

An Evaluation of Progress Toward the Millennium Development Goal One Hunger Target: A country-level, food and nutrition security perspective

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EXECUTIVE SUMMARY

One of the targets of the first Millennium Development Goal (MDG) is to reduce the proportion of people who suffer from hunger by half between 1990 and 2015, with hunger measured as the proportion of the population who are undernourished and the prevalence of children under five who are underweight. Many countries remain far from reaching this target, and much of the progress made has been eroded by the recent global food price and economic crises. As we enter the final five years to achieve the MDGs, we look upon one of the greatest challenges of our time with one billion people hungry, 129 million and 195 million children underweight and stunted respectively and more than 2 billion people deficient in micronutrients.

In light of these global trends, this report charts progress on the hunger component of the MDG 1 commitment, by reviewing country programs and policies and drawing attention to key lessons and future directions for the coming period. Case studies of programs and interventions within countries were reviewed, where the implementation and operational systems required to support reductions in hunger and undernutrition have the potential to shed light on what success and scale might look like.

A number of types of programs were profiled, including prevention- and treatment-based initiatives, food production interventions, multi-sectoral programs, and safety net and food assistance approaches. The report examined both small-scale community based programs as well as efforts to move interventions to national scale.

The strongest lesson emerging from both community-based and national efforts is that making rapid gains in reducing hunger and undernutrition is possible. There is little debate about the technical and scientific evidence underpinning interventions. We know what works. The challenge is integrating the delivery of these interventions within locally owned, locally appropriate systems that facilitate high levels of cost-effective coverage on a sustained basis, with substantive and prioritized financial commitment at the

national and international levels. Many of the case studies presented have found innovative ways to overcome historical barriers to implementation – from household-level delivery systems, to subsidies for small holder farmers, to linking efforts to reduce hunger with wider efforts to empower women or create work and business opportunities.

Evidence from the case studies also suggest that increasing economic growth alone, while necessary and important, is unlikely to be sufficient to address hunger and undernutrition. Food and nutrition security is complex, and requires efforts across a spectrum that includes enhancing food production while simultaneously increasing access and utilization with substantive political commitment to address the most vulnerable populations with an equitable, basic human rights lens approach (11).

Finally, addressing hunger and undernutrition are inextricably linked to wider progress towards other MDG targets. They are both cause and consequence of gains in health, income, education, gender equality and the environment. A comprehensive approach to addressing hunger and nutrition will therefore require working on multiple fronts. While there may be no magic bullet or single recipe for success, the case studies highlighted in this report help us to understand what success might look like as we together define a future direction for 2015.

INTRODUCTION

“We have the means, we have the capacity, to eliminate hunger from the face of the earth in our lifetime. We need only the will.” -- John F. Kennedy, 1963

At the World Summit on Food Security in 2009, global leaders pledged to renew efforts to achieve the first Millennium Development Goal (MDG) of halving hunger by 2015 (13). This renewed commitment is welcome but may not be enough, as over the past decade both the political will and resources to comprehensively address this component of MDG 1 have largely been insufficient (11) 14) (15). As a result over one billion people are hungry, 200 million children are stunted and more than 2 billion people suffer from micronutrient deficiencies (16, 17).

In September 2010, world leaders are coming together at the UN General Assembly to evaluate progress towards the MDGs, examine what has been working and what has not, and reaffirm their common commitment towards the 2015 targets. The aim of this report is to inform these discussions, and review the most up-to-date information on developing country progress towards the hunger component of the first MDG (18). The specific objectives are to:

1. Provide an overview of the current global hunger and undernutrition landscape;
2. Describe the limitations of the MDG1 hunger target indicators;
3. Evaluate the current progress towards the MDG1 hunger target at the global, regional and country levels;
4. Analyze country specific progress towards the MDG1 through a series of case studies;
5. Review the policy environment in which reductions in hunger and undernutrition could be achieved; and
6. Summarize the key lessons, and future recommendations that could lead to accelerated progress towards the MDG1 hunger target.

I. THE GLOBAL HUNGER AND UNDERNUTRITION LANDSCAPE

The MDG1 hunger target and global influences on progress

At the Millennium Summit in September 2000 the largest gathering of world leaders in history adopted the UN Millennium Declaration, committing their nations to a bold global partnership to reduce extreme poverty and to address a series of time-bound health and development targets (19). Among these MDGs is a commitment to reduce the proportion of people who suffer from hunger by half between 1990 and 2015 (18). In 2010, many countries remain far from reaching this target, and ensuring global food security persists as one of the greatest challenges of our time. In the developing world, reductions in hunger witnessed during the 1990's have recently been eroded by the global food price and economic crises (20), which together added 105 million to the ranks of the hungry since 2008 (21).

Hunger, nutrition and the food security mandate

What does it mean to be hungry? The MDG1 hunger target is defined by two indicators however both are not sufficient in providing the complete picture of the determinants of hunger. In its common usage, hunger describes the subjective feeling of discomfort that follows a period without eating (22); however even temporary periods of hunger can be debilitating to longer term human growth and development (23). *Acute hunger* is when lack of food is short term and is often caused by shocks, whereas *chronic hunger* is a constant or recurrent lack of food (24). The term *undernourishment* defines insufficient food intake to continuously meet dietary energy requirements (21) with FAO further defining hunger as the consumption of less than 1600-2000 calories per day. The concept of food security goes beyond caloric intake and addresses both hunger and undernutrition. Reducing levels of *hunger* places the emphasis on the quantity of food, and refers to ensuring a minimum caloric intake is met. Conversely, ensuring adequate *nutrition* refers to a diet's quality. A diet rich in proteins, essential fatty acids, and micronutrients has been proven to improve birth weight, growth, and cognitive development while leading to lower levels of child mortality (25) (26) (27, 28) (29, 30). A lack of these essential vitamins and minerals often results in "hidden hunger" where the signs of malnutrition and hunger are less visible in the immediate sense.

WHAT DOES IT MEAN TO HAVE ENOUGH TO EAT?

The definition of food security set out at the 1996 World Food Summit stated that "*food security exists when all people at all times have both physical and economic access to sufficient food to meet their dietary needs for a productive and healthy life*" (1) (4).

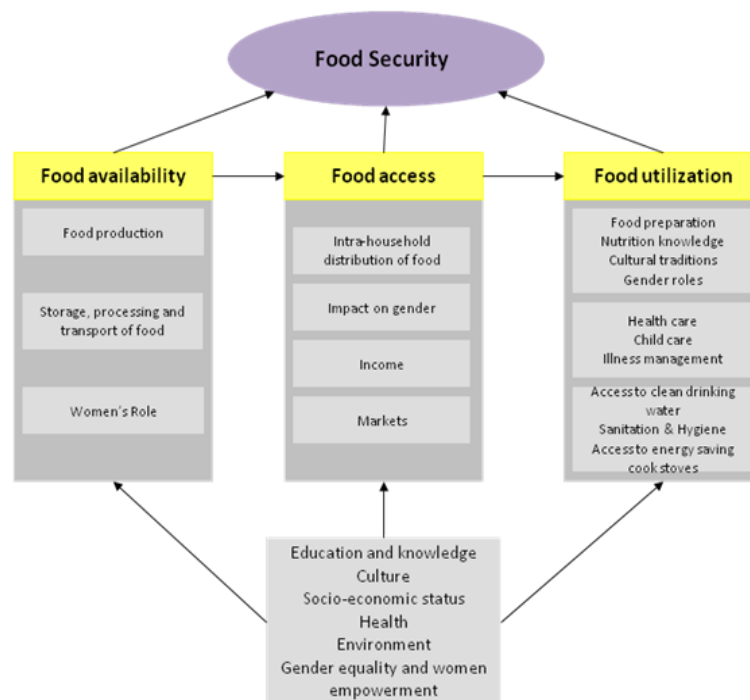
The achievement of food security depends upon three distinct but interrelated processes. The first is *food availability*, which refers to ensuring sufficient quantity and diversity of food is available for consumption from the farm, the marketplace or elsewhere. Second, *food access* refers to households having the physical and financial resources required to obtain these foods. Third, *food utilization* implies the capacity and resources necessary to use food appropriately to support healthy diets. This might include access to potable drinking water and adequate sanitation, knowledge of food preparation and the basic principles of good nutrition, proper child care and illness management, and so forth (1). Most precisely, the concept of 'nutrition security' has been defined as "having adequate protein, energy, vitamins, and minerals for all household members at all times" (31).

For many years, food security has been simply equated with enhancing the availability of food, and was linked to innovations in agricultural production. In many developing countries, agriculture remains the backbone of the rural economy. Increasing agricultural outputs impacts economic growth by enhancing farm productivity and food availability (32), while providing an economic and employment buffer during times of crisis (21). In the 1970s and 80s, large investments in agriculture, technology, roads and irrigation led to major improvements in food production, particularly in Asia and Latin America. During this period the

proportion of official development assistance devoted towards agriculture peaked at 15-20% (21). Over the past decade, decreasing levels of agriculture aid and investment, particularly the dismantling of input, credit and market subsidies, reduced public support to research and extension, and declining infrastructure investments have been linked to rising numbers of people being undernourished (21). The reverse relationship has also been suggested, with hunger and undernourishment carrying substantive economic and social costs with reduced labor productivity, investment in human capital, and escalating poverty (33) (34) (35).

While food availability is clearly important to achieving food security, having the means to effectively access and utilize food remains central to good nutrition. This wider focus is important. There is a growing recognition that food security must be viewed as inseparable from the other MDGs – and that addressing poverty, education, health and basic infrastructure are also critical. This interdependence is illustrated in **Figure 1** (36) which makes the point that achieving sustainable gains in reducing hunger and undernutrition, and improving food security, will depend fully on concerted and synergistic efforts on a number of fronts.

Figure 1: The Determinants of Food Security (36)



The global challenge and the roadmaps

There is clearly much progress to be made in addressing both hunger and undernutrition with an 11% contribution to the global burden of disease (30). As of 2009, one billion people are hungry, and 129 and 195 million children under five years of age are underweight and stunted respectively, with 90% of these children living in just 36 countries (30) (37) (17). Vitamin A and zinc deficiency alone contribute to over half a million child deaths annually – both of which are amenable to simple, effective and low-cost interventions (30). Iron deficiency among pregnant women and children has major implications on cognitive function and productivity (30). Suboptimal breastfeeding in the first 6 months of a baby's life results in 1.4 million deaths per year (30) and in the developing world, less than 40% of infants under 6 months are exclusively

breastfed (17). Optimal infant and young child feeding, which includes exclusive breastfeeding for 6 months and continued breastfeeding with the timely introduction of adequate complementary food to at least two years, has a significant impact on under five child mortality and stunting (30).

It is a global tragedy that humans still suffer from hunger and the figure of 1 billion people seems incomprehensible (11, 14). With just five years remaining to achieve the MDGs, a renewed roadmap to guide and accelerate progress is urgently required. Two recent task forces have attempted to outline a global strategy for ending hunger. The first was the UN Millennium Project Hunger Task Force, which in 2004 laid out a series of priorities for ending hunger that included: the fundamental role of political commitment and sound policy; the importance of supporting agriculture productivity and rural incomes; the need to address both acute and chronic undernutrition, and; restoration and conservation of the natural resources essential for food security (22). The second was the Irish Task Force, which was established by Irish Aid in 2005. Its recommendations echoed and reinforced those of the Millennium Project, by suggesting the following priorities: increasing the productivity of smallholder, mainly women, farmers in Africa; implementing programs focused on maternal and infant undernutrition; and ensuring real political commitment, at national and international levels, to give hunger the priority it deserves (38). *(See Appendix 2 for more details on these two Task Forces).*

Fortunately, these recommendations have coincided with additional resource commitments. In July 2009, the G8 nations alongside leading international organizations committed US\$20 billion over three years to help farmers in poor countries boost productivity, signaling a new international effort to combat hunger and food insecurity. Other initiatives hold promise as well. In 2006, the Gates and Rockefeller Foundations' provided a \$150 million grant to the Alliance for a Green Revolution in Africa (AGRA). This fund has been established with the purpose of achieving a food secure and prosperous Africa through the promotion of rapid, sustainable agricultural growth based on smallholder farmers. Alongside these initiatives, the United Nations recently established the High-Level Hunger Task Force (HLTF) for Food Security to "ensure a coherent system-wide response to both the causes of this crisis and its overwhelming adverse consequences among the world's most vulnerable populations" (39). The Global Alliance for Improved Nutrition (GAIN) has also recently been established as a result of renewed commitment at the United Nations General Assembly Special Session II (UNGASS II) with \$180 million from donors since 2008.

While a strong step in the right direction, there are concerns that some of these initiatives focus largely on addressing hunger and enhancing food availability, and less so on improving nutrition strategies to improve food access and utilization. In addition, the resources pledged may not be enough to address the crisis. The 2009 World Summit on Food Security has estimated that \$44 billion a year would be required to end hunger and achieve food security (40). The World Bank has calculated that nutrition interventions in high burden countries alone would cost \$11.8 billion per year (2). Save the Children UK has estimated the cost of a package to end child hunger and undernutrition to be \$8.8 billion per year in the eight countries where 50% of malnourished children live (10). Médecins Sans Frontières (MSF) estimated that funds dedicated to addressing malnutrition have stagnated, are spent inefficiently and are often allocated inappropriately (41). While these renewed calls for resource mobilization are encouraging, (42) (5) (10) this has yet to translate to actual disbursements, and a great deal of effort to mobilize global support clearly remains.

II. LIMITATIONS OF THE MDG1 HUNGER TARGET INDICATORS

One of the objectives in defining the MDGs was to create targets and objective indicators that could be used to set benchmarks and monitor country-level progress. The MDG1 hunger target has two specific

indicators: the prevalence of underweight children under-five years of age, and the proportion of the population below a minimum level of dietary energy consumption.

Comparing Global to Country Progress

Obtaining an accurate measure of progress towards the MDG1 hunger target, and “food security” is challenging. Often, the progress at the global level masks different levels of progress at the regional, country, and local levels. The regional MDG figures are estimates of progress although “the situation of individual countries within a given region may vary significantly from regional averages” (20). Furthermore, progress varies within individual countries due to variations in geography, ethnic and religious groupings, rural and urban populations, and socioeconomic status – all which regional and even national averages camouflage (43).

Country-led monitoring and evaluation systems are critical to assessing the MDGs. These data systems need to be tracked in real-time to monitor progress and actively inform the national policy and programs. Data from these systems should form the basis of regular national MDG reports and “serve as catalysts for public mobilization aimed at a more vigorous national debate on how the MDGs apply to each country’s situation and link with development priorities and policy choices” as part of the UN Core Strategy on the MDGs (44).

Large efforts are underway with the Inter-Agency and Expert Group (IAEG) on the MDG indicators to improve the coherence, communication and quality of the monitoring and evaluation systems, and data generated from these systems. For example, DevInfo and ChildInfo are excellent databases for tracking the MDGs, yet these tools are only as good as the data that is being uploaded into the system, and the frequency in which data collection rounds take place. More than 20 African countries currently lack nutrition data, and many more countries lack reliable data on the coverage and quality of programs (33). These systems must be strengthened as a matter of urgency.

The World Health Organization (WHO) has recently initiated the Nutrition Landscape Information System (NLIS) as an integrated web-based tool that provides nutrition and nutrition-related health and development data in the form of automated country profiles and user-defined downloadable data from the WHO, United Nations Children's Fund (UNICEF), UN Statistics Division, UN Development Programme (UNDP), Food and Agriculture Organization of the UN (FAO), Demographic and Health Surveys (DHS), the World Bank, International Food Policy Research Institute (IFPRI), and the International Labour Organization (ILO). The REACH initiative to end child hunger and undernutrition partnership is also attempting to improve on data systems at the country level.

The underweight prevalence indicator: The underweight indicator is the proportion of children under five years of age falling below minus 2 standard deviations (moderate and severe) and minus 3 standard deviations (severe) from the median weight-for-age of the reference population. The other anthropometry indicators, stunting (height for age; a measure of chronic undernutrition) and wasting (weight for height; a measure of acute undernutrition), are also crucial in understanding the profile of undernutrition. The underweight indicator was chosen for the MDG 1 target as it is felt to be the single best composite indicator, with the potential to capture aspects of acute and chronic undernutrition combined.

Some have contested the choice of using the underweight measure as the most appropriate nutrition indicator. The UN Standing Committee on Nutrition (SCN) has promoted stunting of children under five years of age as a stronger indicator of hunger and of one of its determinants, poverty. Stunting itself measures the chronic deprivation of inadequate food intake, poor health and poverty resulting in poor child growth potential (45). The UN SCN Task Force on assessment, monitoring and evaluation has suggested that “for monitoring the progress made towards the achievement of MDG 1, it is recommended that both countries and development partners report against the prevalence of stunting in children below the age of five as an internationally agreed indicator of endemic poverty” (46). Global and country level stunting prevalence is often much more severe than undernutrition and wasting, and more accurately reflects nutritional deficiencies, and sickness that occurred in the most critical times of growth for a child (17). Of the top 20 countries with the highest prevalence of stunting, 9 are in Africa, 10 are in Asia, and 1 is in the middle east (Yemen) (17). As a minimum, stunting should be tracked alongside the underweight indicator to get a better assessment of undernutrition in countries.

WHAT IS THE REFERENCE POPULATION FOR ASSESSING UNDERWEIGHT PREVELANCE?

In 2006, the WHO Child Growth Standards replaced the National Center for Health Statistics (NCHS)/WHO reference population, which was based on a cohort of children in the United States. The new WHO standards are based on a cohort of 8,000 children from Brazil, Ghana, India, Norway, Oman and the United States. As UNICEF noted, “overcoming the technical and biological drawbacks of the old reference population, the new standards confirm that children born anywhere in the world and given the optimum start in life have the potential to develop to within the same range of height and weight. This means that differences in children's growth to age five are more influenced by nutrition, feeding practices, environment and health care than by genetics or ethnicity.” With WHO standards becoming the norm, this has posed a problem in comparing old growth references to the new standards as the estimates of anthropometry are different (6). Most of the international community and the Demographic and Health Surveys (DHS) are embracing these new standards.

Proportion undernourished indicator: The second hunger indicator refers to “undernourishment” as established and monitored by the FAO. The measure is a complex estimation of a distribution function of dietary energy consumption on a per-person basis. The mean of this distribution refers to the usual food consumption level and is estimated by the daily dietary energy supply per capita for a country derived from its food balance sheet (averaged over three years). The variance is derived on the basis of food consumption or income data from household income and expenditure surveys. The proportion of undernourished in the total population is defined as that part of the proportion lying below a minimum energy requirement after taking into account a country's sex and age distribution, assuming the minimum acceptable body weight for given height for all sex–age groups and a light activity levels for adults (47) (48). These estimates are difficult to collect at the field level, and it remains questionable how accurate a picture these data capture (49).

Alternative hunger indicators: Others have developed new hunger indicators in an attempt to better capture the progress towards the MDG1 including the Global Hunger Index and the Poverty Hunger Index (48) (50). International Food Policy Research Institute's (IFPRI) Global Hunger Index (GHI) relates three indicators - the proportion of people who are caloric deficient, the prevalence of underweight in children under the age of five, and the mortality rate of children under the age of five – weighted equally over time starting with 1981. The GHI varies greatly by region and country (50) and although an excellent measure that takes into account mortality, the data varies from the MDG tracking data. The Poverty Hunger Index (PHI), which builds on the Human Development Index, combines the five official MDG1 indicators including the poverty indicators, equally weighted with minimum and maximum values chosen for each underlying indicators (minimum being zero). This index takes all five separate measures into account simultaneously, allowing countries to track their own net progress towards MDG1, both poverty and hunger (48).

Measuring success for this report

A sample of country-level case studies were chosen to identify and illustrate factors associated with successes and challenges in achieving the MDG1 target. For the purposes of this report, we have chosen to emphasize a series of undernutrition data and measures. Decreases in underweight prevalence and the proportion of those below the energy requirement were used based on the latest MDG indicators using FAOStat and UNICEF (using the WHO growth reference standards) data. Other outcomes, such as the prevalence of stunting and wasting, and improved micronutrient deficits were also included as measures of progress. Other measures of improvement focused on the emphasis given to nutrition within national development policies; the existence of programs targeting improved nutrition and hunger; their inclusivity and equity in addressing the needs of vulnerable groups (including women and children); their ability to move to scale regionally or nationally, and; their impact on influencing and changing policy.

III. CURRENT GLOBAL, REGIONAL and COUNTRY PROGRESS IN REACHING THE MDG1 HUNGER TARGET

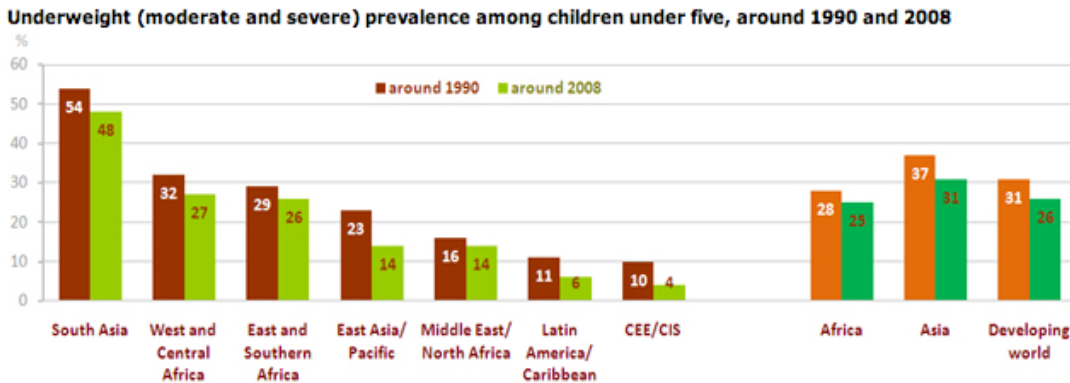
Global and regional progress toward the MDG1 hunger target

In the developing world, the proportion of children under five years of age who were underweight, currently 129 million (17), declined from 31% to 26% between 1990 and 2008 (based on a subset of 86 countries with trend data for the period 1990 and 2008, covering 89% of the developing world's population) (20) (51). The average annual rate of reduction (AARR) of underweight is based on multiple data estimates available from 1990 to 2008 with the AARR needed to achieve a 50% reduction over a twenty five-year period (1990 to 2015). The rate of change required to achieve the goal is a constant 2.8% reduction per year for all countries (17). As of 2005, the AARR was at 1.4% per year which would reduce the proportion of children underweight by 37% by 2015 (52). This progress is insufficient to meet the goal of cutting underweight prevalence in half globally. When taking the recent crises into account, the task will be more difficult, but not unachievable in some countries.

