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USAID OFFICE OF FOOD FOR PEACE FOOD SECURITY COUNTRY FRAMEWORK FOR BANGLADESH FY 2015–2019

FEBRUARY 2015

This report is made possible by the generous support of the American people through the support of the Office of Food for Peace, Bureau for Democracy, Conflict and Humanitarian Assistance, and the Office of Health, Infectious Diseases, and Nutrition, Bureau for Global Health, U.S. Agency for International Development (USAID), under terms of Cooperative Agreement No. No. AID-OAA-A-12-00005, through the Food and Nutrition Technical Assistance III Project (FANTA), managed by FHI 360. The contents are the responsibility of FHI 360 and do not necessarily reflect the views of USAID or the United States Government.

Recommended citation: Magnani, Rich; Oot, Lesley; Sethuraman, Kavita; Kabir, Golam; Rahman, Setara. 2015. *USAID Office of Food For Peace Food Security Country Framework for Bangladesh (FY 2015–2019).* Washington, DC: FHI 360/FANTA.

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ACRONYMS AND ABBREVIATIONS

BBS	Bangladesh Bureau of Statistics
BDHS	Bangladesh Demographic and Health Survey
BDT	Bangladeshi Taka
BMI	body mass index
CDI	Composite Deprivation Index
CDMP	Comprehensive Disaster Management Programme
CHT	Chittagong Hill Tracts
CHTDF	Chittagong Hill Tracts Development Facility
DFID	Department for International Development (United Kingdom)
FANTA	Food and Nutrition Technical Assistance Project
FAO	Food and Agriculture Organization of the United Nations
FFP	Office of Food for Peace
FP	family planning
FPMU	Food Planning and Monitoring Unit
FSCF	Food Security Country Framework
GDP	gross domestic product
GOB	Government of Bangladesh
ha	hectare(s)
Hb	hemoglobin
HIV	human immunodeficiency virus
HKI	Helen Keller International
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
IYCF	infant and young child feeding
kcal	kilocalorie(s)
kg	kilogram(s)
km	kilometer(s)
L	liter
MAM	moderate acute malnutrition
MCHN	maternal and child health and nutrition
MDG	Millennium Development Goal
MICS	Multiple Indicator Cluster Survey
mm	millimeter
MNP	multiple micronutrient powders
NGO	nongovernmental organization
RUSF	ready-to-use supplementary food
RUTF	ready-to-use therapeutic food
SAM	severe acute malnutrition
SBCC	social and behavior change communication

UNDP	United Nations Development Programme
US$	United States dollars
USAID	U.S. Agency for International Development
WFP	World Food Programme
WHO	World Health Organization

EXECUTIVE SUMMARY

The goal of the U.S. Agency for International Development Office of Food for Peace (USAID/FFP) Food Security Country Framework (FSCF) for Bangladesh is to provide guidance on geographic targeting and program priorities to potential applicants for the FFP development food assistance program for the period of fiscal year 2015–2019. To achieve this goal, the FSCF summarizes data on the causes and distribution of chronic food insecurity in Bangladesh; identifies the most at-risk population groups; and describes existing policies, strategies, and programs;

Bangladesh stands prepared to meet many of its 2015 Millennium Development Challenge goals. According to the 2011 Bangladesh Demographic and Health Survey, fertility rates have fallen to 2.3 births per woman, maternal and under-5 mortality have been dramatically reduced to 194 per 100,000 live births and 53 per 1,000 live births respectively, national immunization coverage has reached near universal levels (86%), treatment of diarrhea is at 81%, and more women have access to education than ever before as 63% of women 15–49 years of age are literate. In addition, rice productivity improvements have reached the point where Bangladesh may well become a net rice exporter in the near future.

However, the country continues to be among the poorest in the world. It is highly vulnerable to natural disasters and risks from climate change. Gender inequalities disempower and exclude women from fully accessing their rights and negatively affect their health and food security, food production falls short of total consumption needs, and inadequate livelihood opportunities have encouraged a rural to urban migration for low paying jobs that has led to a large expansion of urban slums in major cities and secondary municipalities. In spite of commendable headway in reducing poverty and the proportion of people suffering from chronic food insecurity, wide geographic and ethnic disparities exist, and about 47 million people live below the poverty line. The country still faces significant food security challenges and while caloric intake has grown impressively, malnutrition remains a very real problem. Bangladesh still suffers from extremely high rates of chronic and acute malnutrition as 41% of children under 5 years of age are chronically malnourished (stunted) and 16% are wasted, while a quarter of women are underweight (with adolescent girls of reproductive age being the most vulnerable), and 22% of children are born with low birth weight. These continued high rates of malnutrition are detrimental to Bangladesh's economic growth and development. Children who are chronically malnourished have poor physical and cognitive development, lower educational attainment, and reduced income-earning and productivity potential and underweight among women can lead to having lower birth weight children, which serves to extend the cycle of poor nutrition and poverty.

Program Priorities for FFP Projects in Bangladesh

The overall goal of the FFP program in Bangladesh is: to reduce chronic and acute malnutrition and food insecurity, and improve resilience to disasters among vulnerable populations. Addressing undernutrition in the first 1,000 days, from pregnancy to 2 years of age, can protect the cognitive and growth potential of children and maximize the positive benefits for communities and the nation through increased future productivity. FFP projects are well placed to address the multisectoral causes of undernutrition through supporting proven maternal and child health and nutrition (MCHN) approaches, built on a sound understanding of the local context and well integrated with livelihoods, agriculture, and other programming. Important overarching themes for this FSCF include the following:

- **Depth over reach.** An intensive multisectoral approach to maximize nutritional outcomes is recommended over extensive geographic and beneficiary project coverage. Assuming no significant FFP funding changes, this approach means fewer upazilas and beneficiaries than the current FFP program.

- **Disaster risk reduction and strengthening resilience as a project priority.** Resilience should not be treated as a cross-cutting theme. Rather it should be a project priority with reducing food insecurity and chronic and acute malnutrition.
- **Gender.** Promoting gender equality, women's empowerment, and engaging men needs to be integrated in all FFP project interventions.

Recommended FFP Program Priorities

Overall Goal: To reduce chronic and acute malnutrition and food insecurity, and improve resilience to disasters among vulnerable populations.		
Cross-cutting program implementation priorities: • Promoting gender equality, women's empowerment and engaging men		
Program Priority 1: To increase food productivity and income levels of food-insecure households	**Program Priority 2:** To increase household resilience to climate change and other shocks	**Program Priority 3:** To reduce chronic and acute malnutrition among children under 5 years of age
Key Design and Implementation Considerations		
• Gender integration • Social and behavior change communication • Good governance • Monitoring and evaluation	• Environmental monitoring and mitigation • Formative and operations research • Strategic partnerships • Scale-up, sustainability, and exit strategy	
Strategic Partnerships, Program and Initiatives (see Appendix 6 for a full list of programs and projects of relevance to FFP programs in Bangladesh)		
National and district government entities and initiatives: • Ministry of Agriculture • Ministry of Chittagong Hill Tract Affairs • Ministry of Disaster Management and Relief • Ministry of Fisheries and Livestock • Ministry of Food • Ministry of Health and Family Welfare • Ministry of Local Government and Rural Development • Ministry of Women's Affairs • Scaling Up Nutrition Movement (SUN) • Health, Population and Nutrition Sector Development Program, 2011-2016	**USAID-funded projects working in the proposed geographic target areas:** • Agriculture Value Chains • Agro-Inputs Program • Aquaculture for Income and Nutrition • MaMoni Health Systems Strengthening Project • NGO Health Service Delivery Project (Smiling Sun) • SHIKHA • SPRING	
Private sector: • Local nongovernmental organizations • Input suppliers • Food processors • Traders • Exporters		

FFP anticipates that monetary resources and commodities will be available for development food assistance programming in Bangladesh in fiscal year 2015. Total anticipated FFP funding is uncertain as is the number of awards possible, and will be subject to the availability of funds and commodities. Applications can include variable annual funding levels over the life of the activity. This FSCF supplements FFP's Fiscal Year 2015 Request for Applications. Both documents must be used for developing an application for submission.

1. INTRODUCTION

Bangladesh remains one of the poorest and most climatically vulnerable countries in the world, and suffers from high prevalence of stunting and wasting among young children. Despite important gains in reducing poverty and increasing agricultural productivity, roughly 25% of the population is considered food insecure. Agriculture employs about 47% of the people (with about 60% of the farming population classified as landless), but contributes to about 18% of the gross domestic product (GDP) (World Bank 2013). Livelihood alternatives for many of the rural poor are limited resulting in significant seasonal migration. While starvation is less widespread than it was 20 years ago as daily caloric uptake has steadily increased, nutritional outcomes have not improved commensurately. Although the role of rice in the diet has declined, it still accounts for 71% of average daily calories. Socioeconomic improvements are clearly necessary for improving nutritional outcomes, and improvements in this area have not been sufficient.

Globally, the objectives of the U.S. Agency for International Development Office of Food for Peace (USAID/FFP) development food assistance program are "to target the underlying causes of hunger and malnutrition, reduce chronic malnutrition among children under 5 years of age and pregnant and lactating women, increase and diversify household income, and strengthen and diversify agricultural production and productivity to build resilience and reduce the need for food assistance" (USAID 2014).

The goal of the FFP Food Security Country Framework (FSCF) for Bangladesh is to provide a detailed understanding of the major causes of food insecurity among highly vulnerable populations. To achieve this goal, the FSCF summarizes data on the causes and distribution of chronic food insecurity in Bangladesh; identifies the most at-risk population groups; describes existing policies, strategies, and programs; and presents key data points to assist USAID/Bangladesh in developing project objectives, priority considerations for project design to sustainably reduce food insecurity and strengthen resilience in targeted areas of Bangladesh.

The FSCF draws on USAID's Policy Determination 19, which states 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. The definition of food security focuses on three distinct but interrelated elements, all three of which are essential to achieving food security.

- **Food availability:** having sufficient quantities of food from household production, other domestic output, commercial imports, or food assistance.
- **Food access:** having adequate resources to obtain appropriate food for a nutritious diet, which depends on available income, distribution of income in the household, and food prices.
- **Food utilization:** proper biological use of food, requiring a diet with sufficient energy and essential nutrients; potable water and adequate sanitation; and knowledge of food storage, processing, basic nutrition, and child care and illness management (USAID 1992).

This document uses the above definition of food security and concepts of risk and vulnerability as a framework to describe the context and determinants of food insecurity in Bangladesh, and the programmatic actions necessary to reduce food insecurity in the country. Appendix 1 includes maps of Bangladesh for reference.

2. BACKGROUND

Bangladesh has made strong progress in reducing poverty, which declined at an annual rate of 2.5% from 1991 to 2010, exceeding the Millennium Development Goal (MDG) target of 2.1%. The rate of reduction between 2000 and 2010 (1.7% annually for the upper poverty line) was faster than the previous decade. Other MDGs that have been reached include reducing the poverty gap indicator to 6.5, compared to the 2015 target of 8.0,[1] and reducing the population living under the poverty line from 57% in 1991 to 29% in 2012 (General Economics Division 2013). Poverty numbers in absolute terms also fell, from about 60.9 million to 44.9 million from 1991 to 2012.

Annual GDP growth (current US$) ranged between 5.7% and 6.7% during the 2004 to 2012 period. Per capita GDP grew by 5.0% per year and the upper poverty line headcount ($1.25/day) fell from 50.5% in 2005 to 43.3% in 2010. Although stunting and underweight levels remain very high, children suffering from stunting fell from 51% in 2004 to 41% in 2011, and numbers of underweight fell from 43% to 37% during the same time period. Notwithstanding this progress, Bangladesh ranks 146 of 187 countries in the United Nations Development Programme (UNDP) Human Development Index, and large numbers of poor and vulnerable households are not food secure. They are unable to attain a minimum basket of food items through their own production, product sales, off-farm employment, and other resources. Several elements critical to food security in Bangladesh are discussed next (Appendix 2 provides a table of selected economic and poverty indicators for Bangladesh).

Bangladesh has also made substantive strides in the health sector, as noted by significant reductions in fertility, maternal and child mortality. In 2011, Bangladesh began the implementation of a new Health, Population, and Nutrition Sector Development Program (HPNSDP 2011-2016) to guide the implementation of health sector service delivery. Nutrition was at this stage integrated within this program and within the Ministry of Health and Family Welfare (MOHFW) under the title of the National Nutrition Services, replacing the previous National Nutrition Program that was previously managed outside the MOHFW. In this regard, the Government of Bangladesh (GOB) has developed an operational plan for nutrition, and this defines the scope of nutrition service delivery that is intended by government and against which non-government partners would need to align. In addition the GOB is a member of the global Scaling Up Nutrition movement which focuses on the prevention of chronic malnutrition in the first 1000 days. These changes reflect the GOB's commitment to nutrition and provide a framework for all development and implementing partners to align and work in coordination with.

Climate change and natural hazards will likely continue to worsen. Bangladesh ranks first in the 2014 Climate Change Vulnerability Index and it will likely suffer more from climate change by 2025 than any other country (Maplecroft 2014). Rainfall is expected to increase by 10% to 15% during the monsoon seasons by 2030 and 27% by 2075; rising sea level is expected to inundate 120,000 square km by 2050; 14% more of the country may become extremely prone to floods by 2030; cyclones in the Bay of Bengal will occur more frequently due to increasing temperature, and the peak intensity of cyclones may increase by 5% to 10% (Food Planning and Monitoring Unit [FPMU] 2013). Coastal salinity problems will likely worsen as changing rain patterns reduce the amount of dry season water supply from upstream river sources. Overall, crop production might be reduced by 30% by the end of the century, rice production could fall by 8%, and wheat production by 32% by 2050 (FPMU 2013). Winter crop production would be seriously hampered due to a warmer and drier environment during non-monsoon seasons, while moisture stress might force farmers to reduce the area under irrigated rice cultivation.

[1] The poverty gap ratio is the mean shortfall of the total population from the poverty line (counting the non-poor as having zero shortfall), expressed as a percentage of the poverty line.

Severe shocks affect between 30% and 50% of the country each year and offset gains in poverty reduction and agriculture productivity (World Food Programme [WFP] 2012a). Bangladesh's geographical location, land characteristics,[2] rivers, and climate make it very vulnerable to natural and human-induced hazards.[3] An estimated 10,000 ha of floodplain land is lost annually, which has enormous impact on the approximately 100,000 people who face loss of homesteads, land, and/or crops, and are frequently displaced to fringe lands, river islands (chars), or urban slums (Ministry of Disaster Management and Relief 2010). The incidence of poverty appears to be greater in riverine areas as erosion damage affects infrastructure, and the threat of erosion and flooding discourages investment (Asian Development Bank 2014).

Resilience and social protection programs do not reach the majority of the poor. The Government of Bangladesh (GOB) has committed significant resources to reducing poverty and lowering the impact of risks faced by the poor and vulnerable population through a variety of safety net or social protection programs.[4] The allocation for social protection programs is about 2.2% of GDP and represents 12% of the 2013 GOB budget. The proportion of all households covered by safety net programs increased from 13% in 2005 to 25% in 2010. Safety net program coverage of the poor increased from 21% in 2005 to 33% in 2010 (World Bank 2013), meaning that about two-thirds of the 47 million people thought to be poor are not covered by social protection programs.[5]

Access to microfinance is more effective than safety nets in helping households cope with shocks by allowing households to smooth consumption during periods such as the "monga," or near famine situation that occurs seasonally before the harvest of aman rice particularly in the north (Ahmed et al. 2012). In addition, the medium- to long-term sustainability of these safety net subsidies will be challenged by competing budgetary objectives including the funding of productive agriculture-related programs such as agricultural research and rural infrastructure (Food and Agriculture Organization of the United Nations [FAO] and WFP 2008).

Lack of diversity in agricultural productivity adversely affects food security. Gaps between actual farm yields and yields at research and experimental stations are problematic across the crops, fish, and livestock sectors, and often exceed 40% in crops.[6] Surface water irrigation has stagnated, largely due to reduction of river flows because of increased sediment loads, shrinkage of wetlands, river silting, and increased salinity. Ground water irrigation has significantly increased owing to the rapid expansion of shallow tubewells leading to continued reduction of water tables during the peak dry months of March and

[2] Vulnerability is augmented by the country's flat topography and low elevation—50% of its area is within six to seven meters of mean sea level, which subjects it to flooding and erosion from a vast network of rivers, sea level surges, and salinity intrusion (Ministry of Disaster Management and Relief 2010).
[3] These include floods, cyclones, droughts, tidal surges, tornadoes, earthquakes, river erosion, fire, infrastructure collapse, high arsenic content in ground water, water logging, water and soil salinity, and various sources of pollution (Ministry of Disaster Management and Relief 2010).
[4] This commitment is reflected in Vision 2021, the Perspective Plan 2010–2021, and the Sixth Five-Year Plan FY11–FY15.
[5] In 2012–2013, about 39 million people were targeted for social protection programs in food aid, employment generation, and development programs, but actual coverage was closer to 27 million (WFP 2012b). Several factors contributed to the low coverage of social protection programs: leakage of funds to ineligible (non-poor) people; an inefficient system with complicated administration involving as many as 30 line ministries/agencies with no formal mechanism for sharing information; and the perception that the GOB does not accept the programs as explicit rights of the poor. The efficiency and effectiveness of these programs can be improved through better targeting and tracking mechanisms as other countries have shown.
[6] Yield gaps generally can be attributed to using inappropriate land; weak water and crop management practices; untimely/delayed farming operations; low yielding varieties and poor-quality seed; and pre- and post-harvest losses due to pests, diseases, and poor management practices. Cultivars with high yield potential are usually tailored to respond to a high level of inputs (nutrients, water, and chemicals). If farmers are unable to affect salinity and alleviate the impact of shallow water tables, flooding, excessive moisture, etc. to suit the improved cultivars, yields fall.

April, resulting in increased irrigation pumping costs and negatively affecting water and sanitation needs and practices (Ministry of Agriculture and FAO 2011).

While rice has contributed most to self-sufficiency in food grains, production gains have been mainly driven by increased irrigation, greater use of high-yielding and hybrid varieties, and other improved inputs. However, rice cannot be expected to experience the growth rate of the past without net technological breakthrough (FPMU 2008). The emphasis on rice production has resulted in decreased production and increased imports of pulses, oilseeds, and fruits, which remain unaffordable to many poor consumers, resulting in greater substitution of pulses for cereals with negative nutritional impact (FPMU 2008). Also, with rice accounting for about 58% of all food crop agriculture in 2010–2011 (76% of cereals), climate-induced yield losses have had serious impact on food security.

Shrinking access to arable land fuels landlessness and food insecurity. Agriculture production growth is being constrained by a land base increasingly pressured by urban encroachment, declining soil fertility due to intensive cropping practices, erosion, salinity, and a growing population which will continue to shrink the size of household farming plots. About 10% of farmers own 50% of the land and roughly 60% of farmers are functionally landless. About 62% of farming households farm 0.4 ha or less, with an average of 0.26 ha. The proportion of land owned by women is uncertain, but is likely less than 3.5%. About 40% of farmers are sharecroppers who cover all production costs and then turn over 60% of production to the landowner (Thomas et al. 2013). Combined with the lack of credit to buy improved seeds and other inputs, sharecroppers have little incentive or opportunity to invest in the land they farm.

Off-farm employment opportunities are expanding at too slow a pace. Earnings from employment are the main pathway to access food for households, especially poor households whose main asset is their labor and can be a pathway to increased equity for women. Off-farm employment is growing but the pace is inadequate to ease the land strain.[7] Unemployment is particularly high among young people between 15 to 24 years of age. This group accounts for about 23% of the labor force (General Economics Division 2013). Relative wage rates have improved. In 2012, rural wages were equivalent to 7.6 kg and 6.8 kg of rice per day for male and female workers, respectively, compared to 4 kg per day in 2007/2008 (the global food crisis). The number of unemployed is estimated at 2.6 million, of which 1.7 million are in rural areas and 0.9 million in urban areas. Domestic employment generation is projected to be just enough to absorb new workers through 2017 (FPMU 2013). Between 2010 and 2025, an estimated 21 million more people will join the labor force and finding employment for this huge increase will pose a daunting challenge (World Bank 2013). Although increased school enrollment has resulted in more years of education for the average worker, the return on investment in education has declined, perhaps due to weak education quality and the faster growth of the labor force compared to the demand for educated workers (World Bank 2013).

Migration is an important strategy for many households in securing food access. International remittances exceeded US$1.0 billion per month for 16 consecutive months through March 2013, and amounted to over a tenth of GDP (Bangladesh Bank 2013). International migration is a high-cost risk and high-reward proposition relative to internal migrations. International migrants send 2.8 times more money home compared to internal migrants. However, poorer population segments tend to migrate internally, and migrants in the poorest expenditure quintile send 2.5 times more from internal compared to international sources (Ahmed et al. 2012).[8] Remittances are lowest in the poorer divisions of Khulna, Rajshahi, and Rangpur (ibid).

[7] Employment opportunities in the garment industry, a low-skill sector, will be under pressure from more efficient competitors like China (FAO and WFP 2008).

[8] Labor shortages are becoming increasingly frequent during the planting and harvesting seasons due to the increasing job opportunities in non-farm activities and due to migration. One study on migration patterns showed that 22% of rural households had members migrating to other regions of Bangladesh, and 12% migrated outside Bangladesh in 2011 (Hasan et al. 2013).

Gender inequality and lack of rights for women undermine progress on food security.[9] Gender inequality and women's disempowerment in Bangladesh adversely affects children's nutritional status and women's ability to seek health care or provide optimal care for themselves and their children. Gender discrimination begins early in the life of women and girls in Bangladesh, as reflected in the widespread practice of early marriage (the median age of first marriage is 15.8 years among women aged 20-49 years of age) and subsequent pregnancy during adolescence. Nearly 60% of adolescent girls have begun childbearing by the age of 19, a figure that has remained unchanged for several decades, despite wider progress on reductions in the total fertility rate. Adolescent girls themselves are more malnourished than their older peers, and children born to adolescent mothers are often malnourished from birth, continuing an intergenerational cycle of malnutrition.

According to the 2011 Bangladesh Demographic and Health Survey (BDHS), more than half of women 15–49 years of age and 80% of adolescent girls (15–19 years of age) reported being unable to make decisions on their own regarding their health or their child's health (National Institute of Population Research and Training [NIPORT] et al. 2013). The baseline study for the Women's Empowerment in Agriculture Index in Bangladesh found that 23% of the women in the sample were empowered and reported greater decision making autonomy on minor household expenditures, daily tasks, and their health (e.g., decisions regarding family planning, protection from violence, and taking action in the case of serious health problems) (Sraboni 2013). Women are often involved in important but unpaid farm work but are not considered farmers (Britt 2010), which undermines women's influence in the family structure and women are often overburdened with household work and childcare. Women's labor force participation in Bangladesh is low as the BDHS 2011 found that 13 % of women aged 15-49 years reported being employed, while 98% of men reported being employed in the preceding 12 months.

[9] Gender equality refers to women and men being treated the same way. Gender equity considers the differences in women's and men's lives and recognizes that different approaches may be needed to produce outcomes that are equitable. Equal treatment will not produce equitable results, because women and men have different life experiences.

3. FOOD SECURITY CONTEXT

3.1 FOOD AVAILABILITY AND ACCESS

According to FAO, per capita food supplies have increased from 2,309 kcal per day equivalent in 2000, to 2,435 kcal in 2004, and 2,481 kcal in 2009 (FAO 2014),[10] which is higher than several South Asian countries including India, Pakistan, Nepal, and Sri Lanka. This partially reflects increased crop productivity as production per ha increased by an annual average of 5.2% during 2006–2011, but production has lagged population growth with per capita food production declining by 2.5% annually during this period (FAO 2014). The shortfall has been filled by a significant increase in cereal imports, a decrease in cereal exports, and food aid.

Poverty remains the primary cause of food insecurity in Bangladesh. Although aggregate food supplies and caloric intake have increased, the large poor population is food insecure as they lack the resources to access an adequate diet. For all the economic and food production progress, a large portion of the population is poor and the prevalence of undernutrition among the population has increased from 15% in 2004/2006 to 17% in 2010/2012 (FAO 2014).

3.2.1 FOOD AVAILABILITY

Land Availability and Access[11]

Bangladesh is losing agriculture land at a rate of 0.05% per year due to various factors including urban encroachment of agriculture land, road infrastructure, water logging, depletion of ground water and soil fertility, erosion, and salinity (Hasan 2013). In the last three decades about 170,000 ha of agriculture land has been degraded by increased salinity (Ministry of Agriculture and FAO 2011). Soil fertility degradation results from imbalanced fertilizer use (overuse of subsidized nitrogen fertilizers), absence of micronutrient application, less use of manure for crops and more for fuel, and cropping intensification combined with the increase of mono culture rice without rotation. Water erosion accounts for about 40% of land loss on about 1,200 km of riverbanks (primarily the Ganges, Jamuna, and Padma rivers) that are most seriously affected as topsoil is washed away and replaced by sand (ibid). This problem is expected to intensify with increased climate change-induced ice melting in the Himalayas. This significant land loss when combined with population growth explains why the size of cultivated area per farm has decreased from 0.81 to 0.51 hectares between 1984 and 2008 (FPMU 2013).[12]

The majority of farming households (62.1%) farm 0.4 ha or less, and these households farm about 27% of all farmland in Bangladesh. The average farm size for these households is 0.26 ha (see Table 2). The average farm size for the country overall is 0.59 ha of which 0.51 ha is cultivated (BBS 2011). High poverty rates and food insecurity are associated with small landholdings, and 51% of households in rural Bangladesh are landless (Ahmed et al 2012). The relationship between poverty reduction and land ownership changed between 2000 to 2005 and 2005 to 2010; during 2005–2010 landless and functionally landless households experienced larger poverty decreases (see Table 3). Poverty reduction among these most vulnerable households was bolstered by an increase in demand for unskilled workers and an increase

[10] According to the BBS, the direct calorie intake method has defined 2,122 kcal per day or below defines "absolute poverty," while "hard-core poverty" refers to a calorie intake of less than 1,805 kcal per capita per day (WFP 2005).

[11] Existing land policies are set by the 2001 Land Use Policy, which provides guidelines for protection of agricultural land and water bodies, and the 1999 National Water Policy, which provides policy direction for the water sector.

[12] On a positive note, the southern area covers about 30% of the arable land. About 15% of the available crop land in this area is not used because of soil salinity or water logging, or left fallow for other reasons. The GOB views this area for transplanted aus rice production (about 750,000 ha) and for irrigated boro rice production (about 700,000 ha) (Ministry of Agriculture and FAO 2012). The expansion to these areas is dependent on new saline tolerant varieties being developed.

in rural wages between 2005 and 2010 (World Bank 2013). In addition to the overall increase in returns from farming, the most important contributor to poverty reduction was the increase in returns from land, accounting for 42% of the reduction in poverty (ibid). Refer to Appendix 3 for regional comparisons of land distribution.

