SAVING LIVES
CHANGING LIVES

Fill the Nutrient Gap
Sri Lanka

SUMMARY REPORT

WFP
World Food Programme

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Fill the Nutrient Gap **Sri Lanka** | SUMMARY REPORT

Triple burden of malnutrition in Sri Lanka

The effects of malnutrition are globally recognised as being devastating and far-reaching. Malnutrition in Sri Lanka takes many forms and is widespread. While national prevalence of stunting dropped dramatically over decades, progress has stalled in recent years and wasting is at the level of a major public health issue. At the same time, prevalence of overweight and obesity is rising, nearly doubling among women in the past ten years, and micronutrient deficiencies are prevalent among children and women. The triple burden of malnutrition has thus become a critical concern. The low economic impact of the agricultural sector, high staple food consumption and low dietary diversity, climate-related shocks, and increasingly unhealthy dietary patterns contribute to the rising triple burden of malnutrition. Addressing malnutrition in Sri Lanka in a sustainable manner must take a lifecycle approach with a special focus on children under 2 years of age, adolescent girls, and pregnant and lactating women (PLW). It must include a range of context-specific, targeted interventions implemented by stakeholders across multiple sectors, such as agricultural production, processing and fortification, and social protection, including education.

Fill the Nutrient Gap (FNG) in Sri Lanka: Purpose

The overarching objective of the Fill the Nutrient Gap (FNG) analysis was to bring together multiple stakeholders to identify and prioritise context-specific policies and programmes aimed at improving nutrition among target groups across the lifecycle, through a focus on nutritious foods and nutrient intake. Stakeholders included the health and nutrition, education, social protection, and agriculture sectors, trade and industry, academia, and the private sector. The results of the FNG will contribute to various programmes: the Multi-Sector Action Plan of Nutrition (20182025), revision of the National Nutrition Policy, the national food fortification work plan (currently being rolled-out), and regular Cost of the Diet (CotD) analyses to monitor affordability of nutritious diets among different population groups in different parts of the country.

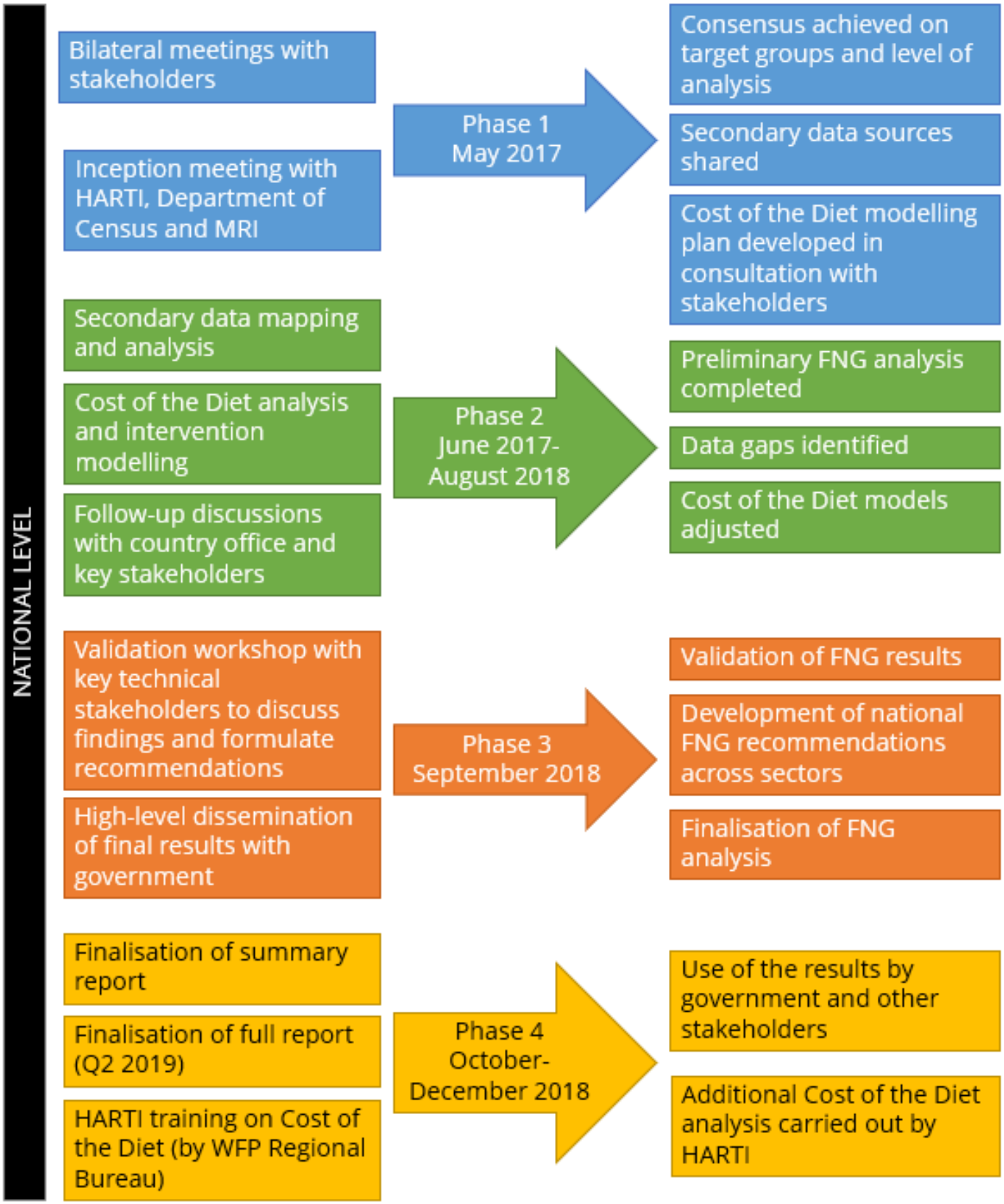
FNG in Sri Lanka: Process

The FNG process in Sri Lanka ran from May 2017 to September 2018 . The analysis comprised a literature review of available secondary sources in combination with linear programming (LP) using the Cost of the Diet (CotD) software. The aim was to understand barriers to adequate nutrient intake and to model potential interventions to improve access to nutrients, which is a prerequisite for improving nutrition, health and development.

The FNG analysis was led by the Nutrition Coordination Division of the Ministry of Health with technical support from the Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) and the World Food Programme (WFP) country office, Bangkok regional bureau, and Rome headquarters. Nutrition data were provided for the assessment through the support of the department of census and statistics and the Medical Research Institute (MRI). At the start of the process, the analysis team from WFP headquarters and the country office met with partners from government, non-government, United Nations agencies, academia and donors to introduce the FNG process, collate secondary data sources, and identify possible interventions, entry points and transfer mechanisms to model with CotD. Over 100 data sources were identified and reviewed, and several data gaps were identified.[1] The analysis prioritised recent, nationally representative government data when available, and triangulated sources to better understand differences in data. Preliminary findings were discussed internally with the WFP country office, validated in a workshop with technical stakeholders, presented to a larger technical

group who brainstormed and formulated recommendations, and finally presented in a high-level dissemination. The detailed process is illustrated in Figure 1.

Figure 1: The Fill the Nutrient Gap (FNG) process and timeline in Sri Lanka



FILL THE NUTRIENT GAP: SITUATION ANALYSIS FOR DECISION-MAKING ON NUTRITION

The FNG analysis is used to identify nutrition-specific and nutrition-sensitive interventions that are most appropriate in a given context to improve availability, physical access, affordability and choice of nutritious foods, which are required for adequate nutrient intake. Any of these barriers can contribute to inadequate nutrient intake, one of the two direct causes of malnutrition (the other being disease).

The analytical process was developed by WFP with technical support from research institutes: the University of California, Davis; the International Food Policy Research Institute (IFPRI, Washington DC); Epicentre (Paris); Harvard University (Boston); Mahidol University (Bangkok) and the United Nations Children's Fund (UNICEF). The FNG provides a framework for strengthened situation analysis and multi-sectoral decision-making that identifies context-specific barriers to adequate nutrient intake among specific target groups. It engages stakeholders from sectors across the food system to propose strategies to overcome these barriers. It has been used in almost twenty countries to date.

The FNG combines review of secondary data and information with LP analysis using the CotD software developed by Save the Children United Kingdom. The FNG analysis considers a range of factors that reflect or affect dietary intake, including: local malnutrition characteristics; the enabling policy environment; type and availability of nutritious foods in local markets; affordability of nutritious foods; nutrient intake; local practices; and cost optimization.

The consolidated information is analysed and the findings are reviewed by a multi-sectoral group of stakeholders at relevant levels to come to a shared understanding of the issues, context and solutions. Through this consultation process, context-specific optimal policy and programme actions, including possible entry points for interventions, are jointly identified for different sectors, including health and social protection, and along the food supply chain in the public and private sectors.

COST OF THE DIET ANALYSIS

The CotD software uses LP to understand the extent to which poverty, food availability and prices may affect the ability of people to meet their nutrient needs. Using price data collected from markets or from secondary sources, the software calculates the amount, combination and cost of local foods that are needed to provide individuals or households with their average needs for energy and their recommended intakes of protein, fat and micronutrients.[2] These diets are calculated within defined constraints to prevent the inclusion of unrealistic types or amounts of food and the provision of excessive amounts of nutrients.

The FNG approach defines the Staple Adjusted Nutritious Diet: the lowest cost nutritious diet that includes the typical staple foods and excludes foods that are considered taboo. This diet is referred to as the 'nutritious' diet throughout this summary.[3] Population expenditure data is compared to the cost of this nutritious diet and is used to estimate the proportion of the population that would not be able to afford a nutritious diet. This non-affordability can be estimated and compared across different regions, seasons or countries.

As part of the FNG process in Sri Lanka, a separate CotD analysis was undertaken at the district level for four seasons (The two cultivation seasons in Sri Lanka are called Yala and Maha, and an analysis was done during the planting and harvesting period for each season). Monthly food price monitoring data from HARTI 2016 was used to calculate food prices and availability, and food expenditure data from the Household Income and Expenditure Survey (HIES) 2016 was used to estimate the affordability of a nutritious diet.

The modelled household had five members, slightly larger than the average four-person household according to the 2016 Sri Lanka Demographic and Health Survey (DHS). Because of this, the household expenditure data was converted to per capita and adjusted accordingly. The household composition was chosen to reasonably resemble an average Sri Lankan household and to include individuals for modelling and analysis by target group. It featured a breastfed child of 12–23 months, a child of 6–7 years, an adolescent girl of 14–15 years, a lactating woman and an adult man. Choosing only the adolescent to more accurately reflect the DHS household size would have resulted in higher household costs than for a household with only the primary school-aged child; with both, the per capita estimate of cost is more realistic, as it is the average of the five household members across age groups and sex.

The nutritious diet that was estimated for a household of five members included two servings of white rice per day for all household members except the child aged 12–23 months who received one portion of white rice per day.[4]

The CotD software is also used to model interventions with the objective of improving the affordability of a nutritious diet for individuals and/or households. Modelling in Sri Lanka was conducted for six districts selected in consultation with stakeholders to represent different geographical characteristics.[5] The selection of potential interventions for modelling was informed by the secondary data review and stakeholder consultations. It included:

- increased availability of local nutritious (unfortified) foods and bio fortified foods;
- Availability of different types of complementary foods or specialized nutritious foods (SNF) made from the market and/or social safety nets (such as school meals);
- micronutrient supplementation;
- fortification of staple foods; and
- conditional cash transfers for vulnerable households.

The modelled interventions were theoretical and would need to be accompanied by complementary behaviour change interventions.

FNG in Sri Lanka: Findings

1.

