ENDING RURAL HUNGER

The case of Ghana

October 2017

www.endingruralhunger.org

Africa Growth Initiative at BROOKINGS

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Author's note and acknowledgements

This report was prepared by Francis Mulangu, an economist at the Millennium Challenge Corporation, as part of the Ending Rural Hunger project led by Homi Kharas. The team at the Africa Growth Initiative within the Global Economy and Development program of the Brookings Institution, led by Eyerusalem Siba and comprising Amy Copley, Christina Golubski, Mariama Sow, and Amadou Sy, oversaw the production of the report. Christina Golubski provided design and editorial assistance. John McArthur provided invaluable feedback on the report. Data support was provided by Lorenz Noe, Krista Rasmussen, and Sinead Mowlds.

This study would not have been possible without the additional insights provided by the following individuals during the course of interviews and exchanges: Faisal Munkaila (Ministry of Food and Agriculture), Dr Irene Egyir (Ministry of Finance and Economic Development), Dr. Kathleen Beegle (World Bank), Theophilus Okyere Labri (International Fund for Agricultural Development), Dr. Fenton Sands (United States Agency for International Development), Samuel Adjei (World Food Program), Boroto Ruhiza (Food and Agriculture Organization), Paulina Addy (WIAD), Aba Hagan (Christian Aid), Eric Banye (Netherlands Development Organization), Dr. Shashi Kolavalli (International Food Policy Research Institute), Philip Tetteh Quarshie (Alliance for Green Revolution in Africa), and Gertrude Ananse-Baiden (Partnership for Child Development). Dr. Francis Kemeze and Mr. Chapman Kodam contributed significantly to the production of this case study. This paper reflects the views of the author only and not those of the Africa Growth Initiative.

Brookings gratefully acknowledges the Bill & Melinda Gates Foundation's support of the Ending Rural Hunger project.

Contents

List of tables and figures

Tables

Figures

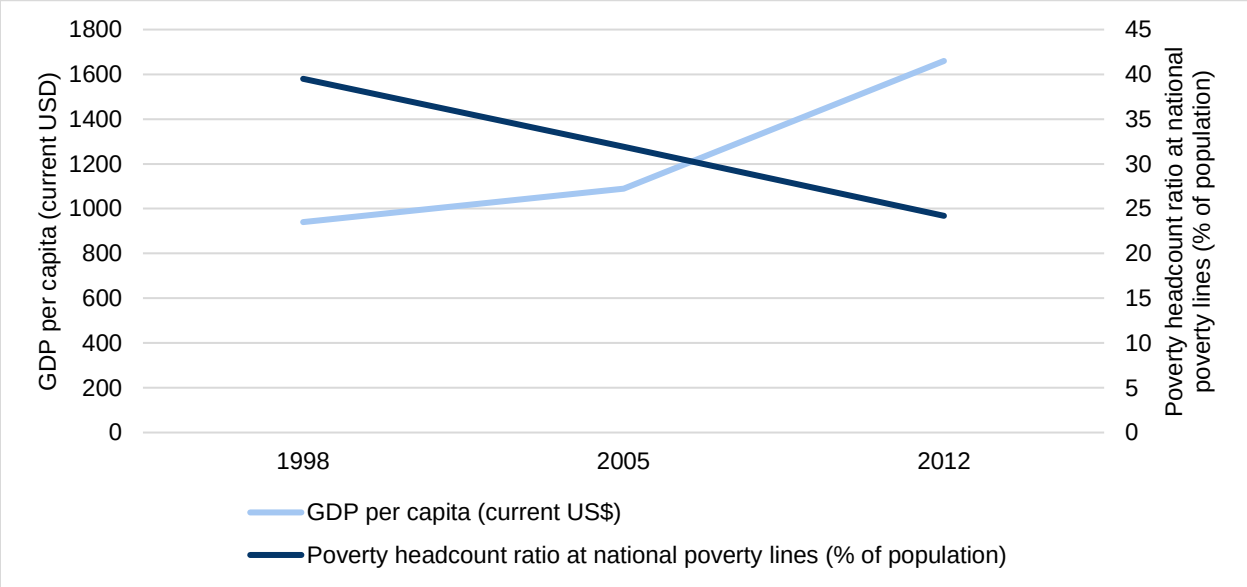
Abstract

This report seeks to examine where food and nutrition security (FNS) needs are highest in Ghana, the factors that explain the prevalence of high food and nutrition needs there, and whether its policies addressing FNS are adequately financed. To attain these objectives, we use the Ending Rural Hunger (ERH) database to identify key findings on country needs, policies, and resource gaps in addressing food insecurity. We also use supplemental secondary data from external sources such as the Ghana Living Standard Surveys 2013/2014 (GLSS 6), Demographic and Health Surveys (DHS), Population Based Surveys (PBS), FAOSTAT data, World Development Indicators (WDI), ministry-level data, and policy documents. In sum, Ghana performs much better than the African average on FNS indicators, with the exception of percent of calories from staples and anemia in children under five. This is largely due to a number of ongoing social protection and agricultural growth programs heavily supported by development institutions and NGOs, thanks to the country's sustained political stability. However, although the FNS needs are not as high as those in other African countries, Ghana is not able to self-finance FNS and other agricultural projects. It still heavily relies on ODA. Going forward, the country will have to push toward domestic resource mobilization and find innovative public private partnerships to help close the resource gap and finance SDG2 and other FNS objectives. The recent graduation of Ghana to lower-middle-income country (LMIC) status means that it will be less likely to qualify for external development assistance, which has historically supported FNS needs. We have noted that extensive work has been undertaken to both restructure internal resource mobilization and make aid money more effective. But further work needs to be done. Ghana needs to work with traditional FNS donor partners to provide clarity about their strategies, timeline, and implications of said strategies.

1. Introduction

Ghana has experienced high economic growth in recent years, propelling it to lower-middle-income status. Maintained by the rise in commodity prices throughout the past decade and half, a buoyant mining sector, and the discovery of petroleum in 2007, economic growth in Ghana averaged 5.4 percent between 2000 and 2010 and grew to 7.1 percent between 2010 and 2016. Per capita income almost doubled from $984 in 2000 to $1,707.7 in 2016; leading the proportion of the population living below the national poverty line (the poverty headcount ratio below the national poverty line) to fall from 39.5 percent in 1998 to 24 percent in 2012, as seen in Figure 1.

Figure 1: GDP per capital and poverty, 1998-2012



Source: World Development Indicators.

These positive statistics, however, obscure the unequal sharing of benefits of economic growth, disadvantaging those still living below the poverty line; persons with disabilities; children; youth and the elderly; women, and, in some cases, certain regions of the country as a result of lack of income-earning opportunities. This unequal sharing is especially true in northern Ghana where poverty rates vary between 50 percent and 70 percent among its three regions (Upper East, Upper West, and Northern regions), exacerbated largely by the poor weather conditions. Given the inconsistent relationship between economic growth, poverty reduction (mostly in Northern Ghana), and equitable income distribution, the government acknowledges the need for enhancing

fiscal measures to better target social protections and helping households meet their food and nutritional security needs.

Goal 2 of the recently adopted Sustainable Development Goals (SDG2) aims to “end hunger, achieve food security and improve nutrition, and promote sustainable agriculture” by 2030. The goal’s targets include doubling agricultural productivity; ensuring sustainable food production; ending all forms of malnutrition, and increasing investment in rural infrastructure and agricultural research, among others. In the aim to outline countries’ progress toward achieving SDG2 and evaluating the needs, policies, and resources in relation to that goal, in October 2015, the Brookings Institution published the report *Ending Rural Hunger: Mapping Needs and Actions for Food and Nutrition Security*. The present report presents the case of Ghana and assesses its existing food and nutrition security (FNS) needs, the policies put in place by the national government in order to address these needs, and the resources available.

Ghana’s Medium-Term Agriculture Sector Investment Plan (METASIP) (2011-2015), which outlines the country’s plan to enhance food security and emergency preparedness with the ultimate goal of transforming Ghana’s agricultural sector, echoes SDG2. Ghana has seen success but, while poised to meet its SDG2 targets, a number of factors threaten its progress. Recent deteriorating macroeconomic indicators—i.e., high government debt following the 2012 elections, currency depreciation, inflation, all of which exacerbated existing power shortages—have been detrimental to the performance of many other social indicators (IFRPI, 2016). Maternal and infant mortality associated with inadequate food and poor access to improved sanitation is an especially concerning area (WDI Online). In addition, the ongoing International Monetary Fund’s (IMF) fiscal stabilization agreement to help shore up the macroeconomic instabilities led the government to scale down social protection programs for FNS, such as fertilizer subsidy and school feeding programs (IFPRI, 2016).

Given the past disconnect between Ghana’s economic growth, poverty alleviation, and performance in achieving FNS (Government of Ghana 2013), successive governments have implemented a series of social protection programs that eventually helped the country meet Millennium Development Goal 1 (MDG1) of reducing poverty by half before the 2015 deadline. Indeed, these multiple interventions coupled with external incentives such as the conditions for the release of the Heavily Indebted Poor Countries (HIPC) funds led to Ghana’s successful poverty reduction. The creation of Ministry of Women and Children’s Affairs in 2002 (renamed Ministry of Gender, Children and Social Protection (MoGCSP)) also marked a step to systematically provide the infrastructure to meet specific needs of vulnerable groups, for example,

in areas of reducing maternal and infant mortality and to tackle cultural practices that inhibit girls' education.

The current list of social protection programs cuts across sectors, ranging from education and health to livelihood support, including agriculture. The social protection programs in Ghana directly targeting FNS include: school feeding programs and take-home rations for girls (which include rice and a can of oil each time they attend school for 85 percent of the month), livelihood empowerment support programs (such as livelihood empowerment against poverty), a national health insurance system, and support for off-farm livelihood enhancement activities. In terms of agriculture, there are programs such as the fertilizer subsidies program, block farm program, agricultural mechanism stock company, and a national food buffer stock program.

The objective of this report is multiple. First, it examines where food and nutrition security needs are highest in Ghana, examining the spatial and demographic decomposition of the affected population in order to assist in better policy targeting. It also investigates factors that explain the prevalence of high food and nutrition needs and how they relate to policy variables such as access to food, consumption and production shocks, rural safety net programs, and the rural investment climate. Second, it explores whether effective policies addressing FNS are in place and whether financial resources are adequately allocated to places with the highest needs. Third, it identifies challenges to existing efforts of the national government to ascertain the right set of priorities in their effort to achieve SDG2. Fourth, it explores more efficient ways by which the government of Ghana and its external stakeholders can align their priorities to achieve the common goal of SDG2. Finally, it provides policy recommendations to assist national governments in addressing FNS needs and achieving the zero-hunger target by 2030.

To attain these objectives, we use the Ending Rural Hunger (ERH) database to identify key findings on country needs, policies, and resource gaps in addressing food insecurity. We also use supplemental secondary data from external sources such as the Ghana Living Standard Surveys 2013/2014 (GLSS 6), Demographic and Health Surveys (DHS), Population Based Surveys (PBS), FAOSTAT data, World Development Indicators (WDI), and ministry-level data on expenditures from budget documents to identify spatial and demographic composition of the population most affected by food and nutrition needs in the country and to assess whether adequate resources are available to address them. Similarly, we systematically analyze national and regional strategic documents to identify government efforts and priority areas to achieve SDG2.