Progress on the prevalence of underweight children

Among low and middle income countries, the greatest declines in the prevalence of children who are underweight have been in the regions of Central and Eastern Europe-Commonwealth of Independent States, East Asia and the Pacific with many countries in all three regions on track to reach the MDG target, in a large part due to progress in China (51). Latin America and the Caribbean also made progress, with levels declining from 11 to 6% between 1990 and 2008, with Mexico seeing major improvements in children who are underweight (51). In the Middle East and Northern Africa, the prevalence of children who are underweight has remained roughly the same from 16% to 14% from 1990 to 2008 (51). The stagnation in this region is primarily driven by Sudan and Yemen. The data also indicated that those living in cities were twice less likely to be underweight than children in rural areas (20) (53). In South Asia, the prevalence of children who are underweight declined from 54% to 48% between 1990 and 2008, but with such high prevalence levels, attaining the target will be very difficult. In India, progress has been slow, and the country has the highest number of children who are stunted (17). There have been small improvements in sub-Saharan Africa, but the level of decline is too slow to meet the MDG target. Prevalence has decreased from 32% to 26% from 1990 to 2008. **Figure 2** demonstrates that most of the children who are underweight live in South Asia and Africa (51).

Figure 2: Regional progress on decreasing the prevalence of children who are underweight (17, 51)

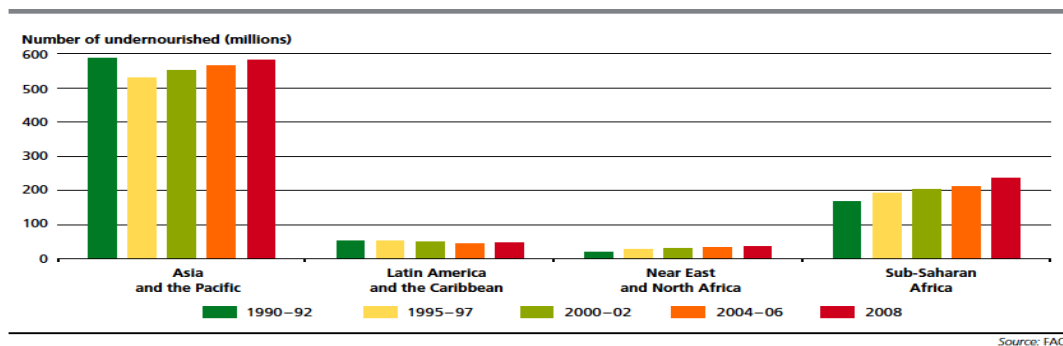


Progress on the proportion of the population who are undernourished

The proportion of undernourished in developing countries, as measured by the proportion of population below minimum level of dietary energy consumption, decreased from 20% to 17% (a decrease in absolute numbers of 9 million) in the 1990s but both the proportion and absolute numbers have reversed course and increased in 2008 due to the food price crisis, which has severely impacted sub-Saharan Africa and Oceania regions (20). Sub-Saharan Africa has the highest proportion of undernourished with 29% followed by Southern Asia including India at 22% (20).

Figure 3 presents time trends for the numbers of undernourished and demonstrates that most of the hungry reside in Asia and the Pacific and sub-Saharan Africa, much like the trends for underweight prevalence (16). Unfortunately, poor progress on addressing hunger coupled with persistently high fertility rates and population growth means the absolute number of undernourished people has been increasing since the 1990s. With 1.02 billion people undernourished (21) it will be difficult to achieve either the MDG1 as well as the 1996 World Food Summit target of reducing the absolute number of hungry people by half to 420 million by 2015 in many parts of the world (21).

Figure 3: Time trends of the number of those undernourished by region (16)

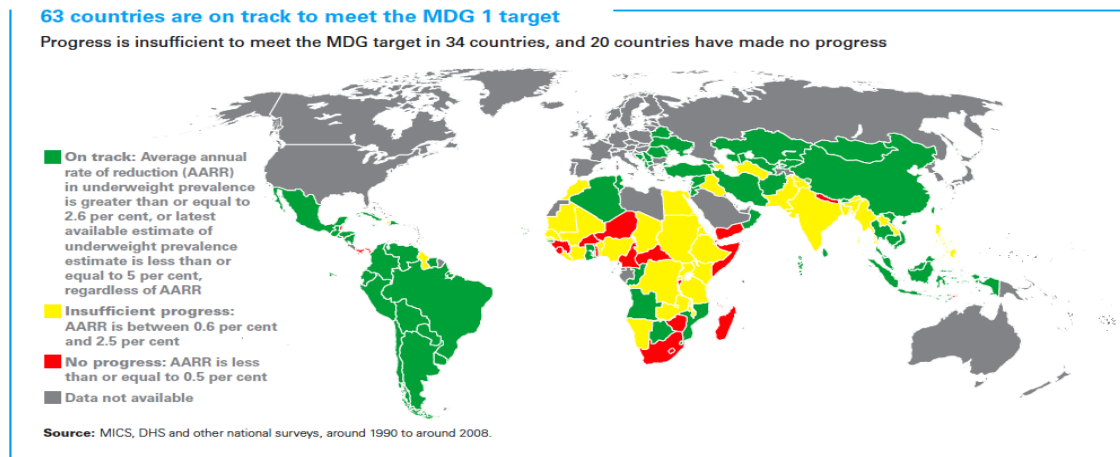


Country-level progress towards MDG1

Of the 117 countries analyzed by UNICEF, 63 are on track to meet the MDG1 target based on the proportion of children underweight (see **Figure 4**) (17). Three years ago, only 46 were on track, which holds

some promise of improvements for certain countries. Of the 20 countries classified as not making any progress at all towards the MDG1, most are in Africa (17).

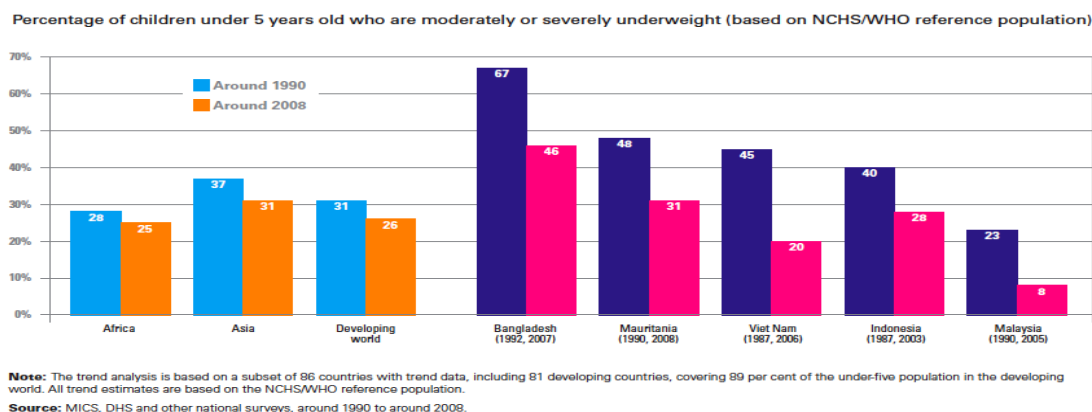
Figure 4: Country progress in meeting the MDG1 indicator for prevalence of children underweight (17)



It is important to recognize that within regions, just as within countries, great disparities exist in levels of undernutrition. Globally, among the highest levels of children stunted and underweight can be found in Burundi, East Timor (Timor-Leste), Madagascar, and Yemen. In the Americas, Belize, Guyana, and Panama are off track in meeting the MDG1. In sub-Saharan Africa, countries with the highest underweight prevalence are Burundi, Chad, Eritrea, Madagascar, and Niger. Conversely, some countries within the region are well on track to meeting MDG1 including Angola, Botswana, Congo, Ghana, Guinea-Bissau, Mozambique, Sao Tome and Principe, and Swaziland (51). In Asia, Bangladesh, India, and Nepal are in the top 10 of countries with the greatest proportion of children underweight (17) while Cambodia, Thailand, and Vietnam are on track to meet the MDG1.

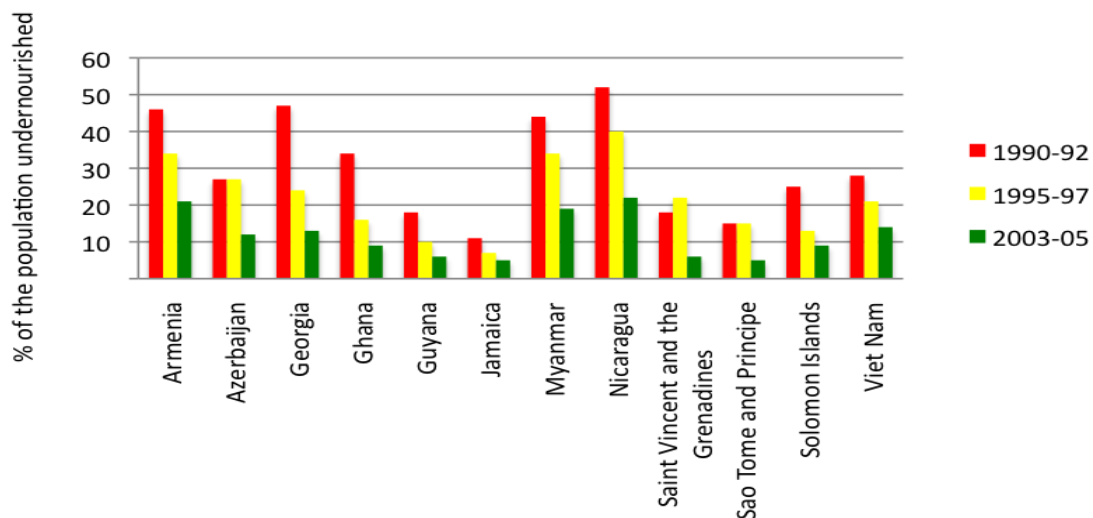
UNICEF data highlight countries that have made the most significant progress towards the underweight indicator for MDG1. These include Bangladesh, Indonesia, Malaysia, Mauritania, and Vietnam, as shown in **Figure 5** (17). Also included in that list are Cambodia, Ghana, Guatemala and Sri Lanka.

Figure 5: Decline in underweight prevalence in Africa and Asia, and countries with the greatest reductions (17)



The countries which have already achieved the MDG1 indicator of proportion of people who are undernourished are shown in **Figure 6** (54). Countries such as Georgia, Ghana, Myanmar, Nicaragua, and Vietnam have reached the target for the undernourishment indicator. China, Japan, South Korea and Taiwan, POC have all been major success stories in improving food security through land reform initiatives (55). The countries, which succeeded in reaching the MDG1 undernourishment indicator, are not always the same countries that have achieved the 1st indicator of the prevalence of children who are underweight. Among those that have been successful in achieving both indicators are Ghana, Indonesia and Vietnam.

Figure 6: Progress for countries in meeting the MDG1 indicator 2 – proportion of undernourished from 1990 to present (54)



IV. PROGRESS TOWARDS THE MDG1: AN ANALYSIS OF COUNTRY POLICIES AND PROGRAMS

The range of interventions required to end hunger and undernutrition have been largely established and agreed upon. Country level progress in achieving MDG targets for hunger and undernutrition requires taking interventions that have been proven to work and developing scalable models to put them into practice. However, a *policy-practice gap exists*, and fully integrating scientific tools within effective delivery systems that can achieve high levels of coverage remains a major challenge (56) (57). This chapter examines a set of specific examples of programs and interventions within countries, where the implementation and operational systems required to support reductions in hunger and undernutrition has the potential to shed light on what success and scale might look like.

The following typology will be used to profile policies and programs that target the hunger MDG1:

- A. Prevention- and treatment-based approaches
- B. Food production-based approaches
- C. Multi-sectoral approaches
- D. Innovative safety net approaches

A. Prevention- and treatment-based approaches to addressing hunger and undernutrition

A recent Lancet series reviewed the evidence base for interventions to tackle child and maternal undernutrition (58), and outlined a range of proven, cost-effective interventions. For children, there was a particular focus on the “window of opportunity” from pre-pregnancy to under two years of age as the first 1000 days of a child’s life (minus 9 months to 2 years). Targeting this age group is essential because it is a period of rapid growth and damage done during this time is potentially permanent. Reducing hunger and undernutrition during this period affects not only child growth and nutrition but also cognitive development (59). The interventions listed in **Table 1** focused on 36 countries that account for 90% of the global burden of child undernutrition (58). This chapter groups interventions into prevention- and treatment-based approaches.

Table 1: Evidence-based interventions for child and maternal undernutrition (58)

Prevention-based interventions	Exclusive breastfeeding for children under six months of age
	Improved complementary foods and practices for children six months to two years of age
	Vitamin A supplements for children 6 to 59 months of age
	Improved nutrition, sanitation and hygiene practices for the household
	Zinc supplementation complemented with oral rehydration solution for the management of diarrhea for children under five years of age
	Iron and folic acid supplementation for pregnant women
	Iodized salt or iodized oil capsules when salt is not available for households
	Fortification of staple foods, complementary foods and condiments
Treatment-based interventions	Treatment of severe acute malnutrition (SAM) with ready-to-use therapeutic foods (RUTF) of children under five years of age
	Treatment of moderate acute malnutrition (MAM) with improved, fortified foods of children under five years of age
	Deworming for children

AI. Prevention-based approaches

The developing world spends \$30 billion USD per year on the “direct damage of hunger” on sickness and premature death (60) whereas preventative approaches are often secondary. There are a number of examples of countries and communities that have implemented various components of a preventative package, with varying degrees of success. A number of these will be profiled as case studies below.

Community prevention-based programs

Peru (see case study 1 in appendix 1)

Peru is currently on track to meet the hunger target of the MDG1. The proportion of the population who are undernourished has decreased from 28% to 15% since 1990 (54), and the prevalence of children under five who are underweight remains low at 5% (with an AARR of 3.6% since 1990) (51). Levels of stunting, however, remain high at 30% (51). The “Good Start to Life” program was initiated in 2000 in 4 regions of Peru and covered approximately 75,000 children under 3 years of age and 35,000 pregnant and lactating women. The program consisted of a series of nutrition, hygiene, and health interventions, similar to the those recommended in **Table 1** (58). The main interventions included in the package were to promote

growth and development of children, enhance antenatal care, ensure adequate diets for pregnant and lactating women, promote exclusive breastfeeding during the first 6 months of life and safe complementary feeding, early stimulation of the child, control of iron and vitamin A deficiency, iodated salt intake, and personal and family hygiene (58). Participatory processes to problem solving and delivery were put into place to build capacity at both the individual and institutional levels, mobilizing human, economic, and organizational resources. After four years, the program was associated with a decrease in the prevalence of stunting, from 54.1% to 36.9%, a decrease in the prevalence of iron-deficiency anemia from 76.0% to 52.3% and a decrease in the prevalence of vitamin A deficiency from 30.4% to 5.3% (61).

Cambodia

While progress has been made in Cambodia on reducing the prevalence of hunger and undernutrition, current levels of stunting and underweight remain high at 44% and 28% respectively (17). The proportion of the population undernourished has reduced from 38 to 25% since 1990 (54). In 2002, the Government of Cambodia adopted a national infant and young child feeding (IYCF) policy and launched a five-year Cambodia Nutrition Investment Plan. The plan recognized that while increasing food production is a key component of food security, it does not necessarily translate into appropriate or adequate food utilization. It also recognized that in order to improve the nutritional status of children, there must be prevention-based behavioral changes in maternal and IYCF practices. In 2004, the Ministry of Health (MOH), with support from UNICEF, WHO, Reproductive and Child Health Alliance (RACHA), and CARE, launched the Baby-Friendly Community Initiative (BFCI), a village based mother support group model designed to address IYCF with a focus on improving complementary feeding as well as breastfeeding practices. By 2007 the BFCI had been scaled up to 11 of Cambodia's 24 provinces and reached approximately 517,000 women in 2,675 villages (19% of the country's villages) (62). A recently revised model is currently being expanded to include thousands more rural villages.

The 2000 Cambodia DHS found that 11% of infants initiated breastfeeding within one hour of birth, and 11% of infants 0–5 months old were exclusively breastfed in the previous 24 hours. Five years later the DHS reported a timely initiation rate of 35% and an exclusive breastfeeding rate of 31% indicating improvements in feeding practices were achieved. The latest UNICEF report indicates an exclusive breastfeeding rate of 41% (17). While these improvements cannot be attributed solely to the BFCI, programs promoting improved IYCF practices that include these initiatives as part of a comprehensive communication effort show considerable promise (62). Similar progress has been observed in the Gambia with the BFCI and the initiative is now being integrated into the national health policy. In resource poor areas, ensuring that essential links are made between household food security and nutrition knowledge, attitudes and practices is key to reducing undernutrition and its consequences, particularly among women and children.

National prevention-based programs

Bangladesh (see case study 2 in appendix 1)

Bangladesh has made major efforts to address hunger and undernutrition. In 1990, 67% of children were underweight, with a reduction to 46% currently (17). Bangladesh is also considered one of the top 24 countries with highest burden of stunting (17). The proportion of the population who are undernourished has decreased from 36% to 27% from 1990 to 2006 (54). Bangladesh's Integrated Nutrition Project (BINP) was the first large-scale government initiative in nutrition (63). With an initial investment of \$65 million from World Bank credit (33), the aim of BINP, which expanded a community nutrition intervention originally done by the Bangladesh Rural Advancement Committee (BRAC), was to reduce child malnutrition through growth monitoring and supplementary feeding of children aged 6–24 months, and supplementary feeding for pregnant women to increase pregnancy weight gain and reduce the incidence of low birth

weight babies. Early evaluations found that while nutrition-related knowledge and delivery and use of micronutrients vitamin A, iron/folic acid and iodized salt improved in the communities with BINP, evidence to support impact on child nutritional status, weight gain during pregnancy or birth weight has been limited.

Burundi and Guatemala

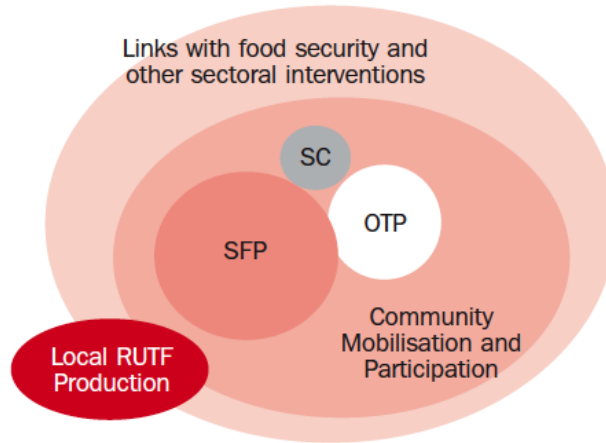
Other national-scale programs that support the delivery of prevention-based approaches (with safety net measures) are underway elsewhere. The Preventing Malnutrition in Children Under 2 Approach (PM2A) is a food-assisted Maternal and Child Health and Nutrition (MCHN) intervention aimed at reducing population levels of child malnutrition by targeting a package of services to all pregnant women and mothers of children up to the age of 6 months, and children 6-24 months regardless of the child's nutritional status (64). PM2A integrates the provision of maternal and child health services with food ration distribution and a strong behavior change communication strategy (65, 66). To ensure long-term sustainability of the intervention, all PM2A programs should be linked with agriculture and livelihoods interventions as well as with complementary services provided by the government or partner organizations operating in the target area. Two large PM2A programs will be implemented in 2010 in countries that are not considered successes thus far in tackling undernutrition and the MDG1 – Burundi and Guatemala. In Burundi, the prevalence of children who are underweight is 39% with an AARR of -0.2% indicating no progress has been made (51). The proportion of the population who is undernourished has worsened since 1990 from 44% to 63% (54). In Guatemala, the prevalence of children who are underweight is 23% with an AARR of 2.7% (51). The proportion of the population who is undernourished has remained unchanged since 1990 from 14% to 16% (54).

A2. Treatment-based approaches

Severe acute malnutrition (SAM) affects 20 million children under five years of age each year and contributes to 1 million child deaths per year (67). Moderate acute malnutrition contributes more to the overall burden of disease, as it affects many more children (68). An innovative community-led public health model to address acute malnutrition in developing countries has been established called Community-Based Management of Acute Malnutrition (CMAM). Originally termed Community-based Therapeutic Care (CTC) (69), CMAM was used mainly in emergency settings. However, the CTC approach was shown to be useful in non-emergency settings when the right components were in place.