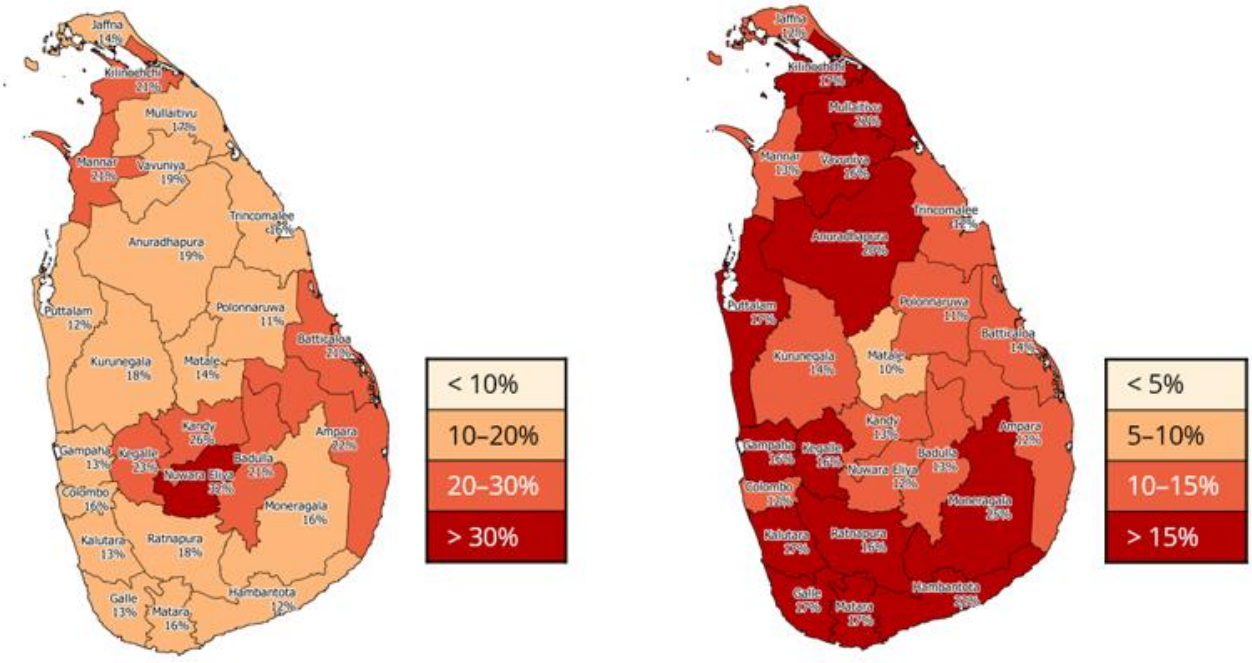
MALNUTRITION IN ALL ITS FORMS IS AN ISSUE ACROSS THE POPULATION, AND THE TRIPLE BURDEN (UNDERNUTRITION, OVERWEIGHT/OBESITY AND MICRONUTRIENT DEFICIENCIES) IS HIGH.

Sri Lanka has seen an impressive decrease in stunting prevalence, from 50 percent of children under 5 years in 1978 to 17 percent in 2016. However, rates have stagnated between 15–19 percent since 2000. Across the country prevalence ranges from 11–32 percent at the district level (Figure 2). In the estate sector (a hangover of large plantations from the British colonial period, now better integrated into the country but still one of its poorest areas), stunting has dropped since 2006 (from 42 percent to 32 percent in 2016). However, it remains twice as high in the estate sector as in rural (17 percent) or urban (15 percent) areas. Across the country, prevalence is twice as high in the poorest quintile (25 percent) as in the wealthiest (12 percent), but while stunting is decreasing among the poor it has been increasing among the wealthy. It is lowest among children with more educated mothers, at 12 percent when mothers have a degree and 38 percent when they have no education.[6]

Wasting continues to affect 15 percent of children under 5, a prevalence classified as very high by the World Health Organization (WHO), with no significant change over the past 40 years. Reaching as high as 25 percent in Monaragala (Figure 3), wasting is a major public health problem that disproportionately affects children in the poorest wealth quintile (17 percent versus 10 percent in the wealthiest quintile), children whose mothers have a very low body mass index (BMI), and children whose mothers have no education (18 percent versus 9 percent of those whose mothers have a degree).[6] Given the lack of progress on wasting in Sri Lanka compared to other indicators such as stunting, and in relation to wasting levels in other countries, but also the relatively low rates of child mortality in Sri Lanka, additional research is necessary for better understanding of the causes, consequences and barriers to improvement. Current data gaps around incidence and severity of child morbidity, child feeding during and after illness, and rates of recovery (or deterioration) could be addressed with monitoring prevalence throughout the year in sentinel sites and through longitudinal cohort studies.

Anaemia prevalence in children under 5 has mirrored that of stunting, with a steady decrease from 52 percent in 1970 to 15 percent in 2012. Although there is variation by district (from 5 percent in Kegalle to 27 percent in Kilinochchi), children are equally affected across wealth groups (13 percent in the wealthiest quintile to 18 percent in the poorest).[7] Micronutrient deficiencies (MNDs), including iron and calcium affect children to varying degrees. Given high prevalence of MNDs among children and the limited dietary diversity of women, it is likely that MNDs are also prevalent among adult women.

The double burden of undernutrition and overweight/ obesity is a growing problem in Sri Lanka. The prevalence of obesity in adult women doubled from 2006 to 2016. Forty-five percent of women of reproductive age (15–49 years) are overweight or obese, (32 percent are overweight



Figures 2 and 3: Prevalence of stunting (left) and wasting (right) in children under the age of 5 *(DHS 2016)*

and 13 percent obese). Overweight/obesity prevalence is higher in older, wealthier and more educated women, and in urban areas. Overweight is still low among children (14 percent of children aged 6–12) and adolescent boys and girls aged 10–18, who are more likely to be underweight (27 percent) than overweight or obese (10 percent total). However, 20 percent of girls aged 15–19 are overweight or obese, a prevalence which increases with age (33 percent of women aged 20–29, and 53 percent of women aged 40–49) (Figure 4).[8]

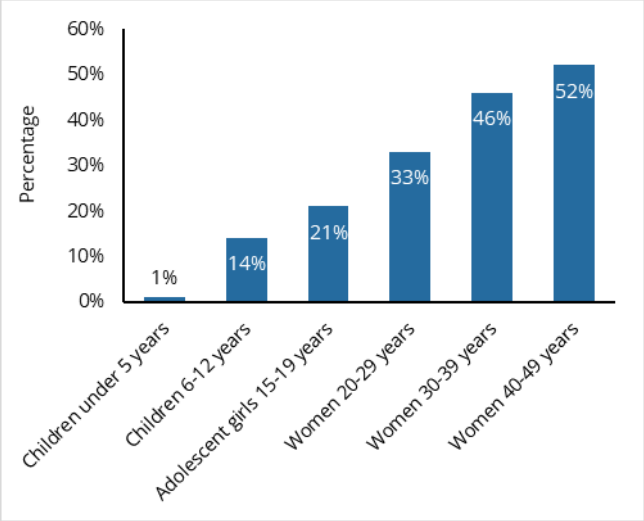


Figure 4: Prevalence of overweight/obesity, by age *(DHS, 2016; Nutritional Status, Dietary Practices and Pattern of Physical Activity among School Children aged 6 -12 Years Survey, 2016)*

Behaviours that may contribute to the increasing prevalence of overweight and obesity, including snacking and lack of physical activity, should be targeted. Only 13 percent of girls aged 13–15 reported being active for 60 minutes or more every day in the previous week, and this dropped to 9 percent of girls aged 16–17. Physical activity rates among boys in these age groups are slightly higher, although still low (21 percent of boys aged 13–15, and 15 percent of those aged 16–17). Forty percent of girls and boys between the ages of 13 and 17 reported that on a typical day they spend three or more hours engaged in sedentary activities such as watching television, playing computer games or talking with their friends.[9]

2.

RATES OF EARLY, EXCLUSIVE, AND CONTINUED BREASTFEEDING ARE HIGH, BUT MORE THAN ONE-THIRD OF INFANTS AGED 4–5 MONTHS ARE NOT EXCLUSIVELY BREASTFED.

Breastfeeding indicators in Sri Lanka are generally excellent. Nearly all children receive colostrum, and overall rates of exclusive breastfeeding are very high nationally (82 percent until six months of age and 87 percent until two years (). However, exclusive breastfeeding drops precipitously between months 4–5. While 87 percent of children are still exclusively breastfed at 2–3 months, this falls to 64 percent at 4–5 months (Figure 5). Mean duration of exclusive breastfeeding is 4.4 months. Of those children under 6 months who are no longer exclusively breastfed, most are receiving complementary foods (14 percent) or plain water (13 percent) in addition to breastmilk.[6]

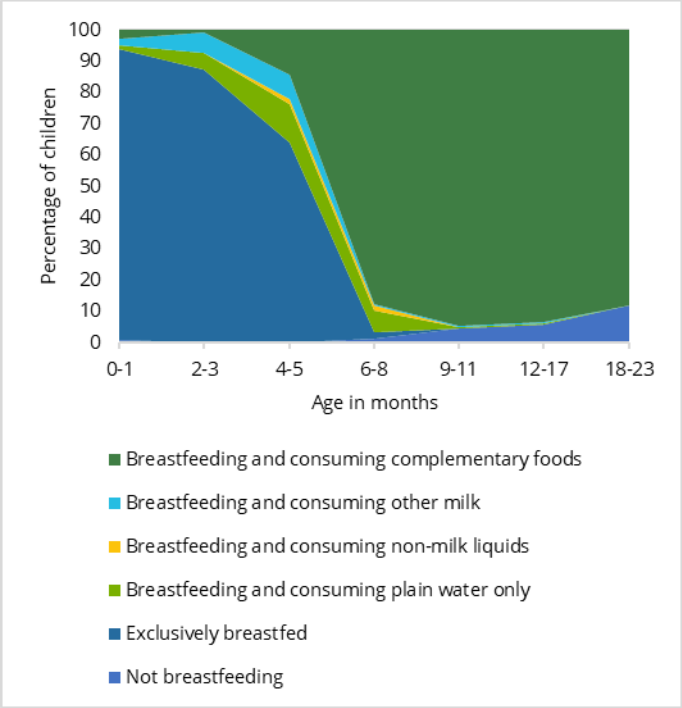


Figure 5: Breastfeeding status by age in months *(DHS 2016)*

Breastmilk is a crucial source of nutrients for children under the age of 2, without which it is more difficult and costly to ensure an adequately nutritious diet. The CotD analysis found that a nutritious diet for a child aged 6-23 months costs 28 Sri Lankan rupees (LKR) per day on average. This assumes that the child is breastfed according to WHO recommendations. If the child is not breastfed the daily cost of a nutritious diet increases by more than 40 percent, to LKR 40 per day, because the child requires a greater quantity and diversity of more expensive nutrient-dense foods, such as animal-source foods (Figure 6).[10]

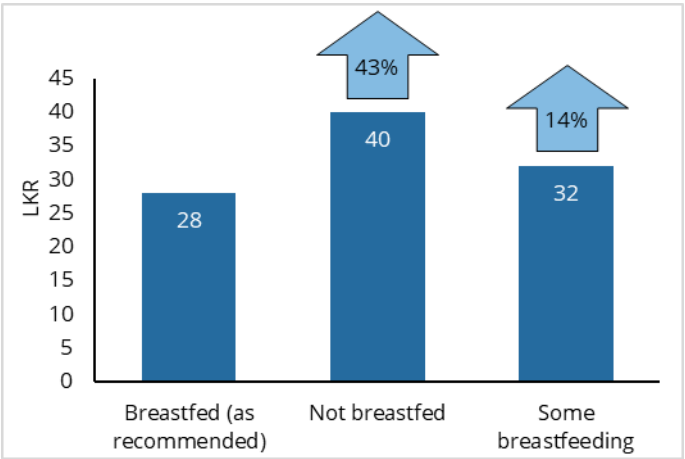


Figure 6: The daily cost of a nutritious diet for a child aged 12-23 months with and without breastfeeding *(Cost of the Diet analysis, 2018)*

The diversity of complementary feeding for young children is a priority area for improving infant and young child feeding (IYCF) practices. Only 62 percent of all children aged 6–23 months received a minimum acceptable diet (MAD) or all three IYCF practices, a proportion driven by low minimum dietary diversity (MDD) in breastfed children and insufficient milk given to non-breastfed children.[11] MAD in breastfed children decreased slightly from 2006 to 2016 (from 83 percent to 79 percent).[12] Over the same period, the proportion of non-breastfed children receiving milk or milk products dropped from 96 percent to 90 percent, and non-breastfed children with three IYCF practices decreased from 58 percent to 53 percent.[13]

IYCF practices are poorest in the estate sector, where only half of children (breastfed and not breastfed) have a minimum acceptable diet compared to over 60 percent in both the rural and urban sectors. Again, this is driven by limited diversity, with MDD ranging from 64 percent in the estate sector to 78 percent in the urban sector.[6] Data on household dietary diversity, which can be compared to MDD to better understand household-level influences on infant feeding practices, was not found.

