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MINIMUM COST OF NUTRITIOUS DIET & AFFORDABILITY ANALYSIS: SRI LANKA

Cost of Diet Bulletin January– December 2023

Hector Kobbekaduwa Agrarian Research and Training Institute

WFP World Food Programme

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COST OF DIET AND AFFORDABILITY

The Cost of Diet Bulletin 2023 presents updated evidence on the cost and affordability of nutritious diets in Sri Lanka amid a changing macroeconomic and food security landscape. In 2022, the Cost of Diet Bulletin highlighted how economic instability, soaring inflation, and supply disruptions significantly increased the cost of food and about half of Sri Lankan households were unable to afford such a nutritious diet, with pronounced disparities between urban and rural regions.

The year 2023, however, witnessed both stabilization and continued vulnerabilities. While headline inflation declined from its 2022 peak, food inflation remained elevated and uneven across districts. Exchange rate fluctuations and rising input costs continued to influence market prices of essential commodities. Moreover, imported food items and animal-source proteins remained costly, driving consumers toward cheaper, less diverse diets.

The Cost of Diet (CotD) analysis is a technique used to calculate the cost of a theoretical, simulated diet that meets all nutritional needs for a typical household, while minimizing overall expenses. This is based on the availability, pricing, and nutritional composition of local foods, and is carried out using the CotD tool.

The CotD tool utilizes linear programming methods to create four hypothetical diets using a locally sourced combination of foods:

1. **Energy-Only Diet:** The least expensive diet that only satisfies the average energy requirements of the household members.

2. **Macronutrient Diet:** The most affordable diet that meets both the average energy needs and the recommended protein and fat requirements of the household members.

3. **Nutritious Diet:** The lowest cost diet that fulfills the average energy requirements and the recommended nutrient intake for the household members.

4. **Food Habits Nutritious Diet:** The most cost-effective diet that satisfies the average energy and nutrient needs of the household, while also taking into account cultural eating preferences.

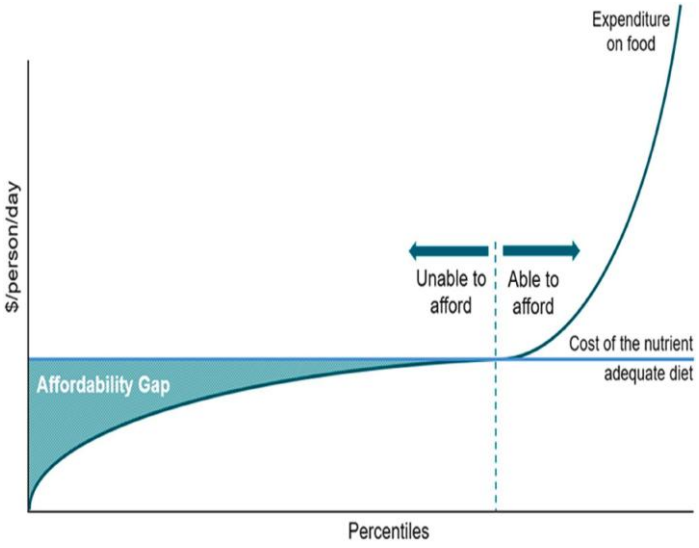


Figure 1 : Visualization of the affordability gap, Source: Balagamwala et al. (2024)

Use of CotD in Estimating Nutritional Affordability

The Cost of the Diet (CotD) can be utilized to estimate the proportion of households that can, in theory, afford a diet that meets nutritional requirements. The cost associated with accessing a diet that meets essential nutrient needs is referred to as the “Nutrient Poverty Line”, while the cost of a diet that

fulfills only basic energy needs is termed the "Calorie Poverty Line."

Applications of CotD and Affordability Assessments

CotD analyses offer valuable insights into how the cost of a nutritious diet varies across different geographic regions and seasonal periods. They help identify nutrients that are most challenging to obtain in adequate amounts and the food groups that contribute significantly to overall dietary costs. Additionally, tracking changes in CotD and dietary affordability over time can serve as a useful indicator for monitoring how economic fluctuations impact household food consumption behaviors.

The CotD methodology is also effective for modeling how social protection measures—such as food assistance or cash transfers—impact the affordability of a nutritious diet. As such, it can function as an advocacy tool to evaluate and compare the cost-effectiveness of various nutrition-related interventions and strategies by highlighting the lowest possible cost of meeting nutritional needs.

