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Fill the Nutrient Gap in Guatemala

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World Food Programme

SAVING
LIVES
CHANGING
LIVES

Fill the Nutrient Gap Guatemala

Report

January 2026



Secretaría de
**Seguridad Alimentaria
y Nutricional de la
Presidencia de la República**



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Secretaría de
**Seguridad Alimentaria
y Nutricional de la
Presidencia de la República**

Foreword

The Secretariat of Food and Nutrition Security (SESAN from its Spanish acronym) of the Presidency of the Republic of Guatemala, in line with its mandate to promote coordination and integration among institutions implementing food and nutrition security interventions across all territorial levels, has led the development of the study “Fill the Nutrient Gap”. This initiative was carried out with the valuable support of the World Food Programme (WFP).

The study aims to analyze the primary barriers that Guatemalan households face in accessing nutritious food. By generating evidence, it seeks to inform actions, policies, and programs that improve access to healthy diets and enhance the nutritional status of the population—particularly among groups experiencing the most significant disparities.

Guatemala is currently facing a critical nutrition situation. It has the highest rate of stunting in Latin America and the sixth highest in the world. Simultaneously, overweight and obesity affect more than half of all women, illustrating the country’s double burden of malnutrition. This situation imposes a substantial economic and social toll: malnutrition is estimated to cost the country USD 12.034 billion annually, equivalent to 16.3% of its Gross Domestic Product (GDP)¹.

Addressing such a complex challenge clearly requires coordinated, multisectoral, and sustained efforts.

The study also reveals significant regional disparities, highlighting the need for interventions tailored to the specific realities of each territory. Bringing solutions closer to communities through a territorial and culturally appropriate approach is essential for closing nutritional gaps effectively and equitably.

The Fill the Nutrient Gap analysis also demonstrates that effective coordination across sectors and levels of government, combined with the commitment of international partners, is key to driving meaningful change and creating better opportunities for all Guatemalans.

Mireya Palmieri Santisteban
Secretary of Food and Nutritional Security of Guatemala

¹ WFP and ECLAC. (2020). The Cost of the Double Burden of Malnutrition: Social and Economic Impact in Guatemala. World Food Programme and Economic Commission for Latin America and the Caribbean. Available at: <https://www.wfp.org/news/paying-price-malnutrition-guatemala-loses-over-16-percent-its-gdp>

Executive Summary

Guatemala is currently facing a complex nutritional crisis. The triple burden of malnutrition, which is characterized by the coexistence of malnutrition, micronutrient deficiencies, and overweight and obesity, is prevalent among all age groups. Over 50 percent of women in Guatemala are overweight or obese. The country has the highest prevalence of stunting among children in the Latin America and the Caribbean (LAC) region and ranks sixth in stunting worldwide. Wasting among children aged under 5 years remains a significant concern, with Guatemala reporting 29,000 cases nationwide in 2024, a 16 percent increase on the previous year. The economic burden of malnutrition in Guatemala is estimated at US dollars (USD)12.034 billion annually, accounting for approximately 16.3 percent of the country's GDP.

To address these challenges, in 2005 Guatemala enacted the National Food and Nutritional Security System Law. This designates food and nutritional security as a state policy, takes a comprehensive approach, and is aligned with the nation's strategies for poverty reduction. Its objectives include promoting actions to eradicate malnutrition by addressing diseases related to under- and over-nutrition, largely by breaking the intergenerational cycle of malnutrition. Ultimately, the law aims to build the conditions that enable access to opportunities for dignified human development for all.

The government of Guatemala has also established the General Government Policy for 2024-2028, which positions the fight against malnutrition as a strategic priority. In this context, it has been determined that collective efforts in combating malnutrition will be a priority for all stakeholders, with special attention given to stunting in children aged under 5 years.

To better understand the barriers faced by households in accessing nutritious food, the World Food Programme (WFP) has collaborated

with SESAN and technical partners and experts in Guatemala to conduct the Fill the Nutrient Gap (FNG) analysis. This analysis focuses on exploring adequate food consumption and nutrient intake and aims to expand the common understanding of gaps in access to nutritious diets. The objective of the FNG analysis is to generate evidence for policies, strategies and programmes intended to improve access to healthy food and enhance the nutritional situation for the population at large, particularly for those with limited access to nutrition.

Methodology and process

The FNG analysis in Guatemala was conducted from June 2024 to May 2025. The initiative was led by the Secretariat of Food and Nutritional Security (SESAN) in collaboration with the WFP country office in Guatemala. They received technical assistance from the Systems Analysis for Nutrition team at WFP's headquarters, and support from the WFP Latin America and Caribbean Regional Office.

A technical working group was established to provide consultation and analytical support. The group consists of senior government officials from various sectors such as health, education, social protection, and the statistics bureau, plus representatives of international organizations, NGOs, and academia.

The FNG analysis consists of two main components: 1) a review of secondary information about various factors that can affect people's diets and nutritional status, and 2) an analysis of diet costs using the ENHANCE linear programming platform. This platform facilitates diet modelling to evaluate how economic barriers restrict access to nutritionally adequate diets.

The review of secondary information focuses on assessing the nutrition and food security of the Guatemalan population, while the diet costs analysis focuses on optimizing the cost of the FNG a nutrient-adequate food basket and a nutrient-adequate basket in line with recommended by the food-based dietary guidelines (FBDGs) from Guatemala.

The FNG nutrient-adequate basket includes a selection of local foods designed to meet a household's macro and micronutrient needs at the lowest possible cost, while the FBDG basket includes foods that satisfy these dietary requirements while adhering to national recommendations, also at minimal cost.

The analysis incorporates an energy basket which represents a selection of foods that fulfil a household's caloric needs at the lowest cost. It highlights the differences between diets that meet only energy needs and those that meet energy and nutrient requirements, emphasizing the importance of nutrient-dense foods.

The FNG analysis assesses the availability, accessibility and cost and affordability of a least cost nutrient-adequate basket and models impact various government interventions on reducing the costs of a nutrient-adequate baskets and filling the nutrient gap.

The Guatemalan FNG's findings are summarized in seven main messages, validated with the technical working group representatives during bilateral meetings and joint workshops where stakeholders contributed to formulating recommendations based on evidence from the FNG analysis.

Main messages

- 1. Almost 40 percent of households in Guatemala lack economic access to a nutritious food basket. Adolescent girls are the most affected, facing significant vulnerability due to their higher micronutrient needs.**
 - The cost of the FNG nutrient-adequate basket is two to four times higher than that of the energy basket, depending on the department.
 - Seventeen of Guatemala's 22 departments have a higher proportion of households unable to afford a nutrient-adequate food basket than the national average cost of Q. 1,531.
 - Adolescent girls experience the highest dietary costs because they require greater nutrient density.



2. An estimated 77 percent of households in Guatemala do not have economic access to the nutrient-adequate basket as recommended by the Guatemalan FBDGs. To enhance both the supply and demand for nutritious foods that align with these guidelines, it is essential to implement integrated approaches that connect nutrition-sensitive agriculture with social protection programmes.

- To follow the recommendations of the Guatemalan FBDGs costs nearly twice as much as meeting the requirements of the FNG nutrient-adequate food basket.
- Vegetables, legumes and dairy products must be made more available to meet Guatemalan FBDGs.
- A nutrition-sensitive agriculture strategy is required to promote initiatives aimed at increasing the production of nutritious foods and addressing nutrient intake gaps.

3. The School Feeding Program plays a vital role in providing nutritious meals to students. Its impact can be further enhanced by creating synergies with health, social protection and agricultural initiatives.

- The School Feeding Program meals provided can cover 62 percent of the cost of the FNG nutrient-adequate food basket for preschool and primary school children, and 55 percent for secondary school students.
- The budget allocated for meals for secondary school students (ages 12-18) should be increased to address their higher nutritional requirements.
- Offering nutritional supplements in addition to the meals could help fill the micronutrient needs of children and adolescents.

4. Supplementation, fortification and the promotion of healthy eating contribute effectively to improving adequate nutrient intake. Better access to - and availability of micronutrient-rich foods through social protection platforms would improve access to nutritious and diverse diets.

- Locally accepted options, such as beef offal, represent a meal especially rich in micronutrients and are economically accessible.
- Supplementation, combined with school rations for early education, could reduce the cost of the nutrient-adequate basket for children aged under 2 years by up to 81 percent.
- Cash transfer programmes could help prevent malnutrition in children.

5. Social protection programmes, such as the conditional cash transfer programme, *Bolsa Social*, can increase households' access to nutritious food baskets. To maximize their impact, it is essential to ensure these programmes are nutrition-sensitive by incorporating nutritional objectives and fostering synergies with health and agriculture programmes.

- The *Bolsa Social* Program should increase both the cash transfer amount and frequency to help close the economic access gap to nutritious food.
- The programme could further contribute to closing the economic access gap to nutrient-adequate baskets if the distribution of a fortified complementary nutritious food were integrated as a programme component and delivered to young children. To ensure optimal use, the initiative should be delivered with nutrition counselling for caregivers.
- Integrating social and behaviour change communication into these programmes is crucial for promoting healthy eating habits and the proper use of the fortified complementary food.

6. Multisectoral actions in health, education, agriculture and social protection can reduce the economic access gap to a nutritious diet. Optimizing the design of existing programmes and increasing their coverage could help to fill the nutrient gap.

- If implemented as designed, the assessed programmes could cover approximately 33 percent of the cost of the FNG nutrient-adequate basket for households. However, to enhance the effectiveness of these programmes, it is essential to ensure that their designs are optimized and implemented as planned in order to achieve their objectives and goals.
- The northern, northeastern and northwestern regions of Guatemala have a larger economic gap in accessing a nutrient-adequate basket than the national average.
- Increasing the amount and frequency of cash transfers in programmes like *Bono Social* and *Bolsa Social* can meaningfully reduce the economic gap in beneficiaries' access to nutrient-adequate food baskets.

7. Achieving a healthy diet for the Guatemalan population is a priority. However, ensuring environmental sustainability is also important. Multisectoral actions can facilitate the transition towards a healthy and sustainable diet.

- Meeting nutritional requirements can have a significant environmental impact.
- Despite Guatemala's minimal contribution to global greenhouse gas emissions, its water and land resources are limited. Therefore, food production should focus on items that require less land and water use.
- Every sector has a role in improving access to nutritious and environmentally sustainable diets. Promoting environmentally sustainable diets can help prevent rising costs for nutritious food, which can result from disruptions in food production due to climate change.





Fill the Nutrient Gap Guatemala

Introduction to Fill the Nutrient Gap (FNG) Guatemala

Building consensus for improved nutrition

Nutrition is a crucial pillar in the development of a healthy, productive nation. Good nutrition enhances the physical and cognitive development of the population, prevents disease, and increases the potential of the workforce and society. Improving diets, especially those of children and women, brings immediate and long-term health, education and economic benefits.

A variety of nutrition interventions that have proven effective were identified in the two Lancet series (2013 and 2021) on maternal and child undernutrition. Improving the nutrition situation in a country requires coordinated actions across the food, social protection, health and education systems. These actions must be grounded in a solid understanding of the local context—its opportunities and constraints—and informed by both global and local evidence.

Fill the Nutrient Gap (FNG) is an analytical process, which includes a secondary literature review in combination with linear optimization to understand local drivers that affect the availability, cost and affordability of a nutrient-adequate basket. Using the Enhance linear programming platform, solutions of interest for improving availability of nutritious foods, lowering their cost and/or increasing income, are then assessed for their potential to improve affordability. In this way, the context-specific potential for the 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 to building consensus around a vision and a path forward for improved nutrition in Guatemala 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 analysis examines gaps in dietary intake, particularly among vulnerable populations, to inform national programmes and policies across food, social protection, education, and health systems to improve nutrition. It assesses the availability, accessibility, and affordability of nutritious foods to identify barriers to adequate nutrient intake and examine the range of food choices available to vulnerable populations, and the factors influencing their decisions.

To identify the most effective combination of interventions to improve diets and nutrient intake, the FNG models the impacts of context-appropriate interventions across systems and identifies entry points to refine programmes and policies by providing targeted recommendations for decision makers.

The analysis is comprised of 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, how these characteristics are affected by seasonality, shocks, and climate change, and population behaviour related to food and diets.
2. An analysis of the extent to which economic barriers prevent adequate nutrient intake using Enhance, an open access, online analytical platform, to identify dietary patterns that are healthy, affordable, and environmentally sustainable. Enhance uses diet optimisation to calculate the minimum cost of healthy food baskets (diverse, balanced and meeting nutrient needs) for multiple regions, seasons and individuals.

Enhance enables the assessment of the extent to which a given amount of money can fulfil dietary needs in a specific context, considering the nutritional requirements of different target groups. The assessment includes modelling the economic impact of possible interventions to increase nutrient intake and fill nutrient gaps. In contexts where relevant, Enhance also allows for the estimation of the environmental impact (greenhouse gas emissions and water footprint) of the food baskets to generate the evidence necessary to inform decisions related to sustainable and equitable food systems transformation.

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

National stakeholders define the scope and focus of the assessment. They contribute data and sources of information to identify context-specific barriers and entry points and, together with the analytical team, develop a shared understanding of the issues and identify appropriate nutrition-specific and nutrition-sensitive interventions that can be implemented by different sectors using existing delivery platforms, such as social safety nets, food processing and markets, antenatal care and school feeding programmes.

WFP developed the FNG methodology 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 early 2025, FNG analyses were completed in 46 countries.

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. Maternal and Child Nutrition 2019; DOI: 10.1111/mcn.12793



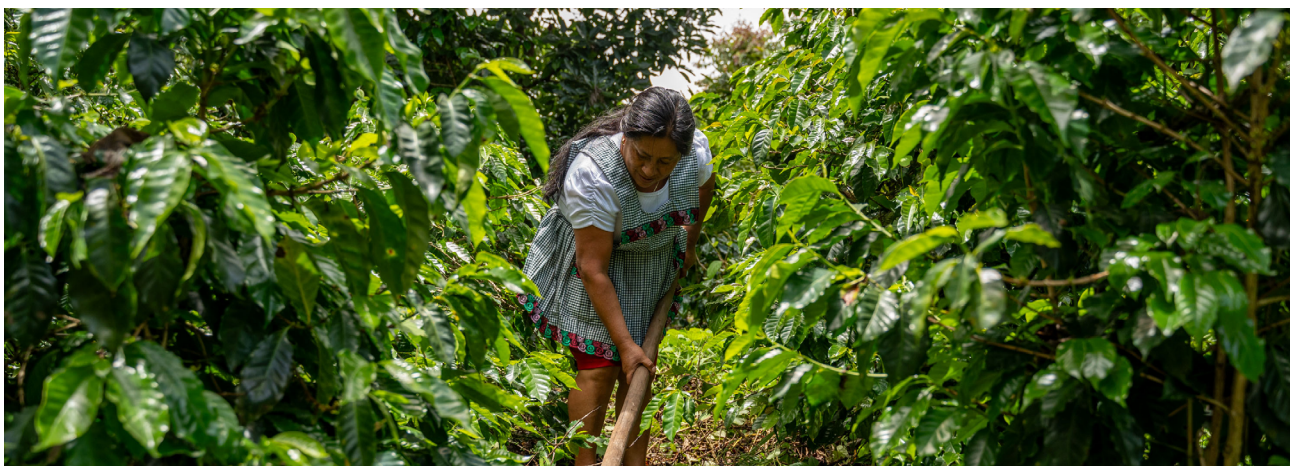
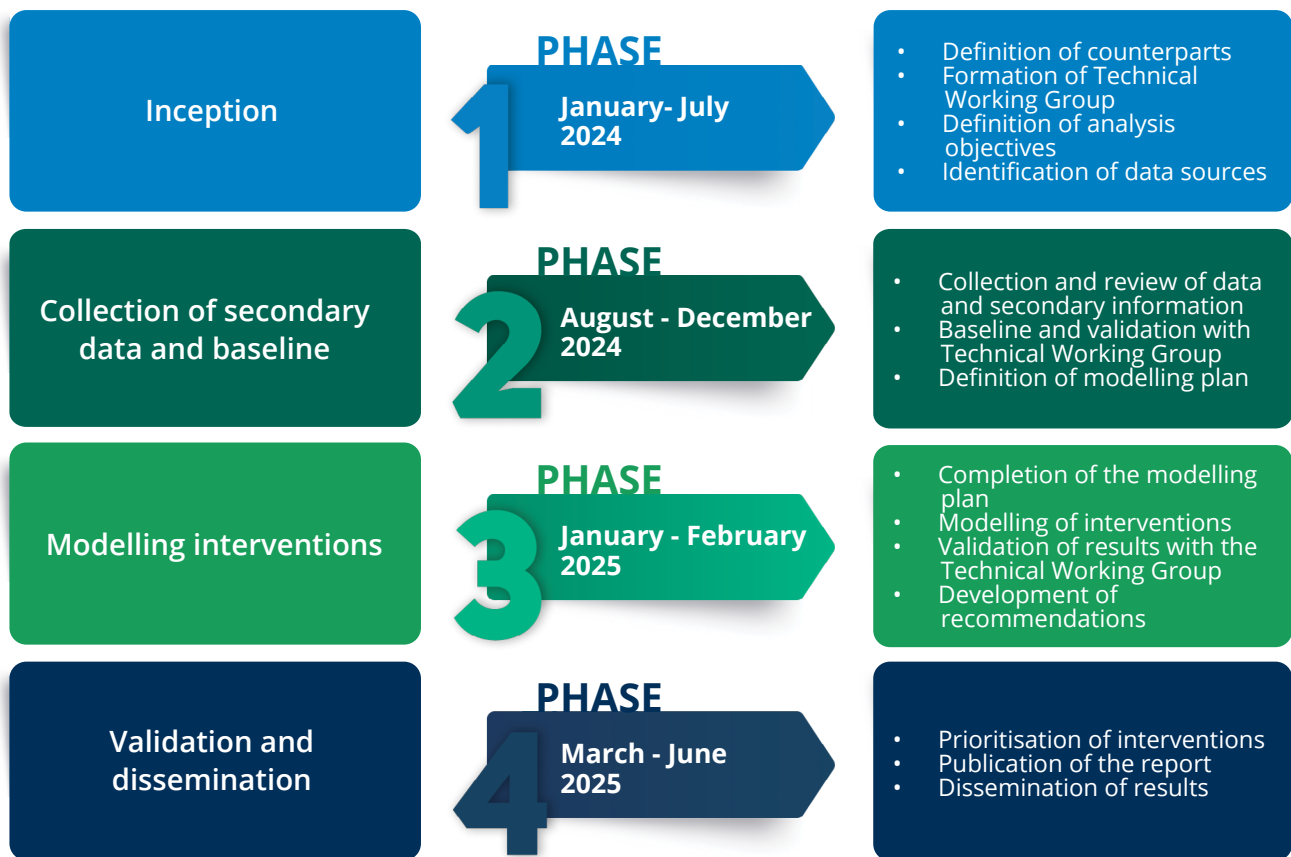
Process and scope of the analysis

Process of the FNG analysis in Guatemala

The process was carried out by WFP and led by the Secretariat of Food and Nutritional Security of the President of the Republic (SESAN).