Summary of main findings

- **Except for percent of calories from staples and anemia in children under five, Ghana performs much better than the African average on FNS indicators**. This is largely due to a number of ongoing social protection and agricultural growth programs heavily supported by development institutions and NGOs, thanks largely to the country's sustained political stability.
- **Persistent poverty, limited agricultural outputs, and seasonal effects as well as fluctuations in food prices have been reported to be the main causes of food insecurity in northern Ghana.** Unlike the southern part of the country, northern Ghana experiences only one rainy season, which makes prices and yields very volatile. Despite the existence of mitigating tools such as rainfall insurance, buffer stock company, and food storage, additional market failures affect the effectiveness of these mitigation tools.
- **Transport and logistical infrastructure for moving food stuff both internally and internationally to maintain food security performs well in Ghana**. In addition to having an adequate road network, Ghana's export time statistic is better than the African average, largely due to the two ports of Tema and Takoradi and the single window systems where importers/exporters can go and pay for all the clearance fees. These factors have also contributed to its better-than-average logistical performance (an indicator measuring a country's quality of trade and transport-related infrastructure, as perceived by logistics professionals).
- **Fertilizer subsidy is by far the most preferred FNS budgetary expenditure item, absorbing between 10 and 34 percent of all agriculture expenditures between 2006 and 2012.** Fertilizer subsidies were fully reintroduced after the 2008 global food price crises and remained in effect until recently. The macroeconomic instabilities that Ghana has been facing since 2012 led the government to abandon the subsidy program due to budget tightening measures in 2016.
- **Rural health and food aid, and school feeding program expenditures are a distant second and third budgetary expenditure, respectively.** These programs have historically been supported by external resources either through budget support from donors or NGO interventions. For this reason, the government of Ghana allocates less of its own resources to these programs.
- **Ghana is not able to self-finance FNS and other agricultural projects**. It still heavily relies on ODA, as the country only allocated 4 percent of its budget to both social

protection contributions and subsidies in 2014. Even when it comes to agriculture-related activities, the government of Ghana only supports input subsidies and leaves the rest to development partners.

- **Going forward, Ghana will have to push toward domestic resource mobilization to help close the resource gap and finance SDG2 and other FNS objectives.** The recent graduation of Ghana to lower-middle-income country (LMIC) status means that it will be less likely to qualify for external development assistance, which has historically supported FNS needs. Ghana has to rely on its own resources to fund FNS.
- **Extensive work has been undertaken to both restructure internal resource mobilization and make aid money more effective. But further work needs to be done.** Ghana needs to work with traditional FNS donor partners to provide clarity about their strategies, timeline, and the implications. Issues for consideration include: How will any phasing out be managed to ensure that development gain previously obtained through donor funds are sustained, particularly in the FNS sectors where donors have played a key role? Are there experiences with LMIC graduations in other continent that can guide Ghana's transition?

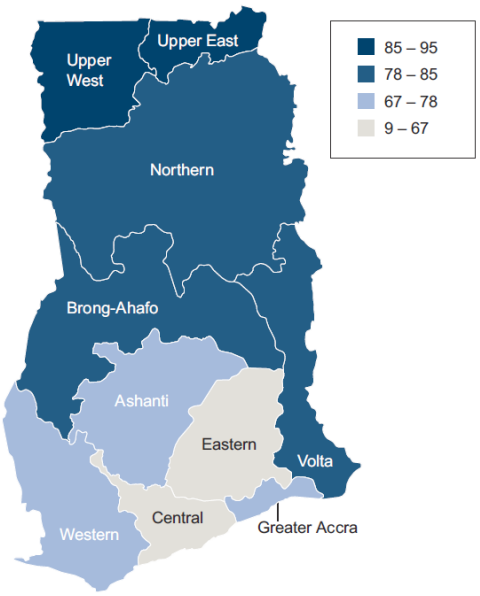
The rest of the paper is outlined as follows: Section 2 discusses Ghana's strategy for achieving SDG2. We will then discuss the state of Ghana's FNS and compare it with the key facts coming out of the ERH scorecards in Section 3. Section 4 discusses some of the on-going interventions to improve FNS outcomes in Ghana. Section 5 discusses the resources allocated by the government to address FNS and compare it to donors' priorities and Ghana's strategy to internally mobilize resources to close the SDG2 financing gap. We conclude in Section 6 with policy recommendations.

2. Ghana's strategy for achieving SDG2

Agriculture has a central role to play in promoting growth, poverty reduction, and in achieving FNS in Ghana. Agriculture contributes about 20 percent of the Gross Domestic Product (GDP). According to the Ghana Living Standards Survey (2013), about 71 percent of the rural population depends on agriculture as a source of livelihood growing crops or keeping livestock. As illustrated in Figure 2, this statistic goes as high as 95 percent in both Upper East and Upper West. For both the urban and rural populations, expenditures on agricultural products, particularly food, form a large share of household budgets. Urban households allocate 47.5 percent of their expenditures to food while rural households spend about 51.3 percent. Thus, improved productivity of agriculture has the potential to reduce poverty through increased incomes in rural areas and low food prices in both urban and rural areas.

The agricultural sector consists of five sub-sectors. The contributions of the various sub-sectors to GDP are: cocoa (2.8 percent), crops other than cocoa (15.6 percent), livestock (including poultry) (1.7 percent), fisheries (1.6 percent) and forestry and logging (2.4 percent). Though the agricultural sector continues to play a key role in Ghana's economy, its contribution to the economy continues to decline, with its share of GDP reducing from about 40 percent in 2000 to about 24 percent in 2013 and 20.1 percent in 2015.

Figure 2: Percentage of households engaged in agriculture



Source: Schnitzer et al. (2014).

The role of agriculture and its importance in ensuring FNS is reflected in Sustainable Development Goal 2 (SDG2). However, the SDGs are new and many sub-Saharan African countries are still trying to figure out how to integrate them into their policy design and implementation. It is no surprise to find that the only document where Ghana has attempted to outline its strategy for achieving SDGs is the Ghana Shared Growth and Development Agenda (GSGDA II), which was put together by the National Development Planning Commission (NDPC) in 2015, but not yet officially approved because of the recent change of ruling party.

The Medium-Term Agriculture Sector Investment Plan (METASIP) is the closest to Ghana's strategy for achieving SDG2, a strategy designed to echo the regional goals outlined in the Malabo Declaration. METASIP's mission is "a modernized agriculture culminating in a structurally transformed economy and evident in food security, employment opportunities and reduced poverty." Its stated objectives are: securing food security and emergency preparedness; improving growth in incomes; increasing competitiveness and enhanced integration into domestic and international markets; sustaining management of land and environment; improving science and technology applied in food and agriculture development and improving institutional coordination. In addition, METASIP targeted to achieve agricultural growth of at least 6 percent of GDP through the allocation of at least 10 percent of government expenditures to agriculture during the period 2011-2015. METASIP is made up of 6 programs, including 1: Food Security and Emergency Preparedness; 2: Increased Growth in Incomes; 3: Increased Competitiveness and Enhanced Integration into Domestic and International Markets; 4: Sustainable Management of Land and Environment; 5: Science and Technology Applied in Food and Agriculture Development; and 6: Improved Institutional Coordination.

Program 1 fits squarely into the FNS theme echoed in SDG 2. Its sub-components are:

(i) Productivity improvement;
(ii) Support to improved nutrition;
(iii) Support for diversification of livelihood options of the poor with off-farm activities linked to agriculture, (d) Food storage and distribution;
(iv) Early warning system and emergency preparedness;
(v) Irrigation and water management; and
(vi) Mechanization services.

One of the key objectives of the support to improved nutrition is to reduce childhood stunting and underweight as well as vitamin A, iron, and iodine deficiencies (in children and women of reproductive age) by 50 percent by 2015. Some of the activities planned to help meet this objective are:

(i) Promoting the production and consumption of high-quality protein maize, orange flesh sweet potato (for vitamin a) as well as moringa and other leafy vegetables;
(ii) Developing other high quality staples—such as cassava, yam, rice, etc.—through breeding,
(iii) Promoting fortification of staples during processing (micronutrient fortification and blending products) and link to the school feeding program;

(iv) Educating and training consumers on the appropriate combination of available foods to improve nutrition; and
(v) Promoting the consumption of micro-nutrient rich foods (e.g., eggs, meat/fish, leafy vegetables, fruits) by children and women of reproductive age, especially in rural areas.

The objective of the Early Warning System and Emergency Preparedness sub-component is to reduce the number of food insecure (vulnerable) households by 20 percent. Some of the planned activities for reaching that objective include:

(i) Identifying vulnerable households in disaster prone areas of the country;
(ii) Constructing vulnerability maps to support targeting of food security and emergency preparedness interventions;
(iii) Supporting vulnerable households and communities to establish household and community systems that can respond to emergencies (with regards to food insecurity);
(iv) Monitoring crops, livestock and fish pests and diseases;
(v) Using weather forecasting to inform farmer decisions;
(vi) Building capacity of National Food Buffer Stock Company to manage national strategic reserves. This will be done by establishing a 6-month supply of food strategic stocks (maize, sorghum, gari, etc.) and using market and price information for managing the stocks and price stabilization; and
(vii) Establishing a National Seed Security stock for emergencies.

Already, a 2014 study on the perceived impact of METASIP finds that the program had a positive impact on productivity improvement as access to fertilizer seeds and information improved. However, challenges still exist: Study respondents highlighted challenges such as the poor adaptability of the machines to local conditions (Boateng and Nyaaba, 2014).

3. Country needs scorecards

Food production and prices

FNS is often associated with a resilient agricultural sector. The experience in Asian and Latin American countries strongly suggests that agriculture can be an engine of growth early in the development process and an important force for poverty reduction and achieving FNS (World Bank, 2008). While agricultural growth has been the precursor to the acceleration of industrial growth in a number of emerging economies such as China, Brazil, and Indonesia; for Ghana, as well as for most African countries, current agricultural productivity is low, and there have been numerous failures in getting agriculture moving. As seen in Table 2, agricultural investments in fertilizer and irrigation in Ghana fall far below Brazil, China, and Indonesia, potentially explaining low yields. Ghana's agricultural sector has not been able to experience anywhere close to the results obtained under the green revolution in Asia, though agricultural GDP is improving at a faster pace than many of its African neighbors. While agricultural value added growth rate averaged about 4 percent between 2009 and 2016, the average among West African counties was about 2.9 percent (WDI Online).

Table 1: Agricultural investment and cereal productivity in Ghana, Brazil, China, and Indonesia

Indicator	Unit	Ghana	Brazil	China	Indonesia	Sub-Saharan Africa
Fertilizer consumption	kg per hectare	25.3	175.7	566	212	16
Agricultural irrigated land	% of agricultural land	0.19	1.64	10.49	16.1	n/a
Cereal yield	kg per hectare	1703.8	4641	5886	5096	1452

Source: WDI Online.

Climate variability (mostly in the North) and market uncertainty (demand and price uncertainty), faced especially by small holders, dampens production incentives and contributes to stagnation in agricultural output and productivity. On one hand, the bimodal rainy season has become less and less reliable for effective agricultural production. Although rainfall volume is not necessarily the problem, rainfall distribution within each year, which has implications on plant growth and flooding, is the biggest threat. On the other hand, price variability across the year in the North exacerbate FNS conditions as food prices are highest during hunger season when households

have run out of their reserves and saving resources to buy inputs for the next season. Households eat fewer meals and are forced to sell their buffer stocks in order to meet FNS needs.

Food distribution margins and seasonal price variability can be high in Ghana. The volatility of maize prices, which is about 0.32 annually mainly due to the high inflation rate and high international prices, is a huge burden for many households, especially for those who are net maize consumers. This is important to note because maize is a key staple with direct implications on FNS. Maize is Ghana's most important cereal crop (accounting for 55 percent of all cereal output), second-most important staple food after rice (both local and imported), second-most important commodity crop, and supports the livelihoods of more than 20 percent of small-holder farmers (FAOSTAT Online).

