Fill the Nutrient Gap Ghana

Report

World Food Programme

May 2023

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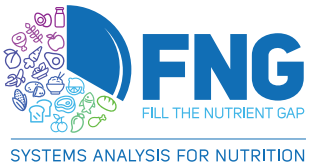

Suggested citation:

National Development Planning Commission and World Food Programme.
Fill the Nutrient Gap: Ghana. Accra, Ghana 2023.

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Foreword

Rapid urbanization, economic growth and changing lifestyles, including diets have impacted negatively on people's nutritional status and health. Ghana's Food environment is replete with cheap energy-dense foods which are high in trans-fat, salt, and sweeteners. On the other hand, the increasing cost of food and inadequate nutritional knowledge have led to unhealthy food choices and eating habits, resulting in increased burden of nutrition-related non-communicable diseases (NR-NCDs) such as diabetes and cardiovascular diseases.

The negative effects of these unhealthy diets are reflected in the current health status of the population. According to Ghana Demographic and Health Survey report, (2014), the prevalence of overweight and obesity among men and women are 40% and 16% respectively; hypertension is at 13% for both women and men; and overweight among children under five has increased from 1 percent in 2014 to 2 percent in 2022. Approximately 86,300 deaths representing 45 percent of all deaths in 2022 were attributed to NCDs (NCD Progress Monitor 2022).

Ghana still experiences significant undernutrition challenges, despite strides made in the reduction of the prevalence of stunting, anaemia, and micronutrient deficiencies. The 2020 Comprehensive Food Security and Vulnerability Analysis showed that 3.6 million Ghanaians were food insecure with 2 million and 1.6 million people moderately and severely food insecure respectively. Malnutrition in all its forms robs the country of its human capital, which is the foundation for socio-economic development. Ghana is estimated to be losing about 6.4 percent of its Gross Domestic Product (GDP) annually through malnutrition.

Ghana has recently developed Food-Based Dietary Guidelines to undergird the importance of healthy diets. While this is commendable, rising food prices threaten affordability of healthy diets and meeting of the nutritional needs of households, thus, increasing the risk of food insecurity and malnutrition. This Fill the Nutrient Gap report shows that healthy diets are inaccessible to most Ghanaians due to the impacts of the COVID-19 pandemic, Russia-Ukraine conflict, climate change and the global economic crisis. The report further shows that food price inflation in 2021 and 2022 dramatically increased the costs of healthy and nutritious diets. Nutrient-adequate and healthy diets cost two to three times more than diets that meet only energy needs.

Ensuring access to safe, nutritious, and affordable food is therefore a national imperative, especially within the context of the current cost of living crisis. The findings of the report provide the evidence for more policy dialogues and solutions on the way forward.

Professor George Gyan-Baffour
Chairman
National Development Planning Commission

Executive Summary

Background

Ghana faces a multidimensional challenge in improving nutrition. The country's dynamic economic expansion in the past decade has benefitted households' food security and nutrition, but not equally across socioeconomic groups or regions. In Ghana's northern most regions, the estimated percentages of households that were food insecure in 2020 were 49 percent in Upper East, 33 percent in Northeast and 31 percent in Northern region. These numbers are stark in comparison to estimates of food security in Ghana's southern most regions, with 4 percent each in Greater Accra and Central, and 5 percent in Western region (Government of Ghana 2020). Another contrast is in the incidence of stunting, with as many as one child in four affected amongst the poorest households compared to fewer than one child in ten amongst the wealthiest households (UNICEF 2022).

Approaches to strengthening food systems for nutritious diets will require a focus on equity. Like many other low- and middle-income countries, Ghana's food system is undergoing a period of transition, creating opportunities for policy formulation that ensures no one is left behind. As demographics, wealth levels, value chain capacities, and consumer preferences change, food systems also change. Policies, programmes and compliance measures must ensure that fresh and nutritious foods are available, that social protection programmes are designed to support nutrition, and that the private sector is an enabling environment for producing, transporting and selling nutritious foods at affordable prices. Consumers, foundational to food systems, must be enabled to access and afford diets that meet their nutritional needs.

In 2016, the Ghana Health Service (GHS) and the World Food Programme (WFP) conducted a Fill the Nutrient Gap (FNG) analysis to identify opportunities within the food system to improve access to, and affordability of, nutritious diets. Since then, the COVID-19 pandemic and macroeconomic fluctuations have impacted household livelihoods and food prices. In 2022, Ghana's National Development Planning Commission (NDPC) and WFP re-initiated the FNG analysis to update results on costs and affordability of diets and to model interventions that could mitigate unaffordability.

Process and Methods

The FNG analysis estimated the cost of three diets: energy-only, nutrient-adequate (or nutritious, as per linear programming) and healthy (as per food-based dietary guidelines), and the percentage of households that, given current food expenditure, would be unable to afford the nutritious and healthy diets. These indicators were calculated for three time periods in 2021 and two time periods in 2022. The cost of energy-only and nutrient-adequate diets are estimated using the linear optimization software Cost of the Diet (CotD) and the cost of the healthy diet was calculated using the Healthy Diet Basket (Food Prices for Nutrition, Tufts University, Boston, USA, 2020). All analyses were carried out in all 16 regions of Ghana.

Diet costs and non-affordability were estimated for a five-person modelled household comprising a breastfed child (12 months), a school-age child (6–7 years), an adolescent girl (14–15 years), a breastfeeding woman (30–59 years), and an adult man (30–59 years). The estimations used retail prices collected by the Ministry of Food and Agriculture and expenditure data from the Comprehensive Food Security and Vulnerability Assessment (CFSVA 2020). The analysis was initiated in October 2022 and finalized in February 2023 with two workshops for results validation and intervention prioritization, plus a final dissemination to a larger group of stakeholders.

Main findings

1. Nutrient-adequate and healthy diets cost two to three times more than diets that meet only energy needs. Diet costs are lowest in northern regions and highest in southern regions.

2. Ghana has experienced macroeconomic shocks due to COVID-19 and the global food crisis. Food price inflation in 2021 and 2022 has dramatically increased the cost of food and of healthy and nutritious diets.

3. Rising food prices have led to more households in Ghana being unable to afford diets that meet their nutritional needs. By late 2022, at least one in two households was not able to afford the cost of a nutrient-adequate diet, increasing the risk of food insecurity and malnutrition.

4. Wealth levels and opportunities to improve living conditions vary widely across socioeconomic groups and geographies. Improving access to nutritious diets requires an equitable multisectoral approach to strengthen households' economic capacities.

5. Nutritious school meals based on diverse local recipes and/or including fortified staples, provide good nutrition for schoolchildren. Ingredients for a meal that covers at least a third of a child's daily nutritional needs cost more than Ghanian cedi (GH□) 1 per day, excluding preparation overheads.

6. Nutrition sensitive agriculture can support dietary diversity and strengthen local food systems. Programmes such as Planting for Food and Jobs (PFJ) and Rearing for Food and Jobs (RFJ) have the potential to improve nutrition outcomes by supporting producers to increase production and consumption of nutritious foods.

7. Value vouchers designed to meet nutrition needs can reduce the affordability gap of a nutrient-adequate diet. Inclusion of fortified foods in value voucher lists can generate demand for fortified and biofortified products and stimulate actors in value chains to ensure supply.

8. Children under 2 years, adolescent girls and pregnant and breastfeeding women are particularly nutritionally vulnerable. Provision of fortified nutritious foods and supplements are cost-efficient ways to meet nutrient needs while continuing to enable increased dietary diversity.

9. The impact of social protection can be increased by making it more nutrition-sensitive, for instance, layering nutrition interventions on top of social protection, and communicating social and behaviour change (SBC) alongside transfers. This can increase the impact on nutrition outcomes of cash transfer programmes such as the Livelihood Empowerment Against Poverty (LEAP) programme.

10. Consumption of unhealthy foods is increasing and leading to overweight, obesity and non-communicable diseases. An SBC strategy could align actors along the food value chain to meet people's nutritional needs and enable them to make decisions that benefit their health and development.

11. Institutional demand can stimulate supply chain development, enabling economies of scale in the production of fortified foods, including rice, and driving down consumer prices. Simultaneously, people must be informed of the benefits of fortified staples and reassured that fortification is safe and does not cause health problems.

Stakeholder recommendations

The FNG stakeholder engagement process led to the identification of stakeholder priorities for the improvement of diets in Ghana. Based on inputs gathered during the workshops held in February 2023, stakeholders prioritized the following actions:

- **Create an enabling environment for the production, transportation and retailing of nutritious perishable food items** by realigning government policies like the PFJ programme towards production of nutritious foods and increasing government support for providing inputs for fruit, vegetables, legumes and pulses to local producers.
- **Leverage social assistance to better support nutrition** by linking programmes within Integrated Social Services to health and nutrition interventions and SBC for healthy diets.
- **Consider equitable approaches to economic growth,** including through targeted approaches towards women, financial inclusion, and investment in comparatively underdeveloped areas, particularly in the north.
- **Strengthen national fortification initiatives** by strengthening capacity for local millers, improved monitoring of fortification compliance, and advocacy for raising fortification standards to internationally recognised recommendations.
- **Utilise technology, media and innovative approaches for SBC** to raise awareness about the risks associated with the consumption of unhealthy food and drinks.
- **Promote private sector investment in the production of nutritious foods** by developing policies that economically enable production and implementing guidelines for labelling and food quality.

Introduction to Fill the Nutrient Gap (FNG) Ghana

In 2016, the Ghana Health Service, with support from WFP, led a Fill the Nutrient Gap (FNG) analysis to identify bottlenecks to accessing nutritious diets. The 2016 analysis estimated that 27 percent of households in Ghana were unable to afford a nutrient-adequate diet. Seven years later, after a period of economic expansion and covariate events like COVID-19, the Global Food Crisis, and macroeconomic fluctuations, the NDPC and WFP undertook a second FNG analysis to understand how non-affordability may have changed and to model interventions relevant in today's context that could mitigate unaffordability.

With a view of working with the UN in Ghana through the United Nation's Sustainable Development Cooperation Framework (UNSDCF), the analysis comes at a time when food systems change is at the forefront of the agendas of the Government of Ghana and WFP in Ghana. The nutrition situation in the country remains complex and targeted, equitable approaches need to be identified and implemented to ensure no one is left behind. In Ghana's northern most regions, the estimated number of households that were food insecure in 2020 were 49 percent in Upper East, 33 percent in North East and 31 percent in Northern region. These numbers are stark in comparison to estimates of food security in Ghana's southern most regions: 4 percent each in Greater Accra and Central, and 5 percent in Western region (Government of Ghana 2020). These numbers are stark in comparison to estimates of food security in Ghana's southern most regions, with 4 percent each in Greater Accra and Central, and 5 percent in Western (Government of Ghana 2020).

Other contrasts include stunting which affects as many as one child in four amongst the poorest households, and fewer than one child in ten amongst the wealthiest households (2). Rates of micronutrient deficiencies follow similar patterns. The 2017 Ghana Micronutrient Survey found that 1 in 4 children in the

lowest wealth quintile suffer from vitamin A deficiency, compared to 1 child in 10 in the highest wealth quintile (3). Overnutrition exists alongside undernutrition. According to the same 2017 survey, 16 percent of women in the bottom wealth quintile are overweight, while 58 percent of women in the top wealth quintile are overweight.

The FNG analysis was developed by WFP with support from strategic partners to provide a framework for strengthened nutrition situation analysis, consensus building and decision making. Through the compilation and analysis of existing data on nutrition, dietary intake, food security, household expenditure and socioeconomic indicators, the FNG tool identifies the main barriers to adequate nutrient intake in a specific context for different target groups. By involving stakeholders throughout the process, different options for improving access to nutritious diets are identified and discussed, including nutrition-specific and nutrition-sensitive policies and programmes.

The overall objective of the FNG in Ghana was to provide a comprehensive nutritional situation analysis of the country with the aim of understanding how people access nutritious foods, identifying the factors that drive cost and affordability of nutritious diets, and exploring opportunities for programming and advocacy for nutrition investment from government and donors. As a result, the FNG process had the following objectives:

1. Generate an evidence base to strengthen social safety nets in Ghana, specifically the LEAP programme, to improve nutrition and food security outcomes.

2. Strengthen the government's response to emergencies, including by leveraging social protection, by being more nutrition sensitive, by providing data that can inform allocation of public resources to health, education, agriculture and social protection, and by promoting policies and programmes that address the root causes of inadequate diets as identified by the FNG process.

3. Strengthen government's advocacy for healthy diets and good nutrition practices by building on current learning from retail programmes and providing evidence for planning Ghana's national healthy diets campaign and national SBC campaign for nutrition.

4. Create momentum and a shared understanding of the private sector's role in providing for nutritious diets. This will inform a strategy for WFP and the government to engage with the private sector, and for launching the Scaling Up Nutrition (SUN) Business Network in Ghana.

5. Support WFP's objectives and strategies and the definition of Ghana's Country Strategic Plan, by providing insights into the economic and systemic barriers to nutritious diets subnationally.

6. Provide evidence for nutritious school meal programmes and fortification initiatives.

Building consensus for improved nutrition

Nutrition is a crucial pillar in the development of a healthy, productive nation. Good nutrition enhances physical and cognitive development, prevents disease, and increases the potential of the workforce and society. Improving diets, especially of children and women, brings immediate and long-term health, education and economic benefits. The two Lancet series (2013 and 2021) on maternal and child undernutrition identified a variety of nutrition interventions that have proven effective. Improving the nutrition situation in a country requires coordinated actions across the food, social protection, health and education systems, actions that are grounded in a good understanding of the local context, its opportunities and bottlenecks, and a synthesis of global and local evidence.

