



SUMMARY REPORT:

14-COUNTRY NUTRITION LANDSCAPE

ANALYSES

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LIST OF ACRONYMS

HDDS	Household Dietary Diversity Score
HFIAS	Household Food Insecurity Access Scale
HHS	Household Hunger Scale
HKI	Helen Keller International
HNP	World Bank Health, Nutrition and Population
ICCIDD	International Council for the Control of Iodine Deficiency Disorders
IDA	Iron-Deficiency Anemia
IDD	Iodine Deficiency Disorder
IDDS	Individual Dietary Diversity Score
IFA	Iron Folic Acid
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IMCI	Integrated Management of Childhood Illness
IMR	Infant Mortality Rate
IPT	Intermittent Preventive Treatment
ITN	Insecticide Treated Nets
I-WASH	A UNICEF-funded project focusing on hand-washing and sanitation in schools
IYC	Infant and Young Child
IYCF	Infant and Young Child Feeding
IYCN	Infant and Young Child Nutrition
JICA	Japan international Cooperation Agency
JMP	The World Health Organization and United Nations Children's Fund Joint Monitoring Program for Water Supply and Sanitation
LNS	Lipid-Based Nutrient Supplements
MAD	Minimum Acceptable Diet
MAM	Moderate Acute Malnutrition
MCHN	Maternal Child Health and Nutrition
MI	Micronutrient Initiative
MICS	Multiple Indicator Cluster Surveys
MDG4	Millennium Development Goal 4
MMR	Maternal Mortality Ratio
MND	Micronutrient Deficiencies
MNP	Multiple-Micronutrient Powder
MUAC	Mid Upper Arm Circumference
NMR	Neonatal mortality rate
NACS	Nutrition Assessment, Counseling, and Support
NCD	Non-communicable Disease
NLiS	Nutrition Landscape Information System
NNS	National Nutrition Strategy

OD	Open Defecation
OIE	World Organisation for Animal Health
ORS	Oral Rehydration Salts
ORT	Oral Rehydration Therapy
PLW	Pregnant and Lactating Women
PROFILES	An evidence-based advocacy tool to support increased political and social commitment to nutrition.
POU	Point of Use
PPP	Purchasing Power Parity
RBP	Retinol Binding Protein
REACH	Renewed Effort against Child Hunger and Undernutrition (joint UN effort)
RUF	Ready-to-Use Foods
RUTF	Ready-to-Use Therapeutic Foods
RUSF	Ready-to-Use Supplementary Foods
SAM	Severe Acute Malnutrition
SC	Save the Children USA
SC-UK	Save the Children UK
SD	Standard Deviation
SF	Supplementary Feeding
SFP	Supplementary Food Program
SPRING	Strengthening Partnerships, Results and Innovations in Nutrition Globally (USAID centrally-funded project)
SQUEAC	Semi-Quantitative Evaluation of Access and Coverage
SUN	Scaling up Nutrition Movement
TB	Tuberculosis
TBA	Traditional Birth Attendants
TFR	Total Fertility Rate
U5MR	Under-five mortality rate
UNDAF	United Nations Development Assistance Framework
UKAID	United Kingdom Development Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
USG	United States Government
USI	Universal Salt Iodization
VAD	Vitamin A Deficiency
VitA	Vitamin A
WAHID	World Animal Health Information System
WASH	Water, Sanitation and Hygiene
WB	World Bank
WDDS	Women's Dietary Diversity Score
WFA	Weight-for-Age
WFH	Weight-for-Height Z score
WFP	World Food Program
WHO	World Health Organization
WHS	World Health Statistics
WRA	Women of Reproductive Age

1.1 Overview of mNutrition

This short summary report highlights the work conducted through a series of detailed nutrition landscape analyses undertaken across fourteen countries¹ as part of the GSM Association Mobile for Development (GSMA) mNutrition Initiative funded by UK Department for International Development (DFID). The countries initially identified for implementation of the mNutrition project included: **Bangladesh, Cote d'Ivoire, Ghana, Kenya, Malawi, Mozambique, Myanmar, Nigeria, Pakistan, Rwanda, Sri Lanka, Tanzania, Uganda and Zambia.**² The landscape analyses served as a comprehensive mapping of the basic and immediate causes of malnutrition (see Figure 1: Causes of Malnutrition Conceptual Framework)—inadequate dietary intake and disease as well as the underlying causes of malnutrition—food and nutrition security, care and feeding practices, health, education, healthy environment including water and sanitation. The basic, and underlying causes of stunting are embedded in a complex web of contextual and immediate influences, and its reduction requires multisectoral action.³⁴ The analyses helped guide the development of nutrition-related content for mobile services in participating countries. GSMA complemented this with an analysis of the mobile phone sector for each country. Findings from the 14 country landscape analyses demonstrate the importance of conducting an initial analysis of the nutrition situation within a country before designing interventions as the immediate and underlying causes of malnutrition vary by country and geographic location within the country. The multiple causes of malnutrition need to be well understood when designing and planning nutrition-specific and sensitive interventions and activities to effectively impact nutritional status. Furthermore, the causes of malnutrition vary amongst targeted populations and geographic locations due to socio-economic factors, geographic terrain, livelihoods, access to food, seasonability and other factors that also must be well understood when designing interventions. This brief presents some of the variances of the complex

causes and factors associated with malnutrition across countries.

The mNutrition Initiative, led by the GSM Association (GSMA) with funding from DFID, aims to develop and scale-up the delivery of mobile nutrition services through embedding messaging in existing agriculture (mAgri) and health (mHealth) mobile phone platforms. The project aims to increase nutrition-related knowledge by providing information to at least 3 million people with various Although the mNutrition project initially targeted implementation in 14 countries, it now focuses on implementation in 12 of these countries⁵ including 8 countries in Africa (Ghana, Malawi, Mozambique, Nigeria, Tanzania, Rwanda, Uganda, Zambia) and 4 countries in South Asia (Pakistan, Sri Lanka, Bangladesh and Myanmar).

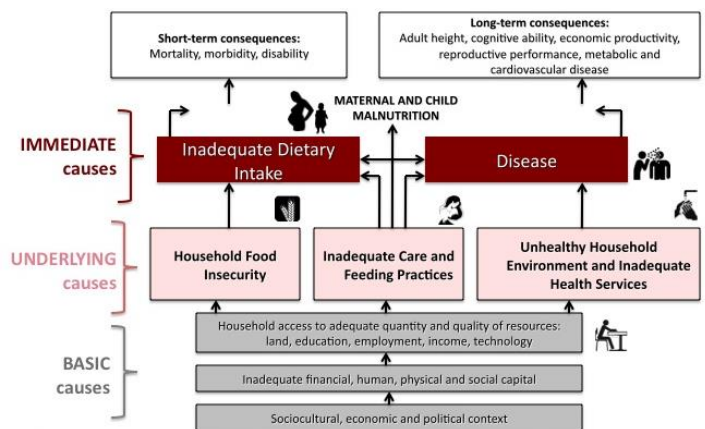


Figure 1: Causes of Malnutrition Conceptual Framework

The black arrows show that the consequences of malnutrition can feed back to the underlying and basic causes of malnutrition, perpetuating the cycle of malnutrition, poverty and inequities. Source: Adapted from UNICEF, 1990.

¹ The original focus countries included: Bangladesh, Cote d'Ivoire, Ghana, Kenya, Malawi, Mozambique, Myanmar, Nigeria, Pakistan, Rwanda, Sri Lanka, Tanzania, Uganda and Zambia. However, GSMA in collaboration with DFID decided not to implement in Kenya and Cote d'Ivoire resulting in the landscape analyses not being validated.

² Please note that since both Kenya and Cote D'Ivoire were not validated in country the comparisons including these two countries only relate to indicators and sources of data that were publicly available online.

³ Stewart et al. 2013.

⁴ Casanovas et al. 2013

⁵ Initially 14 countries were selected for the mNutrition initiative including Kenya and Cote D'Ivoire but in 2015 the decision was made to no longer pursue implementation in those 2 countries and instead focus on the remaining 12 countries.

The ultimate goal of the mNutrition Initiative is to contribute to improving the nutritional status of children under 5 years of age and women of reproductive age (WRA) through one or more of the following:

- Promotion of improved feeding, dietary and caring behaviors and practices.
- Facilitation of referral to and demand creation for nutrition and health services.
- Registration of targeted population for nutrition services and improved nutrition surveillance systems through timely and efficient data collection and recording of key nutrition indicators.
- Promotion of nutrition-sensitive agriculture behaviors and practices including production and consumption of higher nutrient-dense crops and improved livestock management and consumption of animal-sourced foods.

There is an emphasis on the reduction of stunting and micronutrient deficiencies including child and maternal anemia. The mNutrition initiative seeks to achieve these goals by harnessing the power of mobile technologies to improve access to information on nutrition-specific and nutrition-sensitive health and agricultural behaviors and practices especially for the poor. The types of mNutrition services developed and mobile platforms utilized in each country differs based on the country context. Improved access to nutrition-relevant mobile services for the poor is facilitated by a range of support mechanisms provided to the mobile industry by the GSMA mNutrition initiative including, but not limited to: development of nutrition global and local content frameworks, neutral brokerage between mobile and health stakeholders to develop scalable business cases in each country, technical assistance to the service providers to launch and scale mNutrition services, advocacy and regulatory support at the national level, development of guidelines and resources, provision of risk capital (innovation grants) for the launch and scale of mobile services for nutrition and agriculture, M&E and the documentation of best practices.

The GSMA-led mNutrition initiative includes CAB International (CABI), the Global Alliance for Improved Nutrition (GAIN), the International Livestock Research Institute (ILRI), OXFAM, and the British Medical Journal (BMJ) as their mNutrition Global Content Partners (GCPs) to manage the content development process in each of the 14 countries. As one of the first steps in developing high-quality localized content, GAIN conducted a desk review of the nutrition situation in each of the countries of focus. This was summarized in a landscape analysis report for each country. Each of

these landscapes provides a comprehensive overview of all the available information on the nutrition situation in the targeted countries, including relevant demographic information, current nutritional status, the causes (both immediate and underlying) and consequences of malnutrition, as well as an overview of the existing structures including relevant national legislative, regulatory and programmatic frameworks.