The community-based approach engages the community to detect signs of SAM early by sensitizing communities and subsequent active case finding, and provides treatment for those without medical complications with ready-to-use therapeutic foods (RUTF) or other nutrient-dense foods at home (67). If properly combined with clinical care for those malnourished children with medical complications and implemented on a large scale, community-based management of severe acute malnutrition could prevent the deaths of hundreds of thousands of children (67). The CMAM combines three treatment modalities (see **Figure 7**), *inpatient therapeutic (SC – stabilization centers)*, *outpatient therapeutic (OTP)* and *supplementary feeding (SFP)* according to the clinical and anthropometric characteristics at presentation (70).

Figure 7: The three treatment modalities of CMAM (70)



Community treatment-based programs

Malawi (see case study 3 in appendix 1)

Malawi has made modest progress on the hunger target of the MDG1. The proportion of the population who are undernourished has decreased from 45% to 29% from 1990 to 2005 (54) however the prevalence of children underweight remains at 21% with an AARR of 2.4% (51). The Peanut Butter Project works in a rural setting outside of Blantyre Malawi, an area which lacks overall health care facilities. Although not integrating all aspects of the CMAM model, the project and its outcomes, and usage of RUTF did inform the national scale up program in Malawi. Instead of the three-prong CMAM approach, village health aides are trained on screening, diagnosing and basic treatment of acute malnutrition with home-based care. Caretakers and children come to the rural “centre” for assessment, and if found to be malnourished using MUAC, receive a two-week supply of RUTF. The program continues for 8 weeks if needed (71). One study showed that of 826 children enrolled, 775 (94%) recovered, 13 (1.8%) remained malnourished, 30 (3.6%) defaulted, and 8 (0.9%) died (71). This community rooted project shows that with minimal resources, treating children who suffer from SAM can be achieved with village health workers and therapeutic food. This situation will not work in all settings, particularly if a functional government supported rural health worker program or locally made foods are not readily available. However, it does provide an example where action can be taken even in resource-constrained settings.

National treatment-based programs

Although community treatment programs to address acute malnutrition are taking place globally, many countries are now scaling up CMAM, with 42 country-wide action plans and guidelines in Africa, Asia and the Middle East (17). Pilot programs such as the Peanut Butter Project’s early work on home-based therapy helped pave the way for Malawi’s national implementation of community based therapy and international guidelines for the use of community based therapy for severe malnutrition.

Ethiopia, Malawi and Niger (see case study 4 in appendix 1)

CMAM allows for community-based identification, and treatment of 80% of SAM children who do not have complications using RUTF (67) and should be used in settings outside of emergencies – in rural, poverty

stricken areas with annual hunger seasons (72) (73). Country scale-up programs such as in Malawi, Ethiopia, and Niger, have illustrated the complexity of scaling up this approach, while demonstrating early positive results. The commitment and engagement of government, the role of NGOs, the procurement of CMAM supplies, and the data collection for monitoring and evaluation can all influence the success of scale-up.

Ethiopia

In Ethiopia, a country prone to droughts, CMAM was piloted in two districts in 2002. By 2003, the national emergency was used as a motivation to scale up CMAM services more widely mainly working with Concern and UNICEF. The CMAM scale-up in Ethiopia has been relatively successful with UNICEF as coordinators and NGOs as implementers, as opposed the nationally driven health system delivered model in Malawi. An early evaluation has shown strong international support, facilitated by UNICEF and an NGO supported CMAM Support Unit (74).

Malawi

Malawi, with droughts in both 2002 and 2005, began piloting CMAM with UNICEF, Concern and Valid International in select districts. Once piloted in two districts, the monitoring results were encouraging with 87% of children discharged successfully from the program (75) (76). Since this pilot, the program has been scaled nationally, and is considered a model for national coverage. For the scale up program, the national MOH is in the lead, providing direction, resources and support directly to district health offices. NGOs have contributed additional technical support to the CMAM Support Unit. Currently, 344 CMAM sites and 96 inpatient units have been implementing the program in 24 of 28 districts of Malawi (77). Malawi is now reaching 74% of children in need of treatment with a 75% recovery rate (17).

Niger

In Niger, during the 2005 emergency, national CMAM guidelines were developed and services were rapidly expanded by numerous NGOs. Currently, SAM remains high and CMAM services are not consistent. NGOs implement the CMAM services in a top down approach with little overall leadership or full engagement with the MOH (74). In all three countries, Niger in particular, inpatient care is not sufficient, and is not adequately linked into the CMAM model program itself, creating obstacles in the continuum of care (74).

Although Malawi and other places have shown that scalability of CMAM can work with the right governance and support, challenges remain. First, horizontal integration of CMAM programs into weak health and procurement systems adds complexity and burden to those working on the ground if not well coordinated. Second, the “C” of CMAM should not be underemphasized - community mobilization, participation and ownership must be included in large scaled-up national programs in order to succeed in local pockets (75, 78). Third, a challenge remains in that CMAM may be equated solely with the distribution of RUTF instead of “a holistic treatment paradigm that requires close supervision by health and nutrition professionals” (72). However, as demonstrated in the Peanut Butter Project where the national program has not yet reached, promising outcomes can be made in resource-constrained settings.

When prevention and treatment meet: addressing moderate acute malnutrition

Another area of much focus and debate is how to prevent and treat children suffering from moderate acute malnutrition, which has a higher burden than SAM and currently affects 35 million children (30). Lipid-based nutrient supplements, such as Ready to use foods (RUF) hold great potential. The products themselves are largely made up of lipids as the primary source of energy, and are fortified with micronutrients. They are generally stable, provide energy, essential fatty acids, increase the energy density

of complementary foods, and increase absorption of fat-soluble vitamins. Many groups are working to improve these products and it will be important to engage the food industry and establish public private partnerships to ensure technology, commercialization and appropriate local marketing is in place (*See text box*). Addressing moderate acute malnutrition for public health impact and at scale will rely on consumer health seeking and purchasing behavior with more investment in harnessing market-based delivery channels.

Yet, using RUF is thought of as cost-prohibitive in treating moderate acute malnutrition, but to treat children for a shorter time on lipid-based products may save money by catching children early before they progress to SAM, which is more costly to treat. What is known is that success in the scale up of RUF for moderate acute malnutrition, rooted within a CMAM program, must include the development of the RUF formulation that allows high specification take-home rations, alongside community mobilization and engagement (79).

MAKING BETTER FOODS FOR MAM CHILDREN

GAIN is working with governments, public private partnerships, local companies, NGOs, and not-for-profit venture capitalists to improve infant and young child feeding through commercializing nutritious food products including fortified complementary foods, micronutrient powders and lipid-based nutrient supplements. Trials by the Peanut Butter Project, with soya protein substituted for some of the milk powder in the standard RUTF recipe have shown slightly lower recovery rates for severely malnourished children (publication in submission), but have been shown to be equally effective and superior to Corn-Soy Blends in the treatment of moderately malnourished children (8). One study done by MSF showed that short-term supplementation of non-malnourished children with RUTF reduced the incidence of wasting and severe wasting over 8 months in children aged 6 to 60 months in Niger (9). Currently, there is limited information from rigorously designed, comparative studies on the dietary treatment of children with moderate acute malnutrition and more studies need to be done.

Summary and Lessons Learned

The highlighted case studies suggest that community-based prevention and treatment programs focused on proven interventions can be effectively taken to modest scale. However, significant challenges to quality and coverage may take place when moving to national scale. Sound policies, and fostering ongoing engagement of stakeholders and participants have equal bearing on the success of these initiatives as technical content of interventions and programs. As Malawi demonstrated in its scale-up of the CMAM program, integration and ownership by governing bodies is critical, with a focus on ensuring adequate capacity, facilitating on-going data collection, appropriate targeting and tracking well-defined outcomes. Further research is required on how to best operationalize community-based nutrition interventions to enable countries to prioritize, incorporate and scale promising interventions that work at the smaller scale (80) but action and urgency in implementing these interventions should be taken to ensure quick impact. Innovative partnerships between governments, private sector and civil society are also needed to improve access of affordable, nutritional quality products to vulnerable populations.

While prevention and treatment-based interventions form a necessary and important dimension of addressing immediate needs and undernutrition, more durable reductions in hunger must be accompanied by strategies that enhance food and livelihood security including food-production based initiatives that include market-based as well as public good distribution approaches. These are reviewed in the section that follows.

B. Food production-based approaches to addressing hunger and undernutrition

Food production-based approaches that enhance food availability and diet quality through local production and agricultural biodiversity, often fall outside the traditional scope of clinical nutrition, and have therefore been under-researched and under-developed. As a consequence, there remains insufficient evidence to

support well-defined scalable interventions that can be linked to improvements in maternal or child health outcomes (81). On the supply side, farming diverse non-staple crops with high nutritional value has the potential to make rich sources of micronutrients widely available to entire communities (82). On the demand side, raising smallholder agricultural productivity contributes to increasing household income and allows families to purchase more and better quality food if locally available and cost efficient. Agrobioprocessing and high quality fortified foods are also critical for local communities to either have access to or purchase for household needs.

The UN High Level Task Force's Comprehensive Framework for Action (CFA) focused on measures to scale-up and improve food and nutrition security including the need to promote agriculture investments focused on smallholder farmers and rural development (83, 84). From the UN Millennium Project Hunger Task Force, the Ad-hoc Advisory group for the Madrid Food Security Conference (82), the CFA (83) and the Irish Hunger Task Force (38), potential areas of investment and interventions to improve food productivity and livelihoods have been well-defined (see **Figure 8**).

Figure 8: Areas of investment and interventions to improve food productivity and livelihoods

FOOD PRODUCTION	LIVELIHOODS	INFRASTRUCTURE
Improve smallholder access to productivity enhancing inputs through subsidies, credit and support for agro-dealer networks	Support agribusiness and agro-processing technologies to increase incomes	Improve natural resource management: soil improvement, water conservation, biodiversity protection, GHG reductions
Improve agricultural extension services, especially for women farmers	Diversify beyond staple food production towards higher value market-directed commodities	Invest in rural market infrastructure including rural roads, and electrification
Expand irrigation and water harvesting, and improve water use efficiency	Improve access to financial services: rural microfinance, community saving groups and insurance mechanisms	
Decrease post-harvest storage losses in both quantity and quality		

These strategies are critically important as short, medium and long-term approaches to improving food security and rural development. At least half of the world's food insecure are poor, smallholder farmers living in low-income countries cultivating on marginal lands without access to productivity-enhancing technologies or markets to engage in commercial agriculture (84). These farmers, most living on less than 2 hectares, must produce the food they need for their own survival (85). Small farms provide over 90% of Africa's agriculture production (86) and women produce 60-80% of the food that is consumed locally in developing countries (87).

In some developing countries such as China, where huge progress has been made in reaching the MDG1 hunger target, there has been a concentrated effort in improving smallholder farmer output and equitable distribution of land. During the 1980s, land was redistributed to smallholder farmers with a stimulus

package of inputs, infrastructure, grain reserves and spending on agriculture research (23). For a potential impact on the MDG1, smallholder producers (including herders, pastoralists, fisherfolk, gardeners) should have access to improved agriculture-rooted tools and interventions that are linked to nutrition interventions for their families (22).

There are nutrition-focused interventions that can be integrated into the agriculture investments in **Figure 8** that could improve the diet diversity and quality of diets, directly impacting nutritional status of children (88) (89). The introduction of food legumes into farming systems improves soil health through nitrogen fixation, and increases protein and micronutrient intake in the diet. Food legumes may also provide an additional source of cash income for smallholders. Biofortification technology and the introduction of nutrient-rich foods such as orange-fleshed sweet potato have been shown to increase vitamin A intake and serum retinol concentrations in young children in rural Mozambique (90). Biofortification of seeds – the breeding of crops with high amounts of minerals and vitamins in their seeds – is another high impact nutrition intervention (91) along with fortification of staple grains with iron or vitamin A (92). Lastly, the promotion of agrobiodiversity with a focus on nutritional properties of traditional foods, contributes to better livelihoods and boosts the market value of these “specialized foods”, which can be an important boost for rural farming communities (81).

Community food production-based programs

Bangladesh, Cambodia, Nepal, and Philippines (see case study 5 in appendix 1)

South and Southeast Asia remain regions with some of the highest prevalence of children underweight and stunted, with the proportion of the population who is undernourished decreasing from 25% since 1990 to 21% and 16% respectively (54). To address these gaps, Helen Keller International (HKI) introduced its homestead food production program (HFP) in Bangladesh, Cambodia, Nepal, and Philippines. The program integrates animal husbandry with home gardening with the aim of enhancing consumption of micronutrient-rich foods. Between 2003 and 2007, the HFP program was implemented in 30,000 households in these four countries where micronutrient malnutrition is a serious public health problem among women and children. An assessment of the HFP programs in these countries shows that participating households significantly improved dietary diversification, improved animal food consumption (an increase in consumption of protein-rich liver and egg) and contributed to greater reductions in the prevalence of childhood anemia (93). Findings from Bangladesh and Cambodia showed a significant improvement in household income from sale of products from home gardens and animal husbandry. Since women manage home gardens they contribute to the household income thus empowering them to decide how to spend the income generated from these gardens (93) which is usually spent on household child health and education (94).

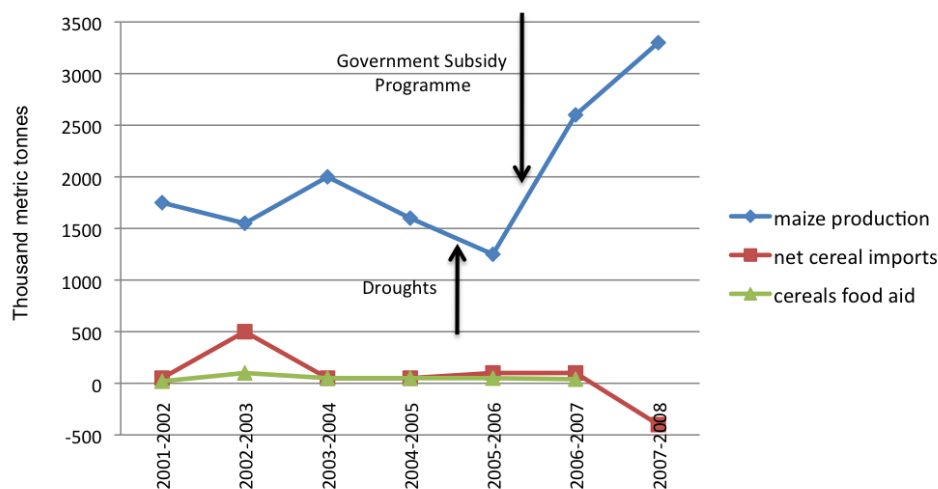
HFP can complement programs aimed at improving gender equality through its positive effect on women’s empowerment and increased control of household resources, or agriculture programs that promote home gardening and livestock to better ensure that available food translates into increased consumption and also into improved nutrition among vulnerable household members (93). The HFP model has recently been enhanced to include interventions to improve child growth through improved breastfeeding and complementary feeding. Emphasis will also be placed on further adapting the model to urban areas due to the rapid growing urban populations in Asia and Africa. In addition, to better assess the impact of this enhanced HFP (E-HFP) program model on child growth, HKI is currently partnering with the IFPRI on aspects of monitoring and evaluation to track program impact pathways particularly looking at cost effectiveness and scalability aspects of the intervention (95).

National food production-based programs

Malawi (see case study 6 in appendix 1)

As the main staple of the diet, maize production by smallholder farmers in Malawi is not normally sufficient to meet annual consumption requirements. With droughts and crop failures, food insecurity can be devastating. In mid-2005, the Government of Malawi responded to severe hunger amongst its population with a national scheme to subsidize improved seed and fertilizer (96). The scheme involved the distribution of fertilizer vouchers (not more than two per household) and maize seed vouchers that enabled most smallholder farmers to purchase fertilizer and seed at about one quarter of the market cost. With the national subsidy scheme, food production has exceeded national demand for 4 consecutive years. In 2008, despite food prices increases, Malawi was able to contain food prices because of the strong maize sub-sector. In 2007 and 2009, Malawi exported maize (85). **Figure 9** demonstrates the significant increase in food production in Malawi over the past few years when compared to food imports and aid (85). These data show promising results of a national scale food security program put into place over several years, due to a willing and committed government dealing with massive food shortages.

Figure 9: Maize production and cereal trade in Malawi (1990 to 2007) (85)



The proportion of undernourished has decreased from 1990 to 2006, from 45% to 29% (85). However, it is yet to be determined whether the subsidy program has had any impact on MDG1 target 2 of underweight. Data from the 2009 DHS Survey will be released in early 2010, and impact on nutritional indicators can then be assessed. Stunting improved slightly from 2004 to 2006 going from 48% to 46%. Underweight levels also slightly improved from 22% to 19.4% (51).

The program does however demonstrate a commitment to tackle undernutrition in Malawi. The Nutrition Division has been placed in the Office of the President, which indicates a strong political will at the highest level to end undernutrition. FAO has provided support to the Government of Malawi to draft the Strategic Framework for a National Action Plan for Food Security and Nutrition which is now released and being implemented (85). Furthermore, community-based management of acute malnutrition, first implemented by Concern, Valid and The Food and Nutrition Technical Assistance-2 (FANTA-2) in the country, has now been implemented on a countrywide scale to all districts (*see case study 4 in appendix 1*).

Summary and Lessons Learned

Both Malawi's national efforts to stimulate agricultural production, and the community-based homestead food production program demonstrate scalable approaches to increase food security and diet diversity. However, both approaches also have potential limitations. To most effectively address undernutrition, country-wide agriculture initiatives such as Malawi's should also work to include elements of increasing the availability and reducing the cost of nutritious food beyond just staple foods or cereals, as well as addressing the needs of populations such as pastoralist and fishing communities (10). There are plans for the Malawi subsidy program to expand to include legumes (groundnuts, beans, soybeans, pigeon peas) in addition to maize. Yet, food-production approaches targeting smallholder farmers will not work for all populations with 22% of the hungry being landless rural poor, and another 20% who are living in poor urban homesteads (84). Locally available, nutrient-rich fortified food products should also be made available to vulnerable households who rely on purchased foods.

In the case of HFP program with their success in the Asia-Pacific countries, the integration of the program into other development initiatives should be further explored. Homestead gardens will not be taken up in every community, particularly communities that are not traditionally farming communities. Water is also an issue in many regions of the world, and although there are innovative ways to use less or recycled water, accessing any amount can be a challenge in semi-arid to arid landscapes.

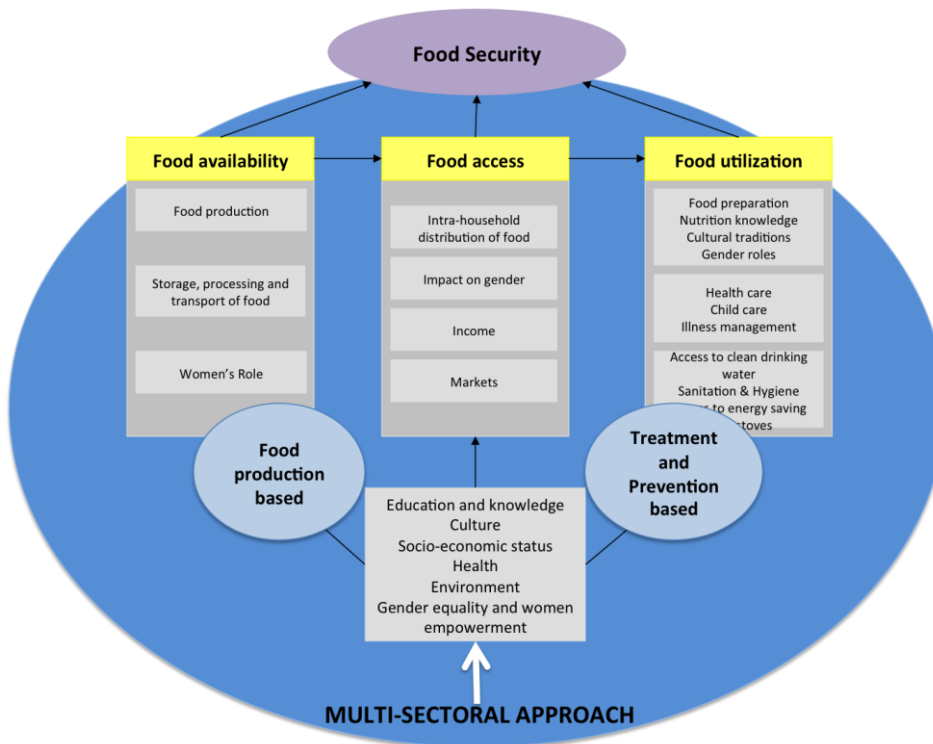
Food-based solutions to improve nutrition should not be underestimated. Improved quality food products, grown locally or made in conjunction with the private sector are critically important, particularly when targeted towards children under two years of age. Home-based and commercial fortification with micronutrients, and nutrient-rich fortified food sources will continue to play a critical role in the health of populations both in the developed and developing world.

The next section moves beyond 'food availability' to highlight the critical dimensions of access and utilization that are equally important components of food security. It will profile delivery systems that work across sectors that place prevention-treatment and food security models alongside scalable interventions that address wider social and economic determinants of hunger and undernutrition.

C. Multi-sectoral approaches to addressing hunger and undernutrition

Recent calls for greater attention to hunger and undernutrition highlight the importance of integrating technical interventions with broader approaches to address underlying causes of food insecurity – incorporating perspectives from agriculture, health water and sanitation, infrastructure, gender and education (33) (97) (98) (99) (22) , as outlined in **Figure 10** below. Such an approach would inherently build on the knowledge and capacities of local communities to transform and improve the quality of diets for better child health and nutrition. Recent research has documented potential synergies between health and economic interventions, suggesting multi-sector approaches may generate a wider range of benefits than single sector approaches acting alone (99) (100). Yet even while addressing broader determinants, political synergized priority to address root causes of hunger and undernutrition in an equitable manner. A number of initiatives that are working to engage these wider approaches will be highlighted below.

