⁴² Manoff Group 2009.
¹⁴³ Plumpy’nut is manufactured by Nutriset, a French company, with several franchises around the world.
Summary

The following key features characterize the response to nutrition insecurity in Haiti before the earthquake:

- There were a growing number of programs addressing child nutrition, but no structure in place to address nutrition security comprehensively. The approach was patchwork, with small, mostly donor- and NGO-run programs operating in distinct areas and little coordination across programs or country-wide efforts.
- While some programs made efforts to coordinate with local or regional governments and/or other program implementers, there was little institutionalized communication across implementers or with government.
- Some programs were experimenting with multisectoral programs (e.g. nutrition and agriculture), but coordination across sectors remained rare and an enormous challenge.
- The health system had serious coverage gaps and was not oriented, nor endowed with the human and material resources, to address nutrition issues.
- The large majority of nutrition programs in Haiti focused on treating malnutrition, and especially severe acute malnutrition. There was, however, little focus on preventing malnutrition, especially chronic malnutrition and micronutrient deficiencies, even though prevention has been proven to be more cost-effective than treatment, both internationally and in Haiti.
- Despite increasing attention to nutrition, investment in improving nutrition security was not sufficient to meet country needs.

This review of nutritional programs, as well as consultations with international actors addressing nutrition security before the earthquake, highlighted the need to collectively shift the focus of programming to address nutrition security more effectively in Haiti. There was consensus on the following recommendations:

- Focus on prevention—and treatment, when needed—of all types of malnutrition, but particularly chronic malnutrition and key micronutrient deficiencies.
- Base interventions on international best practices, such as the “window of opportunity” for intervention (conception to 24 months) and proven interventions not yet systematically adopted in Haiti (e.g. multiple micronutrient powders to reduce anemia, zinc supplements to manage diarrhea, etc.).
- Continue effective and nationwide promotion of healthy nutrition habits, including the promotion of exclusive breastfeeding for 6 months and continued breastfeeding to 24 months, adequate and responsive complementary feeding practices, and the provision of nutritionally rich foods for all nutritionally vulnerable groups.
- Enhance coordination across partners and within government.
- Build capacity and leadership in government to set, promote, and implement nutrition security programs and policies.
- Continue to encourage and support the local production of nutritionally rich foods.
The Way Forward

The immediate response to the 2010 earthquake included food aid, supplementary feeding for children 6-23 months, support for infant and young child feeding (e.g. baby tents, breastfeeding promotion), and treatment of acute malnutrition. This was an excellent starting point and it will be critical to maintain this response as horrific conditions persist. At the same time, there is a critical need to take advantage of the current interest and investment in Haiti to resolve both pre-existing and emerging nutrition security problems with the goal of enhancing the human capital of Haiti’s children.

Soon after the earthquake, a participatory needs assessment led to the development of a vision and set of actions to rebuild the country over the course of 18 months. The Post Disaster Needs Assessment (PDNA) was led by government and conducted in partnership with numerous international organizations in March 2010, and resulted in a National Action Plan for Recovery and Redevelopment of Haiti.

There is a general consensus that in order to protect and promote long-term nutrition security in Haiti, the following priorities and actions are essential:

<table>
<thead>
<tr>
<th>To achieve nutrition security, Haiti should act to:</th>
<th>The first steps to accomplish this include:</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Reduce chronic malnutrition through improved exclusive breastfeeding and complementary feeding practices.</td>
<td>- Promoting behavior change via community education- and household-level outreach.</td>
</tr>
<tr>
<td>- Reduce anemia among pregnant and lactating women and children by providing supplements containing iron and deworming treatments.</td>
<td>- Providing routine micronutrient supplements (iron, iodine, and vitamin A) to pregnant and lactating women and children under two.</td>
</tr>
<tr>
<td>- Reduce iodine deficiency through supplementation and salt iodization.</td>
<td>- Investing in agriculture and agribusiness to increase access to nutrient-rich foods and promote the production of fortified complementary food for children 6-24 months.</td>
</tr>
<tr>
<td>- Reduce vitamin A deficiency through supplementation.</td>
<td>- Investing in basic health services to expand access and quality and include a basic nutrition package, for the most vulnerable.</td>
</tr>
<tr>
<td>- Reduce chronic food insecurity through improved agriculture, investment in agribusinesses, and multisectoral collaboration.</td>
<td>- Supporting government capacity and leadership to set, promote, and implement nutrition security programs and policies.</td>
</tr>
<tr>
<td>- Improve the coverage of basic health and nutrition services by ensuring proper attention to pregnant and lactating women and children under two.</td>
<td></td>
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</tbody>
</table>
Table 2 outlines the short- and long-term actions that are recommended to accomplish each element of this vision.