Table 2. Farm Holdings (2005)

	Farm Numbers		Farm Area		
Farm Size (ha)	000s	%	000 ha	%	Average Farm Size (ha)
Less than 0.2	5,829	38.6	1,011.3	11.2	0.17
0.2–0.4	3,553	23.5	1,398.8	15.5	0.39
0.4–0.6	2,112	14.0	1,283.3	14.2	0.61
0.6–1.01	1,858	12.3	1,695.6	18.8	0.91
1.01–3.03	1,561	10.3	2,726.4	30.2	1.75
More than 3.03	177	1.2	911.8	10.1	5.15
Total	**15,090**	**100.0**	**9,027.2**	**100.0**	**0.59**

Source: BBS 2011

Table 3. Poverty Rates by Landholdings

	Poverty Rate (%)			Population Distribution (%)		
	2000	2005	2010	2000	2005	2010
Landless < 0.05 acre	63.5	56.8	45.6	48	45.8	50.9
Functionally landless 0.05–0.5 acres	59.7	48.8	34.6	13	15.9	15.9
Marginal 0.5–1.5 acres	47.2	35.1	25	17.5	18.8	18
Small 1.5–2.5 acres	35.4	23.7	16.8	9.2	8.8	6.8
Medium/large 2.5 acres or more	20.7	12.8	9.7	12.4	10.7	8.4

Source: World Bank 2013

In 1993, the FAO estimated that women in Bangladesh owned just 3.5% of the country's agricultural land. Twenty years later, this share has shrunk further, to perhaps as little as 2% (Economist 2013). Although there is a constitutional ban on gender-based discrimination, women in Bangladesh do not have equal property rights and rarely hold titles to land due to social norms and practices (Royal Tropical Institute 2011). Women do not generally have the resources or access to credit necessary to purchase land in their own name or to make investments in land that they may possess, and daughters and widows often do not inherit land despite legal provisions granting them inheritance rights (ibid). Co-ownership of marital property does not exist unless a woman's name is on the land document, and separated and divorced women have no right to claim any portion of their husband's land. Under Sharia law, daughters inherit half of the property received by sons, one-eighth share of their husbands' property, and one-sixteenth of their sons' property should the son die before the mother. Many women are aware of these rights, but either do not know how or feel socially restricted to exercise their rights (Sarwar et al. 2007). In Hindu communities, women are always deprived of property inheritance (Royal Tropical Institute 2011). As a result of these factors, women own few assets.

Crop Production Systems

The agricultural crop sector in Bangladesh is dominated by cereals, especially rice which accounted for about 85% of crop area devoted to cereals, oilseeds, pulses, and vegetables in 2011–2012. Rice production dominates other cereals, pulses, and oilseeds while potato is the leading vegetable produced, and mango and bananas are important fruits (see Table 4). Growth rates have been positive for rice (excepting the poor 2012 seasons), maize,[13] and oilseeds which trended lower during 2002–2012. All of the vegetable

[13] The rapid growth of maize production has been driven by increased feed demand from poultry, fish, and dairy farming. Domestic production has not kept pace with demand leading to a substantial increase in imports, increasing an average of 29% per year during 2005–2011 (FAO 2014). Maize can be cultivated in all three crop seasons and fits well into crop rotations. Women

categories have shown positive growth with the exception of sweet potatoes, while some fruit categories grew and some declined.

Table 4. National Agricultural Production (000 tons)

Crop	2002–2007 Average	2008	2009	2010	2011	2012
Rice	39,323	46,742	48,144	50,061	50,627	33,890
Wheat	1,136	844	849	901	972	995
Maize	376	1,346	730	887	1,018	1,298
Millet	21	13	12	12	11	12
Barley	1.5	0.5	0.5	0.5	0.5	0.3
Sorghum	0.6	0.4	0.3	0.3	0.3	0.3
Pulses	312	202	205	220	235	315
Oilseeds	125	141	133	144	148	148
Fruits						
Bananas	804	877	836	818	801	746
Mango and guava	450	803	828	1,048	889	945
Pineapples	208	210	229	234	219	181
Papayas	208	210	229	234	219	181
Melon	93	205	200	216	205	212
Citrus	80	121	127	136	137	147
Other tropical fruits	800	1,417	1,497	1,536	1,504	1,505
Vegetables						
Potatoes	4,280	6,648	5,268	7,930	8,326	8,205
Sweet potatoes	320	307	305	307	298	253
Tomatoes	119	143	151	190	232	255
Onions	471	889	735	872	1,052	1,159
Cabbage	144	211	206	220	207	213
Pumpkin and squash	237	316	340	352	355	365
Other vegetables	1,339	1,709	1,789	1,839	1,918	1,951

Source: FAO 2014

Yields have increased since 2007 for almost all crops. The improvement in rice yields offers potential for more crop diversification in that it allows releasing land for other crops without negatively affecting rice self-sufficiency.[14] Rice productivity has been an important success story for Bangladesh. Productivity (2006–2012) has been high relative to the nine countries of South Asia with the exception of a poor yield year for Bangladesh in 2012 (see Table 5). Bangladesh wheat yields are under South Asia yields, but the Bangladesh yield growth rate has been far higher compared to the South Asia region. Bangladesh has far higher maize yields than the region with a productivity growth rate of 4.5% per year. Notwithstanding the relatively strong productivity performance of Bangladesh cereals, the yield gap remains a substantial concern. Research and experimentation station yields can reach as high as 40% greater than farm yields, due to more controlled conditions, the use of improved agronomic practices, and proper use of inputs (Pullabhotla and Ganesh-Kumar 2012). Greater interaction between farmers, researches, and extension workers can help researchers gain a better understanding of farmer needs and resource limitations. Refer to Appendix 4 for a discussion of productivity issues and constraints.

play an important role in maize cultivation. In one study, women handle about 80% of harvesting, 20% of irrigation, 90% of shelling maize kernels, and 80% of drying (GMark Consulting Limited 2013).

[14] The share of rice value-added in total food value-added has not changed markedly in the past few years indicating there has been no significant diversification in food production despite the growth of fisheries and poultry production (FPMU 2013).

Table 5. Cereal Yields in Bangladesh and South Asia (kg per ha)

Crop	2006	2007	2008	2009	2010	2011	2012
Rice							
Bangladesh	3,854	4,083	4,144	4,240	4,342	4,219	2,933
South Asia	3,301	3,433	3,426	3,455	3,550	3,707	3,464
Wheat							
Bangladesh	1,534	1,847	2,175	2,152	2,396	2,601	2,779
South Asia	2,477	2,570	2,497	2,663	2,591	2,736	2,846
Maize							
Bangladesh	5,300	5,981	6,017	5,683	5,838	6,151	6,884
South Asia	2,231	2,629	2,680	2,327	2,788	2,767	2,782

Source: FAO 2014

Crop Production by Geographic Area

A summary of crop production in vulnerable areas is shown in Table 6. Variations in production by crop are based on several factors discussed in section 3.2.1 including agro-climatic conditions. However, none of the suggested programming areas are subject to dramatic production shortfalls across the crop categories. Based on population, each of the programming areas accounts for a smaller proportion of the country's total rice production compared to national production

Table 6. Crop Production—Major Cereals, Vegetables, and Fruits (2011–2012) in Vulnerable Areas (000 tons)

Zones/ Areas for FFP Projects	Regions (Former/ Greater Districts)*	Crops						
		Rice	Wheat	Maize	Potato (Irish and Sweet)	Ground nut	Vegetables	Fruit
Chittagong Hill Tracts	Chittagong	110.0	0.0	1.7	10.4	0.3	66.2	159.6
Feed the Future Zone of Influence	Barisal	1607.0	7.9	3.5	109.7	2.7	831.1	263.6
	Faridpur	1,229.0	143.0	1.3	37.1	24.3	160.67	213.2
	Khulna	1201.0	3.5	1.5	67.3	0.0	161.1	198.8
	Jessore	2,334.0	53.0	63.3	77.6	1.6	349.8	230.0
Mid and Northern Chars	Pabna	1,159.0	88.0	20.2	48.6	1.1	100.8	174.9
	Rangpur	3,256.0	43.2	284.8	1,775.9	2.7	160.8	184.3
Haors	Sylhet	2,480.0	1.0	1.4	41.8	1.2	90.6	144.7
	Mymensingh	3,523.0	8.8	7.0	117.6	2.3	166.7	243.2
Total Bangladesh		33,890	995	1,298	8,458	54	3,061	4,335

*Production data is for all districts in each region. Vegetable data includes 20 summer and 13 winter varieties. Fruits include 24 varieties.
Source: BBS 2013

Livestock[15]

Livestock contributed just over 14% to agriculture GDP in 2011 (FPMU 2013). Cattle and goats are the most important livestock holdings (see Table 7). Cattle are a typical part of a traditional cropping system as a source of power, transport, and manure, as are buffalo, which are fewer in numbers. Cattle have grown at a slower rate which is puzzling considering the large illegal cross border import trade with India in spite of the Indian ban on exporting cattle. One estimate pegs the smuggling at 2 million head per year, or as many as 3 of every 4 cattle slaughtered in Bangladesh, worth about US$920 million (Azizur Rahman 2013).

Meat and milk productivity are low due to weak genetics as the buffalo and cattle herd are primarily made up of local breeds which are heat tolerant and less prone to disease compared to pure breeds or pure breed

[15] The governing regulatory framework for livestock is the 2013 National Livestock Extension Policy which focuses on veterinary public health and food safety issues, producers' organizations, extension services, linkages among research and extension, and smallholder livestock farming constraints.

crosses. Improved breeds are more common on government and privately owned dairy farms. Milk productivity averages 206 kg/head/year compared to 1,087 kg for India, 1,253 kg for Pakistan, and 9,118 kg for the United States (FPMU 2013). Although there has been some cross breeding, a major selective breeding program will be required to boost the milk subsector. The program would have to include enhanced artificial insemination services now provided by the Department of Livestock Services, BRAC, and a few other organizations. The Bangladesh Livestock Research Institute is the agency responsible for developing suitable breeds, but it suffers from a lack of resources.

Carcass meat yields for goats average 7 kg compared to 10.8 kg in South Asia, with Bangladesh cattle carcass averaging 71.7 kg compared to 124.6 kg across South Asia (FAO 2014). Although low, total production has increased 4.0% per year for milk and 2.2% per year for meat driven by increased animal numbers (see Table 8). Egg production has grown at a 2.9% annual rate. Egg imports, which account for about 50% of consumption, are at 1.9 billion pieces and dried milk imports have reached 63,000 tons (WFP 2014; FAO 2014). Meat imports, on the other hand, are insignificant.

The poor quality and high price of feed and scarcity of fodder is the primary constraint in the livestock sector, and most livestock feed available is inferior with substandard nutritional value (FPMU 2013). The 2010 Animal and Fish Feed Act is intended to address this problem, but has not been effective because of inadequate budget to establish testing facilities in feed production areas.

Table 7. National Livestock Production (Animal Numbers 000s)

Species	Average 2006–2008	2009	2010	2011	2012
Buffalo	1,210	1,304	1,349	1,394	1,443
Cattle	22,857	22,976	23,051	23,121	23,150
Goats	45,543	49,300	51,400	53,400	55,000
Poultry	243,727	262,628	270,712	278,806	285,000
Sheep	1,561	1,730	1,820	1,860	1,890

Source: FAO 2014

Table 8. Animal Source Food Production (Tons)

Species	2008	2009	2010	2011	2012
Eggs	265,200	219,700	268,300	284,000	291,500
Meat	578,811	595,860	610,670	626,531	632,522
Milk	3,059,830	3,224,510	3,398,000	3,498,300	3,518,800

Source: FAO 2014

Fisheries[16]

The fisheries sector accounts for 4.4% of GDP, provides about 60% of animal protein, and contributes to the livelihood of about 16 million people (FPMU 2013). The sector has grown faster than other agricultural sectors over the past 5 years, and the export of high-value shrimp make it the leading agriculture sector for export earnings. The sector is composed of three subsectors: aquaculture, inland capture, and marine capture.

The fishing sector uses more than 160,000 km of Bay of Bengal shoreline, just over 4 million ha of inland waterways, and about 300,000 ha of man-made aquaculture ponds to harvest a variety of fresh and salt

[16] The Fish and Livestock Feed Act 2010 covers the production, processing, quality control, import, export, transportation, marketing, sales, and distribution of fish and livestock feed. The Department of Fisheries and the Department of Livestock Services are responsible for the quality of fish and livestock feed, respectively, through laboratory tests on samples from producers and importers. Antibiotics, growth hormones, steroids, pesticides, and other harmful chemicals are prohibited. The Fish Hatchery Act 2010 covers the establishment of fish and shrimp hatcheries for production of larvae, post-larvae, fingerlings, and related activities. Hatcheries must be registered with the Department of Fisheries, and hatchery operators must have legal documents giving rights to use the hatcheries either as an owner or leaseholder. The hatcheries are prohibited from using banned antibiotics, drugs, and other chemicals, and are required to establish health monitoring and control procedures to minimize the risk of disease.

water species. About 265 fish species and 24 prawn species are found in marine waters (General Economics Division 2013). While capture fisheries have declined due to expansion of irrigated rice production, extensive flood control measures, and the construction of roads, aquaculture has grown rapidly. The total fish catch has grown steadily (5.7% per year) since 1995/1996 led by the aquaculture harvest which has grown an average of 8.8% per year through 2010/2011 (see Table 9). Rural Bangladesh consumers spend 12% of their food budget on fish, and 61% of households consumed fish on any given day, although only 50% of extremely poor households consumed fish on a daily basis (World Bank 2013).

Table 9. Production of Inland and Marine Fisheries (Tons)

	1995–1996	2000–2001	2005–2006	2009–2010	2010–2011
Inland fisheries	609,000	689,000	956,000	1,030,000	1,055,000
Aquaculture	379,000	712,000	892,000	1,352,000	1,460,000
Marine fisheries	269,000	379,000	479,000	517,000	546,000
Total	**1,257,000**	**1,780,000**	**2,327,000**	**2,899,000**	**3,061,000**

Source: BBS 2011

WorldFish and the Ministry of Foreign Affairs of Denmark surveys of smallholders, show average fish yields from small ponds are less than 1,500 kg/ha, but improved management practices and the use of quality inputs can increase yields to 3–5 tons/ha, and greater for tilapia and pangas (Collis 2010). Small fish like the mola make significant contributions to micronutrient consumption. 250 grams of the mola fish can be harvested weekly from a small homestead pond of about 200 square meters and provides daily requirements of vitamin A, calcium, and iron to meet daily requirements for a typical Bangladesh household of five to six family members (Collis 2010). These small indigenous species play a particularly important role to meet micronutrient needs during lean seasons when vegetables are not available or affordable.[17]

An important constraint that is preventing even greater expansion of aquaculture production is the poor quality of genetic stock in hatcheries due to inbreeding and the resulting indiscriminate use of inferior brood fish (FPMU 2013).

Cereal Availability, Agricultural Trade, Food Stocks, and Smallholder Marketing

Trade and stocks. Although the majority of food grains consumed are internally produced, food imports play an important stabilizing role. Although rice production grew substantially, significant imports were required during the 2005 to 2009 period to meet cereal food needs, ranging between 8.3% and 12.5% of food uses (see Table 10). In 2012 public imports of rice were not needed to supply the Public Food Distribution System, and only minor volumes were imported by the private sector, indicating that Bangladesh had achieved short-term self-sufficiency in rice.[18] In 2013, 35,000 tons of rice were imported, and U.S. Department of Agriculture estimates that 2014 imports may reach 400,000 tons. Although continued rice self-sufficiency is hardly assured, Bangladesh may be in a position to become a net rice exporter. However, it is not clear that Bangladesh has a competitive advantage in rice production compared to other rice exporting countries, particularly considering the fertilizer subsidy, which encourages greater use at the artificially low subsidized price. The potential to be a net exporter raises a

[17] Small fish like the mola, producing 10 kg per pond per year in 4 million small ponds, will provide sufficient vitamin A intake for 6 million children (FPMU 2013).

[18] GOB commercial imports are used to supply the Public Food Distribution System which has three main objectives: maintain security stocks for emergencies by managing imports and domestic purchases, stabilize food prices, and enhance food security for the poor (World Bank 2013). Although Bangladesh has made substantial progress in increasing cereal production, has eliminated food rationing, and no longer monopolizes cereal grain trade, the country continues to use the Public Food Distribution System as a food safety net for the most food insecure. The GOB's food distribution program has several components including subsidized open market sales, free distribution through food-for-work, and vulnerable group feeding programs (Global Agriculture Information Network 2012).

policy question of whether Bangladesh should focus on production diversification rather than on potential rice export.

Wheat has been the leading cereal import in most years, with private commercial imports being the principal source of wheat and rice (see Table 11). GOB commercial imports have varied considerably from a low (wheat and rice) of 296 tons in 2006/2007 to a high of 2,040 tons in 2010/2011.[19] Food aid imports have been relatively small, averaging about 125 tons per year during the period.

Table 10. Bangladesh Cereals Balance (000 Tons)

	2005	2006	2007	2008	2009
Production	27,895	28,467	30,462	33,382	33,424
Imports	2,953	2,971	3,571	2,295	3,063
Exports	7	19	22	19	7
Stocks	-966	414	-884	-2,194	-1,702
Food use	27,250	27,622	28,498	27,744	29,035
Other uses	4,088	4,212	4,629	5,728	5,741

Source: FAO 2014

Table 11. Food Grain Imports (000 Tons)

	2007/2008	2008/2009	2009/2010	2010/2011	2011/2012	2012/2013
Rice						
Government commercial	296	396	47	1,264	455	2
Food aid	82	35	4	6	9	1
Private	1,681	187	37	291	59	25
Total rice	2,059	618	87	1,561	523	29
Wheat						
Government commercial	0	295	444	776	540	338
Food aid	177	87	56	158	46	130
Private	1,235	2,031	2,863	2,818	1,181	1,393
Total wheat	1,412	2,413	3,362	3,752	1,767	1,862
Rice and Wheat						
Total food grain	3,471	3,031	3,449	5,313	2,290	1,891
Total commercial	296	691	490	2,040	995	340
Total food aid	259	122	60	164	55	131

Source: FPMU 2013

Smallholder marketing. In a household survey conducted by the International Food Policy Research Institute (IFPRI), farmers sold more wheat and pulses, relative to their production, than other crops, indicating the importance of these two crops as income generators compared to rice which holds relatively greater importance as a home consumption item (see Table 12). The survey examined rice sales in more detail and found that 68% of farmers sold their rice to wholesalers compared to 29% who sold to village collectors and 3% to other buyers (Ahmed et al. 2012). The sales location was primarily at the farm site (53%), followed by the retail market (34%) and wholesale markets (13%). Manual or mechanical means were dominant forms of transport (91%), hauling by animals was second (1%), followed by motorized (less than 1%), and other forms (7%).

[19] Currently there are neither import taxes nor quantitative restrictions on rice imports. Since May 2008, Bangladesh has imposed a ban on rice exports. India has been the principal supplier to Bangladesh, but as a result of India's ban on rice exports, which was eliminated in 2011, Bangladesh importers found alternative suppliers in Southeast Asia and China.

Table 12. Marketing Rates by Crop and Division (%)

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	National
Rice	31	14	31	35	43	40	27	**36**
Wheat	0	48	53	47	55	85	0	**59**
Pulses	51	53	49	54	69	22	22	**53**
Potatoes	8	12	7	0	21	0	6	**11**
Non-leafy vegetables	5	22	19	22	34	10	12	**20**
Leafy vegetables	3	24	9	8	8	2	25	**9**
Fruits	7	9	9	15	8	5	7	**9**

Source: Ahmed et al. 2012

Gender and Agricultural Production

Women participation in the agricultural labor force increased from 5.8 million in 2002/2003 to 7.7 million in 2005/2006 while men working in agriculture fell from 17.2 million to 15.1 million for the same period, perhaps driven by increased migration and off-farm jobs (Jaim and Hossain 2011). However, nearly half of women working in agriculture are unpaid family workers (BBS 2010). The proportion of women working in agriculture increased from 58% in 2000 to 66% in 2008 (see Table 13).

In a longitudinal study of 62 villages, women's time spent per day in agriculture activities increased from 1.11 hours per day in 2000 to 1.28 in 2008 (Jaim and Hossain 2011). Most of this participation was in livestock and poultry where women feed livestock, clean sheds, and collect manure for use as a soil amendment. Only 3.9% of the women workers participated in crop farming in 2008, down marginally from 4% in 2000, with a greater reduction compared to 23% in 1988. This large drop is due to the mechanization of many rice post-harvest operations, including winnowing, drying, parboiling, husking, and milling (ibid). The one area in crop agriculture in which women are more involved than men is in home gardening, where 18% of women took part in 2008 compared to 9% in 2000. Women are also responsible for most childcare and routine household work, typically gathering wood and other supplies for household fuel, and hauling potable water from pumping sites.

For agriculture-related work, women handle much of the drying, curing, and marketing of fish, as hawkers or maintaining market stalls. The majority of the employees in shrimp processing plants in Chittagong and Khulna are women (FAO). Women are also predominantly involved in net-making, the main income generating occupation in many families, and freshwater fish farming (ibid). For work not directly related to agriculture, income-generating activities for women include child care and house cleaning, handicraft work (baskets, brooms, mats, and embroidery), preparing food for sale (such as puffed rice), and even beedi[20] cigarette rolling (Sarwar et al. 2007).

Table 13. Employment of Men and Women (%)

	1988		2000		2008	
	Men	Women	Men	Women	Men	Women
Agriculture	**83.2**	**58.9**	**56.3**	**57.6**	**65.3**	**66.4**
Crop cultivation	79.2	22.7	42.2	2.8	53.6	3.9
Livestock and poultry	28.7	43.2	25.1	50.8	34.5	68.9
Homestead gardening	1.5	9.7	2.7	9.2	2.4	18.0
Fisheries	5.2	1.0	5.7	0.4	3.7	0.5
Non Agriculture	**34.2**	**14.2**	**45.9**	**7.1**	**43.7**	**8.4**
Industry/processing	2.9	8.0	3.9	1.5	3.2	1.1
Transportation	3.0	0.0	5.4	0.0	5.9	0.0
Construction	9.9	3.8	3.8	1.1	4.2	1.6
Business/trade	12.4	0.8	16.9	0.3	14.8	0.4

[20] Beedi cigarettes are a traditional form of tobacco use made from tobacco flake, rolled with a leaf, and tied with a string.

	1988		2000		2008	
	Men	Women	Men	Women	Men	Women
Services	9.3	3.3	17.8	4.3	16.9	5.7

Source: Jain and Hossain 2011
Note: Multiple responses were recorded.

3.2.2 FOOD ACCESS

Poverty Rates

There has been a rapid decline in the proportion of population falling below the upper poverty line, from 48.9% (31.7 million people) in 2000 to 34.5% (15 million) in 2010 (see Table 14).[21] The incidence of extreme (lower) poverty fell from 34.3% (22.2 million people) in 2000 to 17.6% (8.4 million) in 2010. The poverty reduction between 2000 and 2010 (1.7% per year for upper poverty) was faster than the previous decade. The decline in poverty is attributed to increased farm incomes; a greater share of the population reaching working age, which has led to lower dependency ratios; and a tripling of migrants' remittances (FPMU 2013).[22]

Table 14. Prevalence of Poverty

	Poverty (upper)			Extreme Poverty (lower)		
	2000	2005	2010	2000	2005	2010
National (%)	48.9	40.0	34.5	34.3	25.1	17.6
National (millions)	*31.7*	*22.9*	*15.0*	*22.2*	*14,4*	*8.4*
Urban (%)	35.2	28.4	21.3	19.9	14.6	7.7
Urban (millions)	*22.8*	*16.3*	*10.1*	*12.9*	*8.4*	*3.7*
Rural (%)	52.3	43.8	35.2	37.9	28.6	21.1
Rural (millions)	*33.9*	*25.1*	*16.8*	*24.5*	*16.4*	*10.0*

Source: Hussain et al. 2014

In addition to the poor and extremely poor, another vulnerable group are those that fall into the income category that is 25% above the poverty line, which accounts for 19% of the population (about 30.1 million people). Many if not most of this group are one major shock away from falling below the poverty line. Adding this group to the poor and extremely poor indicates that about 50% of the country's population is poor, extremely poor, or very vulnerable to falling below the poverty line (Bangladesh Planning Commission 2013).

Poverty rates have fallen in both urban and rural areas, although rural poverty remains higher throughout the regions. The six divisions (seven with the redefined and smaller Rajshahi Division and the newly created Rangpur Division) have had substantial reductions in the incidence of poverty, but the differences across divisions have not been consistent. The improvement in extreme poverty (lower poverty line) reduction was 7.5 percentage points nationally between 2005 and 2010 (see Table 15). The reduction was relatively dramatic in Khulna (decrease of 16.2 percentage points), Barisal (8.9), and Rajshahi (8.4). The

[21] Poverty for both upper and lower poverty lines is measured by different methods. These include: the "cost of basic needs" method which addresses a basic food basket of 11 items that are scaled according to the nutritional requirement of 2,122 kcal per person per day plus an allowance for non-food items; the headcount rate; the poverty gap; and the squared poverty gap. To determine the lower poverty line (extreme poverty), the non-food allowance is the average non-food expenditures of households whose *total* consumption is equal to the food poverty line, whereas for the upper poverty line (poverty), the non-food allowance is the average non-food expenditures of households whose *food* consumption is equal to the food poverty line.
[22] Landowners with 7.5 or more acres had a poverty incidence of 8% below the upper poverty line, compared to 45% among those with less than 0.05 acres. Poverty incidence in female-headed households was slightly lower than male-headed, since the former group includes households with absent migrant males who send remittances.

other divisions experienced smaller reductions: Dhaka (4.3), Chittagong (3.0), and Sylhet (0.1).[23] These socio-economic disparities are indicative of food security disparities.

Table 15. Division Poverty Incidence—Lower Poverty Line (%)

	2005			2010		
	Rural	Urban	Total	Rural	Urban	Total
National	**28.6**	**14.6**	**25.1**	**21.1**	**7.7**	**17.6**
Barisal	37.2	26.4	35.6	27.3	24.2	26.7
Chittagong	18.7	8.1	16.1	16.2	4.0	13.1
Dhaka	26.1	9.6	19.9	23.5	3.8	15.6
Khulna	32.7	27.8	31.6	15.2	16.4	15.4
Rajshahi	35.6	28.4	34.5	22.7	15.6	21.6
Rajshahi*	—	—	—	17.7	13.2	16.8
Rangpur*	—	—	—	30.8	24.0	30.1
Sylhet	22.3	11.0	20.8	23.5	5.5	20.7

Source: BBS 2010
*New Rajshahi and Rangpur division structures

Labor Participation

While reliance on farming is not by itself a key poverty contributor, subsistence farming which forces households to seek off-farm employment for income to purchase adequate food supplies, is a key factor. Although farming is the primary occupation across all rural income groups, and actually increasing in the higher income groups, the proportion of agriculture wage laborers is much higher among the lower income groups (see Table 16). Regionally, the proportion of agriculture wage laborers is highest in Rangpur and Barisal, and lowest in Chittagong (see Table 17). Wage laborers suffer from low wages as well as uncertain employment. The proportion of salaried and business and trade jobs are much lower among the lower income groups. The resulting household income constraints mean that rural households on average spend nearly 70% of their income on food (NIPORT et al. 2013).