Fill the Nutrient Gap (FNG) is a systems-focused analytical process comprised of a secondary literature review in combination with Cost of the Diet (CotD) linear optimization to understand local drivers that affect the availability, cost and affordability of a nutrient adequate diet. Using the CotD software, solutions of interest for improving the availability of nutritious foods, lowering their costs and/or increasing household income are then assessed for their potential to improve affordability. In this way, the context specific potential for impact of proven interventions can be quantified.

This report presents findings from the analysis and a discussion of its process, methodology and limitations. It highlights recommendations and priorities identified by stakeholders. By identifying and contextualizing new findings, the FNG analysis contributes towards building consensus around a vision and a path forward for improved nutrition in Ghana in a sustainable way that is integrated across the country's food systems.

FILL THE NUTRIENT GAP: SITUATION ASSESSMENT FOR MULTISECTORAL DECISION-MAKING ON THE PREVENTION OF MALNUTRITION

Malnutrition has two direct causes: inadequate dietary intake and disease. The FNG assessment focuses on gaps in dietary intake to inform national policies and actions that can be taken across food, social protection, and health systems to improve nutrition, with a focus on the most vulnerable populations. The FNG considers whether nutritious foods are available, accessible, and affordable in a specific context, and identifies the barriers that lead to gaps in nutrient intake. The analysis focuses on the extent to which vulnerable people have choices in the foods they consume and how those choices are made. The FNG process identifies and models the impacts of context-appropriate interventions to improve diets and nutrient intake across food, health, education, and social protection systems. The results are used to identify entry points across systems, to refine programmes, and to make recommendations to policymakers.

The assessment comprises two components:

1. A country-specific review of secondary data and information on factors that reflect or affect dietary intake. This includes malnutrition trends over time, characteristics of the food system and food environment, and population behaviour related to food and feeding.
2. An assessment of the extent to which economic barriers prevent adequate nutrient intake. This uses the Cost of the Diet (CotD) linear programming software developed by Save the Children (UK), and includes modelling of the economic impact of possible interventions to increase nutrient intake and fill nutrient gaps.

Preventing malnutrition, including through improved access to nutritious foods, cannot be achieved by one sector alone. FNG is designed to inform multisectoral decision making and therefore engages stakeholders from all sectors including food, health, agriculture, education, and social protection.

It is the stakeholders who define the scope and focus of the assessment. They contribute data and sources of information for identification of context-specific barriers and entry points and together with the analytical team develop a shared understanding of the issues and possible solutions. They then identify appropriate nutrition-specific and nutrition-sensitive interventions that can be implemented by different sectors using their existing delivery platforms. These could be social safety nets, food processing and markets, antenatal care, school feeding programmes, etc.

The FNG methodology was developed by WFP with technical support from partners including the University of California Davis, the International Food Policy Research Institute (IFPRI, Washington DC), Epicentre (Paris), Harvard University (Boston), Mahidol University (Bangkok), Save the Children (UK), and UNICEF.

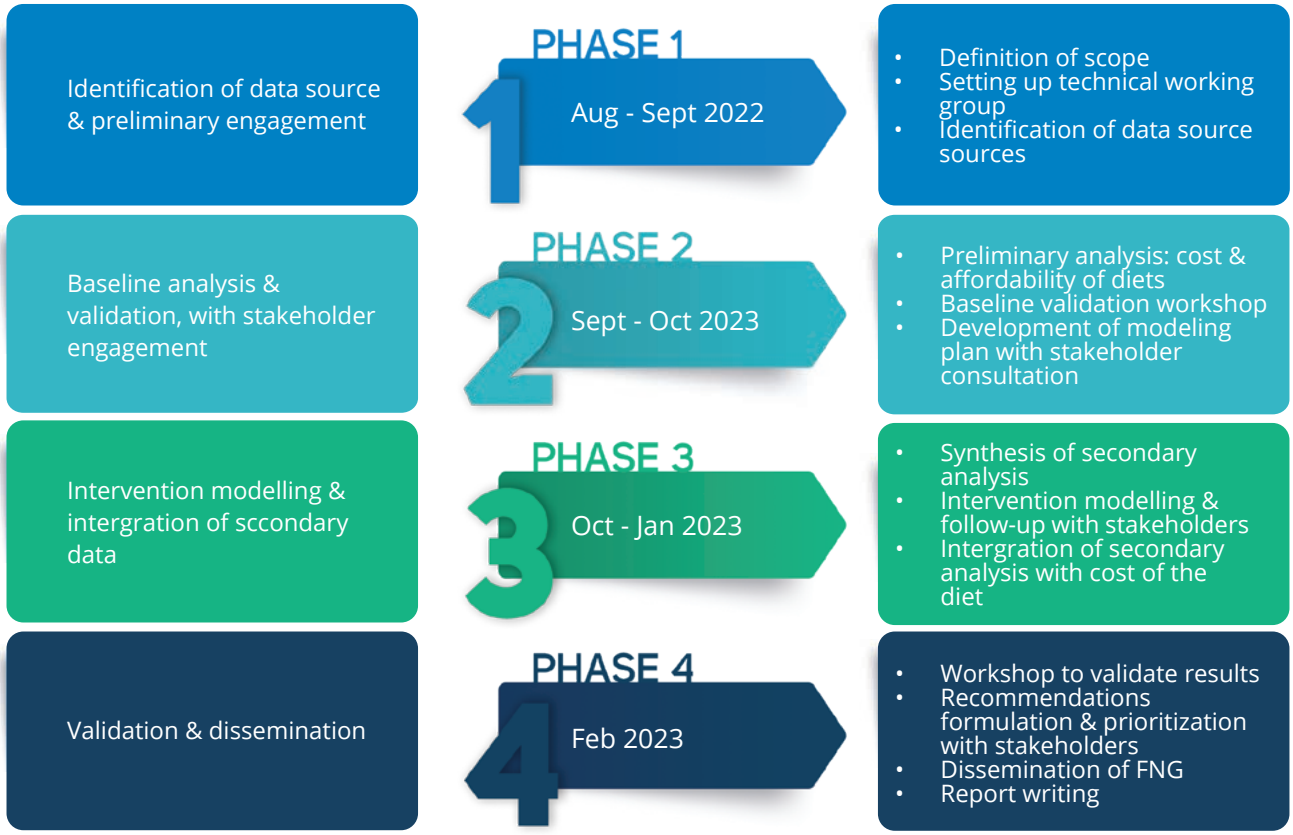
Between 2016 and late 2022, FNG analyses were completed in over 40 countries and at the time of writing, were ongoing in several more.

For more information on the concept and the method of the analysis, see Bose I, Baldi G, Kiess L, de Pee S, The 'Fill the Nutrient Gap' Analysis: An approach to strengthen nutrition situation analysis and decision-making toward multisectoral policies and systems change. Matern Child Nutr 2019: DOI: 10.1111/mcn.12793

Process and Scope of the Analysis

Process of the FNG Analysis in Ghana

Figure 1: The Fill the Nutrient Gap (FNG) process followed in Ghana (2022-2023)



Scope and Focus of the FNG Analysis

Long-term solutions to malnutrition require transformation of the food system along food supply chains, in food environments and in consumer behaviour patterns (Figure 2).

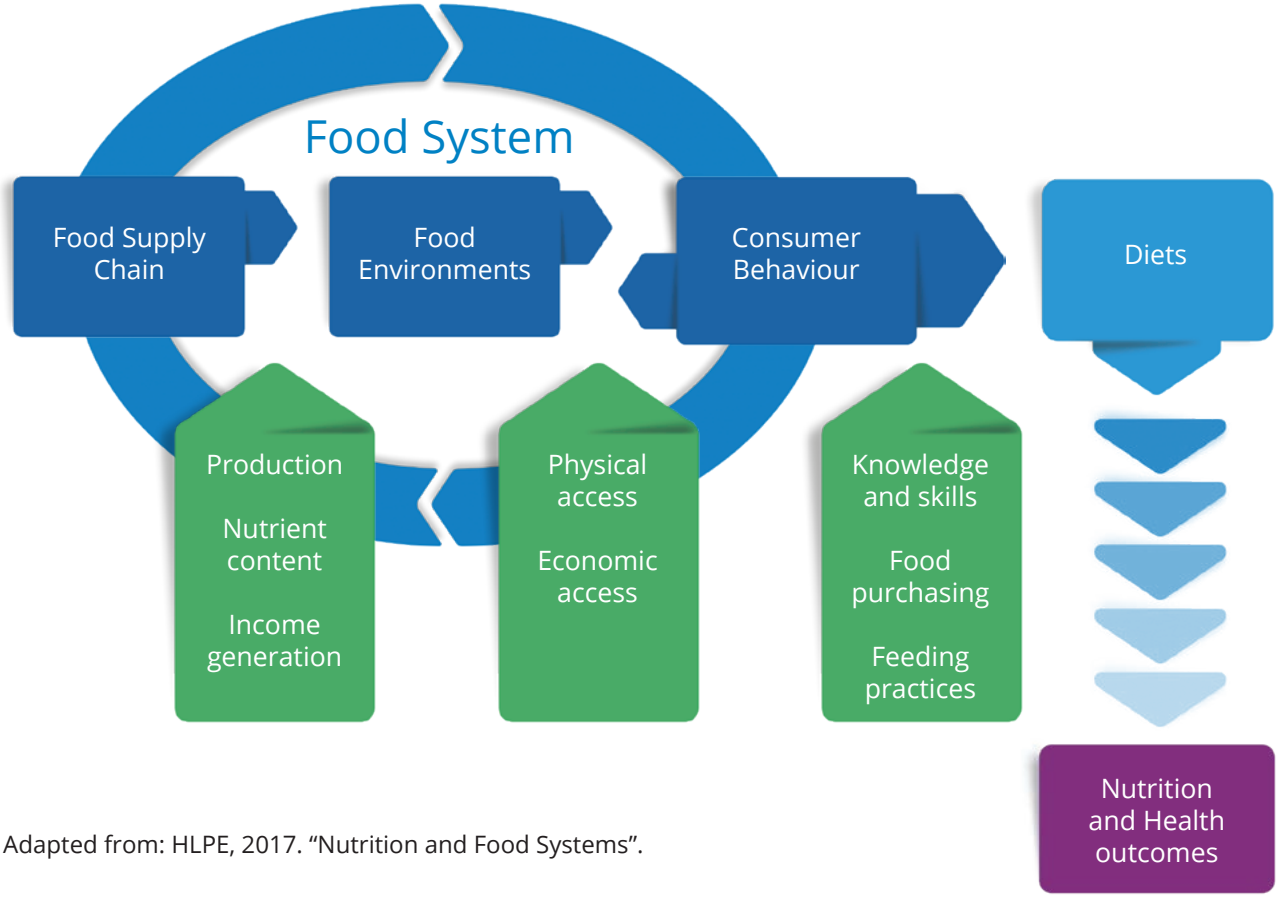
Types of diets calculated by the FNG analysis

The Ghana FNG calculated the lowest costs of three types of diets:

- Energy-only diet: a mathematically optimized diet that meets energy requirements, calculated using the CotD software.
- Nutrient-adequate diet: a mathematically optimized diet that, in addition to energy requirements, meets macro- and micronutrient requirements, calculated using the CotD software.
- Healthy diet: a diet that meets harmonized food-based dietary guidelines in a cost-efficient manner, calculated using Excel and Stata based on guidelines provided by the Food Prices for Nutrition team (4) at Tufts University, Boston, USA.

While the energy-only diet is useful for monitoring the cost of accessing food covering basic energy needs, it should not be used for monitoring or nutrition security. The costs of the nutritious and healthy diets are useful benchmarks for assessing access to locally available nutritious foods but differ in their calculation methodologies and how the indicators can be used. Details on the differences between the costs of the two diets are presented in Table 1.

Figure 2: Food systems for diets, and nutrition and health outcomes framework



Adapted from: HLPE, 2017. "Nutrition and Food Systems".