### Table 2: Actions to achieve nutrition security in Haiti

<table>
<thead>
<tr>
<th>Priority area</th>
<th>Short-term action</th>
<th>Long-term action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reduce chronic malnutrition</td>
<td>• Promote behavior change via community education and household-level outreach.</td>
<td>Invest in the development, production, and marketing of a locally produced fortified complementary food for children 6-24 months.</td>
</tr>
</tbody>
</table>
| Reduce micronutrient deficiencies | • Iron: provide iron-folate supplements to pregnant and lactating women and multiple micronutrient supplements (containing iron) to children 6-24 months.  
  • Iodine: provide iodine capsules to pregnant women and children 6-59 months. 
  • Vitamin A: provide vitamin A supplements to children 6-59 months and post-partum women. | • Support food fortification (vitamin A, iron).  
  • Support salt iodization.  
  Note: fortification efforts must be accompanied by commercialization, distribution, and behavior change communication to promote consumption of fortified foods. |
| Reduce chronic food insecurity    | • Invest in agriculture and agribusiness, including production, improved varieties, and environmental protection (e.g. soil enrichment and prevention of erosion) to increase the availability of nutrient-rich foods at the local level.  
  • Invest in the production of a fortified complementary food for children 6-24 months. |                                                                                  |
| Improve coverage of basic health and nutrition services | • Invest in rebuilding health services to promote access and quality.  
  • Ensure that a basic package of nutrition services is included. |                                                                                  |

It is important that the recommendations listed in Table 2 be coupled with the following broader elements, which involve additional information gathering, the engagement of a wider range of sectors, and strategic collaboration, to ensure comprehensive, sustainable, and long-term progress:

- **An updated understanding of the post-earthquake nutrition security situation.** A nutrition survey was conducted in earthquake-affected regions and in the department of Artibonite, where high migration was expected, during the months of April-June 2010. Additional national-level studies will need to be conducted to gather information on migration patterns, effects of the earthquake on other nutrition indicators (such as stunting and micronutrient deficiencies), region-specific needs, and service availability.

- **Better information systems to track nutrition trends, service provision, and beneficiary needs.** Ideally, a common information system would be adopted across government, NGO, and donor partners to improve information sharing and facilitate appropriate decision-making to improve or scale up programs. Additionally, a government-run NGO registry would help with the coordination and monitoring of actors involved in nutrition security programming.

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145 This age group is the target for Haiti’s Ministry of Health. However, it should be noted that the target population recommended in the 2007 Joint Statement by WHO and UNICEF *Reaching Optimal Iodine in Pregnant and Lactating Women and Young Children* excludes children 24-59 months of age. The Micronutrient Initiative recommends that, in Haiti, iodine supplements are provided to women of childbearing age and infants up to 24 months of age.
• **Consensus among partners about priority actions** for the medium to long run (3-10 years), **clearly defined responsibilities for each actor, and concrete coordination mechanisms.** The revision of the national nutrition policy, which was nearly complete before the earthquake, remains a high priority so that the country can adopt a common framework for nutrition, including protecting nutrition security in emergencies. The validation of the revised policy is also important to set the groundwork for the development of a national nutrition strategy, or implementation plan, which would outline priority activities for a period of about 5 years. This strategy should include clearly defined roles for each actor and outline coordination mechanisms that ensure regular and efficient interaction and communication across institutions and sectors.

• **Enhanced government capacity and leadership to design, promote, implement, and supervise nutrition security programs and policies.** Capacity in nutrition has been a significant and ongoing weakness in Haiti, and this has been exacerbated by the destruction of universities and the loss of government staff due to the earthquake. There is an urgent need to build capacity in nutrition in the Ministry of Health and other ministries. Capacity building should focus not only on increasing technical knowledge of nutrition security, but also on improving capacity in management, data collection and analysis, and coordination efforts for nutrition security programs. With the expansion of medical staff in Haiti, it is also recommended that nutrition be integrated into medical and nursing programs and that nutritional best practices be adopted by health workers and professionals at all levels of the health care system.