Poverty and food insecurity

Food insecurity, poverty, and malnutrition in Ghana are highest in the northern part of the country (Zereyesus et al, 2014). The 2013 Ghana Comprehensive Food Security and Vulnerability Analysis (CFSVA) report presents a detailed picture of the food security and nutrition situation in northern Ghana. The report employs two indicators to classify household food security. The first is a food consumption score, which combines dietary diversity, frequency of consumption, and relative nutritional importance, and then divides households into three groups: poor, borderline, and acceptable food consumption. The second is a wealth index, which is based on asset ownership and housing conditions and divides households into quintiles with the bottom two quintiles generally referred to as poor. The report uses the above two indicators to categorize households into four food security groups:

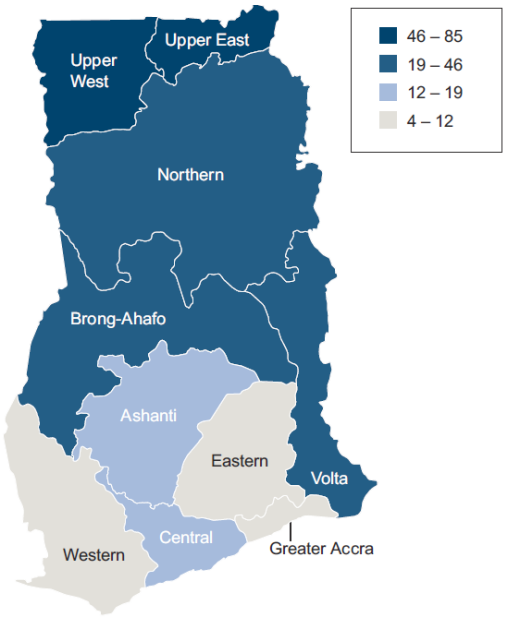
(i) Severely food insecure (households with poor food consumption);
(ii) Moderately food insecure (households with borderline food consumption and in the two lowest (poorest) wealth quintiles);
(iii) Mildly food insecure (households with borderline food consumption and in the three highest (wealthiest) quintiles); and
(iv) Food secure (households with acceptable food consumption).

In 2013, the Upper East Region had the highest proportion of households that are either severely or moderately food insecure (28 percent). In the Northern and Upper West regions 9 percent and 16 percent of households, respectively, were either severely or moderately food insecure,. The five districts across the country, which are located in the three northernmost regions of Ghana, with the highest proportion of households that were severely or moderately food insecure were

Wa West (42 percent), Central Gonja (39 percent), Talensi-Nabdam (39 percent), Kassena-Nankana West (35 percent), and Kassena-Nankana East (33 percent). The CFSVA (2013) report also indicates that more than 680,000 people in the northern regions of Ghana (or about 15 percent of the population) were either severely or moderately food insecure. Of these, 140,000 had a very poor diet, subsisting on staple foods, some vegetables, and oil. The CFSVA report states that persistent poverty, limited agricultural outputs, and seasonal effects as well as fluctuations in food prices are the main causes of food insecurity in northern Ghana. Indeed, seasonal variability of rainfall in Ghana is prominent in the three northern regions. Households in northern parts of Ghana are highly dependent on rain-fed subsistence agriculture and livestock rearing, showing a low degree of economic diversification.

Similarly, when it comes to poverty in rural and urban areas, contrasts emerge. Ghana's population is quite young, with a national dependency ratio of about 79 percent. Notably, the proportion of children (under 15 years old) in rural areas (42.4 percent) is higher than in Accra (33.8 percent) and other urban areas (37.6 percent). Household size in rural areas is also larger than in urban areas (4.5 versus 3.6 members per family, respectively). Both poverty and extreme poverty incidences reveal regional heterogeneity (Figure 3). Poverty incidence stands at 70.7 percent in Upper West while in Accra it stands at 5.6 percent, with a national level of 24.4 percent.

Figure 3: Percentage of households that are poor



Source: Schnitzer et al. (2014).

It is important to describe the patterns of income sources and expenditure shares across the income distribution to better understand the food and nutritional insecurity vulnerability of households to changes in staple prices. As noted above, maize is one of Ghana's key staples. We note that maize prices are volatile but this volatility is not constant across regions and over time. In some years, such as 2008 and 2011, prices experienced high volatility while in other years this volatility is less noticeable. We also notice differences across the regions. The nonexistence of efficient storage facilities could be one of the other factors that may explain the differences in maize price volatility across the regions. However, empirical analysis will be required here to provide the implications of storage infrastructure on price volatility.

According to Table 2, food expenditure as a share of total expenditure is much larger in rural areas than in urban areas. In fact, for all urban households, 47.5 percent of their expenditures are spent on food while rural households spend about 51.3 percent. For all urban households, expenditures account for 91.1 percent of their total budget, while this constitutes 82.3 percent of rural households. There are also differences between the poor and non-poor based on their dwelling location.

Cereals and root crops are key elements for the nutrition of Ghanaians. Table 3 presents food consumption expressed in kilocalories (kcal) per capita per day. Cereal consumption is the highest, followed by root crops consumption. Ghana sources more of its calories from both root crops and fish compared to the regional average.

Table 2: Budget shares

	Poor		Non-Poor		Total	
	Urban	Rural	Urban	Rural	Urban	Rural
Expenditures	**91.7**	**83.8**	**87.4**	**80.1**	**91.1**	**82.3**
Foods	46.9	50.7	50.8	52.1	47.5	51.3
Non-foods	44.8	33.1	36.6	28.0	43.5	31.0
Non-purchased food*	**8.3**	**16.2**	**12.6**	**19.9**	**8.9**	**17.7**
Cereal (as a share of foods)	**12.7**	**14.2**	**16.1**	**15.2**	**12.9**	**14.5**
Maize (as a share of cereals)	27.1	26.7	20.5	23.2	21	24.4
Rice (as a share of cereals)	35.7	36.4	37.3	38.8	37.2	38
Unidentified cereals	**37.2**	**36.9**	**42.2**	**38**	**41.8**	**37.6**

Source: Author's based on GLSS 6 database.

**Non-purchased food is food produced by household but not purchased.*

Table 3: 2011 food consumption by type in Ghana (kcal/capita/day)

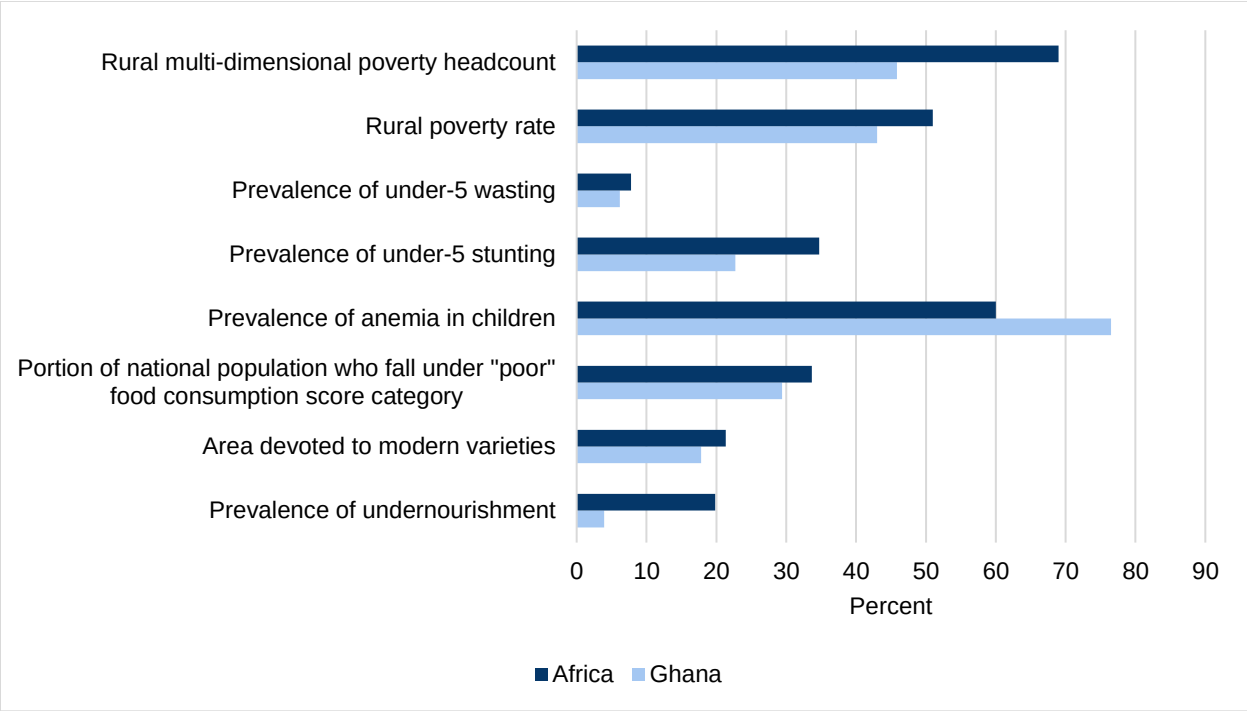
Food consumption	Ghana	West Africa
Cereal consumption	828.13	1225
Root crops consumption	792	539
Meat consumption	40.47	54
Vegetable consumption	24.00	41
Fish consumption	59.23	27

Source: Author's based on FAOSTAT database.

3.1 State of food and nutrition security in Ghana

After its commendable performance in achieving MDG1 and 2 (eradicating extreme hunger and poverty, and achieving universal primary education) and its high performance in a host of FNS indicators (Figure 4). Ghana's prospects for achieving SDG2 by 2030 seems feasible. In fact, except for percent of calories from staples and anemia in children, Ghana performs much better than the regional average on the remaining six indicators, largely owing to ongoing social protection and agricultural growth programs heavily supported by development institutions and NGOs. In fact, the political stability and successful democratic election Ghana has fostered and held over the past two decades have made it attractive for major food and nutritional security projects such as Feed the Future (FtF).

Figure 4: State of FNS in Ghana, 2009-2013



Source: Author's calculations based on ERH database.

Overall, Ghana fares better than the regional average in many FNS indicators (Table 4). The country ranks 27th in the world's ranking of calorie gap, and 4 percent of Ghanaians are likely to be exposed to undernourishment—compared to a regional average of 20 percent. Average dietary energy supply adequacy—the dietary energy supply as a percentage of the average dietary energy requirement—is 142 percent compare to a regional average of 114 percent. In addition, though Ghana's performance has much room for improvement, fewer Ghanaians (51

percent) lack enough money to buy food, compared to 53.8 percent of Africans. The food consumption score (FCS), which is a composite score based on dietary diversity, food frequency, and the relative nutritional importance of different food groups, categorizes each household as having either poor, borderline, or acceptable food consumption. The percentage of Ghana with a poor or borderline food consumption score is 29.4 percent compared to 33.69 percent in Africa.

On the other hand, Ghana performs relatively worse than the regional average in the area of dietary diversity, where it ranks 78th: Ghana receives 66 percent of its calories from staples, compared to 61.8 percent at the regional level. Its average protein supply is 60 grams per capita per day compared to 64.3.