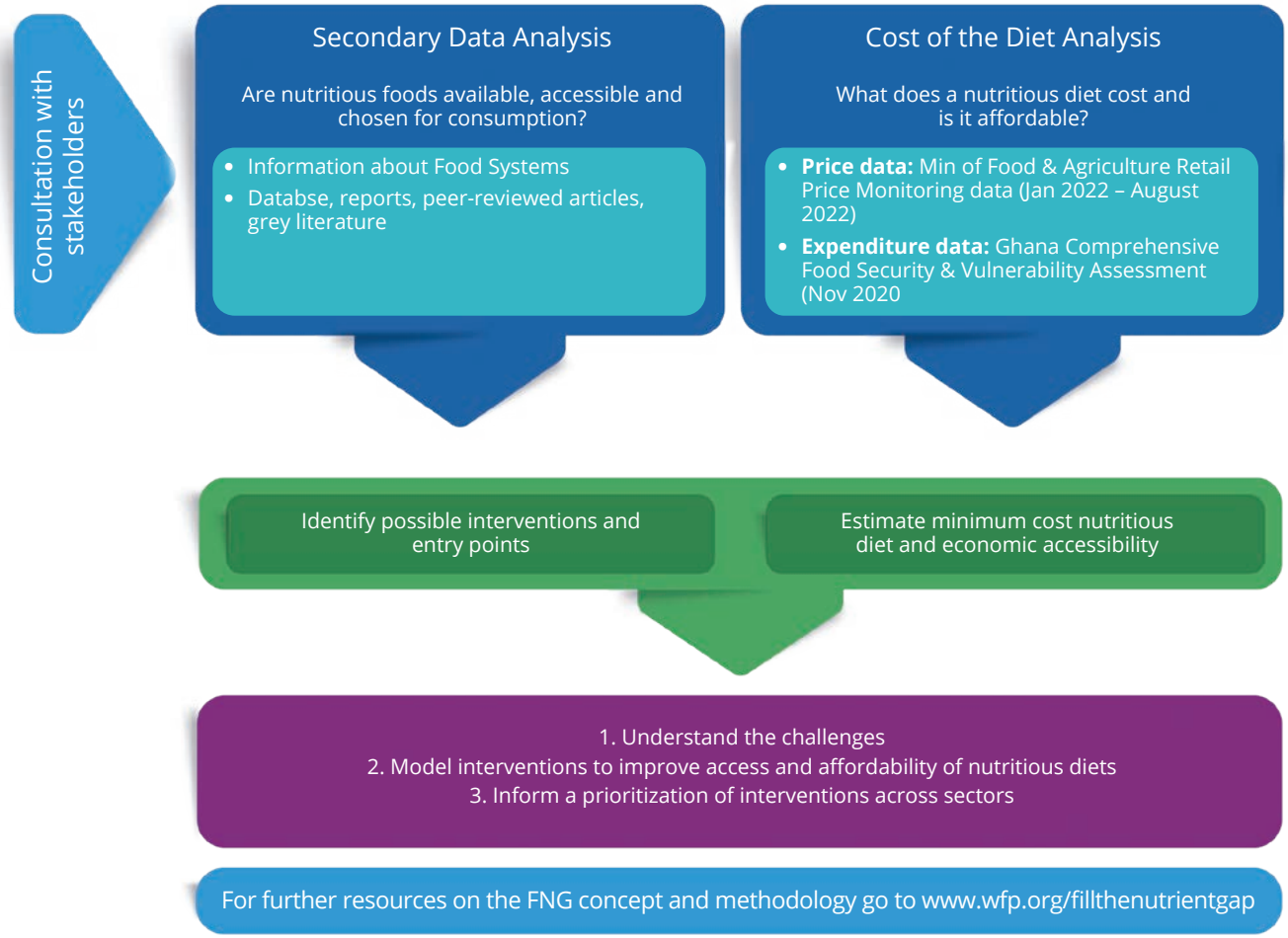
Table 1: Comparison of the nutrient-adequate diet and the healthy diet

Feature	Cost of a Nutrient-Adequate Diet	Cost of a Healthy Diet
Objective of the metric	• Estimating a minimum cost threshold to avoid deficiencies of essential nutrients. This metric can be used to estimate the proportion of households unable to access nutrient-adequate diets. • Inform multisectoral policies/ programmes by modelling the impact of different interventions on the cost of a nutrient-adequate diet.	• Calculating and monitoring the cost of meeting food-based dietary guidelines (FBDGs). Can also be used to estimate the proportion of households unable to access a healthy diet.
Approach	Nutrient-based approach. Calculates the least-cost diet that meets energy and macronutrient requirements as well as selected micronutrient requirements for individuals across the life cycle.	Food group-based approach. Calculates the least-cost diet that meets dietary guidelines defined for a reference individual.
Reference individual	FNG standard modelled household of 5 persons: • Breastfed child (12-23 months) • School-age child (6-7 years) • Adolescent girl (14-15 years) • Breastfeeding woman • Adult man (30-59 years)	Typically uses a single reference individual, usually a non-pregnant, non-breastfeeding woman (30 years). For FNG's purposes, results have been scaled for energy content to be comparable to the modelled 5-person household.
Geographical unit	County level; calculated by region.	
Does it represent the cost of a recommended diet?	No. This is an economic benchmark of the lowest cost for people to meet their nutritional needs with foods available in local markets. This is not a shopping list or recipe, as the food selection may not make palatable recipes.	Yes, as FBDGs focus on foods rather than nutrients. This is an economic measure of the lowest cost of selecting food that would allow people to meet recommended dietary guidelines, given local food prices.
Does the selected diet reflect actual diets and/or preferences?	The diet is not based on dietary guidelines, tastes or local preferences. The modelled diet is, however, adjusted to include at least 2 portions of the most-widely consumed staples in each assessment area and selects foods that are available in the area (from the list of food prices).	While dietary guidelines may be based on cultural preferences, the cost of a healthy diet selects the cheapest items within each food group and is agnostic to tastes and preferences.

Methodology

The FNG analysis is composed of a secondary literature review of the food system and the social protection and health sectors, focusing on placing cost and affordability results in context and on identifying entry points for current and potential nutrition interventions, and a CotD analysis. The CotD analysis uses linear optimization to provide a detailed view of availability, cost and affordability of nutritious diets (Figure 3).

Figure 3: FNG analytical framework



Secondary Data Analysis

FNG secondary data analysis identifies barriers to accessing healthy diets, platforms for reaching nutritionally vulnerable groups in the population, and opportunities for policy and programme interventions to improve access to nutritious foods through multiple sectors, including agriculture, health, social protection and education.

Cost of the Diet (CotD)

COST OF THE DIET (CotD) ANALYSIS

CotD software uses linear programming to understand the extent to which level of income, food availability and food prices may affect the ability of people to meet their nutrient needs. Using price data collected from markets or from secondary sources, the software calculates the amount, combination, and lowest possible cost of local foods that are required to provide individuals or households with their average needs for energy, and their recommended intake of protein, fat and micronutrients1. These diets are calculated within defined constraints to prevent the inclusion of unrealistic types or amounts of food and the provision of excessive amounts of nutrients.

The FNG approach defines the 'Staple Adjusted Nutrient-adequate Diet' as the lowest cost nutritious diet that includes a typical staple food and excludes foods that are prohibited2. It meets requirements for nutrients, including protein, nine vitamins and four minerals, and does not exceed energy and fat requirements. This diet is conceptually similar to the 'nutrient-adequate' diet estimated as the second level of diet quality in the State of Food Insecurity (SOFI) report.

Population expenditure data is compared to the cost of the nutrient-adequate diet and is used to estimate the proportion of the population that would not be able to afford it. This non-affordability can be estimated and compared across different regions, seasons or countries. The estimate of non-affordability is a conservative estimate of the share of households unable to afford the lowest cost nutrient-adequate diet, assuming optimized selection of nutritious foods. The real cost and non-affordability of a nutritious diet is likely to be higher, as reflected by a healthy diet, which includes foods from several food groups and has greater diversity within food groups.

[1] As defined by the Food and Agricultural Organization (FAO) and the World Health Organization (WHO).
[2] This diet is not intended to reflect what individuals or households are currently eating nor should it be used to develop food-based recommendations or dietary guidelines. Foods that are prohibited could be for customary or public health reasons, e.g., raw meat during pregnancy in some parts of the world.

Data sources

Price data for the calculation of the costs of diets came from the Ministry of Food and Agriculture regional monthly retail price monitoring data (5) and ranged from January to August 2022. Expenditure data for estimating non-affordability of diets came from the Ghana Comprehensive Food Security and Vulnerability Assessment carried out in November 2022 (1). Expenditure data was adjusted from November 2020 to average 2021 levels using Consumer Price Index (CPI) factors from the Ghana Statistical Service (GSS).

As described in Box 2, the FNG approach defines the 'Staple Adjusted Nutrient-adequate Diet' as the lowest cost nutritious diet that includes a typical staple food. The staples included for each region were identified using Ghana Living Standards Survey (2017) and validated during the stakeholder workshop.

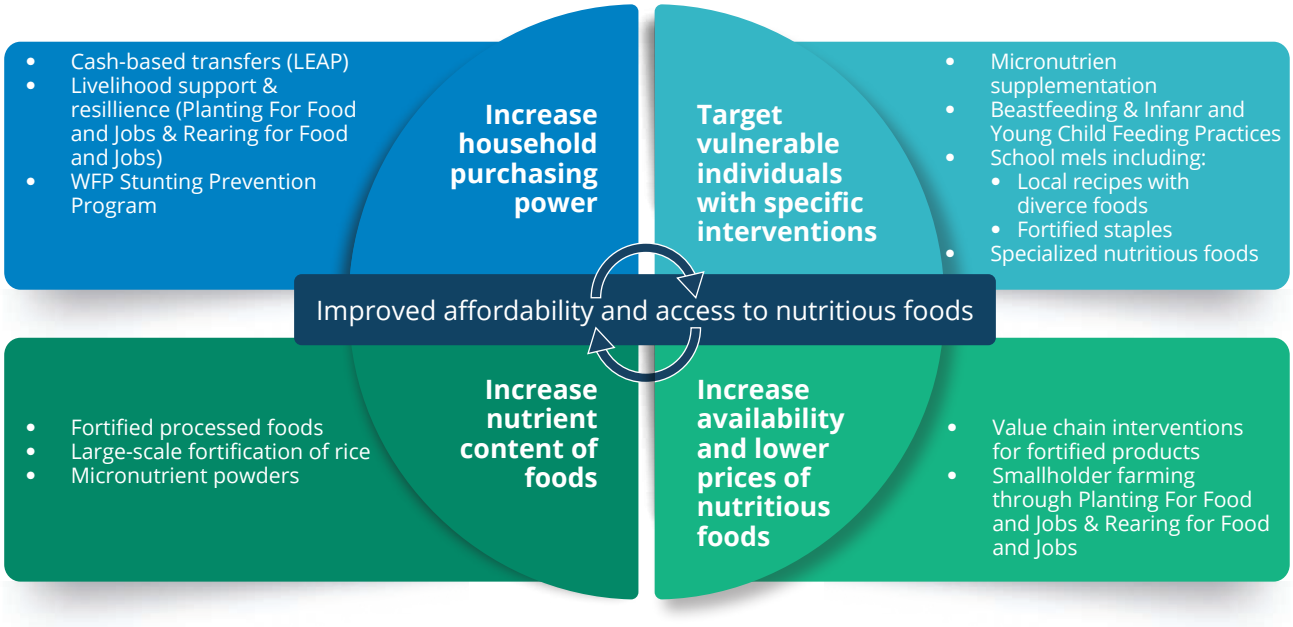
Modelled household & main target groups for the analysis

The five-person household, is comprised of a breastfeeding child (12-23 months), a school-age child (6-7 years), an adolescent girl (14-15 years), a breastfeeding woman, and an adult man. The household cost estimates were used in the calculation of non-affordability.

Intervention modelling

All interventions modelled in the FNG analysis were discussed with stakeholders and defined and approved by them. To identify concrete recommendations based on analyses, the FNG process concentrated on modelling the interventions outlined in Figure 4.

Figure 5: Entry points and interventions modelled to estimate reduction in cost of a nutritious diet



Considerations for interpretation and data gaps

Macroeconomics: During the period of the FNG analysis (October 2022 to February 2023), Ghana underwent significant macroeconomic challenges in price inflation and depreciation of the Ghanian cedi (GH□) (6, 8). Initially, the FNG was estimated using monthly retail food price data for three seasons in 2021; after deliberations with stakeholders, the analysis was updated to the most recent data available at the time of calculation, January through August 2022. In the third and fourth quarters of 2022, year-on-year food price inflation was near or over 50 percent. Any interpretation of the FNG findings should consider the broader economic context and time of analysis, as it is likely that costs and non-affordability have both increased since August 2022.

Currency conversion: The volatility of the exchange rate during the period of analysis posed challenges in interpretation of findings, specifically for understanding effects of seasonality on prices. For consistency, the FNG used an exchange rate of GH□ 6.96 to USD 1, calculated as the average exchange rate between January and August 2022.

Household purchasing patterns: Cash transfer and income generation aim to reflect actual household expenditure patterns, i.e., not all income is spent on food purchases. The analysis assumed that 70% of additional income generated is directed towards food purchases, based on patterns identified for the poorest households surveyed in the Comprehensive Food Security and Vulnerability Assessment (1).

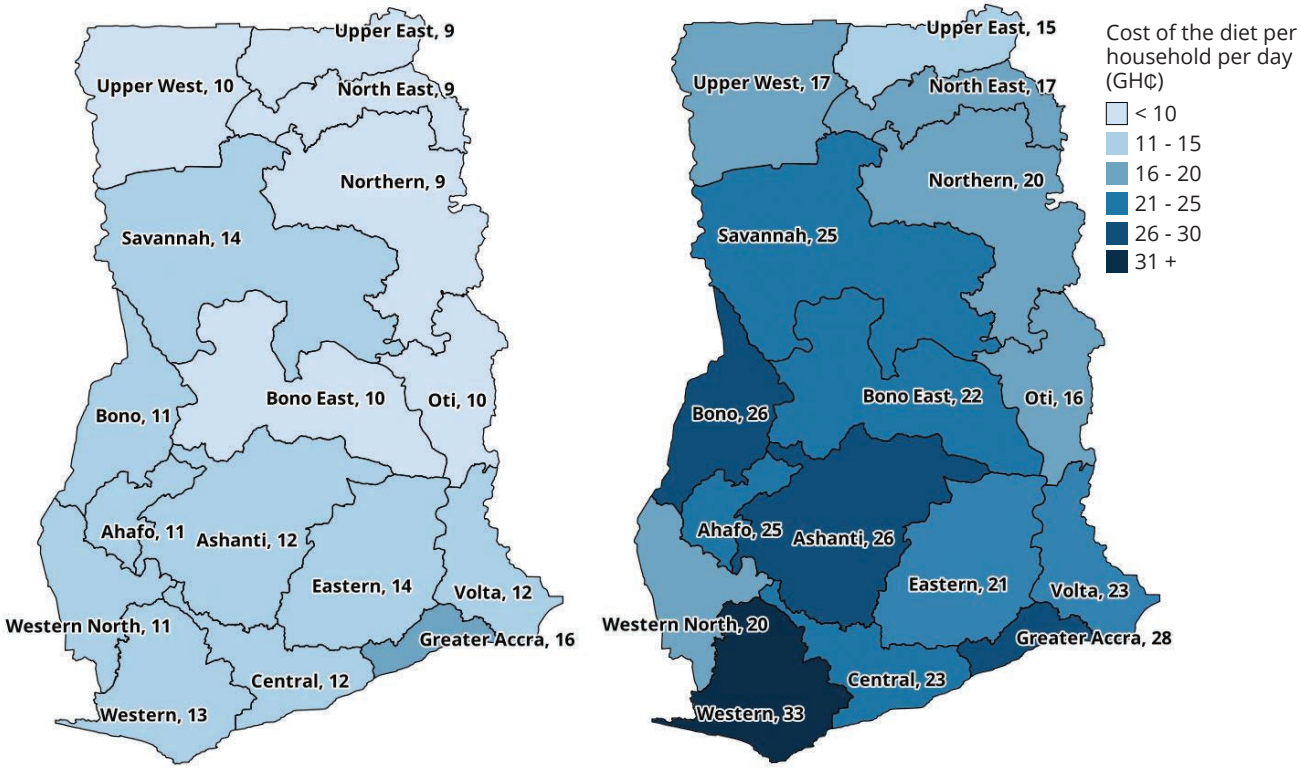
Findings

1.