• **An estimate of the costs to reach the common vision of protecting nutrition security.** Back of the envelope calculations of the cost of scaling up ten proven nutrition interventions in Haiti by the World Bank represent a first step in determining the order of magnitude of investment needed to prevent malnutrition in Haiti. However, more detailed comprehensive analyses of costing and feasibility are necessary to get a more accurate sense of the needs in Haiti.

• **A commitment to scale-up nutrition security activities** to address the needs of the population. This will involve securing funding to cover medium- to long-term interventions and a strategic plan to coordinate efforts throughout this period.

### Household Development Agent (HDA) Initiative

The World Bank, in collaboration with various partners including the Government of Haiti, UN agencies and NGOs, has begun to design a community-level approach to address nutrition security among vulnerable groups in Haiti. The initiative builds on a tradition of using community workers for health services and applies some of the strengths identified in this review, including a preventive approach, behavior change communication, home visits, and a beneficiary tracking system.

The initiative will train and pay community workers called Household Development Agents (HDAs) to provide a basic package of health and nutrition services to young children and pregnant and lactating women and refer them to available basic services, as needed.

More specifically, the HDA will identify family needs and (i) offer behavior change counseling at the household level, (ii) provide a package of basic health and nutrition services (e.g. micronutrient powders, oral rehydration solutions, vaccines, impregnated bed nets) focused on preventing and reducing malnutrition, and (iii) where possible, refer families to other existing services.
Conclusions

Chronic malnutrition and micronutrient deficiencies resulting from poor nutrition security are widespread, insidious problems in Haiti, causing the erosion of human capital and generating high economic and social costs. Although data on nutrition in Haiti continues to be scarce, this report brings into focus the predominant nutrition security challenges in Haiti, while providing a snapshot of how these problems are being addressed and recommendations for the way forward. The severity of the nutrition security situation in Haiti, especially in the wake of the January 12th earthquake, calls for urgent action to address pre-existing and emerging nutrition security problems.

A key conclusion from this report is that despite the lack of a comprehensive approach to addressing nutrition security in Haiti, there are a number of promising approaches in place. If partners come together with a common set of priority actions that focus on preventing malnutrition during the “window of opportunity” using internationally recognized cost-effective interventions, important impacts could be achieved. It is also important to note that unlike other countries in the region, Haiti faces the challenge of both addressing chronic and acute malnutrition. Therefore, the response may be more complex and require both behavioral change and food-based interventions. The involvement of multiple sectors would be beneficial to address the range of determinants of nutrition security.

Forging a common vision and commitment to protect nutrition security, and securing the necessary investment to meet the nutrition security needs in Haiti will help effectively enhance the human capital of Haiti’s children and build a healthier, stronger, and more productive next generation.

<table>
<thead>
<tr>
<th>Priority Actions to Promote Nutrition Security in Haiti</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Reduce chronic malnutrition.</td>
</tr>
<tr>
<td>2. Reduce micronutrient deficiencies in iron, iodine,</td>
</tr>
<tr>
<td>and vitamin A.</td>
</tr>
<tr>
<td>3. Reduce chronic food insecurity.</td>
</tr>
<tr>
<td>4. Improve the health system and include nutrition</td>
</tr>
<tr>
<td>services.</td>
</tr>
</tbody>
</table>
**Annex: Program Case Studies**

This annex includes five case studies based on field visits during the 2009 World Bank-funded nutrition assessment conducted by the Manoff Group. The assessment team selected these organizations based on consultations with the MSPP and other stakeholders about programs illustrating promising approaches to promote nutrition security in Haiti. The five organizations included in this annex represent only a sample of the many organizations that are active in Haiti and implementing good practices. Table 3 outlines the five programs. A review of each organization is included in the pages that follow.