Table 16. Labor Force Participation by Rural Income Group (%)*

	Per Capita Expenditure Quintile (1 lowest; 5 highest)					
	1st	2nd	3rd	4th	5th	Total
Farming	64.4	64.3	67.6	69.4	71.7	**65.9**
Agriculture wage labor	12.0	9.4	7.1	3.4	1.0	**7.7**
Salaried	1.5	2.9	3.0	4.4	5.8	**3.7**
Business/trade	4.1	6.8	7.1	10.8	11.6	**7.9**
Other**	18.0	16.6	15.2	12.0	9.9	**14.8**

Source: Ahmed et al. 2012
* For household members 15 years and over.
** Includes non-agriculture labor, rickshaw driver, livestock worker, self-employed, and unemployed.

Table 17. Labor Force Participation by Division (%)

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	National
Farming	64.4	59.1	68.3	70.3	66.9	67.3	60.7	65.9
Agriculture wage labor	12.0	5.2	6.8	6.6	8.6	13.2	7.1	7.7
Salaried	1.5	4.7	3.4	4.1	3.2	2.6	5.7	3.7
Business/trade	4.1	10.4	7.8	6.3	7.3	5.9	7.8	7.9
Other*	18.0	20.6	13.7	12.7	14.0	21.0	18.7	14.8

Source: Ahmed et al. 2012
* Includes non-agricultural labor, rickshaw driver, livestock worker, self-employed, and unemployed for household members 15 years and older.

[23] Disparities among the regions of the Northeast, Northern Chars, Drought Zone, Haor Basin, Coastal Belt, and Chittagong Hill Tracts are depicted in the 2005 WFP Poverty Maps (refer to Appendix 1).

Lean Seasons

Despite the gains in food production, particularly rice, inadequate access to food and food insecurity remain major problems for a large population segment, particularly during seasonal lean periods. Poor subsistence farming households in rural areas face two distinct lean or hungry seasons. The first is in March and April prior to the boro harvest, and the second occurs in October and November prior to the Amman harvest. Limited off-farm employment combined with lack of food availability, particularly during these lean seasons, obviously worsens household food insecurity. The worst off households have adequate food for only 25% of the year and consume only two meals per day during the lean seasons (WFP et al. 2009).[24] In a 2011 survey, 74.4% of respondents reported that they had never faced any type of food shortage, while 25.6% reported that they sometimes or often faced food shortages (see Table 18). The BDHS in 2011 found that 20% of ever-married women 15–49 years of age reported that in the 12 months before the survey they sometimes, rarely, or never had three "full stomach" meals. The proportion increased to 50% in the least wealthy quintile. The richest quintile reported far fewer incidences of missing meals. Rural households reported higher frequencies of food shortages.

Table 18. Frequency of Household Food Shortages

	Urban (%)	Rural (%)	Total (%)
Never	77.9	72.9	74.4
Sometimes	11.9	15.4	14.4
Often	10.2	11.7	11.2
Total	100	100	100

Source: NIPORT et al. 2011

Calorie Intake

For the average rural household, about 71% of calories come from rice with the poorest quintile far more dependent (78%) than the highest quintile (63%) (see Table 19). The other differences between the diets of the poor and other income groups are oils, milk, eggs, meat, and fish. Although fish is the main protein source for all income groups, only about 50% of extremely poor households consumed fish on a daily basis, compared to 65% for the non-poor (World Bank 2013). Only 6% of poor households reported consuming meat on a given day in 2005 or 2010 compared to about 13% for non-poor households (World Bank 2013). Average caloric intake is highest in Sylhet and lowest in Chittagong although the differences in the food category intake do not appear substantial among the divisions (see Table 20).

In the last 15 years, per capita caloric intake increased by just over four calories per year. This rate of increase will not quickly close the gap of 112 kcal between current per capita consumption and the average normative requirement of 2,430 kcal (FPMU 2013). Consumption of cereals (including rice) decreased, in absolute and relative terms, and average per capita consumption of all other food groups increased between 1995 and 2010, indicating improved dietary diversity. However, the progress in diversification has been slower in rural compared to urban areas. Over the last 20 years, cereals decreased from over 80% of daily energy intake to 70%, compared to a desirable maximum of 60% (FPMU 2013).[25]

[24] A 2013 report showed that in Rangpur the incidence of food shortages varied across districts from 2% to 17% in the non-monga period and 26% to 58% during the monga period, the hungry season. The extent of full meals varied from 30% to 60% in the non-monga period and from 1% to 13% during the monga period (Inchauste et al. 2013 in FPMU 2013).

[25] A less welcomed trend has been increased consumption of sugar and edible oils in the form of fried and sweet foods which are nutrient-poor but high in energy and have led to increases in obesity. Almost 25% of men 35 years and over in the richest quintile are overweight or obese, compared to 1% in the poorest quintile; and among the poorest women in the 15 to 49 age group that have been married at one time, 5% are overweight or obese (FPMU 2013).

Table 19. Caloric Intake by Income Group in Rural Areas

Energy source	Per Capita Expenditure Quintile (1 lowest; 5 highest)					
	1st	2nd	3rd	4th	5th	All Groups
Total daily kcal/per capita	**1,984**	**2,202**	**2,275**	**2,378**	**2,483**	**2,243**
Rice (%)	78.0	73.6	71.2	68.5	63.2	**71.1**
Fortified wheat flour (%)	2.2	2.6	3.0	3.2	3.8	**3.0**
Pulses (%)	1.0	1.2	1.3	1.5	1.7	**1.3**
Oils (%)	5.1	6.7	7.5	8.2	10.0	**7.4**
Vegetables (%)	8.3	8.2	8.1	8.0	7.6	**8.1**
Meats (%)	0.2	0.3	0.7	0.8	1.2	**0.3**
Eggs (%)	0.2	0.3	0.3	0.5	0.6	**0.6**
Milk and milk products (%)	0.2	0.3	0.5	0.7	1.1	**2.4**
Fish (%)	1.5	2.1	2.5	2.6	3.1	**2.4**
Fruits (%)	0.2	0.3	0.3	0.5	0.7	**0.4**
Other (%)	3.1	4.4	4.6	5.5	7.0	**5.0**

Source: Ahmed et al. 2012

Table 20. Caloric Intake by Food Groups by Division

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	National
Total daily kcal/per capita	**2,129**	**2,036**	**2,370**	**2,234**	**2,278**	**2,227**	**2,357**	**2,243**
Rice (%)	72.2	66.4	71.1	71.6	70.6	77.0	70.0	**71.1**
Fortified wheat flour (%)	3.0	5.4	2.6	2.3	3.2	0.8	3.4	**3.0**
Pulses (%)	2.6	1.7	1.3	1.3	0.8	0.7	1.7	**1.3**
Oils (%)	8.5	7.7	7.6	8.8	7.7	5.2	6.5	**7.4**
Vegetables (%)	6.1	7.5	8.0	7.8	8.2	9.6	7.9	**8.0**
Meats (%)	0.5	1.0	0.5	0.7	0.6	0.5	0.7	**0.6**
Eggs (%)	0.4	0.3	0.4	0.4	0.4	0.3	0.2	**0.4**
Milk and milk products (%)	0.3	0.8	0.7	0.3	0.5	0.4	0.5	**0.6**
Fish (%)	2.2	2.8	2.9	2.1	1.7	1.3	2.9	**2.3**
Fruits (%)	0.6	0.4	0.3	0.7	0.4	0.1	0.3	**0.4**
Other (%)	3.7	6.2	4.5	4.1	6.0	4.1	5.9	**4.9**

Source: Ahmed et al. 2012

Food Purchase

The poorest (lowest income quintile) spend 62% of their total monthly expenditures on food compared 52% in the highest income group (see Table 21). Another study found that household expenditures on food have been increasing relative to income since 2000, from 51% in 2000, to 52% in 2005, to 62% in 2008 (WFP et al. 2009). The highest shares of expenditures on food by region are in Sylhet (64%) (see Table 22). Female-headed households spend a greater proportion (64%) on food compared to male-headed households (62%) (WFP et al. 2009). Among the various food groups, there were relative reductions in the shares of total food expenditures on oil, meat and eggs, and cereals, with gains in pulses, vegetables, and milk and milk products from 2005 to 2010 (see Table 23).[26]

Table 21. Budget Share of Consumption Items by Income Group

	Per Capita Expenditure Quintile (1 lowest; 5 highest)					
	1st	2nd	3rd	4th	5th	All Groups
Monthly per capita total expenditure (BDT)	1,323	1,838	2,344	3,041	5,155	**2,692**
Monthly per capita food expenditure (BDT)	825	1,121	1,395	1,766	2,662	**1,531**
Monthly per capita non-food expenditure (BDT)	498	718	950	1,275	2,493	**1,162**

Source: Ahmed et al. 2012

[26] During the period from 2005–2010 the consumer price index for food increased from 127.8 to 195.9.

Table 22. Food Expenditures by Division, 2012

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	National
Monthly food expenditures (BDT)	1,541	1,660	1,667	1,486	1,380	1,146	1,817	1,531
Food budget share (%)	60.8	56.3	60.4	57.6	57.1	59.1	63.6	58.9

Source: Ahmed et al. 2012

Table 23. Share of Food Expenditures (%)

	2000	2005	2010
Cereals	36.0	39.0	38.0
Pulses	2.4	2.7	2.9
Fish	13.7	12.2	12.5
Meat and eggs	10.3	8.5	8.0
Vegetables	7.8	8.4	9.2
Milk and milk products	3.0	3.7	4.0
Oil	4.4	4.3	3.7
Condiments	10.0	7.5	7.1
Fruits	4.1	3.2	3.0
Sugars	1.1	1.6	1.3
Beverages	0.7	0.7	2.0
Miscellaneous	5.7	8.3	8.3

Source: BBS 2010

Gender and Food Access

Pervasive gender inequality in Bangladesh restricts women's freedom of movement and limits them from being able to work to earn income and when women do work they earn only half as much as men (World Economic Forum 2013). Income opportunities for women are often limited to agriculture day labor where women earn 85% of men's earning (nation-wide) with the worst disparity (76%) in Barisal Division (see Table 24). As a result of these gender norms, women of childbearing age in particular have limited access to and control over resources and this limits their decision-making authority on food purchases and financial contribution to household spending on food. Within the household, gender inequality distorts the intra-household distribution of food and this results in women eating less and last (particularly pregnant and lactating women and adolescent girls), this combined with food taboos during pregnancy and lactation contributes to undernutrition of women and children (WFP 2011). A 2010 gender assessment found that mothers-in-law strongly influence household decisions on the purchase, preparation, sharing, and storage of food in the home, which can significantly reduce a younger woman's ability to make decisions about her children's and own food quality and consumption (WFP 2011). As such, women's lack of access to and control over resources severely inhibits food access for mothers and children (Rashid et al. 2014). In fact, a recent study found that a narrowing of the gap in empowerment between men and women was positively associated with in per capita calorie availability and household dietary diversity in Bangladesh (Sraboni et al. 2014). The implication of this is that with so few women permitted to work to earn income, and the amount of income women earn being so low, there is a significant need to engage men in ensuring that the income men earn is maximized to ensure household food access, food security and diet diversity. Furthermore, the social restrictions on women that severely curtail their freedom of movement limit their access to markets, as such men are charged with purchasing food for the household – another reason to engage men with regard to food security and diet diversity.

Table 24. Average Daily Wage Rates (BDT) for Agricultural Laborers, by Division, 2012

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	National
Men	244.5	263.8	236.6	210.6	221.9	197.4	216.9	225,5
Women	186.1	225.0	209.4	189.3	185.2	190.1	185.7	191.8

Source: Ahmed et al. 2012

Food insecurity is highly prevalent in Bangladesh as around 20% of ever-married women 15–49 years of age reported that they did not have three "full stomach" meals per day in the previous 12 months. Data from the 2011 BDHS indicate that women in Sylhet report the highest levels of severe food insecurity, as they were most likely to report often skipping a meal or having less food in a meal because of a lack of food in the home, and scored the highest (indicating high levels of food insecurity) on the BDHS composite food security score (severely food insecure category) (see Table 25) (NIPORT et al. 2013).

Table 25. Household Food Security among Ever-Married Women 15–49 Years, by Division

Division	Availability of meals every day (mostly)*	Frequency of skipping meals (often)**	Frequency of having less food in a meal (often)***	Composite food security score (severely food insecure)†
Barisal	79.5%	2.3%	3.4%	2.1%
Chittagong	81.8%	1.6%	2.5%	2.0%
Dhaka	85.6%	1.5%	1.9%	1.3%
Khulna	77.8%	1.2%	1.6%	1.1%
Rajshahi	80.6%	1.6%	1.9%	1.3%
Rangpur	75.6%	2.0%	2.6%	1.9%
Sylhet	76.8%	3.5%	4.7%	3.4%
National	**81.3%**	**1.7%**	**2.3%**	**1.6%**

Source: NIPORT et al. 2013
* Refers to in the last 12 months often having three "full-stomach" meals per day.
** Refers to in the last 12 months often missing meals a few times per month because there was not enough food.
*** Refers to in the last 12 months often having less food in a meal a few times per month because there was not enough food.
† Composite score based on the Household Food Insecurity Access Scale.

Coping Capacities and Strategies of Populations Vulnerable to Food Insecurity

Households are subject to shocks in the form of natural disasters, internal household events, and external social, political, and economic factors. Shocks may occur gradually such as food price inflation or may be more immediate in the form of a tropical storm, but regardless of source, shocks exert negative impacts on availability or access to food. One example is the spike in prices during the world food grain shortfalls in 2007/2008, which affected the poor disproportionately given their relatively high outlays for food and their relatively low level of savings and assets. Proactive preventative risk reduction measures are often too costly, although formal or informal mechanisms such as public safety net programs or emergency food aid or community support may be able to curtail the impact of shocks. If these mechanisms are not adequate or not available, poor households are forced into adverse coping strategies which may include reducing food consumption, selling productive assets, or postponing schooling.

The 2012 IFPRI Bangladesh Integrated Household Survey (Ahmed et al. 2012) found that medical expenses due to illness or injuries were the most common cause of crisis in rural areas affecting 21.8% of the survey respondents. This was followed by increased food prices (7.6%), loss of productive assets due to factors other than floods (such as cyclones and theft) (4.9%), and death of livestock (4.7%). The shocks were similar across all income groups and the most common coping measure was to do nothing (see Table 26). While urban households are more likely to rely on savings relative to rural households, rural households are more likely to deplete their assets or to use high-interest loans from moneylenders relative to their urban counterparts (World Bank 2013).

Table 26. Rural Coping Mechanisms (%)

None	44.5
Help from others	21.1
Informal loan	20.9
NGO/Institution loan	12.8
Less food consumption	5.8
Lower quality food consumption	5.8

Source: Ahmed et al. 2012

In a 2009 survey, more than 50% of households experienced one or more shocks during the previous year, and like the IFPRI survey, found that rural households were most vulnerable and faced more shocks than their urban counterparts. The most common coping mechanisms were the use of savings and loans, help from friends, and depleting assets. Household savings and loans, the two most commonly used mechanisms, are mainly used to deal with health shocks, and borrowing is extensively used to cope with asset shocks. The use of savings was reported by 26% to 44% of households (variations based on three types of shocks: asset, economic, and health), and the use of loans was reported by 31% to 46% of households. Less than 2% of households reported that safety nets were one of the top four coping mechanisms. The study also found that about 60% of households were unable to cope with climate-related shocks. Savings and borrowing were the predominant sources for finance recovery from climate-related shocks and friends were a much smaller source of help (Santos et al. 2011).

GOB safety net programs are offered as an external coping mechanism. Generally, safety net coverage is good for the most vulnerable and poorest households, day laborers (irregular employment), the chronically ill, those with no education or only primary school, and people with numerous dependents (World Bank 2013). The budget for the 95 social protection programs in fiscal year 2013 was 231 billion Bangladeshi Taka (about US$2.98 billion) providing benefits to 7.76 million people (refer to Appendix 5).[27] However, the average benefit of safety net programs is low and in many cases falling in real terms (Bangladesh Planning Commission 2013). Benefits for poor households accounted for only about 10% of consumption for these households during the 2005 to 2010 period (World Bank 2013). There is also considerable leakage of funds and a significant portion of beneficiaries are non-poor. The large social relief programs in the areas of food security, poverty reduction, livelihoods, health, and nutrition are listed in Appendix 5. Food transfers comprise only 19.4% of the budget for social protection schemes, yet account for 51.4% of beneficiaries. Conversely, old age programs account for 30.4% of the budget, but cover only 3.9% of beneficiaries.

3.2.3 RECOMMENDED PROGRAM PRIORITIES RELATED TO FOOD AVAILABILITY AND ACCESS

A critical variable to increased food availability in Bangladesh is productivity growth. Food demand is expanding, driven by population growth, while food supply increases are being constrained by limited expansion potential for arable land and the offsetting losses of productive areas due to declining soil fertility, erosion and salinity intrusion, inadequate irrigation, increasing incidences of extreme weather events, and other climatic changes. The combination of these factors make a compelling argument that future food availability will be primarily influenced by improvements in reducing the yield gap, better management of water resources, and implementing new technologies involving seed varieties, and soil management and fertility. This will be a time consuming and resource intensive effort for FFP program implementers. Significant progress has been made by Bangladeshi and international research organizations on improved seeds and planting material, but farmers often are unable to capitalize on the productive potential of this research, in large part, because of weaknesses in the agriculture extension system. It is not realistic to expect farmers to eliminate the yield gap because of the unique controls available at research stations and the lack of extension advisory support means that farmers often fail to take advantage of the enhanced productivity potential. Opportunities to address these evolving constraints include:

- Increased productivity for crops, livestock, and fish, whether on owned, rented, or share cropped land, could reduce lean seasons and offer more opportunities for sales of surplus production. This may include shifting some production area from cereals to in-demand high value fruits and vegetables.

[27] The largest single program, comprising 24% of the total social protection programs budget, is retirement pensions for GOB employees.

- More emphasis on the market will be needed. Implementing a market-driven approach for poor smallholders will not be easy due to their lack of experience, limited assets and education, and the lack of land ownership by many. One opportunity would be to leverage market linkages established by FTF projects or other donor projects.
- Another promising food access approach is to improve skills and thus off-farm employment opportunities which may also reduce the incentive for migration from rural to urban areas.

Poverty remains the root cause of inadequate food access and food insecurity in Bangladesh. Because the poor have such limited resources, they are more vulnerable to shocks that create stresses from which some households struggle to recover and others fail to recover. The answer to reducing the vulnerability of poor households is to improve their income earning capacity, but cultural, educational, financial, and other constraints make this a formidable task. For each of the program priorities presented below it will be important to engage men and women in an equitable manner to promote gender equality. Certain activities will naturally engage men more than women because men have greater access to productive resources. Yet in other instances women may play a more prominent role, for example with post-harvest processing, where women are naturally expected to engage in this activity. But fundamentally engaging men is critical to create the enabling environment for women's empowerment. If men do not create the space for change and favor change to promote gender equality, activities that that seek to empower women will have only a limited impact, as women alone cannot challenge or change prevailing gender norms. Further, engaging men could mitigate the risk for women in terms of men accepting the new roles and rights women would gain without a backlash against women (for example in the form of increased domestic violence when women gain access to income through income generating activities).

Program Priority 1: To increase food productivity and income levels of food insecure households

At the farm level, a major productivity constraint is access to land. Many of the food insecure do not own the land on which they farm and are forced into sharecropping or other leasing arrangements which reduce farming profits. Greater access to production credit is another important factor for landless farmers because credit may ease the terms of leasing and sharecropping arrangements, i.e., eliminating the need for the farmer to obtain seed, fertilizer, and pesticides from the land owner may improve the farmer's negotiating position. FFP projects can assist landless farmers (and landholding farmers) to increase their share of sharecropping returns by enhancing productivity through adoption of low-cost appropriate technologies. One of the most cost-effective mechanisms is to organize farmers into small informal groups to demonstrate the appropriate application of technology to maximize productivity.

Working with formally or informally organized farmer groups may allow more market linkage opportunities with the Feed the Future Agriculture Value Chain project, and the Aquaculture and Income and Nutrition project. These value chain projects tend to work with commercial farmers that may be in low-income categories, but are not extremely poor. As FFP project beneficiaries improve the quality and volume of output, there should be opportunities to leverage these commercial market linkages. These opportunities will be geographic and commodity specific and time sensitive depending on Feed the Future project objectives and annual work plans.[28]

Poor natural resource management which degrades resource capacity—soil nutrient depletion, soil erosion, salinity intrusion, declining quality of watersheds, etc.—will reduce productivity and income-generating potential in all regions. The CHT is particularly vulnerable to erosion and nutrient depletion based on the use slash and burn techniques, particularly for hillside agriculture. Natural resource management is an

[28] While integration of interventions by Feed the Future and Food for Peace projects may be an outgrowth of interactions by implementer staff, USAID/Bangladesh may play a more active role by scheduling meetings and other events involving Feed the Future and Food for Peace implementers to provide a discussion platform for program integration.

integrated component in improved farming practices and should be encouraged as a long-term practice. Effective agronomic practices incorporate proper resource management.

Program Priority 2: To increase household resilience to climate change and other shocks

USAID defines resilience as the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth. As discussed in this report, Bangladesh is particularly vulnerable to climate induced changes affecting food production and livelihoods, and will likely suffer more from climate change by 2025 than any other country. Significant climate related impacts include the following:

- Loss of arable land due to rising sea level
- More area subjected to extreme flooding
- More frequent and more intense cyclones
- Reduced soil capacity due to increasing coastal salinity
- Reduced productivity due to warmer and drier non-monsoon seasons

Other shocks and stresses may be more idiosyncratic, such as a family death, prolonged sickness, or loss of remittance support. These external and internal shocks can have profound impacts on households regardless of income or caste. However, for the poorest and most vulnerable, even small shocks can put households over the edge, requiring them to sell productive assets, forgo health care, or reduce food consumption. Recovery potential for these households is low. Consequently, the FFP project must directly incorporate risk reduction into project activities because resilience is directly linked to improved social and economic conditions of the project's targeted vulnerable population.

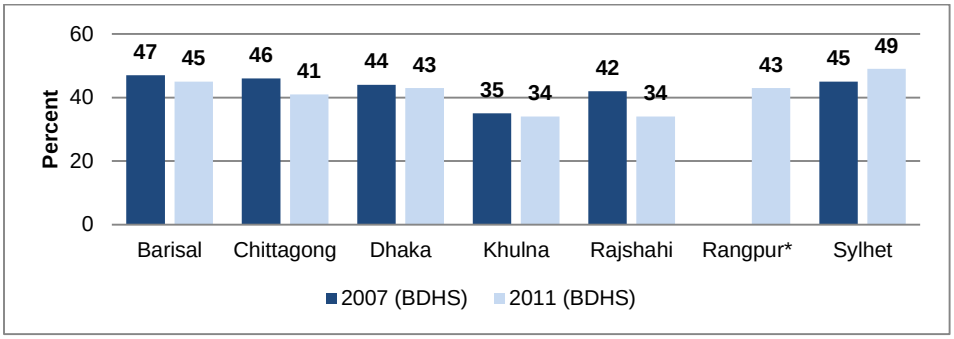
Resilience is multifaceted and can be improved in a variety of ways including through alternative off-farm livelihood opportunities that provide additional household income, by better management of land and water resources and use of improved inputs to enhance productivity, by better access to credit, by the use of microfinance, by greater livestock ownership and other forms of farm income diversification, and by cash and food-for-work initiatives.

3.2 FOOD UTILIZATION AND HEALTH

Child Health and Nutritional Status

Trends in child health and nutritional status. The mortality rate for children under 5 years in Bangladesh is 53 per 1,000 live births and nearly 45% of these child deaths are attributable to various forms of undernutrition (NIPORT et al. 2013). According to the 2011 BDHS, of the 15 million children under 5 years of age in Bangladesh, around 6.2 million (41%) are stunted (chronically malnourished) which places Bangladesh in the World Health Organization's (WHO) highest classification for public health alert for very high stunting prevalence (NIPORT et al. 2013; WHO 1995). Stunting prevalence differs quite dramatically within divisions with the highest prevalence of stunting in Sylhet at 49% and the lowest prevalence in Rajshahi at 34%; however some unions of the Chittagong Hill Tracts have stunting rates as high as 88% (NIPORT et al. 2013; HKI 2013). Unlike other divisions where declines in stunting have occurred, the stunting prevalence has been increasing in Sylhet (see Figure 1).

Figure 1. Stunting Prevalence by Division, 2007–2011

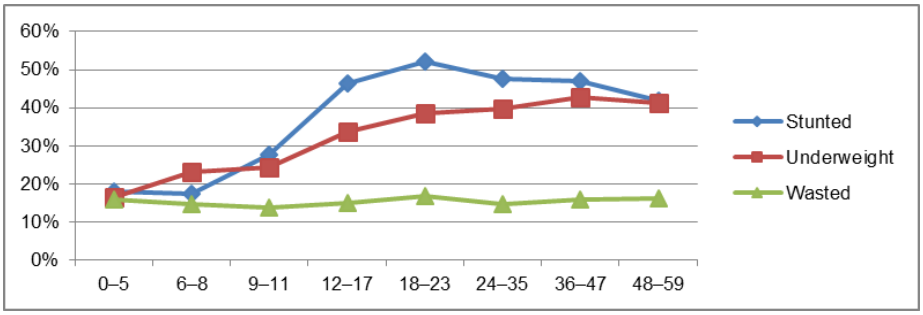


* Note: Rangpur was not a separate division in 2007.

Underweight affects 36% of Bangladeshi children under 5 according to the 2011 BDHS, a decrease of 7 percentage points since the 2004 BDHS. Like stunting, there are large division-wide differences in underweight with a 16 percentage point difference between the highest and lowest prevalence divisions. Underweight is highest among children from the Sylhet division at 45%, an increase from 42% in 2007. The prevalence has decreased in all other divisions between 2007 and 2011, with the lowest prevalence in 2011 in Khulna at 29% (NIPORT et al. 2013).

Malnutrition among children under 5 years of age begins early in Bangladesh, often beginning in utero due to poor maternal nutritional status. Figure 2 indicates that stunting and underweight begins to increase among children from 6–8 months of age, which suggests that continued efforts to increase exclusive breastfeeding and improve complementary feeding practices particularly in the first 2 years of life are crucial to prevent stunting and underweight in this age range.

Figure 2. Nutritional Status of Children by Age



Source: 2011 BDHS (NIPORT et al. 2013)

In addition to high levels of stunting and underweight, Bangladesh also has alarmingly high levels of wasting (acute malnutrition) in children under 5 at 16%, which is considered a critical public health significance level as classified by WHO (NIPORT et al. 2013; WHO 1995). This equals about 2.3 million wasted children; 1.7 million are moderately acutely wasted, and 600,000 are severely acutely wasted. Sylhet has the highest division-wide prevalence of wasting at 18% compared to 13% in Rangpur which has the lowest prevalence (NIPORT et al. 2013).