Nutrient-adequate and healthy diets cost two to three times more than diets that meet only energy needs. The costs of diets are lowest in northern regions and highest in southern regions.

In Ghana, the average daily costs per five-person household of the three diets are as follows: the energy-only diet is GH₵ 12 (USD 1.78), the nutrient-adequate diet is GH₵ 24 (USD 3.38), and the healthy diet is GH₵ 31 (USD 4.45). Costs of the energy-only and nutrient-adequate diets for each region are presented in Figure 5. The sizeable difference between the energy-only diet and the nutritious and healthy diets is due to the foods included in each diet. The energy-only diet is comprised of inexpensive staples such as maize and oil, while the nutritious and healthy diets are comprised of a diversity of food groups and include cereals, pulses, animal source foods, fresh fruit and vegetables.

Figure 5: Cost of the energy-only diet (left) and cost of the nutrient-adequate diet (right) for a 5-person household in GH₵



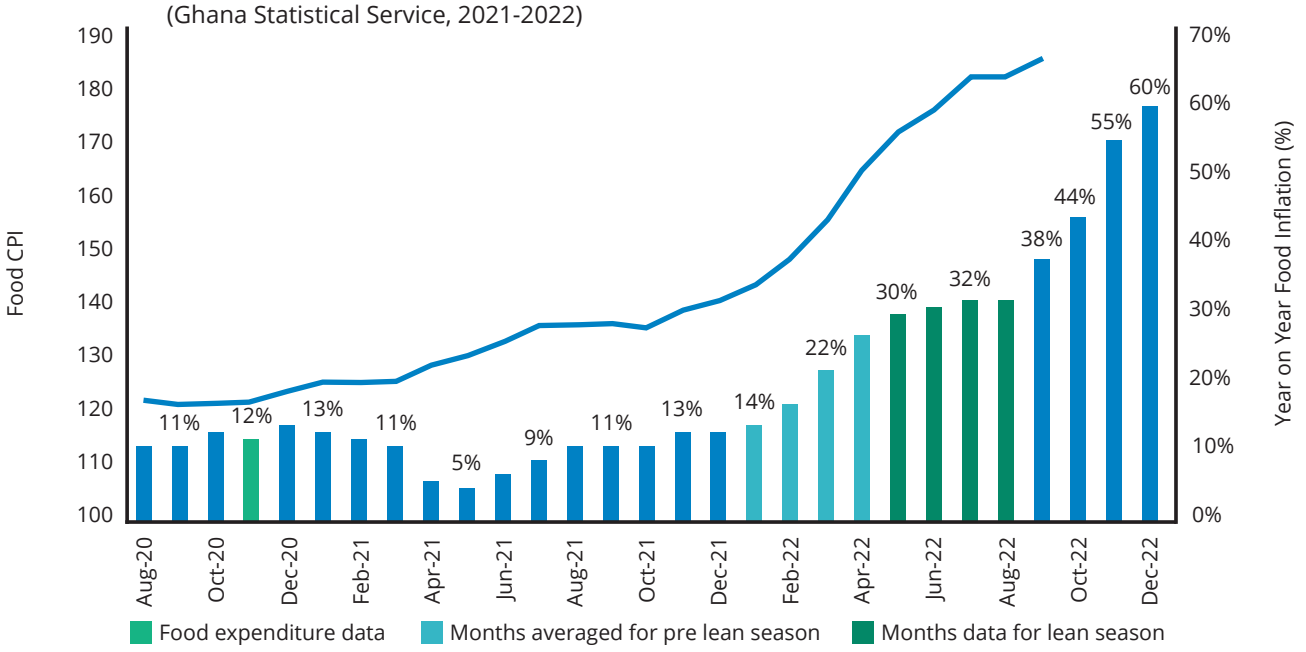
Cost results for each region for each season are available in the extended report (shared on request). When adjusted for inflation, the analysis found that in eleven of the sixteen regions, the cost of the nutrient-adequate diet was highest during one of the lean season (name month/s) included in the analysis (by 3 percent on average).

2.

Ghana has experienced macroeconomic shocks due to COVID-19 and the global food crisis. Food price inflation in 2021 and 2022 has dramatically increased the cost of food and of healthy, nutritious diets.

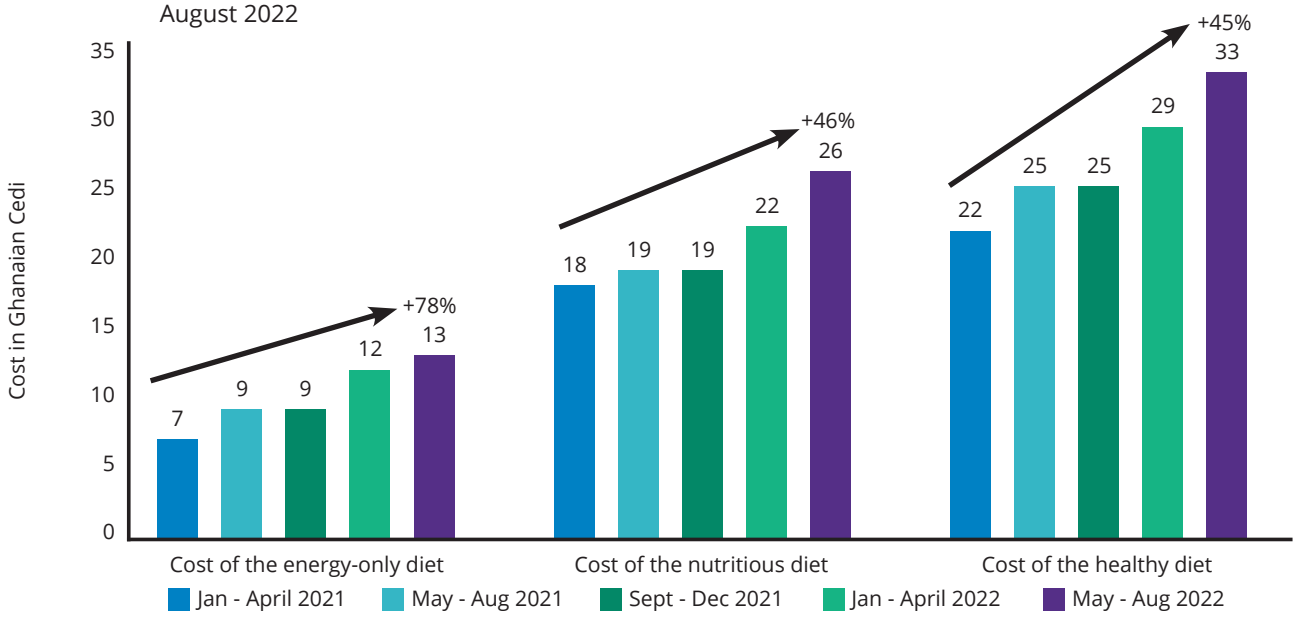
According to the World Bank (7-8), Ghana's heavy dependency on natural resource exports (gold, cocoa and oil) coupled with its dependency on imports of basic food items, exposes the economy to external shocks. During the COVID-19 period, real GDP growth slowed to 0.8 percent, down from 6.5 percent in 2019, and three out of four Ghanaian households reported income decline (7-8). In 2021 and 2022, food price inflation surged, exacerbating the economic constraints to access nutritious foods. Figure 6 shows the food consumer price index (CPI) (left axis) and its interpretation in terms of year-on-year food inflation (right axis) in percentage terms. Since the start of 2022, food inflation has notably increased, making food more expensive in a short period of time (9).

Figure 6: Food CPI and year-on-year inflation between August 2020 and December 2022 (Ghana Statistical Service, 2021-2022)



The increase in food prices is reflected in increasing costs of the three types of diets included in the analysis. Figure 7 shows the costs of the energy-only diet, nutrient-adequate diet and healthy diet, calculated for three additional time periods, previous to the 2022 estimates used in the FNG analysis. Between January 2021 and August 2022, the costs of the diets increased by 78 percent, 46 percent and 45 percent respectively.

Figure 7: Changes in the costs of the energy-only, nutritious and healthy diets between January 2021 and August 2022



3.

Rising food prices have led to more households in Ghana being unable to afford diets that meet their nutrition needs. By late 2022, at least one in two households was not able to afford the cost of nutrient-adequate and healthy diets, increasing the risk of food insecurity and malnutrition.

In 2022, at least 20 percent of households in Ghana could not afford the energy-only diet, 44 percent could not afford the nutrient-adequate diet. and 58 percent could not afford the healthy diet. Non-affordability of the energy-only and nutrient-adequate diet by region (average January to August) is shown in Figure 8. Non-affordability of the energy-only diet ranges from 10 percent in Central region to upwards of 50 percent in Upper West, North East and Savannah regions. Non-affordability of the nutrient-adequate diet also ranges widely, from 30 percent in Central region to as high as 81 percent in North East and Savannah regions. Areas with the highest rates of non-affordability for both types of diets are consistent with areas identified to be most food insecure in the CFSVA (1).

The increases in food prices between 2021 and 2022 impacted on the non-affordability of diets. Assuming households retained stable purchasing patterns between 2021 and 2022 (i.e., food expenditure did not change), the increases in food prices results in sharp increases in non-affordability between January 2021 and August 2022. The national average non-affordability of energy-only diets almost doubled, while the non-affordability of nutrient-adequate and healthy diets each increased by over 40 percent, as shown in Figure 9.

Figure 8: Proportion of household unable to afford an energy-only diet (left) and a nutrient-adequate diet (right)

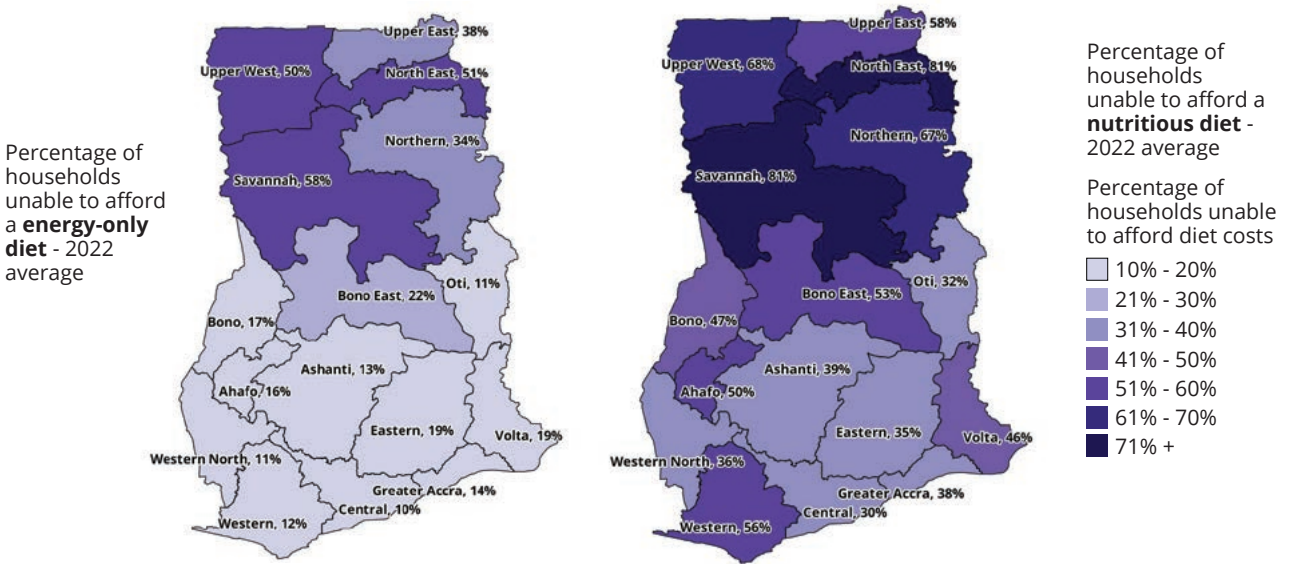
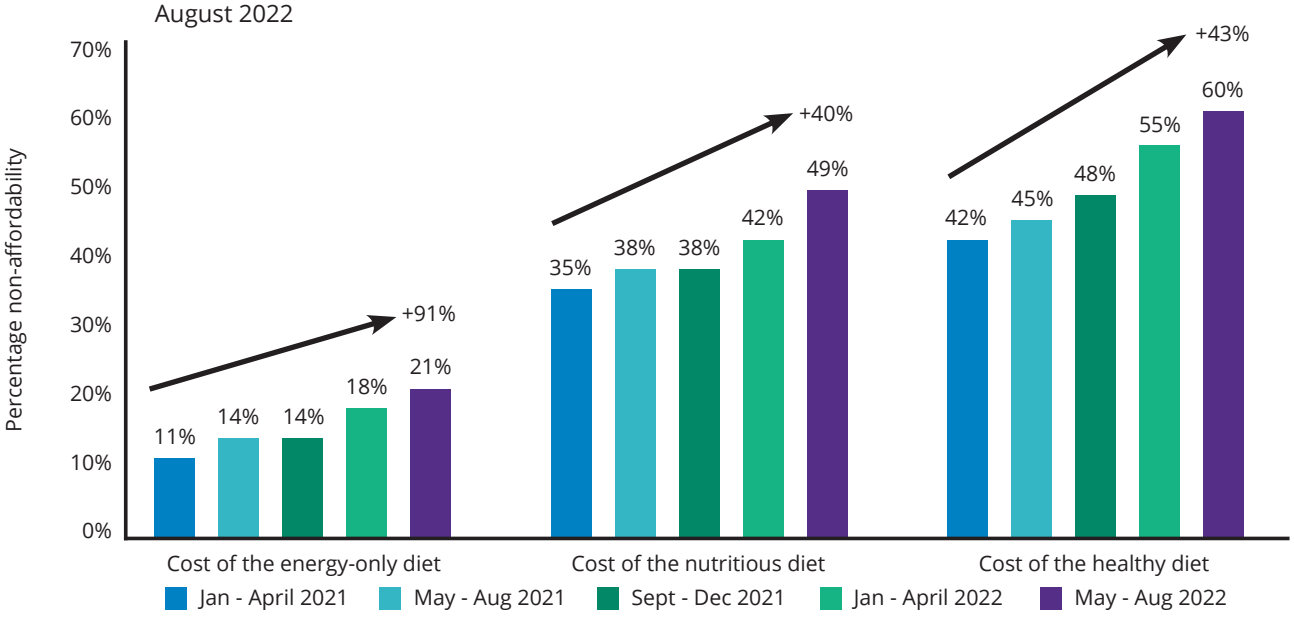