In addition to being diverse, complementary foods should be healthy and nutritious. This is especially important given the increasing double burden, and rising rates of overweight. While dietary diversity among children under 2 increases with age, sugar consumption also increases rapidly. Only 9 percent of children aged 6–8 months received sugary foods in the previous 24 hours, but half the children aged 18–23 months had consumed sugary foods.[6]

Thriposha, a specialised nutritious food produced locally by the government of Sri Lanka, is distributed at health centres to all pregnant and breastfeeding women and to malnourished children 6-59 months. A daily portion of 50 grams of Thriposha covers a significant proportion of the requirements of a child 6-23 months old, and decreases the cost to the household of a nutritious diet for this child by 57 percent (from LKR 28 to LKR 12 per day) (Figure 7).[14]

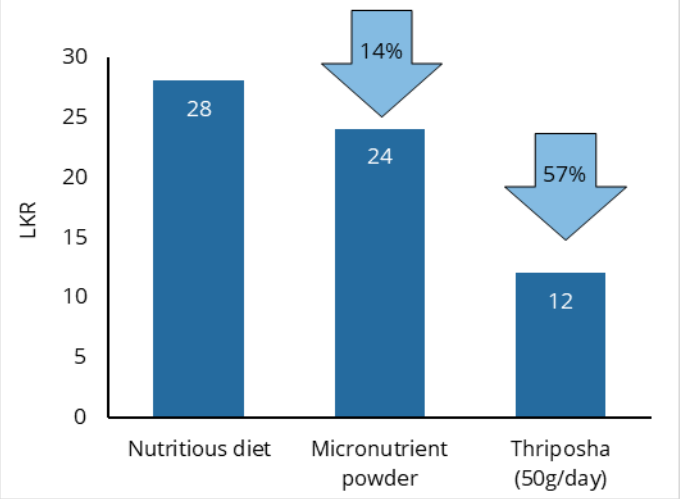


Figure 7: The daily cost of a nutritious diet for a child aged 12-23 months with micronutrient powder (provided 3 days per week) or Thriposha (50 grams per day) *(Cost of the Diet analysis,*

A micronutrient powder (MNP) which, unlike Thriposha, does not provide energy, fat, protein or macro-minerals, could also provide a small but potentially important contribution to ensuring adequate nutrient intake among young children. Providing one gram of MNP three times per week could decrease the daily cost of a nutritious diet for this child by 14 percent (Figure 7).[15]

3.

A NUTRITIOUS DIET IS POTENTIALLY AFFORDABLE FOR MANY HOUSEHOLDS WHICH MAKES IT IMPORTANT TO INFORM CONSUMER CHOICE AND ENSURE AN ADEQUATE SUPPLY OF NUTRITIOUS FOOD. STUNTING, INADEQUATE DIETARY DIVERSITY AND NOT BEING ABLE TO AFFORD A NUTRITIOUS DIET ARE GEOGRAPHICALLY CLUSTERED.

The average daily cost of a diet that meets energy requirements for the modelled five-person household was estimated at LKR 209. A diet that meets nutrient requirements for all members of this household would cost LKR 454, more than twice as much (Figure 8). This cost was similar across districts, ranging from LKR 394 in Jaffna and Kilinochchi to LKR 572 in Colombo. The nutritious diet, unlike the energy-only diet, includes more than 10 different foods in each district, counting a large share of vegetables and animal-source foods (Figure 9).

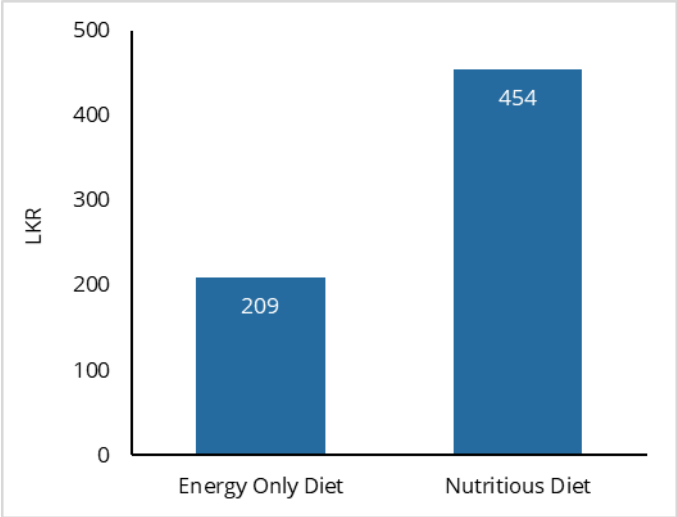


Figure 8: The daily household cost of a diet that meets only energy requirements and a diet that meets energy and nutrient requirements for all members *(Cost of the Diet analysis, 2018)*

Although a diverse diet with many fresh foods is more expensive than one high in staples, the average monthly cost of a nutritious diet (LKR 13,798) is still lower than the average monthly household food expenditure (LKR 19,114), which suggests that this diet should be affordable for most households. Indeed, in most districts fewer than 20 percent of households would be unable to purchase a

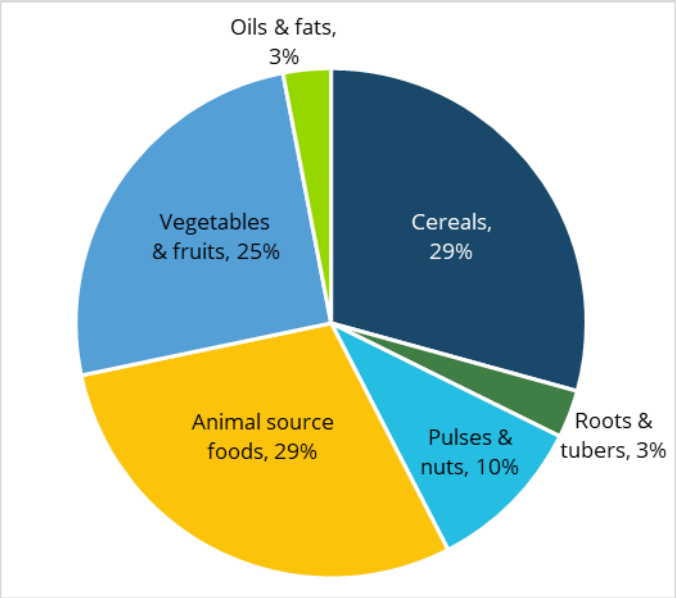


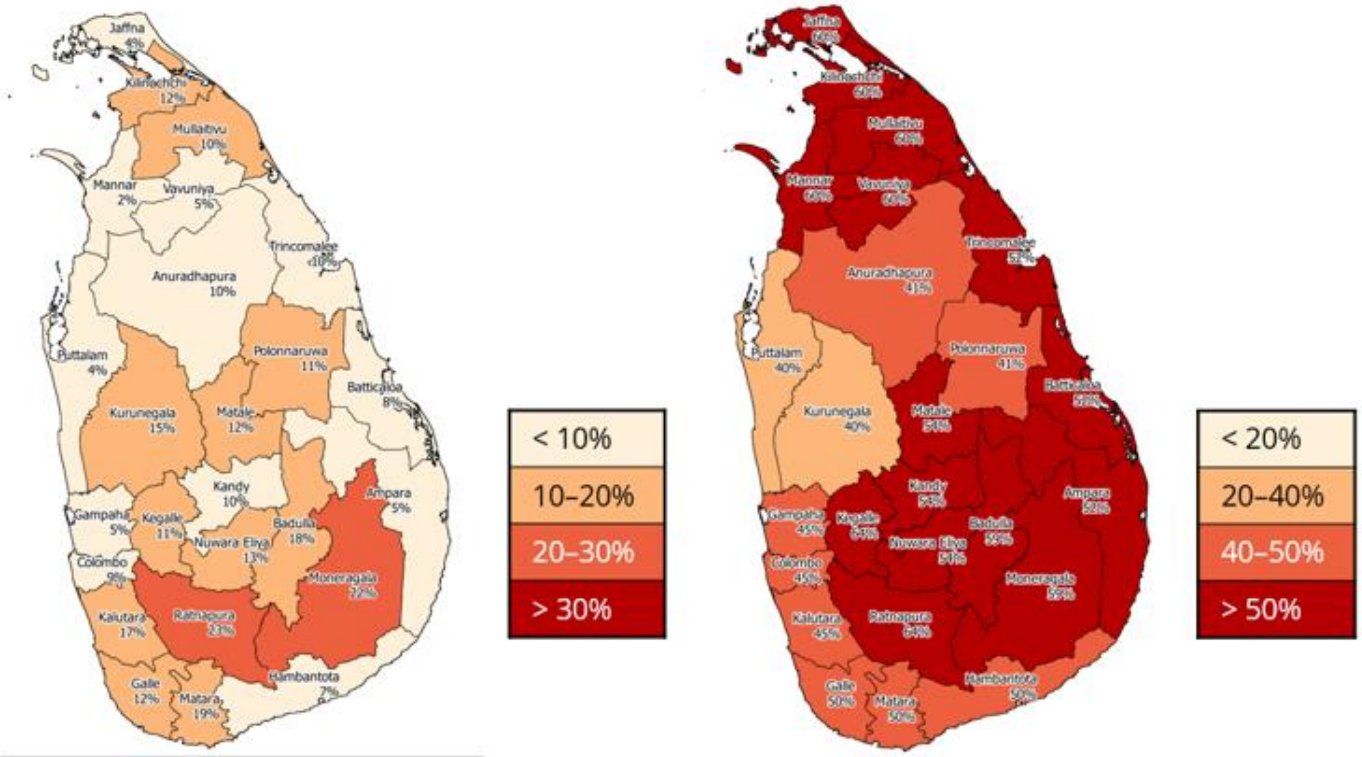
Figure 9: The percentage cost of a nutritious diet for the household by food group *(Cost of the Diet analysis, 2018)*

nutritious diet. Non-affordability is, however, slightly higher in the Central region, with 22–23 percent of households unable to afford a nutritious diet in Monaragala and Rathnapura (Figure 10).

A recent World Bank analysis calculated the cost of a diet that is in line with Sri Lanka's national food-based dietary guidelines (FBDG), which includes more servings of fresh foods than the (minimum cost) nutritious diet calculated for the FNG analysis.[16] This recommended diet would cost on average LKR 835 for a household with the same composition as the FNG analysis, nearly twice as much as a minimum cost nutritious diet, with correspondingly higher rates of non-affordability: between 40–64 percent of households would not be able to afford a diet that meets the FBDG (Figure 11).