It was conducted in coordination with the Ministry of Public Health, the Ministry of Social Development, the Ministry of Agriculture, the Ministry of Education, the National Institute of Statistics (INE), and the Institute of Nutrition of Central America and Panama (INCAP). Figure 1 summarizes the process.

FIGURE 1: THE FILL THE NUTRIENT GAP (FNG) PROCESS FOLLOWED IN GUATEMALA



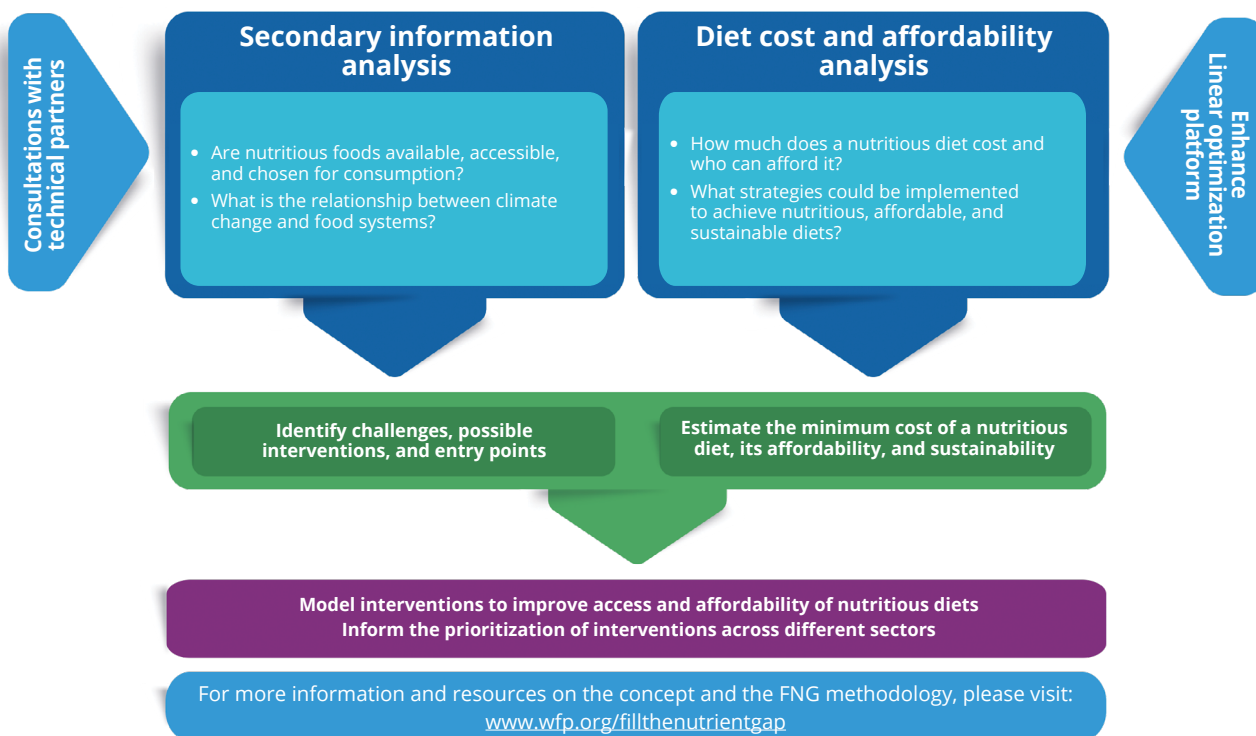
Methodology

The FNG analysis is composed of a secondary literature analysis and a quantitative cost of the diet and affordability assessment (Figure 2). The secondary analysis identifies barriers to accessing nutrient-adequate and healthy diets, platforms for reaching nutritionally vulnerable groups in the population.

Additionally, the analysis permits to identify opportunities for policy and programme interventions to improve access to nutritious foods through multiple sectors including agriculture, social protection, education and health.

Linear programming embedded in the Enhance tool is used to assess the availability, cost and affordability of nutritious diets (Figure 3).

FIGURE 2: FNG ANALYTICAL FRAMEWORK



MODELLED HOUSEHOLD AND MAIN TARGET GROUPS FOR THE ANALYSIS

The FNG analysis conducted for Guatemala estimated baskets and their cost for a model household of five members, including:

- A breastfed child 12–23 months
- A school-age child 6–7 years
- An adolescent girl 14–15 years
- A breastfeeding woman
- An adult man.



COST AND AFFORDABILITY OF DIETS ANALYSIS USING ENHANCE

Enhance is an open access, online analytical platform that uses linear optimization to identify combinations of foods that optimize meeting nutrition, cost and environmental objectives. It allows for analysis of the interplay of cost, affordability, nutritional value, diversity and environmental impact of dietary scenarios.

This supports analysis of the extent to which cost and affordability are a barrier to adequate nutrient intake, including the impact of shocks and climate change, and models how interventions across multiple sectors, such as social protection, health and agriculture, can help mitigate their impact.

Enhance enables the understanding of the extent to which poverty, 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 platform 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. For example, a single food item being a spice or a condiment cannot contribute to more than 1 percent of the caloric intake of the optimized baskets.

For Guatemala, the FNG approach used national household food expenditure data from the Guatemala National Household Income and Expenditure Survey 2022 to derive average dietary patterns. These were used to apply grams-based minimum bounds at food group level to calculate the lowest cost nutritious diet that reflects average dietary preferences, including staple consumption². This diet is referred to as the nutrient-adequate basket or 'nutritious diet' throughout this summary. It meets requirements for nutrients, including protein, nine vitamins and four minerals, and does not exceed the energy average requirement (+/- 2.5 percent) and fat recommended intake.

Population food expenditure data is compared to the cost of the nutritious 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 nutritious 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

Modelled diets

Energy basket

The energy basket is the combination of foods that, at the lowest possible cost, meets only the household's caloric requirements. It consists mainly of basic staple foods and other foods with high energy density.

Nutrient-adequate basket

The nutrient-adequate basket refers to a combination of foods that, at the lowest possible cost, fulfils the household's requirements for energy, macronutrients, and micronutrients. This formulation includes an adjustment whereby approximately 50 percent (± 2.5 percent) of energy is sourced from staple foods for all members of the modelled household. An exception is made for the child aged 12–23 months, for whom the energy contribution from staple foods is adjusted to 30 percent, due to the caloric intake provided by breastfeeding.

Regarding national staple consumption patterns in Guatemala, maize was included as the primary staple food across all regions analysed, with wheat and rice incorporated to a lesser extent.

Beyond staple foods, the FNG analysis utilized national food expenditure data from the Guatemalan National Expenditure Household Survey (ENIGH from its Spanish acronym) 2022–2023 to identify average dietary patterns specific to each department. These patterns informed the application of gram-based minimum and maximum bounds at the sub-food group level (e.g., green leafy vegetables, poultry, citrus fruits), ensuring that the foods selected in the optimized baskets reflect average dietary preferences.

Nutrient-adequate basket based on national FBDGs

Building on the parameters of the nutrient-adequate basket, the nutrient-adequate basket, based on national FBDGs, ensures a specific allocation of energy from each food group, corresponding to the guidelines: “Guías Alimentarias para-Guatemala: Recomendaciones para una alimentación saludable” (1). The proportions of energy according to each food group were as follows: 52 percent of energy comes from staple foods (cereals, roots and tubers), 10 per cent from pulses, 10 percent from animal source foods, 15 per cent from fruit and vegetables, and 13 percent from fats and oils.

Data sources for the cost and affordability analysis

The 2022 ENIGH was used to inform the FNG analysis by calculating the price and availability of food by unit of analysis (for over 200 commodities in each department), and deriving information on total food expenditure for all departments. These food commodities were matched to the Central American and Panama Institute of Nutrition - INCAP - (*Instituto de Nutrición de Centro América y Panamá*) food composition table (2). The ENIGH 2022 data were also used to derive insights on current consumption patterns. The analysis was done at departmental level, and results are also presented at regional and national levels using weighted averages. As for the expenditure data, food and non-alcoholic beverages were included as part of the expenditure categories of the households. The per capita expenditure was first calculated and then expenditure percentiles were

extracted by region of analysis. The calculation of the affordability was carried out using the cost of baskets and comparing this to the expenditure for each department.

Environmental impact of baskets

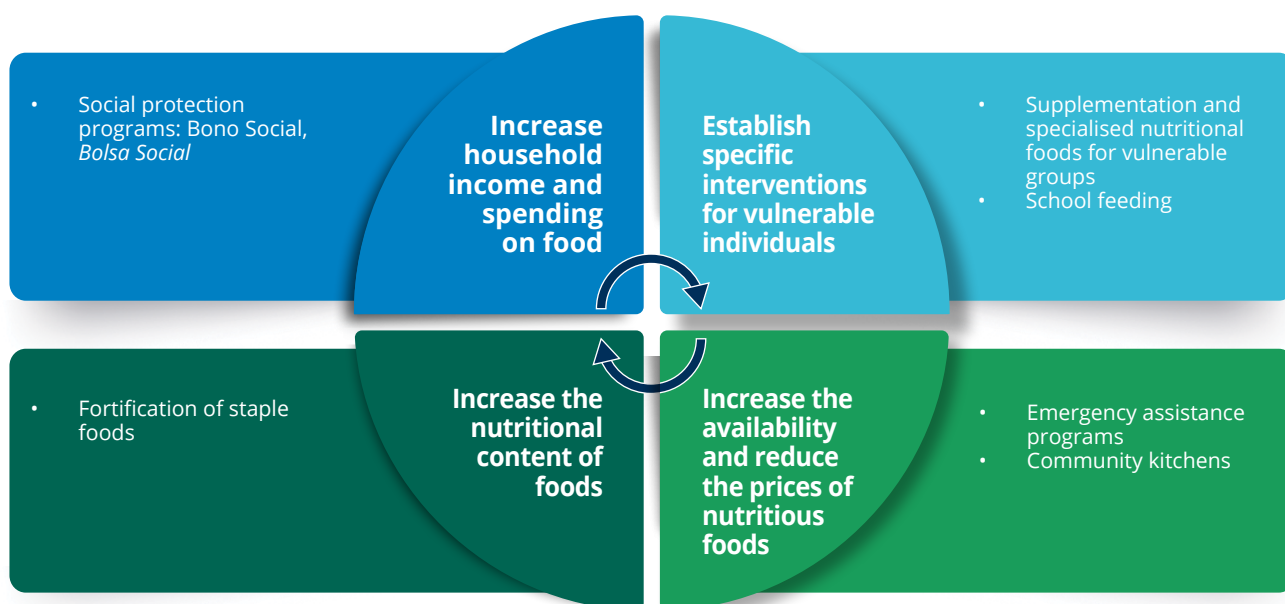
The environmental impact of baskets was estimated using a global database published by Poore & Nemecek (2018) (3). Three environmental impact indicators were estimated: greenhouse gas emissions (in CO₂ equivalents), water use (in litres of water), and land use (metres squared per year). The estimated values of baskets represent an average environmental impact that is based on global values rather than country-specific estimates, therefore these estimates may not accurately represent local production practices.

Intervention modelling

In September 2024, a workshop with stakeholders from different government sectors was organized to consult them about interventions that could contribute to increasing access to healthier and more nutritious diets. Attendees from different sectors (agriculture, education, economy, health, social protection, and academia) participated in an exercise to identify and prioritize interventions to be modelled. The selection and parameters of potential interventions for modelling were informed by stakeholder consultations and programme guidelines (e.g., micronutrient supplementation programs and school feeding menus).

Figure 3 shows the selected interventions and entry points to reduce the cost of nutritious foods and increase access to a nutrient-adequate basket.

FIGURE 3: ENTRY POINTS AND INTERVENTIONS MODELLED TO ESTIMATE THE REDUCTION IN COST OF A NUTRIENT-ADEQUATE BASKET



Scope of intervention modelling

Two types of interventions were modelled: those aimed at the general population, such as the current impact of sugar fortification, school feeding programs, and supplementation; and those focused on the most vulnerable households, including various cash transfer modalities and soup kitchens targeting specific vulnerable groups. Additionally, the analysis assessed the effects of climate change on access to nutrient-adequate food baskets, as well as the environmental impact using indicators such as greenhouse gas emissions, freshwater use, and land use.

Considerations for interpretation and data gaps

While the FNG provides valuable insights into the cost and affordability of nutritious diets, it has limitations that should be considered

when interpreting its results. The FNG analysis estimates the cost and affordability of baskets that meet energy and nutrient needs throughout the life cycle. These estimates provide economic indicators and should not be interpreted as dietary recommendations or actual consumption patterns.

The analysis only includes limited consideration of cultural aspects by constraining the baskets according to the population's food group consumption ranges. The analysis does not consider beverages of any sort, including water. It considers the market cost of a nutrient-adequate basket for the defined model household but does not calculate programme implementation costs or cost-benefit ratios. The models are based on programme design, and do not consider programme implementation limitations. The FNG analysis is based on healthy individuals with normal nutrient absorption and does not consider interactions between micronutrients that may enhance or inhibit absorption. It does not calculate the actual consumption or micronutrient intake of the population.



Findings

Despite its World Bank classification as an upper-middle income country with relatively stable economic indicators, Guatemala faces persistent challenges of inequality and poverty that disproportionately affect indigenous populations. Recent data from Guatemala's National Institute of Statistics (ENCOVI 2023) reveals only modest poverty reduction over the past decade, with 56 percent of the population below the national poverty line in 2023, down slightly from 59 percent in 2014. Significant regional disparities exist, with poverty rates ranging from 90.3 percent in Alta Verapaz to 21.6 percent in Guatemala department. Inequality has worsened, with the Gini coefficient rising from 0.37 in 2014 to 0.42 in 2023. These persistent issues have occurred despite moderate 3.5 percent average economic growth over the past decade (4).

Contributing factors include high labour market informality (70.3 percent nationally, reaching 86.3 percent in agriculture), low labour force participation (59 percent versus 68.1 percent regional average), and significant gender disparities in participation (39.7 percent for women versus 82.2 percent for men). The COVID-19 pandemic and climate related events have further exacerbated these challenges, with microsimulations suggesting the combined impact of COVID-19 and hurricanes Eta and Iota increased poverty by over 5 percent in 2020 (5).

In addition to structural challenges, there is a persistently low level of social investment in sectors that are critical for human development. Compared to other countries in the region, Guatemala allocated the lowest share of central government spending to the social sectors, with 7 percent of its gross domestic product (GDP) going to social expenditure in 2018, compared to an average of 9.6 percent in Central America (6). Guatemala allocated 3 percent of GDP to education compared to Ecuador, Honduras, Costa Rica, Bolivia and Chile, which allocated more than 4.5 percent. Social protection spending

in Guatemala was at 1.4 percent, whereas in countries such as Argentina and Brazil it represented more than 11 percent of GDP (7).

Limited social investment has direct implications for the well-being of the population, particularly in their nutritional status. Guatemala faces a complex nutrition situation characterized by the coexistence of undernutrition, micronutrient deficiencies, and overweight and obesity. This triple burden affects the population throughout the life cycle and across the country.

In 2020, undernutrition alone was estimated to account for 45 percent of public cost of health (USD365 million), its impact on school repetition was estimated to account for 1.5 percent of public education expenditure, and the resulting productivity losses amounted to USD7.8 billion, equivalent to 10.6 percent of GDP. In parallel, the public costs of overweight and obesity, diabetes and hypertension were estimated at USD3,596.2 million, or more than four times the public cost of health. Overall, the annual cost of malnutrition would amount to USD12,034 million, or 16.3 percent of GDP. Guatemala has the highest cost-to-GDP ratio compared to other countries in the region (8).

According to the National Maternal and Child Health Survey (2014-2015), the percentage of children under 5 years of age who were stunted was 46.5 percent, almost one in two children (9). This prevalence of chronic malnutrition is the sixth highest in the world and the highest in the Latin American and Caribbean region. Compared to the previous survey (2008-2009), which reported a prevalence of 49.8%, a decrease of 3.3 percentage points is observed (10). Nationally, the rate of stunting prevalence reduction is extremely low compared to countries implementing successful programmes, where a reduction of up to two percent per year has been documented in countries with similar socioeconomic development patterns in the region.