Figure 9: non-affordability of the energy-only, nutrient-adequate and healthy diets between January 2021 and August 2022

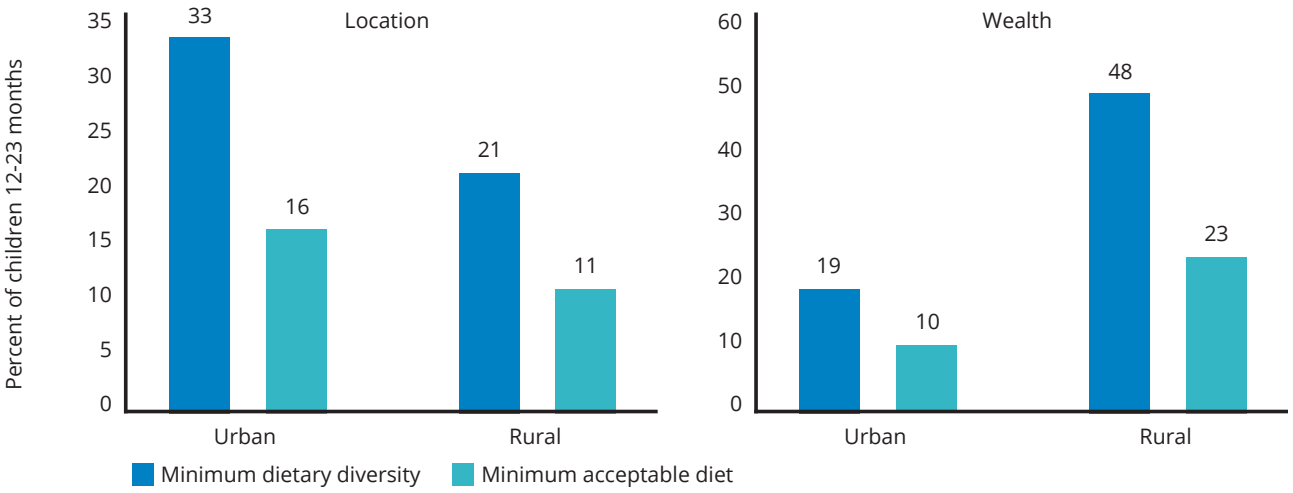


4.

Wealth levels and opportunities to improve living conditions vary widely across socioeconomic groups and geographies. Improving access to nutritious diets requires an equitable multisectoral approach to strengthen households' economic capacities.

Efforts to improve accessibility to nutritious diets require equitable approaches, as nutrition indicators and outcomes differ across socioeconomic groups and living contexts. Figure 10 shows that the percentage of children consuming adequately diverse diets and minimally adequate diets is higher in households that are urban and wealthy than in those that are rural and poor. A similar trend is evident when examining nutrition outcomes in children under 5 years by wealth group: among the poorest quintile of households, 25 percent of children are stunted, while in the highest quintile, 9 percent are stunted (2). Overweight and obesity affects both the poorest and wealthiest households, although rates among the wealthiest percentile are notably higher. According to the Ghana Micronutrient Survey (3), 58 percent of women in the wealthiest quintile are overweight versus 16 percent in the lowest quintile.

Figure 10: Nutrition indicators for children aged 12-23 months by location and wealth group in Ghana (UNICEF 2022)



Although nutrition outcomes may differ, data on consumption patterns for urban and rural households show that both groups have relatively low rates of regular consumption of some nutritious food groups. The Global Diet Quality Project found that not more than 21 percent of adults in rural areas and 24 percent of adults in urban areas regularly consume over 400 grams of fruit and vegetables. Consumption of foods that are associated with increased risk of non-communicable diseases are commonplace in both settings (10).

5.

Nutritious school meals based on diverse local recipes and/or including fortified staples, provide good nutrition for schoolchildren. Ingredients for a meal that covers at least a third of a child's daily nutritional needs cost more than GH₵ 1 per day, excluding preparation costs.

The Ministry of Gender, Children and Social Protection leads the Ghana School Feeding Programme (GSFP). Under the current strategy, school meal procurement is decentralized and each school has a local caterer who selects school meal menus and procures ingredients. Each caterer receives a budget allocation of GH₵ 1 per student per day, from which they must purchase ingredients and transport them, provide fuel and water for food preparation,, pay cooks, and support their own overheads.

Stakeholders indicated that often, caterers do not have the resources to purchase the ingredients necessary for diverse recipes. The GSFP has developed menus based on local recipes that meet at least 30 percent of recommended daily allowance for energy and a full range of nutrients (RDA). To assess if caterers would be able to afford to purchase ingredients for such meals, the FNG analysis priced the ingredients using food price data from the Ministry of Food and Agriculture. Because both meals based on the menu guidelines (school meal 1 and school meal 2) were above the GH₵ 1 allowance, the FNG also included two simple school meals, both comprised of rice, pulses and oil but in the second meal the rice was fortified. A comparison of the meals' compositions, costs and contributions to reducing the cost of the nutrient-adequate diet for a school-age child is given in Table 2.

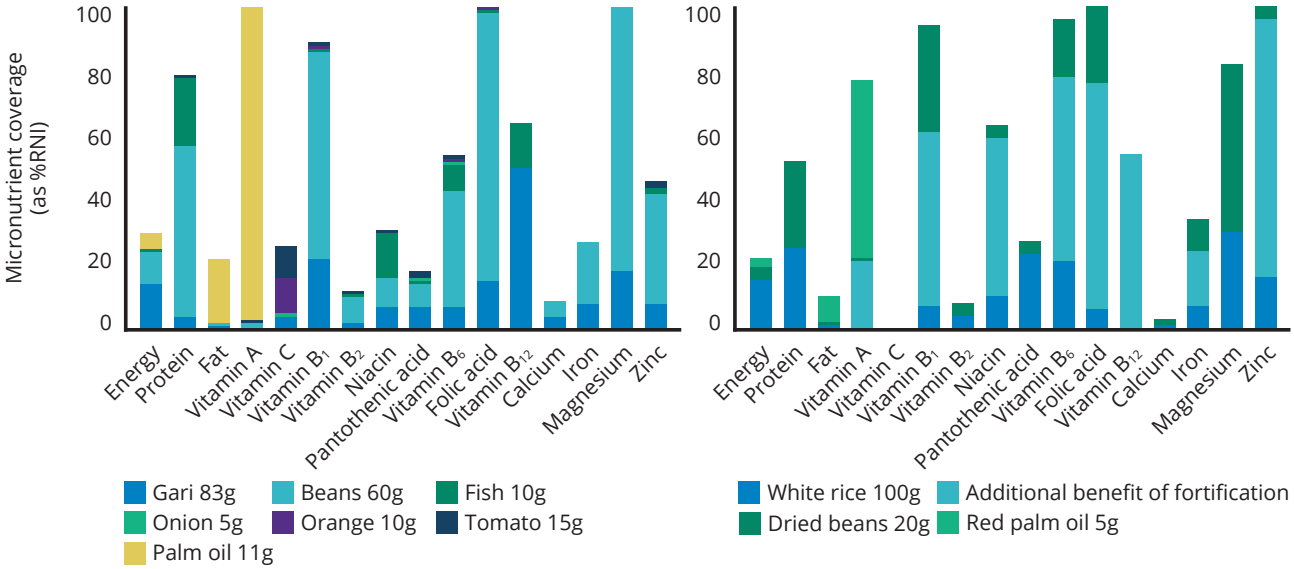
Table 2: Parameters used in school feeding models, cost of the meal provided and the percent reduction in the cost of the child's nutrient-adequate diet when given in-kind to a child of 6-7 years.

Meal	Scenario	Ingredients	Cost of ingredients	Reduction in the cost of the diet
School meal 1: Ampesi with cocoyam leaves	School caterers are able to source nutritious foods based on local recipes	100g yam, 24g tuna, 5g onion, 15g tomato, 15g leaves, 11g palm oil	0.97 – 1.22	15 percent
School meal 2: Bean stew with gari	School caterers are able to source nutritious foods based on local recipes	83g gari, 60g white bean, 10g fish, 5g onion, 15g tomato, 10g orange, 11g palm oil	1.39 – 1.65	16 percent
School meal 3: Simple school meal	Caterers can only afford to procure non-perishable ingredients	100g rice, 20g beans, 5g palm oil	0.59 – 0.85	16 percent
School meal 4: Fortified simple school meal	Caterers can only afford to procure non-perishable ingredients, but the rice is fortified.	100g fortified rice, 20g beans, 5g palm oil	0.67 – 0.97	18 percent

Note: fortified rice is assumed to be 20 percent more expensive than unfortified.

The reduction in the cost of the diet is similar across the meals as they all leave gaps for similar limiting micronutrients, specifically calcium, vitamin B2 and vitamin C. However, the overall contribution to meeting micronutrient needs differs between meals. School meals that are comprised of a diverse basket of foods or include fortified foods, fill more of the nutrient gaps for school age children. Figure 11 compares micronutrient coverage as a percentage of recommended nutrient intake (RNI) from school meal 2 (left) and school meal 4 (right).

Figure 11: Micronutrient coverage provided by school meal 2 (left) and school meal 4 (right) for a child aged 6-7 years



To assess the minimum cash allowances necessary to purchase ingredients for a nutritious school meal, the FNG conducted a costing analysis using WFP's PLUS tool. The PLUS tool utilises retail food price data to calculate the least-cost school meal menu that can meet the micronutrient needs of a school-age child at a threshold set by the user. Modelling was carried out for a child aged 6-12 years (either sex) for the following models:

- Meal 1: Calorie needs are met at 30 percent (550 Kcal) and micronutrient needs are met at 30 percent.
- Meal 2: Calorie needs are met at 30 percent (550 Kcal) and micronutrient needs are met at 50 percent.

Table 3 shows the minimum cost of the ingredients of a school meal per day per child under each of the two modelling scenarios, in four diverse regions of Ghana. Ingredients for a meal meeting at least 30 percent of micronutrient requirements would cost between GH₵ 0.82 and 1.29, depending on the area, indicating that the current budget allocation per school meal would be insufficient to meet the target. The cost of ingredients of a meal increases with higher micronutrient requirement targets. To meet 50 percent of requirements, the minimum suggested percentage defined by WFP, a meal would cost GH₵ 1.25 to 2.11.