In most of the targeted countries, a single consolidated resource covering all aspects of the national nutrition situation had not previously existed. Thus, these landscapes serve as a useful resource to all multisectoral nutrition stakeholders, beyond its original intent to inform prioritized messaging and content for each country.

Methodology

As a part of the overall mNutrition initiative, the landscape analyses serve as the basis for the content development for the mNutrition services. The methodology used to develop these landscape analyses included: 1. Key document review, 2. Country consultations, 3. Secondary data analysis, 4. Landscape analysis development and 5. Validation of the landscape analysis by the in-country team.

1. Key Document Review: Our approach involved a *key document review*—a formalized technique of data collection involving the examination of existing records or documents from each country including: existing national nutrition strategies, the Lancet Series for Maternal and Child Nutrition, the United Nations Renewed Efforts Against Child Hunger and Undernutrition (REACH) documents, implementing partner project reports, evaluations in addition to any key government nutrition national policy and guideline documents.

2. Country Consultations: Key individuals within countries who were familiar the nutrition situation were contacted to assist in accessing key documents that were not always easily available in the public domain and discuss the current nutrition situation in the country.

3. Data Analysis: *Data Analysis* was conducted by analysing data that has previously been collected (primary data) including key data sources such as the Demographic Health Surveys (DHS)⁶, Food and

⁶ Available at: <http://dhsprogram.com>

Agriculture Organization of the United Nations Statistics division (FAOSTAT)⁷ the Global Hunger Index (GHI), International Council for the Control of Iodine Deficiency Disorders (ICCIDD) Global Network, Maternal, Newborn & Child Survival: Countdown to 2015 country profiles data⁸, Nutrition Landscape Information System (NLIS), United Nations Children's Fund (UNICEF) Data⁹ and UNICEF Multiple Indicator Cluster Survey (MICS)¹⁰ the WHO/UNICEF Joint Monitoring Program (JMP)¹¹, World Animal Health Information Database (WAHID)¹², the World Food Program Comprehensive Food Security and Vulnerability Analysis (CFSVA)¹³ and the Global Food Security Index¹⁴ to list a few.

4. Landscape Analysis Development: Next, the landscape analysis was drafted with this information. The landscape analysis structure starts with the country context that reviews geography, demographics including fertility rates, marital status and social economic status including education, gross domestic product and household assets, income and expenditure as well as livelihoods. The nutritional status section summarizes the current nutrition situation in terms of stunting, wasting, underweight, prominent micronutrient deficiencies, and dietary diversity including minimum acceptable diet. The underlying causes of malnutrition section examines a number of issues such as inadequate food and nutrition security, poor maternal nutrition, suboptimal infant and young child feeding (IYCF) and caring practices, inadequate health services and healthy environment, the access to water, sanitation and hygiene (WASH) and hygiene practices, and limited access to education and nutritious foods. Furthermore, the analysis examines the enabling environment that affects the basic causes of malnutrition such as governance, nutrition policy, leadership, governance and operational structures, human resources and workforce

⁷ Food and Agriculture Organization of the United Nations Statistics division (FAOSTAT). Available at: <http://faostat3.fao.org/faostat-gateway/go/to/download/Q/QA/E>

⁸ Available at: <http://www.countdown2015mnch.org/country-profiles/>

⁹ Available at: <http://data.unicef.org/child-mortality/under-five#sthash.V2It9JL4.dpuf>

¹⁰ Available at: <http://ghdx.healthdata.org/series/multiple-indicator-cluster-survey-mics>

¹¹ Available at: [http://www.wssinfo.org/documents/?tx_displaycontroller\[type\]=country_files](http://www.wssinfo.org/documents/?tx_displaycontroller[type]=country_files)

¹² Available at: http://www.oie.int/wahis_2/public/wahid.php/Countryinformation/Animal_situation

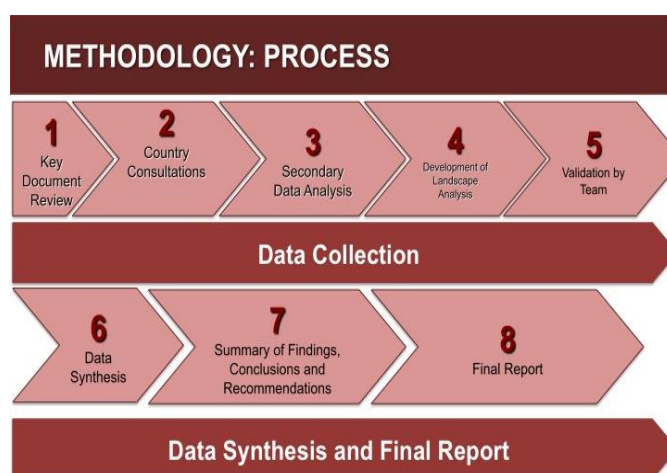
¹³ Available at: <http://www.wfp.org/food-security/assessments/comprehensive-food-security-vulnerability-analysis>

¹⁴ Available at: <http://foodsecurityindex.eiu.com>

for nutrition, lead donors and implementing partners. Finally, a final section focuses on targeting and prioritizing for greater nutritional impact including: geographic focus, targeted populations, and priority nutrition-specific and nutrition-sensitive interventions based on the causes of malnutrition. This section also examines the government's response to malnutrition and reviews the national budget and costing schemes, high level country malnutrition reduction targets and indicators as well as overall country coverage.

5. Validation by In-Country Team: An in-country team then validated this landscape analysis. As part of the validation process broad stakeholder meetings were held in each country to discuss the content of the landscape analysis with key nutrition stakeholders. This exercise was facilitated by one of the GCP consortium members. This included: GAIN in Nigeria, Ghana, Tanzania and Mozambique; CABI in Sri Lanka, Myanmar and Zambia, OXFAM in Malawi, Bangladesh and Rwanda; and ILRI in Pakistan¹⁵ and Uganda. The Landscape Analyses were validated in country by relevant nutrition stakeholders, whereas additions and modifications were made to ensure their accuracy and comprehensiveness. These reports were then used for the development of national nutrition content frameworks that guide the localized content for the mNutrition services in each country. The overview of the methodology to develop the landscape analyses can be found below in Figure 2.

Figure 2: Landscape Analysis Methodology



¹⁵ Due a decision by GSMA to postpone activities in Pakistan, country validation at the time this document had been published is not yet completed, therefore references for Pakistan cited in this summary are made with only publicly available information.

Purpose

This summary report discusses some of the findings and trends discovered after completing a 14 country nutrition landscape analysis for the mNutriton initiative. After completing the 14 country landscape analyses it became clear that there were many similarities and trends as well as differences across countries depending on the country context. Unlike UNICEF's State of the World's Children¹⁶ or the Global Nutrition Report,¹⁷ this report does not aim to compare countries' nutritional status but rather outline general findings, trends as well as highlight some of the key differences. While comparing immediate and underlying causes of malnutrition across countries, this analysis revealed that despite many similarities in terms of levels of prevalence of malnutrition (stunting, underweight, wasting and micronutrient deficiencies) there are great variances between and within countries. This affirms the necessity of understanding the country context well in designing projects that address malnutrition.

¹⁶ Please see <http://sowc2015.unicef.org> for more information.

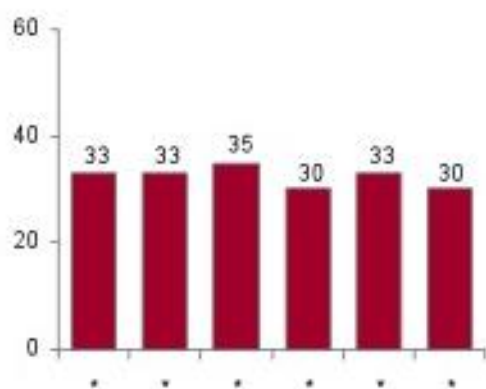
¹⁷ The Global Nutrition Report is available at:
<http://globalnutritionreport.org>

1.2 Trends in Nutritional Status

Stunting, Wasting and Underweight

Limited Progress Against Stunting In Kenya since 1993

Percentage of children < 5 years old stunted (NCHS reference population)



In Kenya, the proportion of stunted children has declined since 2000 to 2009 from 35% to 30%. However, it has remained unchanged since 2003. Source: GAIN

Stunting is generally decreasing across the fourteen countries with the exception of Nigeria, Pakistan and Kenya where stunting has increased or remained the same¹⁸. However, **child wasting—rapid weight loss, is staying the same or worsening** in many of the countries. Wasting is increasing in Malawi, Mozambique, Tanzania and significantly in Nigeria, which may reflect food stresses during lean seasons, food insecurity and deficits due to food unavailability.¹⁹ On the flip side wasting has significantly decreased in Cote d'Ivoire and Pakistan.²⁰ Please see the completed country

¹⁸ In Nigeria stunting has increased from 36% to 36.4% in 2013, in Pakistan stunting has increased from 41 to 45% from 2001 to 2012-13 and in Kenya where the proportion of stunted children has declined since 2000 to 2009 from 35% to 30%, but remained unchanged since 2003

¹⁹ In Nigeria, child wasting increased from 14% to 18% from 2008 to 2013 (NDNS, 2013).

²⁰ In Cote d'Ivoire wasting significantly decreased from 14% in 2007 to 7.6% in 2011-12. Wasting has decreased for Pakistan from 15.1% in

landscapes at (<http://www.gainhealth.org/knowledge-centre/mnutrition-new-nutrition-landscape-analyses-reports-now/>) for more information.