Chronic malnutrition reflects significant inequalities, as the percentage of chronically malnourished individuals is higher in rural areas (53 percent compared to 34.6 percent in urban areas), in indigenous populations (58 percent compared to 34.2 percent in non-indigenous populations), in households where mothers have no education (67 percent compared to 19.1 percent in children whose mothers have higher education), in households with lower economic wealth (65.9 percent in the lowest wealth quintile compared to 17.4 percent in the highest wealth quintile), and in cases of shorter spacing between pregnancies (57 percent compared to 39.6 percent in cases of greater spacing) (9). Growth retardation is still prevalent among school age children, affecting one in four children (11).

Acute malnutrition (wasting) remains a concern in Guatemala, with a prevalence of 0.8 percent recorded in 2022 (12), though this falls within the very low classification according to World Health Organization (WHO) prevalence thresholds (9). Acute malnutrition rates typically spike during the lean season from May to August, and after climatic events that reduce access to food, especially among rural populations dependent on agriculture (13). No apparent disparities are present between urban and rural areas in terms of wasting prevalence, nor by ethnicity (12). According to data from the National Information System on Food and Nutrition Security, there was a decrease in the total acute malnutrition rate per 10,000 inhabitants among children aged under 5 years in 2022 (from 116 in 2021 to 108 in 2022), but an increase was observed to 134 in 2023, and then 155 in 2024 (a 16 percent increase compared to the previous year) (14).

While acute malnutrition remains a concern for national authorities, Guatemala also faces significant challenges related to overweight and obesity, highlighting the burden of malnutrition across all age groups. More than half of women of reproductive age were overweight or obese (33 percent and 25 percent respectively). Overweight and obesity affect all socioeconomic statuses, ethnicities, and age groups. In children aged

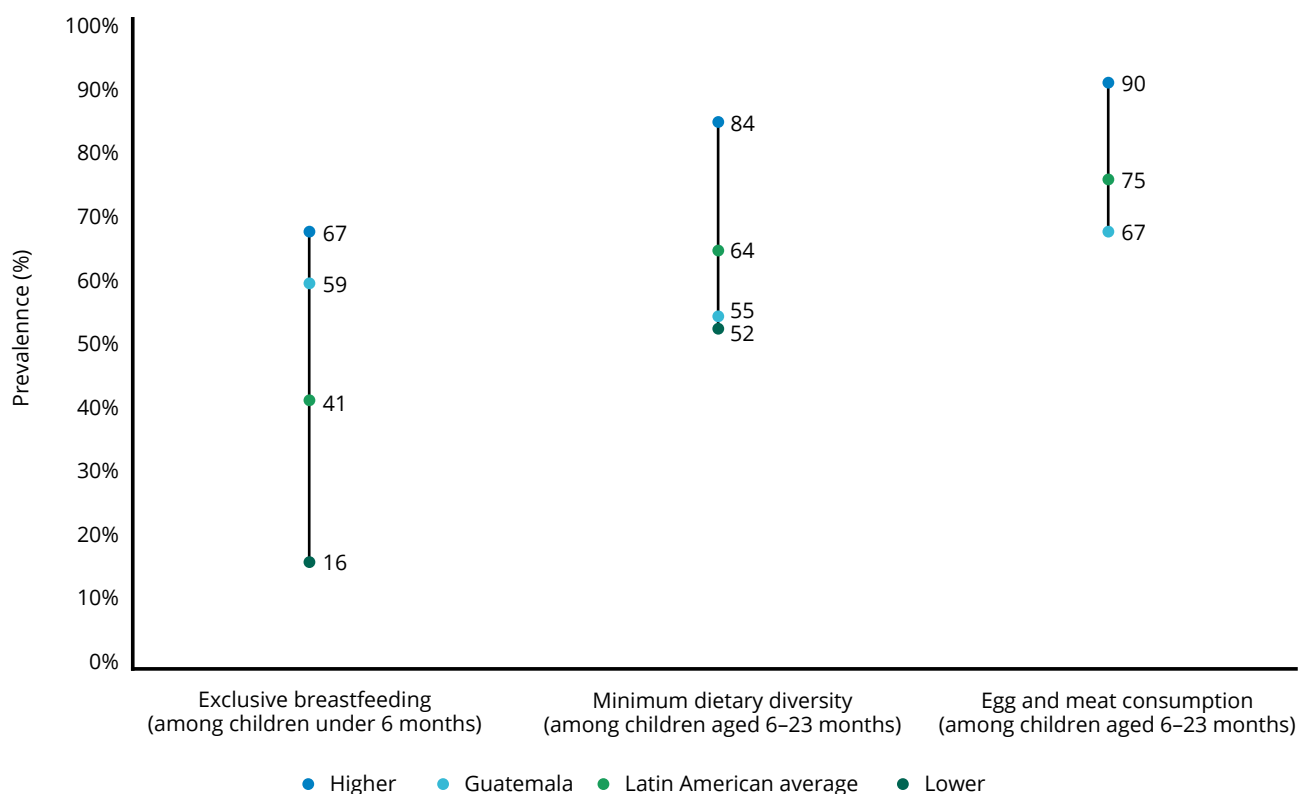
under 5 years, overweight prevalence is 5 percent (9). Among children aged 1-17 years, almost one in five (19.4 percent) is overweight or obese. Adolescents in secondary school have the highest prevalence, with one in four being overweight or obese (26 percent) (11). This is concerning as it exceeds the global prevalence of 18 percent for this age group but remains lower than the global prevalence of six percent for children under the age of 5 (15).

In this context, up to 25 percent of the calories consumed by school age children come from ultra-processed foods (16). Although the Ministry of Public Health and Social Assistance launched dietary guidelines in 2016, emphasizing the importance of physical activity and the moderate consumption of fat and sugars (1), obesity has kept rising (17). To counteract this situation, in 2023 the Government of Guatemala approved a law to promote healthy diets (Law No. 5504), which aims to guarantee the right to health. It includes nutritional labelling norms and regulations on marketing to children and adolescents. The effect of this law on overweight and obesity prevalence across the population is not yet known.

Micronutrient deficiencies remain a problem in Guatemala. In 2022, 13 percent of children aged 6-59 months and 9 percent of women of reproductive age were anaemic.

Adequate dietary intake is essential to nutrition, especially for vulnerable individuals. In Guatemala, about two thirds (63 percent) of women of reproductive age do not achieve minimum dietary diversity. Infant and young child feeding (IYCF) practices show that 59 percent of infants are exclusively breastfed, but 46 percent of children aged 6-23 months receive inadequate minimum dietary diversity (9). Figure 4 compares these key indicators with other countries in Latin America: while Guatemala's exclusive breastfeeding rate is above average, its minimum dietary diversity is below average, and the proportion of children aged 6-23 months consuming meat and eggs in Guatemala is the lowest in the region (18).

FIGURE 4: COMPARISON OF IYCF INDICATORS BASED ON DATA FROM THE UNICEF EXPANDED DATABASE (FROM SURVEYS CONDUCTED BETWEEN 2015 AND 2021 ACROSS LATIN AMERICAN COUNTRIES) (18)



Institutional efforts to address issues related to Food and Nutritional Security have been in place since before 2000. The National Food and Nutritional Security Policy, approved in 2005, was formulated through a consensus among government, social organizations, indigenous groups, and business associations. It seeks to integrate and coordinate initiatives from multiple national actors, aligning with poverty reduction strategies, global policies, and sectoral and regional frameworks while considering the national reality.

The policy establishes guiding principles, thematic axes, and general guidelines to direct the actions of various institutions working to promote food and nutritional security for the Guatemalan population. Among its objectives are promoting actions aimed at eradicating malnutrition, reducing deficiencies and excess related diseases, and preventing the intergenerational transmission of malnutrition. To achieve this, the policy seeks to create and strengthen conditions that ensure dignified human development opportunities for all.

Subsequently in 2005, the Decree No. 32-2005—titled the Law of the National Food and Nutrition Security System—was enacted, thereby officially institutionalizing the issue through the establishment of various entities to implement it. Building upon this foundational effort, the Government of Guatemala introduced its General Policy for the 2024–2028 administration, which incorporates the strategic axis “For a Country Worth Living In: Combating Malnutrition and Undernutrition.” Within this framework, the fight against malnutrition, particularly chronic undernutrition in children under five years of age, has been designated a national priority, with the objective of reducing the prevalence of stunting to 21.5 percent by the year 2032 (19, 20).

Having recognized the current challenges that Guatemala faces in nutrition, food systems and economic landscape, the FNG identified seven main findings as discussed in the following section under the heading Main Messages. The first two messages present the main indicators of cost and non-affordability of least cost diets

and their link to the lack of economic access to nutritious and healthy diets in Guatemala. Messages three, four and five discuss the impact of government interventions in school feeding, health, and social protection on their contribution to economic access to nutritious diets. Message six brings the impact of these multisectoral interventions together, and seven addresses a dual perspective of climate change: its impact on economic access to nutritious and healthy diets, and the environmental impact cost associated with improved access to healthy diets.

Guatemala has the challenge of increasing the investment in social development to reduce inequalities and create opportunities for

historically excluded populations. Prioritizing interventions that can improve access to healthier and nutritious diets is paramount. The FNG can support the task of selecting measures that can have a high impact on addressing nutrition and food security, with special focus on the most vulnerable groups. The FNG can also highlight the need to optimize the design and implementation of existing programmes to achieve the expected outcomes, to develop cost-effective Monitoring, Evaluation and Learning systems for programme management, and to generate accountability on programme outcomes and impact.



Key messages

1.

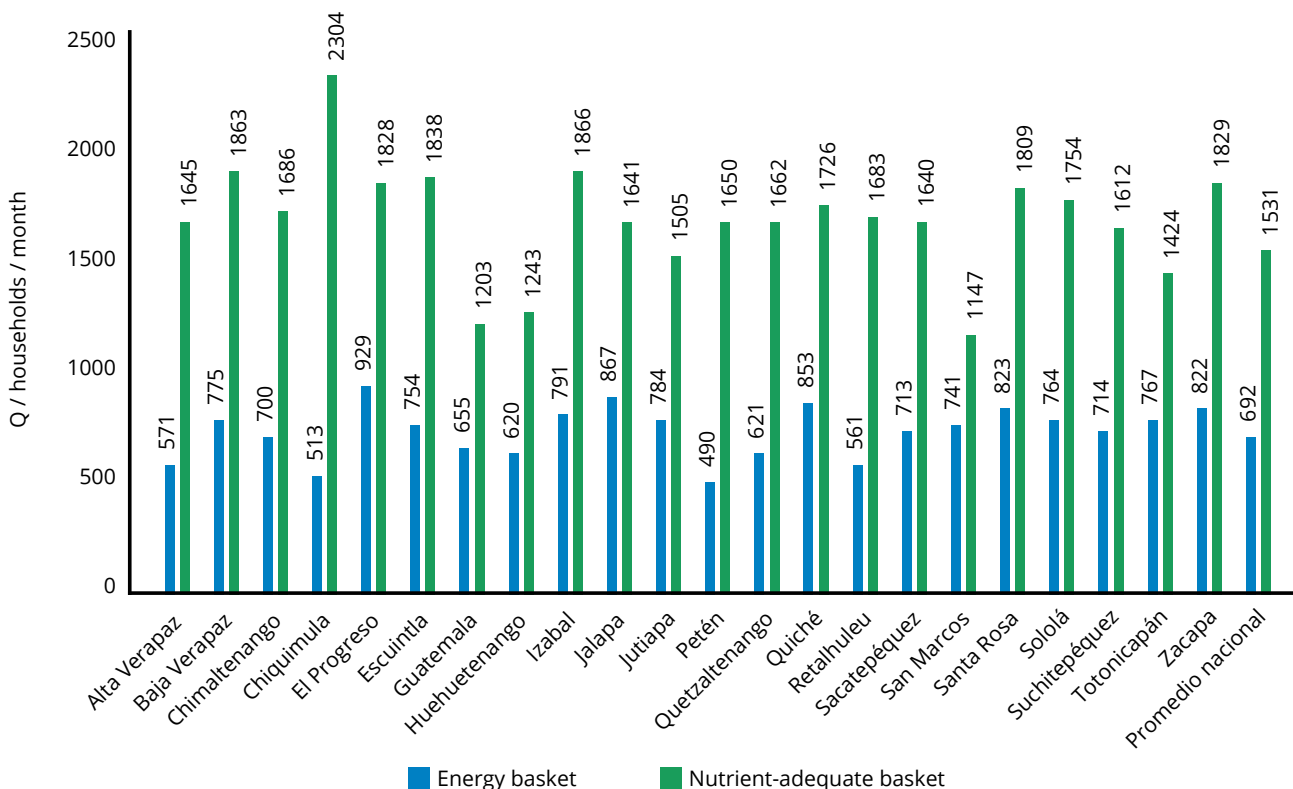
ALMOST 40 PERCENT OF GUATEMALAN HOUSEHOLDS DO NOT HAVE ECONOMIC ACCESS TO A NUTRIENT-ADEQUATE BASKET. ADOLESCENT GIRLS HAVE THE HIGHEST COST, REFLECTING THEIR GREATER VULNERABILITY DUE TO HIGHER MICRONUTRIENT REQUIREMENTS.

- The nutrient-adequate basket is two to four times more expensive than the energy basket.
- Adolescent girls have the highest cost of the diet because they need a higher nutritional density.
- Seventeen of Guatemala's 22 departments have a higher proportion of households unable to afford a nutrient-adequate food basket than the national average cost of Q1,531.

The minimum cost of meeting the energy requirements (energy basket) for the modelled household varies from Guatemalan Quetzal (Q) 490 per month in Petén to Q929 per month in El Progreso, with a national weighted average of Q692. The population weighted average cost of a basket that would meet the requirements for macro and micronutrients (nutrient-adequate basket) for the five members of the modelled household was Q1,531 a month, ranging from Q1,147 (San Marcos) to Q2,304 (Chiquimula).

As can be seen in Figure 5, the cost of the nutrient-adequate basket varies widely across departments. It is two to four times higher than the cost of the energy basket because it includes a greater variety of foods with higher nutritional value, such as animal source foods, which cost more. The energy diet, on the other hand, consists of cereals, oils and other foods that provide a higher energy density at a lower cost.

FIGURE 5: COMPARISON OF THE COST OF THE ENERGY AND NUTRIENT BASKETS ACROSS DEPARTMENTS AND THE NATIONAL AVERAGE



At the individual level, the cost breakdown is as follows: the child aged 6-23 months represents 6 percent of the cost, the school age child 15 percent, the pregnant woman 26 percent, the adult man 25 percent, and the adolescent girl 28 percent. While the adolescent girl requires 24 percent of the household's total calories, her cost for the nutrient-adequate basket represents 28 percent of the household's costs. This disparity underscores her significantly higher nutritional needs during this crucial stage of development. Meeting these needs is more costly because her additional nutrient requirements must be fulfilled with a lower caloric intake compared to an adult. This situation increases the risk of micronutrient deficiencies and obesity. Therefore, it is crucial to target adolescents with nutrition interventions, considering the prevention and management of micronutrient deficiencies in adolescent girls, as their cognitive skills and educational performance are positively associated with their micronutrient status (20).

Meeting requirements for limiting nutrients (i.e., nutrients in the shortest supply) are the primary drivers of the cost of the baskets calculated. Based on local food prices and availability and the nutritional requirements of the modelled household, calcium and protein were limiting nutrients for all members of the household in most departments, and zinc for almost all. Iron was a limiting nutrient for the adolescent girl and the breastfeeding woman in all departments. Vitamin C was limiting for the school age child, the adolescent girl, and the breastfeeding woman in all departments.

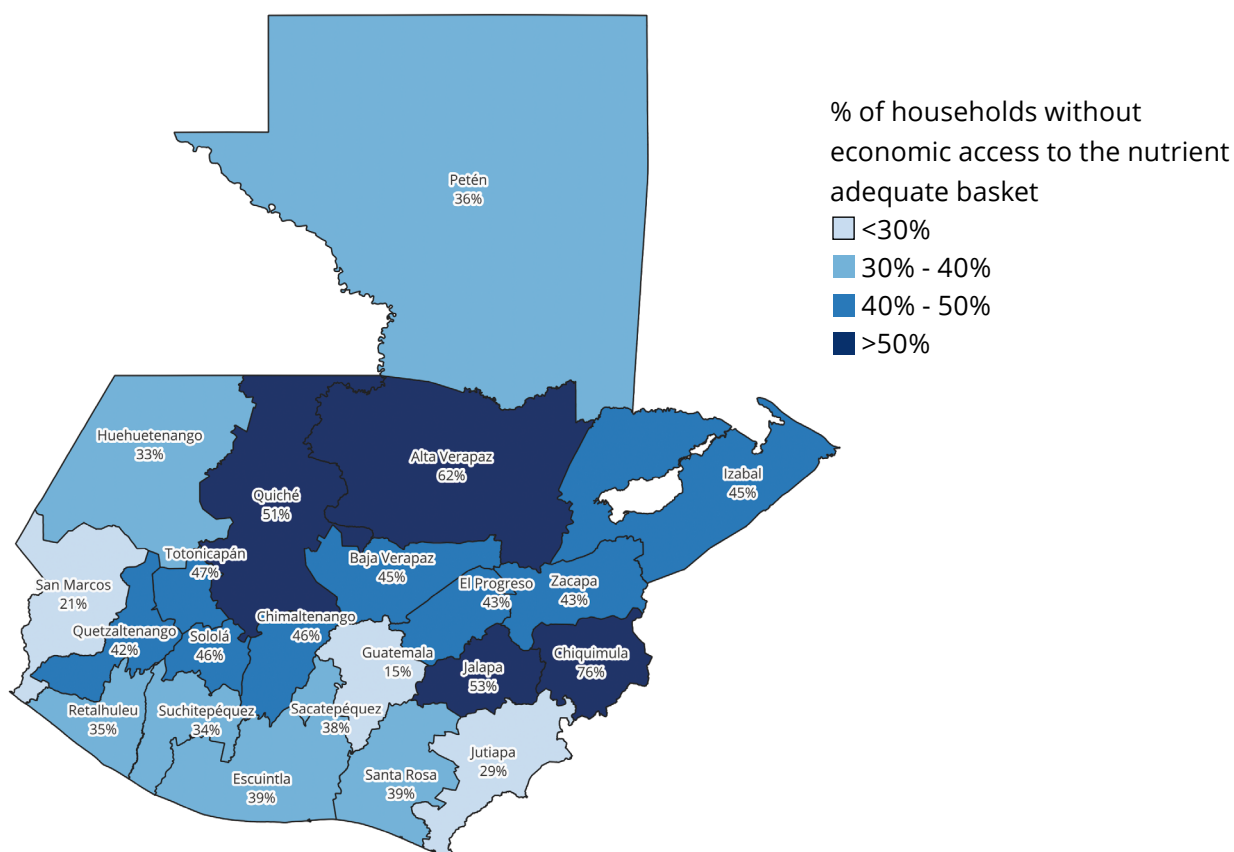
The results of the limiting nutrients analysis are in line with the latest, albeit outdated, national micronutrient survey (Encuesta Nacional de Micronutrientes - ENMICRON), which dates from 2012. 26 percent of children aged 6-59 months and 18 percent of women were iron deficient,

35 percent of children aged 6-59 months had zinc deficiency, 13 percent of children aged 6-59 months and 19 percent of women were deficient in vitamin B₁₂. The prevalence of zinc deficiency in children is twice as high in the poorest quintile as in the wealthiest quintile (51 percent versus 27 percent) (21). This may be related to the findings of a recent study conducted by INCAP, which shows that the nutrients with the highest inadequacies in the Guatemalan population (i.e., not covering 70 percent of nutritional recommendations) are energy, protein, zinc, calcium and vitamins B₁₂ and C (22).