In areas where CotD is relatively high, leading to poor affordability and suboptimal nutritional status, targeted interventions may be required. These could include food-based solutions like fortification, supplementation, or improved market access, as well as non-food strategies such as supporting income-generating activities or providing cash-based incentives to enhance dietary affordability.

Conversely, in regions where CotD is low and diets are affordable, but malnutrition persists, interventions should focus on improving nutrition-related knowledge and behaviors. These may include educational programs on the importance of a balanced diet, food preparation practices, and behavior change communication to encourage healthier dietary choices.

METHODOLOGY

- Weekly retail price data from Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) and food expenditure data from Household Food Security Survey (WFP, 2023) was the two main input data sources.
- Four-member typical family (school-going child (7 years), adolescent girl (14 years), adult woman and adult man was considered.
- All 25 districts were included.
- CotD (Energy only and Nutritious Diets) was calculated.
- The Calculated diets are only the economic benchmarks. Not the actual diets that people eat.
- Following its declaration of bankruptcy in 2022, Sri Lanka faced unprecedented inflation, severe shortages of food, fuel, and medicine, resulting in an acute economic crisis. During such a crisis, the standard methodology of inflating food expenditure data from the 2019 Household Income and Expenditure Survey (HIES) to the year 2023 is not applicable, as people's food expenditure does not increase in line with inflation. Therefore, to calculate affordability, food

expenditure data derived from a survey conducted by the World Food Programme (WFP) in the November-December period of 2022 was used as the basis for estimation.

Note:

Household Food Security Overview (WFP, 2023)

In March 2023, World Food Programme (WFP) and Food and Agriculture Organization (FAO) jointly carried out the second Crop and Food Security Assessment Mission (CFSAM) for Sri Lanka based on a nationally representative sample of 15,035 households, designed to produce district-level estimates. Between August and September 2023, WFP conducted a follow-up survey of 8,633 households, of which 4,398 were drawn from the earlier round (panel sample) and 4,235 were newly selected from the sampling frame. The analysis applied district-level weighting to account for selection probabilities and non-response, ensuring that findings were statistically representative of Sri Lanka's population.

RESULTS

Cost of an Energy-only Diet

The average cost of an Energy-only diet is LKR 421 (*1.3 USD) per household per day. The cost of an Energy-only diet is highest in the Kegalle District (LKR 454/ day). The lowest cost of energy-only diet is observed in the Hambantota district (LKR 380/ day). The composition of an Energy only diet consists of energy-dense foods, mainly representing 1-3 food groups. This diet represents the lowest possible cost to meet only the energy requirements, without considering micronutrient adequacy.

**The average USD to LKR exchange rate in 2023 was 328.4207 LKR per USD*

Cost of an Energy-only Diet by Family Members

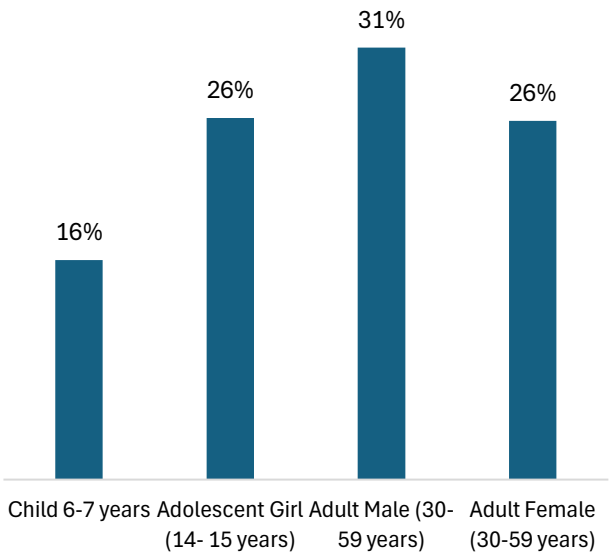
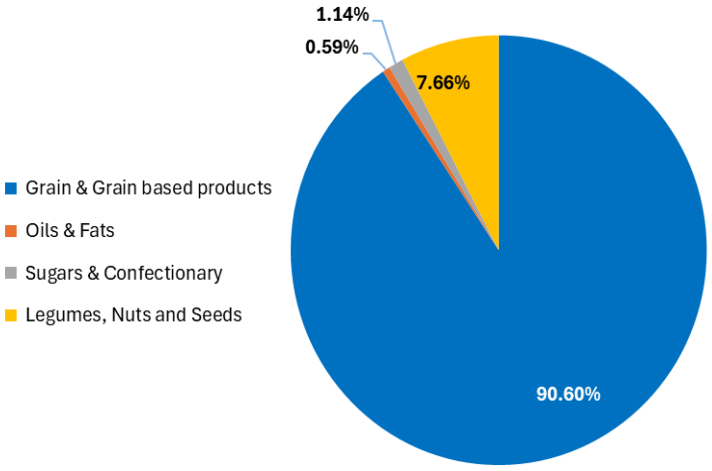