Stunting in Tanzania

Despite significant economic growth, and reduction in child mortality, Tanzania has suffered from persistently high stunting rates while only recently there has been a reduction in stunting based on the Tanzania National Nutrition Survey 2014.²¹ Stunting is high in Tanzania because of a combination of *poor dietary diversity and low meal frequency (feeding practices), inadequate maternal nutrition, insufficient birth spacing, relatively low rates of exclusive breast feeding, poor sanitation and hygiene and, insufficient crop management and agriculture.*²²

Anemia Trends

Anemia²³ is a widespread urgent public health problem associated with increased risk of morbidity and mortality and a major barrier to improved health and economic outcomes. Maternal and child anemia are at epidemic levels particularly among women of reproductive age and in children in many countries worldwide, yet country prevention and control programs have failed to significantly reduce anemia as there are many complex underlying causes. The hemoglobin status children and women improved in some regions with a reduction in anemia prevalence.²⁴ Further improvements are needed

2011 and 11% in 2012-13 (Pakistan National Nutrition Survey Report 2011).

²¹ Tanzania National Nutrition Survey 2014 Final Report. Data collection: 24 September – 21 November 2014. Prepared by: Tanzania Food and Nutrition Centre. Dar es Salaam, Tanzania. December 2014. Available at:

http://www.unicef.org/media/files/Tanzania_National_Nutrition_Survey_2014_Final_Report_18012015.pdf

²² The USAID-funded Mothers and Infants, Safe, Healthy and Alive (MAISHA) Program

²³ Anemia is the condition of a low level of hemoglobin (low red blood cells) in the blood.

²⁴ Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data. *Lancet Glob Health* 2013; 1: e16–25

in all 14 countries as both child and maternal anemia are at WHO severe threshold levels.²⁵

The factors that contribute to the onset of anemia include malaria, hookworm or other helminth infections, nutritional deficiencies, chronic infections, genetic conditions, which vary by region (such as sickle cell and thalassemia), HIV/AIDS, and high fertility.²⁶ As our understanding of anemia has changed, it has been realized that iron deficiency anemia, traditionally thought of as the most common form of anemia, is not necessarily the primary causal determinant, with the recognition that other causes of anemia are important to be addressed in their own right.

Consequences of anemia include reduced cognitive development, reduced educational outcomes, impaired physical growth and immune function, reduced work capacity and performance.²⁷ Anemia during pregnancy is one of the primary causes of maternal mortality and is associated with additional adverse outcomes for both mother and infant, including increased risk of low birth weight.²⁸ Iron deficiency increases the risk of low-birth-weight babies, undermines physical capacity and contributes to deaths during childbirth. Young children and pregnant and postpartum women are the most severely affected by iron deficiency because their demands for iron are high.

Anemia has multiple causes, varies across countries and targeted population groups and the underlying causes are complex which means that the same interventions are not appropriate across or even within countries. Tackling anemia requires further understanding of the underlying causes in each country and tailored and evidenced-based solutions to address the variation in causes of anemia.

Anemia in Kenya, Rwanda and Uganda

Some countries, such as Kenya have suffered with severe levels of anemia due to underlying causes that

have remained unaddressed. In other countries such as Rwanda and Uganda, there have been significant reductions in anemia prevalence attributable to addressing a number of the underlying causes such as malaria, as well as undertaking proactive measures such as increased IFA and deworming. Please see Table 4 for a country comparison.




²⁵ Anemia is considered a severe public health problem if it is above 40% for children 6-59 months of age or above 40% for Women 15-49 yrs with anemia (Sources include: WHO, UNICEF, WFP, United Nations University, CDC and Micronutrient Initiative)

²⁶ Anemia. InTech. Edited by Donald S. Silverberg. 2012.

²⁷ Beard JL, Connor JR. Iron status and neural functioning. *Annu Rev Nutr.* 2003;23:41–58; Abbaspour N, Hurrell R, Kelishadi R. Review on iron and its importance for human health. *J Res Med Sci.* 2014 Feb; 19(2): 164–174

²⁸ Abbaspour N, Hurrell R, Kelishadi R. Review on iron and its importance for human health. *J Res Med Sci.* 2014 Feb; 19(2): 164–174

Table 1: A Comparison of Anemia in Kenya, Rwanda and Uganda

	Kenya ^{29 30 31} 	Rwanda ^{32 33} 	Uganda ^{34 35 36} 
Children 6-59 months of age with anemia	2008 69%	2005 52%	2010 38%
Women 15-49 years of age with anemia	2008 55.5%	2005 28%	2010 17% ³⁸
Leading Causes of Anemia ⁴⁰	<ul style="list-style-type: none"> Insufficient complementary feeding for children over 6 months Shorter duration of exclusive breastfeeding⁴¹ Lack of demand and stock-outs for IFA supplements for women High prevalence of malaria and parasitic infections (worms) Inadequate consumption or low intake of iron; high consumption of staple foods with low bio available iron Inadequate intake of foods that enhance iron absorption 	<ul style="list-style-type: none"> Low ANC attendance or women who attended ANC and did not receive any IFA Inadequate supply and recommended dosage of IFA Low consumption of IFA tablets among women. 	<ul style="list-style-type: none"> Supply and demand of IFA tablets among women. Inability of most households to afford foods rich in vitamins and minerals. Most households cannot afford iron-rich foods like fish, meat and eggs in their diet. Low bioavailability of iron in the diet Malaria Schistosomiasis, worms and hookworm infections, Poor sanitation
Reasons Attributable for Decrease	<ul style="list-style-type: none"> Expansion of coverage for insecticide treated nets (ITNs) 	<ul style="list-style-type: none"> High ANC coverage High IFA coverage and deworming for pregnant women and children National efforts to prevent malaria (high LLIN coverage) 	<ul style="list-style-type: none"> National efforts to prevent malaria including high LLIN coverage and use by women and children Increase of women taking deworming medication during pregnancy of last birth.

²⁹ WHO. 2008. Worldwide Prevalence of Anemia 1993–2005: WHO Global Database on Anemia.

³⁰ Micronutrient Initiative Available at : <http://www.micronutrient.org/english/view.asp?x=595>. And Fiedler, Jack, D'Agostino, Alexis, and Sununtnasuk, Celeste. 2014. Nutrition Technical Brief: A Rapid Initial Assessment of the Distribution and Consumption of Iron–Folic Acid Tablets through Antenatal Care in Kenya. Arlington, VA: USAID/Strengthening Partnerships, Results and Innovations in Nutrition Globally (SPRING) Project. Available at : https://www.spring-nutrition.org/sites/default/files/publications/briefs/spring_ifa_brief_kenya.pdf

³¹ Newer data is forthcoming from the Kenya National Micronutrient Survey 2011, First Round. Available at: statistics.knbs.or.ke/nada/index.php/catalog/72.

³² Micomyiza E, Galloway R. Anemia Control Programs and Decreasing Anemia Prevalence in Rwanda. Available at: http://www.mchip.net/sites/default/files/mchipfiles/Anemia%20Control%20Programs%20and%20Decreasing%20Anemia%20Prevalence%20in%20Rwanda_Micomyiza.pdf

³³ SPRING Nutrition Technical Brief. A Rapid Initial Assessment of the Distribution and Consumption of Iron–Folic Acid Tablets through Antenatal Care in Rwanda. September 2014. Available at: https://www.spring-nutrition.org/sites/default/files/publications/briefs/spring_ifa_brief_rwanda.pdf

³⁴ SPRING Nutrition Technical Brief. A Rapid Initial Assessment of the Distribution and Consumption of Iron–Folic Acid Tablets through Antenatal Care in Uganda. September 2014. Available at: https://www.spring-nutrition.org/sites/default/files/publications/briefs/spring_ifa_brief_uganda.pdf

³⁵ Balikowa, Dacid.O., Social determinants of health: Food fortification to reduce micronutrient deficiency in Uganda Strengthening the National Food Fortification Programme. October 2011. Available at: http://www.who.int/sdhconference/resources/draft_background_paper21_uganda.pdf

³⁶ Stevens GA, Finucane MM, De-Regil LM, Paciorek CJ, Flaxman SR, Branca F, Peña-Rosas JP, Bhutta ZA, Ezzati M. "Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995–2011: a systematic analysis of population-representative data." *The Lancet Global Health*, 1 (2013): e16-25

³⁷ Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. Uganda Demographic and Health Survey 2011. Kampala, Uganda: UBOS and Calverton, Maryland: ICF International Inc.

³⁸ National Institute of Statistics of Rwanda (NISR) [Rwanda], Ministry of Health (MOH) [Rwanda], and ICF International. 2012. Rwanda Demographic and Health Survey 2010. Calverton, Maryland, USA: NISR, MOH, and ICF International.

³⁹ Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. Uganda Demographic and Health Survey 2011. Kampala, Uganda: UBOS and Calverton, Maryland: ICF International Inc.

⁴⁰ Accelerating Reduction of Iron Deficiency Anaemia Among Pregnant Women in Kenya. Plan of Action. 2012-2017. Available at: https://www.k4health.org/sites/default/files/2013_ifa_plan_book_layout2.pdf

⁴¹ Available at: Risk of Infant Anemia Is Associated with Exclusive Breast-Feeding and Maternal Anemia in a Mexican Cohort. *J. Nutr.* February 2006. vol. 136 no. 2 452-458, Jareen K. Meinzen-Derr, M. Lourdes Guerrero, Mekibib Altaye, Hilda Ortega-Gallegos, Guillermo M. Ruiz-Palacios, and Ardythe L. Morrow, Available at: <http://jn.nutrition.org/content/136/2/452.full>

Evidence from large-scale stunting reduction programs demonstrates that nutrition programming decisions must rely on addressing both country-specific immediate and underlying causes of malnutrition.⁴² Immediate causes include poor dietary diversity, inadequate dietary intake and infectious diseases. Underlying causes vary from household food insecurity, inadequate care and feeding practices, unhealthy household environment and inadequate health services.