The cost of the modelled baskets was compared to the distribution of household food expenditure to estimate the proportion of households that cannot afford them. Nationally, it was estimated that 5 percent of households could not afford the energy basket (ranging from 0 to 15 percent). An estimated 37 percent of households lack economic access to a nutrient-adequate basket, with subnational variation ranging from 15 to 76 percent across departments in 2023 (Figure 6).

From the regional perspective, the highest proportion of households without economic access to a nutrient-adequate basket were the North (57 percent) and the Northeast (55 percent). The unaffordability of both the energy and the nutrient-adequate basket limits food and nutrition security in Guatemala. According to the Food Security National Evaluation (ESA), 25 percent of households nationally were moderately and severely food insecure (23). Poverty and the lack of economic access to nutritious food play an important role in determining nutrition outcomes. In 2023, 56 percent of the Guatemalan population lived in poverty (4).

FIGURE 6: MAPPING THE NON-AFFORDABILITY OF THE NUTRIENT-ADEQUATE BASKET AT THE DEPARTMENTAL LEVEL



2.

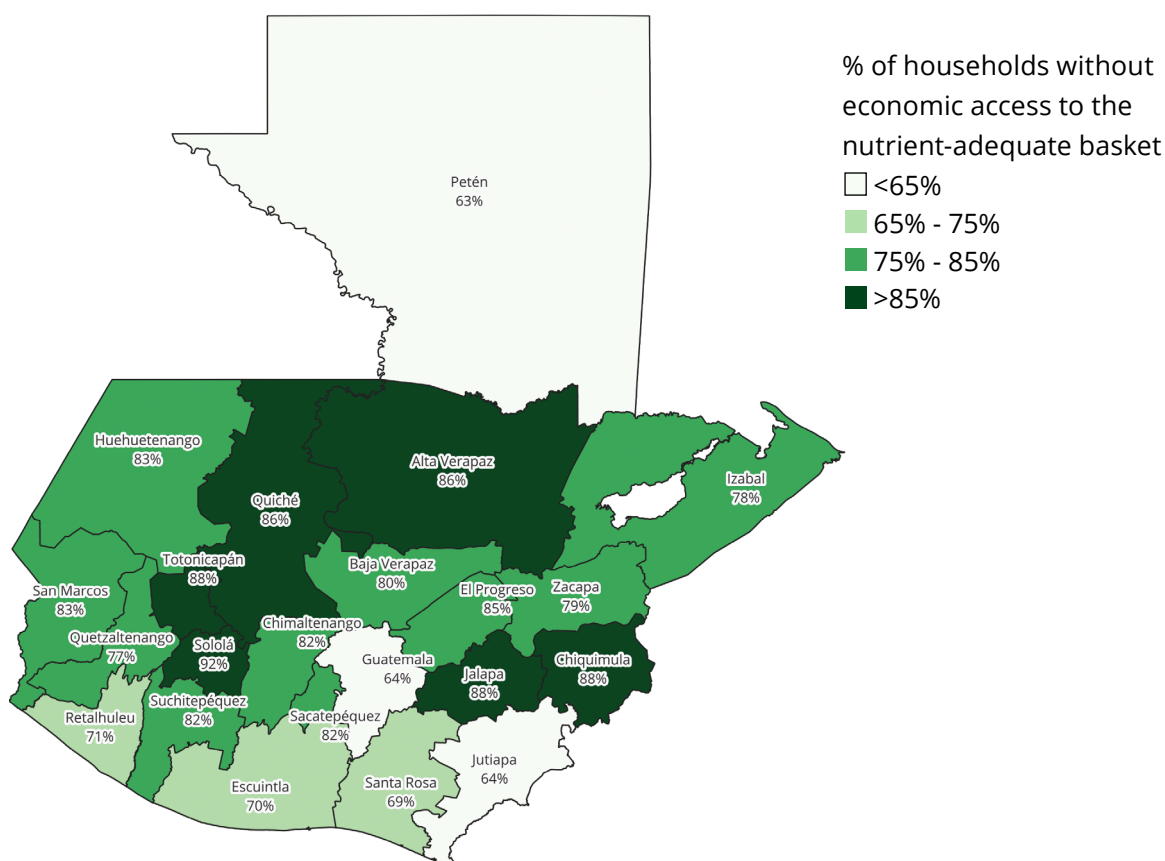
77 PERCENT OF HOUSEHOLDS DO NOT HAVE ECONOMIC ACCESS TO THE NUTRIENT-ADEQUATE BASKET THAT FOLLOWS THE NATIONAL DIETARY GUIDELINES. INTEGRATED APPROACHES LINKING NUTRITION-SENSITIVE AGRICULTURE WITH SOCIAL PROTECTION PROGRAMMES WILL BE ESSENTIAL TO INCREASE THE SUPPLY OF - AND DEMAND FOR - NUTRITIOUS FOODS ALIGNED WITH DIETARY GUIDELINES.

- Meeting national dietary guidelines in addition to nutrient-adequacy costs almost twice as much as the nutrient-adequate basket.
- The availability of vegetables, pulses and dairy products would have to increase for the population to meet the dietary guidelines.

- A nutrition-sensitive agriculture strategy will drive initiatives to increase production and reduce nutritional gaps.

The minimum cost of meeting nutrient-adequacy based on the national dietary guidelines for the modelled household varies from Q2,434 per month in Petén to Q4,029 per month in Sololá, with a national average of Q2,856. These monthly costs are, on average, almost twice as high as the national average cost of the nutrient-adequate basket (Q1,531). This is due to the higher dietary diversity recommended in the dietary guidelines, requiring higher quantities of meat, fruit and vegetables, compared to the optimized nutrient-adequate basket, which is already diverse but with fewer restrictions on the proportions of each food group.

FIGURE 7: MAPPING THE NON-AFFORDABILITY OF THE NUTRIENT-ADEQUATE BASKET BASED ON NATIONAL FBDGS AT THE DEPARTMENTAL LEVEL



To estimate the proportion of households that cannot afford the cost of the modelled basket, it was compared to the distribution of household food expenditure. Nationally, an estimated 77 percent of households cannot afford the nutrient-adequate basket based on the national FBDGs, with subnational variation across departments ranging from 63 percent in Petén to 92 percent in Sololá (as shown in Figure 7). This is consistent with INCAP's findings that if the entire minimum wage were invested in a healthy diet in 2023, there would be a substantial monetary gap of 44 to 56 percent in Guatemala (24).

Food supply is essential to accessing a healthy and nutritious diet. The current food supply in Guatemala mirrors national consumption patterns, with staple foods—mainly corn—providing an abundant energy supply. On average, 3,268 kilocalories are available per person per day, of which 44 percent comes from staple foods (17, 25). Protein supply in Guatemala is approximately 81.7 grams/person/day, which

is sufficient to meet the recommended protein intake for healthy adults (50-60 grams/person/day), but it is worth noting that 43 percent of this available protein is of animal origin and that the availability of legumes per capita per day is considered low. Legumes are imported in a significant proportion of 63 percent, meaning they are not produced in sufficient quantities to meet the country's demand (26).

If we consider the potential food demand necessary to meet the national FBDG, the supply of legumes, dairy products and vegetables would be inadequate. Comparing supply based on food balance sheets and FBDG quantities indicates that the current supply of legumes, dairy products, and vegetables in Guatemala meet only 32 percent, 76 percent, and 41 percent respectively of the recommended daily intake (1). By contrast, the daily available sugar per capita is more than 100 g, or more than 400 kcal, which exceeds the WHO recommendation of less than 10 percent of calories from sugar (27).

In Guatemala, uneven agricultural productivity and inefficient supply chains are among the limiting factors that contribute to an inadequate supply of nutritious food. While cash crops such as sugar cane, palm oil, and rubber are grown on the largest farms, occupying nearly two thirds of the arable land, only 10.5 percent of the country's arable land is devoted to producing the staples of the Guatemalan diet (corn, beans, and rice) (20).

Smallholders, who account for 82 percent of agricultural land, use only one sixth of the arable land, with an average of 0.6 hectares. Smallholder farmers rely on rain-fed agriculture, but the majority have access to motorized equipment and apply fertilizer to their fields. The average total value of crops produced per year remains relatively low, and most smallholders cannot rely on agriculture as their sole source of income (28).

Guatemala also has high losses in its food production: 37 percent of its fruit, 19 percent of its vegetables, and 11 percent of its pulses, while the global average is 8 percent, 7 percent, and 3 percent respectively. These elevated losses are driven by factors such as limited access to post-harvest infrastructure, poor road conditions and transport systems, lack of cold chain storage, and limited technical knowledge among smallholder farmers on proper handling and preservation techniques (17). The Food and Agriculture Organization (FAO) has estimated the losses within Guatemala's main food value chains as follows: 8.5 percent for eggs, 12 percent for tomatoes, 12 percent for milk, 15 percent for black beans, and 20 percent for bananas (29).

Within the National Nutrition and Food Security Policy 2022-2037 (POLSAN), and in line with the national and general government policy, the Ministry of Agriculture launched a new nutrition-sensitive agriculture strategy to promote initiatives to increase production and reduce nutrition gaps in 2025. This will include promoting the production of nutrient-rich foods such as fruit, vegetables, legumes and animal source foods, increasing access to nutritious foods by ensuring greater availability and

affordable access to healthy and diverse foods, and strengthening local food systems and family agriculture such as home and school gardens.

Some specific interventions for nutrition-smart agriculture have been identified by the World Bank (30): improving value chains for nutritious foods whose production is below potential, such as fish (trout and bream), biofortified beans, and peas, and adding post-harvest initiatives to value chains, such as improving cheese production and packaging of nutritious seeds. Specific complementary actions should be adapted regionally as required, such as investments to improve rural infrastructure, policies to diversify agriculture, programmes to support youth in agricultural activities linked to labour shortages in rural areas, and policies to address informal trade (30).

3.

SCHOOL FEEDING IS A CRUCIAL PROGRAMME FOR PROVIDING NUTRITIOUS FOOD TO SCHOOL CHILDREN. THE IMPACT OF THE PROGRAMME CAN BE INCREASED THROUGH SYNERGIES WITH HEALTH, SOCIAL PROTECTION AND AGRICULTURE PROGRAMMES.

- If served at school, school meals could cover 62 percent of the costs of a nutrient-adequate basket for children in preschool and primary school, and 55 percent for children in secondary school.
- The budget for meals served at middle school level (12-18 years of age) should be increased to meet the higher nutritional requirements of this age group.
- Providing nutritional supplements with meals could contribute to the micronutrient requirements of school children.

Based on the principles of the right to food for all and the importance of nutrition and health, the School Feeding Law of 2017 was implemented by

the Ministry of Education (31). The programme is implemented through the Organization of Family's Fathers in each public education centre, which is responsible for procurement, quality control, storage, preparation and distribution of the rations. The law also stipulates that at least seventy percent of the total financial resources allocated to each educational centre must be earmarked for local products from family farming (32). The programme targets cover preschool through secondary school (from 6 months to 18 years old).

The national school feeding programme has two modalities: either a daily meal served at school that includes beverages, animal source food (either meat or eggs), cereals, legumes, and vegetables, or take-home rations consisting of cereals and roots, oil, legumes, eggs, a fortified blend of soy and cereal flour, and fruit and vegetables, designed to last 20-35 days. The programme was originally designed around meals served at school; the take-home modality was introduced during the COVID-19 pandemic as an adaptation to school closures and has been maintained as an alternative option.

In 2024, more than 3.1 million children benefited from the national school feeding programme, with roughly 85 percent receiving the take-home rations (this includes all children between 6 months and 4 years of age who don't have an in-school meal option), and the remaining 15 percent receiving meals served at school. For both modalities the daily budget for each child is Q4 for children in the preschool and secondary levels, and Q6 for children in the pre-primary and primary levels.

Modelling of the different school feeding modalities showed that the school meals served in schools could make the largest contribution to meeting the nutrient needs of children: 62 percent of the nutrient-adequate basket cost for children in preschool and primary school and 55 percent for children in secondary school. The take-home ration, if consumed only by the beneficiary child, could

cover up to 57 percent and 39 percent of the cost for children in pre- and primary school and secondary school, respectively.

However, the take-home ration will likely be shared among household members, which would then reduce the ration's contribution. When accounting for an estimated sharing among all household members, the share of the nutrient-adequate basket cost reduces to 46 percent for children in pre- and primary school, and 34 percent for secondary school children (as shown in Figure 8).

The two different modalities also have different nutritional targets. Both aim for protein to be between 11 and 17 percent of total energy, and carbohydrates to be between 55 and 65 percent, however, as highlighted in Figure 9, the differences in the composition of the two modalities: only school served meals contain meat, while take-home rations have a higher proportion of cereals and roots.

Comparing the composition of the two modalities, the proportion of fruit in the served meal is greater for the younger children. In fact, the served meal designed for pre-primary and primary levels has the highest score for food diversity, with a score of 6 out of 10, while all other modalities score 5 out of 10.

Only the served meal modality also sets nutritional targets: 30 percent of the folate requirement and 20 percent of the iron and zinc requirements for pre-primary and primary children, while the targets are lower for secondary school children: 20 percent for folate and 15 percent for iron and zinc. The nutritional targets are met for preschool and primary school children at an average of 50 percent for folate, 40 percent for iron and 19 percent for zinc. For secondary school children, especially adolescent girls, the meal served meets the 10 percent requirement for zinc but falls short of the folate and iron targets, meeting only 17 percent and 6 percent respectively (see Figure 10).