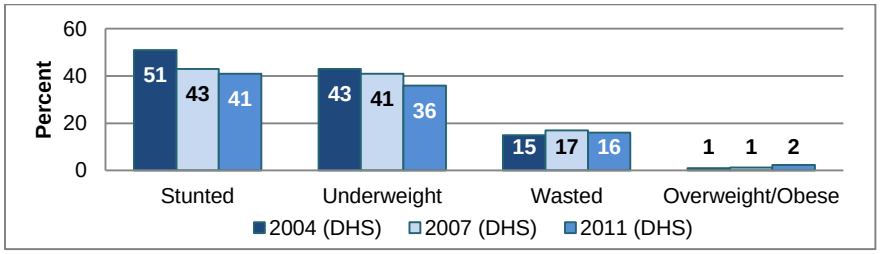
Children with moderate acute malnutrition (MAM) have different nutritional requirements than both non-malnourished and severely acutely malnourished (SAM) children. Children with MAM should receive diets that promote weight gain of at least 5 g/kg/day (Golden 2009). Moderately wasted children in

Bangladesh can be treated using ready-to-use supplementary foods (RUSF) that are either from local foods or foods available locally in the market and that can be prepared safely to mitigate the risk of infection.[29]

In contrast, children who are severely acutely malnourished are at high risk of death and must be treated promptly and according to specific clinical protocols. Key stakeholders working to address acute malnutrition in Bangladesh note that most cases of SAM are uncomplicated cases that can be treated through outpatient therapy using ready-to-use therapeutic foods (RUTF) (Sethuraman et al, forthcoming 2014).[30] However, currently in Bangladesh only very limited quantities of RUTF are allowed by the government into the country as the GOB does not endorse RUTF imports and Bangladesh does not yet have local options available. However, there are several ongoing trials to develop both RUTF and RUSF that are made from local foods or foods that are available in local markets (see the 2014 Bangladesh USAID-BEST Analysis for more information on these trials). The USAID-BEST Analysis suggests that FFP awardees monitor the outcomes of the current trials as they may be options for inclusion in project design; one of which may be reaching conclusion in 2014. Both the shortages of RUTF and lack of community-based treatment options mean that children with SAM must be referred to district-level facilities. While there is virtually no support nationally for the use of RUTF in treating SAM cases, FFP programs have an opportunity to focus on preventing and treating MAM cases to reduce and prevent over time the number of SAM cases that present overall.

While stunting has reduced in Bangladesh at a rate of 1.4% per year since 2004 this rate of change has dramatically slowed with only a 2 percentage point improvement from 2007 to 2011, to a rate of 0.5% per year. The prevalence of wasting has remained relatively constant in recent years increasing from 15% in 2004 to 16% in 2011 (see Figure 3). The high levels of underweight and stunting in children under 5 years are in part a result of low birth weight which affects 22% of births. The high prevalence of low birth weight is a consequence of poor maternal nutrition status during pregnancy, especially during adolescence when adolescent girls themselves are malnourished—often even more so than their older peers. Pregnancy during adolescence prevents further height gain, leading to shorter mothers and an intergenerational cycle of malnutrition (Rah et al. 2008). The persistent prevalence of stunting in Bangladesh that remains virtually unchanged, and a rate of reduction that is even lower than in the past, suggests a need for continued efforts focused on preventing chronic malnutrition in tandem with efforts to manage, prevent and treat acute malnutrition. FFP programs have the opportunity to focus on the prevention of malnutrition using principles such as the Essential Nutrition Actions, (see Appendix 7), that are currently being revised to include and encourage action on improving adolescent nutrition to prevent chronic malnutrition in young children during the 1000 days.

Figure 3. Trends in Nutritional Status of Children Under 5 Years, 2004–2011



The widespread prevalence of stunting and wasting in children adversely impacts Bangladesh's development as undernourished children have an increased risk of mortality, illness and infections, delayed physical development, cognitive deficits, and delayed school entry and poorer school performance.

[29] WHO 2012 provides a table with proposed nutrient composition of supplementary foods for use in the management of moderate acute malnutrition in children.
[30] RUTF are a specially formulated food to treat severe acute malnutrition, which do not require water, preparation, or cooking. They are most commonly targeted to children 6–59 months.

Reducing and preventing malnutrition, especially during the first 1,000 days (from pregnancy through the first 2 years of a child's life) is critical as this is a period of rapid physical and mental growth and is a window of opportunity during which interventions to prevent malnutrition can avert lifelong adverse health, education and productivity consequences. Yet at present in Bangladesh, there are limited nutrition services available to these children. Although the GOB has adopted a new Health, Population, and Nutrition Sector Development Program, in which the GOB has an operational plan dedicated to nutrition, there has been limited progress in service delivery. The GOB, through the HPNSDP and as a member of SUN, has prioritized the prevention of chronic malnutrition during the first 1000 days, and this serves as an opportunity for FFP programs to align with these national priorities. However despite the creation by the MOHFW of the National Nutrition Services, at nearly every level there is a need to strengthen both the service delivery system and the capacity of service providers to provide nutrition services at the community level, an area which FFP programs have an opportunity to contribute to.

Micronutrients. Anemia, which influences a child's brain development and school performance, is still highly prevalent in children under 5 in Bangladesh at 51% and is alarmingly high among children 6–23 months of age at 71%. Studies suggest that 20–50% of anemia in young children in Bangladesh is due to iron deficiency (icddr,b 2010; icddr,b et al. 2013) while high levels of low birth weight (causing low iron stores at birth); maternal anemia; low intake of iron-rich foods among children 6–23 months (54%)[31]; minimal use of deworming medication (only half of children under 5 received deworming medication in previous 6 months according to the 2011 BDHS); arsenic contamination; and deficiencies of vitamins A, B12, other B vitamins, and folic acid are additional factors. Multiple micronutrient powders (MNP), which can reduce iron deficiency and iron-deficiency anemia, are available through the private sector in two ways. One is through the Social Marketing Company (supported by USAID/Bangladesh), which began distributing a MNP under the brand name *Monimix* in 2008. The other is through the BRAC Health Programme (supported by GAIN) through the BRAC Sprinkles Programme, which produces *Pushtikona* 5, an MNP that is available for sale for children 6–59 months. BRAC sells the MNP at US$0.03 per sachet and provides the sachets free of charge to beneficiaries in its Targeting Ultra Poor Programme (Results for Development 2013; BRAC 2013). However, despite the apparent wide availability, MNP supplementation for children under 2 years of age is very limited at 1.3% (icddr,b et al. 2013).

Vitamin A and zinc deficiencies affect 21% and 45% of preschool children, respectively (icddr,b et al. 2013). Children are not consuming enough vitamin A-rich foods in their diets. Nationally, 64% of children 6–23 months of age consumed vitamin A-rich foods in the previous 24 hours and this ranged from a high of 75% in Khulna to a low of 51% in Sylhet (NIPORT et al. 2013). Consumption of vitamin A-rich foods may be improved with the passing of a new bill in 2013 that makes the fortification of edible oil with vitamin A mandatory, and prohibits the import of unfortified edible oil (GAIN 2013). For vitamin A supplementation, the 2011 BDHS reported a significant reduction in the number of children 6–59 months of age who received supplementation in the previous 6 months, dropping from 84% in 2007 to just around 60% in 2011. However, the GOB maintains that coverage with vitamin A capsules remains high, reaching more than 98% of children in need and a 2011 EPI Coverage Evaluation Survey found that 85% of children 9–11 months received vitamin A supplementation and 92% of children 12–59 months received supplementation (UNICEF 2014).

Although iodine deficiency is not a widespread problem in Bangladesh, as more than 75% of children under 5 live in households that consume iodized salt, the quality of the iodized salt may be variable

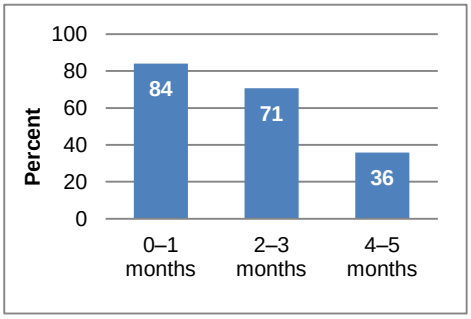
[31] Consumption of iron-rich foods in the previous 24 hours among children 6–23 months nationally was 54%. This ranged from a high of 68% in Khulna compared to a low of 39% in Sylhet (NIPORT et al. 2013).

indicating some pregnant women and children may still be at risk of iodine deficiency (NIPORT et al. 2013; icddr,b et al. 2013).[32]

Infant and young child feeding. Adequate feeding practices during infancy are critical to ensure optimal nutritional status during the first 2 years of life and are essential to prevent stunting and its long-term impacts. Breastfeeding in particular provides nutritional, immunological, and cognitive benefits. While almost every child in Bangladesh is breastfed at some point in their lives (99%), less than half of infants are put to the breast within an hour of birth. For children 6–23 months of age 24% have minimum dietary diversity, and 21% have minimally acceptable diets. These sub-optimal feeding practices are the poorest in Sylhet (where the division-wide prevalence of stunting and wasting are highest); 12% had minimally acceptable diets and only 14% had minimum dietary diversity (NIPORT et al. 2013). In contrast, in Khulna, 28% of children have minimally acceptable diets, and 31% have minimum dietary diversity. These suboptimal complementary feeding practices play a large role in high malnutrition rates as children need optimal nourishment to grow. WHO recommends exclusive breastfeeding for children under 6 months and appropriate feeding for children 6–23 months including: continued breastfeeding, feeding solid/semi-solid food a minimum number of times per day, feeding a minimum number of food groups per day, continued feeding during and after illness, feeding appropriate quantities of food, providing food with appropriate consistency, and feeding nutrient-dense foods (Pan American Health Organization 2003).

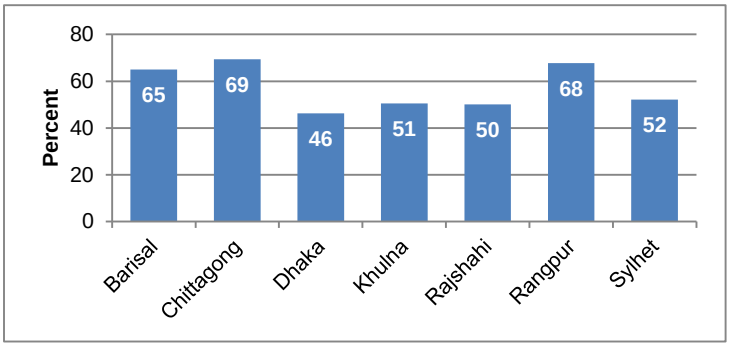
Bangladesh has experienced recent success regarding breastfeeding as the 2011 BDHS showed a dramatic increase in the percentage of children who are exclusively breastfed, from 43% in 2007 to 64% in 2011.[33] Exclusive breastfeeding as reported in the BDHS is based on mothers who self-report that they exclusively breastfed their children in the last 24 hours. While some of the change in exclusive breastfeeding may be due to sampling differences between the two surveys, this increase may also be the result of an intensive multi-pronged effort within the country to address exclusive breastfeeding, or it may be that mothers report that they exclusively breastfed their child because they recognize that it is a good practice. While exclusive breastfeeding stands at 64%, this masks variation in exclusive breastfeeding rates by age. As shown in Figure 4, at 2–3 months 71% of infants are breastfed, but by 4–5 months this drops to 36%, indicating the continued need to promote exclusive breastfeeding for infants between 3–6 months of age. There are wide divisional variations in exclusive breastfeeding practices and continued efforts to address these disparities are warranted (see Figure 5).[34]

Figure 4. Exclusive Breastfeeding Prevalence by Age Group



Source: 2011 BDHS (NIPORT et al. 2013)

Figure 5. Exclusive Breastfeeding Prevalence by Division



Source: 2012-2013 Bangladesh MICS (BBS and UNICEF 2014)

[32] The median urinary iodine concentration for school-age children was 145.7 ug/L and for non-pregnant/non-lactating women 122.6 ug/L; the proportion of school-age children with low urinary iodine concentration (< 100 ug/L) was 40% and 42% among non-pregnant/non-lactating women (icddr,b, et al. 2013).

[33] Among children 0–5 months at the time of the survey.

[34] Divisional differences in exclusive breastfeeding practices were not available from the 2011 BDHS, but were available from the 2012–2013 MICS.

Childhood illnesses. The risk of stunting in Bangladesh is not only a result of poor infant and young child feeding practices, but is a consequence of high disease burden from repeated illness such as diarrhea, fever, and acute respiratory infections that particularly affect the youngest children. Among children under 5, 5% experienced a diarrheal episode in the 2 weeks prior to the 2011 BDHS survey, and 8% of children 6–11 months of age (NIPORT et al. 2013). While close to 81% of children received either oral rehydration salts or recommended home fluids, only 25% received advice or sought treatment from a health facility or provider (ibid). Most mothers reported (78%) receiving oral rehydration salts from private providers (ibid). Zinc supplementation, which significantly reduces the severity and duration of diarrheal episodes, and also prevents subsequent episodes, is available from both public and private providers (Bhutta et al. 2008; NIPORT et al. 2013). Only 34% of children with a diarrheal episode received both oral rehydration therapy and zinc (NIPORT et al. 2013). In addition, 37% of children under 5 had a fever in the 2 weeks preceding the 2011 BDHS, with the highest prevalence in Chittagong (44%). Of the children under 5 who had a fever, only 27% of caretakers sought advice or treatment from a health facility or provider (ibid). Almost 6% of children had symptoms of acute respiratory infections in the 2 weeks preceding the 2011 BDHS, but only 35% of caretakers sought advice or treatment from a health facility or provider (see Table 27) (ibid). Care-seeking from health facilities or providers for all three illnesses were most often lowest in Chittagong (ibid).

Table 27. Child Health and Nutritional Status

	National	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet
Prevalence of Malnutrition								
% of children under 5 stunted	**41.3**	45.1	41.3	43.3	34.1	33.7	42.9	49.3
% of children under 5 underweight	**36.4**	40.0	37.4	36.6	29.1	34.2	34.5	44.9
% of children 6–59 months who are wasted	**15.6**	15.2	15.9	15.7	14.6	16.4	13.2	18.4
Anemia and Micronutrient Nutrition								
Anemia (Hb < 11 g/dL) (6–59 months)	**51.3**	59.6	51.6	47.7	54.2	49.3	57.7	49.5
Received deworming treatment in the past 6 months (6–59 months)	**50.2**	51.7	54.2	51.0	40.2	47.3	48.3	52.9
Living in a house with iodized salt (6–59 months)	**81.8**	87.5	76.2	85.9	93.8	72.6	75.6	87.2
Received vitamin A supplement in the past 6 months (6–59 months)	**59.5**	71.5	66.3	49.3	56.4	66.1	56.0	69.1
Nutrient-Rich Food Consumption (6–23 months)								
% of children consuming iron-rich foods (6–23 months) in the last 24 hours	**53.6**	51.9	50.1	50.0	68.1	61.7	60.4	38.7
% of children consuming vitamin A-rich foods in the past 24 hours (6–23 months)	**63.8**	65.8	60.5	60.9	75.4	68.8	71.0	51.3
Breastfeeding Practices								
% of exclusive breastfeeding through 6 months[†]	**64.1**	65	69.4	46.2	50.5	50.1	67.7	52.2
Median duration (months) of exclusive breastfeeding	**4.4**	2.3	4.0	3.0	4.0	2.9	4.1	3.9
% of children 6–9 months consuming solid, semi-solid, or soft foods in the previous day	**62.6**	—	—	—	—	—	—	—
% of children given increased fluids and continued feeding during diarrheal episode	**23.8**	(36.3)*	21.9	24.5	(27.1)	(18.7)	(22.5)	26.9
% who continued feeding and were given oral rehydration therapy and/or increased fluids during diarrheal episode	**82.7**	(78.0)	80.5	93.9	(69.7)	(64.1)	(86.8)	89.0
Complementary Feeding Practices among Breastfed and Non-Breastfed Children 6–23 Months								
Breastfed								

	National	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet
% with minimum diet diversity	**24.2**	22.1	20.0	25.3	30.7	29.7	25.3	14.3
% with minimum feeding frequency	**64.2**	61.2	55.2	65.2	82.2	63.5	73.2	57.1
% with minimum acceptable diet	**21.1**	17.5	16.9	23.6	28.4	24.8	21.7	11.5
Non-Breastfed**								
% consuming milk or dairy	**55.3**	—	50.2	—	—	—	—	—
% with minimum diet diversity	**41.3**	—	43.2	—	—	—	—	—
% with minimum feeding frequency	**68.5**	—	66.1	—	—	—	—	—
% with minimum acceptable diet	**14.8**	—	15.1	—	—	—	—	—
Illness Prevalence and Prevention								
% of children under 5 who had diarrhea in the 2 weeks preceding the survey	**4.6**	4.9	5.9	4.0	2.6	4.7	4.1	6.0
% of children under 5 with diarrhea; advice or treatment was sought from a health facility or provider***	**24.8**	(34.0)	19.8	26.2	(19.3)	(19.0)	(30.9)	35.3
Among children under 5 who had diarrhea in the 2 weeks preceding the survey, % who received oral rehydration therapy and zinc	**34.1**	(35.2)	39.0	38.2	(22.2)	(14.9)	(35.8)	37.9
% of children under 5 who had a fever in the 2 weeks preceding the survey	**36.5**	40.0	43.5	31.6	34.0	36.3	35.5	37.6
% of children under 5 with fever; advice or treatment was sought from a health facility or provider***	**27.0**	27.1	25.4	27.3	31.6	23.6	29.9	28.2
% of children under 5 who had an acute respiratory infection in the 2 weeks preceding the survey	**5.8**	7.0	7.4	4.6	6.4	5.5	5.4	4.9
% of children under 5 with acute respiratory infection; advice or treatment was sought from a health facility or provider***	**35.2**	40.1	24.3	38.0	45.4	31.1	46.6	43.2
% of households with access to an improved source of drinking water†	**98.5**	95.3	97.0	99.9	94.4	99.3	99.9	93.8
% of households with access to improved, non-shared sanitation†	**33.7**	52.0	59.4	54.0	58.0	52.0	57.4	58.6

Sources: All data are from the 2011 BDHS unless noted otherwise.
* Figures in parentheses based on 25–49 unweighted cases.
** Data were not included for regions other than Chittagong, as there were too few cases to analyze by the BDHS.
*** Excludes pharmacy, shop, and traditional practitioner.
† National prevalence is from the 2011 BDHS; divisional prevalence is from the Bangladesh 2012–2013 MICS where the national coverage was 56.4% for exclusive breastfeeding, 97.9% for improved source of drinking water, and 55.9% for improved sanitation facility.

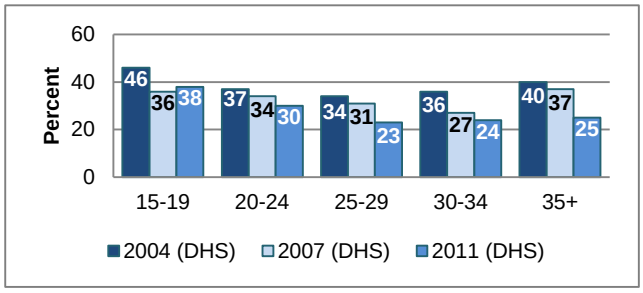
Maternal Health and Nutritional Status

Poor maternal nutrition, which is highly prevalent in Bangladesh, especially among adolescent girls, significantly contributes to an intergenerational cycle of malnutrition and poverty in Bangladesh. Fifty percent of pregnant women and 40% of non-pregnant/non-lactating women suffer from anemia, 57% of non-pregnant/non-lactating women are zinc deficient, and 22% of non-pregnant/non-lactating women are deficient in B12 (icddr,b et al. 2013). In addition, 24% of women 15–49 years of age are underweight (BMI < 18.5). Among adolescent girls aged 15-19 years of age 38% are underweight, and increase since 2007, when only 36% were underweight[35] (see Figure 6). The percent of adolescent girls who have begun childbearing by age has remained consistently high at 58% since 2000 (NIPORT et al. 2013) (see Figure 7). The increasing prevalence of adolescent underweight combined with persistent and high adolescent pregnancy rate is a disturbing trend. Adolescent pregnancy is associated with a 50% increased risk of stillbirths and neonatal deaths, and an increased risk of low birth weight, premature birth, asphyxia, and maternal mortality (Bhutta et al. 2013; WHO 2007).[36] Reducing the adolescent fertility rate and delaying first pregnancies beyond adolescence will reduce the risk of low birth weight and stunting in their children and will allow adolescent girls to grow to their full potential protecting their own nutritional status over the long term (see Table 28 for a composite snapshot of women's health and nutrition status both nationally and at the division level).

Addressing adolescent malnutrition in Bangladesh is the key focal point critical to breaking the intergenerational cycle of malnutrition.

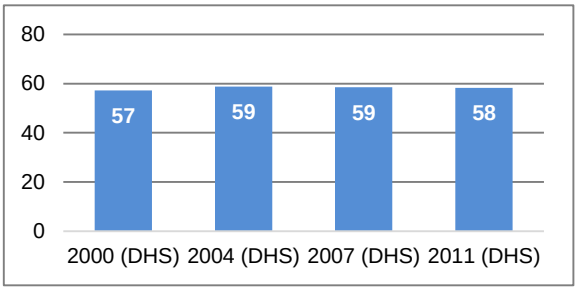
- Thirty-eight percent of adolescent girls are malnourished, the highest of any age group
- Fifty-eight percent of adolescent girls have begun childbearing and this has remained unchanged
- Adolescent pregnancy is associated with increased risk of poor maternal, birth, and neonatal outcomes and is a significant driver of low birth weight and stunting in their children
- Improving and reducing young child malnutrition in Bangladesh now depends on an urgent focus on preventing adolescent pregnancy through strategies that promote access and adoption of family planning, delay marriage and/or first pregnancy

Figure 6. Trends in Maternal Underweight by Age, 2004–2011*



* "Ever-married" women 15–49 years with a live birth in the past 3 years.

Figure 7. Percent of Women 15–19 Years Who Have Begun Childbearing by Age 19



Maternal health service usage is low in Bangladesh as only 55% of women received antenatal care from a medically trained health provider. Receipt of antenatal care from a trained provider is lower among the lowest wealth quintile where only 30% of women received services compared to 87% in the highest wealth quintile. Delivery by a medically trained health provider is also low at 32% and even lower for facility-based deliveries at 29%. For both indicators, income levels show dramatic differences as around 10% of

[35] Among women who have had a birth in the previous 3 years according to the 2011 BDHS.
[36] The risk of dying from pregnancy-related causes is twice as high for adolescent girls (15–19 years) compared to women in their early twenties and is five times greater for girls 10–14 years (WHO 2007).

women in the lowest wealth quintile gave birth at a health facility or received trained medical assistance as compared to around 60% in the highest wealth quintile (NIPORT et al. 2013).

Table 28. Women's Health and Nutrition

	National	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet
Maternal mortality ratio (per 100,000 live births)	**194**	168	186	196	64	173	—	425
Total fertility rate (children per women)	**2.3**	2.3	2.8	2.2	1.9	2.1	2.1	3.1
Median age at first marriage (of women 20–49 years)	**15.8**	15.7	16.6	15.8	15.3	15.2	15.0	17.5
Median age at first birth (of women 20–49 years)	**18.3**	18.2	18.8	18.5	17.9	17.8	17.5	19.7
% of women 15–19 years who have begun childbearing by 19	**58.3**	30.2	27.4	28.8	32.9	32.8	46.0	19.5
% of women 15–49 who are undernourished	**24.2**	27.0	22.4	23.6	19.0	24.8	27.1	35.2
% anemic	**42.4**	45.6	38.4	43.1	37.4	44.1	49.5	39.7
% anemic pregnant (Hb < 11 g/dL)	**49.6**	—	—	—	—	—	—	—
% anemic non-pregnant/non-lactating (Hb < 12 g/dL)	**40.0****	—	—	—	—	—	—	—
% living in houses with iodized salt (among women with a child born in the previous 5 years)	**82.3**	88.6	77.0	86.6	94.1	72.6	74.6	88.6
Median number of months since preceding births (of women 15-49 years)	**47.4**	52.9	41.5	47.3	61.0	56.6	52.1	37.6
% of women 15–49 using any modern method of birth control	**52.1**	54.5	44.5	51.1	56.1	58.3	60.7	35.2
% of married women with an unmet need for family planning	**13.5**	12.1	20.7	13.0	9.5	11.0	9.7	17.3
% of women 15–49 receiving antenatal care from a medically trained provider*	**54.6**	50.8	55.1	54.5	65.4	56.1	49.6	46.7
% of births delivered by a medically trained provider*	**31.7**	28.4	29.7	31.5	49.0	30.9	28.7	24.4
% of women with birth in the last 5 years given vitamin A supplements after birth of last child	**26.9**	24.7	26.8	24.0	26.2	28.6	35.9	25.8

Sources: 2011 BDHS (NIPORT et al. 2013) and 2010 Maternal Mortality Survey (NIPORT et al. 2012) for maternal mortality.
* "Medically-trained" providers included: doctor, nurse, midwife, family welfare visitor, community skilled birth attendant, and medical assistant/sub-assistant community medical officer.
** The *National Micronutrients Status Survey 2011-12* estimated that 26% of non-pregnant/non-lactating women were anemic (icddr,b, et al. 2013).

Gender and Nutrition

Gender inequality is pervasive in Bangladesh and is a significant underlying factor that exacerbates food insecurity and malnutrition and as such is critical to address. The clearest manifestation of this relationship is the high prevalence of early marriage and adolescent pregnancy that reflect prevailing gender norms that discriminate against women and girls and contributes significantly to the high prevalence of low birth weight and chronic undernutrition in their children. Nearly three-quarters of women 20–49 years of age are married by the age of 18 in contrast to only 6% of men.

Gender inequality is also reflected in several other key indicators. For example, only 15% of women of childbearing age reported being employed and among them only 34% reported being able to decide on

their own how to dispose of that income. The 2011 BDHS found that 42% of women of childbearing age 15–49 years reported participating in major decisions (see Figure 8), with women from Sylhet being least likely (35%) to participate in these decisions. Decision-making participation is worse among adolescent girls (15–19 years of age) where only 20% reported participating. With childbearing beginning early, young women with children under 2 years have the least decision-making power and the least access to resources when their children have the greatest nutritional needs. The decision of when and whom to marry is made by family members, and subsequently the decision of when and at what age to begin childbearing is also made by family members. In this context promoting shared responsibility for the nutritional status of women and children among husbands and parents-in-law in addition to working with young mothers is essential, as improving maternal decision-making capacity can have significant positive impacts on her and her children's health and nutrition. But delaying marriage and first pregnancy will also go a long way toward reducing the overall prevalence of undernutrition in Bangladesh.

Maternal education is a key indicator of women's empowerment and is closely related to childhood stunting. Children are less likely to be stunted if their mother had secondary education or higher compared to children whose mother had no education (see Figure 9). In contrast, exposure to domestic violence has a negative impact on childhood stunting. An analysis of the 2007 BDHS data found that women in Bangladesh were more likely to have a stunted child if they had experienced physical or sexual violence by their partners (Ziaei 2012) and unfortunately domestic violence is pervasive in Bangladesh as 53% of women of childbearing age reported ever having experienced various forms of domestic violence in their lifetime.