For both calculated diets (a minimum cost nutritious diet for the FNG, and the cost of a recommended diet from the World Bank), there is a similar geographic pattern of higher cost and higher non-affordability in Central districts. Some of these districts also show higher prevalence of stunting in children under 5 and lower proportions of child MAD. In these areas, economic access to an adequately nutritious diet may be an important barrier to good nutrition among young children and interventions may need to improve household purchasing power or subsidize costs of nutritious foods.

Non-affordability of a nutritious diet may also be higher than estimated or may be subject to fluctuations throughout the year. Sri Lanka's food expenditure curve is fairly flat, so a small change in the cost of a diet would cause a larger change in the proportion of households that cannot afford it. Variations in food production, food prices and incomes, including due to climate-related shocks, likely affect access to a nutritious diet for many households. Food choices may play a role in preferences for non-nutritious items or a greater variety of nutritious foods that are more expensive. Regional differences are also important as seasonal changes in non-affordability could be greater in areas with more vulnerable livelihoods, less physical access to markets and higher poverty levels.



Figures 10 and 11: The percentage of households that cannot afford a minimum cost nutritious diet *(left, Cost of the Diet analysis, 2018)*, and those that cannot afford a recommended diet *(right, Dizon & Herforth, 2018)*

4.

FRESH FOODS ARE AVAILABLE AND CONSUMED BUT GENERALLY NOT IN SUFFICIENT QUANTITIES TO PROVIDE THE NECESSARY BENEFITS.

Households currently spend almost half of their food budget on fresh and nutritious foods across a wide array of food groups including fruit and vegetables, meat and dairy products (Figure 12). However, one third of food expenditure goes toward condiments, prepared food and uncategorised food that may include processed commodities that are high in energy but low in essential nutrients. Spending is also an inaccurate reflection of consumption, as nutrient-dense foods are typically more expensive and thus make up a smaller share of what households eat in terms of quantity compared to what they spend.[17]

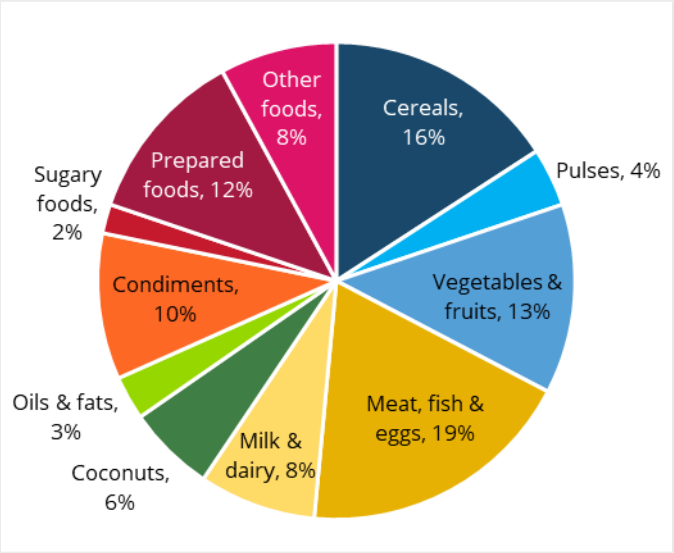


Figure 12: The percentage of household food expenditure by food group *(HIES, 2006)*

Data on the national availability of fruit and vegetables shows that domestic production, which yields an average of 230 grams of fruit and vegetables per capita per day, is insufficient to provide for both the national FBDG and WHO/FAO recommendations of 400 grams of fruit or vegetables per day (Figure 13).[18] These data on insufficient availability also correspond to consumption data in which less than 30 percent of adults reported having five or more servings of fruit and/or vegetables per day. On the contrary, two-thirds of adults did eat fruit or vegetables every day, but only 1-4 servings, and servings may be relatively small (Figure 14).[19] Interventions to increase consumption should improve awareness of the importance of fresh fruit and vegetables in the diet, and the recommended servings, to increase consumer demand and work towards greater national production and better economic access to fresh foods.

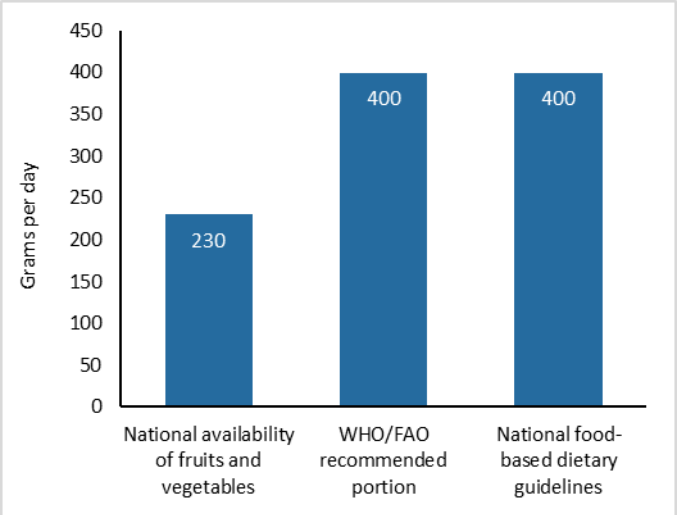


Figure 13: National per capita availability of fruit and vegetables per day, and recommended daily intake according to WHO/FAO and national guidelines *(National strategic review of food security & nutrition, 2017)*

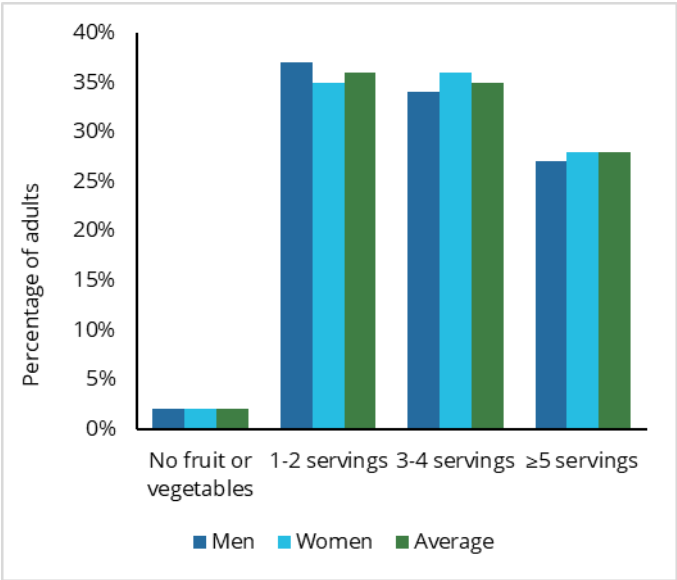


Figure 14: Daily fruit and vegetable consumption by adults *(Non-Communicable Disease Risk Factory Survey, 2015)*

Home gardens represent an important source of fruit and vegetables that could be leveraged to increase availability and household consumption. Plot size and prominence of gardens vary: some households cultivate as little as 0.05 hectares and others more than 2.5 hectares. While gardens cover only two percent of the land area in Mannar, they cover 36 percent in Matara.[20] Research estimates that home gardens yield between 50–60 percent of all leafy vegetables produced nationally, and that 27 percent of fresh food produce (in terms of monetary value) consumed directly by suburban households is from their home garden production (with the remainder purchased on markets).[21] Home gardens are estimated to be the most important source of fruit production in the country.[22]

Additional assessments are needed to understand the current contribution of home garden production to overall availability of produce, and to determine the potential of increased yields from both home gardens and commercial farms. It is also important to consider the demand for

different foods, and whether people would increase their consumption if fresh vegetables and fruits were more readily available or affordable, or whether strong behaviour change interventions would be require.

Programmes or policies targeting dietary behaviours should aim to increase consumption of fresh foods and decrease the current high intake of sugar and processed foods. Per capita intake of plain sugar (excluding sugary drinks and snacks) does not differ very much across regions and sectors and changes only minimally with wealth. In all groups except for the two bottom economic deciles, it exceeds the 5 percent per capita energy intake recommended by WHO, and total sugar intake likely exceeds the 10 percent limit set by WHO.[17] Consumption of salty processed foods is also high, with one-quarter of adults (ages 18–69) reporting that they eat these foods "always or often". This proportion is highest among young men (ages 18–29) at 34 percent.[19]

5.

SRI LANKA HAS DEVELOPED ECONOMICALLY, INCREASING OVERALL WEALTH AND FOOD EXPENDITURE. DESPITE THIS, INCOME INEQUALITY LEADS TO UNEQUAL ACCESS TO NUTRITIOUS FOODS.

Purchasing power in Sri Lanka increased from 2005 to 2016. During this period the consumer price index increased by 130 percent while the average monthly household income rose by 200 percent. This overall increase in wealth is reflected in food expenditure which rose in absolute amount but decreased as a percentage of total household expenditure from 2012 to 2016. However, wealth is not equally distributed, especially across Sri Lanka's areas: average total household expenditure of LKR 77,377 per month in urban areas is more than twice that in the estate sector, where households spend only LKR 34,851 per month on average (Figure 15). Urban households spend 30–40 percent more on food than rural

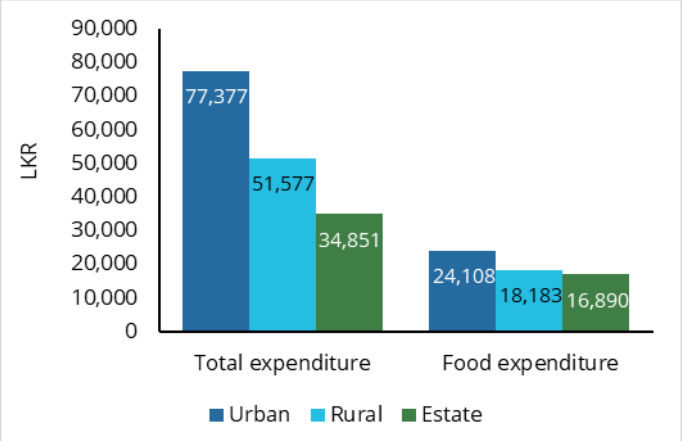


Figure 15: Average monthly household expenditure, by sector *(HIES, 2016)*

or estate households, but while food accounts for 30–35 percent of urban and rural household expenditure, nearly half of household expenditure in the estate sector goes to food. Estate households devote a greater proportion of their expenditure to cereals, accounting for a quarter of their food expenditure (Figure 16).[17]

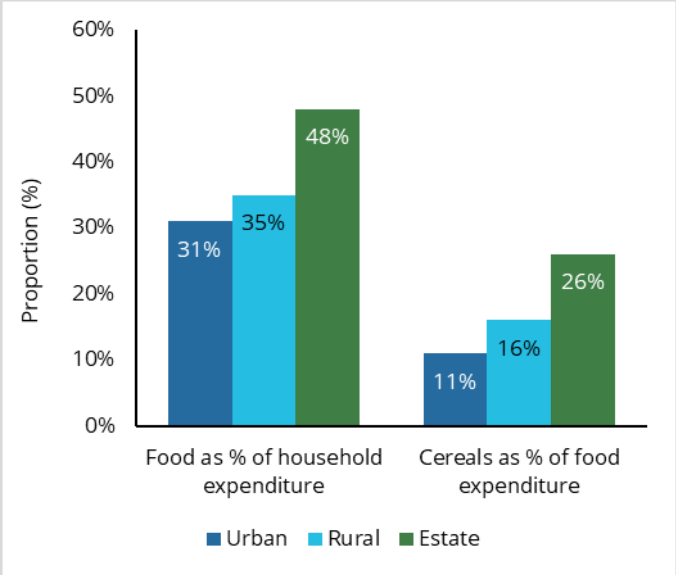


Figure 16: Average percentage of household expenditure spent on food and percentage of food expenditure spent on cereals, by sector *(HIES, 2016)*