⁴² The World Health Organization's Global Target for Reducing Childhood Stunting by 2025: Rationale and Proposed Action. Available at: <http://onlinelibrary.wiley.com/store/10.1111/mcn.12075/asset/mcn12075.pdf?v=1&t=i56ttrms1&s=c6ad1a9277acfee7b13162a53e0f6611bcf37782>

1.3 Immediate Causes of Malnutrition

Inadequate Dietary Intake: Poor Dietary Diversity

Consumption of diverse, nutrient-dense foods is essential for food and nutrition security. Most countries are dependent on monotonous, poor quality diets that derive a high percentage of their calories from staple foods (cereals, roots and tubers) and only consume nutrient-dense foods seasonally, resulting in an inadequate intake of micronutrients.⁴³ Dietary diversity is a key indicator of a high-quality diet and is a considerable factor influencing household food and nutrition security.⁴⁴ Many countries promote the production of nutrient-poor cash crop staple foods such as Bangladesh (rice), Ghana (rice), Sri Lanka (rice), Malawi and Zambia (maize). Diets in Ghana, Malawi, Mozambique, Pakistan, Zambia, Kenya and Tanzania are monotonous and traditionally based on a thick starchy porridge made from maize or other staple crops 'nshima', 'nsima' 'ugali', cereals, maize or cassava eaten with a small amount of 'relish' of a few basic vegetables sometimes supplemented with a little meat, beans or fish.⁴⁵ ⁴⁶ In Rwanda, children who consume primarily cereal porridge ('bouillie') are significantly more stunted than others due to the lack of dietary diversity.⁴⁷

Dietary Diversity

Dietary diversity is defined as the number of individual

⁴³ Diet quality is when a diet provides adequate recommended levels of essential nutrients needed by the body in addition to energy and limited amount of saturated fat, added sugars, and sodium while ensuring consumption of balanced healthy fats.

⁴⁴ Ruel, MT. Animal Source Foods to Improve Micronutrient Nutrition and Human Function in Developing Countries: Operationalising Dietary Diversity: A Review of Measurement Issues and Research Priorities. Food Consumption and Nutrition Division, International Food Policy Research Institute (IFPRI), American Society for Nutritional Sciences. Washington, D.C., 2003. Available from: <http://jn.nutrition.org/content/133/11/3911S.full.pdf>

⁴⁵ Harris et al. Turning Rapid Growth into Meaningful Growth: Sustaining the Commitment to Nutrition in Zambia. Introduction – Turning Rapid Growth into Meaningful Growth: Sustaining the Commitment to Nutrition in Zambia, Jody Harris, Silke Seco Grütz, Cassim Masi and Lawrence Haddad

⁴⁶ Mozambique Demographic and Health Survey, 2011 and Food Balance Sheets - June 2010. Available at: <http://mozambique.opendataforafrica.org/epmjfk/mozambique-income-and-daily-diet>

⁴⁷ CFSVA and Nutrition Survey, 2012.

food items or food groups consumed over a given period of time.⁴⁸ At the household level, dietary diversity is usually considered as a measure of access to food, while at individual level it reflects dietary quality and micronutrient adequacy.⁴⁹ ⁵⁰ Dietary diversity is strongly associated with nutrient adequacy, is widely recognized as being a key dimension of diet quality, and is reflected in food-based dietary guidelines.^{51, 52, 53, 54}

Cultural Food Beliefs & Taboos

There are a number of religious and/ or cultural barriers and/or taboos and practices that prevents adequate food consumption and dietary diverse food consumption. Cultural food beliefs and taboos are often related to animal-source foods for women and young children. For example in Uganda in some districts, females (over 6 years old) are not allowed to eat eggs, poultry, pork, and certain fish, in other districts women are not able to eat mutton and goats milk. Culture can be a strong behavioural determinant to dictate preference or avoidance of certain foods, especially during illness and pregnancy.⁵⁵ The higher a mother's education level or socioeconomic status, the more likely these taboos influence behavior.

⁴⁸ Ruel, MT. 2003. Operationalizing dietary diversity: A review of measurement issues and research priorities. *Journal of Nutrition* 133:3911S-3926S. 2003

⁴⁹ FAO. 2011. Guidelines for measuring household and individual dietary diversity. Food and Agriculture Organization of the United Nations, Rome, Italy.

⁵⁰ World Food Programme (WFP). 2009. Comprehensive Food Security & Vulnerability Analysis Guidelines. United Nations World Food Programme, Rome, Italy.

⁵¹ Nutrition Division/Meeting Programming and Documentation Service, FAO, 2013 adapted from the International Symposium on Food and Nutrition Security: Food-based approaches for improving diets and raising levels of nutrition, FAO, 2010 (<http://www.fao.org/ag/humannutrition/24259-0306025ae307fac11c643947408a112d.pdf>).

⁵³ An Introduction to Nutrition-Agriculture Linkages. MINAG/DE Research Report 72E. Maputo, Mozambique: Directorate of Economics, Ministry of Agriculture. Chung, K. 2012. Available at: <http://fsg.afre.msu.edu/mozambique/WP72Chung.pdf>

⁵⁴ Dietary Diversity as a Measure of the Micronutrient Adequacy of Women's Diets in Resource-Poor Areas: Summary of Results from Five Sites. Arimond, Mary, et al. 2011 (http://www.fantaproject.org/downloads/pdfs/WDDP_Summary_Report_Jul2011.pdf)

⁵⁵ The Food System and Factors Affecting Household Food Security and Nutrition. The Food and Agricultural Organization of the United Nations. Available at: <http://www.fao.org/docrep/w0078e/w0078e04.htm>

The poorer the household, the more likely it is to have low food consumption. Not only do poorer households eat less, they also have a less diverse diet, consuming meat, fish, sugar and dairy products less regularly than their wealthier counterparts. For example, in Kenya, rising urban poverty drives food insecurity and malnutrition. Many of the urban poor resort to coping strategies such as restricting consumption, eating fewer or smaller meals and eating cheaper products.⁵⁶ In Kenya, higher income households consume more diverse meals compared to low-income households that have more restricted nutrient-poor diets (see Figure 3). In Ghana, poorer households have a less diverse diet, consuming meat, fish, sugar and dairy products less regularly than their wealthier counterparts.⁵⁷ In Sri Lanka, constraints to rice paddy production, livestock and fisheries result in low income and vulnerability to food insecurity.⁵⁸ Poor and food insecure households that rely on own household production for consumption often purchase food on the local market, making them highly vulnerable to food insecurity when food prices increase.

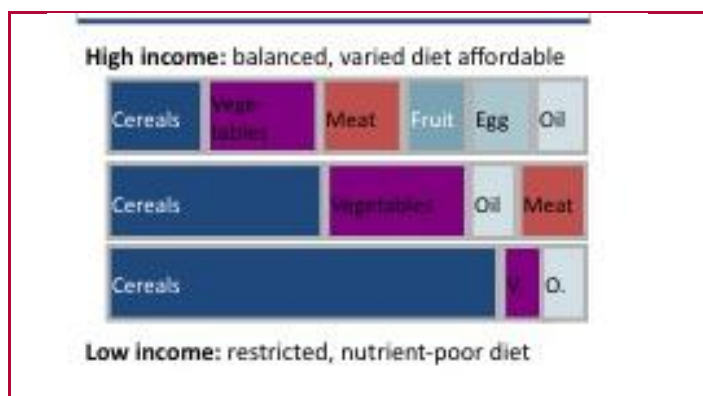


Figure 3: Kenya Diet per Income Group

Source: GAIN, FAO Statistics 2005–07; World Bank Indicators

⁵⁶ FEWSNet and Relief Web: <http://reliefweb.int/map/kenya/kenya-food-security-outlook-update-near-term-july-september-2014> and Comprehensive food security and vulnerability analysis (CFSVA) and nutrition assessment Kenya high density urban areas

⁵⁷ Comprehensive Food Security & Vulnerability, Analysis: Ghana. World Food Program, 2012.

⁵⁸ World Bank & Food Security in the Northern and Eastern Provinces of Sri Lanka. A Comprehensive Food Security Assessment Report . Sri Lanka 2012.

Disease

Malnutrition makes an individual more susceptible to disease contributing to loss of appetite, malabsorption or loss of nutrients. The countries analyzed in this landscape analysis demonstrated that diarrhea, acute respiratory infections, malaria, and HIV and AIDS are responsible for the majority of malnutrition cases caused by disease. Complications of seemingly minor illnesses are more common since malnutrition often affects the way infections manifest themselves. For example in Mozambique, high malaria rates and HIV infection (>11%) may mean that iron fortification and other efforts to alleviate malnutrition will not achieve its impact.⁵⁹ In Uganda, HIV and AIDS persists with high levels of risky behavior (e.g., multiple partners and decreased condom use) while child illness such as fever, diarrhea and acute respiratory infection are high, contributing to high rates of malnutrition.^{60 61} In Pakistan, malnutrition persists due to poor child health; immunization coverage is low where only 54% children age 12-23 months are fully vaccinated and children under 5, especially children 6-23 months of age have symptoms of an acute respiratory infection (ARI) such as rapid breathing- a proxy for pneumonia.⁶²

Many different types of infections (e.g., bacterial, viral, intestinal) make the body less able to absorb nutrients. Diarrhea is the most important infectious disease determinant of stunting of linear growth. More and more research is demonstrating that even if a child survives very early malnutrition, his or her risk of non-infectious diseases is higher later in life. For example, children who are malnourished in the first two years of life and put on weight rapidly later are at high risk of chronic diet-related diseases.⁶³ In Pakistan diarrhea is most common among children 6-11 months, and in Rwanda and Uganda among children 6-23 months of age— a period

⁵⁹ Report on the Millenium Development Goals (UNDP) – Republic of Mozambique 2010; UNICEF 2010; WHO 2010 & Mozambique – Nutrition Analysis. August, 2013. REACH, DHS 2003, MICS 2008 and DHS 2011

⁶⁰ ANC data and UAIS (2004/2005).

⁶¹ Countdown to 2015: Maternal, Newborn and Child Survival, 2013 & Uganda Demographic and Health Survey 2011

⁶² National Institute of Population Studies (NIPS) [Pakistan] and ICF International. 2013. Pakistan Demographic and Health Survey 2012-13. Islamabad, Pakistan, and Calverton, Maryland, USA: NIPS and ICF International.