Figure 8. Women's Participation in Decisions (Own Health, Major Household Decisions, Child's Health, and Visiting Relatives) by Age (2011 BDHS)

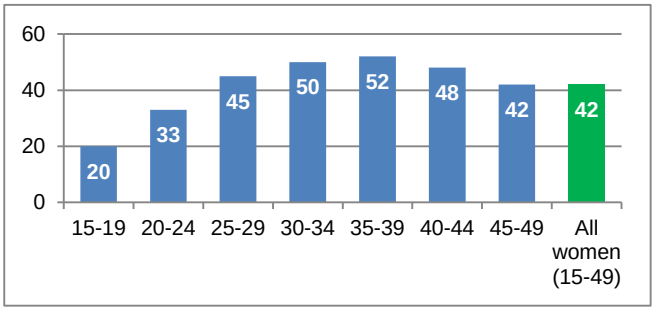
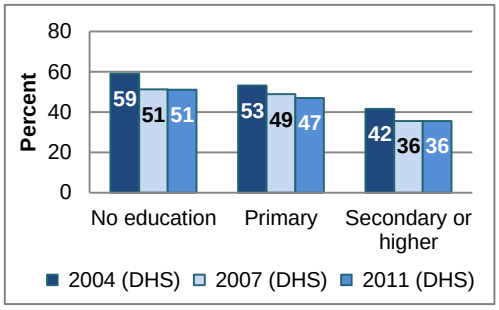


Figure 9. Stunting Prevalence of Children Under 5 by Maternal Education Levels, 2004–2011



Water, Sanitation, and Hygiene

While 99% of households have access to improved drinking water sources, access to clean drinking water is not as universal as it seems due to large seasonal fluctuations (NIPORT et al. 2013). During the dry season many households have reduced access to clean water due to dried up shallow tubewells, while during the monsoon season heavy rainfall causes floods that contaminate drinking water with both waste and salt water (UNICEF). Arsenic contamination further reduces the availability of safe drinking water. In more than 23% of households, drinking water exceeded the WHO limit of arsenic levels and 60% of households surveyed did not know if their well had been tested, and if it had been tested they did not know the results (BBS and UNICEF 2009).[37]

Access to improved sanitation facilities is low in Bangladesh at 37% (NIPORT et al. 2013) and is particularly poor in CHT where according to an assessment of UNDP's program sites, only 17% of households among their intervention sites had access to improved latrines and 9% had access in non-intervention sites (UNDP and CHTDF 2014). A recent article examining open defecation and stunting in

[37] WHO guidelines for an acceptable level of arsenic content is less than 10 micrograms per liter.

India found that open defection, especially in densely populated areas, is a significant contributor to the high levels of stunting in India and provides a strong linkage between poor sanitation and stunting (Spears 2013).[38] Ensuring that children have a hygienic environment to live and play in is critical as recent evidence has suggested that improving the diet of children can only reduce stunting by one-third and other interventions, including those addressing water and sanitation issues, may be critical to reduce stunting further (Dewey and Adu-Afarwuah 2008). Unhygienic conditions in which children live, open defecation (which is particularly harmful in densely populated areas), and living in close proximity to animals, can lead to environmental enteropathy (a subclinical disorder of the small intestine that creates inflammation in the gut and reduces absorption of nutrients), which is caused by the ingestion of large quantities of fecal bacteria (Humphrey 2009; Spears 2013). An evaluation of a GOB and UNICEF sanitation, hygiene education, and water supply program (SHEWA-B) by icddr,b found that rural Bangladeshi children who had cleaner water, better toilets, and better equipped handwashing stations had less environmental enteropathy and better growth (height for age) (Lin et al. 2013). Currently in Bangladesh, a Bill and Melinda Gates Foundation-funded cluster-randomized trial is underway that seeks to generate rigorous evidence about the impacts of sanitation, water quality, handwashing, and nutrition interventions on child health and development in the first years of life. When the study is completed in mid-2016, it may provide critical insight into the role water, sanitation, and hygiene may have on a child's growth and development, particularly in the Bangladesh context (Arnold et al. 2013).

Effectively preventing malnutrition in children under 2 years in this context will depend on continued efforts to work with communities to ensure access to safe drinking water, hygienic sanitation facilities, and hygienic environments for children to play in. However, improving access to water, sanitation, and hygiene facilities alone will not be sufficient as behavior change to improve handwashing behaviors is also needed. A 2008 study of the Sanitation, Hygiene Education and Water Supply Programme found that less than 1% of mothers were observed washing their hands with soap or ash before preparing food, less than 1% of household members washed their hands with soap or ash before eating, and less than 20% of household members washed their hands with soap or ash after defecation (icddr,b et al. 2008). Formative research conducted by the Alive & Thrive project in 2011 found that in Bangladesh a lack of convenience, misconceptions about health risks, and lack of social pressure were key barriers to handwashing by mothers/caretakers (Alive & Thrive 2012). However, the 2008 study also found that only 25% of households had separate soap set aside for handwashing in the home (icddr,b et al. 2008), indicating the need to improve access to sanitary facilities and handwashing materials along with effective behavior change communication on optimal handwashing practices.

3.3.1 RECOMMENDED PROGRAM PRIORITIES RELATED TO FOOD UTILIZATION AND HEALTH

The previous section provided an overview of the scale and breadth of the malnutrition problems that affect women, adolescent girls, and children predominantly in Bangladesh, despite substantive progress in other areas of health. Based on this evidence, this section presents program priorities to improve food utilization to reduce malnutrition and improve nutrition and health outcomes through FFP programming.[39] Opportunities for FFP projects include:

- Preventing chronic malnutrition among children under 5 years of age to reduce the prevalence of stunting at the population level in a program area

[38] While 4.6% of households in Bangladesh reported open defecation according the 2011 DHS, its reduction down from 30.2% in 1993/94 has been a huge success which previous FFP projects have been actively involved in (NIPORT et al. 1994; van Haeften et al. 2013).

[39] The USAID Feed the Future-funded Nutrition Innovation Lab in Asia is currently undergoing research to discover how policy and program interventions can most effectively achieve large-scale improvements in maternal and child nutrition, particularly when leveraging food-based activities (see http://www.nutritioninnovationlab.org/asia/).

- Focusing on the 1,000 days to prevent stunting from occurring
- Preventing and treating illness and acute malnutrition to reduce the impact of infections on weight loss and poor growth in young children
- Improving maternal and adolescent nutrition to improve birth outcomes and reduce low birth weight, which is a risk factor for stunting in Bangladesh
- Delaying first pregnancy beyond the adolescent years to protect the health of mothers and their offspring and reduce the risk of malnutrition for both mother and child
- Engaging men and communities to promote gender equality, women's empowerment, and reduce adolescent pregnancy

Successfully preventing chronic malnutrition however will also significantly depend on strengthening the upazila-level nutrition service delivery system, promoting sound infant and young child feeding (IYCF) practices, and a substantive focus on promoting water, sanitation, and hygiene and ensuring an open defecation-free environment. Gender needs to be integrated into each element. It will be critical to engage men to ensure that they participate in and share responsibility for the health and welfare of their children and support their wives to become empowered and be able to access health and nutrition services for themselves and their children. This is often an area where men are not engaged enough, given the important decision-making role they play.

4. KEY POLICIES, STRATEGIES, PROGRAMS, AND DESIGN CONSIDERATIONS

4.1 Key Policies, Strategies, and Programs Related to Food Availability, Access and Utilization

The following table presents key policies, strategies, and programs that are of relevance to the design of new projects in the FFP context in Bangladesh. Refer to Appendix 6 for details on the policies and programs.

Government of Bangladesh	U.S. Government	Other
Food Availability and Access		

• National Food Policy, 2006
• National Food Policy Plan of Action (2008–2015)
• Country Investment Plan, 2010–2015
• National Plan for Disaster Management, 2010–2015
• Sixth Five Year Plan, 2011–2015
• National Social Protection Strategy, 2014
• National Agricultural Policy, 2010
	• Country Development Cooperation Strategy, 2011–2016
	• Bangladesh Feed the Future Multi-Year Strategy, 2011–2015
	• Bangladesh Feed the Future Strategic Review, 2010
	• Policy Research and Strategy Support Program (IFPRI)
	• Key Feed the Future projects
	  ○ Agriculture Value Chains
	  ○ Agro-Inputs Program
	  ○ Aquaculture for Income and Nutrition
	• FFP Programs ending May 31, 2015
	  ○ PROSHAR
	  ○ SHOUHARDO II
	  ○ Nobo Jibon
		• Chars Livelihoods II Program (DFID)
		• Integrated Agricultural Productivity Project: (FAO and World Bank)
		• Chittagong Hill Tracts Development Facility (UNDP)

Food Utilization and Health		

• Scaling Up Nutrition Movement (2012 onward)
• National Plan of Action for Nutrition (1997, update in progress)
• Fortification in Edible Oil with Vitamin A Bill, 2013
• Health, Population and Nutrition Sector Development Program (2011–2016)
• Operational Plan for Nutrition (one of the 32 operational plans in the Health, Population and Nutrition Strategic Development Plan)
• National Food Policy Plan of Action (2008–2015)
• National Food Safety and Quality Policy and Plan of Action Review of Food Safety and Quality Related Policies (2012 draft)
• Implementation Code of the Marketing of Breast Milk Substitutes (2012 draft)
• National Communication Framework and Plan of Action on Infant and Young Child Feeding (2010)
• National Guidelines For Community Based Management of Acute Malnutrition in Bangladesh (2011)
• National Guidelines for the Management of Severely Malnourished Children in Bangladesh (2008)
• National Strategy for Anemia Prevention and Control (2007)
• National Strategy for Infant and Young Child Feeding (2007)
• The Prevention of Iodine Deficiency Diseases Act (1989)
• Breast Milk Substitute (Regulation of Marketing) Ordinance (1984)
	• Country Development Cooperation Strategy, 2011–2016
	• Multi-Sectoral Nutrition Strategy 2014–2025
	• Bangladesh Feed the Future Multi-Year Strategy, 2011–2015
	• Bangladesh Feed the Future Strategic Review, 2010
	• Policy Research & Strategy Support Program (IFPRI)
	• Key Feed the Future projects
	  ○ Agriculture Value Chains
	  ○ Agro-Inputs Program
	  ○ Aquaculture for Income and Nutrition
	  ○ SPRING
	• Other key USAID programs/projects
	  ○ MaMoni HSS
	  ○ NGO Health Service Delivery Project (Smiling Sun)
	  ○ SHIKA
	• FFP projects ending May 31, 2015
	  ○ PROSHAR
	  ○ SHOUHARDO II
	  ○ Nobo Jibon
		• Agriculture and Nutrition Extension Project (European Union)
		• Alive & Thrive Project (Bill and Melinda Gates Foundation)
		• BRAC Health Program
		• BRAC WASH Program
		• Chars Livelihoods II Program (DFID)
		• Chittagong Hill Tracts Development Facility (UNDP)
		• Food Security and Ultra Poor Project (WFP)
		• Rural Water Supply and Sanitation (World Bank)
		• SHEWA,B Program (UNICEF)
		• WFP-UNICEF School Feeding Program

4.2 Key Design Considerations

This section includes key design considerations for future FFP project implementers in Bangladesh.

Key Consideration	Description
Gender Integration in Program Design	The USAID Gender Policy clearly identifies gender integration as a mandatory consideration in all USAID programming. Gender integration requires identifying and addressing, in all policies and programs, gender differences and inequalities as well as the roles of women and men. The goal of gender integration is to promote gender equality and improve programming and policy outcomes. Applicants are required to explain explicitly how gender issues (such as identifying and understanding the causes of gender inequalities; the differences in roles, responsibilities, and needs of men and women; and the relationships between men and women, within the same sex and between older and younger men and women) are linked to the three dimensions of food security and how gender will be integrated into all program elements. A gender analysis must be completed within the first year of the new program and can be undertaken in tandem with the formative research that will be conducted to strengthen program design. Gender analysis refers to the systematic gathering and analysis of information on gender differences and social relations to identify and understand the different roles, divisions of labor, resources, constraints, needs, opportunities/capacities, and interests of men and women (and girls and boys) in a given context. The objective of the gender analysis is to provide a deeper understanding of current gender issues at the community and household levels in program target areas, and this analysis should extend beyond a review of aggregate national-level data on gender. At the community level, gender issues are dynamic and can change in positive or negative ways—promoting or undermining gender equality. The gender analysis should seek an understanding of current issues and changing trends that may affect program implementation. A better understanding of the influence of gender in program target areas—particularly in the ways that gender issues affect access to program interventions, decision making, and behavior change or program uptake—is important for achieving program nutrition and food security objectives. FFP development programs must ensure a gender-sensitive program design by including such approaches as providing women entrepreneurs with access to financial services, encouraging women's and girls' involvement in decision making at the community level, improving access and control over health care, and involving women in all conflict resolution and peace-building activities. Bangladesh women face significant disadvantages, as they often have little say over household purchases and decisions and due to highly restrictive land rights, have almost no access to land of their own. In addition, women tend to have a higher share of the labor burden within the household. Cultural factors that form gender roles and attitudes are not easy to change. Nonetheless, FFP non-emergency programs can ensure a gender-sensitive program design by encouraging women to join village savings and loan groups, providing training for female entrepreneurs and access to financing to create or expand business opportunities, encouraging women's and girls' involvement in decision making at the household and community level, and improving access and control over health care. Some lessons learned from recent FFP development programming in Bangladesh reveal that: • Gender must be core to program design • Careful timing of activities, including skills building, improves participation by women • A group approach is more attractive to women than men and provides peer support and a positive learning environment for women • New agriculture and irrigation approaches should reduce, not increase, the labor burden on women • Male involvement in MCHN should be mainstreamed through training and relevant materials, by grabbing their attention with emotional concepts, indicating why they should care about MCHN, working to modify stereotypes, finding males where they are (bringing the messages to them), providing explicit actions for fathers, and allowing fathers to practice what they have learned (Alive & Thrive 2014). • Implementers should have a strong understanding of gender and decision-making dynamics around use of income from agribusiness and village savings and loan programs Integrating gender into a FFP development food assistance program does not mean that the program must be exclusively or even primarily focused on women. Integrating gender is about sufficiently understanding the social context in the program area to create an enabling environment at the community level so that men and women can interact, participate, and gain equitably from program efforts in nutrition and food security. The revised version of the Automated Directives System (ADS) 205, issued in July 2013, provides guidance on how to implement USAID's gender equality and female empowerment policy. Applicants applying for the next FFP program in Bangladesh should note the requirements in ADS 201, 202, 203, and 205 for integrating gender equality and women's empowerment into all phases of programming, budgeting, and reporting. ADS 205 defines what a gender analysis is and explains how program offices and technical teams must incorporate the findings of the gender analysis throughout the program cycle, including in country strategies and projects.

Governance	FFP development programs can make a significant contribution to good governance at the community, district, and national levels during the implementation process. At the community level, well designed programs can foster change through skills training and village savings and loan programs that address issues such as transparency, female leadership, and conflict resolution. New programs can benefit from established relationships and committees at the upazila, union, and community levels for disaster risk reduction managed by the Comprehensive Disaster Management Program (CDMP).
Geographic and Beneficiary Targeting	FFP resources target the poorest countries in the world and the most food-insecure regions within these countries. Prospective programs are encouraged to use the guidance in Section 3.1 to select Bangladesh districts and upazilas for potential interventions. Within these areas, specific traditional authorities should be selected based on need and in consultation with the district and upazila authorities and existing donor/NGO interventions in the area. Applicants should develop an integrated rural development program that involves entire communities, which means that the focus population for various component activities may differ. Applicants are encouraged to apply a livelihoods lens when developing a strategic plan for working with individual communities. It is important to understand that not all "poor" farming households, as defined by living under US$1.25 per day per person, are equal. Some are poorer than others, and some have more opportunity or resources than others. The dependency ratio may be the distinguishing factor—e.g., a poor household with one adult and five children under 8 years of age has less labor to produce more food and income than a household with two adults and three children. In other cases such as in Chittagong Hill Tracts, remoteness is a determining factor. While the primary target of the FFP development program in Bangladesh should be the poor, some disaster risk reduction and resilience activities should engage all income segments of the community. To maximize nutrition impacts, households with children under 2 years and pregnant and lactating women should be prioritized for both MCHN and food security activities. In addition to reducing chronic and acute malnutrition, this targeting will facilitate sustainable reductions in food insecurity, which is a major underlying cause of chronic and acute malnutrition. Recognizing that productive activities may represent a significant time burden for women and cause reduced time for young children's care and feeding, program approaches should be chosen to mitigate this effect. Beneficiary targeting should also place special emphasis on involving young adults—especially newly married adolescent girls, as they are especially vulnerable to poor nutrition status, make up a large percentage of the population, will likely become parents during the life of the FFP program, and are often marginalized. Due to extreme food insecurity and vulnerability, the following groups identified in the Comprehensive Food Security and Vulnerability Analysis may also be targeted: female-headed households, the landless, and those with landholdings under 0.5 ha.
Monitoring and Evaluation	As is the case for every FFP development program, programs should develop an effective monitoring and reporting system that is responsive to internal management needs, USAID's Evaluation Policy, and the reporting requirements of USAID/FFP, the Mission, and the U.S. Department of State. Program success at impact and outcome levels will be measured by the collection of baseline and final evaluation indicators. These will be collected either by the programs or by a third party firm supervised by USAID/FFP (USAID/FFP will make a determination on who should collect the data for each award). Baseline and final evaluation indicators will examine changes in economic status and household access to food, as well as children's and women's nutritional status. Some of these indicators are contextual only. In addition, programs must collect USAID/FFP annual monitoring indicators. Several of the annual monitoring indicators are "required" and all programs must collect them. Others are "required if applicable" and must be collected by all programs implementing relevant program interventions. "Standard" indicators are not required, but USAID/FFP strongly recommends their collection for programs implementing relevant interventions. Finally, programs are responsible for planning and implementing a midterm evaluation approximately halfway through the life of each program. Applicants should refer to the current set of USAID/FFP indicators for clarification on USAID/FFP baseline/final evaluation and annual monitoring indicators.
Sustainability and Exit Strategy	USAID/FFP seeks to implement effective models, build capacity, and create an enabling environment adapted to the Bangladesh context. Therefore, applicants must provide an overall development strategy that seeks to create, wherever possible, self-financing and self-transferring models that will continue to spread under their own momentum both during and after the project. It is the expectation that these models will be adopted and adapted by a significant proportion of the population. Sustainability of impact of the FFP development program in Bangladesh is most likely to happen in areas where the following factors exist: • Recognition by community members of activities' proven value and visible outcomes • Ownership and commitment to continue activities on the part of the community, community group, or government • Empowerment of individuals and communities to demand quality services • Extent of transfer to community members, groups, and service providers of the skills and knowledge needed to generate desired outcomes • Institutional capacity of community-based organizations and health facilities is strengthened, as is the capacity of key individuals in those organizations • Adaptability of community-based organizations and health facilities in the face of unpredictable political, environmental, and social changes

	• Explicit plans for resource generation when consumable supplies (e.g., medicines, immunizations, agro-inputs, and food) are needed to sustain impact (Rogers and Macías 2004) The sustainability of program results can be improved with well-implemented integrated programming, as well as through the use of community participatory approaches. Community participatory approaches focus on ensuring community ownership and responsibility from the beginning of program implementation, with communities helping to establish program objectives and engaging in the program planning process. Livelihood activities should be designed to build community members' capacity to earn higher incomes to reduce food insecurity in the future. A market-based approach should be used rather than subsidies, which cannot be sustained. Applicants should look for means to enhance market chains by improving product quality and bringing buyers and sellers together in a mutually profitable manner. During project design, applicants should interview local and national government, and private and community stakeholders to ensure any program proposal works toward mutually supported goals. Rather than establish a parallel health or agricultural extension system, applicants should work closely with the Department of Agriculture Extension, Department of Livestock Services, Ministry of Health and Family Welfare, and Ministry of Local Government and Rural Development, to build the technical, managerial, and administrative capacity of their field teams. Part of a FFP development program's ability to achieve sustainability of program impacts depends on well thought out and implemented exit strategies. An exit strategy is a plan describing how the program intends to withdraw its resources while assuring that the achievement of development goals is not jeopardized and that progress toward these goals continues. An exit strategy may use graduation from specific project areas as steps toward the eventual total withdrawal of resources, or exit may take place at one time across the entire program area. In both cases, the underlying goal of an exit strategy is to ensure sustainability of program impacts after a program ends. Steps to help establish a successful exit strategy include: • Establish a clear but flexible timeline linked to the program funding cycle • Incorporate exit plans from the beginning of program implementation, which may involve linkages with Feed the Future programs in the zone of influence • Implement exit plans in a gradual, phased manner • Consider an exit timetable that allows sequential graduation of communities and/or components
Environmental monitoring and mitigation	The identification and prevention of potential detrimental environmental impacts of USAID FFP assistance is critical to ensuring that interventions do not harm the intended beneficiaries or general environment. USAID's Regulation 216 has a range of procedures and tools to assess and mitigate potential environmental impacts of U.S. Government-funded activities. Mitigation and management of potential environmental impacts must be an integral part of program design. Upon identification of environmental impact management actions in the planning stage, programs can integrate these activities throughout the course of the project. Programmatic integration will ensure more consistent management of potential and identified environmental impacts. Programs should prepare an Environmental Mitigation and Monitoring Plan providing guidance on how technical assistance will be used to mitigate impacts throughout the project and should reference USAID's Global Environmental Management Support guidance.
Formative Research and Social and Behavior Change	As food insecurity is a complex problem requiring interventions that are relevant and feasible in the local context, it is imperative that solid formative research create the basis for building FFP development program actions. A myriad of tools and approaches exist, but the key aspect is that program design is informed by a deep knowledge of the intervention areas and that views and information are sought from a range of stakeholders (younger and older women and men, those engaged in different livelihoods, mothers and fathers, religious and community leaders, as well as invaluable perspectives from community-based organizations and producer groups, and multiple sectors from local government). Strategies, activities, and SBCC will depend on quality information optimally collected by project staff. Examples of where formative research will be essential in Bangladesh include: barriers to reaching and addressing the needs of adolescent girls; determination of potential barriers to adopting new IYCF and water, sanitation, and hygiene practices; and gender equality issues within households in different areas of the country. In addition to formative research, programs are required to undertake a gender analysis and can undertake a vulnerability assessment to understand the current socio-cultural context in which they will operate. It is also essential that qualitative research be carried out when interventions are not effective (for example, to provide insight into why farmers are not adopting new technologies, similar to what would be gleaned in formative research for MCHN).
Programmatic Integration	The cross-cutting nature of food security programs offers an ideal conduit to bring about change through improved health, livelihoods, and resiliency to shocks within households. However, beneficiary participation in multiple programmatic activities offered by the program should evolve naturally rather than be mandated by field staff. Participants need to see the added-value for themselves, especially given their time constraints. To encourage integration, programs should focus attention first on integrated staff training. Project field extension officers will be better able to promote integration if they have a foundation in all program elements. Programs should provide cross-training in the fundamentals of MCHN; water, sanitation, and hygiene; improved agricultural production; formation of village savings and loans, and watershed enhancement. Field

	managers should also monitor the evolution of field team cooperation to provide recommendations or suggest visits to other sites where integration is more pronounced.
Operation Research	Operations research enables programs to identify problems in service delivery and to test programmatic solutions to solve those problems in program implementation. It provides program managers and policy decision makers with the information they need to improve existing services. There are five basic steps in the operations research process: (1) identify the problem in service delivery or implementation, (2) identify a solution or strategy to address the problem, (3) test the solution, (4) evaluate/modify the solution, and (5) integrate the solution at scale. By incorporating well-designed operations research as a key part of program activities, programs can continuously examine the quality of their implementation and identify constraints to delivery, access, and utilization of program activities, adjusting as necessary. Operations research is an iterative process that may be conducted at the beginning of the project and repeated during the life of the activity to ensure continued quality in service delivery and program implementation. Done well, operations research can increase the likelihood that the project will attain its stated objectives.
Resilience, Early Warning and Disaster Risk Reduction	The USAID Resilience Policy clearly identifies how the agency seeks to promote resilience in its programming. The critical importance of resilience to the Bangladesh FFP development food assistance program underscores the imperative that communities undertake a multidimensional analysis of the risks they face and their sources of resilience. This process builds community understanding of the causes and effects of acute and chronic food insecurity and malnutrition. This process also lays a foundation for informing and explaining program design, builds interest in participating in disaster risk reduction activities, clarifies the link between disaster risk reduction and other (e.g., agriculture and health) project activities, and helps lead to the establishment of locally-managed identification and response mechanisms to respond to local shocks. The Bangladesh FFP program aims to embody disaster risk reduction by lessening people's exposure to food security shocks and reducing their vulnerability to the adverse effects of those shocks. Programs may consider including activities to reduce risk linked to GOB early warning programs in the following areas, based on their own local risk assessment: peace-building, conflict resolution, and governance; gender; community and local government emergency response planning; and community sustainable natural resource management and land use planning. Applicants may consider the variety of ways in which disaster risk reduction and early warning may be incorporated into program design and implementation. Under the current three FFP development food assistance programs, disaster risk reduction activities (including development of disaster prevention and mitigation plans) have been made discrete project components with allocated staff to carry out activities. These activities may also be incorporated in a cross-cutting manner across all strategic objectives and intermediate results. Each model presents advantages and disadvantages, and poses different challenges particularly regarding staff recruitment, training, and supervision, as well as ensuring linkages with other project components. Some communities often demonstrate a readiness to engage on disaster preparedness with regard to cyclones, flooding, and drought, but concepts of vulnerability to other slow-onset, small-scale/idiosyncratic, or socioeconomic shocks are not well understood. Experience in Bangladesh suggests that effectively incorporating disaster risk reduction and early warning into FFP programs requires a continual intensive effort with repeated population exposure and capacity strengthening, with the goal of ensuring that community members and representatives view all program activities through the lens of the question, "How does this activity affect the vulnerability of the community, and of different population groups, to the most important shocks they face?" Given limited time and resources, applicants are also encouraged to define the range of shocks and outcomes that the program aims to address to avoid overreaching in the disaster risk reduction/early warning component of the program beyond the overall program focus.
Capacity Strengthening of Public and Private Institutions	Effective partnering and capacity strengthening can improve program implementation, effectiveness, scale, coverage, and sustainability. This process promotes cross-fertilization, transparency, and enhanced potential for a coordinated programming approach. For improved MCHN programming, building the capacity of health service providers, community leaders, community volunteers, traditional birth attendants, and leader mothers can all have a positive impact on IYCF practices, use of health services, and timely care-seeking action for pregnant women with danger signs and children with MAM, SAM, and childhood illnesses. Capacity strengthening of local partners, community volunteers, and service providers is a high priority for ensuring that the program's food security objectives are achieved and maintained in Bangladesh. Capacity strengthening includes activities designed to strengthen communities' abilities to organize, plan, and represent their own interests. Programs may also consider focusing on strengthening the capacities of their own staff and volunteers, providing them with ongoing training and frequent, supportive supervision in which the supervisor provides constructive feedback to improve staff performance and enhance learning. This includes training staff to research and address gender issues as a part of their day-to-day activities to enhance program impact on food security and nutrition outcomes among women, children, and men.