Figure 10: Integrating a Broader Multi-sectoral Approach to Improving Food Security



Community multi-sectoral programs

Millennium Villages in sub-Saharan Africa (see case study 7 in appendix 1)

The aim of the Millennium Villages Project is to accelerate progress towards the MDG targets, including MDG 1 - to eradicate extreme poverty and hunger. The Millennium Villages are situated in 'hunger hotspots', where at least 20% of children are malnourished and where severe poverty is endemic. The countries where Millennium Villages are located are Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal, Tanzania, and Uganda. They were chosen to reflect a diversity of agro-ecological zones, representing the farming systems found in over 90% of sub-Saharan Africa and are demonstration and testing sites for the integrated delivery of science-based interventions in health, education, agriculture and infrastructure (101). Within the Project, hunger and undernutrition is being addressed with an integrated food- and livelihood-based model that delivers a comprehensive package of health and development interventions (102). The aim of the model is to demonstrate the elimination of under-nutrition in a diverse range of sub-Saharan African contexts. The model draws together interventions at a number of levels, including:

- Clinical interventions to prevent and mitigate macro and micronutrient deficiencies among infants and young children, and pregnant and lactating mothers; improve infant and young child feeding practices; and treat moderate and severely malnourished children
- Education and behavior change-based interventions to improve health, nutrition, school attendance and learning outcomes among primary school children; and empowering women by improving effective food preparation and household nutrition
- Household, community- and livelihood-based interventions to increase agricultural production, foster diet diversity, and enhance livelihood security to address longer term nutritional needs

The package has been field-tested, rigorously evaluated and proven effective in the first village of rural western Kenya and early evidence suggests gains have already been dramatic. After two years, maize yields tripled from 2.0 tons/ha to 6.2 tons/ha, and overall production in the village increased 5.4 fold to 2,257 tons. Since 2006, the community worked with agricultural extension officers to diversify their crops for markets and to improve household nutrition. Staple crops were supplemented with high value legumes and vegetables, spices, and fruits. Farmers have also engaged in other income generating activities through demonstration projects, such as livestock for dairy production, poultry, fish farming, and bee keeping. The average food security and diet diversity, on a daily, weekly and monthly time period, amongst households increased. For children under two years, levels of being underweight and stunted decreased dramatically - from 26% to 3.9% and from 62% to 38% respectively. Among children under 5, levels of vitamin A deficiency dropped by half, from 70% to 33% (103). Based on these positive early results, the MVP has adapted and refined the components of the model to the diversity of MV contexts spanning the 80 villages of the 14 field sites in 10 sub-Saharan African countries.

The Millennium Villages Project itself is designed to meet the criteria of sustainability over time and potential for replication over locations. The total cost of the combined interventions is budgeted at \$110 per capita per year for the first five years, with \$60 per year provided by outside donors, \$30 per year by government and the local community, and \$20 per year by NGO and corporate partners. The \$60 per capita per year from outside donors is, by design, within the envelope of 0.7 percent of GNP in official development assistance committed by donor nations to developing countries to support the Millennium Development Goals, and well within the G8 Gleneagles Commitments on aid to Africa, adopted in 2005 for the year 2010, which are in the order of \$80 per person per year. The project aims to unleash self-sustaining economic growth over a ten-year period, by promoting business development (including commercial agriculture) along side the social interventions. By investing in primary health and in the elimination of the poverty trap, the MVP anticipates a benefit-to-cost ratio far above one. The Commission on Macroeconomics and Health estimated that the benefit-to-cost ratio of primary health care in low-income settings to be on the order of six-to-one (104).

Millennium Villages aim to foster a common practical reference point for nutrition focused policy and programmatic learning in MDG-based implementation. As an initiative that takes global policy commitments at face value, Millennium Villages help to identify and strengthen real-time feedback loops between community-, national- and international-level policy and planning processes. In a complex multi-component approach to address undernutrition, it is difficult to make definitive statistical statements regarding the underlying mechanisms through which changes in outcomes are observed. The initiative therefore provides valuable information through which local communities, governments, and development partners can together get down to business and focus on solving real time ground-level problems – rather than abstract problems of how MDG scale-up “might” look in rural Africa.

National multi-sectoral programs

Mauritania (see case study 8 in appendix 1)

REACH is a joint effort to support countries to accelerate progress on MDG1, specifically the underweight target. REACH supports government-led efforts to deliver - at scale and in an integrated manner - interventions across multiple sectors that are proven to have impact within two to five years. The five interventions areas are to improve hygiene and parasite control, increase food availability and accessibility, increase micronutrient intake, improve infant and young child feeding practices and treat severe acute

malnutrition. The REACH initiative goes beyond the Lancet series to address longer-term determinants including food-production approaches as well as cash transfers.

Mauritania has made great progress on the MDG1 indicator of children under the age of five who are underweight, effectively decreasing levels from 48% to 31% between 1990 to 2008 (51). The REACH partnership has piloted this program in two countries: Mauritania and Lao PDR (105). In Mauritania, in partnership with REACH, the government developed a nutrition action plan, mapped out all partners working within the country and did an assessment on what interventions are being implemented, where, and at what scale. Early results show that distribution of vitamin A, iodized salt, mebendazole for worm treatment, has been streamlined with increased coverage. Exclusive breastfeeding rates have also increased in one year, and systems have been put into place for supplementary and therapeutic feeding to screen and monitor children suffering from acute malnutrition (17).

REACH is an excellent example of a UN interagency partnership with governments to scale up complex multi-sectoral approaches to undernutrition and hunger. By pooling resources of the national government, the UN, civil society and private sector, countries lagging behind on attaining MDG1, can accelerate their efforts. With the positive early outcomes, Mauritania was awarded an UNDP/Spain MDG Achievement Fund (MDG-F) to further build on this approach, and there are plans to scale up these multi-sectoral nutrition interventions within Africa.

Mali (see case study 9 in appendix 1)

The MDG Achievement Fund (MDG-F) is a United Nations resource that finances and supports national efforts to accelerate progress on the MDGs. The MDG-F is currently funding programs focused on high impact interventions towards the MDGs and related development goals in select sectors and countries (106). One of the thematic windows is focused on children, food security and nutrition, and the fund has already made awards in 24 countries totaling over \$13 million. Mali, a country with some of the highest rates of child mortality and undernutrition (51) has received an award to improve child nutrition and food security in the 166 most food vulnerable municipalities with four primary outcomes - enhanced food security, improved nutritional status of women and children through appropriate prevention and treatment, the inclusion of nutrition and food security aspects in relevant national and community based frameworks and enhanced national capacities for appropriate assessment and monitoring, including improved responsiveness to changes in levels of nutrition and food insecurity in targeted communities. This multi-sectoral approach, which engages UN agencies with national, regional and local governments, involves health, education, agriculture and water sectors by implementing low cost, high impact interventions including vitamin A supplementation and deworming, provision of drinking water and VIP latrines, promotion of complementary foods and improved food quality through the diversification of agricultural production. Beyond just interventions, the MDG-F will support capacity building and rigorous monitoring and evaluations systems to help support the multi-sectoral intervention framework. The international community looks forward to the results of this important work in Mali and other countries.

Summary and Lessons Learned

The design, testing and measurable success of complex multi-sectoral interventions to improve child nutrition and health remain at an early stage of development. Scale up is urgently required accompanied by innovation and operational research. These highlighted projects from community to country scale will be important to observe over the next few years to assess hunger and undernutrition outcomes when multiple sectors work together, simultaneously to tackle a problem. Although it could be argued that causality is crucial, the vertical programming of single-focused cause and effects may not be effective as we tackle complex determinants of poverty.

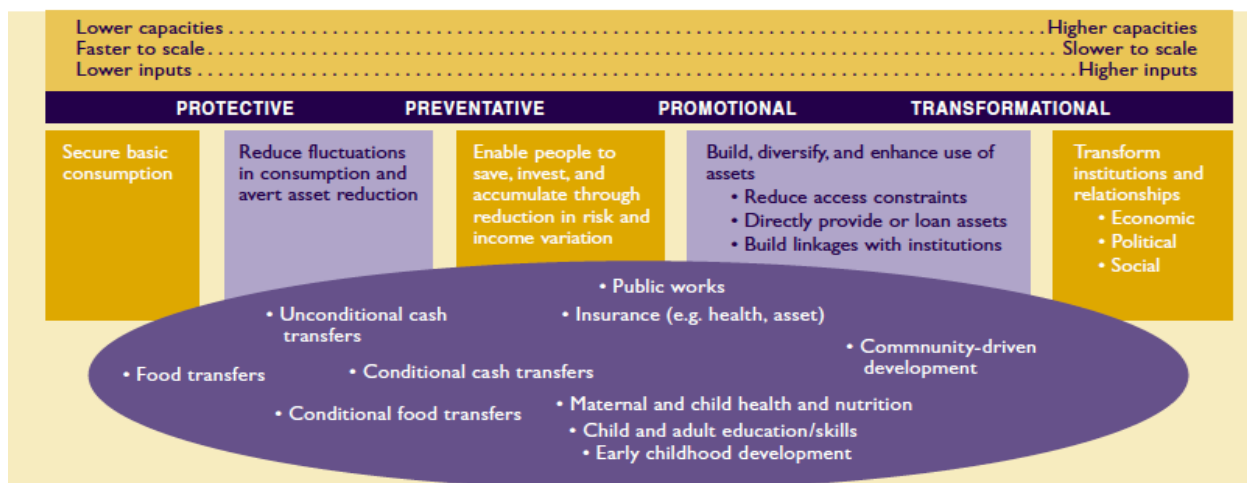
One crosscutting area that should be integrated into every approach, particularly when addressing hunger and nutrition issues through a multi-sectoral lens is the status of women. Women’s well-being, earning potential, empowerment, and education are the driving factors in reducing children’s malnutrition (107). Women and girls need better access to such services as credit, healthcare, and education. It is important to develop and introduce technology and farm implements designed for rural women that will ease their workload (22). Without the inclusion of women in every aspect of hunger and undernutrition strategies, success will be limited.

The short and long-term approaches mentioned above are not always relevant for some communities and populations, particularly those living on the fringes, or living in areas susceptible to natural disasters, conflict zones, or in war-torn countries. To respond to the needs of these particularly vulnerable groups, embedded within many of the food security interventions are safety net modalities that help those living in poverty from falling further into the poverty trap. The following section profiles a number of unique ‘safety net’ modalities highlighting their potential role in mitigating the effects of extreme poverty and hunger.

D. Innovative safety net approaches to addressing hunger and undernutrition

“Social protection involves policies and programs that protect people against risk and vulnerability, mitigate the impacts of shocks, and support people who suffer from chronic incapacities to secure basic livelihoods” (108). Protection can involve insurance, assistance in the form of cash, food, vouchers or subsidies, services providing health and nutrition care, and training and credit services for income-generating activities (108). In **Figure 11** (108), social protections services are grouped by capacity and input needed, and temporality for scale. Social protection has protective, preventative, promotional, and transformational aspects and programs are positioned within the objectives of social protection. However, each type of program can be used to achieve any of the four objectives. As **Figure 11** demonstrates, protective and preventative interventions require less capacity, less inputs, and can be scaled up more quickly. Promotional and transformational interventions require higher-level capacities and resources, and are challenging to scale up (108).

Figure 11: Social protection objectives and mechanisms (108)



Safety nets are a form of social protection (109) that shelter people against the adverse outcomes of poverty through formal or informal mechanisms (7).

The social protection aspect of safety nets are approaches that provide or substitute for income, and may include cash and in-kind transfer programs, subsidies, and labor-intensive public works programs. Also included are mechanisms to ensure access to essential public services, such as school scholarships and fee waivers for health care services (7). Food-based safety nets are designed to ensure livelihoods (for example, through the provision of public works employment paid in food), increase purchasing power (through the provision of food stamps, coupons, or vouchers), and relieve deprivation (through the direct provision of food to households or individuals) (7). The most common types of food-based safety net modalities are supplementary feeding, food vouchers or stamps, food for work or asset and conditional cash transfers that also involve food (109). Many of the programs described in the previous sections of this report could be considered social protection mechanisms, however outlined below are examples of some innovative safety net modalities and alongside short descriptions of their impact on hunger, food security and nutrition.

FOOD VOUCHER PROGRAMS

Food voucher programs provide vouchers that may be used for the purchase of food or specific food and can create less dependency than direct food distribution. Food vouchers include the provision of coupons to purchase a fixed quantity of food (commodity-based vouchers) or food for a fixed monetary value (value-based vouchers). They share a similar market-based approach under which beneficiaries are provided with purchasing power to access food (3). Food vouchers can be given at the same time with primary health care services or education as an incentive for participation (7).

School Meals (see case study 10 on Ghana national school meals program in appendix 1)

Supplementary feeding programs provide food to households or individuals. Most commonly, they target mother, young children, and youths through school meals programs (7). Supplementary feeding is often provided as an incentive for participation in social services such as primary health care and education, particularly as an incentive to increase enrollment and attendance of female students.

School meals are one form of supplemental feeding that have the potential to play an important role in addressing both education and hunger relief (22). The UN Millennium Project Task Force on Hunger also identified locally produced school meals as a quick win strategy to break the cycle of hunger and poverty (22). New Partnership for Africa's Development (NEPAD) and the United Nations 2005 World Summit endorsed and recommended expanding school meals using homegrown foods as a quick impact initiative in achieving the MDGs (110), and the MDG Africa Steering Committee reaffirmed the importance of school meals as one of the concrete opportunities to implement and scale up interventions in support of the MDGs (111). A substantial body of existing research supports the role of school meal programs in generating gains in educational attainment (112), school enrollment and attendance (113, 114). National school meals programs could be scaled if funding from the education sector were used for implementation, as opposed to core, constrained nutrition budgets. Early results from national school meals programs, such as Ghana, have not been immune to challenges (not yet reaching 100% universal coverage) but also have successes (*case study 10*). These national programs serve as excellent examples of public goods for other countries willing to implement national programs.

The World Food Program (WFP) has been supporting school meals, as a way to contributing to better education, better learning, better health and nutrition. Globally, WFP provides meals to 20 million children in school in 68 countries every day (115). These initiatives often involve more than simply providing a meal at school, and may include activities such as take-home rations for poor families who send their children to school, deworming campaigns, micronutrient fortification or supplementation, school gardens and health

and hygiene training (116). Moreover, WFP's model focuses on strategically linking school feeding programs with small-scale farmers, and implementing activities to help farmers increase their crop productivity (117).

Food for Work (see case study 11 in appendix 1)

Food for work provides food for public works by emphasizing improvements in infrastructure and the preservation of natural resources which together have the potential to contribute to longer-term food security (7).

Ethiopia

Ethiopia is one of the poorest countries in the world, with natural resource degradation being one of the most serious challenges in development. MERET (Managing Environmental Resources to Enable Transitions to More Sustainable Livelihoods) is a joint program between the Ethiopian government and the WFP aimed at addressing this challenge. It aims to build communities' resilience against shocks, and improve the livelihoods of rural households, particularly those headed by women. Chronically food-insecure communities participate in projects to rehabilitate the natural environment, and create productive assets. This involves participation in income generating activities aimed at improving livelihoods while using local natural resources in a sustainable manner (118). Examples of program activities include the construction or rehabilitation of roads, reforestation, land restoration and soil conservation, and restoration of rainwater ponds and springs. As a result of the MERET program, 300,000 hectares of land have been restored (119), with one million people benefiting annually, in 600 communities across Ethiopia. MERET has helped to improve food security because the soil and water conservation has facilitated diversification of agricultural production including the cultivation of a wide variety of cash crops – especially fruits and vegetables, some of which were kept for consumption, but most of which were sold – and increased productivity and food availability. All these households continued to produce teff, maize and sweet potatoes as well (120). Some participants were double and triple cropping as a result of MERET, and some said they had increased use of high-yielding seeds (120). In 2005, 41% of MERET households claimed their food deficit months had declined by two or more months as a result of the project (121).

Conditional food and cash transfers (see case studies 12 and 13 in appendix 1)

Food and cash transfers can improve the lives of those who are poor, particularly for households who suffer from a food security shock, when made conditional on beneficiaries using health and nutrition services (122) (33). Cash transfer programs can be given to households as a unit because they meet poverty or vulnerability criteria, or alternatively to individuals or families based on the presence of specific demographic groups such as children, girls, or fostered orphans. Cash transfers can be unconditional—given without obligations—or conditional—tied to obligations of recipients to participate in work, training, education, health, nutrition, or other services or activities. At times, they may be linked to activities, however participation is not obligatory. Cash transfers provide current basic needs of adults and children such as food and clothing (123). Yet, evidence on improvements in health is less clear. Conditional cash transfers increase the likelihood that households will take their children for preventive health checkups, but that has not always led to better child nutritional status (122).

Brazil

Brazil is an example of a country that is on track to meet 2015 MDG1 hunger target (85). The government instituted the Zero Hunger program that included conditional cash transfers and school meals, local food distribution programs, nutrition education, health and nutrition programs, and stimulus programs for poor family farmers. The conditional cash transfer program, along with the school meals program is the main

way for poorer households to access food, and was Brazil's premier strategy in addressing short-term hunger. This conditional cash transfer program was launched as the Bolsa Familia, in 2004.

Bolsa Familia serves the quarter of Brazil's population earning less than the global poverty line of two dollars a day, or around 42 million people. At the household level, it provides a basic income to around 11.1 million families but the transfer is only made if the family meets certain conditions. For example, children must be vaccinated against certain communicable diseases, and school-age children must regularly attend school. Similarly, pregnant women or women with infants must utilize their health care facilities and follow nutritional advice in order to access their support. These conditions provide opportunities for social inclusion for the family. The Bolsa Familia program was largely well accepted into the political, social, and economic establishments (124).

In 2001 there were 16.6 million undernourished people living in Brazil. By 2005, however, the number had been reduced to 12.0 million, and the share of the undernourished in the national population over the same period had dropped from 10% to 6%. Further to this, child malnutrition declined remarkably with stunting in the Northeast region decreasing from 22.2 to 5.9% (85). The FAO has estimated that malnutrition has been reduced by 73% in the last six years. It is unclear to what extent the Bolsa Familia program directly contributed to the dramatic decreases in undernutrition, relative to other advances made during this period. However according to the Minister of Social Development and Fight Against Hunger (125), nine out of ten families reported an improvement in their eating habits, seven out of ten families reported that the variety of foods had increased, and nine out of ten children ate three or more meals a day

Mexico

The Mexican Oportunidades program, another example of a cash transfer program, has demonstrated positive outcomes related to the MDG1 hunger goals for the proportion of the population undernourished and children who are underweight. The Oportunidades was one of the first cash transfer programs in a developing country offering bimonthly direct cash transfers to women to improve the quality, quantity and diversity of food in the household. In order to address undernutrition, Oportunidades offers nutritional supplements to infants between 6 and 23 months, undernourished children between 2 and 5 years, and breast feeding and pregnant woman. The supplement is a milk-based fortified food offering 20% of calorie requirements and 100% of micronutrient requirements including zinc, iron, and vitamins A and C (126, 127). In order to address education and health, the program offers educational grants and incentives for remaining in and finishing school, as well as basic medical services, and health education. By 2008, the program assisted 5 million families in 93 thousand districts in all of the country's most marginalized municipalities (128). Evaluations found that the program has had a positive effect on childhood growth with an increase in mean growth of 16% or 1 cm per child per year in the critical period of twelve to thirty six months (129, 130).

Summary and Lessons Learned

For social protection programs to be effective, the interventions must be aligned with local and national needs, but also what the country is able to implement from capacity, resource and timeliness perspectives. Social protection raises important institutional, financial and administrative challenges, and approaches need to be compatible with cultural, social and economic factors (109). Countries with high levels of poverty and low institutional and financial capacities can start with simpler, protective interventions such as cash or food transfers depending on the local context and drivers, prioritizing interventions appropriate for the most vulnerable groups. As capacities advance, more complex interventions can be added (108).

Integration of social protection systems calls for more sound policies towards food security, and action

plans directed at ending hunger and undernutrition. However, effective policies begin with the will of governments. Without commitment at all levels, starting with country leaders, achieving the MDG1 will be difficult. This next chapter will assess the critical dimension of the policy response to hunger and undernutrition at the country level.

Food Distribution and Aid in Emergencies

A typical notion of what safety nets looks like is in the form of “emergency food aid and distribution” however as demonstrated in the report throughout, safety nets go beyond just emergency-type situations. Targeted food distribution (*see case study 14 in appendix 1*) is a first-response tool in situations where acute hunger is life threatening after a shock. The main issues in the aftermath of shocks are often both availability and access to food. When markets are not functioning and infrastructure has broken down, food may not be available. Re-establishing food and nutrition security, through targeted food distribution programs, is often a critical priority. There is also a need to provide improved nutritional products that address high acute malnutrition rates in emergency situations. Once the immediate response has enabled vulnerable individuals and communities to survive, it is important to work with communities to improve livelihoods through transitional periods – to jumpstart longer-term development processes (131).

The Cost of Food Aid

Although some consider emergency assistance expensive, the cost is small compared to the cost of hunger. A recent report from the World Bank found that good quality food aid can save billions of dollars that would have to be later spent on saving lives from nutrition-related illnesses (2). Further to this are the massive costs associated with a lack of education and loss in human capital as a result of hunger and undernutrition. Food aid does not always focus on the key window from pregnancy until when a child reaches two years of age, which is when women and children are most vulnerable (5) (2). Although difficult to do in times of emergency, food distribution programs could be very effective from a nutritional standpoint if children and pregnant mothers received special priority. Distribution could also be complimented with vouchers for specific nutritious foods (10) (12), and linkages to other health and education services for women and children.