⁶³ Black, Robert E., Lindsay H. Allen, and Juan Rivera (2008), “Maternal undernutrition,” *The Lancet*, 371 (9608): 243-260. [http://www.thelancet.com/journals/lancet/article/PIIS0140-6736\(07\)61690-0](http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(07)61690-0)

during which solid foods are first introduced into the child's diet.^{64 65 66}

In countries with high prevalence rates of malaria such as Malawi, Kenya, Tanzania, Uganda and Zambia, geographical areas endemic in malaria often correlates with high malnutrition rates. In Zambia, malaria is 14.9% prevalence, contributes to 16% cause of children under five deaths and prevalence correlates with provinces with high levels of stunting and severe anemia.^{67 68 69} In Uganda, malaria is responsible for more illness and death than any other disease, causing 13% of children under 5 death; however large-scale ownership and use of insecticide-treated bed nets by women and children contributes to progress against anemia and malnutrition (10% ITN coverage in 2001 and 62% in 2011).^{70 71} Malaria prevention in malaria endemic areas is also important to prevent malnutrition. In Rwanda, there has been much success with ITN coverage as 83% of households own at least one ITN contributing to decreasing stunting rates.⁷²

Infection with helminths or intestinal worms has been shown to have an adverse impact on the physical development of children and is associated with high levels of iron deficiency anemia and other nutritional deficiencies. Myanmar suffers from a high worm infestation—30.8% among children 6-59 months of age and 44.3% among pregnant women. Countries with lower rates of deworming such as Malawi (69%), Tanzania (64%) also experience malnutrition and anemia.⁷³

Unfortunately, HIV infection and poor nutrition often exist in tandem and the combination exacerbates both conditions. HIV infection increases the body's energy requirements while diminishing the body's ability to absorb nutrients. Countries with high HIV prevalence including Nigeria, Kenya and Tanzania often experience higher rates of malnutrition.

⁶⁴ Pakistan Demographic and Health Survey 2012-13.

⁶⁵ Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. Uganda Demographic and Health Survey 2011. Kampala, Uganda: UBOS and Calverton, Maryland: ICF International Inc.

⁶⁶ Rwanda Demographic and Health Survey, 2010.

⁶⁷ Countdown to 2015: Maternal, Newborn and Child Survival, 2013

⁶⁸ Zambia Demographic and Health Survey 2013-14. Preliminary Report. September 2014.

⁶⁹ Zambia National Malaria Indicator Survey 2012.

⁷⁰ Uganda Bureau of Statistics (UBOS) and ICF International Inc. 2012. Uganda Demographic and Health Survey 2011. Kampala, Uganda: UBOS and Calverton, Maryland: ICF International Inc.

⁷¹ Countdown to 2015: Maternal, Newborn and Child Survival, 2013

⁷² Rwanda Demographic and Health Survey, 2010.

⁷³ Tanzania Demographic and Health Survey 2010.

1.4 Underlying Causes of Malnutrition

There are many trends with the underlying causes of malnutrition including: household food insecurity, inadequate care and feeding practices, unhealthy household environment and inadequate health services.

Household Food Insecurity

Households are considered food secure when they have year-round access to the amount and variety of safe foods their members need to lead active and healthy lives. At the household level, food security refers to the ability of the household to secure, either from its own production or through purchases, adequate food for meeting the dietary needs of all members of the household.⁷⁴ Diet quality can be improved through both agricultural food production and consumption of local, diverse, nutrient-dense foods. Agriculture has the potential to improve nutrition through the production of food for consumption, the selling of food for income and through changes of food prices or the quality of foods available.⁷⁵

Household Food Insecurity: Availability & Access

Household food insecurity results from a lack of the availability or access to quality or the appropriate quantity of food mostly due to a lack of resources, such as income or agricultural inputs on the homestead. Food access and availability depends on many factors including domestic and household agricultural production, imports and exports, food stocks, seasonability of food security and food aid. The availability and accessibility of agricultural food products is due to a combination of factors including economic, social, environmental and gender issues.

Food availability is affected by the ability to produce enough quality, crops and the available agriculture inputs to increase the quality and diversity of food production yields. Diversification in agricultural food production at

the homestead can improve incomes while increasing the resilience of smallholder farmers. Nutrition Security can be achieved with access to adequate food through farm and non-farm household's own consumption or from food purchased in the markets (dependent on food prices).

As discussed in the dietary diversity section, most countries are dependent on monoculture farming resulting in poor quality diets that derive a high percentage of their calories from staple foods (cereals, roots and tubers). This is due to countries highly investing in cash crops and staple foods. For example, Bangladesh invests in rice and potatoes, Ghana yams and cassava, Malawi cassava and potatoes, Mozambique-cassava, Myanmar-rice, Nigeria- yams and cassava, Rwanda plantains and potatoes, Sri Lanka-rice, Uganda-plantains and cassava and Zambia maize as their top commodities.⁷⁶

Climate Change & Climate Change Mitigation

Climate change is defined as a set of alterations in the average weather caused by global warming, which is due to emissions of greenhouse gases. Climate change affects not only average surface temperature, but it also involves other physical modifications, such as changes in precipitations, intensity and frequency of storms, and the occurrence of droughts and floods.

Climate change mitigation⁷⁷ can contribute to more nutritious diets, enhanced livelihoods for farming communities and more resilient and sustainable farming systems. This includes:

- Animal practices, such as sustainable rangeland management practices
- Appropriate strategies to protect primary breeding stock
- Appropriate provision of fodder plants
- Appropriate feed (e.g., zero grazing and semi-zero grazing), and
- Nutritional supplements during times of stress.

Source: Market and Policy Driven Adaptation to Climate Change, Copenhagen Consensus 2012. Francesco Bosello, Carlo Carraro, Enrica De Cian.

Seasonal weather conditions and climate change can also increase the burden of shocks on livelihoods that in

⁷⁴ FAO

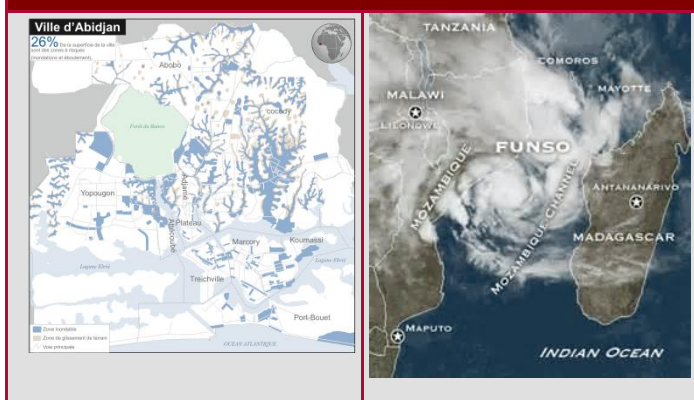
⁷⁵ Harris, J. Agriculture, Nutrition and Health Essentials for Non-Specialist Development Professionals. A follow-up paper to the 2020 Conference Leveraging Agriculture for Improving Nutrition and Health, Delhi 2011. International Food Policy Research Institute (IFPRI). April 2011. Available from: http://www.fsnnetwork.org/sites/default/files/2020_anh_essentials_jody_harris_m.pdf

⁷⁶ Food and Agriculture Organization of the United Nations. Statistics Division, 2012.

⁷⁷ World Watch Institute, 2011.

return affects food and nutrition security. For example, in Cote d'Ivoire every year during the rainy season the country suffers floods and landslides affecting crop outputs (see Table 2). Countries such as Malawi, Mozambique and Zambia depend on rain-fed agriculture affecting agriculture production during the dry seasons. Seasonality from 'shocks' such as peaks in food insecurity such as unpredictable harvests and/or epidemics of infectious diseases (for example diarrhea, TB), affects household food intake often leading to variable food prices and prolonged hunger gaps.^{78 79}

Table 2: Climate Change in Cote D'Ivoire & Mozambique⁸⁰



Every year during the rainy season, Cote D'Ivoire faces **floods and landslides**. Mozambique suffers from a variety of adverse climatic events such as drought, flood and cyclones.

Seasonal food insecurity, especially during the '*lean season*' when there are gaps in food availability, leads to the consumption of mainly staple foods.⁸¹ This is especially apparent in countries that depend on a

majority of their calories on staples such as Bangladesh (rice), Malawi (maize) and Zambia (maize). This lack of diet diversity often results in malnutrition— 'wasting' or sudden weight loss as well as stunting through prolonged food insecurity and micronutrient deficiencies. Reduced food availability and quality as well as increased female participation in the agricultural labor market results in poorer infant and young childcare and feeding practices.⁸² It is important to understand the lean season in each country when planning nutrition programs since they vary across and within countries and geographically within each country. Table 3 lists the common lean seasons in each of the fourteen countries.

Although seasonality is sometimes predictable such as during rainy season, it is often not. Climate change and unpredictable shocks and stresses such as floods, natural disasters or droughts make precise timing and impacts hard to predict.⁸³ For example, Mozambique suffers from multiple natural disasters including flooding, droughts and cyclones affecting food reserves, crops and fruit trees, producing acute food shortages. In Pakistan, continuing climate change threats include floods and tropical cyclones that cause constant food crises. Climate change, a long-term change in the earth's climate, or of a region on earth (e.g. extended rainy/monsoon seasons, abnormal weather conditions) can further exacerbate malnutrition as it can have a direct impact on multiple underlying causes of undernutrition, including food production, food prices, food security, health, caring practices, water and sanitation.⁸⁴ Climate change and seasonal variations in temperature and rainfall can increase disease incidence such as diarrhea that can further exacerbate malnutrition.⁸⁵

⁷⁸ Seasonality refers to any regular pattern or variation that is correlated with the seasons. Adverse seasonality describes the potentially damaging consequences for human well-being of seasonal fluctuations in the weather and the full range of its associated impacts on lives and livelihoods. Source: Seasonality: The Missing Piece of the Undernutrition Puzzle?. Action Against Hunger. December 2013. and Devereux, S., Sabates- Wheeler, R., Longhurst, R., (eds.) 2012 Seasonality Rural Livelihoods and Development. Earthscan: London.