These disparities in wealth present an important barrier to adequate nutrition. The proportion of households that cannot afford a nutritious diet is highest in the estate sector. In Rathnapura, for example, a nutritious diet is unaffordable for only 16 percent of urban households but rises to 22 percent among rural households and 35 percent in the estates (Figure 17).[23]

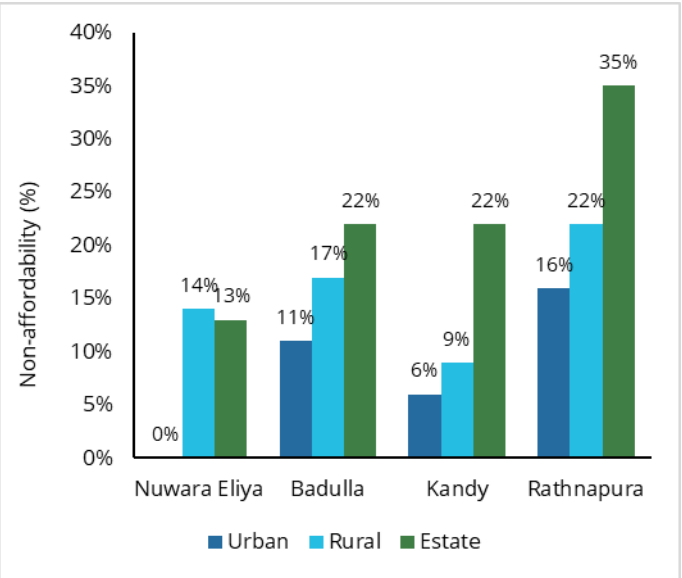


Figure 17: Percentage of households that cannot afford a nutritious diet in selected districts, by sector *(Cost of the Diet analysis, 2018)*

The greater wealth and purchasing power of urban households, particularly compared to estate households, is reflected in their purchasing choices and consumption patterns. While a larger share of food expenditure goes to maintaining staple food intake in the estate sector, urban households spend more on a wider variety of food groups. Expenditure on animal source foods, including meat, fish and milk, is higher in urban areas, as is expenditure on prepared foods.[17] This trend is confirmed in data showing higher consumption of animal source foods among urban women than among women in the rural or estate sectors. Two food groups, however, are similarly accessible to women across sectors: 80–90 percent of all women reported consuming vitamin A-rich fruit and vegetables (although, as previously discussed, likely in insufficient quantities) and 26–36 percent of women consumed sugary foods.[6]

6.

AGRICULTURE IS A MAJOR EMPLOYMENT SECTOR BUT DOES NOT CONTRIBUTE GREATLY TO GDP. SMALLHOLDER PLOT SIZE IS DECREASING AND LABOUR IS PRIMARILY INFORMAL.

Sri Lanka's population is overwhelmingly rural and dependent on agriculture, with four out of five people living in rural areas and farmers representing a quarter of the workforce. However, agriculture accounts for only 9 percent of Sri Lanka's Gross Domestic Product (GDP), of which 2 percent is tea production in the estates where only 4 percent of the population lives. This is disproportionately lower than the two other main sectors that contribute to GDP: services (62 percent of GDP and nearly half of the workforce) and industry (39 percent of GDP and 26 percent of the work force) (Figure 18).[24] The low economic impact of agriculture indicates likely inefficiencies in the sector, where employment is predominantly informal.

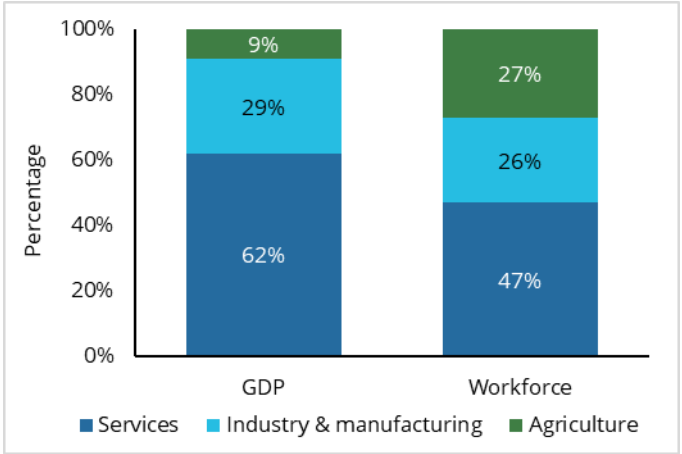


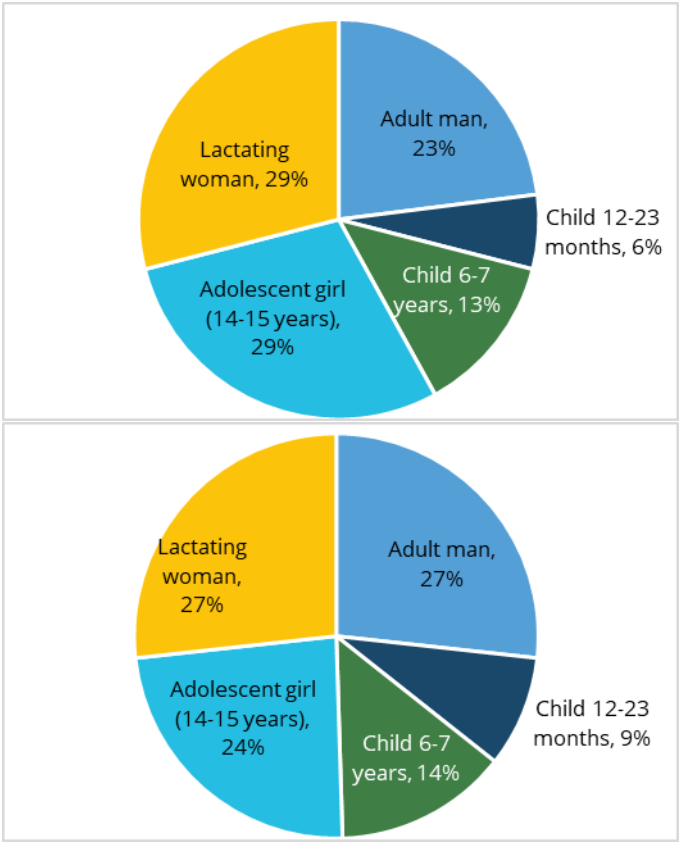
Figure 18: Percentage of national Gross Domestic Product and national workforce by sector *(World Bank, 2015 & Census, 2016)*

Livelihoods are also threatened by increasing pressure on land, with the size of smallholdings decreasing steadily over time. Among households cultivating fewer than eight hectares, the Agriculture Census found that the average holding size was 1.1 hectares in 1962, 0.8 hectares in 1982, and fewer than 0.5 hectares in 2002.[18] Women are especially economically vulnerable as many work informally and/or in the household without remuneration. Moreover, although women account for three quarters of labour on farms, they rarely own the land they work. In the estate sector, women provide 70 percent of the labour.[25]

7.

INTRA-HOUSEHOLD DYNAMICS NEED TO BE UNDERSTOOD TO IMPROVE INDIVIDUAL AND HOUSEHOLD NUTRITION. ADOLESCENTS, PREGNANT AND LACTATING WOMAN HAVE PARTICULARLY HIGH NUTRITIONAL NEEDS, MAKING THEM MORE VULNERABLE.

Women and adolescent girls are particularly vulnerable to poor nutrition, and their needs are compounded during pregnancy and lactation. The CotD analysis shows that the nutrient requirements of an adolescent girl and a lactating woman are the most expensive in the modelled five-person household. Each of them accounts for nearly 30 percent of the cost of a nutritious diet for the household, a larger share



Figures 19 and 20: Percentage of the household cost of a nutritious diet by individual (top) and percentage of household energy needs by individual (bottom) *(Cost of the Diet analysis,*

than the adult man and disproportionately higher than their shares in a household energy-only diet (Figures 19 and 20).

Stunting prevalence among adolescents (ages 10-14) has decreased since 2003, but this age group remains susceptible to micronutrient deficiencies and, increasingly, overweight and obesity. Iron deficiency is three times higher in adolescent girls (one-third of girls aged 10-18) than boys (11 percent aged 10-18) and prevalence of iron deficiency and iron deficiency anaemia nearly doubles in older adolescents (boys and girls aged 15-18) as compared to younger children (boys and girls aged 10-14). Forty six percent of adolescents (aged 10-18) are vitamin D deficient, and another 13 percent have vitamin D insufficiency. This is highest in girls: a total of nearly 70 percent have vitamin D deficiency (50 percent) or insufficiency (19 percent).[26]

Only half of all adolescents reported meeting minimum dietary diversity of five or more food groups every day. While nearly all of them ate grains at least once a day, most had vegetables only 2-3 times per week or less. Fruit and meat consumption was even lower, generally less than 2-3 times per week (except for chicken, which was eaten slightly more).[26]

Given this low consumption of nutrient-dense foods and prevalence of deficiencies in iron and potentially other micronutrients, supplementation could make an important contribution to meeting the needs of adolescents. The cost of a nutritious diet for an adolescent girl could decrease by up to one-third with iron-folic acid supplementation (given according to the international specification), reflecting the high cost of foods available on the market that could meet her requirements in iron and folic acid. A multi-micronutrient tablet would have even greater impact, reducing the cost of her nutritious diet by more than 40 percent, from 139 LKR per day to 79 LKR (Figure 21).

Dietary diversity in adult women is quite good compared to adolescents. Consumption of vitamin A-rich fruit and vegetables is high, and over half of women reported consuming other fruit and vegetables, legumes and nuts, and animal-source foods (except dairy). However, consumption of oily and fatty foods is also common (nearly half of women) and nearly one-third of women consumed sugary foods. As noted earlier (message 4), these reported frequencies might be for small quantities and of both nutritious and "empty calorie" foods, but increased sugar consumption is of concern for Sri Lanka's rising double burden.[6]

Women are principal decision-makers for household nutrition but their agency and time are often limited. Although women prepare the meals in 80 percent of households, they often do not decide on food purchases. Education and knowledge may restrict their decisions: women with no education were much less likely to consider the nutritional value of meals for their households than women with advanced degrees. Three-quarters of women with no education reported low interest in preparing nutritious food, while 70 percent of women with university degrees had high interest in nutritious meals.[27] Formal sector employees are entitled to 84 working days of maternity leave and one hour per day to breastfeed thereafter, but many women are informally employed or engaged in other kinds of work. Given the amount of farm labour and other unremunerated family work that falls to women, they may not have enough time to prepare and feed nutritious meals to their young children and provide optimal care and stimulation.