V. THE POLICY ENVIRONMENT IN WHICH REDUCTIONS IN HUNGER AND UNDERNUTRITION HAVE POTENTIAL

Why do some countries do better than others in progressing towards the MDGs? Much of the work begins with political will and national policies. This chapter will highlight three country cases and end with some challenges and recommendations on how to improve on policies that can ultimately impact programming on the ground for effective change in hunger and undernutrition.

Ghana Country Case Study

Ghana is generally considered food secure with agriculture being the main livelihood strategy for most of the population. Ghana’s underweight prevalence stands at 18% with an AARR of 3.1% (17). The proportion of those undernourished has decreased from 34 to 9% since 1990, meeting the MDG1 target. Although progress has been made, stunting remains high at 28% and Ghana is considered one of the 36 countries with a high burden of undernutrition (30). Substantial inequalities continue to exist, between the poor north and the more affluent south, and between urban and rural areas. Ghana is economically stable, although still considered a developing country, with a sound political system.

The national government is committed to ending hunger and undernutrition, and has given autonomy and resources for program planning and implementation to the Nutrition Unit. Despite its relative success, Ghana has been afflicted by a host of challenges to developing a coherent response to the MDG1 hunger

target. These include a lack of adequate funding, the nutrition sector being straddled among many ministries, and the low priority, poor coordination and the necessary capacity to build a robust national policy.

A landscape assessment was conducted to assess levels of commitment and capacity to scale up hunger and nutrition interventions and programs (132). This assessment showed that the country had over 20 policies and strategies aimed at improving undernutrition including the 2005 Ghana Free of Malnutrition, the Community-based Growth Promotion Program, and the Health Sector Program of Work 2007-2011 (133). Despite these focused initiatives, there remains no national food and nutrition policy. Furthermore, the monitoring and reporting systems had not previously been centrally coordinated, making assessments on progress towards nutrition unclear (132). The programs cover a breadth of nutrition interventions in multiple sectors, but it is acknowledged that coordination and collaboration between government agencies may not work as effectively as they should. The Ministry of Food and Agriculture controls the food security and production budget; whereas Ministry of Health controls health aspects of nutrition, leading to competing sources of funding and no principle department with lead responsibility.

The first nationwide comprehensive food security assessment was released in 2009 (134). The results showed that persistent food insecurity was concentrated in the poorest regions of the country - areas that were the most prone to floods and droughts that had been disproportionately affected by 2009's soaring food prices (134). The two main policies to address food insecurity challenges include the National Social Protection Strategy whose objective was to provide policy direction regarding the protection of persons living in extreme poverty. The Food and Agriculture Sector Development Policy plays a complementary role in supporting smallholder farmers with extension services to rural areas.

With these challenges of funding, coordination, and the absence of a clearly articulated policy, how has Ghana progressed towards the MDG1? Some of the credit for Ghana's success has been linked to strong economic growth led primarily by the agriculture sector particularly the improvements in maize, yam, rice and cassava varieties alongside improved agriculture services. There has been a 25% increase in cropped area, and a 36% and 50% increase in yields of maize and cassava respectively. Market liberalization has had a positive impact for the cocoa sector (38).

Accompanying these economic changes, there has been a significant investment from NGOs, with resources, capacity and technical tools to assist Ghana, with much of the funding (two-thirds to three-fourths) to support nutrition security (135). Programs such as PROFILES, a process for nutrition policy and advocacy designed to demonstrate the contribution that improved nutrition can make to human and economic development has been working in Ghana to assist in improving the effectiveness of the action plan (33). These initiatives are an important first step, and should serve a solid foundation on which to build a comprehensive and durable response to hunger and undernutrition.

Vietnam Country Case Study

In Vietnam, the prevalence of children who are underweight is currently 20% with an AARR of 4.1%. The proportion of those undernourished has reduced from 28 to 14% from 1990 to 2008, already achieving the MDG target of halving hunger (17, 54). The country's success was due in part to a strong economy, which was accompanied by substantial urbanization. However, much of the rural areas, where 80% of the population resides, remain dependent on agricultural production as the primary source of income.

Concurrent to its economic success, Vietnam has made considerable investments in rural infrastructure and has established a rural development fund that provides subsidized credit (85). Vietnam also underwent land

tenure reform known as “Doi Moi” which promoted economic transformation with intensified rice production and served to enhance food security and household incomes. This was accompanied by a diversification of agricultural production towards more nutritious crops, and those that reap higher economic returns such as coffee and cashews (136). To build onto the Doi Moi, a new holistic policy for Agriculture, Farmers and Rural Areas, termed Tam Nông, is being established, to focus on improving livelihoods in rural areas through agriculture, forestry, fisheries and food processing but also through alternative livelihoods for 2010-2020. Climate adaptation and mitigation, and comprehensive food and nutrition security programming are also included in this strategy.

In 2001, the National Nutrition Strategy (NNS) 2001-2010 was adopted by the Prime Minister which culminated in a national nutrition policy aiming at improving protein energy malnutrition, dietary diversity and micronutrient deficiencies. The Draft Master Plan of Nutrition (MPN) for the period 2003-2007 was developed to provide a basis for implementation of the NNS. The Ministry of Health served as the primary implementer sector but worked in partnership with agriculture, rural development and education. The National Institute of Nutrition (NIN) assisted the MOH by deploying professional and technical activities, along with the tools and expertise to support evaluation (137).

While underweight prevalence has greatly improved due to enhanced food security, income, health gains and political commitment (138), stunting rates remain persistently high in Vietnam. As with Ghana, disparities exist between urban and rural communities, and ethnic groups. In response to this, in 2006, the country focused renewed attention and political commitment to reduce stunting (139). The NIN within the Vietnamese MOH serves as a focal point for nutrition and has demonstrated strong leadership in coordination national and international partners. A Stunting Reduction Strategy has been introduced which consists of an essential nutrition package based of high impact interventions with sub-national targeting and adaptation depending on resources and provinces with more vulnerability (140). By 2020, the new policy hopes to improve the nutrition of women and children, with clear and well-defined targets, and to prioritize programming to provinces with the greatest need (141).

India Country Case Study

India suffers from the highest prevalence of stunting at 48% in the world, and a 31.2% share of the developing world’s burden of stunting. While underweight prevalence is decreasing somewhat, it remains alarmingly high at 48% of children under five years (17). The proportion undernourished has decreased marginally from 24% to 21% since 1990 (54). The situation for children and women remains critical. The percentage of children under five who are underweight has been virtually unchanged between 1998-1999 and 2005-2006, hovering near 50%. The percentage of women who are underweight decreased only marginally, from 36% to 33%, during the same period (142). India is widely expected to miss the MDG hunger target by a significant margin (143).

India remains an enigma in global hunger: how can a country with striking economic growth and strong agricultural productivity be failing to achieve commensurate reductions in hunger? First, inadequate purchasing power persists in India due to insufficient employment and livelihood opportunities, insecure land tenure, and lack of growth in non-farm jobs—particularly for lower caste households (144) (145, 146). Second, Indian women are undervalued in society and “eat least and last” (145, 147). Restricted access to resources, healthcare services, and decision-making power impacts India’s high prevalence of underweight women and low birth weight babies. National rates of child anemia, calorie deficiency, and child illness point to unsatisfactory feeding practices, which in turn reflect poor maternal nutritional status, socio-cultural traditions, economic limitations, and oftentimes mothers’ young ages (143). Third, India’s notably low public health expenditures compounds issues of access, with 75% of national health spending being

from out-of-pocket payments for private care. Childhood illness is a critical factor in nutrition, yet fewer than 50% of Indian children receive professional health care, and 30% are not vaccinated (143). Lastly, India's rapid urbanization and overcrowding makes households particularly vulnerable to malnutrition by fomenting competition around access to basic services such as healthcare, water, and sanitation. There are particular difficulties for migrants, homeless persons, and those living in informal urban settlements in accessing government nutrition and welfare schemes (e.g. below poverty line cards required for the Public Distribution System's subsidized wheat and rice, or job cards required for the National Rural Employment Guarantee Act) (145).

Nutrition interventions in India have also been historically weak and ineffective. The Integrated Child Development Services (ICDS) program, the primary source of public spending on child nutrition, began in 1975. It operates as a nutrition safety-net program providing meals for children under 6, supplementary food for adolescent girls and mothers, informal preschool activities, home visits, and monthly health days. Much of the food distributed was cereal-based and low in essential micro and macronutrients. Despite a threefold budget increase since the MDGs were set, ICDS is only reaching 12.5% of Indian children ages 6 months to 6 years. The program is widely criticized for poor targeting focusing on children from 4-6 years of age instead of the established window of opportunity from conception to 24 months (145, 148, 149). Centers are often located in wealthier parts of town, making them poorly situated to target vulnerable children in poor households or lower castes living in remote areas (145, 148, 149). Indeed, longitudinal data from ICDS attendees has reported no impact on nutritional status (145) (149, 150).

Similarly, the National Rural Health Mission (NRHM) was launched in 2005 to facilitate access to nutrition, sanitation, and primary healthcare services for India's rural masses (151). NRHM seeks community-level involvement through the locally elected Panchayat Raj Institutions and volunteer ASHAs (Accredited Social Health Activist). However, the nutrition component has taken a backseat to other interventions geared toward infant and maternal mortality. ASHAs, for example, largely focus on institutional deliveries because they are remunerated for these outcomes (152).

Summary and Lessons Learned

There is much that can be learned from Ghana, Vietnam and India about generating a coordinated and comprehensive approach to addressing hunger and undernutrition. Both Ghana and Vietnam have made substantial progress towards the MDG1 hunger goal in the wake of agricultural growth, diversification and strong economic gains. However, there were likely a host of other contributors to their success. Nutritional gains took place concurrent with improvements in health and sanitation, land reforms, and policy initiatives with varying degrees of coordination and effectiveness. Consolidating post-1990 reductions in hunger through the formulation of clear policy mandates, efforts to address the needs of vulnerable groups, and establishing locally driven platforms for monitoring and evaluation will be critical.

The case of India is more complex and draws attention to the fact that economic growth alone is an insufficient catalyst for reducing hunger. Issues of equity, ensuring the status and rights of women, land tenure; employment diversification and the concurrent development of public health programs and systems remain critical barriers to the achievement of better nutritional outcomes. As a complex 'long-wave' event, undernutrition will inevitably require an appropriate combination of quick wins and longer-term approaches. In the Indian context, this process must be founded on a solid policy platform that is mirrored by a commitment of resources. Such an approach would draw together quick wins to attain rapid gains, with wider food security initiatives that include local production of fortified foods, land reform, and agricultural diversification (153, 154). Finally, for sustainable gains to be achieved, these objectives should be aligned with strategies to address wider vulnerabilities such as social exclusion and the status of women,

poor access to education, and expanding coverage with essential primary health care interventions (155, 156).

VI. ACCELERATING PROGRESS ON HUNGER AND UNDER NUTRITION: KEY LESSONS AND FUTURE DIRECTIONS

2010 marks the two-thirds point on the MDG timeline. It is a time both for reflection on progress made since 1990, while looking forward with pressing urgency to the coming five years. This report has reviewed progress on the second component of the MDG 1 commitment, which called for reducing of the proportion of underweight and undernourished children by 50%. In doing so, it takes stock of where we've come, drawing attention to key lessons and future directions.

On the surface, the figures paint a picture of great challenges ahead. More than 1 billion people are living in hunger and 195 million children are stunted as the result of malnutrition. The proportion of children underweight living in developing countries declined only marginally between 1990 and 2008 – from 31% to 26%, with vast inequalities within and between countries (16, 17).

Progress in the developing world has been too slow and the consequences are well apparent. Globally, undernutrition still contributes to roughly half of the 8.8 million child deaths that take place each year. This represents nearly one-third of the global burden of disease among children (16)(17)(30). Micronutrient deficiencies weaken the health, growth and productivity of over two billion people worldwide placing constraints on countries' development potential (33).

In response to these alarming figures, there has been a convergence of international support, policy direction, and resource mobilization around addressing hunger and undernutrition. Advocates highlight the evidence and importance of technical quick-wins alongside more durable, long-term investments. A renewed political imperative has been accompanied by a substantial resource commitment from the G8 and others. While many argue this may not be enough, the global community must leverage this momentum to further accelerate progress.

The question of how to best translate these commitments into concrete outcomes has been the focus of much of this report. There is a growing body of evidence and best-practice examples of what needs to be done. A spectrum of hunger and nutrition interventions have been reviewed, drawing both from local and national experience, and generating important lessons both on what works and how to strengthen delivery systems. These approaches broadly fall into 4 categories:

- 1) **Prevention- and Treatment-based approaches**: The most serious consequences of undernutrition can be prevented and managed with a range of scientifically-proven, cost-effective interventions – from vitamin A and zinc supplementation, to protocols for the management of moderate and severe malnutrition (58). Putting these into practice, often as an 'integrated package,' has been shown to be effective in settings as diverse as Peru, Cambodia and Bangladesh. However, moving these programs to national scale poses a host of implementation challenges, and a tenuous balance exists between maintaining quality and increasing coverage. When moving to scale, the technical content of interventions must be closely paired with attention to the process of implementation. There is substantial emerging evidence that a clear policy direction, fostering stakeholder ownership and ongoing engagement, developing local capacity, and strengthening monitoring and

evaluation systems that feedback into programs, are all necessary and important determinants of program success.

- 2) **Food production-based approaches:** Food production-based approaches aim to enhance food availability and diet quality through local production and agricultural biodiversity. These interventions are critical for generating durable and longer-term gains in food security. Examples from both Asia and Africa have demonstrated encouraging evidence of success. Through subsidizing seed and fertilizer production, Malawi in particular has gone from a country that was a recipient of food aid, to one that feeds its neighbors in a matter of just a few years.

However, enhancing food availability is just one part of the food security equation. The growth and consumption of staple crops must be counter-balanced with efforts to foster diet diversity in order to maximize the benefits to growth and micronutrient deficiency. Initiatives to improve food production should be simultaneously coupled with efforts to ensure both improved access and utilization. Improved food approaches should also expand to improved high quality complementary foods for children under two years of age that are fortified and rich in essential nutrients as well as fortified staple foods for households.

- 3) **Multi-sectoral approaches:** Recent calls for greater attention to hunger and undernutrition highlight the importance of integrating technical, well-coordinated interventions with broader strategies that address underlying causes of food insecurity – incorporating perspectives from agriculture, health water and sanitation, infrastructure, gender and education.

This report highlighted the importance of embedding nutrition within a wider development framework. Much of the progress towards reducing undernutrition in countries such as Ghana and Vietnam has been built on the back of a rapidly changing economic climate. However, India, despite impressive economic gains, is home to some of the highest rates of undernutrition in the world. Issues such as gender equity, education, legal reform and land tenure, and special efforts to address the needs of vulnerable groups are all critically important to making real progress. Hunger and undernutrition have bi-directional relationships with many MDG targets, and fostering longer-term progress may require synergistic efforts on multiple fronts.

- 4) **Innovative safety net approaches:** Embedded within many food security interventions are safety net approaches that help those living in desperate poverty from falling deeper, including communities facing conflict or natural disaster. This report drew attention to an encouraging range of ‘delivery innovations’ that have transformed safety nets from short term-fixes towards comprehensive strategies that generate wider gains. Supplementary school meals, conditional food and cash transfers, and food for work programs are examples where linking immediate needs to broader developmental milestones holds great promise.

Critical Gaps and Solutions

From the country-level analysis of programs and policies highlighted in this report, a host of common implementation gaps have been identified that hinder progress towards reducing hunger and undernutrition.

Critical Gap #1: ***Weak systems*** in much of sub-Saharan Africa and some countries in Asia have been unable to introduce and sustain the delivery of critical hunger and nutrition interventions.

Solution: Components that strengthen systems must have earmarked funding and capacity when implementing hunger and undernutrition programs including increased capacity of primary health care systems, database systems, education systems, food and eco systems, or infrastructure systems. Without the foundation in place at the local level, building programs will not be sustainable. Coordination across sectors will be critical to build the systems as a whole.

Critical Gap #2: **Access barriers** such as cost, distance, and transport pose serious challenges to many communities.

Solution: In such settings, providing an essential package of services and resources to those who need them most and broadening the reach of safety nets, and nutrition and health services will require moving beyond facility-based models, and introducing novel strategies such as a cadre of Community Health Workers and Agriculture Extension Workers, or mobile schools and clinics for pastoralist populations that move with the population.

Critical Gap #3: **Absence of accurate and timely data** has been a major limitation.

Solution: Regularly updated and well collected is crucial for identifying coverage gaps and generating information on how and where to intervene. Data must be communicated in real time to demonstrate what is working at the community, district and country levels. Utilizing simple, free and open-source technologies such as SMS-based applications with mobile phones can revolutionize data collection systems in low resource settings.

Critical Gap #4: **Prioritizing programs targeting the most appropriate populations** is often not done.

Solution: Ensure programs and policies prioritize the poorest of the poor, smallholder farmers, those living on the margins with geographical constraints and female headed households, pregnant women and children under two years of age. This will ensure financial investments are relevant, and being spent on the most critical populations.

Critical Gap #5: **Ownership of programs and policies at the country, district and local level** is often lacking, and is detrimental for long-term change.

Solution: National, regional, district and local governments, communities, leaders within villages, and households themselves need to have decision making power, and be accountable and incentivized to make programs and social protection work on the ground. Projects, whether at a local or national scale, should first begin with dialogue and coordination with local leaders and stakeholders to ensure the interventions are relevant, viable, and wanted in communities.

Critical Gap #6: **Reactive and less proactive** leads many programs to waste resources, without a lens on local determinants that impact hunger and nutrition outcomes.

Solution: Approaches should be prevention-rooted, and focused on quick impact initiatives linked with long-term investments in the determinants of hunger and undernutrition, and ultimately poverty. Food assistance and safety nets can help build physical assets and strengthens human capital to protect livelihoods, and build resilience to shocks.

Critical Gap #7: **Resources are scarcely dedicated** to nutrition.

Solution: Ideally, policies and programs that address hunger and undernutrition should be integrated across sectors with budget priorities nested in agriculture and rural development sectors as well as in health. Substantive investments towards in-country capacity building, and innovative partnerships that potentially involve the private sector are vital. It is also essential that governments recognized nutrition as a public good, hence investments in the areas of improving nutrition for women and children are essential.

Critical Gap #8: **Poor quality food products and lack of engagement** of the private sector.

Solution: Research and subsequent mobilization and distribution of improved food products that are tailored to the needs of vulnerable populations are critical. More dedicated resources are needed for nutritionally adequate food for young children. It will be important to engage with private sector and the food industry to assist in developing improved products, market mechanisms, and streamlined delivery channels.

Critical Gap #9: **Underweight and undernourishment MDG1 indicators** fail to provide the entire picture.

Solution: Countries may also benefit from simplifying and streamlining core nutrition measures, at least in the short term. The use of indicators such as mid-upper arm circumference (MUAC) can also be measured in conjunction for rapid, cost-effective detection of acute malnutrition. It is clear that children under five years of age who are underweight and the proportion of the population who are undernourished are not the best indicators to assess hunger, food security and the health of a population. Stunting, the height for age of children under five years of age, provides a better indicator to assess the long-term determinants of hunger, poor nutrition and poverty. While collecting underweight data is still critical to assess progress made towards the MDG1, stunting data should be measured and reported routinely in program and national assessments.

Critical Gap #10: **Addressing broader social and economic determinants** of hunger and undernutrition are put in the “parking lot” and considered too difficult to address.

Solution: Approaches that address immediate needs of hunger (social safety nets, food and nutrition programs, health systems strengthening) must be accompanied with long-term development programs that promote agriculture and rural development, create employment, and increase incomes. Stronger operations research modalities in both agriculture and nutrition, along with the links between their respective interventions with women’s empowerment embedded within is critical. A long-term lens on overall food systems and natural resource management must bring together perspectives and priorities from both urban and rural communities. Lastly, for many poor communities, access to land, resources, technology and tools, with local and regional access to agricultural trade are key in linking with the larger MDG1 goal.

Lessons Learned and Broad Future Directions

As 2015 approaches, what can be learned from the case studies presented in this report that might assist countries that are currently off-track in meeting the hunger component of the MDG1 target? Furthermore, based on the global experience of the past two decades, what are the critical take-home implementation messages that are critical to rapidly accelerating progress towards eliminating hunger and undernutrition?

Clear policy and visible leadership: The experience of countries as diverse as Vietnam, Ghana, Brazil and Malawi, all highlight the importance of a clear national policy direction. Nutrition policies can either be embedded centrally within the Poverty Reduction Strategy Policies (PRSPs) or as stand-alone initiatives linked to the overall development vision for countries moving forward. There is plenty of evidence to suggest in the absence of clear policy, rapid gains are much more limited. A review of PRSPs in 40 countries where malnutrition is high demonstrated that while most of the policies mentioned nutrition, very few made significant attempts to formally incorporate nutrition into the actual strategic priorities (33).

Adequate financing: Many governments under invest in programs and efforts to reduce hunger and undernutrition, and fail to provide the minimal and essential domestic public goods and investments in

agriculture and health needed for sustained growth (84)(157). In countries that cannot afford to provide these goods, international development assistance and food aid will remain an indispensable, temporary supplement. Many PRSPs do not currently contain hunger reduction strategies. Taking steps to redress gaps in budgetary allocations in line with locally relevant priority areas will be essential if gains in reducing hunger and undernutrition are to be achieved (60).