Table 3: Nutrition programs featured in the case studies

<table>
<thead>
<tr>
<th>Organization</th>
<th>Description of Activities</th>
<th>Location</th>
<th>Scale*</th>
</tr>
</thead>
</table>
| Haitian Health Foundation  | • Integrated community health, including prenatal care, breastfeeding promotion, integrated management of childhood illnesses (IMCI), and growth monitoring and promotion (GMP).  
• Production of AK-1000.  
• Maternity hospital. | Grand-Anse department                      | Large                                         |
| Partners in Health         | • Integrated community health.  
• RUTF production.  
• School feeding.  
• Agriculture.  
• Income generating activities.  
• Community health worker training. | Center department (city of Hinche and 7 small towns) | Large  |
| Terre des Hommes            | • Hospital-based therapeutic feeding center.  
• Outpatient therapeutic feeding program.  
• Mobile clinics.  
• Growth monitoring and promotion activities.  
• Community kitchens.  
• School feeding linked to community gardens. | South department (city of Les Cayes and 4 small towns) | Small  |
| World Vision               | • Integrated nutrition, education, agriculture, small business projects.  
• Community health worker training in health and nutrition.  
• Food distribution and nutrition education for pregnant/lactating women and children <5. | Centre and Artibonite departments, Ile de la Gonâve | Medium |
| Meds and Food for Kids      | • RUTF production.                                                                         | North department (city of Cap Haitian)        | Small  |

*Note: exact coverage figures are not available, so for the purposes of this paper programs were categorized as small: under 10,000 beneficiaries; medium: 10,000–100,000 beneficiaries; or large: over 100,000 beneficiaries.*
Since 1987, the Haitian Health Foundation (HHF) has worked to improve access to health services and ensure positive health and nutrition behavior change for more than 225,000 of the poorest people in over 100 rural mountain villages in the southwestern department of Grand-Anse. HHF uses an integrated community approach, which aims to reach each family, child and pregnant woman with healthcare, education, and development and relief services.

HHF has a strong focus on maternal health and nutrition, by providing services such as prenatal care and culturally appropriate behavior change communication (BCC) including breastfeeding education, promotion, and support. These messages are targeted not only to mothers, but also to grandmothers, fathers, siblings, and teens in the community. Pregnant women are given a “birth plan” to assure that they are prepared for the challenge of childbirth and have the resources they need for the birth (i.e. personal hygiene items, money for hospital services, etc.). Other integrated community service packages for women include neonatal tetanus vaccination during pregnancy, syphilis detection, and community-level maternity hospitals to ensure proper and safe deliveries.

The integrated service package for children under five focuses on health and nutrition activities, including growth promotion and targeted counseling, and treatment of malnutrition using local foods (e.g. AKA-1000 or Akamil, see box). Community workers distribute AKA-1000 flour in all 100 HHF villages and during health rally posts, where it is cooked and fed to children under five. HHF also implements IMCI initiatives such as detection and treatment of pneumonia at the community level.

Community health agents and community groups take responsibility for the provision of ongoing preventive and basic curative care. HHF nurses and medical doctors supervise community health agents, and evaluate their performance on an ongoing basis. Community agents are paid based on their length of service and provide a platform for a wide variety of community engagement seminars, with topics ranging from human and reproductive rights to community development and problem solving. HHF tries to build new health initiatives on the successes of previous activities so that lessons learned are put into practice to ensure effective service provision.

**AKA-1000**

AKA-1000 (pronounced “akameel”) is a high protein nutritional supplement for children under five. It was designed in the 1960s based on scientific studies of cereal-bean mixtures in Haiti by a team including Haiti’s Bureau de Nutrition. The name was selected in reference to an existing gruel drink commonly consumed in Haiti (called AK-100) to show that this version is 100 times better.

AK-1000 is simple to prepare, inexpensive, and has been well accepted by Haitian families. AK-1000 uses local commodities (beans and rice, beans and corn, or beans and millet) and can therefore be manufactured at the village-level. This can create employment for local farmers while also improving the nutritional status of vulnerable children.

The disadvantages of AKA-1000 are its long cooking time, its lack of essential vitamins and minerals, and its incomplete caloric density. To remedy these problems studies have been proposed to fine-tune a pre-cooked AKA-1000 to reduce preparation time and to fortify AKA-1000 with a micronutrient pre-mix. A new factory is beginning to produce a fortified and pre-cooked variety, which takes 20 minutes, rather than 1 hour to cook. It is also important to include essential fatty acids and enhance the caloric density of the mix.