Table 4: Food security needs in Ghana

Indicators	Unit	Ghana	Regional average	Ghana's global ranking	SSA comparison
Calorie gap				**27**	
Undernourishment	Percent	3.92	19.82	24	Bottom 10
Average dietary energy supply	As a percentage of the average dietary energy requirement	141.62	114.46	5	Top 10
Lack enough money to buy food	Percentage of respondents who have admitted to "not having enough money to buy food" in the 12 months before the survey was conducted	50.97	53.82	77	
Dietary diversity				**78**	
Calories from staples	Percent	66	61.81	87	
Average protein supply	Grams per capita per day	60	64.34		
Food consumption score	Percentage of national population with "poor" or "borderline" score	29.40	33.69	14	
Child malnutrition				**81**	
Under-5 wasting	Percent	6.2	7.80	63	
Under-5 stunting	Percent	22.7	34.73	50	Top 10
Anemia in children	Percent	76.5	60.03	110	Bottom 10
Rural poverty				**57**	
Rural poverty rate	Percent	43.24	51.40	54	
Rural multidimensional poverty headcount	Percent	45.87	69	43	Top 10

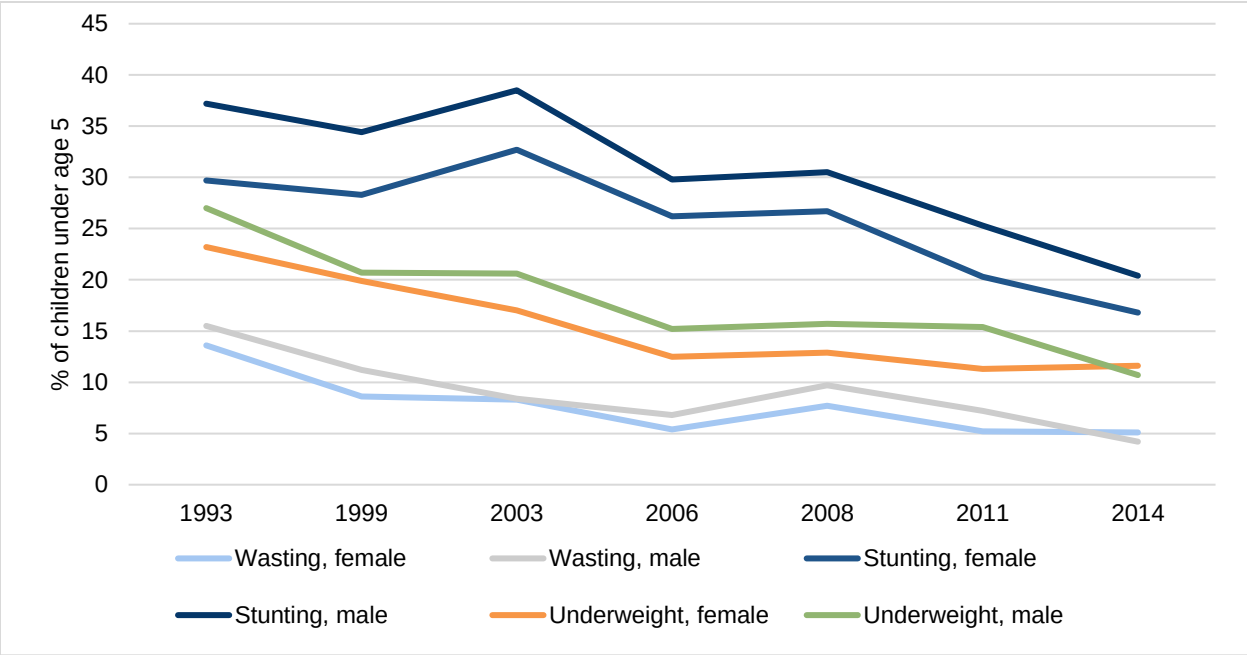
Note: The above statistics represent a five-year average for the period 2009-2013.

Ghana ranks 81st in childhood malnutrition and performs higher than the African average. The share of Ghana's young population that suffers from under-5 wasting is 6.2 percent, compared to the regional average of 7.8 percent, while that of under-5 stunting is 22.7 percent, compared to 34.7 percent. However, the prevalence of anemia among children is relatively high at 76.5 percent, compared to a regional average of 60 percent.

After comparing the ERH scorecards across West African countries, anemia in children appears to be the most important FNS need in Ghana—a finding confirmed by many individuals at institutions handling FNS objectives in the country. Anemia in children impairs mental, physical, and social development, causing negative behavioral and cognitive effects, resulting in poor school performance and work capacity in later years (Soliman, De Sanctis and Kalra, 2014). Ghana has the fifth-worst case of anemia in children in Africa after Niger (76.6 percent), Senegal (79.4 percent), Mali (80.5 percent), and Burkina Faso (86.5 percent). Iron deficiency is globally the most common cause of anemia in under-5 children with a smaller proportion due to deficiencies in other micronutrients such as folate, vitamin A, and vitamin B12. The relatively high costs of nutritious baby food pushes parents to feed their children high-starch content foods, such as yam and cassava, which have low iron content. As part of the government's response, the Ghana Health Service, Food and Drugs Board (FDB), and other collaborators have initiated the National Food Fortification Project (NFFP) as a means of addressing malnutrition in the country. The objective of this nationwide campaign is to raise the consciousness of the public to patronize fortified foods (Gyebi, 2011).

As seen in Figure 5, the incidence of childhood malnutrition has been decreasing dramatically over the past 17 years. Notably, female children do have better nutritional outcomes than their male counterparts (WDI, 2016), which is not surprising given the mostly matrilineal kinship system that prevails in Ghana. In addition, the decreasing incidence of malnutrition over time is not unexpected in light of the multiple interventions sponsored by both the government and donors.

Figure 5: Prevalence of child malnutrition in Ghana, 1993-2014



Source: WDI (2016).

3.2 Validating ERH scorecards

We now compare the ERH database for the case of Ghana with the results presented in the previous section and provide a discussion of the gaps. Though Ghana maintains middle-income status due to its $1,700 GDP per capita, it still has 6 million people living in rural poverty, and 2.5 percent of the total population is malnourished. While these figures reflect the data in the GLSS 6, they fail to highlight the regional differences of the poverty rate, GDP per capita, and share of population undernourishment (Zereyesus et al., 2014).

According to the ERH database, Ghanaian households are more exposed to the variation of international food prices than their African counterparts are as a whole and one of the top 10 affected countries. The heavy dependence on imported rice and chicken can serve as one explanation to this conclusion. While rice has overtaken maize as the main staple food consumed in Ghana, 70 percent of its consumption comes from imports. Similarly, more than 50 percent of chicken consumed in Ghana is imported (ACET, 2016).

In food safety net programs, we note that Ghana performs much better than regional average but performs poorly on a global scale. As for the coverage of those programs, we note here that Ghana performs poorly than both the region and the globe. Ghana's coverage score is likely low because the bulk of its social safety net programs focus in the northernmost regions where poverty

and FNS conditions are worse, thus ignoring the pockets of food and nutritional insecurity found in the south. In addition, this could also be due to financial constraints of the social safety net programs.

Table 5: Consumption and income volatility and rural safety nets in Ghana

Indicators	Unit	Ghana	Regional average	Ghana's global ranking	SSA
Consumption and income shocks					
Household exposure to food price shocks	Index	617.1	500.79	61	Top 10
Rural safety nets					
Food safety net programs	Score: 0-4	2	0.95	23	Top 10
Social safety net coverage	Percentage of the poorest 20% of rural population participating in social assistance programs	6.53	26.13	67	
Productivity and production shocks					
10-year agricultural TFP growth (%, 1961-2010)	Percent	0.86	1.22	75	
Agricultural value added per worker	2005 USD	752	694.63	76	
Cereal yield (kg per hectare)	kg per hectare	1705.03	1485	68	
Variation in cereal crop yields	tons per hectare	0.12	0.21	40	

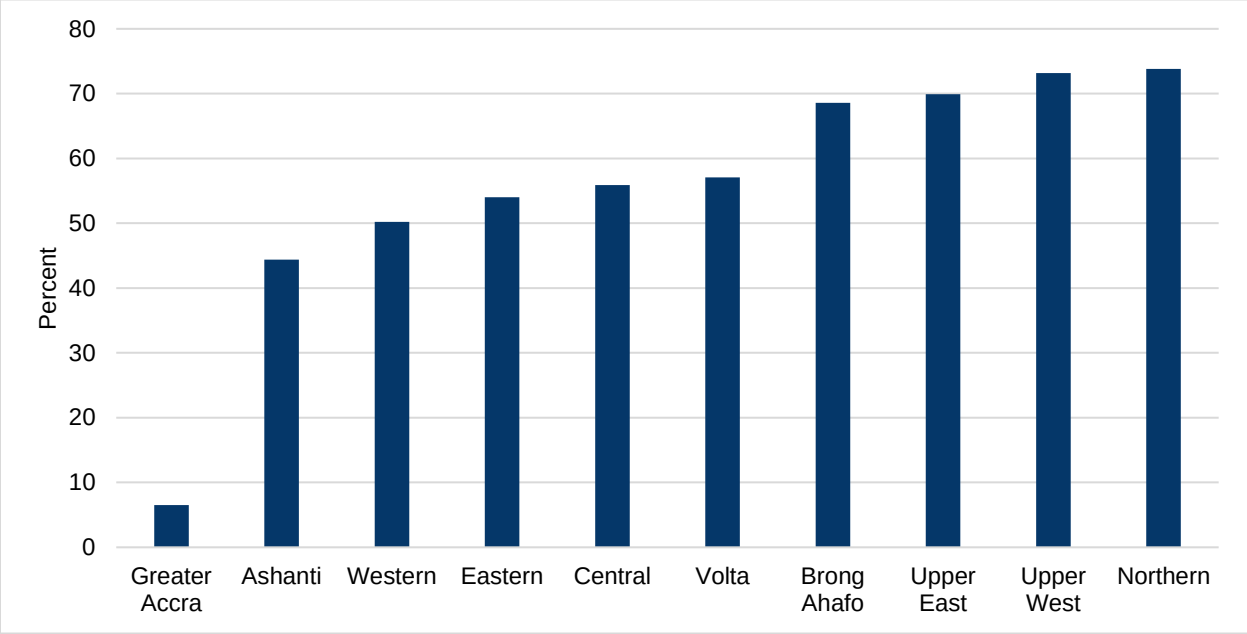
Source: Author's calculations based on ERH database.

Productivity and production shocks indicators reflect the poor performance of the Ghanaian agricultural sector despite the numerous interventions to transform it. Although Ghana cereal productivity is above the regional average, it is still low, even four times smaller than that of the maximum regional cereal productivity in the sample (Egypt, 7086.24). On the other hand, the volatility in cereal productivity in Ghana is lower than the regional average of 0.21. The low total factor productivity (TFP) growth may be explained by poor agricultural supporting services such as extension, research and development, credit and insurance, and food crop markets. One potential explanation for the low agricultural value added per worker is the large number of individuals involved in agriculture (Figure 6).

Figure 6 presents the share of population earning income from agriculture although this figure has been coming down over the past years as more and more youth move away from agriculture.

Notably, over 40 percent of the population depends on agriculture in every region for Ghana, with the exception of Greater Accra.

Figure 6: Share of population depending on income from agriculture



Source: Author's calculations based on GLSS 6 database.

The maize subsector has a yield gap of about 40 percent against laboratory experiments and a yield gap of 74 percent against South Africa. The rice yield (2 metric tons/ha for non-irrigated and nearly double that for irrigated land) has a yield gap of 74 percent against China. Since farmers are known to often reuse grains harvested in previous season as seeds in the next season, there is poor adoption of improved varieties (Table 6). While this approach lowers the cost of production, it also reduces the potency of the seeds and makes them vulnerable to pests and diseases (ACET, 2016) (for more on improved varieties, see below). The variation in crop yield is high because of the lack of insurance markets in Ghana. While one insurance company can indemnify farmers in the event of adverse rainfall shock exists, the high premium rate makes it less attractive to the mostly poor farmers that need it most.