Central coordination: Both nutrition and hunger fall within a broader mandate that necessarily includes agriculture, health, education, water and sanitation and other departments. This poses clear challenges to leadership and coordination. Too often, no single entity or team takes primary responsibility for working at the nexus of research, policy and program development (17). From a policy and budgeting perspective, it is difficult to commit staff and resources when a sector is divided among four departments. Given these realities - one national plan, one budget, one framework and one reporting mechanism should be in place for a harmonized, streamlined effort (158). Even in decentralized mechanisms, a chain of command must exist up to the national level where capacity, data and reform management should be centralized. International organizations should play an active role in supporting national governments through providing tools and technologies, capacity and resources to address hunger and undernutrition in the context of a wider, locally owned development strategy.

Comprehensive and context-relevant approach: This report and the discussion above have highlighted four distinct approaches to addressing hunger and undernutrition. While the relative weight of any single approach may vary from country to country, all are important to consider in countries where progress towards the hunger component of MDG1 remains strained. There is an evidence base and emerging consensus on what the minimum contents of the 'nutrition basket' should contain. However, local context and local processes remain all-important. Countries must develop contextually-relevant priorities that integrate technical prevention and treatment-oriented interventions with wider efforts to address to enhance agricultural productivity, food security and diet diversity. Within many countries, coverage gaps will remain among vulnerable groups, and securing safety-nets through the use of food aid, conditional cash transfers or food-for-work programs will be inevitable (60). Poverty and hunger hotspots within countries should be a top priority, as should pregnant women, mothers and children under five years of age - with a special emphasis on under twos. Finally, strengthening the systems required to extend coverage with essential interventions will require sufficient attention to the 'process-side' of the delivery equation. The case studies in this report suggest this is often neglected, yet plays a critical role underpinning program success. How communities are engaged and mobilized, how international partnerships and national stakeholders are coordinated, and how health and agricultural extension workers facilitate intervention delivery are as important to achieving rapid hunger and nutrition gains as the technical content of specific interventions.

Measuring progress: Accurate and timely hunger, vulnerability and nutrition information is the cornerstone of a broad-based hunger and nutrition strategy. It is imperative that partnerships be developed to support nationally-led, monitoring systems to measure, feedback and appropriately hone and refine program activities. Building this capacity should be the central goal of both national government and donor-funded activities and should be done at the beginning of policy crafting and implementation. In high-risk countries, more frequent updates than 3 to 5 yearly nutrition surveys will be essential if reaching the 2015 targets is to be achieved. This is especially important in high-risk settings, among vulnerable groups, or to assess the effectiveness of programmatic innovations.

Nutrition and the wider MDG context: While nutrition specific interventions remain the backbone of an effective response to hunger, the case studies in this report repeatedly support the need for a

comprehensive response to be firmly embedded within in the wider MDGs agenda. Durable gains will hinge on concurrent steps to reduce poverty, improve access to education, empower women and girls, and facilitate access to basic infrastructure including safe water and sanitation, energy, transport, and communication. Persistent high levels of undernutrition in India, despite a strong economic engine, attest to the importance of applying this wider lens. Working on multiple fronts simultaneously has the potential to leverage synergies and catalyze gains that extend beyond those achieved through sector specific programs working in isolation. While multi-sectoral approaches may seem difficult and unwieldy, it is time for the global community to take on the challenge as we move forward towards 2015.

In summary, this report affirms that through energetic and engaged national leadership and with the support of robust international partnerships, rapid progress in reducing levels of hunger and undernutrition by 50% by 2015 is attainable. Accelerating progress towards these targets is less about the development of novel innovations and new technologies and more about putting what is already known into practice. Success will hinge on linking clear policies with effective delivery systems for an evidence-based and contextually relevant package of interventions that can rapidly be taken to scale. Persistent hunger and undernutrition remain an inexcusable unfinished agenda and successfully closing the few remaining gaps is a pre-condition for wider global progress towards achieving the MDGs.

APPENDIX ONE: CASE STUDIES

CASE STUDY #1

A Prevention-Based Approach to Hunger and Undernutrition: A Community-Scale Perspective

A Good Start to Life Program

Country of Focus: Peru

Peru is on track to meet the hunger portion of the MDG1 with a decrease in the proportion of undernourished from 28% to 15% since 1990 (54), and the prevalence of children who are underweight of 5% (with an AAR of 3.6%) (51). However, stunting remains high at 30% (51). The “Good Start to Life” program was initiated in four regions of Peru in 2000 and was assessed after four years (61). By 2004, the program covered approximately 75,000 children under 3 years of age and 35,000 pregnant and lactating women living in 223 rural communities. The main participating partners in the program were the Health Directorates of the four regions, personnel from 434 health facilities, several local NGOs, 23 local radio stations to communicate messages, and the leadership of the 223 communities.

The program consisted of an intervention package of nutrition, hygiene, health, similar to the Lancet recommended interventions (58), early stimulation, and participatory processes that built capacity at both the individual and institutional levels, and mobilized human, economic, and organizational resources. The main interventions were to promote growth and development of children, antenatal care, adequate diets for pregnant and lactating women, exclusive breastfeeding during the first 6 months of life, adequate complementary feeding, early stimulation of the child, control of iron and vitamin A deficiency, iodated salt intake, and personal and family hygiene.

After four years, the program was associated with a decrease in the prevalence of chronic malnutrition, as measured by stunting, from 54.1% to 36.9%, a decrease in the prevalence of iron-deficiency anemia from 76.0% to 52.3 % and a decrease in the prevalence of vitamin A deficiency from 30.4% to 5.3%. The annual cost was US\$116.50 for each child in the program (61).

An evaluation concluded that “Contrary to programs in other regions of the world, this program did not have a priority focus on curative approaches, mostly because the few cases of severe malnutrition detected were referred to health care services and treated as indicated by standard practice. The lesson is that in this scenario, the decreased prevalence of stunting was the result of a mostly preventive approach that prioritized children under 3 years of age and pregnant women” (61).

CASE STUDY #2

A Prevention-Based Approach to Hunger and Undernutrition: A National-Scale Perspective

Bangladesh Integrated Nutrition Project (BINP)

Country of Focus: Bangladesh

Bangladesh is making some progress towards the MDG1 but the progress is insufficient. Children who are underweight remain at 46% and the proportion of the population who are undernourished decreased from 36% to 27% from 1990 to 2006 (54). Although Bangladesh has made huge strides in tackling underweight since 1990 when the prevalence was at 67%, the number of children underweight remains high. Bangladesh is also considered one of the top 24 countries with highest burden of stunting (17).

In 1995, a large country-scale program, Bangladesh's Integrated Nutrition Project (BINP) was financed by a \$65 million World Bank credit and is considered the first large-scale government initiative in nutrition (63). The idea was to scale a community nutrition intervention originally piloted by the Bangladesh Rural Advancement Committee (BRAC) (33). The project focused on prevention-based interventions including maternal education, child feeding practices and childcare. After the initial \$65 million, another \$92 million was given through the National Nutrition Program in 2002 as a sector wide approach and was incorporated into the PRSP indicating the commitment of the government of Bangladesh to address malnutrition (63).

The project's aim was to reduce child malnutrition through growth monitoring and supplementary feeding of children aged 6–24 months, and supplementary feeding for pregnant women so as to increase pregnancy weight gain and, hence, reduce the incidence of low birth weight in Bangladesh through three objectives:

1. Improve the capacity of national-level institutions in Bangladesh in the areas of advocacy, analysis, policy advice, operations research, and program support;
2. Improve the capacity of communities, households, and individuals in the project area to understand their nutritional problems and to take appropriate action; and
3. Improve the nutritional status of the population in the project area, with particular emphasis on children and pregnant and lactating women.

The project had three primary components: (1) the national-level nutrition activities, (2) the multi-sectoral nutrition program (garden and poultry raising), and (3) the community-based nutrition component. At the end of the initial project, there was clear evidence that nutrition-related knowledge concerning infant feeding practices and delivery and use of micronutrients vitamin A, iron/folic acid and iodized salt were improved in the communities with BINP. The evidence presented a mixed picture concerning any additional effect of BINP on child nutritional status, weight gain during pregnancy, or birth weight beyond those seen in the non-project areas, where both improved. Whether this was due to a true lack of impact on outcomes per se or weaknesses in the evaluation designs and the data remains unclear (63).

BINP has been subjected to many evaluations, and controversy (159) (160) due to issues of design and indicators chosen to measure. One evaluation stated, "Although some reports have claimed success for the nutrition interventions, others have suggested there was little effect. This lack of consensus has fueled considerable controversy and detracted from the important task of building a nutrition vision and a platform for action in a country that has malnutrition rates that are among the worlds highest" (63).

Another evaluation of BINP found that the program had not achieved its objective to reduce child malnutrition at a population level after a \$65 million investment. "Investment in improved nutrition is important and its potential impact should be maximized. However, the international community has an

obligation to see that loans and other investments are based on sound and proven techniques” (159).

Several lessons for future nutrition preventive multi-component scaled programs came out of an evaluation (63):

- Projects can set themselves up for failure if they are overambitious in their objectives.
- Greater emphasis should be placed on building the capacity and the incentives for making timely and appropriate design adjustments during implementation, based on operations research. This implies much greater emphasis on mechanisms that ensure information is fed into programmatic changes in a timely manner.
- Explicit and sophisticated program theories should be adopted to guide analysis and to address the common problems in translating evaluation findings into program and policy decisions.

Some have suggested that the main cause of nutritional improvement in Bangladesh is most plausibly the substantial rise in daily energy supply which took place in the late 1990s, which rose 10% from 1995 to 2000, mainly from increases in rice production (161).

CASE STUDY #3

A Treatment-Based Approach to Hunger and Undernutrition: A Community-Scale Perspective

St. Louis Nutrition Project and Project Peanut Butter
Country of Focus: Malawi

St. Louis Nutrition Project, a research and working group associated with the University of Malawi College of Medicine, has been working in rural communities in Malawi to implement outpatient therapeutic care programs using home-based therapy and ready-to-use-therapeutic-food (RUTF). Work on home-based therapy has been ongoing since 2001, with successes that have paved the way for national implementation of community based therapy and international guidelines for the use of community based therapy for severe malnutrition.

The RUTF is made locally, called Chiponde, in the Project Peanut Butter factory in Blantyre Malawi, to decrease production costs and respond to immediate needs in the country. The Project Peanut Butter factory is a local Non-Governmental Organization (NGO) in partnership with Nutriset and makes between 450 to 990 tons of Chiponde per year (162).

St. Louis Nutrition Project has implemented outpatient care for children with severe malnutrition in the district of Machinga, which lack overall health care facilities or any nearby health system. Village health aides are trained on screening, diagnosing and basic treatment of acute malnutrition with home-based care. The preparation to implement the project takes just 10 days. Caretakers and children come to the rural “centre” to get assessed, and receive a 2-week supply of RUTF. The program continues for 8 weeks if needed [95]. One study showed that of 826 children enrolled, 775 (94%) recovered, 13 (1.8%) remained malnourished, 30 (3.6%) defaulted, and 8 (0.9%) died. Mean weight gain was $2.7 \pm 3/7$ g/kg/day (71).

Health aids and locally made RUTF was available for this project and in order to scale, these factors must be taken into account. Other settings may not have either to work with. Yet, the rural setting of this project with little more than village health workers and therapeutic food, and no medical personnel, had promising results. With only 10 days of training and preparation, this model could be used in time limited, resource-constrained settings if the RUTF is in place.

The project has been trying formulations in clinical trials in Malawi to test the efficacy of different types of ingredients because of the high cost of powdered milk, which has limited many projects from taking on CMAM. Trials with soya protein substituted for some of the milk powder in the standard RUTF recipe have shown slightly lower recovery rates for severely malnourished children (publication in submission), but Soya-based formulations of RUTF – Soya Chiponde - have been shown to be equally effective and superior to Corn-Soy Blends in the treatment of moderately malnourished children (8). Current studies are comparing this Soy Chiponde to improved corn soya blends (CSBs). Forthcoming studies will be measuring the usefulness of antibiotics as a standard component of home based therapy on a large-scale level. Valid, who pioneered CTC, is also producing RUTF in the country.

CASE STUDY #4

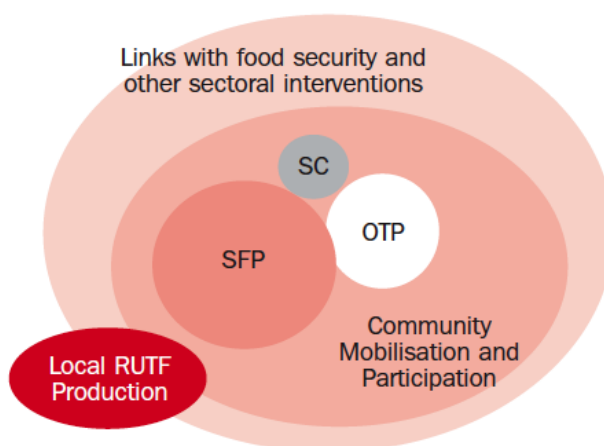
A Treatment-Based Approach to Hunger and Undernutrition: A National-Scale Perspective

Integration of community- based management of acute malnutrition (CMAM) into the national health systems

Countries of Focus: Ethiopia, Malawi, and Niger

Severe acute malnutrition (SAM) affects 20 million children under five years of age each year and contribute to 1 million deaths per year (67). An innovative public health model to address acute malnutrition in developing countries has been developed called Community-Based Management of Acute Malnutrition (CMAM) is a community-led approach to addressing malnutrition. Originally called Community-based Therapeutic Care (CTC) and developed by Valid International (69), CMAM was used only in emergency settings. However, the CTC approach was shown to be useful in non-emergency settings when the right components were put in place. The community-based approach engages the community to detect signs of SAM early, and provides treatment for those without medical complications with ready-to-use therapeutic foods (RUTF) or other nutrient-dense foods at home (67). If properly combined with clinical care for those malnourished children with medical complications and implemented on a large scale, community-based management of severe acute malnutrition could prevent the deaths of hundreds of thousands of children (67).

CMAM is a public health intervention based on the principles of coverage, access and cost effectiveness. The model attempts to maximize population-level impact by focusing on providing effective therapeutic care to the majority of acutely malnourished people as outpatients, using techniques of community mobilization to engage the affected population and maximize coverage and compliance. Wherever possible, programs build on local capacity and existing structures and systems, helping to equip communities to deal with future periods of vulnerability. The CMAM model treats people suffering from severe acute malnutrition using a combination of three treatment modalities (shown in the figure below), **inpatient therapeutic (SC – stabilization centers), outpatient therapeutic (OTP) and supplementary feeding (SFP)** according to the clinical and anthropometric characteristics at presentation (70).



From 2000-2003, NGOs expanded the CMAM approach beyond the emergency settings in all three countries. In Ethiopia, a country prone to droughts, CMAM was done in two districts in 2002. In 2003, the national emergency was used as a motivation to scale up CMAM services more widely mainly working with

Concern and UNICEF. Malawi, with droughts in both 2002 and 2005, began piloting CMAM working again with UNICEF, Concern and Valid International in select districts and has since scaled up nationally. In Niger, during the 2005 emergency, national CMAM guidelines were developed and services were rapidly expanded by numerous NGOs. Early positive results of the CMAM programs from the three countries served as a catalyst to scale up further. In Malawi for example, when piloted in two districts (Dowa and Mchinji) the monitoring results were encouraging with 87% of children discharged successfully from the program as shown in the table below (75) (76).

Interim monitoring results from Dowa District, Malawi, CMAM project, Aug 2002-Dec 2003						
	Stabilization Centre		OTP		Combined	
Exits	n	%	N	%	N	%
Discharged	1299	87	1160	69	1160	69
Death	101	7	47	3	148	9
Default	25	2	242	14	267	16
Referred to hospital/SC	50	3	217	13	50	3
Other	20	1	26	2	46	3
Total	1495		1692		1671	

In 2007, FANTA-2 evaluated the integration of CMAM into the national health systems of Ethiopia, Niger and Malawi (74). There were similarities and differences across the sites. Similarities included:

- Services from previous emergencies provided lessons for scale up
- Systems were weak and staff was trained adequately
- Access to health care was generally poor
- Strong community outreach increases case load
- Supplies were donor driven
- Performance indicators were not regularly collected
- Referral and treatment networks were fragmented

Yet there were key differences between the three countries. In Niger, SAM remained high and CMAM services were not consistent. NGOs implemented the CMAM services in a top down approach with little overall leadership. In Ethiopia, decisions were made at the district and regional levels with UNICEF as coordinators and NGOs as implementers. The country has strong international support, facilitated by UNICEF and an NGO supported CMAM support unit (CSU). Malawi has been considered the model for scale up. The national MOH was a leader in implementing CMAM and provided support to district health offices. NGOs supported the CSU and provided technical support. In all three countries, inpatient care was not sufficient, and was not adequately linked into the CMAM model program itself, creating obstacles in the continuum of care (74).

The Malawi government has included CMAM in its national strategy and the CMAM operational plan has been officially signed by Ministry of Health. The Operational plan is now the key document for advocating for resources and other CMAM related interventions. In preparation for the phase out of implementing NGO's in the various districts, phase out strategies have been developed and District Health Offices are taking over in a leadership role. Currently, 344 CMAM sites and 96 inpatient units have been implementing CMAM programs in 24 districts of Malawi. The remaining 4 new districts that are implementing CMAM have participated in national learning forums. In preparation for scale up in the country, training for CMAM has been done in all the 28 districts, including capacity assessments especially targeting the 4 remaining districts. Of the approximately 59,000 children with SAM, 60% are being treated, with a 75% recovery rate.

In the national scale-up Malawi is now reaching 74% of children in need of treatment(17).

CMAM databases have been established in all 24 implementing districts at District Health Offices (DHOs) and national data comprising OTP, NRU and SFP has been produced and shared at the national level. The national picture on CMAM performance is above the Sphere standards. In the future, an integrated web-based nutrition database will be developed.

Key factors for the success in Malawi (77):

- Institutionalization of CMAM into the Essential Health Package
- Community involvement
- Presence of supporting NGOs and willingness of those NGOs to support DHO's to take on CMAM
- Local production of RUTF
- Funding supporting from CHAI and Concern Worldwide for RUTF procurement
- Presence of a national support unit - CMAM Advisory Services to assist MoH with coordination and technical support for CMAM activities
- Enabling environment - integration of CMAM into national policies and guidelines

Key challenges faced in Malawi (77):

- High costs of RUTF and overall cost of CMAM management versus national budget ceilings
- CMAM has not yet been fully integrated into the national supervision checklist.
- CMAM is not well linked with other health services at community and health facility level
- Limited participation of clinicians in the management of CMAM resulting into poor management of cases
- Inadequate supplies of CMAM equipment

The FANTA-2 evaluation made key recommendations for integrating CMAM into a health system including the need for an enabling environment, quality of services, access to services and supplies and competencies for CMAM but also noted that CMAM provides the opportunity to strengthen health systems. The global recommendations include (74) (76):

- Advocate and attract technical and financial support from donors to integrate CMAM into national health policies and strategic plans.
- Support country initiatives to invest in the key elements identified for successful integration and sustainability of CMAM.
- Invest in developing tools for improving assessment, design, monitoring and evaluation of CMAM.
- Update donor project proposal guidelines for CMAM programming and include guidance based on the key elements for improved integration identified in the review.
- Broaden the base of NGOs providing CMAM support and include grantees that are in best position to address key elements for integration and scaling up of CMAM through their expertise in strengthening health systems.

CASE STUDY #5

A Food-Based Approach to Hunger and Undernutrition: A Community Scale Perspective

Homestead Food Production Programs

Countries of Focus: Bangladesh, Cambodia, Nepal, and Philippines

Helen Keller International (HKI) introduced its homestead food production program (HFP) in Bangladesh, Cambodia, Nepal, and Philippines to enhance consumption of micronutrients-rich foods. Between 2003 and 2007, the HFP program was implemented in around 30,000 households in these four countries.

Micronutrient malnutrition is a serious public health problem among women and children in these countries. The HFP program integrates animal husbandry with home gardening. Increasing consumption of animal products has proven to be more effective in improving overall health (163).

A review of the HFP program in these countries shows that participating households significantly improved dietary diversification, improved animal food consumption (an increase in consumption of protein-rich liver and egg) and contributed to greater reductions in prevalence of anemia among children (163). HKI's success with HFP in these countries illustrates the importance of homestead food production for alleviating hunger and improving nutrition. HFP is a good tool to introduce new foods that have a higher micronutrient value into a community's diet. In addition it provides variety and makes the diet more enjoyable (164).

Homestead gardens are a good source of income for households that sell their produce and enable them to save money they would have otherwise spent on food. Income generation increases savings rate and makes money available for education and further investment (164). Findings from Bangladesh and Cambodia showed a significant improvement in household income from sale of products from home gardens and animal husbandry. Since women manage home gardens they contribute to the household income thus empowering them to decide how to spend the income generated from these gardens (163). Homestead gardens also promote biodiversity because of the focus on locally available, indigenous plants and breeds of animals. These local breeds are hardier and better suited to local climates (164).

HFP contributes to women's empowerment and increased control of household resources and thus could be a complement to programs aimed at improving gender equality. Implementing the HFP program in coordination with other interventions for combating micronutrient deficiencies such as – deworming, vitamin A supplementation, home fortification with micronutrient powders and choosing foods with higher vitamin A content for home gardening – could maximize benefits (163).