Table 3: Cost of minimally nutritious school meals in selected regions of Ghana

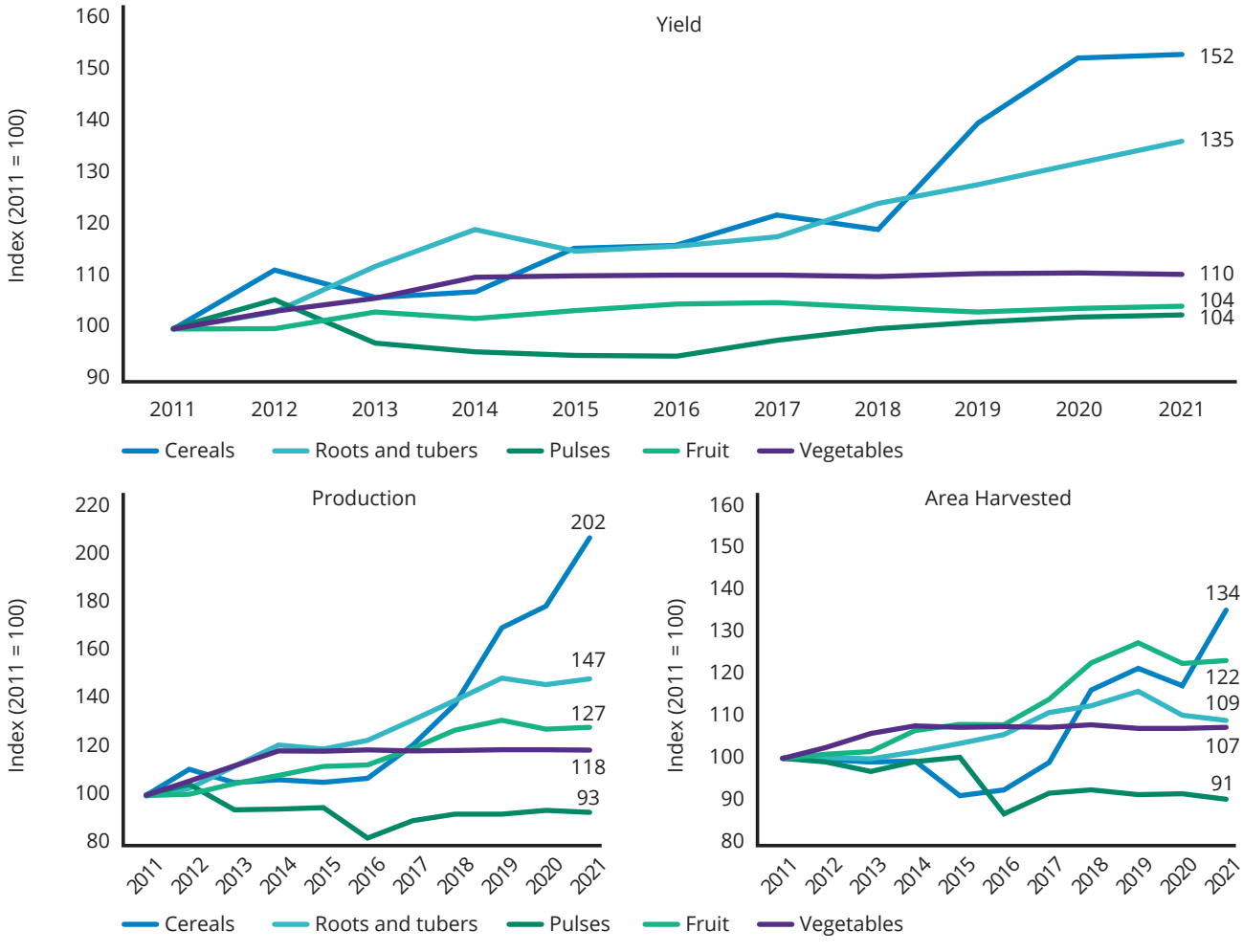
	Calorie needs are met at 30 percent and micronutrient needs are met at 30 percent Cost of ingredients (GH₵)	Calorie needs are met at 30 percent and micronutrient needs are met at 50 percent Cost of ingredients (GH₵)
Ashanti	1.09	1.68
Western	1.29	2.11
Upper East	0.82	1.25
Northern	0.82	1.35

6.

Nutrition-sensitive agriculture can support dietary diversity and strengthen local food systems. The PFJ and RFJ programmes have potential to improve nutrition outcomes by supporting producers to increase production and consumption of nutritious foods.

Agriculture continues to be a dominant industry in Ghana. The sector accounts for one fifth of national GDP and provides livelihoods for an estimated 45 percent of households (11). Progress in crop agriculture in the last decade has been in favour of staple crops. Figure 12 shows the area harvested, total production quantity, and yield values indexed to 2011, and shows that cereals have increased across all three criteria, while pulses, fruit, and vegetables have decreased or increased modestly. These trends indicate that the agricultural sector continues to orient towards the production of cereals over other food groups (12).

Figure 12: Changes in area harvested, production and yield by food group between 2011 and 2021 (national averages; FAOSTAT)



Ghana's Ministry of Food and Agriculture has rolled out the PFJ and RFJ programmes to support households in the production of staple foods and nutritious plant-based and animal source foods, for households' own consumption and market sales. The FNG modelled the potential impact of such programmes for crop, milk and egg production (full findings in the FNG Ghana extended report). The parameters used for the crop production model are provided in Table 4 and are based on findings from the monitoring report of the PFJ programme (13). In the baseline scenario, it is assumed that producers are using standard methods and producing maize, soybean and white or yellow sweet potatoes. In the improved scenario, producers are using improved production methods and have also changed from white or yellow sweet potato to orange flesh sweet potato.

Table 4: Parameters used in modelling the Planting for Food and Jobs Programme

Model	Modelling zones	Harvest	Production commodities	Amounts consumed by household (monthly)	Amounts sold by household
Planting for Food and Jobs **Baseline**	Western, Northern, Upper East, Ashanti	Once per year	Maize Soybean[1] **Yellow flesh** sweet potato	20 kg of each crop	**35 – 45 kg** (depending on area)
Planting for Food and Jobs **Improved crop & yields**			Maize Soybean **Orange flesh** sweet potato		**43 – 54 kg** (depending on area)

It was found that in the improved scenario, households were better able to cover their total household cost of the nutrient-adequate diet. If households consume roughly 5kg of each crop produced per week, the food basket in the improved scenario reduced the cost of the diet more than in the baseline scenario (49 percent versus 45 percent). This is due to the additional nutritional value of the improved basket, as the orange flesh sweet potato contributes to filling nutrient gaps for vitamins A and C. Because the market prices for orange flesh sweet potato were marginally less than the prices of yellow flesh in the price data, the revenue generated through sales of produce were similar under both models, but slightly higher in the baseline model (11 percent versus 10 percent in the improved yield scenario).

In addition to planting, the FNG modelled the potential impacts of the RFJ programme (results not shown). The analysis found that based on production levels calculated during the project's evaluation, consumption of eggs made possible by improved poultry production could cover 5 percent of the household's daily cost of the nutrient-adequate diet. Based on average production quantities for milk per cow in Ghana (14-15), a household that is supported with the RFJ to sell and consume milk could cover between a quarter to over half of the total household cost of the nutrient-adequate diet, depending on wholesale costs of milk in a specific region.

7.

Value vouchers designed to meet nutritional needs can reduce the affordability gap of a nutrient-adequate diet. Inclusion of fortified foods and bio-fortified in value voucher lists can generate demand for fortified products and stimulate value chain actors to ensure supply.

At the time of analysis, WFP was implementing the Stunting Prevention Programme, a value voucher intervention targeting nutritionally vulnerable pregnant women and girls, and children under two years in the Northern region. Before moving to a value voucher modality, the programme functioned as a commodity voucher.

The current value voucher programme enables beneficiaries to pick from a list of nutritious food items, such as green leaves and eggs, and to select fortified foods, specifically a porridge blend fortified to WFP's specifications for SuperCereal for women and girls and KokoPlus, a protein /micronutrient powder for children aged under two. The analysis modelled the current value voucher modality and the previous in-kind modality to assess the impacts of both in covering the cost of the nutrient-adequate diet for children and women. Parameters used in the modelling are shown in Table 5.

[1] Soybean was selected based on monitoring reports for the Planting for Food and Jobs programme. Soybeans are a proxy for the reality of food purchased and consumed in most households in Ghana, primarily cowpeas and/or groundnuts.

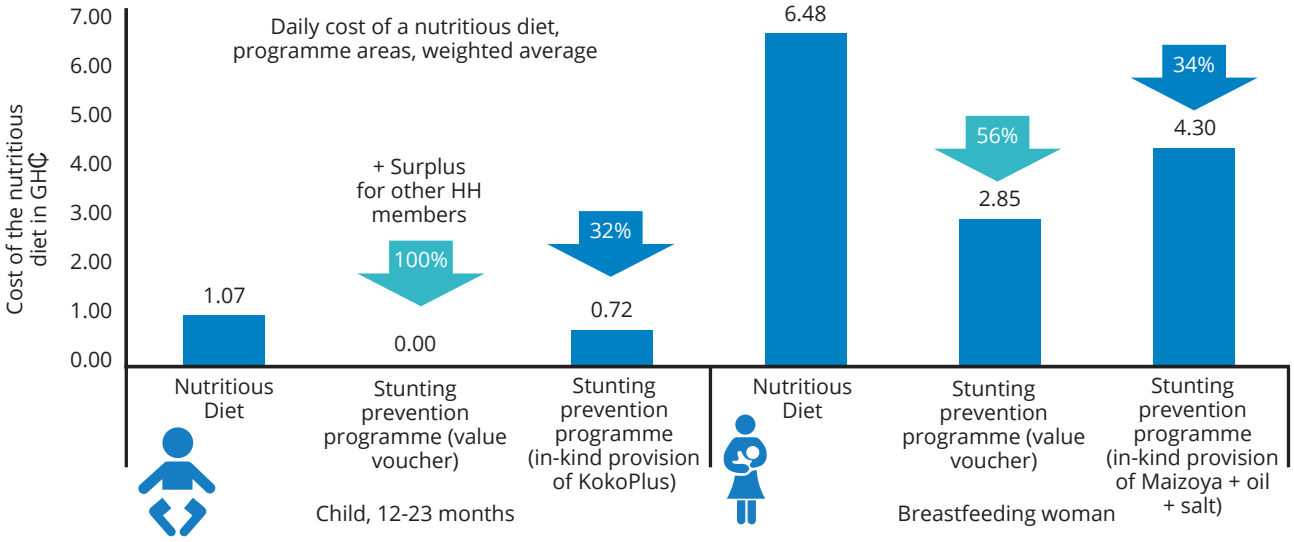
Table 5: Parameters used in modelling WFP Stunting Prevention Programme

		Basket (per month)
Scenario 1: Value voucher modality	Children 6-23 months	USD 7 value
	Pregnant and breastfeeding women and girls	USD 16 value
Scenario 2: Commodity voucher transfer	Children 6-23 months	30 Sachets of KokoPlus (15 g per sachet)
	Pregnant and breastfeeding and girls	6kg of Maizoya, 1L of fortified vegetable oil, 200g iodised salt

Note: Modelled for Northern Region, Savannah and North East

Figure 13 shows the reduction in the cost of the nutrient-adequate diet for the child aged under two and the breastfeeding woman under both programme modalities. The value voucher can cover the entire cost of the nutrient-adequate diet for a child aged 12-23 months and the remaining value can be spent on foods for other household members. The value voucher covers more than half the cost of the nutrient-adequate diet for the breastfeeding woman. The in-kind provision of fortified foods also significantly reduces the cost of the nutrient-adequate diet for both individuals, but by less than the value voucher, as shown in Figure 13.

Figure 13: Reduction in the cost of the nutrient-adequate diet after provision of the value voucher and in-kind modality of the stunting prevention programme



8.

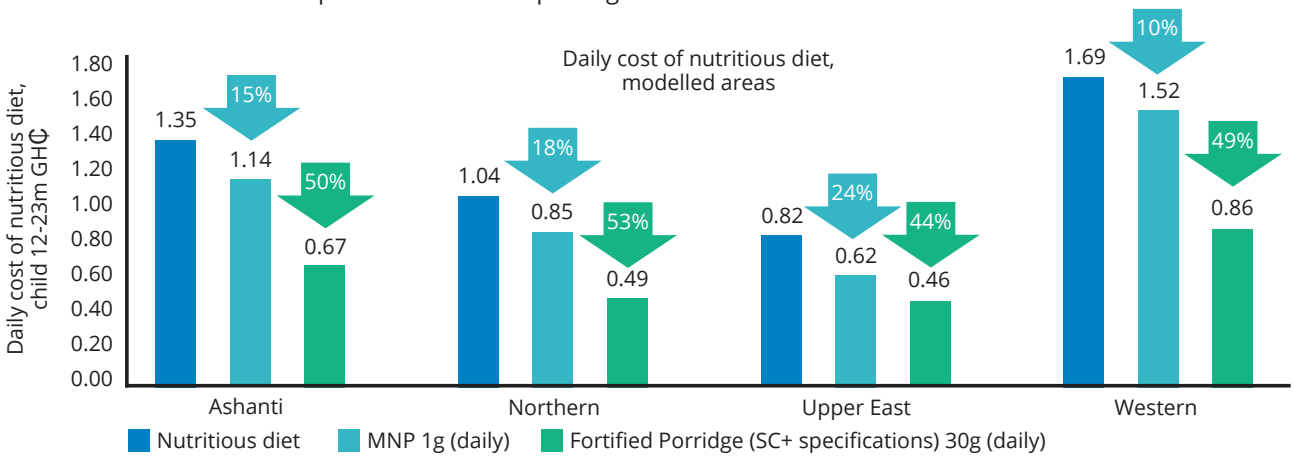
Children aged under 2, adolescent girls and pregnant and breastfeeding women are particularly nutritionally vulnerable. Provision of fortified nutritious foods and supplements are cost-efficient ways to meet nutrient needs while continuing to enable increased dietary diversity.

Malnutrition becomes intergenerational when a cycle begins in which undernourished women and girls give birth to malnourished children, who then do not have the resources or access to health services and nutritious foods to enable them to develop into healthy adults. Children aged under two require nutrient-dense foods to be able to grow and develop, while adolescent girls and pregnant and breastfeeding women have heightened nutritional needs due to their growth and reproductive status. Nutrition-specific interventions can help to support nutrient intakes for these groups.