Table 6 displays Ghanaian farmers' access to productivity enhancing inputs. Ghana does poorly compared to the regional average in productivity-enhancing indicators such as arable land equipped for irrigation, total renewable water resources per capita, and percentage of area devoted to modern varieties. However, it does well in distance to source of fertilizers, which is expected given Ghana's countrywide fertilizer subsidy program. Ghana also does well in areas such as road density and export time, owing to the country's commendable effort to improve

connectivity since the post-independence period. In addition, the two ports of Tema and Takoradi and the single window systems contribute to Ghana's better-than-average time to export. This performance also contributes to a better-than-average logistical performance, which is supported by Ghana's acquisition of tacit exporting knowledge because of its historical exports of cocoa and gold. On the other hand, Ghana does not perform well in other areas, such as arable land equipped for irrigation.

Table 6: Access to productivity enhancing inputs in Ghana

Indicators	Units	Ghana	Regional average	Ghana's global ranking	SSA comparison
Access to financing for farmers	Score: 0-4	1.5	1.125		
Road density	Km per 100 sq km of land (logged)	3.83	2.143	22	Top 10
Arable land equipped for irrigation	Percent	0.70	7.49	105	Bottom 10
Total renewable water resources	Cubic meters per year per capita	2216	13061	76	
Area devoted to modern varieties	Percent of agricultural area	17.83	21.35	15	
Share of researchers with PhD	Percent	0.000017	1.32E-05	11	Top 10
Share of female researchers	Percent	1.00E-07	9.99E-06	21	
Time to export	Days	19	30.98	43	Bottom 10
Logistics performance	Index	2.285	2.2	68	

Source: Author's calculation based on ERH database.

Access to finance is poor for two reasons. First, agricultural credits are not attractive as they lock the fund for a long period, preventing rural banks from quickly making their profits. As a result, rural banks avoid extending credit to farmers unless farmers are supported by a donor that provides additional guarantees. Second, interest rates in Ghana are very high—at more than 30 percent—leading farmers to avoid borrowing from them altogether.

Access to irrigation can also be improved. Despite Ghana' endowment of sufficient water resources, estimates of Ghana's irrigation potential range from 0.36 million to 2.9 million hectares (out of 4.8 million hectares of total arable land) depending on the degree of water control. As seen in Table 6, Ghana has very poor irrigation infrastructure, making the production of key imported crops such as rice—a water-intensive crop and one of Ghana's largest imports—very difficult.

The low total renewable water resources per capita score is mostly explained by poor access in the north of Ghana, which constitutes 50 percent of the country land mass. Poor adoption of modern varieties is explained by the past failure of the improved seed introductions that relied on a market-based system to minimize leakage rather than a collaborative system that allows farmers to contribute to seed development through individual trials. The Ghana seed development system has always relied on a participatory plant-breeding system. This system relies on farmer's own evaluations of new varieties based on local knowledge and preferences. This method enables public research systems to fine-tune new seeds to existing conditions; moreover, it also results in open access arrangements through which farmers gain access to unreleased varieties, which they experiment with and distribute through their own network. However, the new seed multiplication and distribution system supported by current legislation commercializes seeds by creating commercial networks to minimize leakages of seeds to farmers to ensure that farmers purchase seeds rather than multiply and distribute them. This framework of property rights in commercial seeds devalues farmers' knowledge and their contribution to the adaptation of the modern seed (Amanor, 2010).

4. Policies and interventions to address food and nutrition security needs

Strengthening Ghana's food and nutrition security—the capacity to ensure that all Ghanaians have access at all times to enough food for an active and healthy life—remains a fundamental challenge to the country's future prosperity. Although pockets of food insecurity have always existed in Ghana, the situation became particularly prominent after prices of staple foods, such as rice and vegetable oil, doubled between January and May 2008 (Cudjoe et al., 2010). A combination of rising oil prices, depreciation of the U.S. dollar, biofuel policies to reallocate the use of food crop to produce biofuel, market speculation, and temporarily imposed trade restrictions contributed to the rapid surge in food prices—resulting in a 53 percent food price hike and subsequent increase in poverty by 0.3 percentage point from its 2005 levels (Minot and Dewina, 2015). This situation prompted the government to initiate trade-oriented, consumer-oriented, and producer-oriented policy responses to cushion and address the distortions created by the rising food prices. Studies after the 2008 crisis have shown that the two most widely applied market and trade policy measures to address the challenge of rising food prices are reducing of tariffs or custom fees, and selling grain from public stocks or from imports (Miranda et al., 2016). Specifically, the initial Ghanaian government's reaction to mitigate the impact of the high food prices included: an export ban of maize and other commodities in May 2008; provision of 50 percent subsidies on fertilizer in 2009, which was first introduced in 2008; 20 percent subsidies on tractor prices; and the removal of imports duties on rice, wheat, yellow corn, and vegetable oil. While these policies were initially established in response to the crisis, many of them became permanent tools to improve FNS.

The social protection programs in Ghana are meant not just to assist the vulnerable and excluded, but also to empower them to make meaningful contributions towards economic transformation of the country. To this end, Ghana's social protection strategy is an integrated one that encompasses direct and indirect cash transfer schemes, specific sectoral development programs, skills development, and job creation instruments with wide range of targets. We describe below some of the key programs.

4.1. Ghana School Feeding Program (GSFP)

The Ghana School Feeding Program (GSFP) is an initiative introduced in 2004 by the government of Ghana first to meet the MDGs of reducing poverty and later, in 2010, mainstreamed into Ghana

social protection policy to increase school enrollment and reduce hunger. The basic concept of the program is to provide pupils in select public primary schools in the country with one hot, nutritious meal per school day, using locally grown foodstuffs. The long-term objective of the GSFP is to contribute to poverty reduction and FNS and to increase school enrollment, attendance, and retention through better nutrition and elimination of child wasting, stunting, and underweight. In 2010, when designed, the program was intended to serve about 1.04 million children in all 138 districts of Ghana.

The GSFP is based on locally grown food products, which should promote domestic food production and improve market access for resource-poor farmers. The government wanted to achieve this objective through an increase in employment and income level of farmers at the community and national levels. In addition, greater availability, access, and utilization of food crops and products at the community level are assumed to enhance FNS. By the end of the program in 2016, it was expected that there will be an 8 percent increase in real income at national and community levels, an 8 percent increase in employment at the community level, and greater availability, access, utilization, and stability of food crops at the community level.

The most comprehensive evaluation of the GSFP has been conducted by the Partnership for Childhood Development (PCD). The study consisted of a randomized control trial conducted over 5,000 children between 2013 and 2016 across all regions of Ghana. Some of the key results, summarized by Aurino et al., (2016), include: Participation in agriculture increased by about 5 percent in GSFP communities; value of own food consumed increased for households in GSFP communities by 1,729 GHC ($450); and net enrollment at the kindergarten level increased by nearly 11 percent. On the nutrition front, school feeding reduced the probability of stunting among children by 0.158 points.

4.2 Livelihood Empowerment against Poverty (LEAP)

The flagship program of the country's National Social Protection Strategy, the Livelihood Empowerment against Poverty (LEAP) program, is a social cash transfer program that provides cash to extremely poor households across the country. A unique feature of LEAP is that, aside from these payments, beneficiaries are provided with free health insurance through the National Health Insurance Scheme, which began in 2004-2005. LEAP's main goals are to alleviate short-term poverty and encourage long-term human capital development. Following the rise in food prices in 2008, 15,000 households were selected to participate in the emergency LEAP (E-LEAP) program and eligibility criteria included small-scale crop producers with few productive assets and

female-headed household without income. Without the cash transfer, selected households would not have been able to afford meeting their food and nutritional needs given the exorbitant cost of living. The program expanded gradually and now reaches over 70,000 households with an annual expenditure of approximately $20 million. The program is funded by the government of Ghana (50 percent), donations from DFID, and a loan from the World Bank, and is implemented by the Department of Social Welfare (DSW) in the Ministry of Gender, Children and Social Protection (MoGCSP).

Interestingly, a recent assessment of the program shows LEAP has increased school enrollment among secondary school aged children by 7 percentage points and reduced grade repetition among both primary- and secondary-aged children. Among primary school aged children, LEAP has reduced absenteeism by 10 percentage points (Handa et al., 2013). The FNS impacts of the free health insurance have yet to be evaluated.

4.3. Agricultural enhancement programs

4.3.1. The Block Farms Program (BFP)

The Block Farm Program aims to, among other things, increase food security through the use of science and technology in agricultural production. The program consolidated large tracts of arable land (in blocks) to exploit economies of scale and to ensure that participating farmers benefit from subsidized mechanization services and inputs (fertilizers, improved seed, and pesticides) made available in the form of credit as well as provision of extension services by the Ministry of Food and Agriculture (MoFA) for the production of crops with a comparative advantage. Started on a pilot basis in 2009 in six regions—Ashanti, Brong Ahafo, Central, Northern, Upper East, and Upper West—the program led to increased productivity in maize, rice, and soybean (Benin et al, 2013). By 2010, all 10 regions of Ghana were participating in BFP, and more crops had been added, including sorghum, tomato, and onions.

Designed to focus on youth, BFP was expected to generate employment among the rural poor, especially the youth (15-35); increase productivity; improve farmers' incomes; and increase food security. However, as Benin et al., (2013) report, the participation rate of youth in the program is low (at 25 percent).Youth cultivated only slightly more than an acre on average, compared to 1.5 acres for adult females and 2.5 acres for adult males.

4.3.2. Agricultural Mechanism Service Centers (AMSEC)

The Agricultural Mechanism Service Centers (AMSEC) were introduced in 2007 to improve agricultural production by providing timely and affordable mechanized services to farmers who cannot afford their own agricultural machinery. The improved access to subsidized tractor services also came with introduction of improved farm practices (row planting, recommended planting density, and spacing).

The centers are designed as private entities specialized in mechanization service provision. At first, 12 AMSECs were piloted in eight regions of the country and expanded to 88 centers by August 2011. Each AMSEC was allocated a package of five tractors with basic implements and a trailer, and had to pay 20 percent of the subsidized equipment prices up front with the balance to be repaid over a two- to three-year period. The subsidies, covered by the government, amount to one-third of the tractor prices. It reduced the capital cost of the machinery, a major barrier to entry into the mechanization services market. The AMSEC program has contributed to improving access by all farmers in the targeted regions to those services and has raised the average area mechanized from 5.3 acres per farmer in 2008 to 7.8 acres per farmer in 2010, representing a 21 percent per year increase in the area mechanized (Benin et al., 2013).

The AMSEC program has had some challenges too, the Ministry of Food and Agriculture had estimated that the country would need about 16,667 tractors by 2015. However, only 5,000 tractors (with accompanying disc ploughs, disc harrows, trailers, and power tillers) had been imported and made available to qualified private-sector operators and farmers by 2013 (Benin et al., 2013). In addition, the sustainability of such programs are questionable given its low profitability (Houssou et al., 2013). Houssou et al., (2013) found that the high cost of moving tractors from one district to another affected its profitability.