Plans are underway to integrate behavior change techniques in HFP to improve nutrition interventions such as breastfeeding and complementary feeding that enhance child growth. Additionally, since a majority of the world's population now lives in urban areas, the model could be adapted to benefit urban poor. The HFP model can also be used to target vulnerable groups, such as households with people living with HIV/AIDS because they require additional food and have added healthcare costs, further straining their resources (163).

For HFP to be successful it must be based on local practices and take into account existing structures and organizations. Inputs for HPFs should be locally sourced and encourage reliance on local materials to ensure continued access and sustainability of the program. A further ingredient to sustainability is to keep input and labor requirements low and flexible. Projects cannot take for granted abundant family labor or a low or zero opportunity cost of family labor (164).

CASE STUDY #6

A Food-Based Approach to Hunger and Undernutrition: A National Scale Perspective

A National Program with High-Productivity Quick Impact(96)
Country of Focus: Malawi

The smallholder sub-sector of Malawi comprises about 2.4 million households with an average farm size of 1.2 hectares (ha). Maize, the staple food crop, is grown by 97% of farming households on about 1.6 million ha of smallholder farms and contributes 60% to total calorie consumption (165). Over decades of intensive cultivation in the absence of significant fertilizer use, soils in smallholder fields have been depleted of nutrients, particularly nitrogen. National yields of smallholder maize have averaged 1.2 MT/ ha during the last 20 years (166). More than half of the farming households operate below subsistence. Only 20% of maize producers sell their product and most households purchase maize at much higher prices when stocks are exhausted.

In the 2004/5 rainy season, many parts of the country went without rain for up to one month during January and February 2005. This dry spell had a devastating effect on maize production: the national average yield dropped to 0.76 MT/ha, one of the lowest on record. Total maize production for the 2004/5 season was just 1.23 million MT -- a decline of 24% from the previous year, and just 57% of the estimated national maize food requirement. The UN issued a “flash appeal” for food aid and agricultural inputs. Donors responded with food aid but were unwilling to support an input subsidy.

The Government of Malawi responded in mid-2005 with a national scheme to subsidize improved seed and fertilizer (96). The scheme involved the distribution of fertilizer vouchers (not more than two per household) and seed vouchers that enabled most smallholder farmers to purchase fertilizer and seed at about one quarter of the market cost. Drawing on \$58 million from its national budget in 2005, \$65 million in 2006, and an estimated \$80 million in 2007, the program reached most of Malawi’s smallholder maize farmers. Resulting harvests in 2006, 2007, 2008 and 2009 have dramatically improved the level of national and household food security (see table below) (54) (167). The surplus of over a million MT in 2007 enabled the country to export 300,000 MT maize to Zimbabwe and contribute to regional food security through World Food Program procurements (168). The Government recently announced resumption of exports following the record 2009 harvest.

	2003	2004	2005	2006	2007	2008	2009
Production (mil MT)	1.98	1.61	1.23	2.58	3.44	2.78	3.66
5-year av. 2001-2005 (mil MT)	1.62	1.62	1.62	1.62	1.62	1.62	1.62
% above average	22%	-1%	-24%	59%	112%	72%	126%

Malawi’s experience demonstrates the feasibility and value of investing in food crops grown by smallholders as a first step towards sustained economic growth. In a country where agriculture employs 78% of the national labor force and provides food security and livelihoods for over 10 million people, agricultural productivity growth is having a direct positive effect on the broader achievement of the MDGs. The number of Malawians at risk of hunger decreased from almost 5 million in late 2005 to just over 500,000 in late 2007 (169). The most recent Malawi Vulnerability Assessment Committee report showed that just 142,000 people required food assistance (170). Moreover, at a time when many country experienced food riots, Malawi’s surplus over the past year has buffered the population from the recent food price increases.

CASE STUDY #7

A Multi-Sectoral Approach to Hunger and Undernutrition: A Community Scale Perspective

The Millennium Villages Project (MVP)

Countries of Focus: Ethiopia, Ghana, Kenya, Malawi, Mali, Nigeria, Rwanda, Senegal, Tanzania, and Uganda

The Millennium Villages (MVs) are demonstration and testing sites for the integrated delivery of science-based interventions in health, education, agriculture and infrastructure. The aim of the Project is to accelerate progress towards the MDG targets, including MDG 1 - to eradicate extreme poverty and hunger. The range of interventions adheres to a cost ceiling of \$110 per capita sustained over a 5-10 year period, reflecting the full value of contributions from government, external donors, local communities, and the Project itself (101).

The MVs are situated in 'hunger hotspots', where at least 20% of children are malnourished and where severe poverty is endemic. The MVs were chosen to reflect a diversity of agro-ecological zones, representing the farming systems found in over 90% of sub-Saharan Africa. Sites range from slash-and-burn in rainforest margins to pastoralism in deserts, reflecting varied levels of population density, soil conditions, climate instability, water access, disease profiles, environmental degradation, nutritional deficiencies and food availability, market access, education levels, cultural traditions and religious norms (101).

The MVP model employs a three-pronged food and nutrition security approach. First, clinical interventions focus on persistent macro and micronutrient deficiencies in children, including vitamin A supplementation, treatment of severe acute malnutrition and regular growth monitoring. For cases of moderate malnutrition, families receive nutrient-rich flour and other food commodities. In addition, basic maternal health interventions such as basic antenatal care and institutional delivery are supported by efforts to promote adequate weight gain and improve coverage with iron and folic acid supplementation.

Second, education and behavior-based interventions include homegrown school meals programs, gardens and nutrition activities after school, along with de-worming campaigns. Balanced school meals have been demonstrated both to increase school attendance as well as improve learning outcomes. Food and nutrition education and increased knowledge for women is also a critical intervention addressed.

Finally, household, community and livelihood-based interventions engage longer-term realities of food and livelihood security. These consist of subsidized seed and fertilizer interventions to increase agricultural productivity; the introduction of high-value crops, and; agro-processing initiatives and microfinance programs to stimulate small-business development. Taken together, these efforts are an attempt to enhance nutritional intake and diet diversity, while affording households the additional income required to address nutritional needs in a sustainable fashion. This approach is complemented by a community health worker program to promote exclusive breastfeeding and locally appropriate complementary feeding, home-based fortification, and proper food storage techniques.

The MVP is underpinned by a robust monitoring and evaluation platform that involves detailed socio-economic and health surveys including food frequency and diet diversity questionnaires, anthropometric measurements of all children under five years of age, and blood collection for micronutrient measures. In agriculture, a random sample of MVP staple crop plot yields is compared to a random sample of control plots for each year's major growing season.

Mid-term assessments were recently completed for the MV in Western Kenya and early evidence suggests gains have already been dramatic. After two years, maize yields tripled from 2.0 tons/ha to 6.2 tons/ha, and overall production increased 5.4 fold to 2,257 tons. Since 2006, the community worked with agricultural extension officers to diversify their crops for markets and to improve household nutrition. Staple crops were supplemented with high value legumes and vegetables, spices, and fruits. Farmers have also engaged in other income generating activities through demonstration projects, such as livestock for dairy production, poultry, fish farming, and bee keeping.

The average food security and diet diversity, on a daily, weekly and monthly time period, amongst households increased. For children under two years, levels of being underweight and stunted decreased dramatically - from 26% to 3.9% and from 62% to 38% respectively. Among children under 5, levels of vitamin A deficiency dropped by half, from 70.0% to 33.3% (103). Based on these positive early results, the MVP will further adapt and refine the components of the model to the diversity of MV contexts spanning the 80 villages of the 14 field sites in 10 sub-Saharan African countries. This will involve further quantitative assessment to provide evidence of consistency and reproducibility of gains observed early on in Kenya. It will also involve more detailed qualitative work (implementation science) to elucidate how and why changes took place, alongside key leverage points, generating lessons for replication, scale-up and transfer to other contexts.

CASE STUDY #8

A Multi-Sectoral Approach to Hunger and Undernutrition: A National Scale Support Perspective

The REACH

Countries of Focus: Lao PDR and Mauritania (105)

REACH is a joint effort among the UN (FAO, UNICEF, WFP and WHO), civil society and private sectors to support countries to accelerate progress on MDG-1, Target 2 (halve the proportion of underweight under-fives). REACH supports government-led efforts to deliver - at scale and in an integrated manner – interventions that are proven to have impact within two to five years.

REACH-promoted interventions focus on five priority areas related to food security, health, and care as shown in the table below. This ‘menu’ of interventions serves as a starting point for country scale-up planning and is then customized to the specific country situation, based upon a rigorous, fact-based analysis, building upon existing information and activities by stakeholders. REACH starts with the overall objective of reducing child malnutrition and puts the child at the center, bringing partners together to each contribute to delivering a joint, coordinated solution.

Five areas	Interventions
Improve hygiene and parasite control	Household water treatment
	Hand washing with soap
	Bed nets and intermittent preventive treatment
	Deworming
Increase food availability and accessibility	Local homestead food production
	Conditional cash transfers
	Supplementary feeding
Increase micronutrient intake	Micronutrient supplementation and fortification
Improve infant and young child feeding practices	Exclusive breastfeeding
	Complementary feeding
Treat severe acute malnutrition	Therapeutic feeding

(105)

At the country level, the REACH initiative supports the establishment of a local, multi-stakeholder and governance structure comprising the national government (in a lead role) as well as the UN, civil society and the private sector. In doing so it aims to build as much as possible on existing structures in order to not duplicate or complicate existing local working mechanisms. One of the unique aspects of the REACH approach is its placement of a management consultant as REACH facilitator at the country level, to support and facilitate the multi-sector, inter-agency team in its development of an action plan. A first step is to jointly establish a comprehensive country situation analysis to identify gaps, constraints and opportunities for scaling up existing and new effective nutrition interventions. Based on this situation analysis, a detailed scale-up action plan is developed that:

- Selects and prioritizes the appropriate mix of interventions. The interventions that are promoted are evidence-based, suitable to rapid scale-up and have proven impact within two to five years
- Defines delivery strategies and identifies responsibilities of each partner for implementation
- Creates deliberate synergies among operations and delivery channels
- Quantifies costs and required resources
- Matches resource needs at the country level to potential country, regional and global sources
- Supports resource mobilization to fill gaps

REACH also has a broader global agenda, in support of country action. A senior-level interagency team, hosted by WFP in Rome with seconded staff from UNICEF, WHO, WFP and Save the Children and with significant support from the Boston Consulting Group (BCG) and World Vision International has the mandate to coordinate a broad partnership of public, private and UN agencies working towards this common goal. Its key functions are to:

- Support the country process
- Codify lessons learnt and facilitate the know-how and best practice exchange among practitioners and experts across countries
- Mobilize resources for intervention scale-up from a wide array of donor countries and institutions
- Advocate at the global level for increased attention to and investment in nutrition
- Manage the broad partnership and regularly report on progress

REACH has been piloted in two countries - Mauritania and Lao PDR - between June 2008 and June 2009. The objective of the first one-year phase was to test a facilitated, multi-stakeholder approach to action planning and advocacy for the scale-up of essential nutrition interventions targeted at children under 5. In each pilot a working structure was formed comprising relevant government ministries, key UN agencies, the NGO community, academia and the private sector. Based on a comprehensive situation analysis across all players, a Scale-up Action Plan has been developed, which will be used as the basis to coordinate activities, mobilize the required additional resources, and monitor results.

In Mauritania thus far, the visible impact of the REACH program falls into two categories. First, the “status or problem indicators” that are to be addressed by the specific, REACH-promoted interventions have improved. Initial results can already be observed for some interventions that have been implemented at scale in a coordinated manner. For example, the availability of iodized salt (> 15 PPM) at the household level increased from 2% to 24%. Moreover, exclusive breastfeeding rates increased from 11% to 19% between September 2007 and December 2008. As is known from research, these improvements in the “problem indicators” will ultimately lead to a reduction in the prevalence of underweight among children under five – the ultimate goal of the REACH approach. Secondly, in terms of process improvements, the REACH program in Mauritania generated a detailed common understanding of the nutritional situation and a concrete scale-up plan with clear tasks and responsibilities. Significant resources have been mobilized, and some initial operational synergies and successes have already been implemented. These first concrete outcomes need to be built upon and further strengthened in the next phase of the REACH process so that visible impact, at scale, can be achieved. This underscores the need for the action plan to be put into practice through careful coordination and monitoring across all involved organizations, for which additional resources will now need to be mobilized.

A mapping of stakeholders produced a detailed landscape of all the organizations involved in the implementation of each intervention, along with the role they perform as either donors, catalysts, government implementing departments or field coordinators. With the high number of organizations and stakeholders working in the country, this mapping is critical for countries to understand where and what organizations are working on, and at what capacity.

Furthermore, an “integrated indicator dashboard” was developed which consolidated key status indicators per intervention. This dashboard provided an easy and comprehensive reference to the nutrition community, enabling decisions to be made about prioritizing interventions for scale-up, and demonstrating the positive correlation between coverage and status. The selection of indicators was performed and validated by stakeholders in country, with support by international experts.

REACH uses a holistic approach to the planning of scale-up, by first identifying all the channels that could potentially deliver a particular intervention, and then defining the ideal channel usage to achieve scale in each intervention, and create synergies across interventions. The key strengths of the REACH process distilled from the pilot experience in Mauritania is that the approach is:

- Solution driven - focuses on the child's needs versus institutional mandates or existing policies
- Based on effective teamwork – makes cooperation effective at all levels while supporting government leadership, and exploiting synergies in delivery and resource mobilization
- Fact driven and action oriented – uses a thorough, tested and user-friendly set of tools for systematic situational and gap analysis, planning, implementation and monitoring
- Driven by a dedicated process facilitator- encourages, supports and guides coordination and teamwork
- Maintains a full-country perspective - focuses on delivering at scale, while systematically identifying gaps and overlaps
- Ambitious - aims for a sustained step change in action, instead of incremental improvements

CASE STUDY #9

A Multi-Sectoral Approach to Hunger and Undernutrition: A Municipality Scale Perspective

Spain MDG Achievement Fund: Improving Child Nutrition and Food Security in the most vulnerable councils (171)

Country of Focus: Mali

In 2007, UNDP and the Spanish Government launched the four year UNDP/Spain MDG Achievement Fund (MDG-F) of €528 million to be focused on achievement towards the MDGs and related development goals in select sectors and countries.

The Fund “will support innovative actions with the potential for wide replication and high-impact in select countries and sectors, within the framework of the Millennium Declaration’s global partnership for development and the Paris Declaration on Aid Effectiveness. The Fund’s decisions and approach will be informed by the imperatives of ensuring national and local ownership of Fund-supported activities, alignment with national policies and procedures, coordination with other donors, results-orientation and mutual accountability”(106). Through the thematic window of *children, food security and nutrition*, the MDG-F hopes to “support interventions alleviating child hunger and undernutrition, and enhance local capacities to develop, implement and monitor effective policies and programs regarding the access of food to children” (106).

Five UN agencies (UNICEF, WFP, WHO, FAO and UNDP) were granted funding from the MDG-F to support activities to improving Child Nutrition and Food Security in the most vulnerable councils in Mali. The funded project will apply an integrated approach to achieve four primary outcomes:

- (1) Enhanced food security
- (2) Improved nutritional status of women and children through appropriate prevention and treatment
- (3) The inclusion of nutrition and food security aspects in relevant national and community based frameworks
- (4) Enhanced national capacities for appropriate assessment and monitoring, including improved responsiveness to changes in levels of nutrition and food insecurity in targeted communities

The project aims to use a participatory approach at both upstream (national policy) and downstream (local) levels in order to reduce child mortality rates by maximizing the economic and social benefits of improved nutrition and food security for women, children and their families. The relevant MDGs being targeted are primarily MDGs 1 and 4.

The joint project intends to harmonize programs being carried out by different UN Agencies and Government Agencies. Furthermore, it is in line with the new Government’s initiative to accelerate the achievement of the MDGs in 166 most food vulnerable and impoverished councils (‘Initiative de mise en oeuvre des objectifs du millenaire dans les 166 communes les plus vulnérables du Program National de Securite Alimentaire’). Under the Initiative-166, the Government has committed to mobilizing 35% of the required funds, the donors 55% and households 10%. Active participation of the Malian Group for Nutrition and Food Security will be crucial to ensuring local ownership and participatory decision-making. As indicated in the *National Plan for Food Security* (Plan National de Securite Alimentaire – PNSA), on which the Initiative-166 is built, implementation and monitoring will be done through multi-sector-based collaboration between administrative structures (municipalities, circles, region, national coordination) and technical services at all levels.

The strategies to implement this program will be the provision of technical assistance, facilitation of participatory decision-making and direct implementation of interventions as approved by the government. Roles and responsibilities at each level are defined as follows:

At the municipal level: Key stakeholders are associations, professional organizations or communities and health centers. They propose and implement interventions based on local (council) development plans (PDSECs).

At the local and regional level: The players are the regional offices of international organizations (UN agencies), state services, decentralized governments and the NGO community. At this level, technical services must validate the consistency of the local development plan with regional policies.

At the national level: Under the leadership of the Commissariat for Food Security, a committee will be formed to coordinate and oversee this program. It will be composed of national authorities concerned (ministries and director generals) as well as the central offices of international agencies.

Given that all interventions will be carried out in the framework of existing local development plans, sustainability and ownership is ensured as much as possible. The communities will implement all activities with technical input from relevant agencies as required. Additional technical assistance from specialized NGO's will be available whenever indicated. The potential outcomes are as follows:

Outcome 1:

The first of the joint program's four outcomes areas is the reduction of child malnutrition and food insecurity through the application of integrated, preventive approaches. Emphasis will be placed on the implementation of proven high impact, low cost interventions – specifically, the promotion of essential family behaviors. Vitamin A supplementation and deworming, provision of drinking water and VIP latrines, promotion of complementary foods and improved food quality through the diversification of agricultural production will complete these preventive behaviors.

Outcome 2:

Nationwide management of acute malnutrition is possible. In order to increase coverage levels and improve the impact of these interventions, the quality of services and community involvement both need to be improved. This will be possible through improved technical assistance by relevant government services, assisted by specialized NGO's, and improved dialogue with local leaders and other partners. Causal analyses of malnutrition at the local level will be done and linked to improved data collection and analysis, so as to enhance the community's understanding of malnutrition, its prevention and treatment and the active role both health services and communities have to play.

Outcome 3:

The third area of focus is to include nutrition and food security in all relevant national and community-based frameworks. This will be done through awareness raising campaigns at all levels, using existing information. A national forum on nutrition will be organized after consultation with community, district and regional levels. This forum will inform politicians, donors, policy makers and other stakeholders at all levels on the importance of and linkages with nutrition to many other sectors. This forum will be an opportunity to revisit the PSNAN (*Plan Strategique National pour l'Alimentation et la Nutrition*) against sectoral strategies. It is expected that this will increase ownership of the PSNAN and enhance implementation by all sectors. In turn, communities will adjust the local development plans in order to reflect adequately local nutrition and food security solutions.

Outcome 4:

In support of the entire program, enhanced national capacities for assessment, evaluation and response to changes in the level of access to nutrition and food security will be sought. Better articulation between existing information systems will be necessary. The existing multi sectoral technical platforms at all levels, including administrative structures and technical services, will be reinforced.

Although the program is just getting underway, the cooperative work of UN Agencies and the Malian Government is an effective strategy in ensuring that government priorities towards hunger and undernutrition remain central in planning, implementation and monitoring of the program over the next four years. This is especially important on cross-sectoral programs such as nutrition, gender and capacity development/strengthening.

CASE STUDY #10

School Meals

National School Feeding Program
Country of Focus: Ghana

Ghana's National School Feeding Program was launched in 2005. The concept of the program is to provide primary school children who live in the poorest areas of Ghana with one hot nutritious meal per day, using locally grown foodstuffs, with the aim of contributing to poverty reduction and food security through three different mechanisms. First, providing children with a nutritious meal reduces hunger. Second, providing an additional incentive to schooling increases school enrolment, attendance and retention. Finally local food production is boosted. By using locally grown food, this creates a market for local farmers, thus contributing to local wealth creation in the rural area. With an improved income, such a household would be able to supplement their diet.

Since December 2008, pupils from one out of five of all primary schools have been benefiting from Ghana's school feeding program. By 2010, it is anticipated that around 1 million school children will benefit from the program in 2900 schools. Although the cost of a school meal started at US \$0.20, it was increased to US \$0.28. In fact, a report found that US \$0.20 was not sufficient to provide a nutritious meal. Further to this, as the price of food staples continue to rise, either quantity or quality of school meals will decline, or the price will have to be increased (172). The total cost of the program for 2008 was around US \$ 23,124,000. It was anticipated to be around US \$ 46,616,000 for 2009 (173).

Outcomes

Enrollment: Enrollment increased by 10% from baseline, when the school feeding program was implemented (174). However, the increases in enrollment have not been followed by corresponding increases in teachers, textbooks and other school resources.

Health: There are not detailed data on the effects of the school meal program on hunger and malnutrition, and anthropometric measures. However, the quantity and quality of the meals did not always reach nutritionally adequate levels for children. A report found that zinc and iron are the two hardest micronutrients to fulfill in the school feeding program (172). A recommendation was made to consider alternative ways to supplement the children's diets (e.g. through fortification) to avoid an abundance of calories in order to meet the micronutrient needs. The cooks were not always provided with health training, which in combination with poor sanitation facilities and unclean water, can compromise the health of the school children. In 2007, there was a national de-worming exercise in public schools, which would have been a synergy with other nutrition programs such as the school feeding program.