The FNG analysis modelled the potential impact of in-kind provision of a micronutrient powder (MNP) and a porridge fortified according to WFP specifications for SuperCereal Plus for the child aged 12-23 months. Across the modelling areas included, the MNP was found to reduce the cost of the nutrient-adequate diet by up to a quarter, and the fortified porridge by over half, as shown in Figure 14. The greater reduction of the porridge is due to the porridge covering some of the child's calorie needs in addition to micronutrients.

The analysis modelled iron and folic acid (IFA) tablets for the adolescent girl and breastfeeding woman. Across modelling areas, provision of IFA once per week reduced the cost of the nutrient-adequate diet for the adolescent girl by 14 percent on average, while provision of the IFA once per day for the breastfeeding woman reduced the cost by 19 percent.

Figure 14: Reduction in the cost of the nutrient-adequate diet for the child aged 12-23 months when including micronutrient powder or fortified porridge



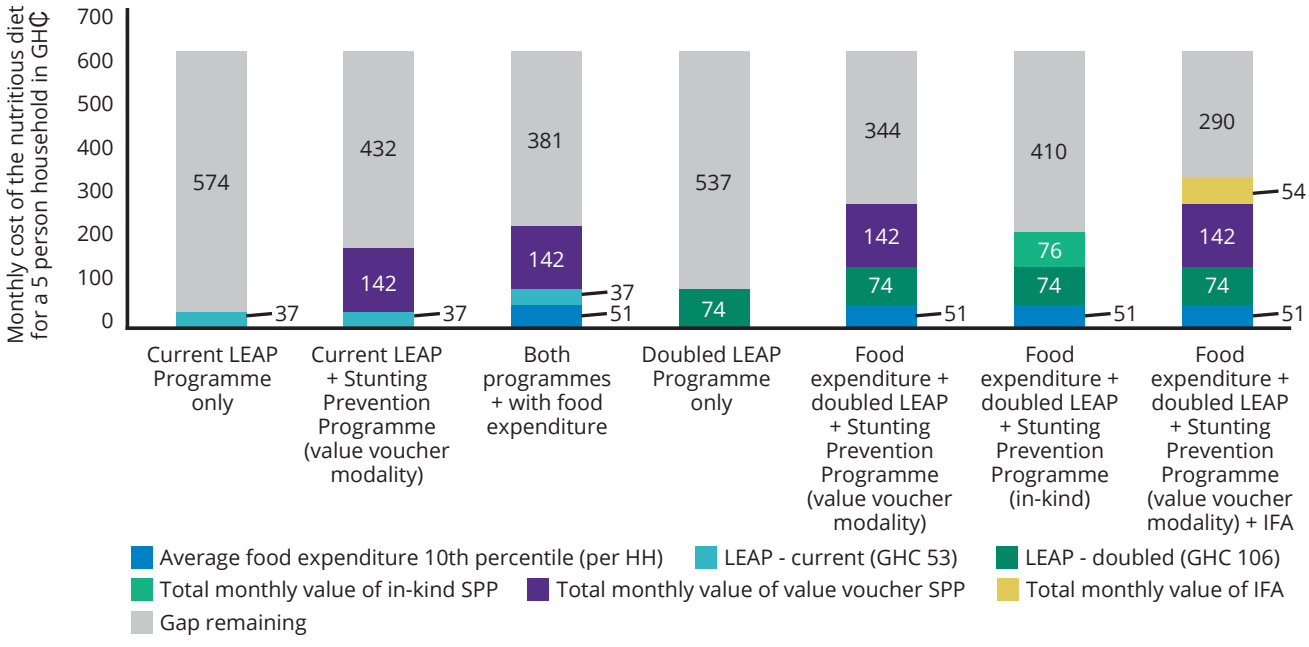
9.

The impact of social protection can be increased by making it more nutrition-sensitive. Layering nutrition interventions on top of social protection and providing SBC alongside transfers, can increase the impact of programmes like LEAP on nutrition outcomes.

Ghana has a wide portfolio of social protection programmes but national budget allocation is low compared to other low- and middle-income countries. In 2019, spending on social protection in Ghana was equivalent to 0.6 percent of GDP, while the average for other such countries is 1.6 percent. The LEAP programme is one major national social protection programme targeting the extreme poor; households with individuals who are elderly, disabled, or lacking productive capacities; households with orphans and vulnerable children, pregnant women or households with infants under one year old. The programme provides bi-monthly cash transfers of GH₵ 64 and GH₵ 106 to households, depending on beneficiary eligibility.

The FNG analysis modelled the current and potentially doubled LEAP transfer values and their potential contribution to covering the cost of the nutrient-adequate diet for a 5-person household on a monthly basis, shown in Figure 15. The figure shows the coverage provided by the transfer under different scenarios, including if households have no other income, have average income of the bottom ten percent of food expenditure, and layering of income, the LEAP transfer values, and other nutrition related interventions. The analysis shows that doubling the transfer value and linking programmes like LEAP with other interventions can help to further reduce the affordability gap (depicted in grey in Figure 15), by covering specific nutritional needs of individuals within the households.

Figure 15: Coverage of the daily cost of the nutrient-adequate diet through the LEAP and layering of additional nutrition-specific interventions

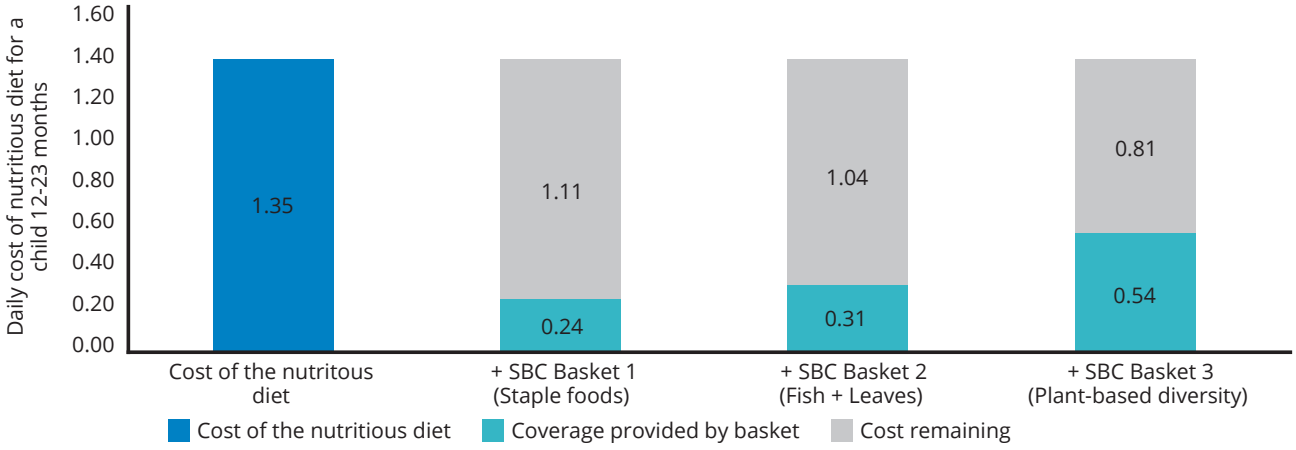


Other complementary programmes such as SBC interventions, can enable social protection transfers to be more nutrition-sensitive. The FNG analysis modelled the lower bound of LEAP transfer programme (transfer of GH₵ 64 once every two months, equivalent to GH₵ 32 per month) in a scenario where the household chooses to spend the entire cash transfer on the child aged under two. The analysis identified three types of food basket which could be purchased per month with that cash transfer amount:

- Basket 1 Staples: 3 kg maize and 2.7 kg of cassava.
- Basket 2 Fish and vegetables: 1- 1.2 kg of fish and 1-1.5kg of green leafy vegetables.
- Basket 3 Diverse plant source: 1.2kg of orange flesh sweet potato, 1.2kg of green leafy vegetables, and 1.2-1.5kg of beans.

Figure 16 shows the coverage of the daily cost of the nutrient-adequate diet for the breastfed child aged 12-23 months when consuming each of the baskets. The fish and vegetable basket and the diverse plant source basket cover more of the cost than the staple foods basket because they provide more of the micronutrient needs of the child. These results indicate the potential importance of SBC in supporting households in making purchasing choices that can support nutrient intake.

Figure 16: Monthly cost of the nutrient-adequate diet covered by basket purchased with LEAP cash; modelled for a child aged 12-23 months



10.

Consumption of unhealthy foods is increasing and leading to overweight, obesity and non-communicable diseases. An SBC strategy could align actors along the food value chain to meet people's nutritional needs and enable them to make decisions that benefit their health and development.

Children and adults in Ghana are increasingly consuming unhealthy foods on a regular basis (10). Stakeholders raised the regular consumption of sugar-sweetened beverages (SSB), a major concern for nutrition particularly among children and adolescents. While Ghanaian consumers have a variety of SSB and other forms of high sugar or high fat processed foods in local marketplaces, there is also a robust marketplace for fortified products. To help signal which fortified products can meaningfully benefit nutrient intakes, the Ghanaian private sector, the German Development Cooperation (GIZ), the Association of Ghana Industries, and the Ghana Standard Authority, developed the OBAASIMA label. For a product to be certified with a seal, it must contain above the minimum defined quantity of fortified premix comprised of 18 vitamins and minerals and below the defined maximum quantity of calories, fat, sugar and salt.

The FNG analysis modelled the cost of the nutrient-adequate diet for the adolescent girl if she were to select either an OBAASIMA product or a sugar-sweetened beverage. Despite costing between GH₵ 2.5 and GH₵ 3.5, the purchase of a fortified porridge only increased the cost of the nutrient-adequate diet by GH₵ 0.39 to 1.64 across modelling areas, because the porridges contributed to covering both energy and micronutrient needs. If the adolescent girl instead chose to consume an SSB priced at GH₵ 4, the cost of the nutrient-adequate diet would increase GH₵ 3.64 and 4.09, since the beverages contribute to filling calories needs but do not contribute to covering micronutrient needs.

These results indicate the importance of, and need for, nutrition literacy, education and awareness amongst consumers. This requires concerted social marketing and advocacy campaigns involving sector stakeholder partners and consumers. SBC campaigns can enable consumers to demand more nutritious products that also follow guidance in terms of maximum content of sugar, fat and salt from the private sector, while government-supported initiatives in guideline development, minimum standards, or relaxing of import taxes for specific ingredients, can align value chain actors to meeting people's nutritional needs.

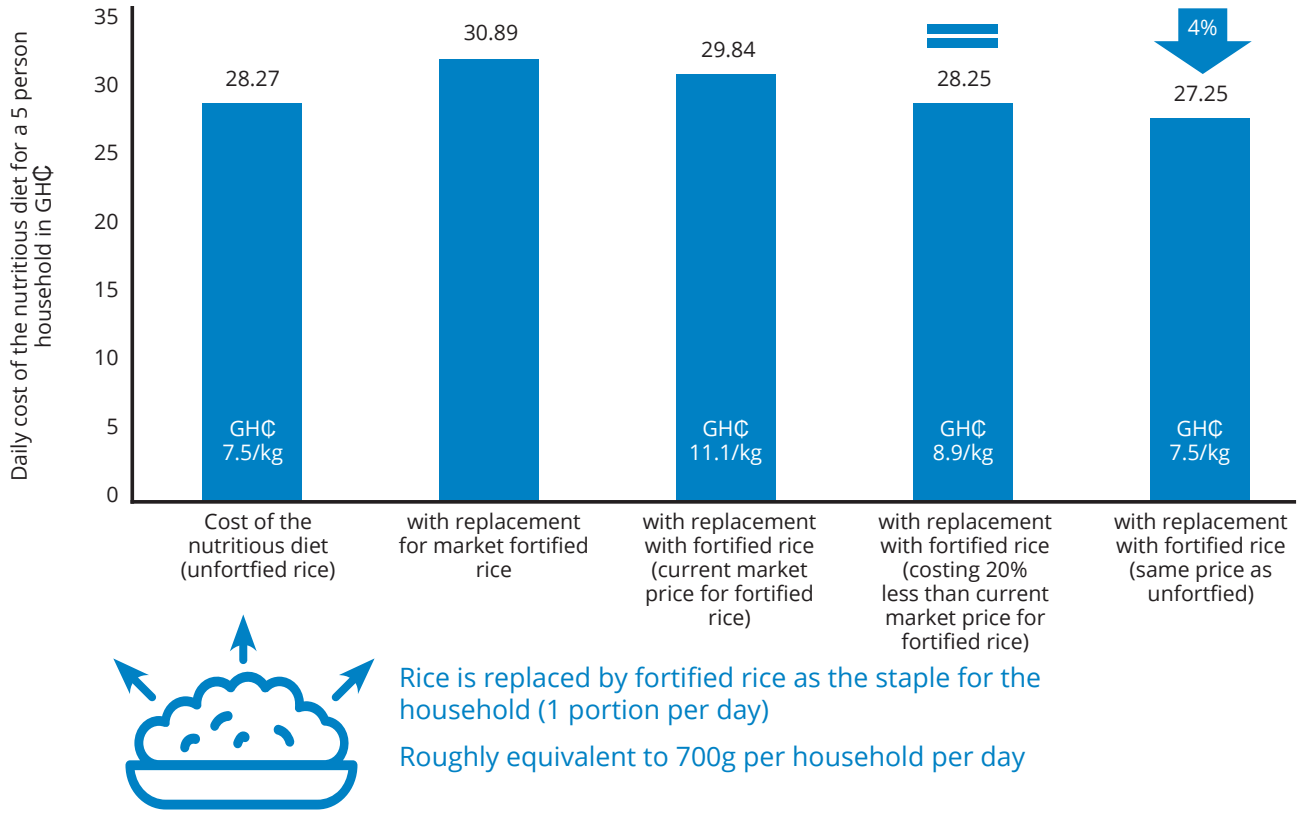
11.