The current government ration of 50 grams of Thriposha per day provided to pregnant and lactating women, decreases the daily cost of their nutritious diet by roughly 15 percent across the districts modelled. A ration of 100 grams, which covers a large portion of a lactating woman's required intake for many micronutrients, would decrease the cost of her nutritious diet by 27 percent in the districts modelled. Supplementation with iron and folic can reduce

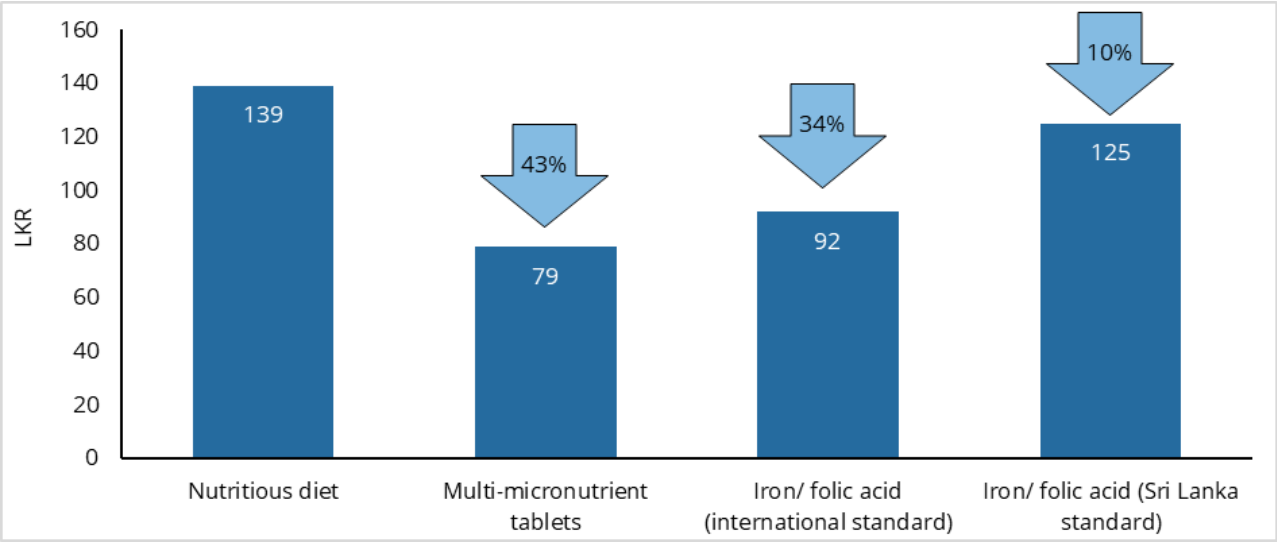


Figure 21: The average daily cost of a nutritious diet for an adolescent girl (aged 14-15 years) with daily micronutrient supplementation provided (multi-micronutrient tablet or iron and folic acid) *(Cost of the Diet analysis, 2018)*

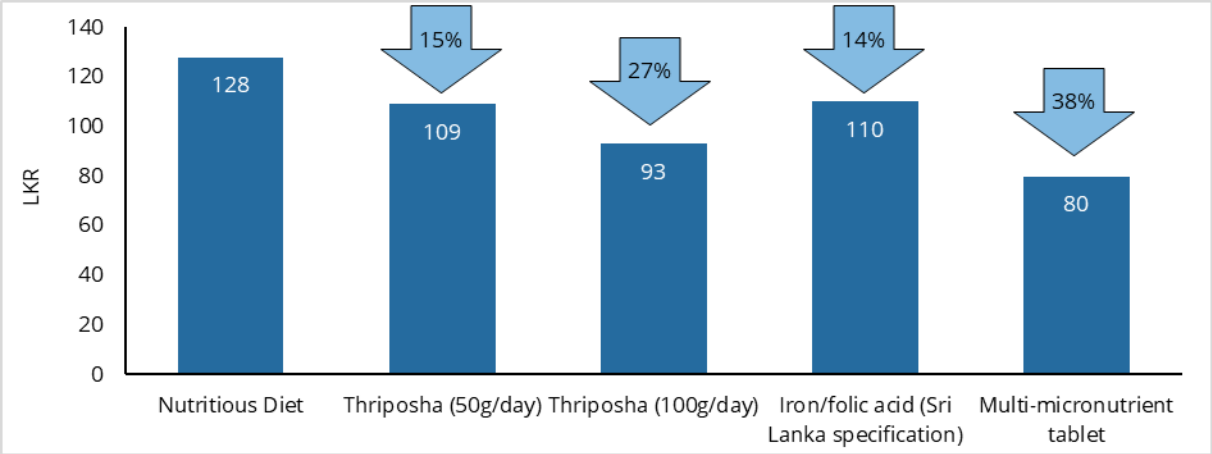


Figure 22: Average daily cost of a nutritious diet for a lactating woman (30-59 years) with daily interventions provided (Thriposha, multi-micronutrient tablet, or iron and folic acid) *(Cost of the Diet analysis, 2018)*

the cost by approximately 14 percent (Figure 22). These decreases reflect the high cost of nutrient-dense foods available on local markets to meet the nutritional needs of women, particularly foods rich in iron.

In addition to specialised nutritious foods and supplements, targeted vouchers can contribute to improved nutrient intake in individuals and households. Sri Lanka's national PLW voucher programme currently provides 20,000 LKR worth of nutritious food per woman during her last six months of pregnancy and first four months post-partum. Assuming the full amount of the voucher does go toward foods consumed by the woman, this could cover between 40-50 percent of the cost of her nutritious diet in the districts modelled (Figure 23). Even if distributed across the household, the value of the voucher would cover more than 10 percent of the cost of a 5-person household's nutritious diet.

The Samurdhi voucher, a higher amount intended to improve family-level nutrition and food consumption, reduces the cost of a nutritious diet for the household by 20 percent across the modelled districts (Figure 24).

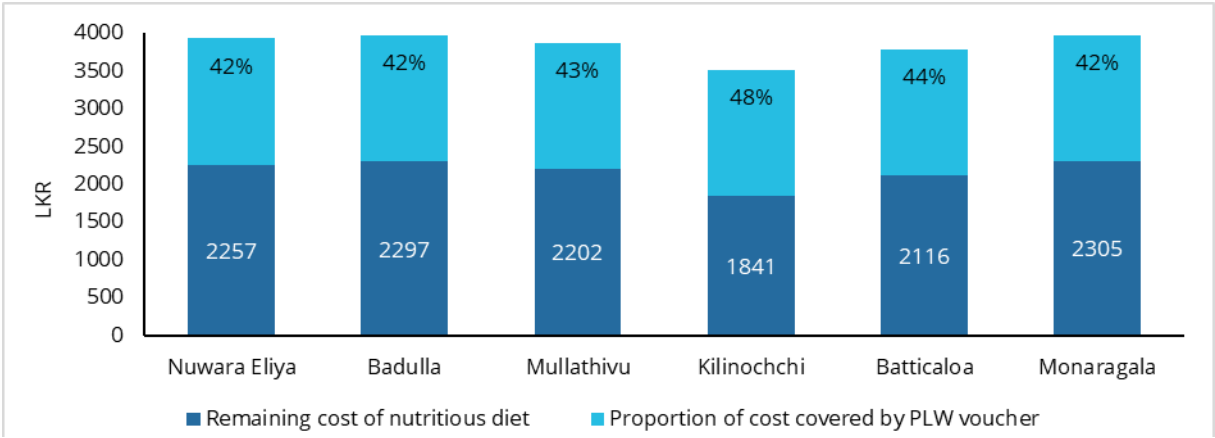


Figure 23: Average monthly cost of a nutritious diet for a lactating woman in selected districts, with the percentage contribution of the PLW voucher and the remaining cost to the household *(Cost of the Diet analysis, 2018)*

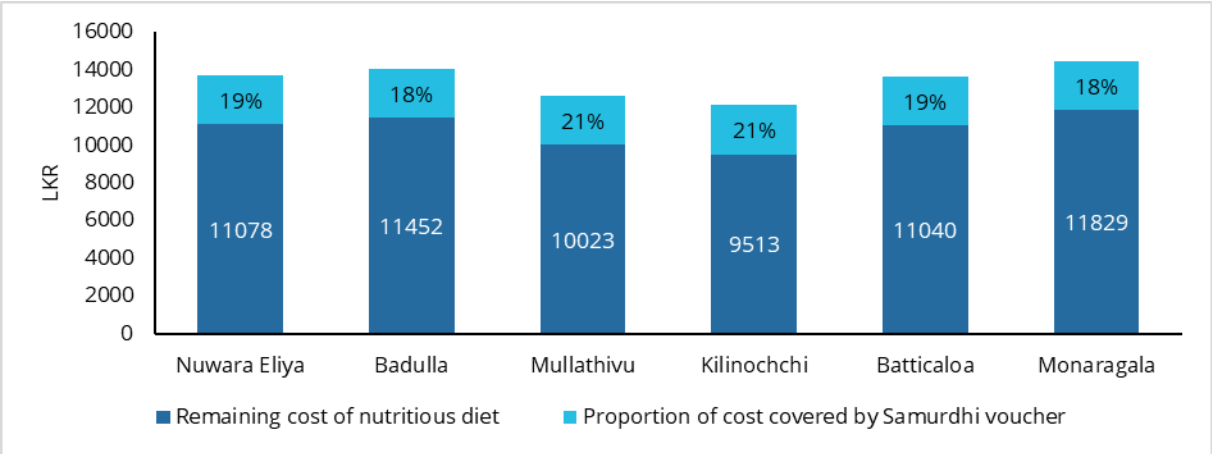


Figure 24: Average monthly cost of a nutritious diet for a household in selected districts, with the percentage contribution of the Samurdhi voucher and the remaining cost to the household *(Cost of the Diet analysis, 2018)*

8.

CLIMATE-RELATED SHOCKS PUT FOOD SECURITY AND NUTRITION GAINS AT RISK AND MAY ALSO LEAD TO SEASONAL DIFFERENCES IN AVAILABILITY AND ACCESS.

Seasons and harvesting patterns do not vary much throughout the country. This is reflected in prices of foods that are not regulated, which do not vary much across seasons and only slightly across districts. Because prices are fairly constant, the cost of a nutritious diet was found to be stable across seasons, increasing in some districts during the Maha season, especially the Maha harvest.

However, Sri Lanka is susceptible to climate-related shocks, and is likely to experience an increasing number of events like bad harvests and droughts as the effects of climate change intensify. These shocks are linked to livelihoods and household food and nutrition security. There is significant overlap between areas with more climate-sensitive livelihoods and incomes, greater risk of food insecurity, higher poverty rates, and lower road density. The greatest climate impacts on income are expected for rain-dependant livelihoods, including rainfed paddy and other agriculture. In these zones access to nutritious diets could decrease, potentially leading to higher rates of malnutrition.[28]

9.

RICE CONSUMPTION IS HIGH THEREFORE FORTIFICATION OF RICE AND OTHER STAPLES HAS HIGH POTENTIAL TO IMPROVE MICRONUTRIENT INTAKE.

Domestic production in Sri Lanka is focused on staples and has not diversified much over the past 10 years.[18] Rice dominates both production and consumption and, as a result, Sri Lanka is nearly self-sufficient in rice production (other staples are imported).[29] Consumption of staples, primarily rice, exceeds national and international recommendations. Across the country Sri Lankans get 75 percent of their energy intake from carbohydrate foods, yet the national food-based dietary guidelines recommend 65 percent and the WHO 50 percent.[30]

In addition to the importance of increased dietary diversity as highlighted in previous sections, fortification of staple foods could contribute to better nutrient intake. A national fortification policy that is currently pending cabinet approval would include: mandatory wheat flour fortification with iron and folic acid to combat anaemia; rice distributed through social safety nets, including schools, fortified with iron and folic acid; and a recommendation to assess the feasibility of local production of fortified rice kernels. Although this proposed national specification for fortified rice includes only iron and folic acid, including additional micronutrients (such as B vitamins, vitamin A and zinc) should be considered as it could make an important contribution to improved micronutrient intake.

Rice fortified with iron and folic acid could reduce the cost of a nutritious diet for households by more than 10 percent, if available for purchase on the market at a price 2 percent higher than that of unfortified rice. Multi-micronutrient fortified rice, in particular, would cover all of the household's requirements for many B vitamins and zinc, as well as folic acid, and contribute substantially to vitamin A requirements (Figure 25). For the household, this represents a straightforward way to improve their nutrient intake with minimal time and effort. Fortified wheat flour provides additional nutrients but would decrease the household's cost only slightly (2 percent) because wheat flour is consumed less than rice.