Source: Warren and Berggren 2005; Gebrian personal communication.
Recognizing that it would be difficult to document progress and coverage of health care in rural villages using basic tools, like index cards and notebooks, HHF developed a computerized system of family registration. The HHF team found an existing mother and child-focused family information instrument (called the “regis kay”) from the Haitian Child Health Institute and modified it for their use through a process of consultations with local Ministry of Health officials, field nurses, community health workers, and community and religious leaders. With the approval of these stakeholders, a family registration form was designed in Creole, tested, and revised. The registry tool used the Haitian statistical numbering system, which assigned a specific number for each of the departments and communes for standardized geographical identification. Also, each village and each household had a unique number and this was written on the top of the door of each household. Maintaining a manual data capture system using the family registration form was quickly seen as inadequate, so HHF worked with programmers to create a fully computerized system that allows household, family and individual health and social information to be maintained over time.

The data gathered in the family registry includes information from birth certificates, health records and BCG scars, a quality of life index (e.g. number of rooms, source of water, roof and floor types, presence of latrine and radio, etc.), recent experiences (e.g. diarrhea in the previous two weeks, deaths in the previous year), services received (e.g. prenatal consultation, multivitamin supplements, etc.) and nutritional status (e.g. child weight, hemoglobin level, etc.). This information is housed in various rosters (e.g. child weight, pediatric vaccinations, pregnancy, etc.). Nurse supervisors examine the rosters of community health workers for completeness on a monthly basis and excellent performance is rewarded publically. The information gathered in the registry (e.g. vaccination status, use of prenatal care, and family planning) is used to plan for village level care. HHF staff visit households every five years to validate the registry.

The registry system also has a strong communication and feedback component. Early in the process, nurses shared an update on the family registration and service provision with the community every three months using a locally adapted pie chart. Later, community health workers took on this responsibility. The primary audience for the update was originally health committees, but this expanded to mothers’ clubs in 1990, fathers’ associations in 1994, and youth groups in 1999. The family registration system has been fundamental to ensuring that there is equity in the identification of need and provision of services, and has allowed HHF to identify areas of need and address them effectively.146

In addition to its comprehensive registry system, HHF is one of the few programs with evaluation data. While there is no program-level impact evaluation data available, there is evidence of impact of HHF’s acute respiratory infection (ARI) detection program, albeit from 1998. The evaluation, which reviewed 50 randomly selected monthly case reports (out of a total of 69), indicated that assessments made by community health workers were correct for 92 percent of the cases and treatment was correct in 86 percent of cases, but referral was recommended in only 28.6 percent of cases where it was warranted. The evaluation also found that medication (cotrimoxazole) was regularly replenished and available for distribution, and that not only was the incidence of ARI

146 Lewis and Gebrian 2009.
reduced in HHF communities (from 6.2/1000/year at baseline to 3.1/1000/year at evaluation), but that the proportion of all pneumonia deaths in children under five years, which were in children under two months of age, were lower than reports from similar analyses from other developing countries (8.3 percent in HHF villages versus 30 percent average in other countries). The ARI detection and treatment program was considered to be well functioning due to the effective early identification of cases, strong community participation, and education of community members about warning signs of ARI in their children.147

The HHF approach is unique in that it entails the engagement of community leaders, joint planning with communities, a community census and tracking of beneficiaries, and comprehensive monitoring and evaluation at the community level. There have been extensive monitoring and evaluation exercises both internally and externally, providing HHF with an accurate baseline and allowing the community to map its members, keep track of every inhabitant, and have ownership of the data.

Partners in Health

PIH, or Zanmi Lasante (ZL) in Creole, began in 1985 under the leadership of Paul Farmer in Haiti as a small community clinic treating local patients in the Central Plateau. Treatment was provided at the community-level (with extensive outreach to patients in far-flung areas) for common conditions like diarrhea, pneumonia, and childbirth, which often prove fatal for Haiti’s poor and malnourished, as well as for complex diseases like HIV and tuberculosis.

In 1998, Zanmi Lasante became the world’s first program to provide free, comprehensive HIV care and treatment in an impoverished setting. The expansion of coverage of HIV and TB patients has allowed the organization to better identify and treat patients with other diseases. PIH now features a full-service hospital with over 100 beds, which provides comprehensive pediatric and adult healthcare services, including care for malnourished children and women.148 Mobile health clinics complement these health services in hard-to-reach communities.

Although it has a strong focus on health, PIH also provides other types of assistance to poor families in the Central Plateau, including agriculture assistance, education (schools for school-aged children and nutrition education for mothers), school feeding, and income-generating activities for families with undernourished children. The vision is to provide holistic support for community strengthening that involves health care, education, and community mobilization.