FIGURE 8: MODELLING RESULTS OF THE COST OF THE NUTRIENT-ADEQUATE BASKET FOR THE TARGETED CHILDREN WITH THE SCHOOL FEEDING RATIONS (TWO SCENARIOS: CONSUMED ENTIRELY BY THE RECIPIENT CHILD OR ALTERNATIVELY SHARED WITHIN THE HOUSEHOLD), AND THE MEAL SERVED AT SCHOOL

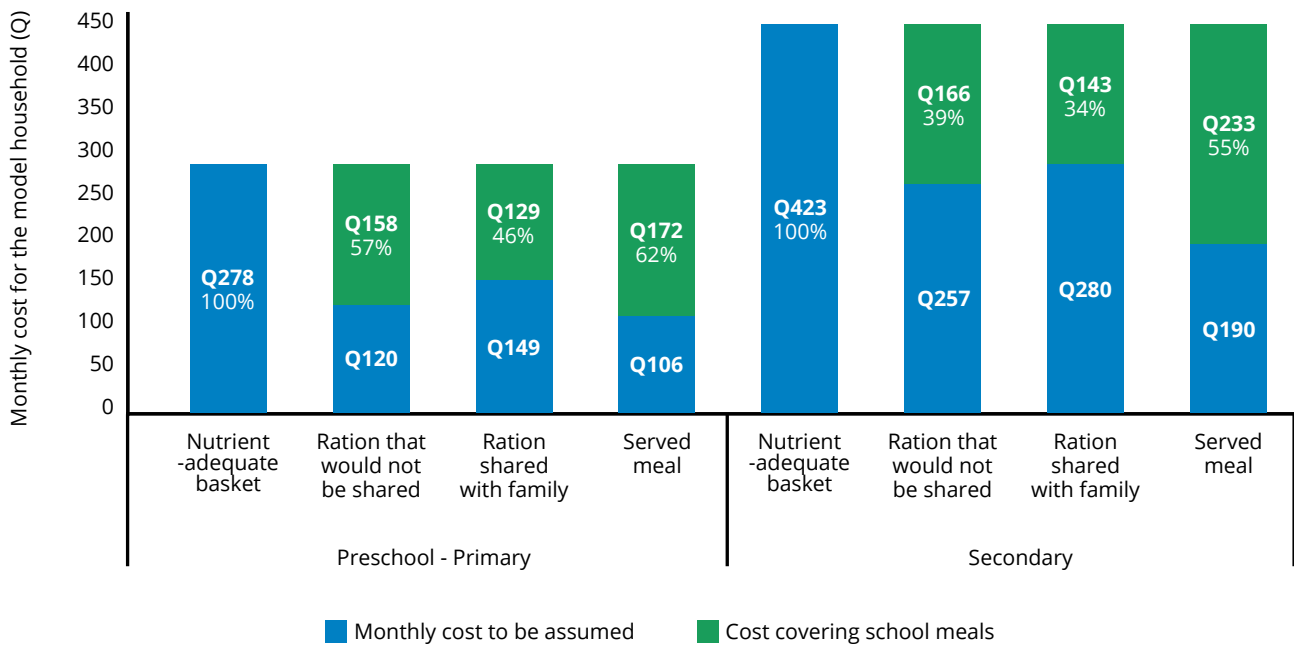


FIGURE 9: CONTRIBUTION OF FOOD GROUPS TO THE CALORIC PROVISION, ACCORDING TO THE TWO SCHOOL FEEDING MODALITIES (SERVED MEAL OR TAKE-HOME RATION) BY SCHOOL LEVELS

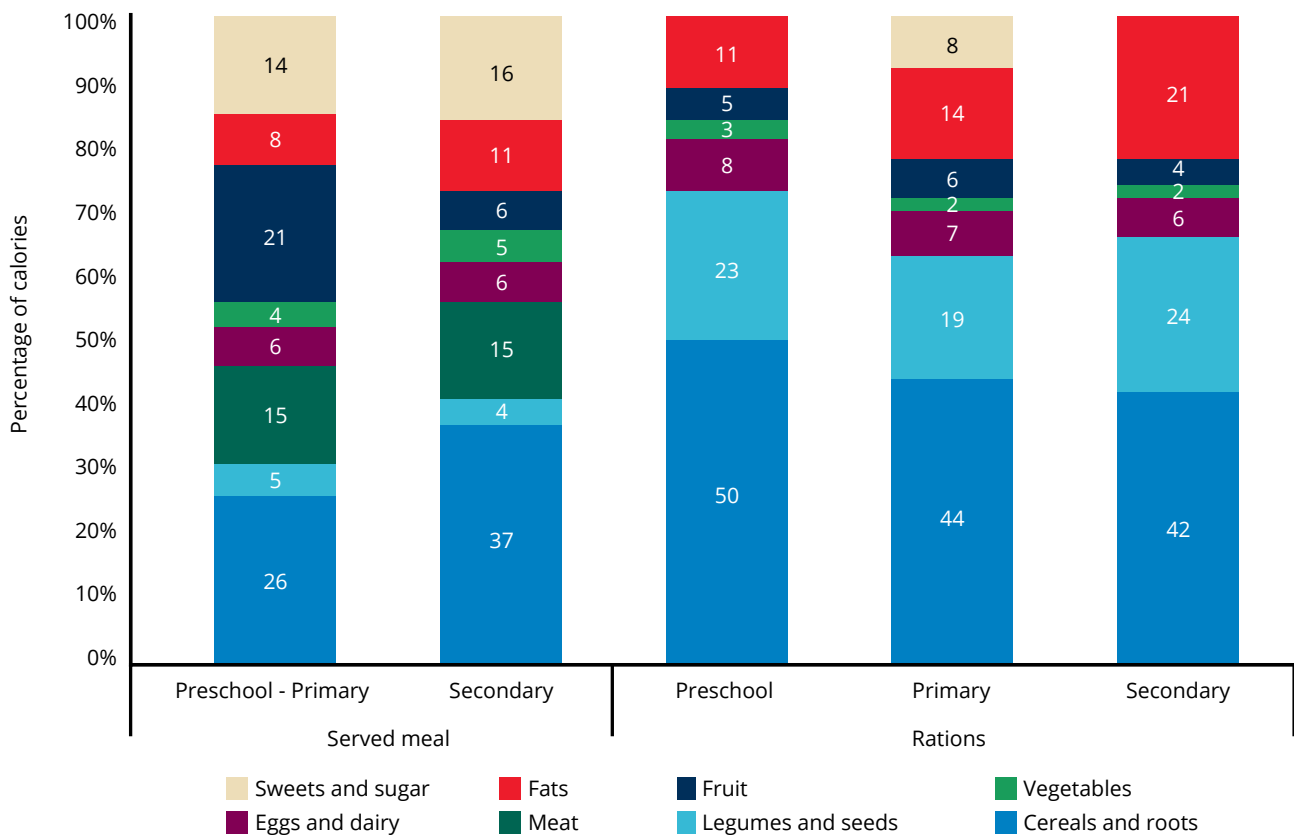
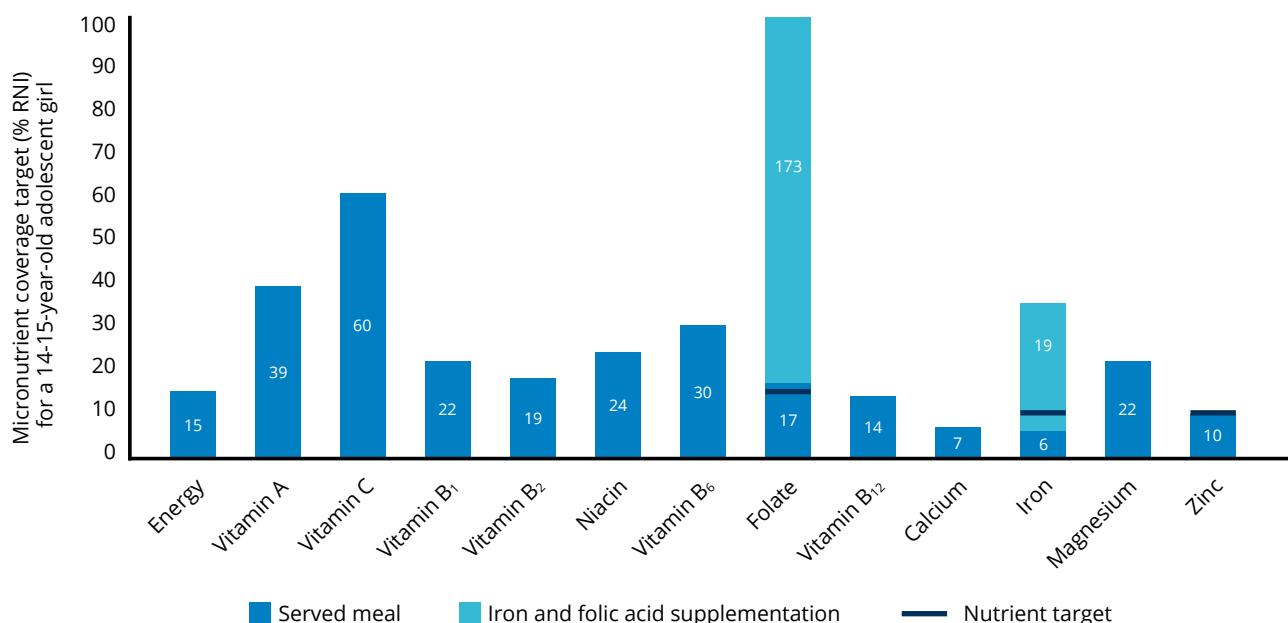


FIGURE 10: CONTRIBUTION OF THE SERVED MEAL RATION TO THE DAILY ENERGY AND RECOMMENDED NUTRIENT INTAKES (RNI) OF THE ADOLESCENT GIRL (14-15 YEARS), WITH THE ADDITION OF IRON AND FOLIC ACID SUPPLEMENTATION, AND THE NUTRIENT TARGET OF THE PROGRAMME



The Ministry of Health currently recommends the following supplements for the different age groups: daily multiple micronutrient powder for children aged 1 to 5 years (pre-primary), iron supplementation every eight days for children aged 5 to 10 years (primary school), and iron and folic acid every eight days for women of reproductive age, which includes adolescents in secondary school. Providing iron and folic acid with the meal served to the adolescent girl could increase the intervention’s contribution to the least costly nutrient-adequate basket from 58 percent to 85 percent, meeting and exceeding the nutritional targets of the programme.

While supplementation strategies can help address key micronutrient gaps, the broader school food environment presents additional challenges. The availability of ultra-processed food (UPF) and sugar-sweetened beverages significantly impacts dietary quality and affordability, complicating efforts to achieve balanced nutrition among school age children. The school food environment in Guatemala can be characterized as obesogenic, with school

food kiosks and nearby street vendors offering mostly UPF (33). As a result, 46.3 percent of school age children consume fried and salty snacks daily, while 79.1 percent drink sweetened beverages (15).

Moreover, the current design of the school feeding programme includes sugar-sweetened beverages, bringing the percentage of caloric intake from sugar to over 10 percent above the WHO recommendation (27). Modelling showed that this level of UPF consumption in the diet of school age children increases the cost of the nutrient-adequate basket by more than 200 percent. The increase in cost is related to the high caloric and low micronutrient content of UPF, which means that other foods consumed must be very nutrient-dense, and therefore expensive, if nutrient needs are to be met without exceeding the daily caloric target. Our modelling results suggest that restricting access to UPF is crucial for enhancing the quality of school meals, improving the food environment, and increasing nutrient intake among school age children and adolescents.

4.

SUPPLEMENTATION, FORTIFICATION, AND PROMOTION OF HEALTHY DIETS EFFECTIVELY CONTRIBUTE TO ADEQUATE NUTRIENT INTAKE. IMPROVING ACCESS TO - AND AVAILABILITY OF - MICRONUTRIENT-RICH FOODS THROUGH SOCIAL PROTECTION PLATFORMS CAN INCREASE ACCESS TO DIVERSE AND NUTRITIOUS DIETS.

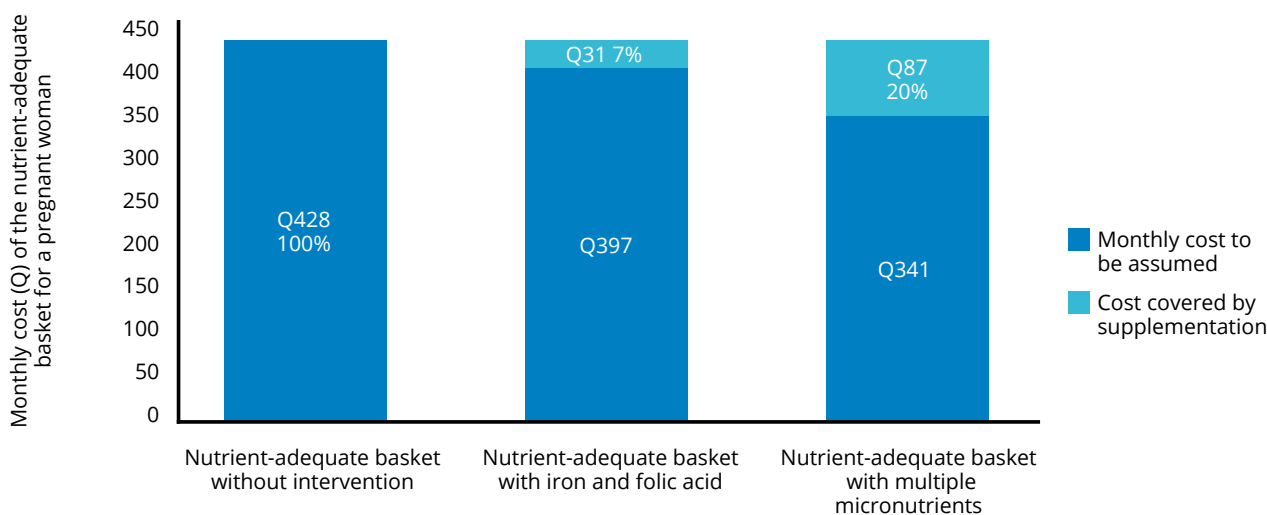
- Supplementation combined with school rations during early education could contribute to reducing the cost of meeting nutrient needs for children under 2 by up to 81 percent.
- Culturally accepted local options such as beef offal are particularly micronutrient-rich and affordable.
- Targeted cash transfer programmes could contribute to preventing child malnutrition.

Widely consumed staple foods fortification, such as sugar with vitamin A, is one of the key actions identified to prevent micronutrient deficiencies under the framework of POLSAN (20). Alongside vitamin A supplementation for young children, sugar fortification has contributed to a significant reduction in vitamin A

deficiency in Guatemala, from 16 percent in 1995 to 0.3 percent in 2010 (21). In Guatemala, sugar consumption is monitored at the population level, and due to rising consumption levels, the supplementation scheme was adjusted. Originally targeting children aged 6 months to 5 years, it has now been scaled down to reach children aged 6 months to 2 years (34). The FNG nutrient-adequate basket modelling, without sugar fortified with vitamin A, revealed a 3 percent increase in the cost of the basket for the household.

The Government of Guatemala has developed many interventions targeting the first 1000 days of a child's life (from conception to 2 years of age), and iron and folic acid (IFA) supplementation for pregnant women is an important intervention included in the national guidelines (10). Current IFA supplementation coverage among pregnant women is more than 80 percent (12). However, global evidence shows that multiple micronutrient supplementation (MMS) is more effective than IFA tablets: the risk of low birth weight and diarrhoea are reduced by an additional 15 percent in children whose mothers took MMS (35). The contribution of MMS to the cost of the nutrient-adequate basket is greater (20 percent) than that of IFA (7 percent), as shown in Figure 11.

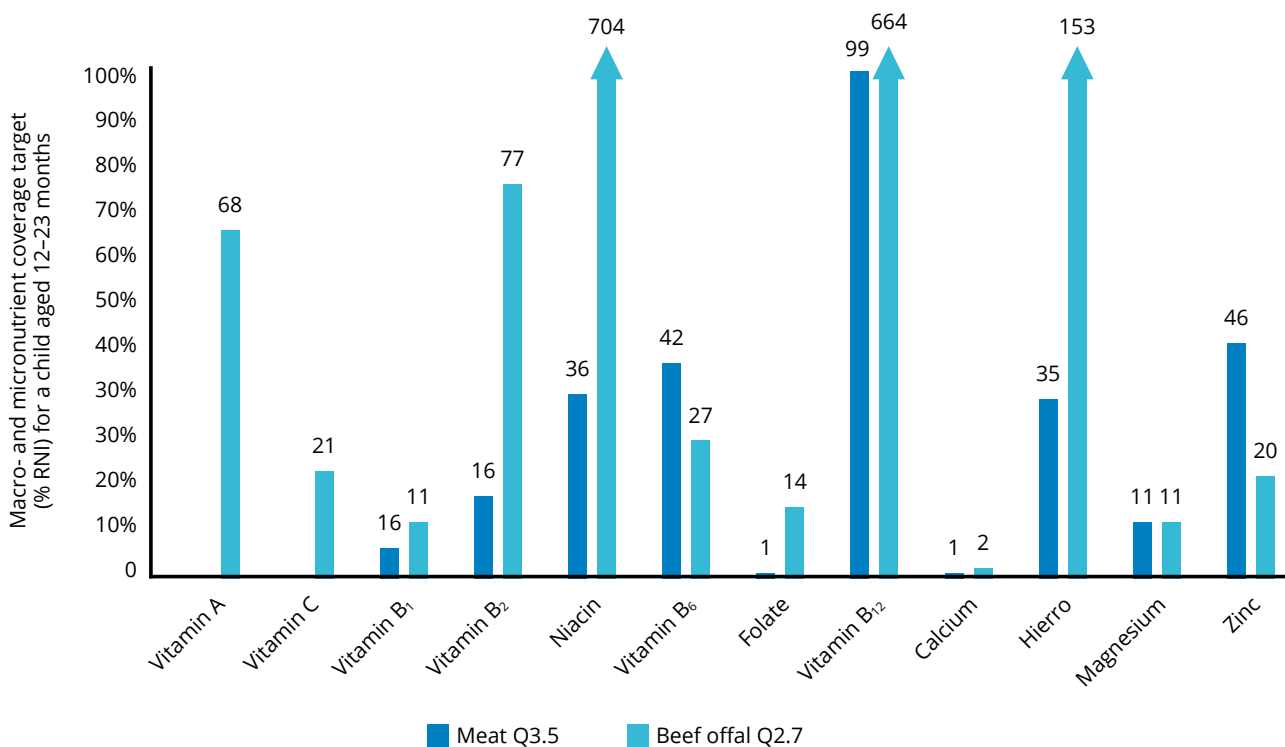
FIGURE 11: COST OF THE NUTRIENT-ADEQUATE BASKET FOR THE PREGNANT WOMAN, WITH AND WITHOUT IRON AND FOLIC ACID (IFA) OR MULTIPLE MICRONUTRIENT SUPPLEMENTATION (MMS)



Evidence shows that social and behaviour change communication (SBCC) can improve people’s knowledge, enabling them to make better decisions and change their own nutrition practices and behaviour, and is therefore key to malnutrition prevention. In Guatemala, under the leadership of SESAN, there is a strategy that promotes Social and Behaviour Change. It includes strategic lines aimed at addressing issues related to health and nutrition, dietary diversity, social protection, water, sanitation, and more. The Ministry of Public Health and Social Assistance, the Ministry of Agriculture, the Ministry of Education, and the Ministry of Social Development all participate, and the strategy includes entry points that enable action on preventing malnutrition in all its forms.

Another recent initiative is a behaviour change strategy led by WFP in Guatemala, which encourages more nutritious, diverse, and healthy eating. It includes the promotion of culturally acceptable and accessible nutrient-rich foods, such as beef offal, among others. Based on this effort, modelling was conducted to assess the contribution of a 40-gram portion of beef organ meat to daily nutritional requirements compared to regular beef, in terms of reducing the cost of the nutritious food basket while maintaining adequate nutrient levels. On average, in Guatemala, beef offal are 22 percent cheaper than regular beef and provide greater contributions to the nutritional requirements of children aged 12 to 23 months, specifically for vitamin A, vitamin B₂, niacin, vitamin B₁₂, and iron (see Figure 12).