4.3.3. The Fertilizer Subsidy Program

The government of Ghana introduced a fertilizer subsidy program (FSP) in 2008 to promote the domestic production of agricultural products, increase the productivity of Ghanaian farmers, and modernize its agricultural sector. The FSP also aimed to raise the national average rate of fertilizer use from 8 kg per hectare to 20 kg per hectare, increase the profitability of farm production, and improve private sector development in the fertilizer market. The fertilizer subsidy program was originally implemented via a voucher system in 2008-2009 and later replaced by a waybill system where four types of fertilizer (NPK 15:15:15, NPK 23:10:05, urea, and sulphate of ammonia) were

subsidized at the port entry, making the fertilizer available to farmers who can afford the fertilizers at price of about 64 percent of the retail market.

The program has led to an increase in the fertilizer application rate and improved yields and profit margins for beneficiary farmers (Goyal and Nash, 2016: Benin et al., 2013). It also led to an increase in the number of providers of agricultural inputs, which increased the availability of fertilizer and raised fertilizer imports by 39.5 percent (Benin et al., 2013). The overall future economic return of the program is positive, with an estimated benefit-cost ratio of 1.7, although potential success comes with high risks because costs associated with the program over time could easily take up a larger share of the MoFA budget (up to 35 percent by 2020) (Goyal and Nash, 2016). However, the program was discontinued in 2016.

4.3.4. National Food Buffer Stock Company Limited (NAFCO)

Established in 2009 as a state-owned company with initial budget of $3.8 million, NAFCO was set up as a limited liability company to manage the government's emergency food program. Its main task consists of purchasing, selling, preserving, and distributing food; reducing postharvest losses; facilitating the export of excess stock; and insuring farmers against income shocks by providing a minimum guaranteed price and a ready market for their production as NAFCO expanded the demand for food grown in Ghana by selling products to all state institutions such as the military, schools, hospitals, and prisons.

NAFCO also serves as buffer stock mechanism to ensure stability in the demand and supply of food. It usually purchases cereals at pre-determined prices taking into consideration cost of production and some profit margin for farmers based on farm budget analysis estimated by the National Post Harvest Committee of MoFA. Not many studies have looked at the impact of NAFCO, but Benin et al. (2013) concluded that grain price stability noticed in 2010 in Ghana can partially be attributed to NAFCO.

In recent years, NAFCO has faced some challenges, such as access to sufficient funds to purchase stocks from farmers during glut and excess production, lack of enough and modern warehouses, shortages in drying and cleaning facilities for storing excess foodstuffs, and limited market to sell excess stored grains. These obstacles affected its ability to stabilize prices and be the buyer of last resort that it was designed to be in order to fight the market variability faced by small-holder farmers.

To conclude, these consumer-, producer-, and trade-oriented programs have encountered a mixture of success and failures. While programs such as school feeding programs, AMSEC, and, to some extent, the fertilizer subsidy program registered success, the same cannot be said of the other programs. Notably, programs implemented by government alone are among those that felt short of meeting their targets. On the other hand, programs either implemented via some form of public-private partnership (PPP), such as private actors in the case of AMSEC and fertilizer subsidy program were relatively more successful.

5. Resources

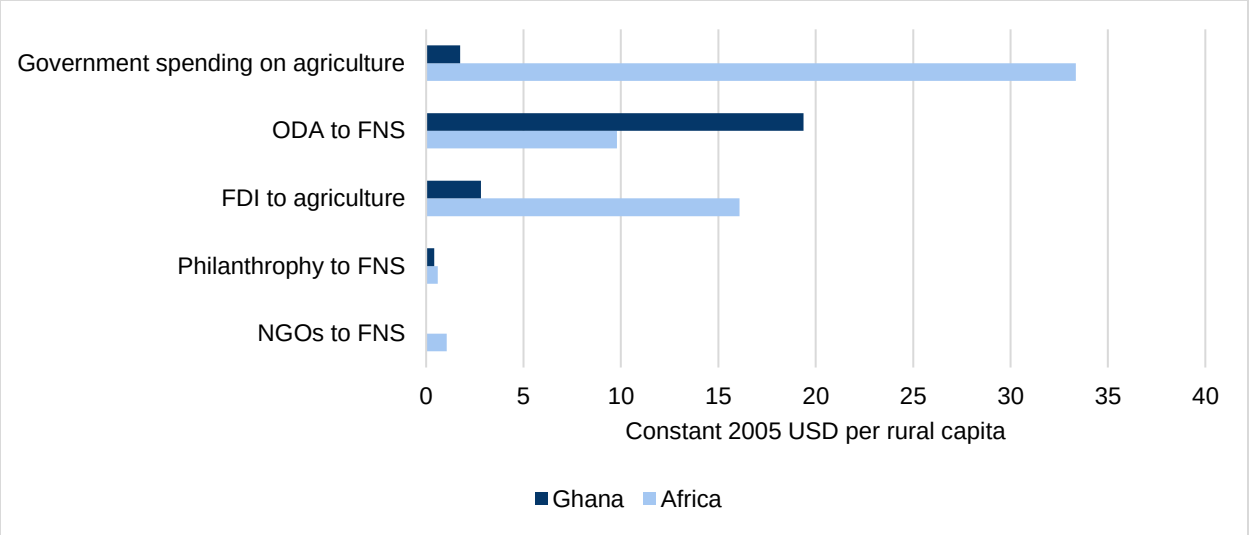
5.1 National and external resource allocations to FNS

Ghana is not able to finance FNS and other agricultural projects as noted in the METASIP program by itself. It still heavily relies on ODA as the country only allocates 4 percent of its budget to social contributions and subsidies (Development Initiative Data Hub, 2014). This is notably true for of agriculture-related activities, where the government of Ghana only targets input subsidies and leaves the rest to development partners. On the other hand, we have noted that 40 percent ($462 million) of ODA was allocated to agriculture and food security ($139 million), health ($228 million), and WASH programs ($95 million) in 2014. In order to meet SDG2, it is important for the country to rethink its resource mobilization strategy in light of its new LMIC status that precludes the country from qualifying for certain aid monies.

In addition to needs and policies, the Ending Rural Hunger database assesses the existing resources toward funding FNS and the sources of aid to improve FNS indicators. The data shows that ODA to FNS in Ghana is higher than the regional average (Figure 7). However, government spending on agriculture, FDI to agriculture, and both philanthropy and NGO activities are lower in Ghana than the regional average. Moreover, a look at Figure 8 reveals that in 2014, both FDI and long-term debt made up 82 percent of resource inflows in Ghana compared to 18 percent of official ODA.

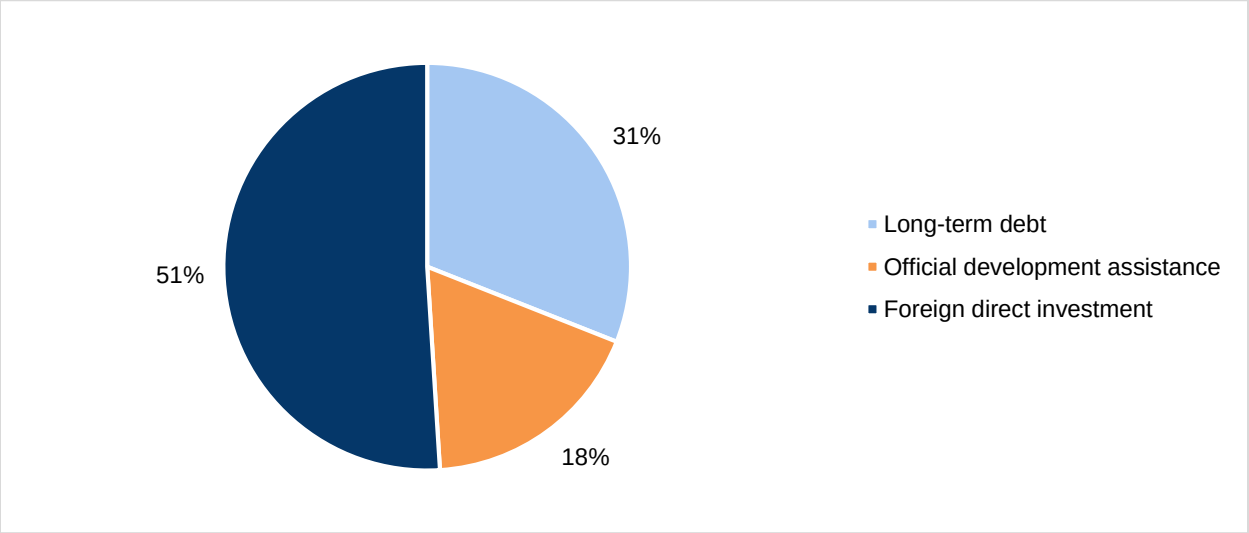
More than 90 percent of agriculture-specific expenditure in Ghana comes from donors, and between 2006 and 2012 donors' share of agricultural expenditure was consistently greater than that of the National government—mostly due to the advent of the Feed the Future program, as illustrated in Figure 9.

Figure 7: Financing sources for FNS in Ghana, 2009-2013 average



Source: Author's calculations based on ERH database.

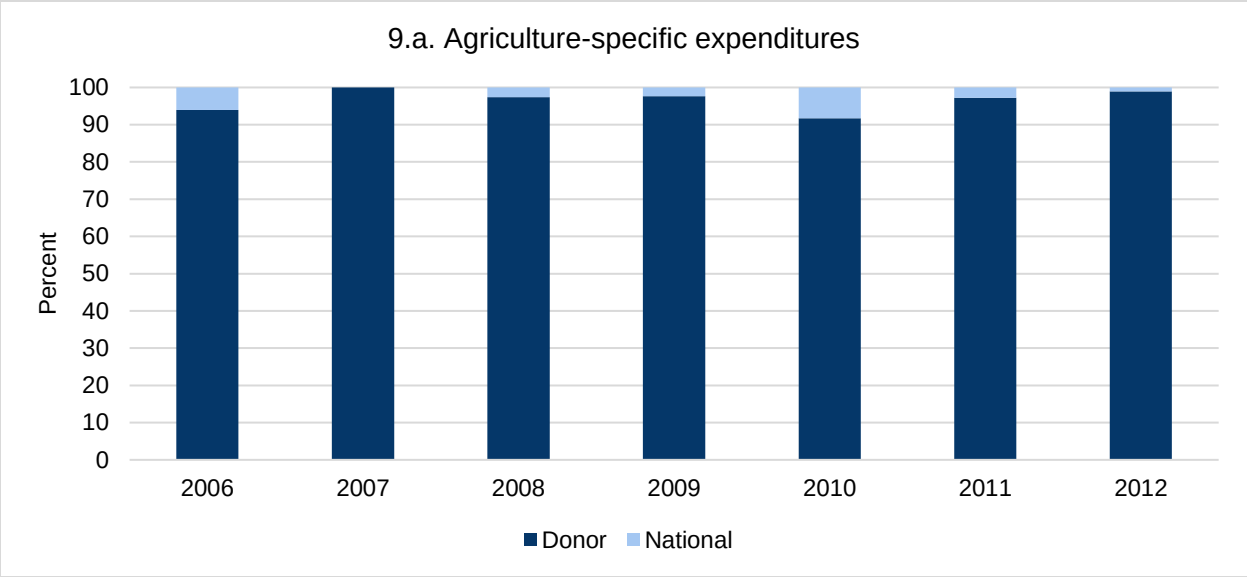
Figure 8: External resource flows to Ghana, 2014