Zanmi Agrikol (“Partners in Agriculture” in Creole) is the new agricultural branch of the organization, which aims to complement Zanmi Lasante by addressing an underlying cause of undernutrition. Under Zanmi Agrikol, community agricultural workers assess family circumstances and teach families how to improve their agricultural yield to improve food security. Community workers also provide advice on irrigation and land terracing, a package of seeds, tools, fruit trees (mango, avocado, papaya, citrus), and one goat to each family. Each eligible family receives

147 CDC 1998.
148 PIH 2006. Services include: inpatient and outpatient care, radiology, ophthalmology, lab, blood bank, etc.
support for one season and then must pay back the seeds and give one goat to another family not yet in the program. Such collaboration has created a 60 percent increase in land productivity due to the terracing and fertilization.

All of the agriculture work on the Zanmi Agrikol farm is focused on the local production of peanuts to produce the RUTF (Nourimanba) that Zanmi Lasante uses to treat wasted children. Direct contracting with farmers provides work to 110 farmers and neighbors and assures quality of the peanut production. Zanmi Agrikol still works at a very small scale, but it now grows, harvests, processes, packages, and delivers Nourimanba (RUTF) to nine different malnutrition clinics in the Central Plateau. This is a promising foray into multisectoral efforts to address malnutrition and to ensure lasting nutrition security.

Zanmi Lasante is also notable for its advanced in its use of community workers, selected by their communities, to provide regular services and support to patients. Community health workers provide general health support (although the focus of the training curriculum has been on HIV/AIDS and TB). Agents femme, who are community health workers focusing on women’s health, provide counseling and services on reproductive health. Accompagnateurs work with patients living with chronic diseases such as HIV and tuberculosis and some also monitor medical and socioeconomic needs. And, agents agricoles provide training and support on agricultural activities.

Finally, PIH partners with other non-governmental organizations and the Haitian Ministry of Health to rebuild or refurbish existing clinics and hospitals, facilitate access to essential drugs, establish laboratories, train and pay community health workers, and complement Ministry of Health personnel with PIH-trained staff.

**Terre des Hommes**

Terre des Hommes (TdH), a Swiss NGO, has been providing nutrition services in the south of Haiti since 1989. TdH works in cooperation with six government health centers to care for children suffering from chronic and acute malnutrition, and to educate mothers and communities about nutrition and basic healthcare. TdH provides services to its communities through both institutionally- and community-based activities. Community-based activities, which reach more isolated populations, include growth monitoring and promotion, treatment of malnutrition during emergencies through mobile clinics, and support for ‘Mothers Clubs’ to promote community engagement, focused on maternal and child health and nutrition. Simple cases (without medical complications) of moderate and severe malnutrition are addressed in the community with RUTF and regular monitoring of child growth. TdH’s hospital-run clinic treats children suffering from malnutrition with complications. The hospital program involves parents in their children’s recovery and builds the capacity of caregivers to take care of their children.

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149 Burch et al. 2008.
Although it is best known for the treatment of SAM, TdH also runs a systematic home visit program for children with growth faltering. The home visit program consists of six months of home visits, during which a community worker provides targeted health and nutrition education to the family and counseling for behavioral change. There is no food provided to the family. Even without food, recovery rates have been notable. The recovery process for these children generally takes between 6 to 9 months of home visits and counseling, and recuperation rates throughout the year range from 79 to 92 percent, compared to mortality rates of approximately 5 to 15 percent.\(^{150}\)

Terre des Hommes is among the only programs with a strong capacity to detect and treat malnutrition during emergencies. Emergency interventions are typically carried out through TdH’s mobile clinic units, which bring care to children living in rural and hard-to-reach areas. Severe cases of malnutrition following natural disasters are transferred and treated at temporary local stabilization centers. Due to TdH’s notable success rates, the MSPP has requested that TdH provide training to other NGOs for the detection of malnutrition during emergencies.

Like many other programs, the success of TdH programming is hampered by long distances from the household to the treatment centers, lack of available time for parents to come to the center, lack of adequate sanitary structures, and lack of personnel staffed at the health centers. However, thanks to its coordination and integration with the MSPP at the local health center level, a large number of children continue to be successfully treated. Program acceptance by the parents is high and TdH’s mobile clinics provide the only source of growth monitoring and care for remote populations, particularly during seasons prone to natural disasters.