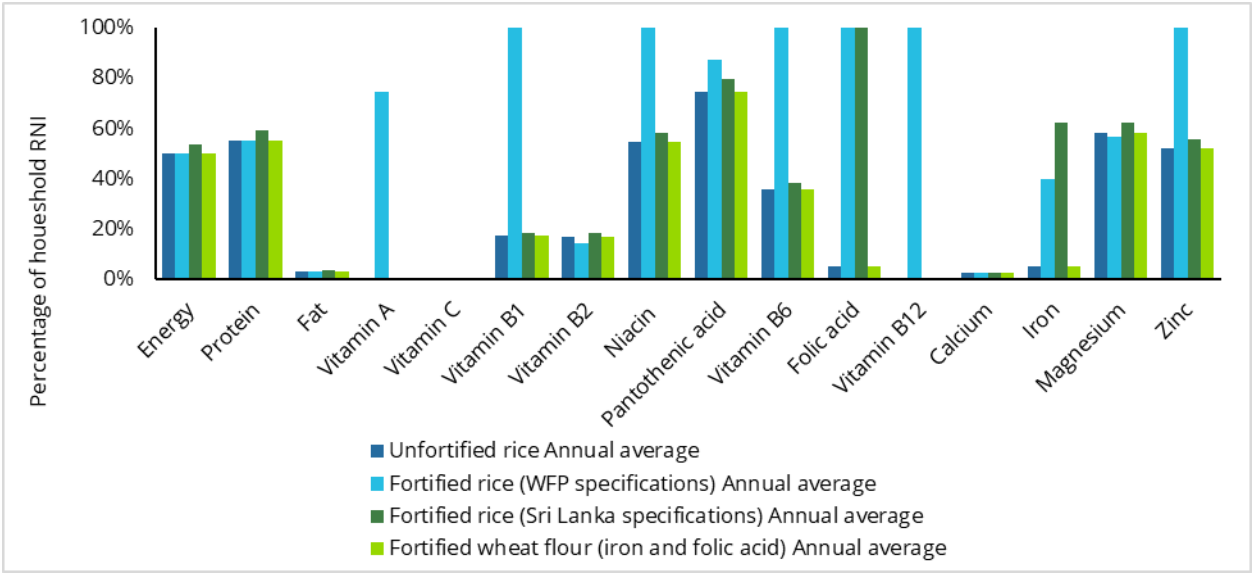


Figure 25: Percentage of household Reference Nutrient Intake covered by unfortified rice and different fortified staples *(Cost of the Diet analysis, 2018)*

10.

SCHOOL MEALS ARE AN IMPORTANT PLATFORM FOR REACHING SCHOOLCHILDREN WITH DIVERSE AND NUTRITIOUS MEALS AND ESTABLISHING HEALTHY DIETARY PATTERNS.

Nearly all boys and girls in Sri Lanka attend school between ages 6 and 15, making the educational system a crucial entry point for nutritional interventions to prevent undernutrition and overweight/obesity. Primary school-aged children (6-12 years) are still more likely to be thin (40 percent, including 10 percent severely thin) than overweight (9 percent including obese), and stunting prevalence is higher in 12-year-olds than in younger children, but anaemia prevalence is relatively low (less than 15 percent).[31]

Educational interventions, including school meals, should aim to improve nutrient intake and dietary diversity while also limiting unhealthy behaviours. The most frequently consumed food groups among children aged 6-12 years were cereals, vegetables other than green or yellow, and oily foods, eaten by at least 70 percent of children. More than half of children reported eating bread, fish and milk products, green vegetables, and fruit the previous day. Consumption of meat was low (one-third of children), and only 10 percent ate pulses. Increasing or maintaining consumption of nutritious and fresh foods must be complemented by limiting snacking, especially intake of processed sugary foods. 90 percent of children aged 10-18 reported having a snack every day, and 70 percent of children aged 6-12 ate sugary products. Finally, micronutrient supplementation through schools could also be expanded to increase the number of children aged 10-18 who receive iron (currently 67 percent), vitamin A (33 percent) and deworming treatment (65 percent).[31]

Sri Lanka's midday school meal programme currently prioritises primary school children, with 40–50 percent of children aged 6-9 receiving meals. Rations consist of five food groups – cereals, pulses, vegetables, animal-source foods, and oil. A separate programme provides a daily ration of milk. Both programmes contribute to meeting the nutrient needs of children and reducing the amount of money their families must spend to ensure an adequately nutritious diet. If combined, the school meals and milk would cover one-fifth of the cost of a nutritious diet for a school-aged child (Figure 26).

Giving fortified rice in school meals, as the proposed fortification measure that is currently awaiting approval, would further improve the nutrient intake of school children. It would provide a greater intake of certain B vitamins, folic acid, and zinc if it were fortified with multi-micronutrients. Fortified school meals would decrease the cost to the household of a nutritious diet for the school-aged child by one fifth, and by one quarter if combined with the milk programme. An iron supplement added to the current unfortified school meal ration would decrease the cost slightly more than the current ration alone (Figure 27). However, if the school meal programme were to expand coverage to secondary schools and target adolescents, particularly girls, iron supplementation could be an effective addition given the higher needs of this older age group.

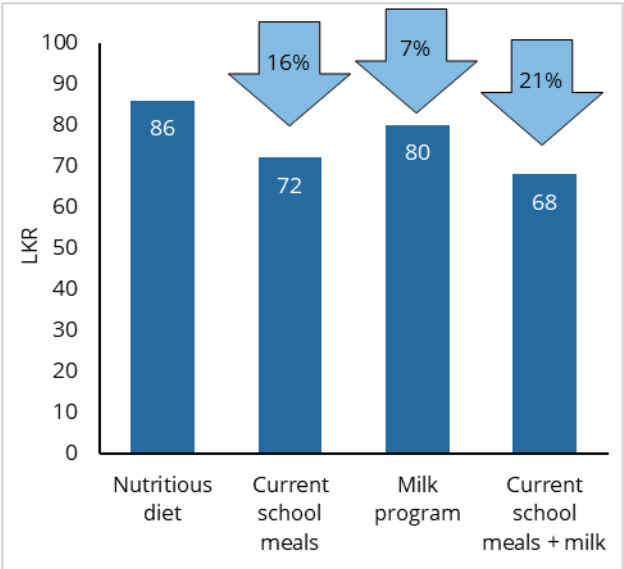


Figure 26: Average daily cost of a nutritious diet for a school-aged child (6-7 years) with school meal interventions *(Cost of the Diet analysis, 2018)*

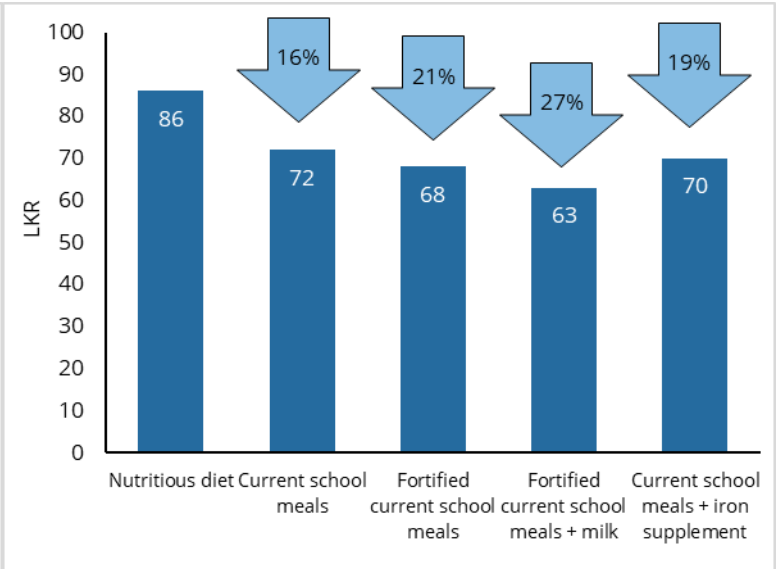


Figure 27: Average daily cost of a nutritious diet for a school-aged child (6-7 years) with school meal interventions and fortified foods. Fortified school meals include rice fortified with vitamins A, B1, B6, B12, niacin, folic acid, iron and zinc *(Cost of the Diet analysis, 2018)*

Stakeholder recommended priorities based on FNG findings and developed through group work, by sector

During the dissemination workshop, the main findings from the FNG analysis were shared and discussed with a broad group of stakeholders, who then worked together to formulate and prioritise recommendations. Participants formed six groups around a given theme: IYCF, agriculture, dietary diversity, climate-related shocks, food industry and social protection. Each group was asked to brainstorm interventions that could contribute to improved dietary diversity based on the challenges and opportunities identified by the FNG findings. The groups then selected one priority intervention, presented below, for which they identified target groups, objectives, specific opportunities and gaps, sectors to engage, and short- (1-2 years) and medium-term (3-5 years) activities.

1) IYCF: Develop and implement a communication for behavioural impact (COMBI) strategy to improve dietary diversity among children under 5 years.

Minimum dietary diversity among young children in Sri Lanka is constrained by unavailability or unaffordability of a diverse diet, health (such as frequent illnesses), inadequate IYCF practices, and other factors that influence caregivers including food taboos and myths. The FNG results highlight many good practices, particularly around breastfeeding, but show that minimum dietary diversity in particular is low and has not improved over recent years.

The COMBI plan should target caregivers with messages about the importance of animal source foods, fruit and vegetables, leveraging the increased literacy rate and the current high focus on children in national policies. Health centres, mother support groups and other existing community-based organisations are good potential entry points for COMBI, but efforts must be made to address any language barriers or capacity constraints at the level of the health centres. Male caregivers should be included alongside women with the aim of improving gender equality and intra-household dynamics. The strategy and the specific messages should be developed in consultation with a broad range of sectors and stakeholders, including not only the ministries of health and women and child affairs, but also religious leaders, media, and social services.

In the short term a multi-sectoral working group should be established to develop the plan, with the aim of beginning implementation within 3-5 years. In the medium term, a team should be assembled (possibly volunteers) and trained on COMBI so they can train caregivers.

2) Agriculture: Identify and select nutrient-rich crops for school, home and community gardens for improved nutrition.

Sri Lanka has a number of existing programmes and initiatives to promote good agricultural practices, nutrition and resilience, including home garden promotion, school and preschool meals and gardens, edible landscapes, and Samurdhi. The working group brainstormed several areas where there is room for improvement, including:

- crop selection and breeding based on nutritional value;
- nutrient analysis of crops;
- better post-harvest loss management;
- greater education and awareness on affordable nutritious foods and production;
- promotion and establishment of community gardens;
- management of off-season crop production;
- promotion of under-utilised crops; and
- initiatives for better sustainability and resilience in agriculture.

The priority identified for agriculture entails leveraging Sri Lanka's high crop diversity, existing gardening programmes and government extension services, and strong organisational structure for the development of technology. These aim to increase the knowledge base, improve coverage of agricultural initiatives, and strengthen coordination among institutions. The recommendation is two-fold: 1) improve data collection on local crops and their nutrient content, and 2) develop and promote garden models that are adapted to diverse geographic areas, incorporating locally grown nutrient-dense crops. This is particularly important for good nutrition outcomes, as the FNG found that a large share of domestic production of fruit and vegetables is from home gardens. The need for strong multisectoral collaboration was highlighted, including with the private sector (potential engagement with seed and fertilizer companies, food processing companies, and retailers).

Specific objectives highlighted by the group include:

- identify crops with high nutrient content that could improve nutrition at low cost;
- develop innovative and attractive low-cost production techniques;
- enhance sustainable production and marketing of these crops; and
- ensure economic sustainability of nutritious food production.