⁷⁹ Hillbruner C, Egan R. Seasonality, Household Food Security, and Nutritional Status in Dinajpur, Bangladesh. Food Nutr Bull. 2008; 29:221–31. 2008. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/18947035>

⁸⁰ Ivory Coast: Areas at risk of flooding and cholera (June 2014). http://reliefweb.int/sites/reliefweb.int/files/resources/Cote%20d_Ivoire_Zones%20a%20risques%20d_inondations.pdf

⁸¹ Although no internationally recognised definition exists for 'hunger season' or 'lean season' there is a common understanding that it is a certain period of time of the year where people face challenges in terms of food insecurity.

⁸² Hillbruner C, Egan R. Seasonality, Household Food Security, and Nutritional Status in Dinajpur, Bangladesh. Food Nutr Bull. 2008; 29:221–31. 2008. Available from:

<http://www.ncbi.nlm.nih.gov/pubmed/1894703>

⁸³ Seasonality: The Missing Piece of the Undernutrition Puzzle? Action Against Hunger. December 2013. Available from:

<http://www.actionagainsthunger.org.uk/mediaroom/latest-news/seasonality-the-missing-piece-of-the-undernutrition-puzzle/>

⁸⁴ Who Cares About the Impact of Climate Change on Hunger and Malnutrition? ACF International. 2014. Available from:

http://dd0jh6c2fb2ci.cloudfront.net/sites/default/files/publications/Briefing_paper_Who_cares_about_the_impact_of_climate_change_on_hunger_and_malnutrition_03.2014.pdf

⁸⁵ Seasonality: The Missing Piece of the Undernutrition Puzzle? Action Against Hunger. December 2013. Available from:

<http://www.actionagainsthunger.org.uk/mediaroom/latest-news/seasonality-the-missing-piece-of-the-undernutrition-puzzle/>

Household Food Insecurity: Market Access

Household food insecurity also results from a lack of access to markets to buy affordable food and sell own food produced at a reasonable price. Most countries rural household food production is dominated by subsistence farming with limited access to local markets, leading to significant post-harvest losses. In addition, poor and food insecure households often purchase food on the local market, making them highly vulnerable to food insecurity when food prices increase. High food prices are a main driver of food shortages, regardless of location. Food insecure households are more vulnerable to high food prices - especially during the lean season when their own stocks have run dry. All fourteen countries have rural populations dependent on agricultural livelihoods whereas poor households simply cannot afford to access enough nutritious food during the lean season. Nigeria suffers a cyclical hungry season and urban households are more affected by price rises and ability to purchase food during the lean season. In Cote D'Ivoire, in some areas in the North-western and South-western parts of the country, food stocks are limited or exhausted resulting in an early lean season (April to August). The market is the primary mode of access for dairy products (98%), sugar (98%), legumes (86%) and, to a lesser degree, leaves and vegetables (48%).⁸⁶

It is important to remember that even if household food security is achieved, malnutrition may persist because of the poor intra-household distribution of food, unclean water, poor sanitation and hygiene and inappropriate care capacity and feeding practices discussed in the following section.

	January	February	March	April	May	June	July	August	September	October	November	December
Bangladesh												
Cote d'Ivoire												
Ghana-North												
Ghana South												
Kenya												
Malawi												
Mozambique												
Myanmar												
Nigeria, North												
Nigeria, South												
Pakistan												
Rwanda												
Sri Lanka												
Tanzania, Bimodal												
Tanzania, Unimodal												
Uganda												
Zambia												

⁸⁶ Ivory Coast Food Security Assessment in Emergencies April 2012 Data collected in January and February 2012.

Inadequate Care and Feeding Practices

The World Health Organization reported that inappropriate feeding in children is responsible for one-third of the cases of malnutrition.⁸⁷ Throughout the countries looked at, inadequate and poor care and feeding practices are a key underlying cause of malnutrition. Poor and inadequate care and feeding practices can result in children becoming vulnerable to malnutrition and the irreversible outcome of stunting. Stunting results from inadequate intake of food over a long period of time that may be worsened by poor care and feeding practices.⁸⁸ Stunted growth and development is attributable to a combination of household and family factors, especially inadequate *infant and young child feeding (IYCF) practices—especially exclusive breastfeeding⁸⁹ and complementary feeding.⁹⁰* Addressing *early initiation and continuation of breastfeeding and exclusive breastfeeding* from 0 to 6 months of age are critical for child survival and the prevention of infections.⁹¹ Optimal complementary feeding with nutrient-dense, micronutrient-rich foods is paramount for children under 2 years of age to support growth and development. In addition, increasing caregivers' feeding knowledge and practices can improve nutritional outcomes.

In terms of care and feeding practices, great variances were found across countries. For example, rates of exclusive breastfeeding vary across countries significantly—as low as 12.1% in Cote d'Ivoire and as high as 85% in Rwanda. Considerable variation exists with the highest rates in Rwanda (85%) and Sri Lanka (76%) and the lowest rates in Cote D'Ivoire (12%) and Nigeria (17%).^{92 93} Ironically, Cote D'Ivoire has poor infant and young child feeding practices, they have very low exclusive breastfeeding rates (12.1%) for children under 6 months of age, also local foods are introduced to babies far too early and are often poor in the nutrients,

yet still Cote D'Ivoires' stunting rates are lower than most other countries (29.6% in 2012).^{94 95}

Rwanda has a very high exclusive breastfeeding rate (85%⁹⁶) but still very high stunting; this may be attributed partially to late and poor complementary feeding habits. In Rwanda, complementary feeding is often started late, only 11 percent of Rwandan infants under 6 months receive complementary foods.⁹⁷ For breastfeeding children, liquids other than breast milk are introduced earlier than the recommended age of 6 months, often leading to poor nutrition and complementary feeding.⁹⁸ Initiation of breastfeeding and complementary feeding also varies, in Pakistan 18% of mothers initiate breastfeeding within the first hour of life and in Malawi it is as high as 95% of mothers.^{99 100}

Complementary feeding for infants 6-23 months of age—including a wide variety of practices and dietary choices is one of the central pillars supporting healthy growth and development and recognized as the weakest link among the infant and young child feeding interventions for healthy growth.¹⁰¹ Unlike breastfeeding, appropriate complementary feeding encompasses a wide array of practices and dietary choices.¹⁰² In terms of complementary foods, quality and diversity is a major factor in success. For example, in Ghana, few children consuming quality foods (and/or low quantities) such as meat, legumes, red palm oil, fruits, vegetables and dairy, limiting their nutrient intake.¹⁰³ In Malawi, complementary feeding remains poor, whereas 19% of children under 6 months are already consuming solid or mushy foods, and when food is introduced infants are fed mostly starchy staple grains.¹⁰⁴ In Sri Lanka, for many breastfeeding children, liquids other than breast milk are introduced earlier than the recommended age of 6 months, and 30% of breastfed children age 4-5 months receive complementary foods.¹⁰⁵ Bangladesh has documented recent improvements for improved and

⁸⁷ Zhou H., Wang XL, Ye F, Zeng XL, Wang Y. Relationship between child feeding practices and malnutrition in 7 remote and poor counties, P R China. *Asia Pac J Clin Nutr.* 2012;21(2):234-40.

⁸⁸ Darteh et al. *BMC Public Health* 2014, 14:504. <http://www.biomedcentral.com/1471-2458/14/504>

⁸⁹ Exclusive breastfeeding is the practice of giving an infant only breastmilk and no other food or fluids, not even water, with the exception of supplements or medicines that are prescribed by a doctor.

⁹⁰ Complementary feeding is the act of giving semi-solid or solid foods in addition to breastmilk to a child.

⁹¹ Bhutta Z, Ahmed T, Black R, Cousens S, Dewey K, Giugliani E, Haider B, Kirkwood B, Morris S, Sachdev H, Shekar M. (2008). What Works? Interventions for Maternal and Child Undernutrition and Survival. *Lancet*, 371, 417-440.

⁹² Nigeria: DHS 2013

⁹³ Sri Lanka DHS, 2006-07.

⁹⁴ Cote D'Ivoire Demographic and Health Survey, 2012.

⁹⁵ Ghana Demographic and Health Survey 2012.

⁹⁶ Rwanda Demographic and Health Survey, 2010.

⁹⁷ Rwanda Demographic and Health Survey, 2010.

⁹⁸ Rwanda Demographic and Health Survey, 2010.

⁹⁹ Pakistan National Nutrition Survey (NNS) 2011.

¹⁰⁰ Malawi DHS 2010.

¹⁰¹

<http://onlinelibrary.wiley.com/store/10.1111/mcn.12088/asset/mcn12088.pdf?v=1&t=i56u84rt&s=2dcf4aaefe133ae0dc19ea3eee6edd3ec826e328>

¹⁰² (PAHO/WHO 2003; WHO 2005).

¹⁰³ Optifood and FES study results for Infants and Young Children among Farming Families in Ghana and Kenya. GAIN.

¹⁰⁴ Malawi DHS 2010.