World Vision

World Vision (WV), a US Title-II NGO, has been working in Haiti for over 30 years and is the largest organization providing food aid in the country. In addition to distributing food, WV offers health and nutrition programs that focus on preventative nutrition activities, the treatment of severe acute malnutrition, community-based nutrition education, agricultural assistance, and community health worker training schools in communes in the Center department, Artibonite, and Ile de la Gonâve.

In the Center department, World Vision has pioneered a focus on preventing undernutrition by targeting all pregnant and lactating women and 6-24 month-old children, rather than only those children who have already been identified malnourished. Under the preventive approach, WV provides nutrition and health education as well as food aid conditional on attendance at monthly health education classes and monthly growth monitoring and promotion sessions. Health education sessions are segregated by audience (fathers, lactating mothers, etc.) and focused on specific themes.

A recent evaluation comparing the preventive approach versus a recuperative approach found that the preventive approach had greater impacts on stunting, underweight, and wasting than the recuperative approach. Under the preventive approach, nutrition services and food aid were

\(^{150}\) TdH 2008.
provided for 18 months for children 6-24 months and under the recuperative approach services and food aid were provided only to already malnourished children under five for a 9 month period. After three years (May 2002-September 2005), the prevalence of stunting, underweight and wasting was lower in communities that were exposed to the preventive compared to the recuperative program (differences in favor of the preventive group were 4, 6, and 4 percentage points respectively).\textsuperscript{151} It is impossible, however, to disentangle the impact of the food aid from that of the ongoing education and counseling in this study.

Although the preventive approach has been proven successful and is the preferred approach for the 6-24 month age group, World Vision also continues to provide treatment (via weekly rations of RUTF) for all children under five who are severely malnourished. WV also provides antibiotics, deworming medication, and micronutrient supplements upon admission into the treatment program.

World Vision has also shown success with home micronutrient fortification with \textit{Sprinkles (Babyfer in Creole)}. According to one study, the combined distribution of Babyfer and wheat soy blend (WSB) was successful in reducing anemia among children 6-24 months. Over two months, the prevalence of anemia (hemoglobin <10g/dl) among children receiving both Babyfer and WSB fell from 54 to 24 percent, compared to the control group receiving only WSB (without Babyfer) whose anemia prevalence actually rose from 39 to 43 percent.\textsuperscript{152}

A new integrated program complements World Vision’s nutrition programming. The program, called the Program Development Zone, addresses agriculture, education, microfinance, and health services. There are 10 PDZ in the Haut Plateau, all of which are supported largely by sponsorship in conjunction with Title II food aid (from USA, Canada, and Taiwan). The program links nutrition activities with agriculture or income-generating small businesses and agricultural programs, which cover soil protection, tree planting, field planting, livestock, and small business.

Lastly, World Vision has a training school for community health workers. World Vision staff train supervisors who, in turn, train a group of CHWs in breastfeeding, vitamin A distribution, family planning, HIV/AIDS prevention, complementary feeding using enriched porridges, and the use of RUTF. Supervisors’ training includes the above-mentioned topics, with the addition of deworming, growth monitoring, CMAM, prevention of mother-to-child transmission (PMTCT), immunizations, and counseling.

\textit{Meds and Food for Kids}

\textit{Meds and Food for Kids} (MFK) has been active in Haiti since 2003, and focuses primarily on the development, production, and distribution of highly nutritious RUTF. MFK’s local production of RUTF (called \textit{Medika Mamba}, which is Haitian Creole for peanut butter medicine) is used to save the lives of severely malnourished children in Haiti. \textit{Medika Mamba} is made of peanuts, powdered milk, oil, sugar, and a vitamin and mineral mix, and is produced at a factory in the city of

\textsuperscript{151} Menon and Ruel 2007.
\textsuperscript{152} Menon et al. 2007.
Cap Haitien, where it is packaged for home-based care. The energy- and protein-dense paste does not require refrigeration or cooking, and as much as possible, ingredients are grown and/or purchased in Haiti to stimulate peanut farming and contribute to the local economy. As of 2009, MFK employed 24 staff to cull, shell, prepare, test, and package the *Medika Mamba*.

MFK has state-of-the-art equipment to test for aflatoxin and other pathogens during the various stages of production. Their laboratory is quite advanced, and the conditions are sterile and safety protocols are strictly enforced.