FIGURE 12: PRICE AND CONTRIBUTION OF A PORTION (40 g) OF BEEF OFFAL OR BEEF MEAT TO THE DAILY NUTRITIONAL REQUIREMENT USING THE RNI OF CHILDREN AGED 12-23 MONTHS AS A REFERENCE



In addition to SBCC, the government also has nutrition-specific and nutrition-sensitive interventions for children under 2 years of age. Multiple micronutrient supplementation with micronutrient powders (MNP) is one of the interventions included in the Ministry of Public Health and Social Assistance nutritional

guidelines (9), and data show that 60 percent of children aged 6-59 months had received MNP within the previous six months (12). Modelling the contribution of MNP to the cost of the nutrient-adequate basket showed that it could cover 7 percent of the cost for the child aged 6-23 months, as shown in Figure 13.

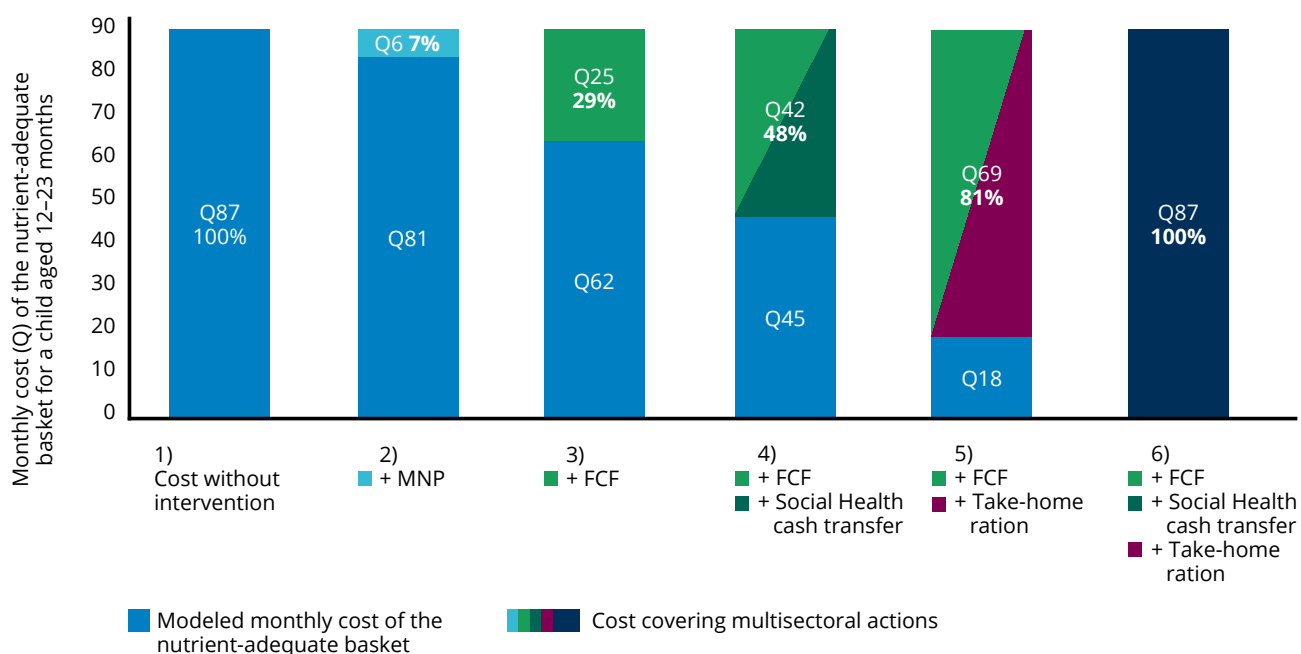
Guatemala also has experience with the use of fortified complementary food (FCF). Since 2020, NutriNiños (a corn-soy blend with cow's milk protein, and micronutrients) has been included as part of the government's programmatic offerings and thus has been incorporated into the modelling. FCF contains not only micronutrients premix, but also macronutrients and energy, and therefore makes a greater contribution to reduce the cost of the nutrient-adequate basket compared to that of MNP: it could cover 29 percent of the cost, as shown in Figure 13.

In addition to this in-kind support, the Ministry of Social Development also implements a conditional cash transfer (Bono Social Salud, which will be discussed in more detail in message 7). This cash transfer is targeted to households with young children if they comply with the health services, including receiving FCF. The combined

contribution of both the cash transfer and FCF to the nutrient-adequate basket of a child aged 6-23 months was modelled; both could cover 48 percent of its cost (see Figure 13).

As discussed in message 3, the Ministry of Education also provides take-home rations to children under 2 years of age as part of the school feeding programme. The provision of FCF together with this ration was modelled, and this combination could cover 81 percent of the cost of the nutrient-adequate basket of the child aged 6-23 months (see Figure 13). If FCF were provided with the school feeding ration and the cash transfer, 100 percent of the nutrient-adequate basket of the child aged 6-23 months would be covered. The synergy of these multisectoral interventions helps address and close the nutrient gap for young children.

FIGURE 13: COST OF THE NUTRIENT-ADEQUATE BASKET FOR A CHILD AGED 6-23 MONTHS 1) WITHOUT INTERVENTION, 2) WITH MNP, 3) WITH FCF, 4) WITH FCF AND THE SOCIAL HEALTH CASH TRANSFER (BONO SOCIAL SALUD), 5) WITH FCF AND TAKE-HOME RATION FROM SCHOOL FEEDING PROGRAMME, AND 6) THE COMBINATION OF FCF, THE SOCIAL HEALTH CASH TRANSFER AND TAKE-HOME RATION



5.

SOCIAL PROTECTION PROGRAMMES HELP HOUSEHOLDS INCREASE ACCESS TO NUTRITIOUS FOODS. IMPACT IS AMPLIFIED BY ENSURING THESE PROGRAMMES ARE NUTRITION-SENSITIVE THROUGH THE INCLUSION OF NUTRITION OBJECTIVES AND BY CREATING SYNERGIES WITH HEALTH AND AGRICULTURE PROGRAMMES.

- The amount of the cash transfer should be increased to close the gap in economic access to a nutrient-adequate basket.
- If adequately designed and implemented, interventions that include fortified complementary food in the programme could contribute to closing the economic barriers to meeting nutrient needs.
- It is crucial to integrate social behavioural change strategies into the programmes to promote healthy eating habits and appropriate use of the complementary food.

The Ministry of Social Development implements various programmes to support the most vulnerable household of Guatemala. Soup kitchens are established throughout the country to address poverty, serving over 4.4 million rations of breakfast or lunch to anyone in a situation of vulnerability or affected by a crisis in 2024. While this programme does not have a specific nutritional objective, it could have a nutrition-sensitive approach, considering that its menus are designed to be diverse, including animal protein (egg or cheese for breakfast, and meat for lunch), legumes for breakfast, and both meals include cereals, fruit and vegetables. The model shows that soup kitchens could cover 65 percent to 97 percent of the cost of a nutrient-adequate basket for their users.

The *Bolsa Social* is another important intervention carried out under the Ministry of Social Development. It is a conditional cash transfer of Q250, provided regularly, targeting

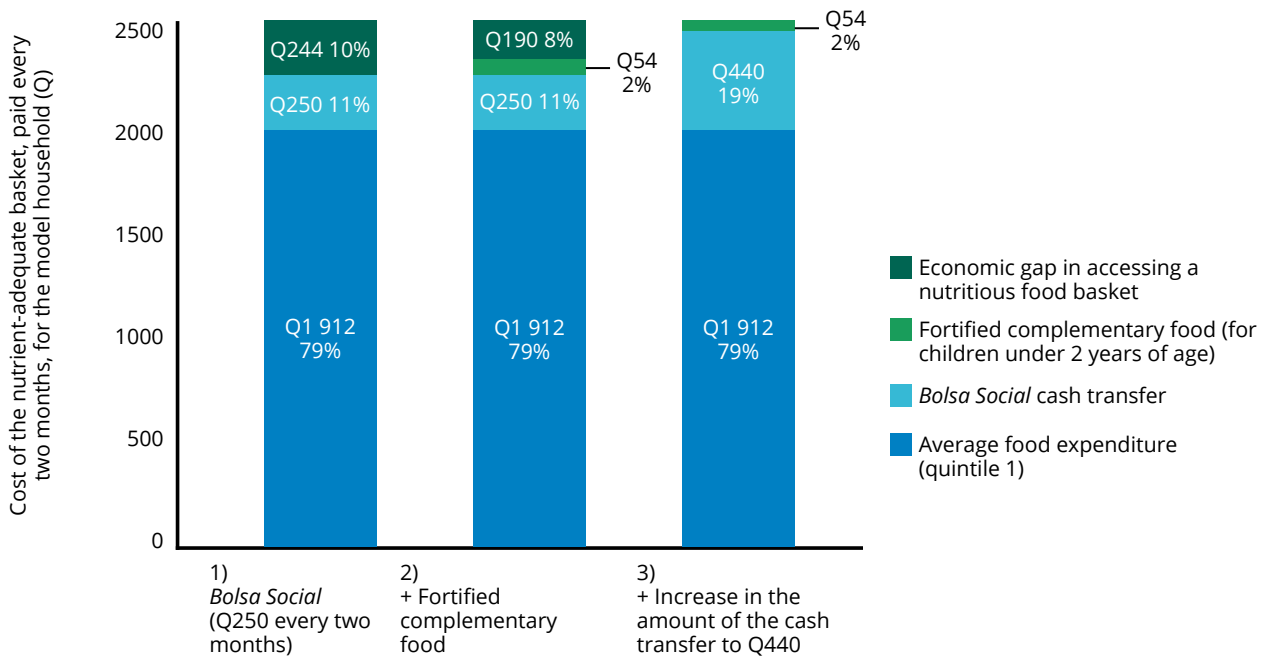
poor households with children aged 0-15 years or elderly in the department of Guatemala.

Beneficiaries are responsible for enrolling their children in school; in 2024 it reached over 50,000 families. Although the unaffordability rate is lowest in the department of Guatemala (15 percent), it should be noted that more than 20 percent of the population lives in the capital city.

We assessed the contribution of the *Bolsa Social* to the cost of the household's nutrient-adequate basket, based on a frequency distribution of every two months. From the total cost of the nutrient-adequate basket that a household has to bear, the average current food expenditure of the bottom quintile contributes 79 percent, as shown in Figure 14. The cash transfer covers 11 percent of the cost of the nutrient-adequate basket, which leaves a 10 percent gap for vulnerable households (see Figure 14). The modelling results show that if the government were to integrate another intervention in addition to the *Bolsa Social* —specifically, food with high nutrient density targeting children under 5 — the cost of the nutrient-adequate basket that households would have to bear could decrease from 10 percent to 8 percent.

The model presented in Figure 14 included NutriNiños. However, further and more in-depth analysis is needed to assess adherence to NutriNiños use and address concerns related to programme design. Also, to fill the remaining nutrient gap that households in the department of Guatemala would have to cover, we modelled an increase in the amount of the *Bolsa Social* cash transfer, from Q250 to Q440 every two months (or Q220 monthly). This cash transfer amount would cover 19 percent of the cost of the nutrient-adequate basket, allowing the household to close its gap. Monthly cash transfers could ensure more stable income and facilitate better access to food compared to bi-monthly distributions, as beneficiaries would not have to save a proportion of their payments, which may be unrealistic for such a low-income group.

FIGURE 14: COST OF THE NUTRIENT-ADEQUATE BASKET FOR THE MODELLED HOUSEHOLD, COVERED BY FOOD EXPENDITURE OF THE LOWEST QUINTILE AND 1), THE CURRENT *BOLSA SOCIAL* CASH TRANSFER (Q250 EVERY TWO MONTHS), 2) THE CURRENT *BOLSA SOCIAL* CASH TRANSFER (Q250 EVERY TWO MONTHS) PLUS THE FCF, 3) THE *BOLSA SOCIAL* WITH INCREASED CASH TRANSFER (Q440 EVERY TWO MONTHS) AND THE FCF



It is crucial to integrate SBCC strategies into the *Bolsa Social* programme to promote healthy eating habits and appropriate use of the cash transfer and the complementary food. We know that the most common food items purchased with the cash transfer are sugar, oil, and eggs. SBCC can promote greater diversity in purchases so that households are more likely to buy products such as offal, eggs, fruit and vegetables.

Evidence has shown that SBCC could reduce stunting and, together with cash transfers, could improve dietary diversity (23, 36). Regarding the consumption of FCF, it is important to integrate the promotion of adequate consumption of the FCF into the SBCC for households to know that it is designed for young children based on their specific nutritional needs.



6.

MULTISECTORAL ACTIONS IN HEALTH, EDUCATION, AGRICULTURE, AND SOCIAL PROTECTION CAN REDUCE THE GAP IN ECONOMIC ACCESS TO A NUTRITIOUS DIET. OPTIMIZING THE DESIGN OF EXISTING PROGRAMMES AND INCREASING THEIR COVERAGE COULD CONTRIBUTE TO EFFECTIVELY CLOSING NUTRIENT GAPS.

- Together, the studied programmes, as currently designed, have the potential to cover 33 percent of the cost of the household's nutritious diet. However, to ensure their effectiveness, it is crucial to optimize their design and implement them as intended to achieve their objectives and goals.
- The north, northeast, and northwest regions have a larger affordability gap than the national average.
- Ensuring monthly payments and increasing the amount of the cash transfers could further reduce the gap in economic access to a nutrient-adequate basket among its recipients.

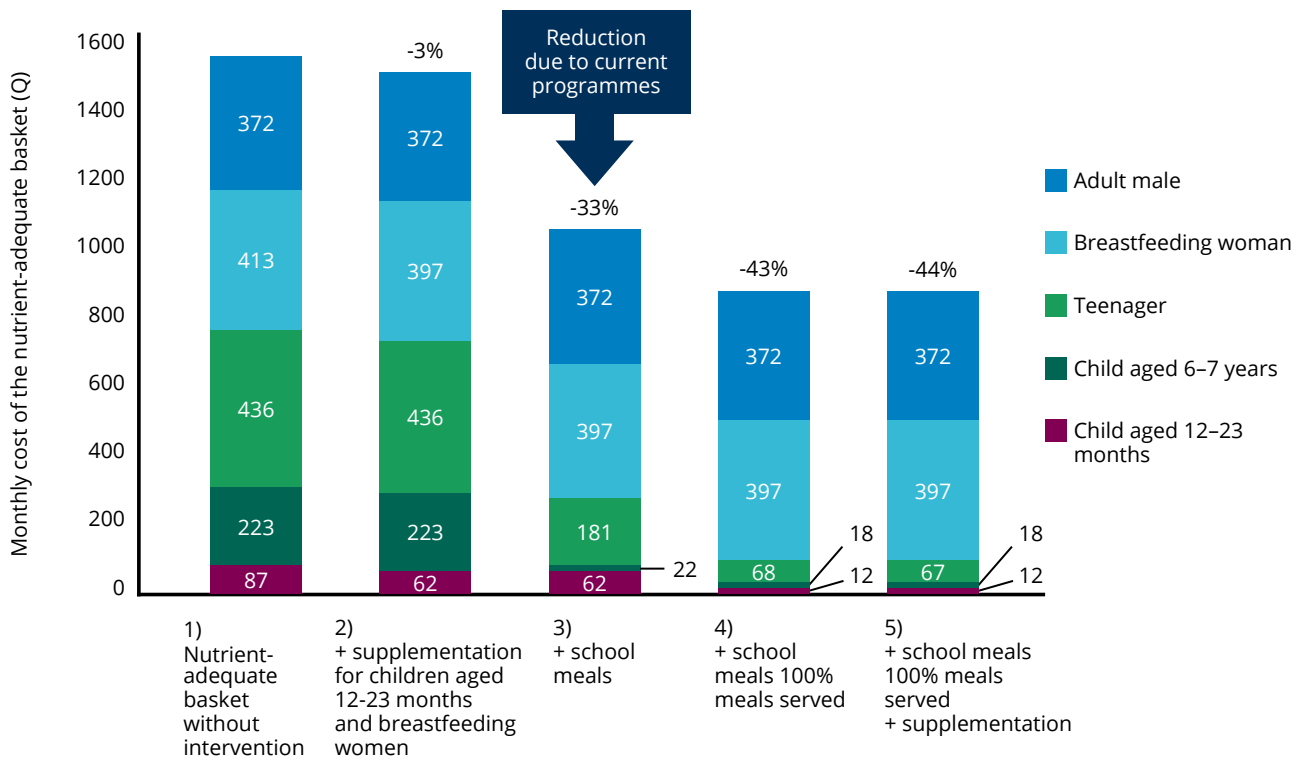
As currently designed, the programmes targeting the entire population with a life cycle approach, i.e., supplementation and school feeding programmes, can reduce the gap in economic access to a nutrient-adequate basket by 33 percent on average (see Figure 15). The proportion of the cost of the basket covered by the school feeding and supplementation programme varies across the country: in the northern, northeastern, central, and southwestern regions, the share rises to 37-38 percent. With the existing in-kind programmes, a gap remains for the poorest households. On average, of the Q1,531 monthly cost for the household, 54 percent is covered by current food expenditure (households in the lowest quintile)

and 33 percent by supplementation and school feeding, with a remaining gap of 13 percent. This gap is higher in the north, northeast, and northwest, where it reaches 24 percent.

Message 3 highlighted the fact that the served school meal is more effective in reducing the cost of the nutrient-adequate basket than the ration, and that integrating it with supplementation could further reduce the cost of their nutrient-adequate basket for school-age children. This, plus changing the current implementation of school feeding to 100 percent served meals, could reduce the gap in financial access to a nutrient-adequate basket by 44 percent (see Figure 15).