Institutional demand can stimulate supply chain development, enabling economies of scale in the production of fortified foods, including rice, and driving down consumer prices. Simultaneously, people must be informed of the benefits of fortified staples and reassured that they are safe and do not cause health problems.

Domestic production of rice is increasing as consumers prefer it to other types of staples and its production is being supported through governmental programmes like the PFJ. In 2020, rice consumption was estimated to be 45kg per person per year, making it a good opportunity to improve nutrient intakes if fortified. Fortified rice is already available in the Ghanaian marketplace, although levels of micronutrients remain below internationally recommended standards. To assess the impact of consuming rice fortified to WFP's standards on the daily household cost of the nutrient-adequate diet, the FNG analysis modelled the following scenarios, results for which are shown in Figure 17.

- Scenario 1 (grey bar): Households consume unfortified rice as a staple food (1 portion per person per day) at 2022 market prices for unfortified rice (GH₵ 7.5/kg)
- Scenario 2 (blue bar): Households replace unfortified rice with fortified rice (WFP specifications) at 2022 market prices for fortified rice (GH₵ 11.1/kg)
- Scenario 3 (dark green bar): Households replace unfortified rice with fortified rice (WFP specifications) at 20 percent less than market prices for fortified rice in 2022 (GH₵ 8.9/kg)
- Scenario 4 (light green bar): Households replace unfortified rice with fortified rice (WFP specifications) at 2022 market prices for unfortified rice (GH₵ 7.5/kg)

Figure 17: Cost of the nutrient-adequate diet for a five-person household under different pricing scenarios of fortified rice

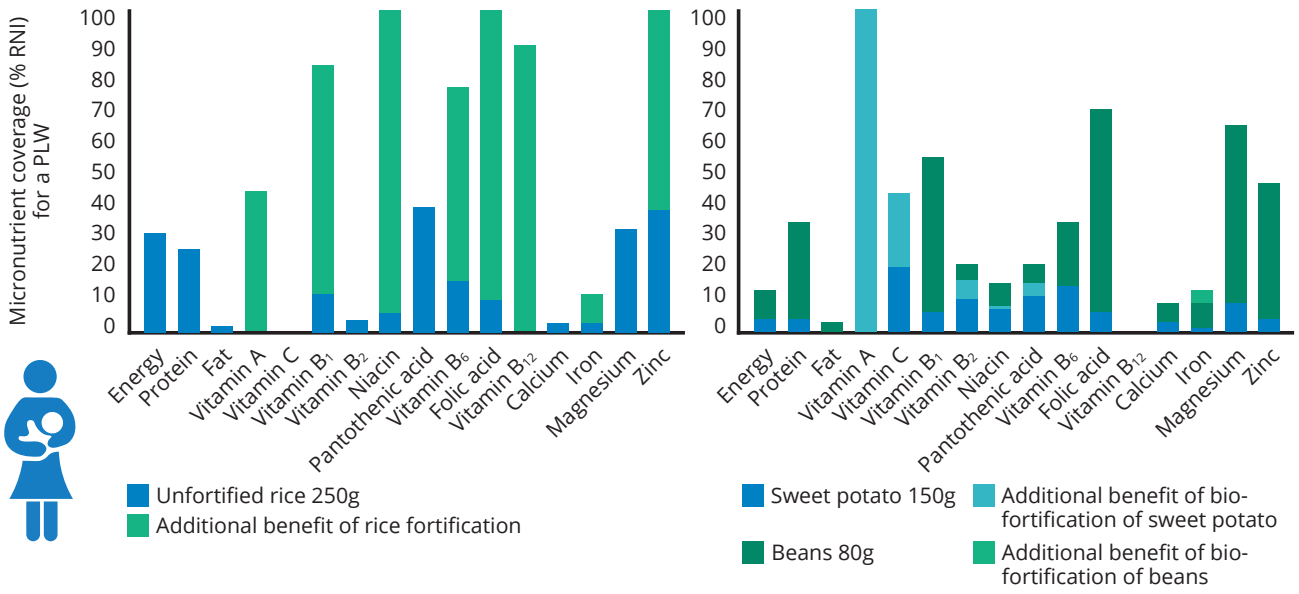


Rice is replaced by fortified rice as the staple for the household (1 portion per day)

Roughly equivalent to 700g per household per day

Figure 18 shows that replacing unfortified rice with fortified rice at current prices marginally raises the cost of the nutrient-adequate diet. If the price of fortified rice were to fall by 20 percent (but still remain higher than the price of unfortified rice), the cost of the nutrient-adequate diet would remain unchanged. If the price of fortified rice could reduce to the price of unfortified rice, the cost of the nutrient-adequate diet would decrease because households would be receiving both the energy contributed by unfortified rice, plus the additional nutritional benefits of the fortification premix. This is shown in Figure 18 where the contribution of one portion of fortified rice is shown on the left for the breastfeeding woman. On the right of Figure 18, this is compared to a meal comprised of bio-fortified foods which can also help to close nutrient gaps, although for fewer micronutrients than post-harvest fortification.

Figure 18: Coverage as a percentage of recommended nutrient intake (RNI) for a breastfeeding woman provided by 250g of fortified rice and a 230g biofortified meal



Stakeholder recommended priorities

On February 8th and 9th, the NDPC and WFP Ghana Country Office held two online virtual validation workshops, the first on agriculture, fortification and the private sector, and the second on social protection, school feeding and nutrition-specific interventions. The objective of the workshops was to validate the modelling results and receive feedback from the technical working group on modelling results, and to identify their priorities based on the FNG findings.

Findings and priorities were presented on February 15th during the WFP Ghana Country Strategic Plan (CSP) workshop. The findings and priorities identified by the technical working group were presented to a larger group of stakeholders, including leadership from the NDPC and WFP. Stakeholders provided comments and additions to the priorities previously identified. A summary of priorities by sector is presented below.

Sector	Recommended priorities
Social protection	• **Develop guidelines and targeting criteria** within the Ghana National Household Registry programmes to **scale up** LEAP/Integrated Social Services programmes. • **Develop SBCC guidance for providing nutrition messages** within Integrated Social Services. • Diversify funding sources for social protection programmes • Continue to **strengthen linkages between the health systems and LEAP** with provision of health screening linked to treatment of malnutrition. • Ensure that **emergency household assistance** using vouchers enables and **encourages recipient households to purchase nutritious foods, including fortified products.** • Increase value of LEAP payments to match economic conditions.
Use of media and technology to promote healthy diets	• Explore innovative approaches to **use mobile and web-based media to provide SBCC messages** on nutritious and healthy diets. • Develop mechanisms for harmonising dissemination of nutrition messages across government departments. • **Develop awareness campaigns on the impacts of consuming sugar-sweetened beverages.** • **Develop guidelines** with the Food and Drug Authority of Ghana on the **regulation governing advertising of unhealthy foods,** especially to young consumers
Fortification, including bio-fortification	• Conduct feasibility studies on **maize flour fortification.** • Develop stronger **guidelines for food safety** (i.e., handling and storage) related to large and medium-scale **rice fortification** and ensure adherence through stronger monitoring and regulation. • **Strengthen producer capacity to adhere** to safety guidelines, quality assurance and quality control for large-scale fortification. • **Sensitize consumers** to the benefits of **fortified rice.** • **Promote production and consumption of bio-fortified foods** by raising awareness of health benefits. • **Increase investment** in **bio-fortification** of staple crops through the Crops Research Institute for better access, cost-effectiveness and sustainability. • **Provide economic support to producers of specialized fortified nutritious foods** through tax exemptions for inputs.
Multisectoral coordination & private sector	• **Invest in multisectoral platforms** at the **regional level** for more integrated and innovative programmes. • Organise regional, district and community **food fairs** using local **bio-fortified food crops.** • Promote **coordination/collaboration between health and agricultural** extension workers **to build nutrition awareness** among producers and to promote production of nutrient-dense products. • Explore opportunities to **deploy nutrition extension officers** in schools and communities to create awareness of nutrition and **healthy diets.** • Strengthen initiatives across the food value chain to **support private sector's contribution to nutrition,** by creating an **enabling environment for production and distribution** of fortified and nutritious products and **raise consumer demand.**

Agriculture and food systems	• **Invest in irrigation and infrastructure** for more efficient production and transport to allow small-holder farmers to reach retailers and stabilize availability of seasonal fruit and vegetables. • **Support producers in producing fresh foods** and **discourage the importation of products** which can be grown efficiently within Ghana. • **Continually adapt PFJ/RFJ** based on better monitoring, evidence and feedback. • **Prioritize production of non-staple, nutritious food items** and **bio-fortified foods** in PFJ and promote these foods through the health sector. • **Support development of community farming** modules in PFJ. • Research to **assess the barriers that women face** in using agricultural technologies. • Develop **awareness campaigns** targeted at producers to **reduce post-harvest losses** and **ensure financial and technical capacities.** • Develop **partnerships with the private sector** for the **procurement of inputs for production of animal source foods.**
School-based programming	• **Increase budget allocation for GSFP to** more than GH 1 per child per day. • **Strengthen community ownership of GSFP** through parent contributions. • **Promote school gardening** of nutritious and bio-fortified crops for meals. • **Provide formal nutritional training** and increase awareness of the benefits of fortified and bio-fortified foods for caterers, teachers and management committees. • **Organize peer-to-peer programmes** to **raise awareness of the nutritional needs of adolescents.** • Develop mechanisms at the district/subdistrict levels **to ensure that school menus are adapted to local food preference and to strengthen local economies.** • **Review the implementation strategies of the current programme** to find bottlenecks and opportunities. • **Advocate for a parliamentary bill** to entrench the government's commitment to the effective implementation of GSFP.
Health and nutrition-specific	• **Develop IFA supply chain** to support provision to adolescent girls in schools and pregnant and breastfeeding women in health centres. • Build a business case for **developing domestic supply chains for micronutrient supplements** like MNP. • **Increase knowledge** of the **nutritional requirements of adolescent girls.** • **Strengthen the capacity of community health workers** and members of mother-to-mother support for **promoting infant and young child feeding (IYCF).** • **Strengthen capacity of subnational stakeholders** to implement IYCF SBC at health facilities, schools and community level through community groups.
Women's empowerment and financial inclusion	• **Promote women's engagement in loans associations,** especially for developing small-scale agricultural production. • **Leverage women's saving groups to provide SBC** through community health workers. • **Connect women's savings groups to the formal banking sector** to ensure their security and sustainability. • Develop mechanisms for **linking women agricultural producers to markets and to school procurement programmes.** • **Build women's capacities in using mobile technology** to improve access to mobile financial services and better delivery of SBC through mobile platforms.
Strengthening value chains for nutritious foods	• **Invest in transport, processing, preservation, and storage infrastructure,** especially in **northern parts of the country,** to enable better transport of perishable foods from production areas to consumers and to reduce post-harvest losses. • **Explore innovative approaches in utilising mobile** and banking to strengthen and build capacity of small-holder farmers, retailers, and consumers to supply, distribute and demand nutritious foods.

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Acronyms

CFSVA	Comprehensive Food Security and Vulnerability
CotD	Cost of the Diet
CPI	Consumer Price Index
FAO	Food and Agricultural Organization of the United Nations
FNG	Fill the Nutrient Gap
GDP	Gross Domestic Product
GH□	Ghanaian Cedi
GHS	Ghana Health Service
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GSFP	Ghana School Feeding Programme
GSS	Ghana Statistical Service
IFA	Iron and Folic Acid
LEAP	Livelihood Empowerment Against Poverty
LMIC	Low and Middle Income Countries
MNP	Micronutrient Powder
NDPC	National Development Planning Commission
PFJ	Planting for Food and Jobs
RFJ	Rearing for Food and Jobs
SBC	Social and Behaviour Change
SC	SuperCereal
SC+	SuperCereal Plus
SSB	Sugar-sweetened beverages
SUN	Scaling Up Nutrition
UNSDCF	United Nation's Sustainable Development Cooperation Framework
WFP	World Food Programme

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The Ghana Fill the Nutrient Gap Analysis was led by the National Development Planning Commission (NDPC) and its partners and was coordinated under the leadership of Dr Kodjo Essiem Mensah-Abrampa and Mrs Mary Mpereh. Special thanks to Phyllis Parbey and Emmanuel Kofi Seyram Abotsi of the NDPC. The analysis was made possible by the WFP Ghana Country Office team, with particular thanks to Patience Asiedu, Olatunji Sonoiki, Shaibu Osman and Emma Anaman; and WFP Ghana Country office senior management Anna Mukini-Bunya and Barbara Clemens for their overall guidance to the FNG. We thank the WFP Regional Bureau Dakar with particular thanks to Marie Ndiaye and Juliette Mouline; the Systems Analysis for Nutrition team at the WFP HQ Nutrition Division, with particular thanks to Zuzanna Turowska, Mysbah Balagamwala, Frances Knight, Jo Jacobsen, Jane Badham and Saskia de Pee; and special thanks to all the partners and stakeholders who provided valuable inputs into the process.

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This Fill the Nutrient Gap Analysis was made possible with funding from The Rockefeller Foundation.