¹⁰⁵ Sri Lanka DHS 2006-7.

timely breastfeeding practices and complementary feeding with continued breastfeeding.¹⁰⁶ Breastfeeding is nearly universal in Bangladesh, as 90% of children are breastfed until age 2, as recommended. There has been a dramatic increase in the level of exclusive breastfeeding between 2007 and 2011, and the reasons are still unclear about how this improved with possible attributions to intensive mass media campaigns on IYCF.¹⁰⁷ However, complementary foods are not introduced in a timely fashion for all children as only 67% of breastfed children age 6-9 months receive complementary foods in Bangladesh.¹⁰⁸

Countries are facing challenges with feeding practices during diarrhea, further exacerbating the problem as in Pakistan (36%) and in Malawi (44%) caregivers offer less or much less liquids to children when they have diarrhea. In Nigeria, appropriate treatment of diarrhea is still very low despite some improvement over the last decade, only 38% of children with diarrhea were treated with oral rehydration therapy.¹⁰⁹

Inadequate Caring Practices: Early and Child Marriage

Early and child marriage contribute to poor birth spacing, high fertility and more likely chance of entering the intergenerational cycle of malnutrition. Intergenerational growth failure is a cycle of poor nutrition that perpetuates itself across generations. Growth faltering earlier in life leaves women permanently at risk of obstetric complications and delivering low birth weight babies. Malnourished mothers also face higher mortality and disease rates, impaired mental and physical development and increased risk of adult chronic diseases. Stunted children with inadequate food, poor health and care become stunted adolescents, and these stunted girls may become the next generation of malnourished mothers. Adolescent pregnancy heightens the risk of low birth weight and the difficulty of breaking the cycle. Mozambique has one of the world's highest rates of child marriage— 14 percent of young women aged 20-24 had been married before the age of 15 and 48 percent before the age of 18.¹¹⁰ Child marriage is also

high in Sri Lanka, 2% child marriage (by 15 years of age) and 12% of children married by 18 years of age¹¹¹

Unhealthy Household Environment: Water, Sanitation and Hygiene (WASH)

Water, sanitation and hygiene (WASH) practices are linked to overall health and nutritional status. A poor health environment with inadequate access to clean water and unsafe sanitation and hygiene practices increases the risk of enteric diseases that indirectly cause malnutrition.¹¹² The combination of access to a safe water supply, correct and consistent use of a hygienic sanitation facility and hand washing with soap at critical moments reduces the incidence of infant diarrhea and may prevent the onset of environmental enteric dysfunction preventing malnutrition.¹¹³ Evidence demonstrates positive health benefits for children living in households that have stopped defecating in the open including breaking down the fecal-oral transmission cycle of disease. Open defecation rates are an important predictor of height in developing countries, revealing the direct benefits of eliminating open defecation.¹¹⁴ ¹¹⁵ Open defecation is a serious problem in India (48%), Mozambique (40%), Ghana (19%) Cote D'Ivoire (28%) and Zambia (43%).¹¹⁶ These countries, with the exception of Zambia also have low use of improved sanitation. Encouraging the use of improved latrines can help prevent malnutrition. Kenya (70%), Malawi (90%), Tanzania (88%) and Uganda (66%) also have high percentages of using unimproved sanitation facilities. Many countries, such as India, Pakistan, Cote D'Ivoire, Mozambique and Tanzania have significant differences in urban versus rural improved sanitation, suggesting

¹¹¹ UNICEF State of the World 2014. Available from:

<http://www.unicef.org/sowc2014/numbers/>

¹¹² United Nations Children's Fund (UNICEF), 1990. Available from: <http://www.unicef.org/>

¹¹³ Critical moments include: 1. Before cooking and preparing foods or complementary foods; 2. After using the toilet, especially after defecation; 3. After cleaning a child's bottom or safely disposing of children's feces; 4. Before eating or before feeding an infant/child (including before breastfeeding); 5. After house or animal chores.

¹¹⁴ Spears, D., How Much International Variation in Child Height Can Sanitation Explain? Policy Research Working Paper. no. WSP 6351.2013. Available from: http://www.princeton.edu/rpds/papers/Spears_Height_and_Sanitation.pdf

¹¹⁵ Andres, LA, Brice, B, Chase, C and Echenique, JA. Sanitation and Externalities: Evidence from Early Childhood Health in Rural India. The World Bank. South Asia Region. Sustainable Development Unit & Sustainable Development Network, Water and Sanitation Program. January 2014. Available from:

http://www.unicef.org/cambodia/19061_19072.html

¹¹⁶ Joint Monitoring Programme for Water Supply and Sanitation, Estimated on the Source and use of Water Sources and Sanitation Facilities, Updated April 2014,

¹⁰⁶ Alive & Thrive. Getting Strategic With Interpersonal Communication: Improving Feeding Practices in Bangladesh. Washington, D.C., USA: Alive & Thrive, 2014.

¹⁰⁷ Alive and Thrive Bangladesh, IFPRI.

¹⁰⁸ Alive and Thrive Bangladesh, IFPRI.

¹⁰⁹ Nigeria Countdown to 2015: Maternal, Newborn and Child Survival, 2013 and Nigeria DHS 2013. Available from :

<http://www.countdown2015mnch.org/country-profiles/nigeria>

¹¹⁰ Mozambique DHS 2011.

that it is much more difficult to access improved sanitation in rural areas.

Kenya (38%), Mozambique (51%), Nigeria (36%), Rwanda (29.3%), and Tanzania (47%) have a high percentage of the population using unimproved drinking water sources. Sri Lanka, on the other hand, enjoys a high percentage of people who have access to improved drinking water (82.9%) and improved sanitation (92%) but still suffers from high malnutrition. Safe disposal of child feces and use of latrines for children under 5 years of age has often been overlooked as contributing to malnutrition but countries that put/rinsed into drain or ditch or leave it in the open suffer higher rates of stunting.¹¹⁷ Many countries have a high percentages of the population that do not use soap while washing their hands especially Mozambique, Nigeria and Ghana. Most countries households don't have a hand washing station and if they do it is a temporary structure that does not get used.

Inadequate Health Services: Unhealthy Household Environment: Access to Health Services: Barriers to Health Services

Access to health care is a key priority for improving a country's overall health status. If women cannot access quality antenatal care (ANC) services in the first place or have barriers to attend ANC, it increases the chance that the woman and her baby will not be linked to the formal health system, resulting in poor health and nutritional outcomes. When pregnant women are not linked to the formal health system they fail to attend growth monitoring and immunize their children and do not get the counseling they need resulting in poor eating habits and poor care and feeding practices. Good antenatal care and essential nutrition counseling during pregnancy is important for the health of the mother and the development of the unborn baby during the first 1,000 days and increases the chance of using a skilled attendant at birth. Pregnancy is a crucial time to promote healthy behaviors, caring and feeding practices and parenting skills. The underlying barriers for ANC attendance and access to health services need to be addressed to improve health outcomes. Inadequate care during this time breaks a critical link in the continuum of care, and affects both women and babies.

¹¹⁷ Kothari, Monica T., Noureddine Abderrahim, Amanda Coile, and Yuan Cheng. 2014. Nutritional Status of Women and Children. Rockville, Maryland, USA: ICF International.

The main barriers to accessing health care across countries include lack of money, long distances to health facilities and not wanting to go alone. In Cote D' Ivoire (76%), Pakistan (66%), and Zambia (74%) women reported the most problems accessing health care.^{118 119}

¹²⁰ One of the biggest barriers to women accessing healthcare are financial barriers especially in Cote D Ivoire (67%), Ghana (45.1%), Nigeria (42%), Rwanda (53%), and Uganda (49%). Long distances to health facilities, especially in rural areas, poses a great physical barrier to accessing health services especially in Cote D Ivoire (40%), Kenya (75%), Uganda (41%), and Zambia (41%). Seventy five percent of Kenyans lives in rural areas and where physical barriers pose a challenge to health care delivery. Another significant barrier to accessing healthcare are women not wanting to go alone, especially in Pakistan (51%), Ghana (18.4%), Rwanda (17%) and Uganda (22%).^{121 122} Other factors, such as a women's attitudes towards wife beating-an indicator of violence against women could act as a barrier to accessing health care for women themselves and their children, affect their attitude toward contraceptive use, and impact their general wellbeing.¹²³ In Sri Lanka, over 53% of women justify wife beating.¹²⁴ A women's ability to make decisions about their own health care is an important factor to be able to access to health services; in Bangladesh 30% of married women report that their husbands are the main decision makers for decisions about their health care, major household purchases, and visits to family members or relatives.¹²⁵

¹¹⁸ Zambia Demographic and Health Survey, 2007.

¹¹⁹ Cote D Ivoire Demographic and Health Survey, 2011-2012; Photo credits: www.who.int

¹²⁰ National Institute of Population Studies (NIPS) [Pakistan] and ICF International. 2013. Pakistan Demographic and Health Survey 2012-13. Islamabad, Pakistan, and Calverton, Maryland, USA: NIPS and ICF International.

¹²¹ Rwanda Demographic and Health Survey, 2010.

¹²² Ghana Demographic and Health Survey, 2008.

¹²³ Women who believe that a husband is justified in hitting or beating his wife for any of the specific reasons may believe themselves to be low in status both absolutely and relative to men.

¹²⁴ UNICEF State of the World 2014. Available from: <http://www.unicef.org/sowc2014/numbers/>

¹²⁵ Bangladesh Demographic and Health Survey, 2011.

1.5 Country Snapshots: Geographic Variations

Nigeria

In Nigeria 37% of children under age 5 are stunted, 18% are wasted, and 29% are underweight (2013).¹²⁶ Over half the regions have prevalence of stunting above the national average—especially in the north. There are emergency wasting levels in the entire country (<10%); the North West, followed by North East and North Central have the highest wasting rates. A number of factors may contribute to this regional variation for increased malnutrition the north including **higher fertility rates, teen pregnancies** in the Northern region and **lower ANC coverage, lower use of family planning methods, lower participation of women in household decision-making** and **longer distances to health facilities**.

Fertility rates are highest in North West Zone, where women have an average of 6.7 children. Nearly 23% of adolescent women age 15-19 are already mothers or pregnant with their first child—with the North West Zone having the highest adolescent fertility rate (36%). Use of family planning methods vary by residence and zone while less use contraceptives in the northern zones. ANC coverage varies by zone and it is only about 40% in the North West Zone compared to 91% in South East Zone. Women's decision-making varies by region as just 12% of women in North West Zone participate in all three decisions, compared to more than 60% of women in South West Zone.