*Medika Mamba* has proven higher recovery rates (85 vs. 25 percent) compared to other treatments, such as hospitalization, daily feeding programs, or dry ration donations. The peanut-based paste is considered as the least burdensome for caretakers in terms of time spent away from home, transportation costs, and lost opportunities. It has been estimated that the cost of treatment with *Medika Mamba* is approximately $68 per child, although this varies according to the weight of the child (which determines the amount consumed per day). The average treatment requires 8–12 weeks and about 13–15 kg of RUTF.

By the end of 2009, MFK was producing 60 metric tons of *Medika Mamba* for approximately 5,000 children. Using the number of children estimated to be suffering from acute malnutrition from the 2009 nutrition survey (51,000 with moderate acute malnutrition and 8,600 with severe acute malnutrition); MFK produces enough to treat more than half of the severely wasted children and 10 percent of the moderately wasted children in Haiti. With certification now in place, there are plans to scale up production.

MFK has trained staff at MSPP, Partners in Health, World Vision, Catholic Relief Services (CRS), Hospital Albert Schweitzer (HAS), Children’s Nutrition Program, and many smaller organizations to use *Medika Mamba*. The MFK protocol includes admission criteria, treatment of complications, grading edema, procedures to follow in case of no weight gain, discharge activities, and specific steps for each visit, including medications (e.g. de-worming) and counseling topics.

MFK’s successful production of a safe and effective RUTF product provides a useful intervention to treat acute malnutrition in accordance with Haiti’s protocol for treating acute malnutrition, while also promoting local farming and economic growth.

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153 Manoff Group 2009.
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Glossary

**Acute malnutrition (wasting):** Low weight-for-height defined as more than two standard deviations below the mean. Wasting is the result of a recent shock such as lack of calories and nutrients and/or illness.

**Anemia:** The condition of having less than the normal number of red blood cells or less than the normal quantity of hemoglobin in the blood (hemoglobin <11g/dl.). Although the primary cause of anemia worldwide is iron deficiency, it is seldom present in isolation and coexists with a number of other causes, such as malaria, parasitic infections, nutritional deficiencies, etc.

**Chronic Malnutrition (stunting):** Low height-for-age; defined as more than two standard deviations below the mean. Stunting is the cumulative effect of long-term deficits in food intake, poor caring practices, and illness. During the first two years of a child’s life, this can be reversed.

**Food security:** When all people at all times have access to sufficient, safe, and nutritious food to maintain a healthy and active life; based on the three pillars of food availability, access to food, and use of food.

**Hunger:** The inability to meet basic daily caloric needs.

**Low birthweight:** Weight at birth less than 2500 grams.

**Malnutrition:** Poor nutritional status caused by deficiency or excess (undernutrition or overnutrition).

**Nutrition security:** the ongoing access to the basic elements of good nutrition: a balanced diet, safe environment, clean water, and adequate health care (preventive and curative) for all people, with a particular focus on pregnant and lactating women and young children, who are at greatest nutritional risk.

**Overnutrition:** Excessive weight relative to height. Overweight is body mass index (BMI)>25; obesity is BMI>30.

**Ready-to-Use Therapeutic Food (RUTF):** High-energy, fortified, ready-to-eat food suitable for the treatment of children with severe acute malnutrition. RUTF is typically peanut-based and is used directly, as is, without mixing with water or other substances.

**Severe Acute Malnutrition (SAM):** Grade of acute malnutrition defined as more than three standard deviations below the mean weight-for-height.

**Stunting (chronic malnutrition):** Low height-for-age; defined as more than two standard deviations below the mean. Stunting is the cumulative effect of long-term deficits in food intake, poor caring practices, and illness. During the first two years of a child’s life, this can be reversed.
Undernutrition: Poor nutritional status due to deficiencies. Three different indicators are used, each defining a different type of undernutrition.

Underweight: Low weight-for-age; defined as more than two standard deviations below the mean. The most frequently used indicator, as it only requires a scale and the age of the child.

Wasting (acute malnutrition): Low weight-for-height defined as more than two standard deviations below the mean. Wasting is the result of a recent shock such as lack of calories and nutrients and/or illness.

z-score: The deviation of an individual’s value from the median value of a reference population, divided by the standard deviation of the reference population.
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