Agriculture: The target of having 80% of food purchased from local farmers was not achieved. With the exception of the Eastern Region, all other schools in Ghana purchased less than 20% of the ingredients locally. Only 16% of schools had a school garden by the end of 2007, whereas the aim had been to reach 50%. Thus, targets for improving the lot of local farmers had not been achieved (174). There are several constraints to each crop that inhibit small local farmers from selling to the participating schools. Local farmers were not provided with support or inputs with which to increase production. Commonly farmers are forced to sell during the harvest season at a low price due to a lack of storage or drying facilities, or the immediate need for cash.

It was suggested that farmers arrange themselves into a cooperative, to better place themselves in the value chain. They would easier be able to obtain financing from NGOs and banks in order to purchase necessary inputs, or arrange a shared storage facility or drying facility for crops. With better access to market information (e.g. through SMS messages), this would improve their negotiation bargaining power. Further to the fact that the program had not been adequately linked with local farmers, is the challenge that critical Stakeholders such as the Regional/District Directors of Education, Health and Agriculture had not been engaged extensively in the implementation of the program.

CASE STUDY #11

Food For Work

Managing Environmental Resources to Enable Transitions to More Sustainable Livelihoods (MERET)
Country of Focus: Ethiopia

Ethiopia is one of the poorest countries in the world, with natural resource degradation being one of the most serious challenges in development. MERET (Managing Environmental Resources to Enable Transitions to More Sustainable Livelihoods) is a joint program between the Ethiopian government and the World Food Program (WFP) aimed at addressing this challenge. It aims to build communities' resilience against shocks, and improve the livelihoods of rural households, particularly those headed by women. Chronically food-insecure communities participate in projects to not only rehabilitate the natural environment, but also create productive assets and join in income generating activities which are aimed at improving livelihoods while using local natural resources in a sustainable manner (118).

The distinguishing characteristic of MERET is it utilizes a community-based, participatory approach as a means to empowering the poor people it serves. It is a far cry from the controlling methods of the 1970s and 1980s, where communities felt little sense of ownership of their projects, due to a lack of participation. The partnership between the WFP and Ethiopian government has existed for over 30 years, although MERET was launched in its current form in 2002 (175).

Some of the activities include measures to build or rehabilitate roads, reforestation, land restoration and soil conservation, and restoration of rainwater ponds and springs. This works towards long term food security, by improving the natural resource base on which communities depend for producing food. Further to this, there are important immediate gains as WFP provides food for those involved in implementing the project. Each participant receives 3kg of cereal per workday for up to three months. This is an essential incentive to encourage community members to contribute the often heavy labor needed.

WFP's main implementing partner is the Ministry of Agriculture and Rural Development (MOARD). District government officials collaborate with communities on planning, implementation and evaluation. The federal and state governments provide policy guidance, funds and technical assistance. Finally, the WFP supplies the food to community members, in exchange for their work in constructing and maintaining conservation structures. WFP transports food commodities from the port of Djibouti to regional hubs in Ethiopia. MOARD then transports the food to the districts and MERET distribution sites. WFP also helped design the methodology, while training both community members and government officials. The emphasis is on building local capacity, in order for the communities themselves to improve their lot.

As a result of the MERET program, 300,000 hectares of land have been restored (119), with one million people benefiting annually, in 600 communities across Ethiopia. MERET has helped to improve food security because the soil and water conservation has facilitated diversification of agricultural production including the cultivation of a wide variety of cash crops – especially fruits and vegetables, some of which were kept for consumption, but most of which were sold – and increased productivity and food availability. All these households continued to produce teff, maize and sweet potatoes as well (120). Cohen et al (2008) also report some participants double and triple cropping as a result of MERET, and some said they had increased use of high-yielding seeds.

The most vulnerable households continued to experience food shortages, but these were reduced and for many previously vulnerable groups, the three months of MERET food enabled them to achieve full food

security (176). The IFPRI study of food for work in Ethiopia found that such food is well targeted to the poorer and more vulnerable households (177). In 2005, 41% of MERET households claimed their food deficit months had declined by two or more months as a result of the project (121). Further to this, the project has enhanced community capacity to plan and manage their development activities. It has shown that communities and the district government can collaborate together and engage in a dialog. The MERET approach is now used in Ethiopia's national Community-Based Participatory Watershed Development guidelines. Some communities identified that they would like additional services, such as home economics and nutrition advice.

There may be a number of practical synergies between MERET and other interventions. MERET and school planning can be further coordinated, so as to provide labor for constructing school infrastructure and school gardens. WFP's school feeding program staff and government officials were inspired to deepen synergies through the Children in Local Development (CHILD) initiative. Moreover, as school feeding and enrolment rates improve, and literacy levels increase, rural communities need rely on district officials less, contributing to greater empowerment over time (120).

The Horn of Africa Initiative on Food Security is a regional initiative whereby governments of Djibouti, Kenya, Eritrea, Ethiopia, Somalia and Uganda agreed on a common framework for action on food security, including strengthening not only institutions but also community-focused capacity building. This is a demonstration of the willingness of the Ethiopian Government to move towards community approaches in agriculture(120).

CASE STUDY #12

Conditional Cash and Food Transfers

Zero Hunger
Country of Focus: Brazil

Brazil is an example of a country that is on track to meet 2015 food security targets (85). President Lula introduced in 2003 a Zero Hunger strategy to ensure that by the end of his administration, every Brazilian would have three meals a day. In fact, Lula's target for Brazil was bolder than that of the MDGs', as he was aiming to eradicate hunger. The Zero Hungry strategy recognized that poverty is a major cause of hunger. The strategy combined conditional cash transfers to the poor to increase their purchasing power, alongside investments in farming to a) meet the increasing demand for food and b) support the farmers themselves.

Some of the challenges Brazil faced were, while on the one hand Brazil had enjoyed economic growth, growth had not been equitable. Moreover, although there was diversification in agriculture, the modern agribusiness sector had existed alongside family farmers, and the potential of family farmers is only now being explored.

There are several prongs to the Zero Hunger strategy, and they include conditional cash transfers and school meals, local food distribution programs, nutrition education, health and nutrition programs, and stimulus programs for poor family farmers. The conditional cash transfer program, along with the school meals program is the main way for poorer households to access food, and was Brazil's premier strategy to addressing short-term hunger. This conditional cash transfer program was launched in 2004 as the Bolsa Familia (Family Grant) and replaced previously existing ones. Bolsa Familia serves the quarter of Brazil's population earning less than the global poverty line of two dollars a day, or around 42 million people. At the household level, it provides a basic income to around 11.1 million families. The money is deposited in bank accounts, notably to the mother of the family, and is on average \$36. As of 2008, the benefit can now reach up to \$80 per month, and depends on the number of the children in the household (178). This program ensures a family can access food by increasing the family's income. The program costs almost \$5 billion a year and is the largest income transfer program in the world.

However, the transfer is only made if the family meets certain conditions. For example, children must be vaccinated against certain communicable diseases, and school-age children must regularly attend school. In the event that a child is kept at home or sent to work, the family will lose their right to the transfer. Similarly, pregnant women or women with infants must utilize their health care facilities and follow nutritional advice in order to access their support. These conditions provide opportunities for social inclusion for the family. The Bolsa Familia program was largely well accepted into the political, social, and economic establishments (124). One of the characteristics of the Zero Hungry program is the approach known as "shared management": that is, an active engagement between government and civil society. It also works well with other health and nutrition programs.

An *unconditional* cash transfer, which is also part of Brazilian policy, is the Continuous Benefit, which pays a monthly minimum wage of around US \$190 to 2.5 million elderly or disabled people who cannot work, and who earn less than US\$47. The funds for this program in 2007 were \$5.8 billion (179).

In 2001 there were 16.6 million undernourished people living in Brazil. By 2005, however, the number had been reduced to 12.0 million, and the share of the undernourished in the national population over the same period had dropped from 10% to 6%. Further to this, child malnutrition declined remarkably with

stunting in the Northeast region decreasing from 22.2 to 5.9% (85). The FAO has estimated that malnutrition has been reduced by 73% in the last six years. It is unclear if the Bolsa Familia program directly contributed to this dramatic decreases in undernutrition however according Patrus Ananias de Souza, the Minister of Social Development and Fight Against Hunger (125), as a result of the Bolsa Familia program, nine out of ten families reported an improvement in their eating habits, seven out of ten families reported that the variety of foods had increased, and nine out of ten children ate three or more meals a day. However, it remains to be seen whether the program directly made contributions to the declines in undernutrition, as the impact of conditional cash transfers on nutrition indicators remains weak and poorly understood.

In terms of the effects of the Zero Hunger program on poverty, the Brazilian Institute for Applied Economic Research (180) found that the number of poor people decreased by 27% and the number of extremely poor fell by 48% between 2003 and 2008 as a result of economic growth, increased minimum wages and cash transfer programs, all of which were captured in the Zero Hunger strategy. Zero Hunger had provided a safety net for both consumers and the family farmers, which has been a buffer against the recent financial crises. However, despite the remarkable gains from the programs, Brazil remains a country with huge wealth gaps.

The FAO evaluated the Zero Hunger program and summarized a number of key lessons (180). First, the Zero Hunger program showed that it is financially possible to significantly reduce hunger in the short term. The Bolsa Familia project requires 2% of the federal budget and only 0.4 % of the GDP, but benefits a quarter of Brazil's 190 million people. The FAO also found that institutional arrangements for food security systems need to be strengthened, especially with monitoring and evaluation systems. The FAO emphasized the benefits of the decentralized local systems, as it is at the local level that most active social participation takes place. Finally, the FAO argued that with the strong political will, much could be achieved with such social programs.

CASE STUDY #13

Cash and Food Transfers

Oportunidades/PROGRESA
Country of Focus: Mexico

In 1997, the Mexican government developed the Oportunidades program, formally known as PROGRESA, to improve the education, health and nutrition of Mexico's poor. Though initially launched to address poverty, the Oportunidades program has shown positive outcomes related to hunger. By examining the Oportunidades program in relation to the two MDG1 hunger indicators, it is possible to evaluate the contribution Mexico is making to alleviating hunger through a multi faceted poverty intervention (181).

The Oportunidades program was designed to address education, health and education in the short-term. Additionally, the program was designed to meet the long-term goals of eliminating the cyclical nature of poverty in Mexico. The program was conceived as a temporary project that would be phased out in three or four decades as the beneficiary children reached adulthood (182). Oportunidades was one of the first cash transfer programs offering bimonthly direct cash transfers to women to improve the quality, quantity and diversity of food in the household in a developing country. Cash transfers add 20-30% to the household income, and currently cap at 820 pesos or roughly US \$86 (129). To address the nutritional component of the program, Oportunidades offers nutritional supplements for infants between 6 and 23 months old, undernourished children between 2 and 5 years old, and breast feeding and pregnant woman. The supplement is a milk-based fortified food offering 20% of calorie requirements and 100% of micronutrient requirements including zinc, iron, and vitamins A and C (126, 127). Additionally, for the educational and health components of the project, the program offers educational grants and incentives for remaining in and finishing school, basic medical services, and health education.

When the program began in 1997 it targeted roughly 300,000 families. Within three years it extended to 2.6 million families in 50,000 villages covering 40% of all rural families and 10% of the Mexican population (183). In 2000, the newly elected Vincent Fox extended to program to incorporate the urban poor. By 2008, the program assisted 5 million families in 93 thousand districts in 100% of the country's most marginalized municipalities (128). The program budget began at approximately 367 million pesos and in 2008 it costs 38 thousand million pesos plus about 4 thousand, 2 hundred million pesos which are part of the better living program to defray the cost of food as it rises globally (128). The Oportunidades program has been praised for its efficiency, for every 100 pesos allocated to the program, nine or fewer are allotted to administration costs (128) (184). In addition to funding from the Inter-American Development Bank, in April of 2009, the World Bank approved a loan of 1.5 billion dollars to the Mexican Government to expand the Oportunidades program as the budget approaches 4 billion dollars (185).

Locating eligible program participants carried out in two stages. First, underserved and/or marginalized communities were identified throughout Mexico. Second, utilizing data from the 1995 censuses, eligible households were identified within the chosen communities to participate. Using a proxy means test (PMT) households considered "poor" were eligible while, "un-poor" households were not. 52% of households in the identified communities were eligible to participate and 90% of the identified households enrolled in the program (182). Sixty eight% of beneficiaries live in small communities with a population of 2,500 or less (186). Once enrolled, households receive benefits for three years as long as they abide by the conditions of the program. Requirements include attending scheduled appointments for all family members in health care centers where their nutritional and health status is monitored. These appointments include

immunizations, baby care, growth monitoring of children, pre-natal and post-natal care and health education for women. Expecting and breast-feeding mothers, and children under the age of five are monitored frequently and are measured for wasting, stunting, and development delays.

Oportunidades was designed to incorporate evaluations into its development. Program eligible households took part in household surveys known as 'ENCEL' which assessed the impact of education, consumption, time allocation, gender relationships, and program feedback (130). ENCEL did not assess the nutrition component of the program, instead the Instituto Nacional de Salud Publica (INSP) collected nutritional data (130). Utilizing these surveys, the International Food Policy Research Institute (IFPRI) was hired to conduct the initial evaluation from 1997-2000. Subsequently, numerous national and international institutions have played an important role in continuing to evaluate the success of the program. The evaluations compare individuals and families receiving benefits with a control group of similar households not yet receiving the benefits (184). The initial data collection and subsequent research allows for comparative and longitudinal work on the effects of Oportunidades on the education, health and nutrition of poor Mexicans.

Three issues have been identified which affect the outcomes and public opinions of the program.

1. Allocation of the nutritional supplement- Less than 60% of children who are supposed to receive the nutritional supplement do (130). Additionally, data shows that intra-household sharing of the supplements prevents the supplement from being fully consumed and dilutes its potency (184).
2. Community Relations- because there are Oportunidades eligible households within the same community as ineligible households, tensions have developed between the groups (184) .
3. Criticism of unequal accountability for recipients of the program vs. officials and employees of the program- Recipients feel that if they are subject to sanctions for poor participation, then there should be equal sanctions for the poor performance of those dispensing the services (187).

Nutrition and Hunger Outcomes

Indicator 1: Prevalence of underweight children under-five years of age

Evaluations assessing the effect of the program on growth were conducted in urban and rural areas. Evaluations suggest that the program has a positive effect on increasing childhood growth and reducing stunting in the critical period of twelve to thirty six months and increases the mean growth by 16% or 1 cm per child per year (129, 130). In Rural areas, children 0-6 months at baseline, receiving the intervention had height measurements greater than those not receiving the intervention by 1.1cm (188). In urban areas children 0-6 months at baseline were 1.5cm longer than those not receiving the intervention (127). Infants in urban evaluations gained weight beyond the standard associated with linear growth, begging the question, "Does the nutritional supplement lead to overweight children? (127). Further research is needed to determine the relationship between the supplement and a general pattern of overweight individuals in poor Mexican households. Relevant outcomes related to anemia demonstrate that after 1 year with the program children are 25.5% less likely to be anemic and have higher hemoglobin levels than those not receiving the intervention (128, 188).

Indicator 2: Proportion of population below minimum level of dietary energy consumption

While there is no direct evaluation that addresses this indicator directly, survey work and the evaluations conducted by IFPRI offer useful data on food consumption and caloric intake. Household evaluations demonstrate that in 1999, Oportunidades households receive 7.1% more calories than households not receiving the intervention (181). Included in this percentage is a raise of 7.8% in calories per person per day. The increase in caloric intake is a proponent of an expanding diet and an increase in food consumption in two food groups, fruits and vegetables and animal products (181). Additionally in 1999, households in the Oportunidades program had a cash value of food consumption 10.6% higher than families not receiving the

intervention. This value of consumption is greater for the poorest households (189). In 1998, 48% of program participants claimed they “eat better” and 19% claimed they eat more (189). The cash transfers in addition to the health education appear to be making an impact on families consuming more food and having a more balanced and diversified diet.

The Oportunidades program evaluations do not identify which specific elements of the program affect which outcomes. This is a crucial point when thinking about the relationships between education, health and nutrition. For this reason it is important to point out some other outcomes which might be correlated with better nutrition and a reduction in hunger. Children 0-5 years old, participating in the program have a 12% lower incidence of illness than those in the control group (129, 183). Adults reported an average of 19 fewer sick days compared to those not receiving program benefits (129). Newborns in the program were 25.3% less likely to be reported as ill (183).

The Oportunidades/PROGRESA program does not aim to alleviate hunger. Instead it strives to end a continuous cycle of poverty in Mexico. However, the combination of education, nutrition and health interventions plays an important role in the alleviation of hunger in Mexico. Using the MDG hunger indicators, it is clear that the Oportunidades program has impacted the height and weight of program participants, in addition to increasing their caloric intake and variety of foods consumed. Additional research on health indicators supports the impact of Oportunidades on the overall health and well being of project participants.

CASE STUDY #14

Food Distribution and Aid for Emergencies

World Food Programs' Emergency Food Distribution and Aid

Countries of Focus: Chad, DPRK, DRC, Kenya, Pakistan, Sudan, Uganda, Yemen and Zimbabwe

The Comprehensive Framework for Action (CFA) on the Global Food Security Crisis argued that food production, and food-and-nutrition assistance programs are vital complementary components of a comprehensive strategy. This includes emergency food aid. Even with adequate long-term strategies to tackle hunger and malnutrition, there will always be situations where emergency food aid is necessary to serve populations who have suffered some shock. The World Food Program is the leading provider of this type of assistance.

Even a few months of inadequate nutrition may have long-term consequences. Children under two who do not receive nutritious food face life-long negative effects in health, educational performance, mental growth and productivity as a result of this deprivation (190). Emergency food aid therefore plays a critical role in filling the gap where food productivity and access is not sufficient to adequately feed a population. Such food assistance should be scaled up. Channeling food assistance via women should be encouraged and opportunities to improve program efficiency should be pursued.

WFP's largest operations program in both 2008 and 2009 was and is Sudan. WFP serves approximately 6 million people with the Emergency Operations services, which focuses primarily in the Darfur region in response to the basic needs of approximately 2 million internally displaced persons (191).

In response to a government request for relief assistance, the WFP launched an emergency operation in the Democratic People's Republic of Korea (DPRK) in September 2008, which targeted children, pregnant and lactating women, and the elderly, who are classed as "high need". More recently in June 2009, the DPRK requested the WFP to refocus on a more targeted geographic proportion of the population, due to limited resources (191).

WFP's Protracted Relief and Recovery Operation in Zimbabwe began in May 2008. Some of the programs include providing food assistance to those on anti-retroviral therapy, providing institutional and school feeding to support employment and human resource development, in addition to food assistance to mobile and vulnerable populations and highly vulnerable households. WFP also supports seasonally shock-affected food insecure households through Emergency Vulnerable Group Feeding.

In the Democratic Republic of Congo, WFP provides food to around 3 million people through their Protracted Relief and Recovery Operations. WFP also aids the recently displaced 162,000 people in the northeastern region of the country, in an ongoing emergency operation (191).

Through 2008 and 2009, WFP supported around 900,000 vulnerable individuals – including many displaced persons – in Chad through various relief efforts. Food assistance is provided to refugee populations, in addition to various other therapeutic and safety net programs (191).

WFP's emergency operations in Pakistan have aimed to support the hundreds of thousands of internally displaced persons and vulnerable populations who have suffered as a result of high food prices. In Yemen, WFP provides protracted relief to malnourished children, pregnant and nursing women, TB and leprosy patients. Additional emergency assistance is targeted to Somali refugees and those affected by the internal

regional conflict. Moreover, emergency food supplies were airlifted to the eastern part of the country in October 2008, following extreme flooding (191).

WFP supports many other countries, including providing emergency relief to around 340,000 refugees from Somalia and Sudan in Kenya, supporting the approximately 1.4 million people in the northeastern region of Uganda, who were suffering the effects of drought while protracting relief and recovery operations to support the internally displaced refugees in the northern and southwestern parts of the country. However, in some areas of Uganda, more sustainable programs such as food-for-work, food-for-training programs and post harvest handling have phased out the emergency food distributions (191).

Though some consider expensive, the cost of safety net programs and emergency assistance is small compared to the cost of hunger. A recent report from the World Bank found that good quality food aid could save billions of dollars that would have to be later spent on saving lives from nutrition-related illnesses. Further to this, are the massive costs associated with a lack of education and loss in human capital as a result of hunger and malnutrition (2).

APPENDIX 2

THE HUNGER ROAD MAPS

Two critically important task forces set the roadmap on how to end hunger: The UN Millennium Project Hunger Task Force and the Irish Hunger Task Force. In 2004, the UN Millennium Project Hunger Task Force made recommendations that fed into the larger effort to address the Millennium Development Goals and the Millennium Development Goals-based poverty reduction strategies—strategies that too often underemphasize agriculture and nutrition (22). The Task Force recommended seven priority areas that remain just as relevant as we approach the last five years to reach the MDGs. The recommendations were to:

1. improve political action
2. reform national policy
3. increase agricultural productivity for food insecure farmers
4. improve nutrition for the chronically hungry
5. provide productive safety nets for the acutely hungry
6. improve rural incomes and markets
7. restore and conserve natural resources essential for food security

At the UN Summit in 2005, Ireland made a commitment to reach the target of 0.7% of Gross National Income (GNI) for Overseas Development Assistance (ODA) by 2012 with an increased effort to “tackle the root causes of hunger.” Irish Aid identified hunger and food security as critical elements of the global development challenge and established the Irish Hunger Task Force to come up with specific recommendations. The Task Force made three important recommendations:

1. increase the productivity of smallholder, mainly women, farmers in Africa
2. implement programs focused on maternal and infant undernutrition
3. ensure real political commitment, at national and international levels, to give hunger the absolute priority it deserves.

The Task Force understood that agriculture development is essential to address chronic hunger but not sufficient to address acute and chronic undernourishment that plagues vulnerable communities (38).

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