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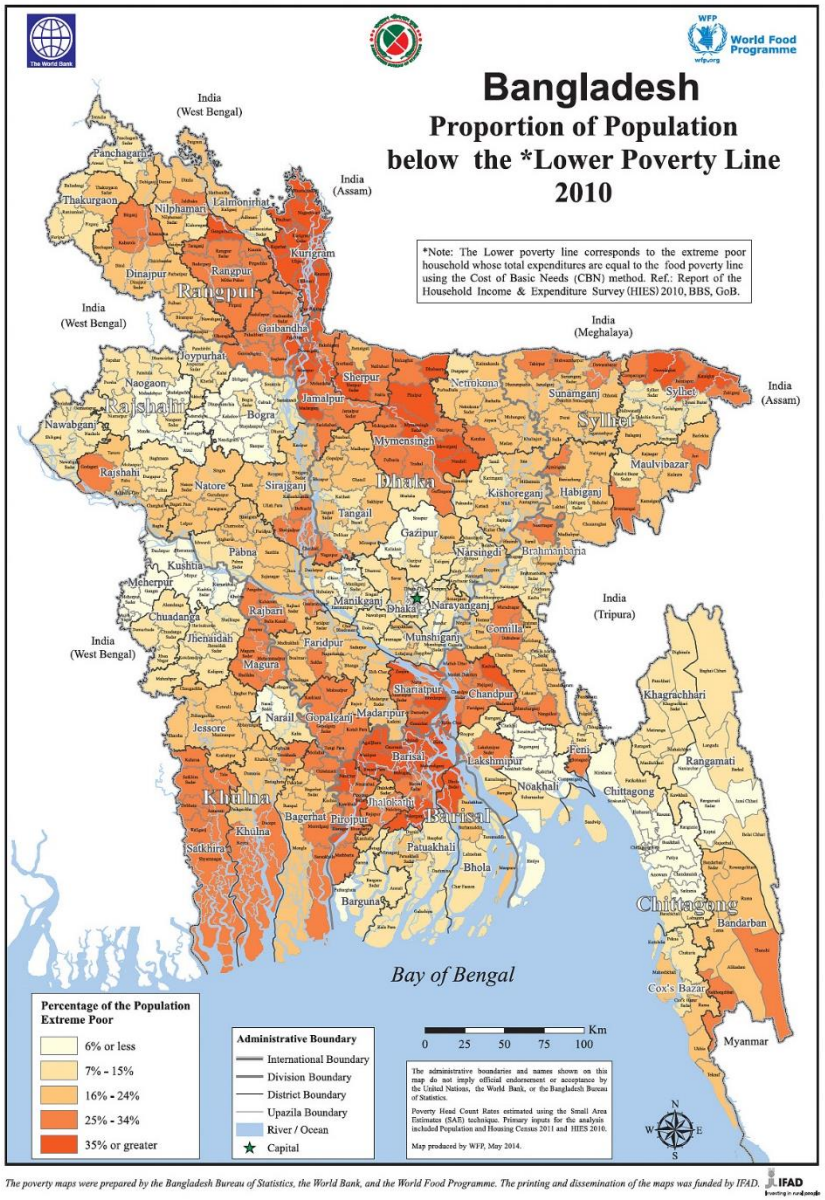
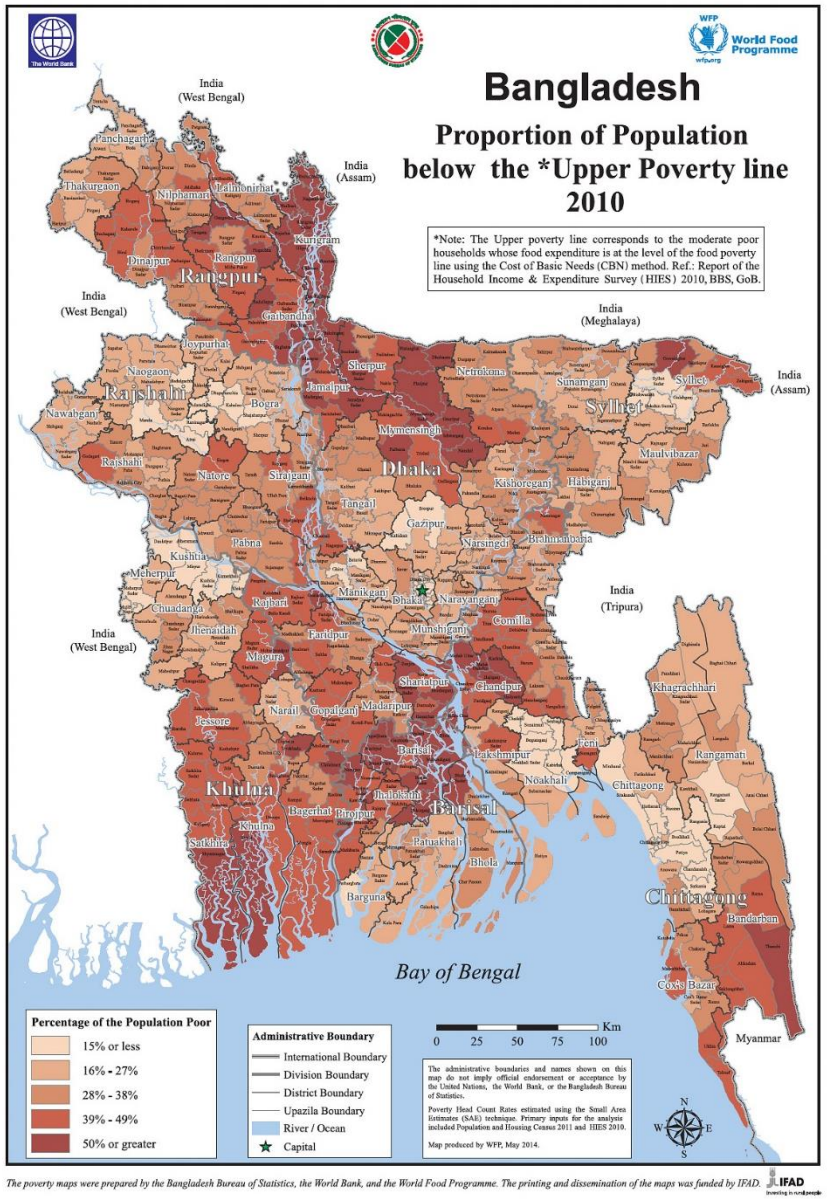
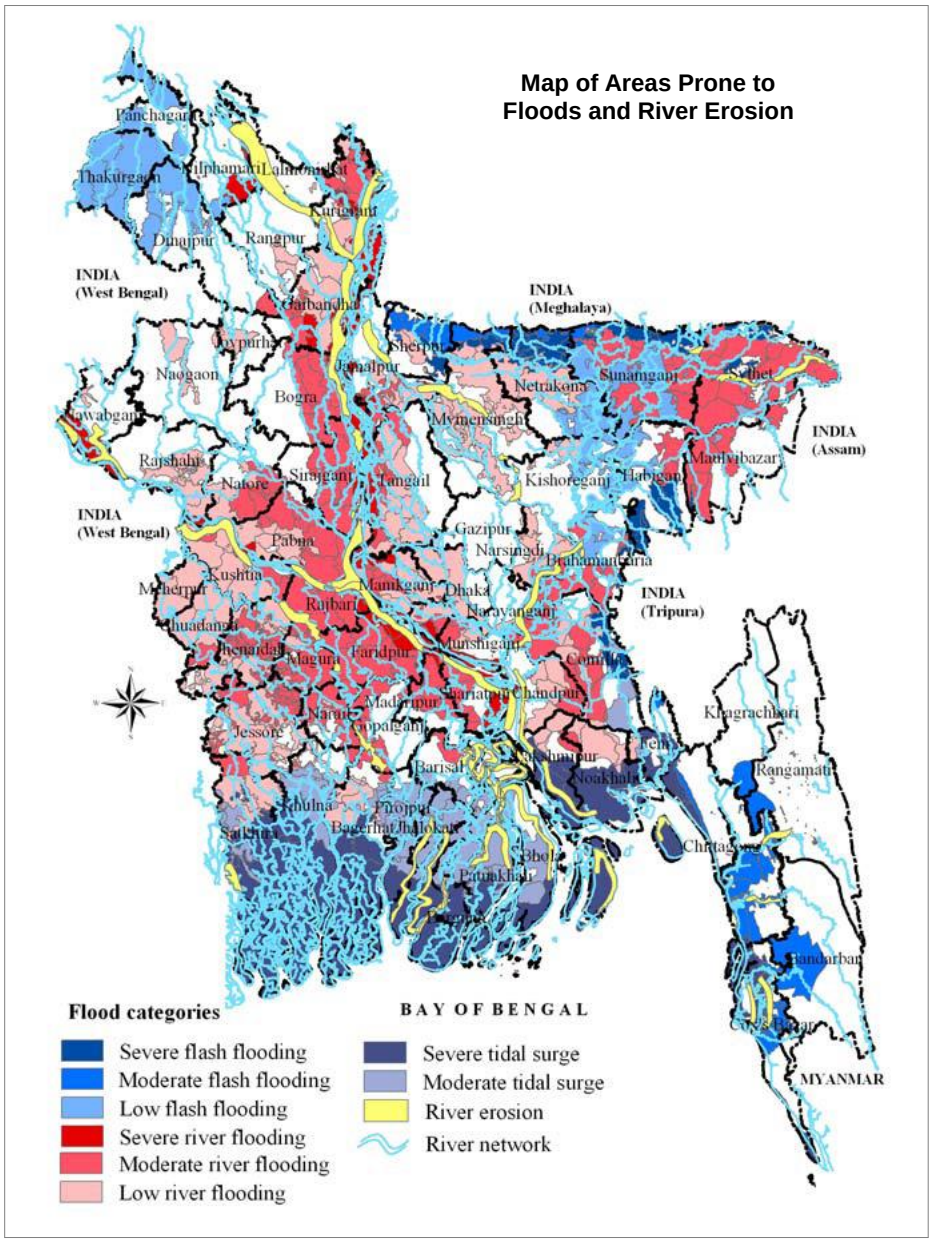
APPENDIX 1. MAPS

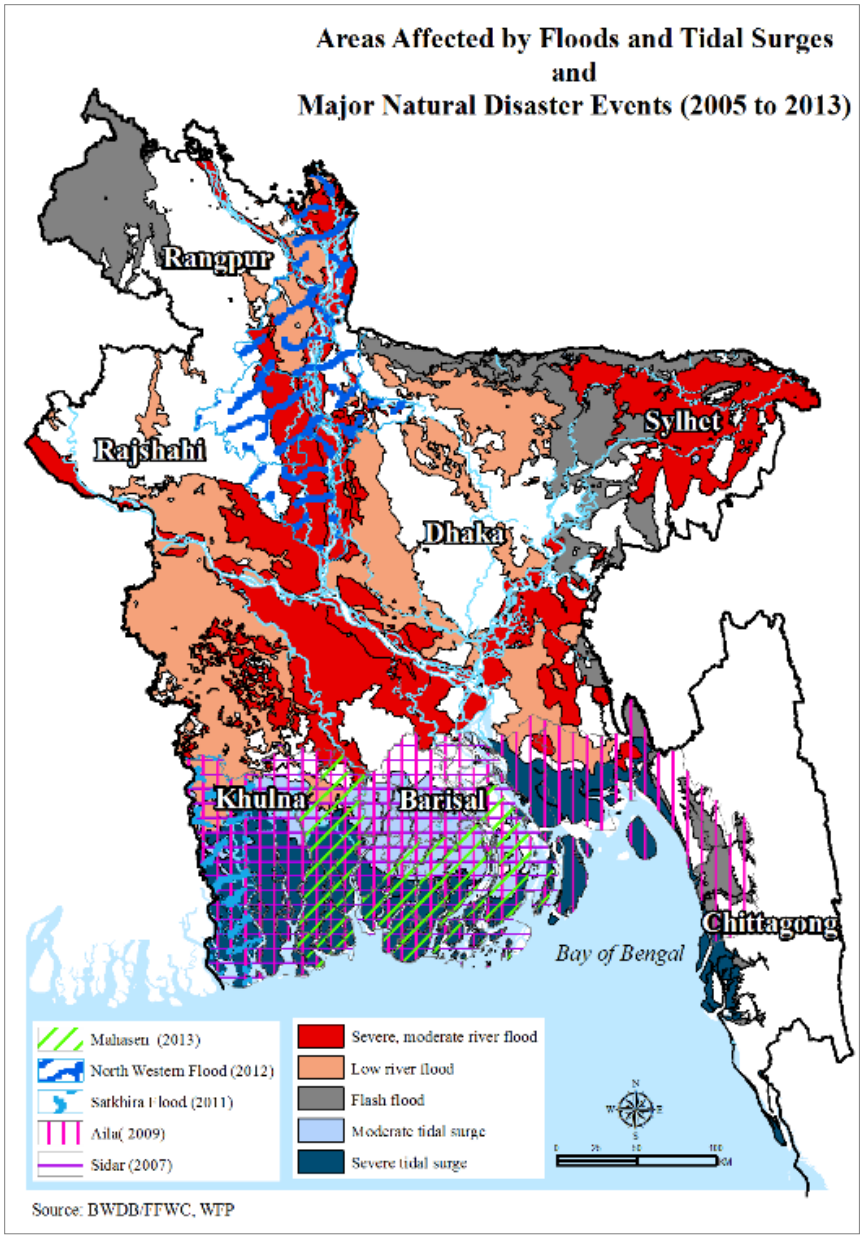
Poverty Maps



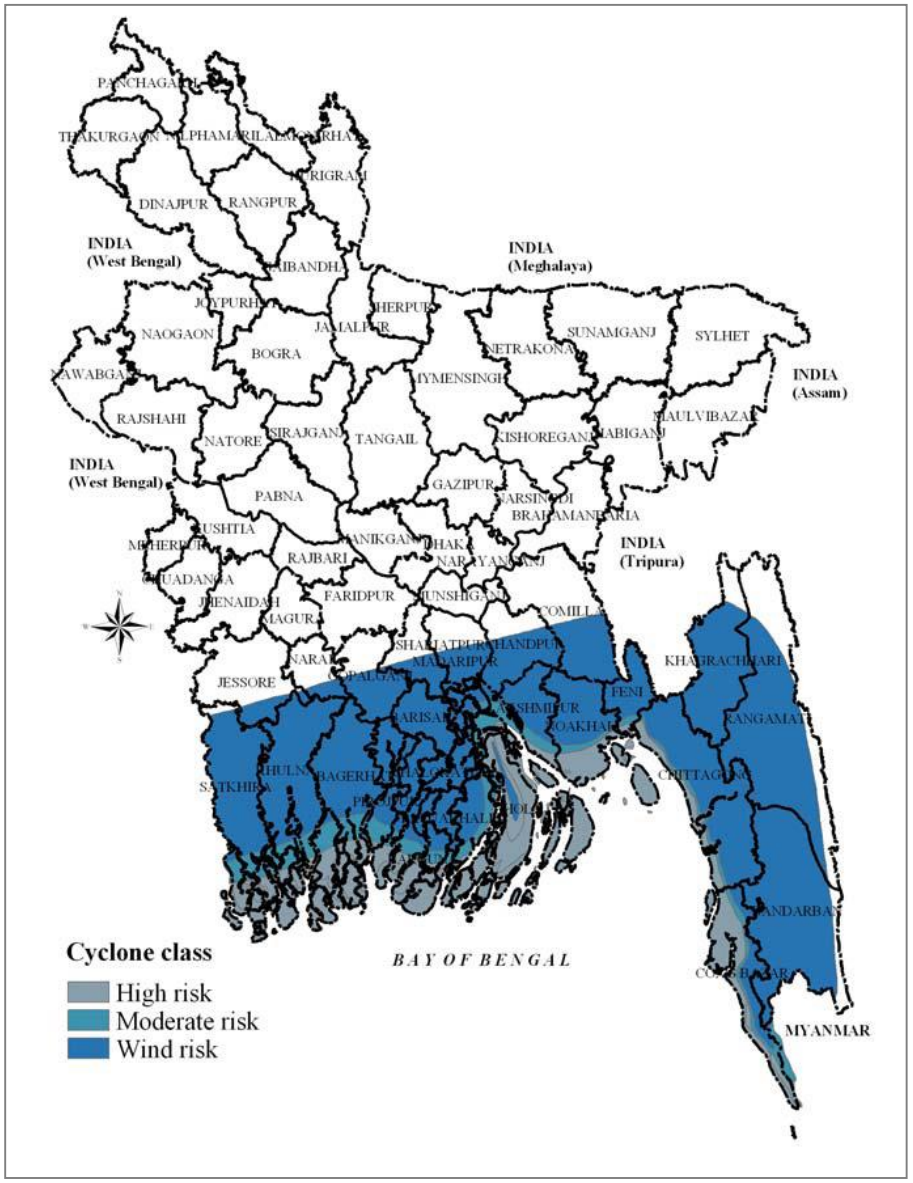


Climate-Related Maps

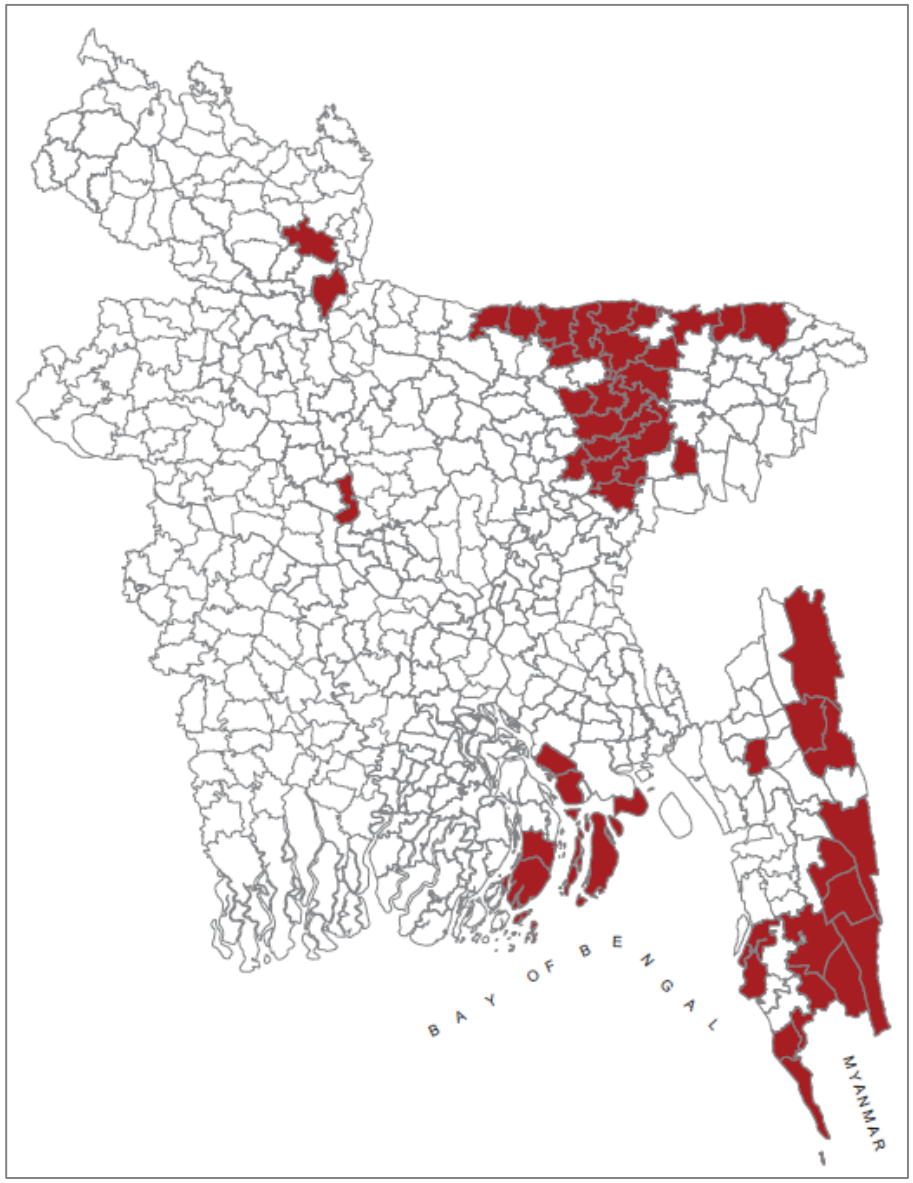




Map of Areas Prone to Cyclones

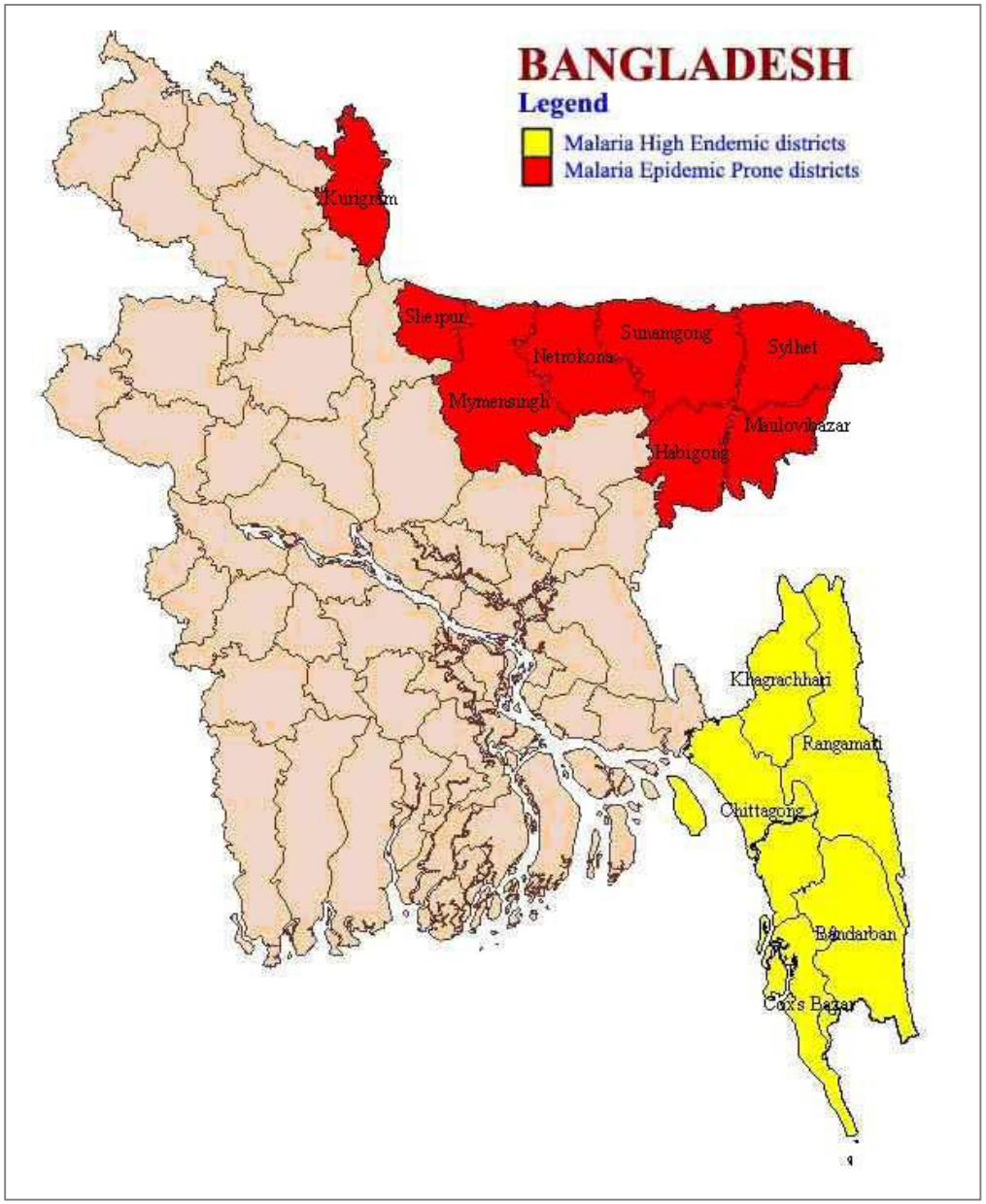


Most deprived 50 upazilas based on composite deprivation index



Source: BBS, Bangladesh Institute of Development Studies (BIDS), and UNICEF. 2013. Child Equity Atlas: Pockets of Social Deprivation in Bangladesh. Dhaka: BBS. p. 112.

Endemic Malaria Districts in Bangladesh



Source: http://www.nmcp.info/

APPENDIX 2. SELECTED ECONOMIC AND POVERTY INDICATORS FOR BANGLADESH

Indicator	Bangladesh	South Asia[1]
Population		
Total (million)	154.7	2,286.1
Rural population (% of total)	71.1	68.6
Population density (per square km)	1,174.3	341.3
Economy		
GDP per capita (constant 2005 US$)	597.0	1,009.2
Consumer price index (2005 = 100)	170.0	165.37[2]
Poverty		
Age dependency ratio (% of working age population)	54.5	55.3
Population below poverty line (US$1.25/day (purchasing power parity)	43.5	31.0
Human Development		
Human Development Index (UNDP)	.515[3]	.558
Gender-Related Development Index	111 of 148	-
Mobile subscribers (per 100 people)	63.8	68.8
Internet users (per 100 people)	6.3	11.6
Agriculture		
Food production index	104	127
Agriculture value added per worker (% of GDP)	17.7	18.2
Cereal yield (kg/ha)	2,988	2,925
Education		
Literacy rate (adult female)	53.4	50.3
Literacy rate (adult male)	62.0	73.2
Literacy rate (male and female youth 15–24 years)	78.7	79.5
Net primary school enrollment (%)	92	88
Net secondary school enrollment (%)	46	59
Life Expectancy, Fertility, and Mortality		
Life expectancy at birth (female)[4]	68.8	68.0
Life expectancy at birth (male)[4]	66.6	64.9
Total fertility rate (children per woman)[5]	2.3	2.6
Under-5 mortality rate (per 1,000 live births)[5]	53.0	59.5
Infant mortality rate (per 1,000 live births)[5]	43.0	46.6
Neonatal mortality rate (per 1,000 live births)[5]	32.0	31.6
HIV Prevalence		
Prevalence of HIV (% female 15–24 years)	0.1	0.3 (male and female)
Prevalence of HIV (% male 15–24 years)	0.1	
Maternal Health		
Maternal mortality ratio[6]	194	190[7]
Median age at first marriage (among women 20–49 years)[5]	15.8	-
Median age at first birth (among women 20–49 years)[5]	18.3	-
% of women 15–19 years who have begun childbearing[5]	30	-
Food Security Indicators		
Global Hunger Index	19.4 (58 of 778)	20.7
% of households with poor or limited food consumption (food insecure)[8]	25	-
Prevalence of undernourished in total population (% of total population)	16.8	17.8
Dietary Diversity Indicators		
% of dietary energy supply from cereals, roots, and tubers[9]	77.2	62[10]
Average supply of animal source protein (grams/capita/day)[9]	16.5[11]	13[10]
Water and Sanitation		

Indicator	Bangladesh	South Asia[1]
Improved sanitation facilities (% of population with access)[5]	36.6	38.9
Improved water source (% of population with access)[5]	98.5	90.2
Malnutrition		
Stunting prevalence (% children under 5)[5]	41.3	37.7[12]
Wasting prevalence (% children under 5)[5]	15.7	16.0[12]

Source: World Bank online database except where noted otherwise.
[1] The World Bank's South Asia category includes Afghanistan, Bangladesh, Bhutan, India, Iran, Maldives, Nepal, Pakistan, and Sri Lanka; UNICEF's South Asia category includes all the same countries as the World Bank except for Iran.
[2] Trading Economics: http://www.tradingeconomics.com/south-asia/consumer-price-index-2005--100-wb-data.html
[3] 46 of 186 countries.
[4] **BBS 2012**
[5] NIPORT et al. 2013
[6] NIPORT et al. 2012
[7] UNICEF: http://data.unicef.org/maternal-health/maternal-mortality
[8] WFP et al. 2009
[9] BBS 2010
[10] FAOStat, 2008–2010: http://faostat3.fao.org/faostat-gateway/go/to/home/E
[11] 24.8% of protein
[12] UNICEF: http://data.unicef.org/resources/2013/webapps/nutrition#

APPENDIX 3. REGIONAL LAND COMPARISONS

Comparisons among the divisions in Bangladesh show that Sylhet has the largest proportion of larger landholders and the smallest percentage of marginal farmers, while Chittagong has the greatest percentage of marginal farmers and is the lowest in the large farmer category.