However, to fully bridge this gap, it is essential to increase the purchasing power of poor households. The Bono Social is a conditional cash transfer implemented under the Ministry of Social Development, which has two modalities: Bono Social Salud for households with young children or pregnant women, and Bono Social Educación for households with school age children. Both include cash transfers of Q500, aiming for regular disbursements; nonetheless, the exact frequency can vary based on the availability of funds. They target poor households nationwide except in the Department of Guatemala. Beneficiaries are co-responsible for complying with health services (Bono Social Salud) or enrolling their children in school (Bono Social Educación). In 2024 they reached more than 85,000 families. We analysed the contribution of Bono Social to the cost of the household's nutrient-adequate basket (considering that 38.2 percent of expenditure is spent on food (4) depending on the frequency of the cash transfer, together with the in-kind interventions already described. As detailed, the current design of the in-kind programmes (school feeding and supplementation) already covers 33 percent of the monthly cost of the nutrient-adequate basket for the household (Q1,052 per month instead of having Q1,531).

FIGURE 15: COST OF THE NUTRIENT-ADEQUATE BASKET FOR THE MODELLED HOUSEHOLD PER INDIVIDUAL, 1) WITHOUT INTERVENTION, 2) WITH SUPPLEMENTATION WITH FCF FOR THE CHILD AGED 6-23 MONTHS AND SUPPLEMENTATION WITH IFA FOR THE LACTATING MOTHER, 3) WITH SUPPLEMENTATION AS PER 2) AND THE CURRENT SCHOOL FEEDING (BOTH TAKE-HOME RATIONS AND SERVED SCHOOL MEALS) TARGETING THE CHILD AGED 6-7 YEARS AND THE ADOLESCENT GIRL, 4) WITH SUPPLEMENTATION AS PER 2) AND THE SCHOOL FEEDING IF IT CONSISTED 100 PERCENT OF SERVED MEALS, TARGETING THE YOUNG CHILD AGED 6-23M, THE CHILD AGED 6-7 YEARS AND THE ADOLESCENT GIRL, 5) WITH SUPPLEMENTATION AS PER 2, AS WELL AS SUPPLEMENTATION FOR CHILD AGED 6-7 WITH MNP AND THE ADOLESCENT GIRL WITH IFA, AND THE SCHOOL FEEDING IF IT CONSISTED 100 PERCENT OF SERVED MEALS, TARGETING THE YOUNG CHILD AGED 6-23M, THE CHILD AGED 6-7 YEARS AND THE ADOLESCENT GIRL

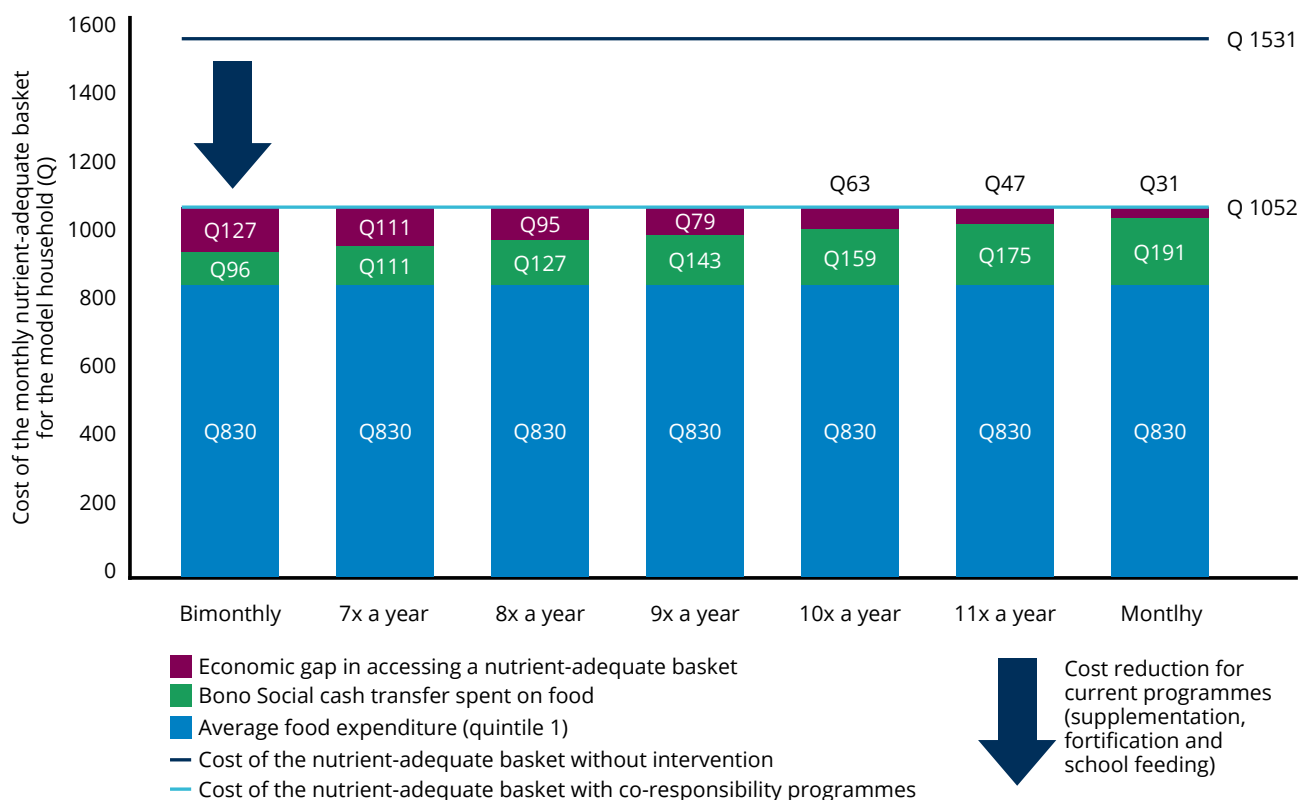


The cash transfer covers from 9 percent of the remaining cost of the nutrient-adequate basket if it is distributed every two months, but up to 18 percent if it is transferred every month (see Figure 16). Considering the food expenditure of the households in the lowest quintile, the monthly cash transfer would leave a financial gap of Q31 monthly, or 3 percent. In order to fully cover the cost of the nutrient-adequate basket, we modelled an increase in the amount from Q500 to Q580 monthly. This amount would cover 21 percent of the cost of the nutrient-adequate basket which, together with existing food expenditure and in-kind interventions, would then allow the household to close their financial gap.

Multisectoral programmes could increase the proportion of households with economic

access to a nutrient-adequate basket, thereby filling the nutrient gap. Given the current coverage of both in-kind and cash transfers, their combined contribution to the cost of a nutrient-adequate basket would reduce the unaffordability of nutrient-adequate baskets from 37 percent without any intervention to 19 percent. There are opportunities to improve programmes through their design, such as nutrition-sensitive agriculture, changes in types of supplements (e.g., IFA supplements for the United Nations international multiple micronutrient antenatal preparation multiple micronutrient supplements (UNIMMAP MMS), changes in school feeding modalities, and the frequency and amounts of cash transfers. It is essential to ensure multisectoral interventions and increase coverage.

FIGURE 16: COST OF THE NUTRIENT-ADEQUATE BASKET FOR THE MODELLED HOUSEHOLD DECREASED BY IN-KIND INTERVENTIONS (SUPPLEMENTATION AND SCHOOL FEEDING, INCL. FORTIFICATION), COVERED BY THE FOOD EXPENDITURE OF THE LOWEST QUINTILE, AND THE BONO SOCIAL (Q500), WITH FREQUENCY OF DISTRIBUTION INCREASED FROM EVERY TWO MONTHS TO EVERY MONTH



7.

ACHIEVING A HEALTHY DIET FOR THE GUATEMALAN POPULATION IS A PRIORITY. HOWEVER, ENSURING ENVIRONMENTAL SUSTAINABILITY IS ALSO IMPORTANT. MULTISECTORAL ACTIONS CAN CONTRIBUTE TO A TRANSITION TO A HEALTHY AND SUSTAINABLE DIET.

- Meeting nutritional requirements could have a greater environmental impact.
- Guatemala's contribution to global emissions is small; however, its resources are limited.
- Each sector could have a role in ensuring access to nutritious and environmentally sustainable diets to prevent increasing the cost of healthy diets in the future.

Greenhouse gas emissions (GHG) emissions and agricultural water use may need to increase further to ensure adequate diets. Although Guatemala contributes very little to global GHG emissions – 0.05 percent according to World in Data – sustainable use of resources to mitigate climate change is important to ensure access to healthy diets in the future (37).

Water is increasingly scarce in Guatemala, but more efficient use can help conserve this resource. According to projections by the FAO's AQUASTAT, the country's renewable freshwater resources are being rapidly depleted: their current level is 24 percent of what it was 50 years ago (38). Food availability in Guatemala largely depends on rainfed agriculture, which contributes to a high level of vulnerability to climate-related crises and extreme weather events such as droughts, excessive rainfall, and floods.

Farmers in the Dry Corridor reported six poor years of agricultural production between 2006 and 2016 (13, 28). As a result, imports of white maize have increased due to losses of more than 50 percent of domestic production in the Dry Corridor regions (39).

The IMPACT² economic model (40), which considers factors such as food production, consumption, and trade – was used to project the effects of climate change on food prices through 2050 in Guatemala. The result showed a 34 percent increase in the cost of the nutrient-adequate basket, highlighting the importance of climate change mitigation for improved nutrition. This is attributed to the overall predicted increase in prices across various foods nationwide. Staple foods such as maize, wheat and beans are expected to see the highest increases, with prices rising by 33 percent, 36 percent, and 25 percent respectively. By contrast, the price increase for animal source foods ranges from 13 percent to 18 percent.

The FNG analysis estimated that current diets emit 4 kg CO₂e/person/day, whereas the nutrient-adequate basket based on the national FBDG would have a higher footprint, estimated at 6.6 kg CO₂e/person/day (Figure 17). Both exceed the EAT-Lancet commission target for 2050 of 1.4 kg CO₂e/person/day, a global reference planetary health diet including reducing GHG emissions (41).

The nutrient-adequate basket based on the national FBDG would more than double land use, from 8.5 m²/person/day to 19 m²/person/day, both exceeding the EAT-Lancet commission target for 2050 of 1.4 m²/person/day. For agricultural water use, the nutrient-adequate basket of the FBDG would require a 62 percent increase, from 355 litres/person/day to 576 litres/person/day, but both remain below the EAT-Lancet commission target (704 litres/person/day).

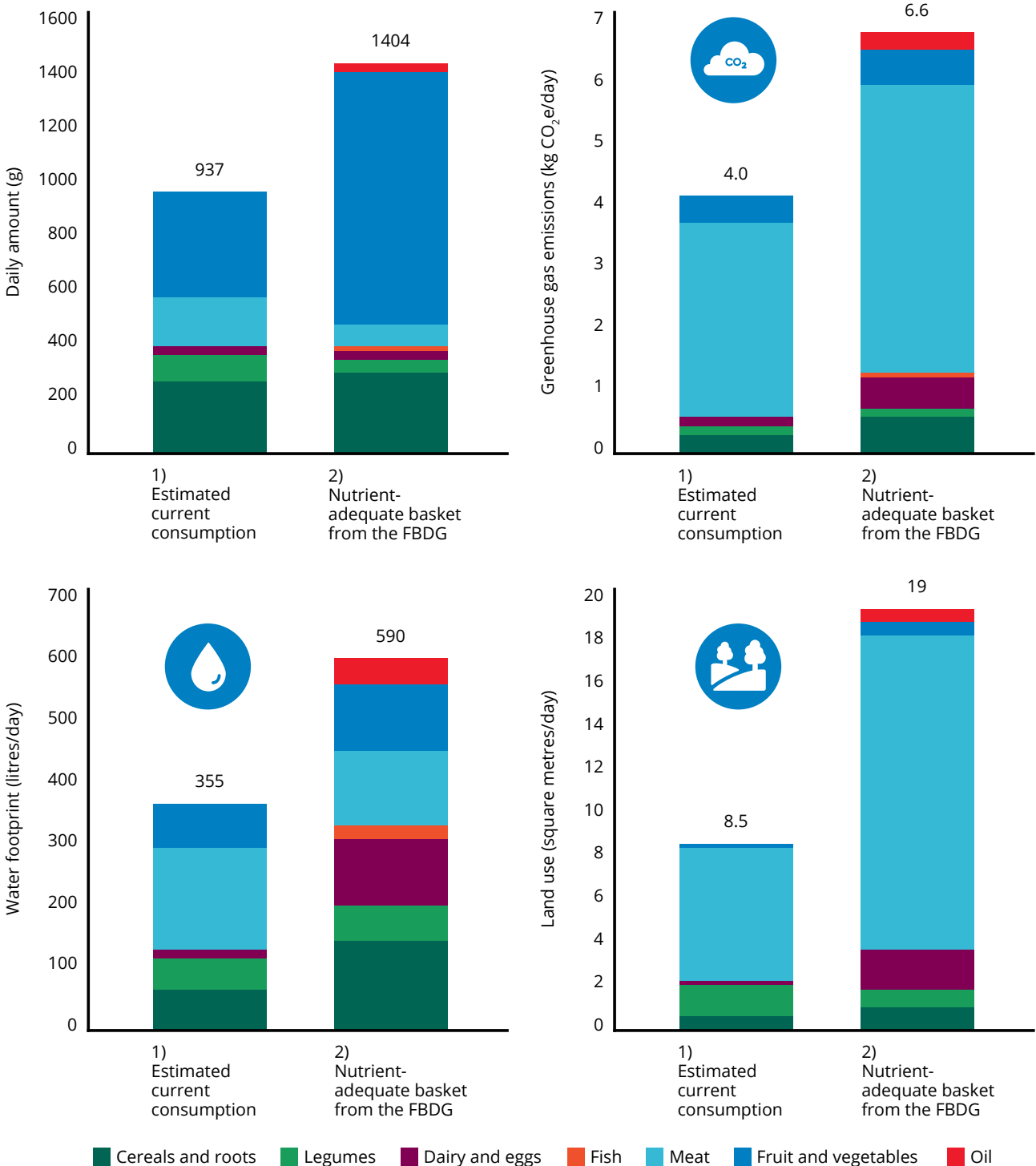
The large contributors to the environmental impact of current diets in Guatemala are animal source foods, primarily meat (77 percent for GHG emissions, 46 percent for water use, and 71 percent for land use), most of which are driven by beef and, to a lesser extent, dairy and eggs (4 percent for GHG, 8 percent for water use, 2 percent for land use).

² The International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT), which links economic, water and crop models.

The overall increase of the GHG emissions and land use from the current diet to the nutrient-adequate basket based on the national FBDG is mainly driven by an increase in red meat, a more cost-effective contributor to meeting nutrient

needs within the guideline's recommendations – while the quantity of poultry decreased from the current diets to the optimized FBDG-based basket.

FIGURE 17: DAILY AMOUNT (g), GREENHOUSE GAS EMISSIONS (KG CO₂e/DAY), WATER FOOTPRINT (LITRES/DAY) AND LAND USE (IN SQUARE METRES/DAY), FROM 1) THE ESTIMATED CURRENT CONSUMPTION, AND 2) THE OPTIMIZED NUTRIENT-ADEQUATE BASKET FOLLOWING THE NATIONAL FBDG



The quantity of dairy and eggs is higher in the nutrient-adequate basket of the FBDG when compared to the estimated consumption, which explains the higher water footprint, GHG emissions and land use. The larger quantity of food in the nutrient-adequate basket is mostly driven by the great quantities of fruit and vegetables selected, which increased the overall environmental impact of the basket marginally.

Updating the FBDG recommendations to consider more affordable and environmentally sustainable foods is required to adequately guide the design of policies and programmes involving dietary recommendations, as well as nutrition and food security interventions. It is important to acknowledge that the interpretations of these results have certain limitations as they are derived from global averages of the environmental impact of food.

Lower cost healthier diets could increase environmental pressures if they are not combined with sustainable production practices and waste reduction. Potential environmentally friendly diet alternatives that are rich in nutrients could also be further explored. While addressing food insecurity and malnutrition remains a priority in Guatemala, the government has developed a Roadmap for Sustainable, Resilient and Inclusive Food Systems, which is aligned with POLSAN. It commits to ensuring the sustainability of food production systems; implementing resilient agricultural practices that increase productivity and production; contributing to the conservation of ecosystems; strengthening resilience to climate change such as extreme weather events, droughts, floods and other disasters, and progressively improving soil and land quality by 2030. Each sector could play a crucial role in achieving this goal, with win-win solutions for nutrition and climate (32).



Recommendations

Following the findings from the FNG analysis, stakeholders from the technical group involved in the implementation process convened to discuss and formulate a series of recommendations. They aim to enhance the responses of the social protection, health, and agricultural sectors and programmes to improve the living conditions, nutrition, health, and overall well-being of vulnerable populations in Guatemala.

The recommendations have been organized into two main categories: 1) Strategies for institutional strengthening and multisectoral coordination, and 2) recommendations to optimize and strengthen the design of relevant programmes within the social protection, health, and agricultural sectors. The recommendations follow, and category 2 includes recommendations for multisectoral collaboration.

1. Strategies for institutional strengthening and multisectoral coordination

- Implement coordinated and multisectoral actions to ensure access to a comprehensive package of interventions aimed at guaranteeing the right to food and facilitating access to a nutrient-adequate basket for vulnerable households.
- Implement comprehensive mechanisms to target, monitor and evaluate access to the nutrient-adequate basket for the populations in the most vulnerable departments and regions.
- Generate evidence on the importance of multisectoral nutrition actions to support decision making, develop public policies and

implement multisectoral initiatives aimed at enhancing access, availability and consumption of healthy and nutritious foods.