Ghana

Ghana has a well-developed health system, but it faces critical bottlenecks.¹²⁷ Policies and plans are in place, and innovative reforms are underway. However, in some cases, standards have not been established; in others, implementation is weak and variable along geographical lines.¹²⁸ Access to healthcare is uneven and is skewed in favor of urban instead of rural areas, and hospitals

instead of clinics. Child stunting for children under 5 is 23% nationally in Ghana—but it is higher in the Northern (37.4%), Central (23.1%) and Upper East (31.5%) regions reflecting different wealth quintiles.¹²⁹ Acute and chronic malnutrition have different geographic correlations as acute malnutrition focuses on the northern regions. Ghana suffers from both acute and seasonal food insecurity affecting short term wasting and underweight. Lack of dietary diversity affects diet quality—most Ghanaians, regardless of location or wealth eat a similar diet consisting of staple foods, some vegetables and oil, and little else.¹³⁰ Poor and food insecure households often purchase food on the local market, making them highly vulnerable to food insecurity when food prices increase. In terms of water, sanitation and hygiene (WASH) 17.5% of the total population and 28.6% of the rural population are with unimproved (unsafe) drinking water.¹³¹ A striking 85.6% of the population still uses unimproved sanitation and while 28% of the population are still practices open defecation.¹³²

Mozambique

In Mozambique there has been a slight improvement in stunting rates over the last 5 years, however the prevalence of stunting varies across the country though is particularly high in the Northern areas of Mozambique. Nationally, 43% of children under age 5 are stunted. In Northern Mozambique prevalence ranges from 42%-55%. Stunting rates are higher in rural areas (47% vs. 35%) and in boys (47% vs. 40%). The absolute number of stunted children varies widely. Considering that the vast majority of Mozambicans live in rural areas, reductions in stunting need to be addressed in rural areas.

¹²⁶ National Population Commission (NPC) [Nigeria] and ICF International. 2014. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International.

¹²⁷ Saleh (The World Bank) The Health Sector in Ghana: A Comprehensive Assessment (2013)

¹²⁸ Saleh (The World Bank) The Health Sector in Ghana: A Comprehensive Assessment (2013)

¹²⁹ MICS, 2011.

¹³⁰ Comprehensive Food Security and Vulnerability Analysis (CFSVA). And National Rice Development Strategy (NRDS) for Ghana, 2012.

¹³¹ Joint Monitoring Programme for Water Supply and Sanitation, Estimated on the Source and use of Water Sources and Sanitation Facilities, Updated April 2014

¹³² Joint Monitoring Programme for Water Supply and Sanitation, Estimated on the Source and use of Water Sources and Sanitation Facilities, Updated April 2014.

1.6 Conclusion

There are several nutrition trends which remain consistent across countries. While the rate of stunting amongst children under five has declined in many countries, it still remains persistently high in most cases. Similarly rates of anemia and other micronutrient deficiencies remain high in women of reproductive age and children.

However, despite the fact that general trends may be consistent across countries, looking within countries has revealed a more diverse picture. Several determinants within countries mean that there are dramatic regional differences in income levels, food security, stunting, ICYF practices etc. all of which may have an impact on the nutrition situation. For example, anemia may remain high amongst urban dwellers even compared to their rural counterparts despite the fact that they have greater access to commodities such as fortified foods and iodised salt (affordability may affect consumption). Although stunting is typically higher in rural areas this may not necessarily align with areas of food insecurity but rather with regions having lower socioeconomic status. Examining the situation in each country reveals unique trends, dictated by unique determinants. This has been particularly important to consider at the outset when designing the mNutrition project as there are very specific determinants that must be considered when creating specific messages for specific subsets of the population.

ANNEX 1: TOP FOOD COMMODITY PRODUCTION AND STAPLE FOOD PRODUCTION

Bangladesh	Cote d'Ivoire	Ghana	Kenya	Malawi	Mozambique	Myanmar	Nigeria	Pakistan	Rwanda	Sri Lanka	Tanzania	Uganda	Zambia
1.Rice, paddy	1.Cocoa Beans	1.Yams	1.Mangoes, mangosteens, guavas	1. Cassava	1.Cassava	1.Rice, paddy	1.Yams	1.Milk, whole fresh buffalo	1.Plantains	1.Rice, paddy	1.Meat indigenous, cattle	1.Plantains	1.Maize
2.Potatoes	2.Yams	2.Cassava	2.Milk, whole fresh cow	2. Potatoes	2.Meat indigenous, pig	2.Meat indigenous, chicken	2.Cassava	2.Milk, whole fresh cow	2.Potatoes	2.Tea	2.Bananas	2.Cassava	2.Meat indigenous, cattle
3.Milk, whole fresh goat	3.Cashew nuts, with shells	3.Cocoa, beans	3.Meat indigenous, cattle	3. Maize	3.Beans, dry	3.Beans, dry	3.Fruit, citrus nes	3.Wheat	3.Cassava	3.Coconuts	3.Beans, dry	3.Meat indigenous, cattle	3.Cassava
4.Mangoes, mangosteen, guavas	4.Plantains	4.Plantains	4.Maize	4. Tobacco, unmanufa	4.Bananas	4.Meat indigenous, pig	4.Rice, paddy and	4.Cotton lint	4.Beans, dry	4.Rubber, natural	4.Maize	4.Milk, whole fresh cow	4.Sugar cane

Table 3: Top Food Commodity Production (2012) and Staple Food Production

Bangladesh	Cote d'Ivoire	Ghana	Kenya	Malawi	Mozambique	Myanmar	Nigeria	Pakistan	Rwanda	Sri Lanka	Tanzania	Uganda	Zambia
				ctured									
5. Meat indigenous, cattle	5. Meat, game	5. Taro (cocoyam)	5. Potatoes	5. Ground nuts, with shell	5. Cotton lint	5. Vegetables, fresh nes	5. Groundnuts, with shell	5. Rice, paddy	5. Avocados	5. Meat indigenous, chicken	5. Milk, whole fresh cow	5. Maize	5. Cotton lint
6. Meat indigenous, goat	6. Rubber, natural	6. Maize	6. Tea	6. Pigeon peas	6. Pulses	6. Meat indigenous, cattle		6. Meat indigenous, buffalo	6. Meat indigenous, cattle	6. Plantains	6. Cassava	6. Beans, dry	6. Tobacco, unmanufactured
7. Jute	7. Cassava	7. Groundnuts, with shell	7. Bananas	7. Bananas	7. Sugar cane	7. Groundnuts, with shell		7. Meat indigenous, cattle	7. Maize	7. Milk, whole fresh cow	7. Rice, paddy	7. Sweet potatoes	7. Meat, game
8. Fruit, tropical fresh nes	8. Rice, paddy	8. Meat, game	8. Beans, dry	8. Beans, dry	8. Tomatoes	8. Fruit, fresh nes		8. Sugar cane	8. Sweet potatoes	8. Areca nuts	8. Groundnuts, with shell	8. Coffee, green	8. Vegetables, fresh
9. Milk, whole fresh cow	9. Palm Oil	9. Rice, paddy	9. Milk, whole fresh camel	9. Meat indigenous, cattle	9. Maize	9. Pigeon peas		9. Mangoes, mangosteens, guavas	9. Milk, whole fresh cow	9. Meat indigenous, cattle	9. Vegetables, fresh	9. Meat indigenous, pig	9. Meat indigenous, chicken
10. Vegetables, fresh nes	10. Cotton lint	10. Oranges	10. Sugar cane	10. Cotton lint	10. Tobacco, unmanufactured	10. Sesame seed		10. Meat indigenous, chicken	10. Tomatoes	10. Eggs, hen, in shell	10. Sunflower seed	10. Vegetables, fresh nes	10. Cottonseed
2	4	5	2	3	3	1		2	5	2	3	3	2

ANNEX 2: KEY MALNUTRITION INDICATORS TO MEASURE PROGRESS

Table 4: Key Indicators to Measure Progress Against Malnutrition

Nutritional Impact- Immediate	Stunting	Stunting among children 0-59 months of age
	Wasting	GAM prevalence among children 0-59 months of age SAM prevalence among children 0-59 months of age
	Vitamin A Deficiency	Children 6-59 months of age with Vitamin A deficiency
	Underweight	Underweight among children 0-59 months of age
	Iron Deficiency Anemia	Children 6-59 months of age with anemia Women 15-49 years of age with anemia
	Iodine Deficiency Disorder	School-aged children with iodine deficiency disorders
Underlying Causes	Food Security	Households with poor or borderline food consumption Global Hunger Index Score Rank (2013)
	Health & Sanitation	Under 5 years mortality rate (per 1,000 live births)
		Women 15-49 years with problems accessing health care
		Household access to an improved water source
	Care and Feeding Practices	Household access to improved sanitation
		Exclusive Breastfeeding of children until 6 months of age
		Timely initiation of breastfeeding (within the first hour)
Education	Children left in inadequate care 2005–2012	
	Females that completed primary school or higher	
Basic	Population	Total Fertility Rate
	Gender	Women's intra-household decision-making
	Poverty	Population living under the national poverty line

Source: Adapted from United Nations Renewed Efforts Against Child Hunger and undernutrition (REACH)

ANNEX 4: AGRICULTURE- NUTRITION IMPACT PATHWAYS

Table 6: Agriculture-Nutrition Impact Pathways	
Agriculture Food Production & Consumption	
Pathway 1*	Agriculture as a Source of Food: Food Production for Own Consumption (Direct)
Pathway 2	Agriculture as a Source of Income: Agriculture Production –Increased Income—Food Expenditure
Pathway 3	Agriculture and Food Prices affecting Purchasing Power and Food Consumption Patterns
Agriculture Food Production & Non-Food Expenditure	
Pathway 4	Agriculture Income Spending: Non-Food Expenditure- relating to Health & Nutrition
Women's Empowerment & Gender Equality (Strong Evidence)	
Pathway 5*	Women's Status, Access & Control over Resources
Pathway 6*	Women's Time Use, Knowledge & Care Capacity
Pathway 7*	Women's Nutrition and Health
Macroeconomic Growth (Indirect-Modest Effect)	
Pathway 8	Macroeconomic Growth through Agricultural Productivity (Indirect)
<i>Source: Adapted from several documents that analyzed the agriculture-nutrition impact pathways. (*) Indicates the most direct pathways with the strongest evidence according to the World Bank, 2013.</i>	