Table A4.1. Distribution of Land by Farm Size (%)

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	Bangladesh
Marginal farmer < 0.05 acre	33.2	45.9	36.4	29.6	37.2	43.1	16.0	36.3
Small farmer 0.5–1.49 acres	42.5	42.2	47.3	46.3	42.5	41.5	46.4	44.6
Medium farmer 1.5–2.49 acres	12.7	8.0	11.5	16.1	11.5	8.3	19.8	11.8
Large farmer 2.5+ acres	11.6	4.0	4.9	8.1	8.8	7.0	17.9	7.3

Source: Ahmed et al. 2012

The Gini coefficient is 0.803 (includes landless farmers), which indicates a very high concentration of land ownership among fewer larger farmers. The proportion of pure-tenant farmers, or those not owning land, is 34% in rural Bangladesh. Of this group, 67% are sharecroppers (these farmers usually net only 38%–40% of the crops they produce after incurring all production costs), 19% lease land for cash, and 14% do both (see Table A4.2). About 37% of farmers cultivate only their own land, and the proportion of mixed-tenant farmers who cultivate their own land and also sharecrop and/or lease other land is 29% (Ahmed et al. 2012).

Table A4.2. Land Ownership and Land Use Relationships by Division (%)

	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Sylhet	Bangladesh
Pure tenant	**24.1**	**37.1**	**33.5**	**30.3**	**34.1**	**36.1**	**36.8**	**33.5**
Sharecrop	66.1	60.3	72.0	53.9	68.2	72.8	72.7	67.0
Cash lease	25.4	27.6	16.5	22.2	20.5	13.2	5.3	18.8
Both	8.5	12.2	11.5	23.9	11.4	14.0	22.0	14.1
Own land only	**44.1**	**39.9**	**40.1**	**33.9**	**29.7**	**39.2**	**33.7**	**37.1**
Own and sharecrop/lease	**31.8**	**23.0**	**26.5**	**35.8**	**36.2**	**24.7**	**29.6**	**29.4**
Sharecrop	56.4	69.1	69.8	63.0	45.0	74.4	59.4	62.3
Cash lease	25.6	16.5	17.5	19.6	32.1	19.2	13.2	21.4
Both	18.0	14.4	12.7	17.4	22.9	6.4	27.4	16.3

Source: Ahmed et al. 2012

APPENDIX 4. PRODUCTIVITY ISSUES

Crop Seasons

Bangladesh has a tropical monsoon-type climate, with a hot and rainy summer and a dry winter. January is the coolest month and April the warmest. The climate is one of the wettest in the world with most areas receiving more than 1,500 mm of rain a year, with some hilly areas receiving over 5,000 mm. Most of the country receives 2,000 mm or more, 80% of which falls in the monsoon season, although the seasonality and volume of rain can be highly variable for any location (WFP 2005). The three seasonal crop periods are the dry and relatively cool winter from November to February, a hot and humid summer from March to early June, and the monsoon season from June to October.[40] While rice can be produced in all three seasons, most other crops are limited to one or possibly two seasons (see Table A5.1).

Land is regularly cropped twice in one year and on occasions three times resulting in a crop intensity figure of 173 (BBS 2011), meaning that in the aggregate farmers are harvesting an average of 1.73 crops per year. Triple cropping is on the upswing; between 2001 and 2008, the area triple cropped increased by 2.8% annually, while single and double cropped areas declined slightly each year (BBS 2011). Double and triple cropping can improve soil fertility by avoiding mono cropping and if legumes are included they add nitrogen to the soil. There are a several cropping combinations. Rice and wheat are commonly rotated with oilseeds, potatoes, vegetables, or sugarcane added as a third crop or as a substitute for wheat. Other common two-crop combinations are aman-boro rice, aman-aus rice, or aman-boro rice; three-crop combinations include aman-boro-aus, aman-boro-jute, and aman-boro-pulses (WFP 2005). Even four-crop combinations are possible in some areas.[41] Boro rice production has grown more rapidly than aus and aman rice. In 2010–2011 boro made up 56% of total rice production compared to 6% for Aus and 38% for Aman (Ministry of Agriculture and FAO 2011).

Table A5.1. Crop Calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Paddy												
Aus			P	P			H	H				
Broadcast aman			P	P							H	H
Transplanted aman	H					P	P	P	P			H
Local boro	P			H	H						P	P
High yield boro	P	P		H	H	H						P
Pulses												
Masur (lentils)	H	H							P	P		H
Khesari (grass pea)	H	H	H						P	P	P	H
Other												
Wheat			H	H							P	P
Potato	H	H	H						P	P	P	
Onion				H	H	H				P	P	P

Note: P refers to planting; H refers to harvest.
Source: WFP 2005

[40] Crop-growing is divided into two main seasons, the Kharif and Rabi. Rice, jute, maize, and millet are grown during the Kharif season, and wheat, mustard, chickpea, and pulses are grown during the Rabi season. The Kharif season extends from May through October, while the Rabi season starts in November and continues until April. In addition to these two main seasons, another transition season is called Pre-Kharif which runs from March/April and ends in May/June (WFP 2005).
[41] These include boro-aman-jute-mustard, boro-aman-mustard-aus, aman-aus-boro-tea, aman-boro-jute-wheat, aman-wheat-boro-aus, aman-boro-wheat-aus, and aman-aus-black gram pulses-boro (WFP 2005).

Productivity Constraints

Irrigation.[42] Irrigation has been a critical factor in tripling rice production since the early 1970s particularly with the introduction of irrigated boro rice, which offers far greater yields than rain-fed rice. Irrigated rice yields are 32% higher compared to rain-fed rice (Ahmed et al. 2012). Irrigation also enables farmers to grow an additional crop during the dry winter season which increases cropping intensity. The share of cropped area under irrigation has continued to expand increasing from 44% of total cropped area in 2007 to 46% in 2011 (see Table A5.2). Irrigation is primarily from ground water sources,[43] with just over 21% of irrigated area relying on surface water, and the proportion has decreased since 2007. The dependence on ground water has resulted in declining water table levels, e.g., in northern districts the ground water table declined from 3.7 meters in 1981 to 6.6 meters in 2011 and there are indications that the rate of decline is increasing (FPMU 2013). Coupled with excessive ground water extraction is the decrease in groundwater recharging because of falling river levels and reduced wetlands.

Table A5.2. Irrigation Water Source

	2007–2008	2009–2010	2010–2011
Irrigated crop area (% of total cropped area)	44.2	45.3	45.8
Surface water irrigation (% of total irrigated area)	23.3	22.0	21.3

Source: FPMU 2013

Farmers use several methods for ground and surface water irrigation: traditional methods such as the swing basket, and other techniques including shallow and deep tubewells, low-lift pumps, hand pumps, and canal irrigation schemes. The shallow tubewell is the predominant irrigation method. The Ministry of Agriculture reported that in 2006 there were over 1.2 million shallow tubewells, 107,000 low-lift pumps, and nearly 30,000 deep tubewells (Ministry of Agriculture and FAO 2011). Another survey indicated that shallow tubewells account for 69.1% of irrigation methods, followed by deep tubewells (17.9%), low-lift pumps (9.6%), manual methods (3.0%), and canal irrigation (0.5%) (Ahmed et al. 2012). In 1996, the National Commission on Agriculture estimated that the maximum sustainable level of extraction through shallow tubewells had been reached. The continued expansion of shallow and deep tubewells has resulted in over-extraction of groundwater which will have adverse consequences on drinking water supply and contributes to arsenic contamination.

Seed system.[44] Seed production and distribution involves the public and private sectors. Government agencies include the Bangladesh Agricultural Development Corporation, Bangladesh Agricultural Research Institute, Bangladesh Rice Research Institute, and Department of Agriculture Extension. The Bangladesh Agricultural Development Corporation, an autonomous corporate body under the Ministry of Agriculture, is the largest producer of foundation seeds for rice, wheat, maize, jute, vegetables, spices, potato, pulse, and oilseeds. This group produces certified or "Truthfully Labeled" seeds through seed

[42] The Bangladesh Water Act of 2012 is the legal and policy framework for management and use of water resources including water ownership, use rights, and the recovery of rivers.

[43] Ground water is the main source for irrigation for 61% of farmers, 11.3% use surface water, 18.5% use both sources, and 9.2% depend on rainfall. There are some substantial differences among regions largely based on proximity to rivers: groundwater sourcing ranges from 0.5% in Barisal to 71.8% in Rajshahi, and surface water ranges from 1.1% in Rangpur to 50.8% in Sylhet. The rate of irrigation coverage ranges from only about 15% of total cropped land in Barisal Division to about 85% in Rajshahi Division, although the shares of rice area under irrigation varies much less from 72% in Rajshahi to 94% in Sylhet (Ahmed et al. 2012).

[44] The National Seed Policy of 1993 is the basis for the current government structure in the sector and shapes the legal, regulatory, and institutional mechanisms. The policy governs three regulatory institutions: the National Seed Board, the Seed Wing of the Ministry of Agriculture, and the Seed Certification Agency. The National Seed Board develops and monitors seed policy; the Seed Wing has a policy role but also monitors seed supply and demand and administers the Seed Certification Agency, which is responsible for seed quality, testing, and certification (Pullabhotla and Ganesh-Kumar 2012). The Seed Certification Agency generally certifies seeds of five "notified" crops: rice, wheat, jute, potato, and sugarcane (Ministry of Agriculture).

multiplication farms and 75 contract growers' zones (FPMU 2013). Certified seeds and Truthfully Labeled seeds are primarily distributed by the Bangladesh Agricultural Development Corporation's seed sales centers and through private seed dealers (Bødker et al. 2006).

The Bangladesh Rice Research Institute has developed 61 rice varieties since 1970, of which 57 are inbred and 4 are hybrid varieties. Varieties cover 80% of the rice area and accounts for 90% of total rice production. The institute is working on short-duration and stress-tolerant varieties, including saline-resistant high-yielding varieties, and submergence resistant varieties. The new varieties should contribute to enhanced resilience. The institute is also working on vitamin and iron-fortified rice varieties. For other crops, the Bangladesh Agricultural Research Institute has developed two disease-resistant varieties of wheat, three high-yielding varieties of pulses, five of vegetables including three hybrids for eggplant and tomato, six of potato, and three of fruits.

The private sector is comprised of more than 100 seed companies, over 8,000 registered seed dealers, and thousands of farmers contracted to produce seeds (FPMU 2013). Also, about 20 nongovernmental organizations (NGOs) have become involved in seed production as part of their development and livelihood programs. BRAC has become a major player, with 23 seed producing farms and an agricultural research center with capacity to produce 5,200 tons of certified seeds of hybrid maize, rice, onion, pulses, oil crops, and potatoes (Islam 2014). Seed quality remains an issue with as much as 85% of the stock being untested, unlabeled, or of unknown quality (Bangladesh Seed Grower, Dealer and Merchants Association 2007).

Most private seed companies confine themselves to trading in seeds or sourcing from the public sector and imports rather than conducting research or multiplication, because of the dominant role by the public sector in these functions. The informal system continues to function, in part, because of inadequate production of high quality seeds, but also because of farmer unwillingness to buy higher price seeds. One survey found that informal sources accounted for more than two-thirds of Bangladesh-origin modern rice seed varieties and 75% of Indian-origin modern rice seed varieties used by farmers (Hossain 2013). For traditional rice varieties, the volume in the informal system is about 96%, while hybrid rice varieties are purchased primarily through the formal system.

A significant portion of the demand for rice high-yielding varieties is met by seed imports; 61.4% of all rice used is imported, considerably higher compared to wheat and maize seed (see Table A5.3). Of the 85 hybrid rice varieties presently cultivated in Bangladesh, 79 are imported varieties highlighting the weaknesses in the domestic seed research and seed production systems (Pullabhotla and Ganesh-Kumar 2012). The proportion of improved seeds for vegetable crops is considerably lower at 12% for potato, 20% for vegetables, 12% for pulses, and 12% for oilseeds.

Table A5.3. Improved Seed Supply from Public and Private Sources (%)

Crop	2007/2008	2011/2012
Rice	40	59
Wheat	41	72
Maize	93	96
Potato	5	12
Pulses	1	12
Vegetables	36	20
Edible oilseeds	4	12

Source: FPMU 2013

Fertilizer. Increased fertilizer use has been an important contributor to productivity growth, particularly for rice, accompanying the impact of improved varieties and greater irrigation use. Bangladesh produces

urea, triple super phosphate, and single super phosphate, but domestic production has declined resulting in increased imports needed to meet demand (see Table A5.4).

Table A5.4. Fertilizer Imports

	2005	2006	2007	2008	2009
Imports	1,602	1,477	1,420	1,025	1,493
Bangladesh production	3,152	2,936	2,923	2,024	1,837

Source: FAO 2014

The drive for self-sufficiency in rice led the Government of Bangladesh to support fertilizer use through a subsidy system which is now the largest single public expenditure in agriculture accounting for 4.3% of all government spending (FPMU 2013).[45] The cost of the fertilizer subsidy doubled between 2007 and 2011. As Bangladesh has moved closer to achieving exportable surpluses of rice, the justification for the fertilizer subsidy will be more problematic. As with any subsidy there are concerns about who benefits—farmers, consumers, and traders—and whether the subsidies are resulting in excessive use or an imbalance of nutrients. Bangladesh farmers used 184.4 kg/ha compared to total South Asia use of 174.5 kg in 2010 (see Table A5.5).

Use of organic fertilizers—manure and compost—is low. Opportunities abound with the plethora of raw materials to produce biogas from poultry offal in live bird markets and waste from fruit and vegetable wet markets. However, organic manure has some disadvantages because of high labor and transport costs. There are perhaps 25,000 to 30,000 biogas plants in operation (Dhaka Tribune 2013) and could reach 150,000 units by 2016 (BSS 2011).[46]

Table A5.5. Fertilizer Use, South Asia (2010)

	kg/ha
Bangladesh	184.4
India	178.5
Nepal	23.2
Bhutan	10.6
Sri Lanka	230.8
Pakistan	217.1
South Asia	174.5

Source: http://www.worldbank.org/en/country/bangladesh

Farm Mechanization. About 80% of land preparation is done with mechanized assistance encouraged in large part by the rapid increase in the use of two-wheel power tillers (Ziauddin and Ahmmed 2010). However, other mechanized equipment, such as seed bed preparation equipment, seeders, weeders, and harvesters are still limited due to small and fragmented plots, limited farmer ability to buy them, inadequate equipment quality produced by domestic fabricators, and low tariffs on imported equipment but high tariffs on imported spare parts. Nevertheless, between 1996 and 2012 the number of four-wheel tractors increased from 2,000 to 30,000; power tillers or two-wheel tractors from 100,000 to 440,000; and threshers from 15,000 to 255,000 (International Development Enterprises 2012).

[45] The Ministry of Agriculture is also involved in appointing one dealer and three sub-dealers in each union. The Ministry of Agriculture leaves procurement and distribution largely in the hands of these private dealers and their suppliers.
[46] The Government of Bangladesh implemented the National Domestic Biogas and Manure Program in 2010. The program is being implemented by Infrastructure Development Company Limited, a government owned non-banking financial institution, in partnership with a range of other national and local partner organizations.

Manual labor inputs are considerable. For rice cropping, men average between 675 and 1,048 hours per ha (varying by season and variety), while women work between 8 and 38 hours per ha (Ahmed et al. 2012). For leafy vegetables, men average 1,950 hours per ha compared to 477 hours for women.

Agricultural extension services. The Department of Agriculture Extension under the Ministry of Agriculture is responsible for crop agriculture extension services for farmers, while the Department of Fisheries and the Directorate of Livestock Services offer extension services covering those subsectors. The Department of Agriculture Extension has 12,875 sub-assistant agricultural officers operating in the country and reached 1.3 million farmers in 2011 with training and other support services (FPMU 2013). In terms of manpower numbers, the Department of Agriculture Extension has adequate resources, but their effectiveness is constrained by the lack of budget to cover the costs of operations other than salaries, such as transportation to travel to farmer sites and communications.[47] Only about 15% of the Department of Agriculture Extension budget is allocated for operations, which contributes to limited contact with farmers; only about 10% of the farming population has direct contact with extension staff (World Bank 2005).[48]

Department of Agriculture Extension staff skills are generally weak due to inadequate training and education in the agriculture school system, and weak linkages between research and extension. The National Agricultural Technology Project has targeted this linkage by involving researchers in extension planning and participation in farmer field demonstrations where farmer feedback can inform researcher efforts (Pullabhotla and Ganesh-Kumar 2012). The Department of Agriculture Extension is also heavily involved in the administration of the fertilizer subsidy scheme and fertilizer distribution, which diverts time and energy.

Some private entities are providing extension services in the form of embedded assistance which is included as a service to the buyer of a particular farm input. The increase in contracting arrangements by supermarket chains and food processors for fruits and vegetables has been another source of privately provided extension support.

Credit access. Agriculture credit is a significant problem for many farmers, but particularly for the functionally landless with little or no collateral and poor credit history. This leads to an informal system of lending, based essentially on in-kind transactions, with the possibility of farmers/sharecroppers being exploited by moneylenders and traders. These informal sources of lending in Bangladesh are considered to be as important in rural credit as are formal lending sources (FAO and WFP 2008).

Access to credit is important for household resilience and as a coping mechanism against internal and external shocks. A 2009 survey showed that over 33% of households and 25% of the poorer group used credit to cope with shocks (Santos et al. 2011). Credit can have a major impact on smoothing consumption. One study showed that household consumption variability when faced with income shocks was reduced by about 50% among Grameen Bank borrowers (Pullabhotla and Ganesh-Kumar 2012). This underscores the value of credit as something beyond a means to finance agriculture production.

Another survey found that about 38% of farmers had access to agriculture credit, with loans from friends and relatives being the most common (30%), followed by NGOs (28%), Bangladesh Krishi Bank (17%),

[47] The Department of Agriculture Extension lacks adequate female staff needed to reach out effectively to rural women in production agriculture and home gardens, which can improve nutrition outcomes. Female household heads are less likely to get extension services and are less likely to access quality services than males (Ragasa et al. 2013).
[48] Each sub-assistant agricultural officer is responsible to visit 1,000–1,200 farmers, compared to 280 in countries like China and Vietnam (FPMU 2013).

local moneylenders (7%), and government banks (6%).[49] While more than half of landless farmers took loans from informal sources (56%), larger farmers were far more likely (83%) to take loans from the formal sector. Two public sector rural finance banks, the Bangladesh Krishi Bank and the Rajshahi Krishi Unnayan Bank, account for more than 50% of bank lending to agriculture (Pullabhotla and Ganesh-Kumar 2012).[50]

Crop insurance has the potential to be a risk management tool in addition to microcredit to enhance resilience against extreme weather and other events that damage crops. Bangladesh introduced crop insurance in the late 1970s, but it experienced large losses for a variety of reasons and was stopped in 1996 (Climate Change Cell 2008). Weather index-based crop insurance is another form which incorporates historical weather and crop production data. It has the advantage of reducing farm-level monitoring and has relatively low transaction costs. The Asian Development Bank and Japan International Cooperation Agency have provided US$2 million for a 3-year pilot program on weather index-based crop insurance, with the goal of covering at least 12,000 farm households (Asian Development Bank 2013).

[49] In the 2010 BBS Household Income and Expenditure Survey (HIES), 32% of the households reported receiving loans from financial or non-financial institutions, friends, moneylenders, etc. The proportion was higher in rural areas (35%) than in urban areas (24%). The key sources were Grameen Bank (21%), the Association for Social Advancement (18%), and other NGOs (14%), many of which have established a significant position in rural credit, as well as BRAC.

[50] The Bangladesh Bank has expanded credit for small farmers and sharecroppers cultivating under 200 decimals (1 decimal = 435 square feet). The Bank has provided about US$65 million to BRAC's Borga Chashi Unnayan Programme, which offers credit at 5% interest through village organizations that manage the credit and promote savings. Loan duration varies between 6 to 10 months, with a third of the loan repaid in monthly installments and the rest at harvest. In 2013, 578, 210 farmers used the credit, a 2.4-fold increase since 2010 (FPMU 2013).

APPENDIX 5. SOCIAL PROTECTION PROGRAMS

Program Categories	Budget (Million BDT)	Beneficiaries (000 people)	% of Budget	% of Beneficiaries
Pregnancy and Early Childhood	5,357	56.7	2.3%	0.7%
Maternal, Child, Reproductive, and Adolescent Health	*1,390*	*6.7*		
Revitalization of Community Healthcare Initiative	*3,967*	*50*		
School Age	20,290	1,404	8.8%	18.1%
School Feeding Programs	*4,565*	*244*		
Working Age	54,398	1,037	23.6%	13.4%
Allowances for Widows, Deserted, and Destitute Women	*33,120*	*92*		
Economic Empowerment of the Poor	*1,104*	*401*		
Food Assistance for Chittagong Hill Tracts	*2,423*	*35.7*		
Employment Generation for the Ultra Poor	*12,000*	*4.2*		
Vulnerable Group Development	*8,589*	*226*		
Food-for-Work	*14,297*	*167*		
One Household One Farm	*5,380*	*96.7*		
Old Age	70,118	305.2	30.4%	3.9%
Disability	1,030	28.6	0.5%	0.4%
General Purpose	16,119	104.1	7.0%	1.3%
Food Transfers	44,787	3,986.3	19.4%	51.4%
Vulnerable Group Feeding	*12,008*	*850*		
Test Relief Food	*12,620*	*130*		
Gratuitous Relief Food	*2,596*	*900*		
Open Market Sales	*17,580*	*2,206.3*		
Others	18,800	831.6	8.1%	10.8%
TOTAL	**230,970**	**7,760**		

Other school age programs include: stipends for primary, secondary, and higher education. Other working age programs include: social development fund, rural employment and road maintenance fund, and Ashryan 2 project. General purpose programs include: climate change fund, national service, block allocations for disaster management, and others.