- Ensure effective political and strategic management for the consistent and sustainable allocation of resources dedicated to implementing comprehensive programmes in the education, agriculture, health, and social protection sectors. Special attention should be given to nutrition to mitigate the country's economic losses associated with the triple burden of malnutrition.
- Implement targeted multisectoral strategies to enhance women's access to nutrient-rich foods, especially adolescent girls.
- Integrate the FNG analysis systematically for timely multisectoral decision making, targeting specific geographic areas.
- Strengthen the national social information system, specifically the single beneficiary registry for adequate targeting and multisectoral decision making.
- Facilitate the transfer of the FNG analysis's technical and methodological knowledge and skills to the Guatemalan government for its future institutionalization and use.

2. Programme design for participating sectors

1. SCHOOL FEEDING PROGRAMME

- Encourage the implementation of the school feeding programme and use of the school meals menus. This model improves dietary diversity and quality, especially regarding animal source foods, and boosts the intake of essential micronutrients such as iron, zinc and folate. Meals served at schools help reduce the

- overall cost of a household nutrient-adequate basket. Implementation requires raising awareness within the school community, improving school infrastructure for food preparation, and ensuring access to safe water.
- The care of young children through the school feeding programme linked to a micronutrient supplementation programme can meaningfully contribute to filling nutrient intake gaps in this population. To achieve substantial results, it is essential to expand the coverage of both the "Acompañe a Crecer" early childhood education programme and the school feeding programme. It is also recommended that inter-institutional coordination between the Ministry of Education and the Ministry of Public Health and Social Assistance be strengthened to ensure effective micronutrient supplementation, as this intervention plays a crucial role in reducing nutrient deficiencies.
 - Leverage the findings from the FNG analysis to revise and strengthen the nutritional guidelines of the existing school meals programme to improve their affordability. This should include the development of diversified school meal menus that prioritize fresh or minimally processed nutrient-rich foods, incorporating a variety of fruits, vegetables, whole grains, and animal-sourced products. Emphasizing the gradual reduction in sugar content and increasing the use of affordable foods that are rich sources of limiting nutrients are also recommended.
 - Adjust the budget allocated for the school meals of secondary school children to meet the nutritional needs of adolescents, particularly adolescent girls. The budget should ensure coverage of a larger proportion of adolescent dietary requirements, prioritizing the physiological requirements of adolescent girls. This adjustment is essential because increased nutritional needs lead to higher food costs at the household level, which can restrict access to adequate and nutritious diets for adolescents living in poverty.
 - Enhance the connection between the school feeding programme and the development of sustainable food systems by purchasing food from family farmers. Focus on increasing the production of foods that align with school meal menus, considering seasonal availability and utilizing low cost, nutrient-dense native foods. This initiative should be achieved through collaboration between the Ministry of Education and the Ministry of Agriculture.
 - Strengthen food and nutrition education within the school community, including parents, students, teaching staff, and other stakeholders. The aim is to foster healthy environments, encourage nutritious dietary habits, promote physical activity, and facilitate social and behaviour changes to reduce the consumption of UPF which increase dietary costs without offering any nutritional benefits. This includes regulating food sales at schools.
 - Establish an effective monitoring and evaluation system based on a theory of change that defines the programme design, identifies implementation challenges, and includes process and impact indicators for programme monitoring and evaluation in alignment with the objectives of national regulation.

MULTISECTORAL RECOMMENDATIONS

- Strengthen collaboration between the Ministry of Education and the Ministry of Agriculture to develop strategies that improve the local supply chain, aligning the supply of food from the family farming programme with the demands of the school feeding programme across the country. This approach complies with the School Feeding Law, which mandates that 70 percent of the financial resources allocated to each school must be used to purchase food from family farming.
- Foster joint piloting of preventative health initiatives for schoolchildren, as established in the School Feeding Law. For example, it is essential to highlight the significance of linking the school feeding programme with

micronutrient supplementation and other actions that may reduce the cost of the nutrient-adequate basket in the household.

- Establish a coordination pathway between the Ministry of Public Health and Social Assistance and the Ministry of Education to ensure that young and school age children, including adolescents, receive micronutrient supplementation. Develop strategies to meet the demand for micronutrients that will help reduce the affordability gap of a nutrient-adequate basket in the household, as indicated by the FNG findings.

2. PROGRAMMES AND ACTIONS FOR NUTRITION-SENSITIVE LOCAL PRODUCTION

- Enhance agriculturally sustainable food systems by providing technical guidance on nutrition-sensitive agriculture. Focus on promoting the production of foods that have high nutritional value, addressing the limiting nutrients identified in the FNG analysis. Aim to bridge the gaps between food availability in Guatemala and the recommendations outlined in the FBDGs.
- Promote the production and market accessibility of animal source foods, highlighting low-cost options like offal, which offer high nutritional value at a lower cost.
- Increase the implementation and coverage of community, family, and school gardens as tools for promoting food and nutrition education, increasing dietary diversity, and improving access to local food to reduce the cost of obtaining healthy foods.

MULTISECTORAL RECOMMENDATIONS

- Establish collaboration between the Ministry of Agriculture and the Ministry of Education to define action for planning the demand and supply of products required for the school feeding programme. This includes, but is not limited to, creating collaborative spaces for

jointly developing school menus, educational school gardens, and other related activities.

- Strengthen technical assistance and promote collaborative initiatives where there is a lower proportion of purchases from family farming for the school feeding programme. This process should be coordinated jointly by the Ministry of Education and the Ministry of Agriculture, with support from the Superintendency of Tax Administration, the Ministry of Economy and other agencies to improve access to local markets.
- Coordinate the planning and technical assistance process between the Ministry of Agriculture, the Ministry of Public Health and Social Assistance, and SESAN to prioritize the production of foods that provide critical nutrients, in line with the FBDGs and with attention to the FNG limiting nutrients.

3. SOCIAL PROTECTION PROGRAMMES

- Strengthen conditional cash transfer programmes by incorporating SBCC strategies in their design to promote healthy, varied and environmentally sustainable diets.
- Expand coverage and increase the frequency and amount of cash transfer programmes to reduce the affordability gap of vulnerable families. This will contribute to improving food access and dietary diversity.
- Develop monitoring and evaluation systems based on processes and strategic outcomes to facilitate continuous improvements in programme implementation and assess the impact on access to nutritious food for vulnerable families.
- Promote the use of logic models and theories of change in the design of nutrition-sensitive social programmes by incorporating actions to encourage the use of cash transfers to purchase and consume healthy foods and reduce the consumption of UPF.

- Develop specific social protection programmes that address the nutritional needs of adolescents, focusing on adolescent girls to help them reduce the identified nutrient gaps.

MULTISECTORAL RECOMMENDATIONS

- Institutionalize the complementary feeding programme for young children within the Ministry of Social Development³ as part of multisectoral actions to ensure a nutritious diet for young children.
- Improve inter-institutional coordination so that vulnerable families receive a comprehensive package of multisectoral interventions that contribute to a balanced diet and reduce the affordability gap of the nutrient-adequate basket, according to the FNG results.

4. SUPPLEMENTATION, FORTIFICATION, AND HEALTHY EATING PROMOTION PROGRAMMES

- Revise the FBDGs to emphasize closing nutrient gaps and promoting the consumption of healthy, affordable and locally available foods. Consider factors such as seasonality, cultural eating habits, and the structure of local food systems. Environmental sustainability in food production, particularly regarding the use of water and land resources, should also be considered.
- To have a greater impact on maternal and child nutrition and health, it is recommended to substitute the use of iron and folic acid supplements for pregnant women with multiple micronutrient supplements, such as the UNIMMAP formulation endorsed by the WHO.
- Promote healthy eating habits and less consumption of UPF and sugary beverages by regulating marketing practices with special attention to marketing to children and adolescents. This can be done through the

development of policies and programmes that prioritize the promotion of dietary diversity based on available and accessible foods. To support child growth and development it is essential to implement food and nutrition education strategies that promote the consumption of nutritious local foods.

- Encourage the approval and implementation of the front-of-package labelling law to warn the population about the adverse health effects associated with the consumption of UPF and sugared beverages.

MULTISECTORAL RECOMMENDATIONS

- Promote the consumption of nutritious foods with particular attention to foods rich in iron, zinc, calcium, vitamin C and high-quality proteins across programmes and sectors. Strengthen food and nutrition education for vulnerable families to increase dietary diversity and reduce deficiency of these and other micronutrients.
- Strengthen conditional cash transfer programmes by expanding coverage and cash transfer frequency (e.g., from 8 to 12 transfers per year), increasing the amount of the transfer based on the FNG findings, and ensuring timely delivery of the funds.
- Collaborate with the Ministry of Education to enhance access to micronutrient supplementation programmes for young children and school aged children. This will improve micronutrient intake and help reduce the cost of nutritious food for vulnerable households.
- Collaborate with the Ministry of Education to promote and strengthen the school community's knowledge of Water, Sanitation and Hygiene (WASH), food safety, healthy eating, and preventative health actions, as established by the School Feeding Law.

³ El programa de alimentación complementaria de Guatemala es administrado actualmente por el Ministerio de Salud, pero será transferido al Ministerio de Desarrollo Social, lo que requerirá un proceso de institucionalización.

References

1. Gobierno de Guatemala, Instituto de Nutrición de Centro América y Panamá (INCAP), Organización Panamericana de la Salud (OPS). Guías Alimentarias para Guatemala: Recomendaciones para una alimentación saludable. Guatemala: PROGRAMA NACIONAL PARA LA PREVENCIÓN DE ENFERMEDADES CRÓNICAS NO TRANSMISIBLES Y CÁNCER, 2016.
2. Instituto de Nutrición de Centro América y Panamá (INCAP). Tabla de Composición de Alimentos de Centroamérica (TCA-INCAP). Guatemala: 3ª Edición, 2018.
3. Reducing food's environmental impacts through producers and consumers. J. Poore, T. Nemecek. 987-992, s.l.: Science, 2018, Vol. 360.
4. Instituto Nacional de Estadística. Encuesta Nacional de Condiciones de Vida (ENCOVI). Guatemala: Gobierno de la República - Guatemala, 2023.
5. World Bank. Poverty and Equity Brief: Guatemala. Washington D.C.: World Bank, 2024.
6. División de Desarrollo Social y la División de Estadísticas de la Comisión Económica para América Latina y el Caribe (CEPAL). Panorama Social de América Latina. Santiago: Naciones Unidas, 2019.
7. Pinzón, Renata Pardo y Pinilla-Roncancio, Mónica. Análisis de Pobreza Multidimensional y Protección Social en Guatemala. Guatemala: UNDP, 2023.
8. Comisión Económica para América Latina y el Caribe (CEPAL), Instituto de Nutrición de Centroamérica y Panamá (INCAP), Gobierno de Guatemala, WFP. El costo de la doble carga de la malnutrición: impacto social y económico. Guatemala: Gobierno de Guatemala, 2020.
9. Ministerio de Salud Pública y Asistencia Social (MSPAS), Instituto Nacional de Estadística (INE), ICF. Encuesta Nacional de Salud Materno Infantil 2014-2015: Informe Final. Guatemala: MSPAS/INE/ICF, 2017.
10. Gobierno de la República de Guatemala. Gran Cruzada Nacional por la Nutrición. Guatemala: Gobierno de la República de Guatemala, 2020.
11. Ministerio de Educación. Situación nutricional de los estudiantes en los centros educativos públicos que son beneficiarios del programa de alimentación escolar. Guatemala: Ministerio de Educación, 2023.
12. Secretaría de Seguridad Alimentaria y Nutricional (SESAN), Instituto de Nutrición de Centro América y Panamá (INCAP), Instituto Nacional de estadísticas (INE). Informe de la línea base de la Gran Cruzada Nacional por la Nutrición. Guatemala: Gobierno de Guatemala, 2021/2022.
13. WFP. Country Strategic Plan (2021-2024). Rome: WFP, 2021.
14. Dirección de Epidemiología y Gestión del Riesgo. Situación epidemiológica de la Desnutrición Aguda en menores de 5 años. Guatemala: MSPAS, 2025.
15. UNICEF. UNICEF advocacy strategy for the prevention of overweight and obesity in children and adolescents. New York: UNICEF, 2020.
16. Instituto de Nutrición de Centroamérica y Panamá (INCAP). De la Finca a la Escuela: Promoviendo el consumo de frutas y vegetales en escuelas de Guatemala y Costa Rica. Guatemala: INCAP, 2020.
17. The Global Alliance for Improved Nutrition (GAIN), The Columbia Climate School, and Cornell University College of Agriculture and Life Sciences. The Food Systems Dashboard. Geneva: GAIN, 2024. <https://www.foodsystemsdashboard.org>
18. UNICEF. Expanded Database on Infant and Young Child Feeding (IYCF) Indicators. s.l.: Retrieved from [https:// data.unicef.org/resources/indicators-for-assessing-infant-and-young-child-feeding-practices/](https://data.unicef.org/resources/indicators-for-assessing-infant-and-young-child-feeding-practices/), 2023.
19. Consejo Nacional de Desarrollo Urbano (Conadur/Segeplán). Plan Nacional de Desarrollo K'atun: nuestra. Guatemala: Gobierno de Guatemala, 2014. 978-9929-618-82-4.

20. Secretaría de Seguridad Alimentaria y Nutricional de la Presidencia de la República. Política Nacional de Seguridad Alimentaria y Nutricional. Guatemala: s.n., 2023. 978-9929-8334-0-1.
21. Ministerio de Salud Pública y Asistencia Social (MSPAS). Encuesta Nacional de Micronutrientes 2009-2010. Guatemala: Ministerio de Salud Pública y Asistencia Social (MSPAS), 2010.
22. Méndez, H, Santisteban, PL. Tendencias de la situación alimentaria en Guatemala: análisis secundario de encuestas nacionales de condiciones de vida, 2006 y 2014. Guatemala: INCAP, 2022.
23. WFP. Evaluación de la Seguridad Alimentaria (ESA). Ciudad de Guatemala: WFP, 2024.
24. López Santisteban, P. El acceso a los alimentos en Guatemala: La CBAN, tendencia del precio y la brecha de nutrientes según diferentes tipos de salarios. Guatemala: INCAP, 2023.
25. Instituto Nacional de Estadística. Hoja de Balance de Alimentos (HBA). Guatemala: Gobierno de la República de Guatemala, 2023.
26. Instituto Nacional de Estadísticas. Canasta Básica Alimentaria. Guatemala: INE, 2025.
27. WHO. Guideline: Sugars intake for adults and children. Geneva: World Health Organization, 2015.
28. Food and Agriculture Organization. Small family farms country factsheet: Guatemala. Rome: FAO, 2018.
29. FAO, Universidad de la Valle, y Observatorio Económico Sostenible. Estimación de la pérdida de alimentos en 10 cadenas de la canasta básica de Guatemala. Guatemala: FAO, 2024.
30. World Bank. Nutrition Smart Agriculture in Guatemala. Guatemala: World Bank, 2020.
31. Ministerio de Educación (MINEDUC). Ley de Alimentación escolar: Decreto Número 16-2017. Guatemala: Gobierno de Guatemala, 2017.
32. Gobierno de Guatemala. Guatemala - Nuestra Hoja de Ruta: Hacia sistemas alimentarios sostenibles, resilientes e inclusivos. Guatemala: Gobierno de Guatemala, 2021.
33. Guatemalan school food environment: impact on schoolchildren's risk of both undernutrition and overweight/obesity. Pehlke, E. L., Letona, P., Hurley, K., and Gittelsohn, J. 542-550, Oxford University Press: Health Promotion International, 2016, Vol. 31.
34. Mazariegos, M, et al. Análisis de la situación y tendencias de los micronutrientes clave en Guatemala, con un llamado a la acción desde las políticas públicas. Washington, D.C: FHI 360/ FANTA, 2016.
35. Effective interventions to address maternal and child malnutrition: an update of the evidence. Keats, EC, et al. 367-84, s.l.: Lancet Child Adolescent Health, 2021, Vol. 5.
36. More evidence on cash transfers and child nutritional outcomes: a systematic review and meta-analysis. Manley, J. et al. 4, s.l.: BMJ Glob Health, 2022, Vol. 7.
37. Our World in Data. Annual CO2 emissions including land-use change, 1870 to 2023. s.l.: Global Carbon Project, 2024.
38. FAO. AQUASTAT FAO's Information System on Water and Agriculture. Rome: FAO, 1999.
39. Reliefweb. GIEWS Update: Central America - Drought causes crop losses in "Dry Corridor" in Central America. Guatemala: Available at: <https://reliefweb.int/report/guatemala/giews-update-central-america-drought-causes-crop-losses-dry-corridor-central>, 2018
40. International Food Policy Research Institute (IFPRI). (2022). Projections from IFPRI's IMPACT model: Climate change and food systems. In 2022 Global Food Policy Report: Climate Change and Food Systems (Chapter 14, pp. 146-161). Washington, D.C.: IFPRI. https://doi.org/10.2499/9780896294257_14
41. Balancing a sustained pursuit of Nutrition, health, affordability and climate goals: exploring the case of Indonesia. De Pee, S., et al. 5, s.l.: The American Journal of Clinical Nutrition, 2021, Vol. 114.

Acronyms

ENIGH	National Household Expenditure and Income Survey
FBDG	Food-based dietary guidelines
FNG	Fill the Nutrient Gap
GDP	Gross domestic product
GHG	Greenhouse gases
INCAP	Central American and Panamanian Institute of Nutrition
INE	National Institute of Statistics
MAGA	Ministry of Agriculture
MIDES	Ministry of Social Development
MINEDUC	Ministry of Education
MINECO	Ministry of Economy
MNP	Multiple micronutrients powders
MSPAS	Ministry of Public Health and Social Assistance
POLSAN	National Policy of Nutritional and Food Security 2022-2037
RNI	Recommended Nutrient Intake
SAT	Superintendencia de Administración Tributaria
SESAN	Secretariat of Food and Nutritional Security of the President of the Republic
UPF	Ultra processed food/s
WFP	UN World Food Programme
WHO	World Health Organization

Contributors

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