Implementation of this approach would entail multiple phases. The first phase requires identification and collection of information on locally grown crops (either collation of available information or primary data if necessary), and

subsequent selection of appropriate nutrient-dense crops to be promoted in different agro-ecological zones. The second phase consists of developing home garden models in schools based on the crops identified, and then adapting these models to home and community gardens.

Complementary activities include measures that can engage the private sector by introducing competition for these crops and rewarding producers, and interest can be stimulated with food shows to increase knowledge about possible crops, how to grow them and manage post-harvest losses, and their nutritional benefits.

This intervention involves a wide range of partners across sectors. The department of agriculture and the ministry of agriculture will have a lead role in many of the activities, including selecting appropriate crops for the gardens (in collaboration with the ministries of education and health), developing and adapting school garden models for homes and communities (in collaboration with the presidential secretariat), organizing food shows (with research institutes and universities), providing and developing necessary technology, supplying materials for planting and infrastructure facilities, raising awareness and promoting education around these crops (with the private sector, the ministries of health and education, and universities), and helping to develop consumer-oriented value chains (with international non-governmental organisations and HARTI).

3) Dietary diversity: Improve dietary diversity through effective implementation of Sri Lanka's Food-Based Dietary Guidelines (FBDGs).

Though Sri Lanka's Food-Based Dietary Guidelines were recently revised, the FNG results showed that consumption of staple foods remains too high while fruit and vegetables appear to be consumed at about half the amount recommended. An implementation plan with a focus on results should be developed for the FBDGs, including design of indicators for monitoring and evaluation, and formulation and implementation of a nutrition behaviour change communication strategy.

Some of the short-term activities identified for this recommendation have already been accomplished, inclu

ding revision of the guidelines and agreement with the government to formulate an implementation plan. Additional activities to be undertaken for the preparation of an implementation plan include designing indicators for monitoring and evaluation, and formulating and implementing a nutrition behaviour change communication strategy. Once implementation of the FBDGs begins, there should be regular review and revision of the programme.

Strong multisectoral engagement and coordination is crucial to translate the high political commitment into prioritisation and resource allocation for effective implementation. The plan should involve development and/or enforcement of healthy dietary guidelines based on the FBDGs for school and preschool meal programmes and workplace canteens. This will require the participation of the ministries of health, education, agriculture, and estates, as well as social welfare and the children secretariat. Media channels should be sensitised to promote healthy food purchasing and cooking behaviours, while also engaging with the private sector for better regulation of advertising for unhealthy foods.

4) Climate change: Mitigate the effects of climate change on agricultural production and the cost of nutritious food through climate-smart agriculture approaches.

Sri Lanka is highly vulnerable to climate change and the resulting shocks, such as more frequent and severe droughts and floods, which pose a threat to agricultural production and food and nutrition security. These outcomes may be mitigated through the broad-scale development and implementation by smallholder farmers of climate-smart agriculture (CSA), which entails use of resistant crop varieties, smart water management, and weather-based decision management.

Effective use of CSA approaches will require public and private sector investment across the agricultural and meteorological sectors. Short-term activities identified include: training and capacity-building in meteorology, development of a mechanism to translate weather information into understandable agricultural guidance, strengthening of the agricultural extension system (both physical and digital), farmer training including on nutrition and the importance of crop diversity, and development of a coordination mechanism between the government and private sector. Mobile platforms present an excellent opportunity to disseminate messaging, and telecom companies will play a crucial role in ensuring dissemination of CSA messages and techniques.

Advocacy will be required to leverage the high government priority for agricultural modernisation into effective interdepartmental coordination, policy consensus, and resource allocation for necessary research and design. Sri Lanka has well-established research institutes which should be engaged to provide technical inputs and guidance. Other sectors can contribute complementary interventions including weather indexed insurance (through banking and insurance companies), weather forecasting and early warning systems (through the meteorological department), and data management on weather and crops (through the agriculture and agricultural exports departments and the meteorological department).

5) Food industry: Implement fortification of staple foods.

Fortification is an important approach for improving micronutrient intake of the population, alongside efforts to increase dietary diversity. Momentum towards fortification of staple foods in Sri Lanka must be maintained if it is to be implemented. In addition to mandatory fortification of wheat flour, fortified rice has recently been approved for use in school meals and social protection, including the voucher programme targeting pregnant and lactating women. Although rice remains the primary staple in Sri Lanka, fortified wheat flour has great potential in the estate sector, where it is consumed more. Entry points for consumption of fortified staples are plentiful, but concerted efforts will be needed to ensure adequate supply and demand, and monitoring and evaluation of coverage and outcomes, supported by public-private partnerships and input from technical partners.

Effective implementation of these measures will require, in the short term, the development of a solid monitoring and evaluation framework, ongoing sensitisation of policymakers and food industry stakeholders, and increased awareness among beneficiaries about fortified foods. Surveys should be planned to assess both supply and demand for fortified commodities to ensure accurate targeting and to explore the possibility of introducing additional fortified products. In the medium to long term, continued impact assessment will be critical to identify gaps and strengthen the programme as needed. Collaboration between the private and public sectors, including media, can be leveraged to move forward on other initiatives such as introducing new value-added products (i.e. fortified with micronutrients) and to reschedule the current programme by updating the commodity list for the cash voucher provided to PLW through the ministry of women and child affair for instance.

Development and provision of fortified foods requires public -private partnerships with food producers, and the involvement of the ministries of agriculture, industry, health, and finance. The ministries of education, women and child affairs, and trade and commerce play a crucial role in provision of fortified foods through safety nets and marketplaces. As fortified products become available, mass media and civil societies, along with the ministry of health, must spearhead behaviour change and demand creation activities around these foods.

6) Social protection: Expand the current school meal programme for primary schools to universal coverage and to cover adolescents in secondary school, and expand the preschool meal programme to target the estate sector.

A range of social protection programmes already exist with nutritional targets for various vulnerable groups, including cash vouchers for PLW, the Samurdhi social transfer, the school morning meal programme, and the milk programme for schoolchildren. These are complemented by non-social protection programmes in nutrition, health and other sectors, such as the Thriposha supplementation programme (for undernourished children from 6 months to 5 years and all PLW), iron/folic acid supplementation for school children and pregnant women and multi-micronutrient supplementation for infants and young children.

The priority intervention identified in the group work is to expand the current government school meal programme for primary schools to have island-wide coverage and to be more nutrition-sensitive, including promotion of healthy local foods and targeting the specific nutrition needs of adolescents. A complementary programme should be implemented in estate sector preschools. School meals should include rations of fortified rice, as per the recently approved cabinet measure, with the planned pilot in Anuradhapura district. All programmes should be accompanied by school canteen policies in line with the national FBDGs.

The ministries of education, health and finance should lead the activities for school meal interventions in partnership with the private sector, development agencies, academia and the media. Short-term activities identified include: budget briefs for increased financial allocations to school and preschool meals, development of programme evaluation, drafting of legislation regulating advertising of unhealthy foods, initiatives to promote healthy foods among schoolchildren and parents and empower them to make informed decisions, and piloting a preschool meals programme in the estate sector. In the medium term, the programme should be expanded to cover all preschool and schoolchildren and adolescents, island-wide. In addition to regular monitoring of implementation, an evaluation of the nutritional status and dietary behaviours of the children should be undertaken after 3-5 years.

The school and preschool meals programmes should be accompanied by media involvement and behaviour change interventions to raise awareness of good nutrition among children and parents, and by legislation regulating advertising of unhealthy foods especially targeting children.

ENDNOTES

1. Key sources included the 2016 Sri Lanka DHS, the National Nutrition and Micronutrient Survey 2012, the Global School Health Survey 2016, the National Nutrition and Micronutrient Study of School Adolescents 2018, the National Strategic Review of Food Security and Nutrition 2017, Dizon & Herforth 2018, the Household Income and Expenditure Survey 2016, the Non-communicable Disease Risk Factory Survey 2015, the Sri Lanka Food Security Atlas 2015, Sri Lanka Consolidated Livelihood Exercise for Analysing Resilience 2014.
2. As defined by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO). The need for 9 vitamins and 4 minerals is included.
3. 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.
4. Please refer to the full report for the list of staple preferences applied.
5. The modelled districts were Nuwara Eliya, Badulla, Mullathivu, Kilinochchi, Batticaloa and Monaragala.
6. DHS. 2016.
7. National Nutrition and Micronutrient Survey, 2012.
8. DHS, 2016; Nutritional Status, Dietary Practices and Pattern of Physical Activity among School Children aged 6-12 years, 2016.
9. Global School Health Survey – Sri Lanka, 2016.
10. The foods selected by the software include only those that were available on the market. No price data were available for formula or breastmilk substitutes. Animal source foods that were selected to meet the nutrient requirements of the non-breastfed child, across districts, included dried fish, chicken liver and beef liver.
11. MAD is a composite indicator of minimum meal frequency, 4 or more food groups (minimum dietary diversity), and breastmilk. For non-breastfed children, the third IYCF practice is consumption of milk or milk products.
12. DHS, 2016, according to the calculations consistent with the DHS-V.
13. Ibid. It should be noted that the sample size for non-breastfed children was small, at 190 in 2006 and 152 in 2016, and therefore results from these data should be interpreted with caution.
14. The nutrient needs of an acutely malnourished child are higher than those of a child who is not malnourished. The child modelled in this analysis is assumed to be healthy, and the contribution of the interventions including Thriposha would therefore be slightly lower for a malnourished child.
15. Three times weekly is equivalent to 78 sachets over six months, within the recommendation of 60-90 over six months.
16. Dizon & Herforth 2018. The Cost of a Recommended Diet (CoRD) is an estimate of the cost of a diet that meets national food-based dietary guidelines using government food price data.
17. Household Income and Expenditure Survey, 2016.
18. National Strategic Review of Food Security and Nutrition, 2017.
19. Non-Communicable Disease Risk Factor Survey, 2015.
20. Pushpakumara et al, 2010.
21. Kumari et al, 2009.
22. Weerakkody, 2004.
23. This calculation is based on differences in household expenditure by sector, while the cost used for the nutritious diet remains the same.
24. FAO & WFP, 2017; Department of Census, 2016.
25. Department of Census, 2016; Kalansooriya, 2018; & Kalansooriya & Chandrakumara, 2014.
26. National Nutrition and Micronutrient study of school adolescents in Sri Lanka, 2018.
27. Kalansooriya, 2018.
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31. Nutritional Status, Dietary Practices and Pattern of Physical Activity Among School Children Aged 6-12 Years, 2017

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LIST OF ACRONYMS

COMBI	Communication for Behavioural Impact
CotD	Cost of the Diet
CSA	Climate-smart agriculture
DHS	Demographic Health Survey
FAO	Food and Agriculture Organisation
FBDGs	Food-Based Dietary Guidelines
FNG	Fill the Nutrient Gap
GDP	Gross Domestic Product
HARTI	Hector Kobbekaduwa Agrarian Research and Training Institute
HIES	Household Income and Expenditure Survey
IYCF	Infant and young child feeding
LKR	Sri Lankan rupee
LP	Linear programming
MAD	Minimum acceptable diet
MDD	Minimum dietary diversity
MNP	Micronutrient powder
MMT	Multiple micronutrient tablet
PLW	Pregnant and lactating women
RNI	Reference Nutrient Intake
TSA	Targeted social assistance
UN	United Nations
UNICEF	United Nations Children's Fund
WHO	World Health Organisation
WFP	World Food Programme

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Front page: WFP/Nguyen Duc Hoang
Page 1: WFP/Nguyen Duc Hoang
Page 3: WFP/Sadhana Mohan
Page 19: WFP/Nguyen Duc Hoang

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