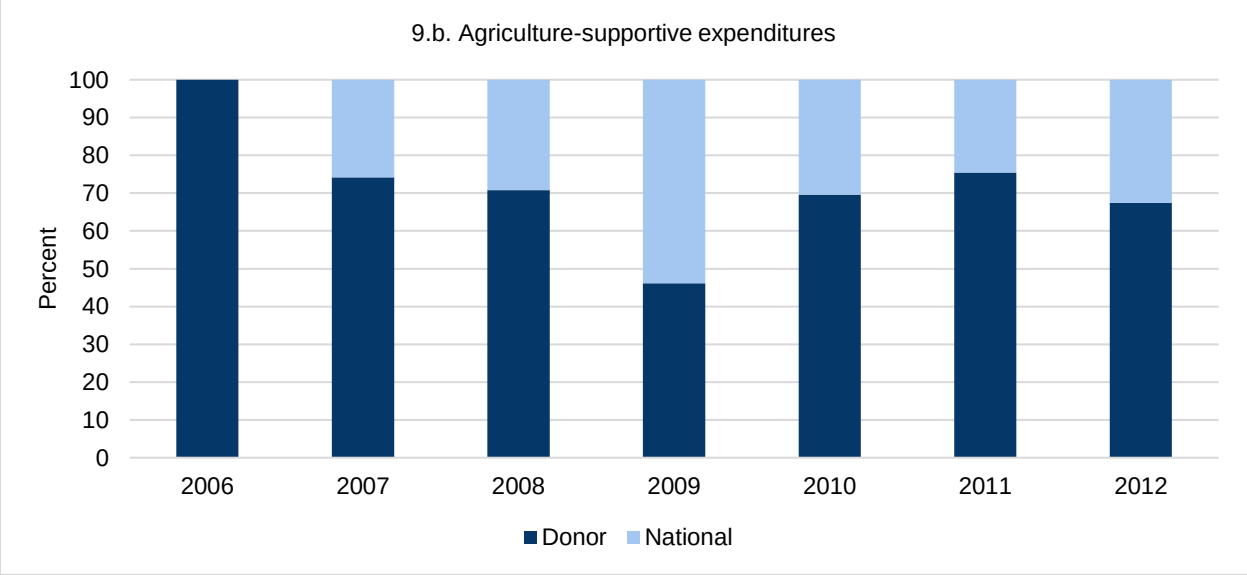


Source: Development initiative data hub.[1]

[1] http://devinit.org/post/projects/development-data-hub/

Figure 9a-b: Agriculture expenditures in Ghana



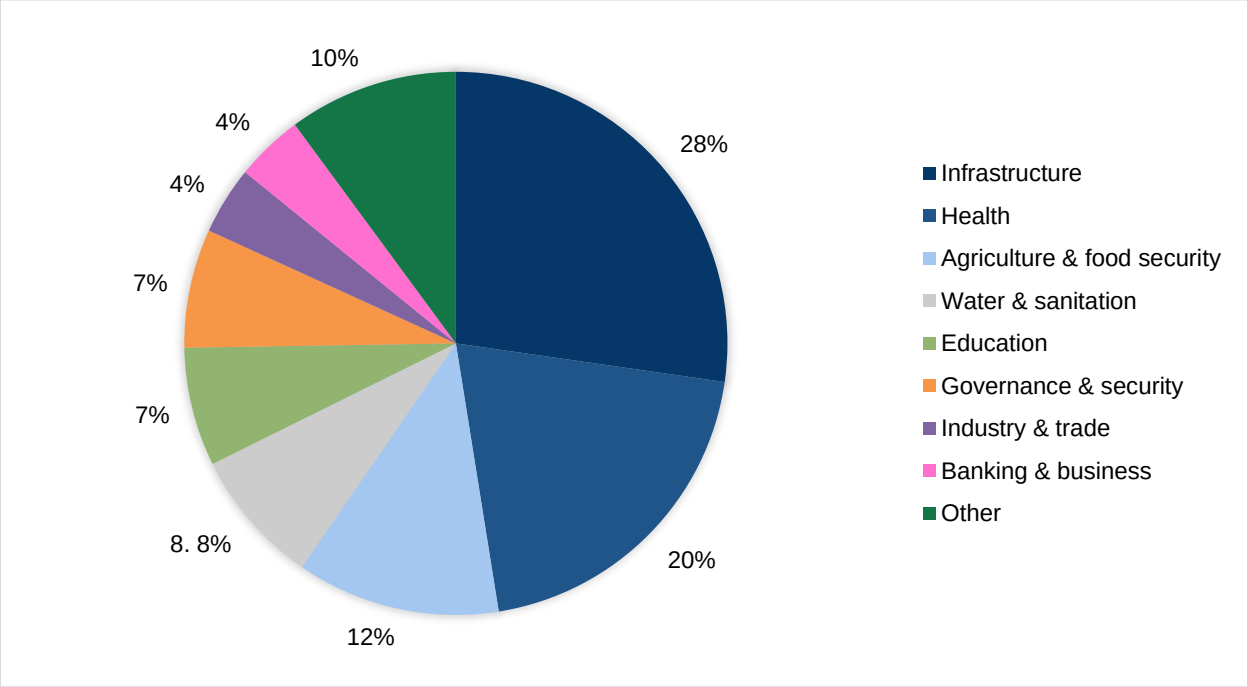


Source: MAFAP database (2014).

It seems that the goals of the government of Ghana differ from those of ODA donors: ODA prioritizes infrastructure, health, agriculture, and food security (Figure 10). Health is one of the high-priority areas both for the government and ODA. However, the government of Ghana puts very little emphasis on agriculture and WASH (water sanitation and hygiene) programs, leaving them to ODA—though some expenditures on poverty reduction, education, roads, and other transport affect agriculture. ODA spending can have an intersectional nature where an amount

computed in one category can have spillovers in another. For example, spending on improving road and transport will improve farmers' access to markets.

Figure 10: ODA sectoral priorities, 2014

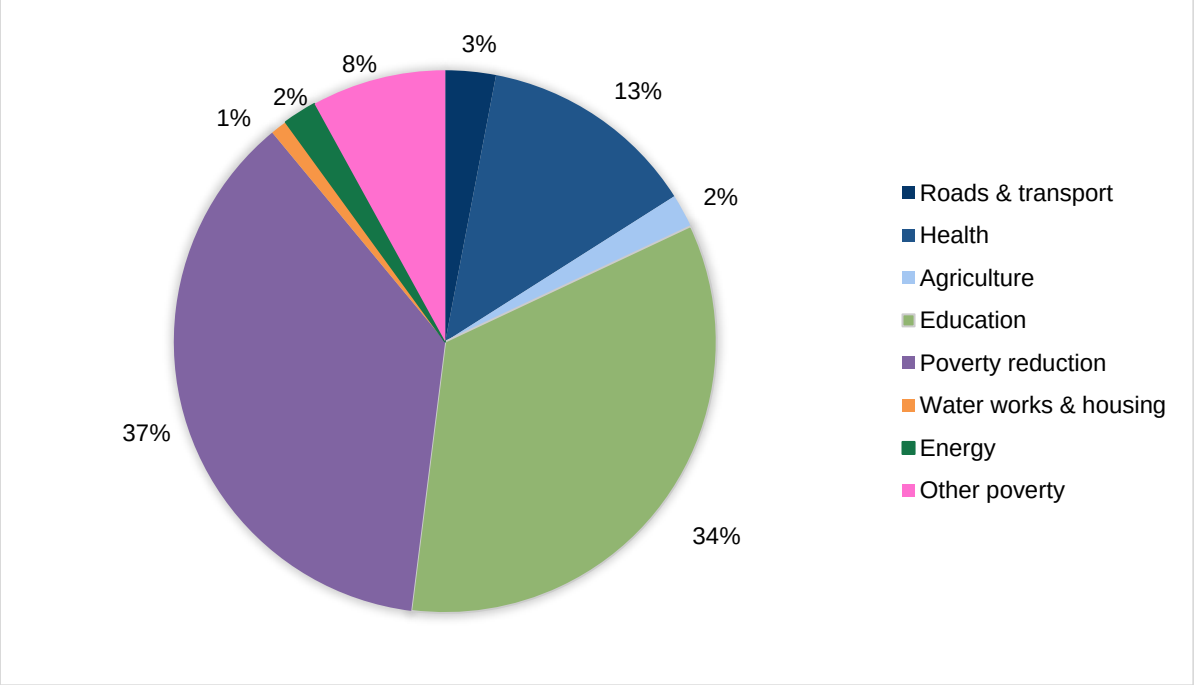


Source: Development initiative data hub (2014).

We take a deeper dive by looking at the composition of public agricultural expenditures because the low figures on agricultural expenditure presented in Figure 11 seem lower than expected; especially given the CAADP compact signed by Ghana to allocate 10 percent of its budget to agriculture during the Maputo declaration of 2003. The low expenditure share might be due to the fact that some infrastructure investment, such as feeder roads (for which Ghana performs well, as illustrated under road density in Table 6), that are supposed to support agriculture are not registered as agricultural expenditure. The data put together by the Monitoring African Food and Agricultural Policies (MAFAP) project looks at agriculture-specific expenditures (expenditures that directly target the agricultural sector), as well as agriculture-supportive expenditures (those that indirectly benefit the sector).

Additional domestic and international resources will be necessary to finance the cost of the implementing the METASIP. Only approximately 34 percent of funds were domestically provided through the 10 percent budget allocated to agriculture and other cost recovery funds from private and public partnerships. Table 7 provides the source of internal funds and the funding gap.

Figure 11: Sectoral expenditures as a percentage of total government expenditure, 2015



Source: MAFAP data online.

Table 7: METASIP funding sources and gap, GHC million

Source	Year					Total
	2011	2012	2013	2014	2015	
Government of Ghana increased allocation	66.8	70.8	75.0	79.5	84.3	376.4
Cost recovery: Private-public partnerships		18.0	30.0	42.0	42.0	132.0
Other internally generated funds	1.5	1.6	1.7	1.8	1.9	8.5
Total funds from domestic sources	**68.3**	**90.4**	**106.7**	**123.3**	**128.2**	**516.9**
Estimated METASIP Cost	**284.3**	**378.5**	**340.1**	**319.4**	**210.1**	**1532.4**
Funding gap	216.0	288.1	233.4	196.1	81.9	1015.5

Source: MoFA (2014).

The funding gap, which constitutes about 66.3 percent of the total METASIP cost, was expected to be covered by donors and philanthropists. The expected contributions from said actors have not materialized. Consequently, despite the expiration of the METASIP, the program is still under implementation as it failed to reach its objectives.

Before seeking external resources, a re-prioritization of government budget allocation will be necessary to close the gap. According to budget allocation figure published by the MAFAP,

poverty reduction welfare programs and education are given priority, while agriculture and water works and housing are among the lowest (Figure 11). Poverty reduction programs include welfare improvement projects, which include FNS. While these are important expenditures, investing in productive sectors such as agriculture will yield better results, including economic transformation (McArthur and McCord, 2017).

5.2. Resource mobilization strategy for funding SDG2

Given the huge gap between the resources needed to attain the large number of SDGs and other social and agricultural projects as mentioned in METASIP, ODA will continue to be very important. Improving the effectiveness of the use of ODA at the country level will not only enable greater achievement of the SDGs, It would also help Ghana sustain ODA to finance SDGs and other social projects listed in METASIP. In addition, as the aid landscape becomes more complex with many new actors and traditional resources become much more uncertain amid the economic slowdown in the European Union and the forthcoming aid cuts from the United States, the ability of national authorities to manage the various actors in place to support a national development strategy in a coherent manner and domestic resource mobilization become critical in determining whether or not countries are able to attain their SDGs. For this reason, this section will discuss Ghana's experience in adjusting its aid management practices.