Figure 2: The cost of an energy-only Diet by family members, Source: CotD analysis -2023

Cost of Energy-only Diet by Food Categories

Figure 3: The cost of an Energy-only Diet by food categories, Source: CotD analysis -2023



Affordability of Energy-only Diet

On average 100% of the population can afford an energy-only diet in the year 2023 representing the total 25 districts.

Cost of Nutritious Diet

The average cost of a nutritious diet is LKR 915 (*2.8 USD) per household per day. The cost of a nutritious diet is the highest in Polonnaruwa District (LKR 1142), while the lowest in the Trincomalee District (LKR 850).

**The average USD to LKR exchange rate in 2023 was 328.4207 LKR per USD*

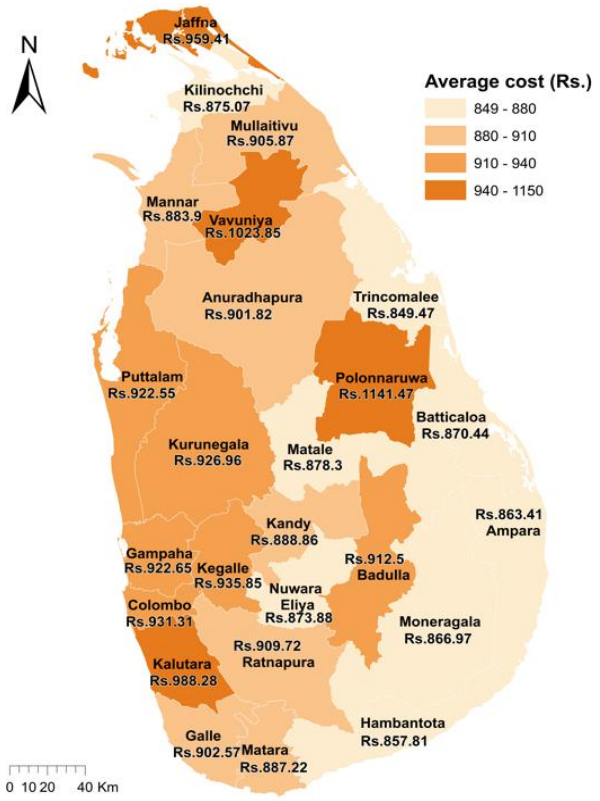


Figure 4: The national distribution of the minimum cost of a Nutritious Diet, Source: CotD analysis -2023

Cost of Nutritious Diet by Family Members

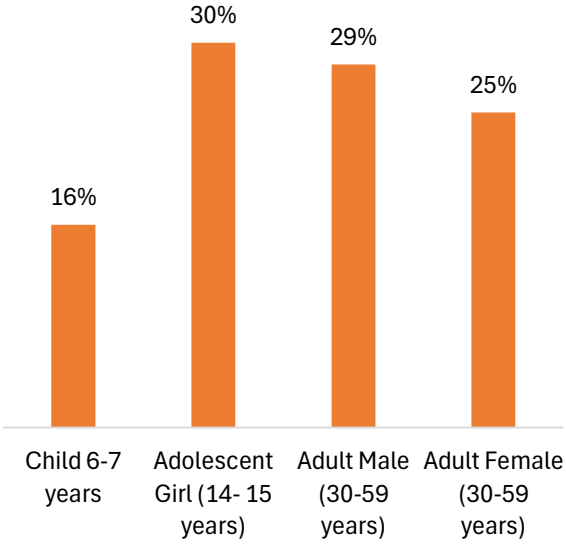


Figure 5: The cost of Nutritious Diet by Family members, Source: CotD analysis -2023

Cost of the Nutritious diet by age indicates the highest cost percentage for the adolescent girl (30%), proven by her higher nutritional requirements.