Source: Bangladesh Planning Commission 2013

APPENDIX 6. POLICIES, STRATEGIES, AND PROGRAMS/PROJECTS RELATED TO FOOD SECURITY IN BANGLADESH

Government of Bangladesh Policies, Strategies, and Programs			
Description of policy, strategy, or program/project	**Lead organization**	**Dates**	**Sector**
Climate Change Strategy and Action Plan 2009: Long-term strategy for conducting adaptation programs to address the impacts of climate change in Bangladesh.	Ministry of Environment and Forests	2009	Climate change and resilience
Country Investment Plan: A 5-year road map on investing to improve agriculture, food security, and nutrition. It is considered the investment arm of the 2006 National Food Policy. The plan identifies 12 programs and 40 subprograms and numerous projects to be executed from July 2010 to June 2015. The plan addresses public investments under the GOB Annual Development Plan, and is designed to leverage investment by the private sector. While the basic goals and objectives of the Country Investment Plan are stable, the number of projects and related financial resources will change throughout the 5-year period.	Food Division Ministry of Food and Disaster Management	2011–2015	Food security and nutrition
Health, Population and Nutrition Strategic Development Plan: Ensures quality and equitable health care for all citizens in Bangladesh by improving access to and utilization of health, population, and nutrition-related services with special attention to improving the health status of the disadvantaged and the underserved—poor, women, children, elderly, marginalized, and physically and psychologically challenged.	Ministry of Health and Family Welfare	2011–2016	Health, population, and nutrition
National Agricultural Policy: The goals of the policy are to achieve food self-sufficiency and to increase agriculture output which will allow Bangladesh to attain 2021 growth goals.	Ministry of Agriculture	2010	Agriculture
National Food Policy: Promotes adequate and stable supply of safe and nutritious food; increased purchasing power and access to food for the people; and adequate nutrition for all individuals, especially women and children.	Ministry of Food and Disaster Management	Approved in 2006	Food security
National Food Policy Plan of Action (2008–2015): The plan translates the National Food Policy into 26 strategic areas of intervention and, under each, identifies priority actions, responsible actors, and a set of policy targets and indicators. The preparation of the Plan of Action involved 11 ministries, civil society, NGOs, the private sector, and Bangladesh Development Partners. The 12 Country Investment Plan programs directly derive from the 26 areas of action, by aggregating and prioritizing those requiring investment.	Food Planning and Monitoring Unit	2008–2015	Ministry of Food and Disaster Management
National Plan for Disaster Management: Developed by the Disaster Management Bureau in the then Ministry of Food and Disaster Management. In 2012, this function was transferred to the newly created Ministry of Disaster Management and Relief. The ministry, through the Plan, guides the design and implementation of disaster management policies and programs. The vision for disaster management is to reduce the vulnerability of people, the poor in particular, to the effects of natural, environmental, and human induced hazards to a manageable and acceptable level. The plan is designed to strengthen the capacity of the Bangladesh disaster management system in improving its response and recovery management at all levels.	Ministry of Disaster Management and Relief	2010–2015	Disaster planning and response
National Social Protection Strategy: Seeks to streamline and strengthen the existing safety net programs with a view to achieving better results from money spent, and to broaden the scope of social protection from the narrower safety net concept to include employment policies and social insurance to address the emerging needs of a middle income Bangladesh in 2021 and ahead.	Bangladesh Planning Commission	2014	Social protection programs

Government of Bangladesh Policies, Strategies, and Programs			
Description of policy, strategy, or program/project	**Lead organization**	**Dates**	**Sector**
Sixth Five Year Plan: Develop plans, strategies, policies, and institutions to help guide the private sector in helping Bangladesh achieve the goals set in Vision 2021 and the associated Perspective Plan 2010–2021 that sets development targets.	Ministry of Planning Government	2011–2015	Multisectoral

U.S. Government and U.S. Agency for International Development (USAID) Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
Bangladesh Feed the Future Multi-Year Strategy	USAID	2011–2015	Agriculture, nutrition, food security; nationwide
Bangladesh Feed the Future Strategic Review	USAID	2010	Agriculture, nutrition, food security; nationwide
Country Development Cooperation Strategy	USAID	2011–2016	Multisector; nationwide
Agriculture Extension Capacity Building Activity Project: Objectives are to strengthen the agricultural extension system to sustainably improve food security and nutrition for 200,000 vulnerable women and smallholder farmers.	USAID, CARE, Dhaka Ahsania Mission	2012–2017	Agriculture extension 20 districts in Dhaka, Barisal, and Khulna
Agriculture Value Chains Project: Objectives are to enhance long-term food security in the Southern Delta by applying a market systems approach to increase access to and availability of diverse and nutritious fruits, vegetables, and pulses in local, regional, and national markets which will contribute significantly to achieving improved food security in the targeted area.	USAID, DAI	2013–2018	Food security, livelihoods, and nutrition 20 districts in Dhaka, Barisal, and Khulna divisions
Agro-Inputs Program: Objectives are to help establish a sustainable input retail network of 3,000 input dealers serving over 1 million smallholder households across 20 southern districts and generating more than US$100 million in sales.	USAID, CNFA	2012–2017	Agriculture and food security 20 districts in Dhaka, Barisal, and Khulna divisions
Aquaculture for Income and Nutrition: Objectives are to improve livelihoods of 1 million households and add over US$200 million in fish and shrimp production to the aquaculture industry to sustainably reduce poverty and hunger. It is working on the appropriate regulatory and policy framework for implementation of existing policy and regulatory measures in the Hatchery and Feed Acts to secure fish seed and fish feed quality; working to establish new salt-tolerant shrimp species; working with the USAID Greater Harvest and Economic Returns from Shrimp program to bolster production capacity in established species; improving stock of tilapia, carps, shrimps, and prawns; providing training and capacity-building of government and private hatcheries to be local hubs for sourcing, developing, and distributing quality seed to fish farms; and improving nutrition through homestead horticulture.	USAID, World Fish with Department of Fisheries, Bangladesh Fisheries Research Institute, BRAC, Central Institute of Freshwater Aquaculture, Save the Children	2011–2016	Aquaculture and food security 20 districts in Dhaka, Barisal, and Khulna divisions
The Bangladesh Policy Research and Strategy Support Program for Food Security and Agricultural Development: Objectives are to conduct applied research to fill knowledge gaps on critical food security and agricultural development to provide policy options and advisory services to decision makers and stakeholders, collaborate with national institutions to strengthen analytical capacity within the country, and stimulate policy dialogue.	USAID, International Food Policy Research Institute	2010–2014	Nationwide

U.S. Government and U.S. Agency for International Development (USAID) Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
MaMoni Health Systems Strengthening Project: Objective is to improve the utilization of integrated maternal, newborn, and child health; family planning; and nutrition services.	USAID, Jhpiego, Save the Children, John Snow, Inc., Johns Hopkins University Institute for International Programs, icddr,b, Dnet, and Bangabandhu Sheikh Mujib Medical University	2013–2017	Health systems strengthening Districts: Bhola, Brahmanbaria, Habiganj, Jhalokathi, Lakhsmipur, Noakhali, Pirozepur
NGO Health Service Delivery Project (Smiling Sun): Objectives are to support the delivery of essential service packages through a network of around 25 NGO clinics that will reach around 20 million people in poor and underserved communities.	USAID, Pathfinder International, CARE	2012–2016	Health
Nobo Jibon: Objectives are to reduce food insecurity and vulnerability for 191,000 direct beneficiary households (nearly 1 million people).	USAID, Save the Children	2010–2015	Food security, livelihoods, health, and nutrition Barisal Division: 10 upazilas
PROSHAR: Objectives are to reduce food insecurity among vulnerable rural populations; income and access to food of poor and ultra-poor households improved; health of pregnant and lactating women and children under 5 (with particular attention to children under 2 improved; and institutions and households prepared to respond effectively to shocks.	USAID, ACDI/VOCA	2010–2015	Food security, livelihoods, health, and nutrition Khulna Division: Batiaghata, Lohagara, and Sarankhola upazilas
SHIKHA project: Objectives are to improve maternal diet and infant and young child feeding practices in the Feed the Future area. (The SHIKHA project was designed based on the successes of the Bill & Melinda Gates-funded Alive & Thrive Project, with additional emphasis on improving maternal dietary diversity.)	USAID, FHI 360, BRAC, Asiatic Marketing & Communications Limited	2013–2016	Maternal and child nutrition 26 upazilas in Barisal and Khulna divisions
SHOUHARDO II: Objectives are to reduce child malnutrition while contributing to greater livelihood security and women's empowerment and to transform the lives of 370,000 poor and extremely poor households in 11 of the poorest and most marginalized districts by reducing their vulnerability to food insecurity.	USAID, CARE	2010–2015	Food security, livelihoods, health, and nutrition Regions: North Char, Mid-Char, Haor, and Coastal; 11 districts; 30 upazilas; 172 unions
The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project: Objective is to use the 1,000 days approach to improve the nutritional status of women and children under 2 years of age.	USAID, John Snow Research and Training Institute, Helen Keller International, Save the Children, International Food Policy Research Institute, Manoff Group	2011–2016	Maternal and child health 40 upazilas in the USAID Feed the Future zones of influence of Barisal and Khulna
WASHplus Bangladesh: Supports healthy households and communities by creating and supporting interventions that lead to improvements in access, practice and health outcomes related to water supply, sanitation, and hygiene and indoor air pollution.	USAID, FHI 360, Winrock, CARE, WaterAid	2010–2015	Water, sanitation, and hygiene Southern Bangladesh

Other Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
Adaptation to Climate Change and Rehabilitation of Livelihoods in Selected Districts of South Bangladesh: Objectives are to restore the livelihoods and means of production destroyed by the two cyclones of 2007 and 2009, with approaches for medium- and long-term adaptation to climate change; and to support climate-resilient agricultural production and alternative income-generating activities, as well as community- and school-based disaster risk reduction and climate change adaptation.	GIZ, BRAC, Ministry of Agriculture	2011–2016	Livelihoods Districts of Barguna, Patuakhali, and Bhola in Barisal Division
Alive & Thrive Project: Seeks to develop scaled-up models for preventing child undernutrition by improving infant and young child feeding practices.	Bill & Melinda Gates Foundation, FHI 360, BRAC	2009–2014	Infant and young child feeding; 50 upazilas across Bangladesh
BRAC Water, Sanitation and Hygiene Programme (WASH II): Objective is to halve the proportion of the population without sustainable access to safe drinking water and basic sanitation by 2015. The programme provides sustainable and integrated services in rural and isolated areas, breaking the cycle of contamination caused by unsanitary latrines, contaminated water, and unsafe hygiene practices.	BRAC—funded by the Embassy of the Kingdom of the Netherlands, DGIS, the Bill and Melinda Gates Foundation, and DFID	2011–2015	Water, sanitation, and hygiene Urban and rural Bangladesh in 53 districts and 248 sub-districts
CARE-GSK CHW Initiative: Public-private partnership to improve health outcomes of women and children under 2 years of age in traditionally underserved and poor communities.	Glaxo Smith Kline Bangladesh, CARE	2012–2015	Health Sunamganj District
Char Development and Settlement Project IV: Objectives are to improve and secure livelihoods for the poor living on five chars by improving basic infrastructure (embankments, canals, minor roads, bridges, cyclone shelters, and foreshore plantations).	IFAD & Netherlands Embassy	2011–2018	Livelihoods; Chittagong and Noakhali districts
Chars Livelihoods Programme: Objectives are to increase income and reduce environmental vulnerability among the people occupying Chars areas by providing productive assets - mostly cattle – which allows beneficiaries to diversify their incomes. Assist households to build plinths to raise their homes above flood levels, provide hygienic latrines, and train households to produce cattle feed, raise poultry, and collectively market milk.	Australian Agency for International Development, DFID, Maxwell Stamp	2009–2015	Livelihoods, resilience, and environmental vulnerability
Chars Livelihoods Programme II: Objectives are to improve the livelihoods, incomes, and food security of extremely poor people on island chars, by raising homes on earth plinths for flood protection, providing access to sanitary toilets, and improving incomes through asset transfers and other means.	DFID, Australian Agency for International Development	2010–2016	Livelihoods Jamuna River districts of Bogra, Gaibandha, Jamalpur, Kurigram, and Sirijganj in northwest Bangladesh
Children's Safe Water Program: Objectives are to provide the most marginalized, disaster-affected people in urban and rural areas with access to safe drinking water to contribute to the achievement of Millennium Development Goal 4: reduce child mortality.	Procter and Gamble, CARE	2012–2014	Safe drinking water
Chittagong Hill Tracts Development Facility: Objectives are to strengthen governance following the peace accords, empower communities, and to improve food production capacity	UNDP	2005-2015	Governance, economic development, food security Bandarban, Khagrachari and Rangamati districts
Coastal Climate Resilient Infrastructure Project: Objectives are to construct climate resilient road infrastructure and cyclone shelters to improve market access and achieve improved livelihoods.	IFAD, Asian Development Bank, and KfW	2013–2019	Climate infrastructure 12 districts in Dhaka, Barisal, and Khulna divisions

Other Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
Economic Empowerment of the Poorest (EEP): Objectives are to enable one million people to lift themselves out of extreme poverty via a challenge fund for selected NGOs to provide assets and services to beneficiary households. Productive assets (cows, other livestock, transport, etc.) are combined with cash, nutrition supplements, education, business, and other forms of training, small-scale water and sanitation infrastructure, and hygiene education.	DFID	2008–2016	Food security and poverty reduction; nationwide
Employment Generation Program for the Poorest Project (EGPP): Objectives are to provide short-term employment on community subprojects to enable households to better cope with vulnerability.	World Bank	2010–2014	Employment generation; nationwide
Empowerment and Livelihood Project: Objectives are to improve the livelihoods, quality of life, and resilience to climate variability, natural hazards, and other shocks of the rural poor. Components include community and livelihood development at the village level, institutional development and livelihood promotion at the inter-village level, and capacity development and partnership building from cluster to national levels.	World Bank	2010–2016	Livelihoods
Enhancing Sustainable Food and Livelihood Security of the Ultra-poor, Marginal Farmers and Sharecroppers: Objectives are to address food and livelihood insecurity, malnutrition, seasonal vulnerability, social exclusion, injustice, and discrimination to the target groups: the ultra-poor women and the marginal farmers and sharecroppers.	European Union	2012–2014	Food aid, food security Badalgachi, Damoirhat, Mahadevpur, Patnitala, Porsa, and Sapahar upazilas of Naogaon District
Food and Livelihood Security program for the ultra-poor women, small and marginal farmers: Objective is to improve food security and livelihoods of the rural ultra-poor, marginal farmers, and sharecropper households in northwestern Bangladesh by diversifying income sources through capacity building and providing assets and input support, increasing diversity, and increasing crop yields of marginal farmers and sharecroppers.	European Union, Resource Integration Centre Association	2012–2014	Food aid, food security 6 upazilas: Bagatiapara, Baraigram, Gurudaspur, Lalpur, Natore sadar, and Singra in Natore District
Food Policy Program: Objectives are to generate applied research to fill knowledge gaps on critical food security and agricultural developmental issues, and to facilitate the policymaking process, stimulate policy dialogue, and communicate evidence-based research findings to relevant ministries and other stakeholders. There are three specific interventions: provide policy advisory services, carry out research in collaboration with national institutions for developing evidence-based policy options, and improve the effectiveness of the delivery of food-policy related information to decision makers and other stakeholders.	International Food Policy Research Institute; Poverty, Health and Nutrition Division; Development Strategy and Governance Division	2010–2014	Food policy; nationwide
Haor Infrastructure and Livelihood Improvement Project: Objectives are to reduce poverty and enhance access to health care facilities by improving road infrastructure, increasing aquaculture production, and securing jobs for rural women.	IFAD	2012–2020	Livelihoods development 5 districts in the Haor Basin in the Dhaka and Sylhet divisions
Health, Nutrition & Food Security for Marginalized Children and their Families: Objectives are to improve health, nutrition, and food security conditions of 8,000 marginalized children and their families in 40 government primary schools.	DANONE, CARE	2010–2014	Health and nutrition Gabtoli, Sariakandi, Sherpur, Sibganj and Sonatola upazilas in Bogra District
Humanitarian Innovation Fund Early Warning System: Objectives are to complement the existing early warning system for fishing communities through digitization and public awareness	Humanitarian Innovation Fund, CARE	2012–2014	Early warning; Cox's Bazaar

Other Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
Improving Delivery and Uptake of Essential Nutrition through the Health and Food System and in the Community: Objectives are to improve the delivery, monitoring, and uptake of essential nutrition interventions and practices through the local health and food system and the community.	UNICEF, CARE	2013–2015	Health and nutrition Satkhira District: Ashahuni and Shayamnagar upazilas; Barisal District: Muradi Upazila
Improving Food Safety in Bangladesh: Objectives are to improve food safety and reduce incidence of food-borne illness and strengthen stakeholder involvement and coordination leading to enhanced trade in food commodities (e.g., fish and fish products and fruits and vegetables) and lead to an efficient and well-functioning food safety control system.	FAO—funded by the Netherlands government	2012–2015	Health; nationwide
Initiative for Leading Food and Livelihood Security Sector: Objectives are to improve food security and reduce income poverty for the rural ultra-poor and marginal farmers' households in northwest Bangladesh, contributing to Millennium Development Goal 1.	European Union, Eco-Social Development Organization Association	2012–2014	Food aid, food security 5 upazilas: Bholahat, Gomastapur, Nachole, Nowabganjin, and Shibganj of Nowabganj District in Rajshahi Division
Integrated Agricultural Productivity Project: Objectives are to sustainably enhance productivity of crop, livestock, and fisheries subsectors, and strengthen capacities to manage a country-led and inclusive process for designing, implementing, monitoring, and evaluating investment operations in agriculture and food and nutrition security.	FAO, World Bank—funded through Global Agriculture and Food Security Program	2011–2015	Agriculture and food security Rangpur and Barisal
Katalyst Phase III: Objectives are to provide technical assistance to, and share risk through, partnership grants with private sector businesses, e.g., seed producers and feed millers, to extend their reach to smallholders; and to strengthen the capacity of public institutions such as the Department of Agriculture Extension and the Seed Certification Agency.	DFID, Swiss Development Cooperation, Ministry of Foreign Affairs of Denmark	2013–2017	Business development; nationwide
Main River Flood and Bank Erosion Risk Management: Objectives are to sustain incomes and livelihoods of people along the erosion prone main rivers in Bangladesh; enhance resilience to flood and riverbank erosion risks; integrate flood and riverbank erosion disaster risk mitigation measures with non-structural and structural measures; establish measures to sustain infrastructure involving local communities; and strengthen flood and river erosion risk management system, including an improved knowledge base and institutional performance in sustainable operation and maintenance and long-term river erosion management.	Asian Development Bank	2012–no specified closing date (loan)	Agriculture (irrigation, drainage, and flood protection) Project area along the Jamuna, Ganges, and Padma rivers
Manoshi Project (part of the BRAC Health Programme): Objectives are to develop and deliver an integrated, community-based package of essential health services.	BRAC	2007–ongoing	Maternal, neonatal, and child health Urban slums in 8 city corporations throughout Bangladesh
Maternal, Neonatal and Child Health Survival Project (part of the BRAC Health Progamme): Objectives are to increase knowledge and practices related to maternal, neonatal, and child health; improve provision of quality maternal, neonatal, and child health services at household and community levels; increase availability and access to quality continuum of maternal, neonatal, and child health care and services at facilities; and increase participation, accountability, and responsiveness to communities' voice in maternal, neonatal, and child health services.	BRAC, UNICEF, Government of Bangladesh	2005–ongoing	Maternal, neonatal, and child health Rural Bangladesh

Other Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
Modern Food Storage Facilities Project: Objectives are to increase the grain reserve available to households to meet their post-disaster needs and improve the efficiency of grain storage management. Components include construction of modern grain storage silo facilities for rice and wheat, facilitate households' access to domestic silos for food grain and seed storage to improve household-level food security during and after natural disasters, enhance the institutional capacity of the Food Planning and Monitoring Unit, address analytical gaps and support the development of an evidence-based policy framework to improve the efficiency and performance of the country's overall food storage system and management of strategic grain reserves, and improve the coordination of public agencies involved in procurement, public storage, distribution of food grains, as well as disaster relief.	World Bank	2013–2029	Nationwide
National Agriculture Technology Project: Objectives are to improve the quality of research and extension services, decentralize extension services, and make them more responsive to farmers' needs.	International Fund for Agricultural Development (IFAD), International Development Association	2008–2014	Agriculture research and extension; nationwide
The National Food Policy Capacity Strengthening Program: Objectives are to build institutional and human capacities to design, implement, and monitor food security policies, particularly to improve the capacity of the Food Planning and Monitoring Unit and its collaboration with the policy wings and planning units in the GOB.	FAO—funded by USAID and the European Union	2009–2014	Food policy and planning; nationwide
The National Food Policy Capacity Strengthening Programme: Objectives are to enhance agriculture productivity (crop, livestock, and fisheries) and strengthen capacities to manage the process for designing, implementing, monitoring, and evaluating investments in agriculture and food and nutrition security.	FAO—funded by World Bank and Global Agriculture and Food Security Program	2011–2015	Food security; Barisal and Rangpur divisions
PROSPER Programme: Objectives are to address key gaps and priorities identified by the 2005 national strategy for accelerated poverty reduction; increase access to financial services for 20% of extreme poor people, and increase micro and small enterprises; introduce flexible financial and support services to help eliminate monga; and provide legal protection of savings for 15 million poor households through new microcredit regulation. Around two-thirds of the funding goes to beneficiaries through financial intermediaries with the remaining focusing on regulatory enabling environment and capacity building.	DFID, Bangladesh Bank	2007–2014	Microfinance
Rural Water Supply and Sanitation Project: Objectives are to increase provision of safe water supply and hygienic sanitation in rural areas where shallow aquifers are highly contaminated by arsenic and other pollutants such as salinity, iron, and bacterial pathogens; and facilitate early emergency response. Components include developing the public-private participation model for the construction and management of rural piped water schemes in areas where shallow tube-wells are highly affected by arsenic contamination, salinity, iron, and a low water table; target unions with severe shortages of safe water supplies, and those with water quality problems, i.e., shallow aquifer contamination with a population density that may preclude private sector interest in the provision of piped water supply; and capacity strengthening.	World Bank	2012–2017	Water, sanitation, and hygiene; 125 rural locations

Other Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
Safe Motherhood Promotional Project II (SMPP II): Objectives are to improve maternal and neonatal health service quality and utilization in peri-urban and rural areas.	Japan International Cooperation Agency, Ministry of Health and Family Welfare, CARE	2013–2014	Health; Narsingdi and Satkhira districts
Safety Net Systems for the Poorest Project: Objectives are to improve the equity, efficiency, and transparency of major social safety net programs to benefit the poorest households; strengthen the Ministry of Disaster Management and Relief program administration and transparency; and develop the Bangladesh Poverty Database.	World Bank	2013–2017	Safety net programs; nationwide
Sanitation, Hygiene Education and Water Supply in Bangladesh (SHEWA-B): Objectives are to improve the standards of hygiene practices in a sustainable way and ensure that underserved areas have access to adequate sanitation and safe water.	UNICEF and Government of Bangladesh, funded by UK AID	2009–2014	Water, sanitation, and hygiene; Reaches 20 million Bangladeshi's in rural and urban areas (19 districts) including the Chittagong Hill Tracts
Second Chittagong Hill Tracts Rural Development Project: Objectives are to increase annual household income in subproject areas through better market access with road and footpath improvements, increase product transformation though micro agribusiness development, improve security of land tenure arrangements, and better irrigation infrastructure and watershed management.	Asian Development Bank	2011–2019 (loan)	Multisector; Chittagong Hill Tracts
Second Crop Diversification Project: Objectives are to increase farmer incomes and enhance food security by fostering commercialization of agriculture through interventions to promote diversification into high-value crops and value addition, gender mainstreaming, and climate change adaptation. Direct beneficiaries are marginal, small, and medium farmers with landholdings up to 3 ha. Landless people will benefit through generated employment opportunities in rural areas.	Asian Development Bank	2010–2016 (loan)	Agriculture and food security 43 upazilas in 18 districts of Barisal, Dhaka, and Khulna divisions 9 upazilas in 9 districts of Rajshahi and Rangpur divisions
Skills and Training Enhancement Project: Objectives are to strengthen selected public and private training institutions to improve training quality and employability of trainees. Components include support to public and private institutions offering diploma-level and short-term technical and vocational education and training programs; support pilot activities such as operational support to Industry Skills Councils and Secondary School Certificate vocational schools; and strengthen the capacity of the GOB to manage these programs.	World Bank	2010–2016	Vocational training; nationwide
Social Economic Transformation of the Ultra Poor II (SETU II): Objectives are to work to sustainably graduate 20,000 extreme poor households out of poverty by facilitating a community-led development process to empower women and men in extremely poor households.	Shiree/EEP, GOB, DFID	2012–2015	Livelihoods and community development Gaibanda, Lalmonirhat, Nilphamari, and Rangpur districts
Stimulating Change through Access and Livelihoods Enhancement of Urban Poor (SCALE-UP): Objectives are to assist 10,000 poor and extreme poor people (60% extreme poor and 70% women) in improving livelihoods.	UNDP, CARE	2013–2014	Livelihoods 7 districts in Dhaka, Khulna, and Rangpur divisions
Strengthening the Dairy Value Chain Phase II: Objectives are to double dairy related incomes of 35,000 farmers in the northwest by improving smallholders participation in the value chain, including farmer mobilization and education, access to markets, and access to productivity-enhancing inputs in remote areas.	Bill and Melinda Gates Foundation, CARE	2013–2015	Dairy; Northwest Bangladesh

Other Programs			
Description of policy, strategy, or program	**Lead organization(s)**	**Dates**	**Sector and locations**
Support for BRAC Strategic Partnership Arrangement: Objectives are to deliver health and education services and livelihoods assistance to build resilience among the poorest and most marginalized communities, particularly women and children. BRAC decides on allocations of pooled funds from various development partners.	Australian Agency for International Development, DFID, BRAC	2012–2015	Health and livelihoods
Sustainable Access to Land Equality (SALE): Objectives are to strengthen access to land and property rights for all citizens, especially for the poorest in line with the overall Access-to-Land program, and to facilitate NGO interaction to ensure transparency and accountability in land administration and management through introduction of digital land management system for updating land records in the targeted areas.	European Union, CARE	2013–2015	Property rights Borguna District: Amtoli Upazila; Rajshahi District: Mohanpur Upazila; Jamalpur District: Sadar Upazila
Sustainable Healthcare by Enabling Improved Knowledge and Access (SHEBIKA): Objectives are to improve the health, hygiene, nutrition, and productivity of 650 extreme poor wage-earning women connected to export markets and 3,250 family members through development of 12 commercially viable and qualified community health workers/private community-based skilled birth attendants.	KIK Textilien, GmbH, Ministry of Health and Family Welfare, CARE	2012–2014	Health, nutrition, and livelihoods Bogra, Lalmonirhat, Nilphamari, and Rangpur districts in northern Bangladesh
Sustainable Technology Transfer to Enhance Productivity for Ultra Poor: Objectives are to contribute to food security and nutrition of poorest bottom 20% of the population of severely food insecure and hard to reach areas with high density of indigenous people.	European Union, Netz Partnerschaft Fur Entwicklungund Gerechtigkeit Ev	2011–2014	Food aid, food security Chapai Nawabgonj, Dinajpur, Kurigram, Mymensingh, Naogaon, Netrokona, Rajshahi, and Rangpur districts
Urban Partnerships for Poverty Reduction Programme (UPPR): Objectives are to support women and children in slums and informal settlements in 23 cities and towns by investing in safe water sources, low-cost toilets, footpaths, and a grant fund for women to set up small businesses for apprenticeship training and to keep drop-out-risk children in school.	DFID	2008–2014	Urban poverty reduction

APPENDIX 7. ESSENTIAL NUTRITION ACTIONS[51] AND KEY HYGIENE ACTIONS

Essential Nutrition Actions

1. Promotion of optimal nutrition for women
2. Promotion of adequate intake of iron and folic acid and prevention and control of anemia for women and children
3. Promotion of adequate intake of iodine by all members of the household
4. Promotion of optimal breastfeeding during the first 6 months
5. Promotion of optimal complementary feeding starting at 6 months with continued breastfeeding to 2 years of age and beyond
6. Promotion of optimal nutritional care of sick and severely malnourished children
7. Prevention of vitamin A deficiency in women and children

Source: Guyon and Quinn. Booklet on Key Essential Nutrition Action Messages, 2011.

Key Hygiene Actions

1. Safe treatment and storage of water at point-of-use

- Treat water to make it safe to drink. Treatment options include:
  - Hypochlorite (chlorine) solution
  - Boiling
  - Solar disinfection
  - Commercial filter
- Store treated water safely in a covered narrow-neck container with a tap, if possible. Pour water into a clean pitcher to serve or use a ladle that hangs on the wall to dispense water. Do not touch the water inside the container with hands.

2. Safe preparation and storage of food

- Wash hands before preparing food and feeding children.
- Use clean utensils and dishes.
- Clean food preparation areas with soap and water.
- Cover food with netting or cloth or store food in covered containers to protect it from insects, pests, and other animals.
- Separate raw and cooked food.
- Eat food within 2 hours of preparation.
- Use treated water to wash raw foods.
- Cook food thoroughly.

3. Wash hands using correct technique at critical times

- Handwashing with **soap** is the best way to prevent the spread of infection from person to person.
- Just rinsing hands is not enough. You have to use soap or ash every time you wash your hands.
- Wash hands under poured or flowing water. This removes the dirt and germs. A wash basin in which many people wash their hands in the same water does not prevent infection.
- Wash your hands **before** handling, preparing, or eating food and before feeding someone or giving medicines, and wash hands often during food preparation.
- Wash your hands **after** going to the toilet, cleaning a person who has defecated, blowing your nose, coughing, sneezing, or handling an animal or animal waste
- Wash your hands both before and after tending to someone who is sick.

4. Sanitary disposal of feces

- Always use a latrine.
- Dispose of the infant‘s/child‘s feces in a latrine.
- Wash hands after going to the toilet, changing a child‘s diaper, or cleaning a person who has defecated.
- Keep the house and compound clear of animal feces

Source: Integrating Water, Sanitation and Hygiene into Nutrition, WASHplus. 2013; World Health Organization; USAID. 2010. How to integrate water, sanitation and hygiene into HIV programmes.

[51] The ENA are being updated in early 2015. Please check the CORE Group website for an update.

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