Recently, fiscal pressures in traditional donor home countries have meant reallocation of resources from lower-middle-income countries (LMICs) to least-developed countries (LDCs). As a result, bilateral grant resources to Ghana are on the decline, as illustrated in Figure 12. ODA has become an increasingly smaller part of financial flows, with ODA inflows as a percentage of GDP declining from 12 percent in 2000 to 4.71 percent in 2015. Net ODA inflow peaked at $2.4 billion in 2008, declining steadily thereafter to $1.7 billion by 2015 (World Development Indicators Online). Ghana's LMIC status has limited its eligibility for concessional funds, and loan terms and conditions from traditional multilateral and bilateral donors are being reviewed.

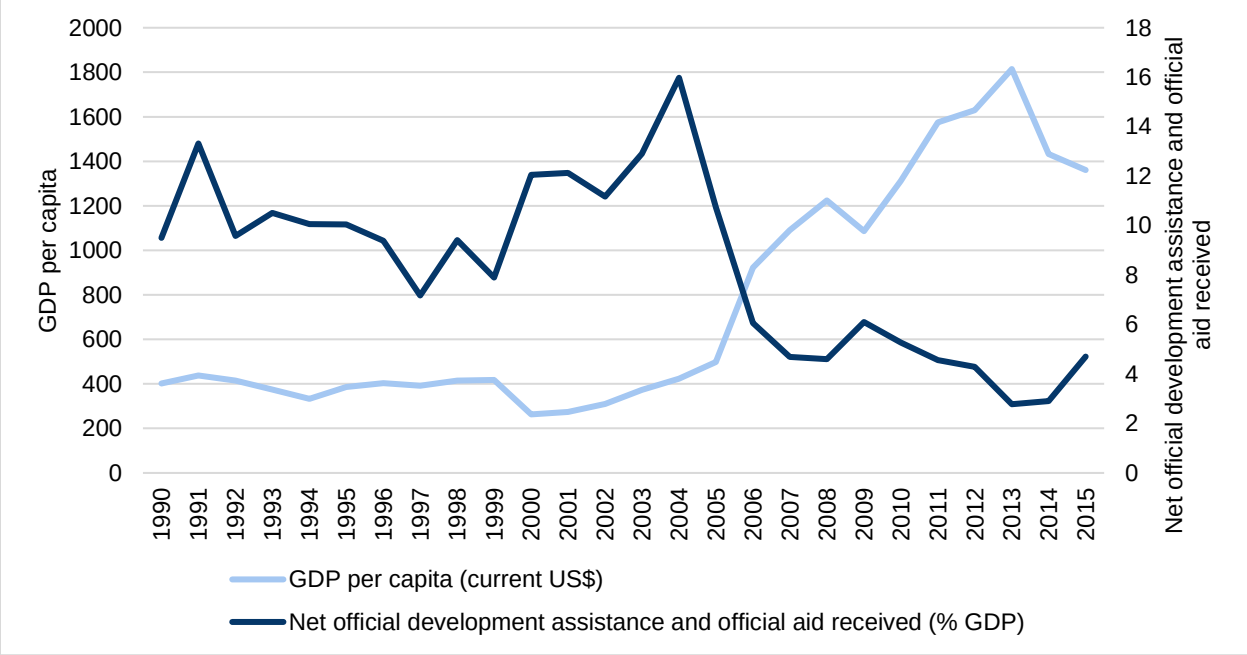
The changing landscape and the multiplicity of sources and channels of aid[2] have posed enormous challenges for mobilizing external resources to address goals such as SDG2 among newly vetted LMICs such as Ghana. Challenges include aligning resources to development priorities; assessing funds relative to their cost and weighing the economic benefits of projects vis-à-vis the cost; assessing the efficiency and cost of projects; improving the negotiating capacity of the government and its ability to accept and reject funds based on the terms and conditions

[2] Each source come with its conditionalities, which makes it hard for Ghana to meet and therefore access the resources.

and the suitability in meeting specific development priorities; and evaluating the effect of access to finance on the total aid portfolio.

Ghana is slowly adapting its aid policies and processes to this changing landscape. In response to the rapidly changing context, the Ministry of Finance has begun working on a new Development Cooperation Policy that is expected to articulate the uniqueness of the different funding instruments, providers, and partners, and the Ghanaian government's goals, strategies, and guidelines for engaging with development partners in this new environment towards meeting the country's development priorities.

Figure 12: Net official development assistance and official aid received (% of GDP) and GDP per capita



Source: WDI Online.

The Debt Management Strategy outlines the government's plan to guide debt management over the medium term. Ghana is re-strategizing to take advantage of available non-traditional resources[3] for social protection projects such as those targeting FNS while considering borrowing on non-concessional and commercial terms for infrastructure projects that are self-financing as a

[3] Key non-traditional sources include philanthropic foundations such as the Bill and Melinda Gates Foundation, Mastercard, and funds coming from climate finance.

means to minimize costs and refinance risks. Capital expenditure is to be financed with long-term debt and short-term bills for liquidity management.

In terms of institutional structures and processes, there is a strong push toward domestic resource mobilization to help finance SDG2 and other social and agricultural projects. The Tax Policy Unit at the Ministry of Finance coordinates with the Ghana Revenue Authority to ensure effective mobilization of domestic revenue. There have been extensive reforms in tax administration in the last six years, since the merging of the Tax and Revenue Agencies into the Ghana Revenue Authority in 2009. Extensive work has been undertaken to merge the structures and processes of the domestic tax divisions and to build their capacity with the objective of providing the taxpayer with efficient and seamless service.

6. Conclusion and recommendations

The second of the 17 proposed SDGs is “end hunger, achieve food security and improved nutrition, and promote sustainable agriculture.” This report aimed to study Ghana’s progress toward achieving SDG2, using data from the Ending Rural Hunger database. It finds that except for calories from staples and anemia in children under five, Ghana performs better than most African countries in FNS indicators such as children stunting, wasting, and underweight. National scores, however, obscure the within-country differences that exist between the poor north and the less-poor south of Ghana. Though Ghana has a strategy for improving its FNS, the resources available and allocated to meet the policy objectives are mostly dependent on donors. Only in rare occasions, such as after the 2008 food price crises, does the government intervene in a large way to remedy deteriorating FNS conditions.

While Ghana was able to meet most of the FNS-related goals outlined in the MDGs, its current economic status will make tackling the SDGs more challenging. In the past, Ghana received assistance through the HIPC initiatives to address poverty and FNS needs. Today, its middle-income status makes it ineligible for such funds. However, the recent economic crisis the country is facing may cast a few doubts about the end of traditional aid for Ghana. Either way, it is important for Ghana to internally mobilize resources for financing FNS-related initiatives, especially targeting the northernmost regions of Upper East, Upper West, and Northern.

To both end poverty and improve FNS, Ghana must depend less on donors as its income rises (Laborde et al., 2016). Internal resource mobilization will become a key tool for meeting FNS needs, and it is important for Ghana to rethink and redraft its aid management policy. Ghana has already begun to merge the structures and processes of the domestic tax divisions in an effort to maximize internal resources, but further work needs to be done. Ghana needs to work with traditional donor partners to provide clarity about their strategies, timeline, and the implications. Issues for consideration include: How will any phasing out be managed to ensure that development gains previously obtained through donor funds are sustained, particularly in the FNS sectors where donors have played a key role? Are there experiences with LMIC graduations in other continents that can guide Ghana’s transition?

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Appendix

Table A: METASIP expenditure estimate, (GHC million, constant 2010 prices)
(Current $1=GHC4.2)

Program/Component	Year					Total
	2011	2012	2013	2014	2015	
Program 1: Food Security and Emergency Preparedness						
Productivity improvement	33.3	72.2	14.5	14.0	2.1	136.1
Improved nutrition	2.3	4.2	4.2	0.2	0.2	11.1
Diversification of livelihood options for the poor	2.2	7.3	6.5	5.5	0.5	22.0
Food storage and distribution	0.1	0.4	0.7	0.3	0.0	1.4
Early warning systems and emergency preparedness	1.3	1.3	1.3	1.3	8.7	1.3
Irrigation and water management	11.1	64.9	85.0	103.6	21.6	286.2
Mechanization services	20.0	20.0	20.0	20.0	20.0	100.0
Total Program 1	**72.3**	**170.4**	**132.3**	**144.9**	**45.6**	**565.6**
Program 2: Increased Growth in Incomes						
Promotion of crop, livestock and fishery production for income	43.8	52.6	22.7	12.9	185.1	43.8
Development of new products	2.1	2.0	2.0	2.0	2.0	10.2
Pilot value chain development	40.7	40.5	40.5	40.4	40.3	202.4
Intensification of FBOs and out-grower concepts	1.5	1.5	0.9	0.2	0.2	4.3
Development of rural infrastructure	94.9	96.6	86.4	86.4	86.2	450.3
Urban and peri-urban agriculture	0.3	0.3	0.2	0.2	0.2	1.4
Total Program 2	**192.6**	**184.8**	**182.6**	**151.8**	**141.8**	**853.70**
Program 3: Increased Competitiveness and Enhanced Integration into Domestic and International Markets						
Marketing of Ghanaian produce in domestic and international markets	5.3	4.7	4.6	4.6	4.5	23.6
Total Program 3	**5.3**	**4.7**	**4.6**	**4.6**	**4.5**	**23.6**
Program 4: Sustainable Management of Land and Environment						
Awareness creation and use of SLM technologies by men and women farmers	1.6	6.8	6.6	6.5	6.5	27.9
Total Program 4	**1.6**	**6.8**	**6.6**	**6.5**	**6.5**	**27.9**
Program 5: Science and Technology Applied in Food and Agricultural Development						
Uptake of technology along the value chain and application of biotechnology in agriculture	0.4	0.5	0.6	0.3	0.3	2.1
Agricultural research funding and management of agricultural research information	10.0	10.0	10.0	10.0	10.0	40.0
Total Program 5	**10.4**	**10.5**	**10.6**	**10.3**	**10.3**	**52.1**

Program 6: Enhanced Institutional Coordination						
Institutional strengthening and intra-ministerial coordination	0.2	0.3	2.4	0.3	0.4	3.6
Inter-ministerial coordination	0.2	0.3	0.2	0.3	0.2	1.2
Partnership with private sector and civil society organizations	1.0	0.5	0.5	0.5	0.5	3.0
Coordination with development partners	0.7	0.3	0.3	0.2	0.2	1.8
Total Program 6	**2.1**	**1.3**	**3.4**	**1.3**	**1.4**	**9.6**
Total METASIP	**284.3**	**378.5**	**340.1**	**319.4**	**210.1**	**1,532.4**

Source: MoFA (2011).

Table B: Enabling policy environment for agricultural productivity

Indicators	Ghana	Regional average	Global ranking	SSA comparison
Enabling conditions for rural financial services	4.5	3.656056	15	Top 10
Access to water for agriculture	3.92	3.627204	44	
Access to land	3.565	3.544389	64	
Women's secure access to land	1	.5543478	1	Top 10
Women's access to financial services	0.5	.4021739	1	
Access to agricultural input markets	4.665	3.724852	13	Top 10
General investment climate				
Investment climate for rural business	4.335	3.711019	34	Top 10
Doing business index	64.285	48.09772	22	Top 10
Allocation and management of resources for rural development	3.94	3.671833	48	
Dialogue with rural organizations	4.1075	3.816667	39	
Nutrition policies				
National dietary guidelines	0.5	0.34	47	
Time bound nutrition targets	1	0.33	1	Top 10
Governments promote complementary feeding	1	0.82		
Food safety score	70%	50.21%	72	

Source: Author's calculations based on ERH database.