Composition of Nutritious Diet by Food Group

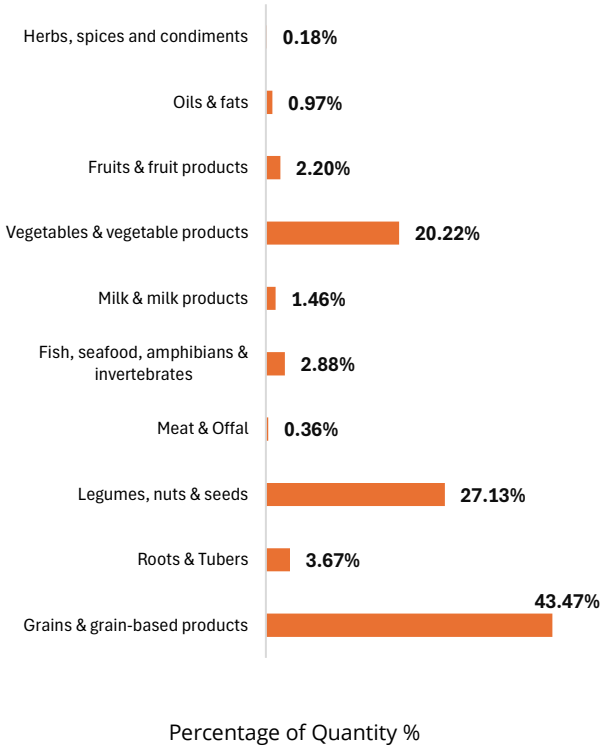


Figure 6: The Composition of Nutritious Diet by Food Group, Source: CotD analysis -2023

A nutritious diet consists of food items from ten different food groups, which provide essential nutrients such as starch (from grains and tubers), proteins (from fish and seafood, meat and offal, milk products, and legumes), fats (from oils and fats), and micronutrients, minerals, and fiber (from vegetables, fruits, and condiments).

The largest proportion (by weight) comes from grains and grain-based products (43%), followed by legumes, nuts, and seeds (27%), with dhal being the main vegetable protein source. Vegetables and vegetable products contribute 22%, with kathurumurunga being the primary vegetable in the diet.

Furthermore, it has been observed that, compared to 2022, animal protein sources (which made up 10%) have been replaced by plant-based protein sources in 2023. As a result, the share of animal protein has dropped to 5%, which has led to a decline in the overall nutritional quality of the diet.

Cost of Nutritious Diet by Food Group

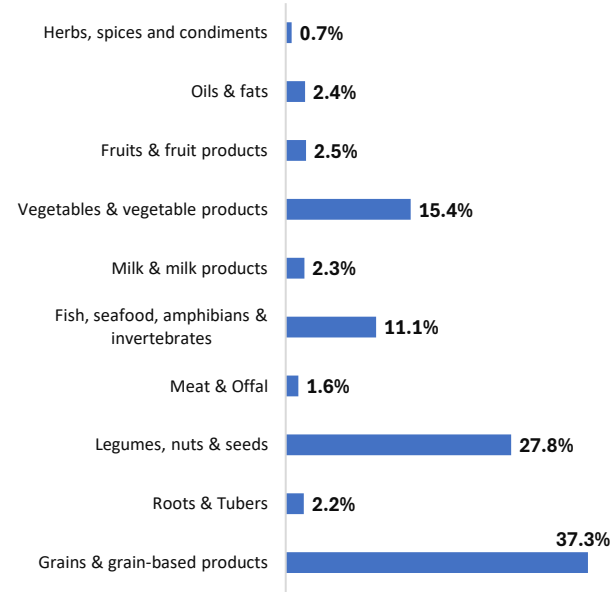


Figure 7: The Cost of Nutritious Diet by Food Group, Source: CotD analysis -2023

The food categories that provide proteins, such as legumes, meat and offal, fish and seafood, and milk and dairy, collectively account for 43% of the total cost of a nutritious diet. In contrast, cereals and tubers, which make up the largest share of the food quantity (43%), contribute only 37% to the overall cost of the diet. This highlights that protein sources remain more expensive compared to other food sources.

Out of all food items included in the analysis, the following were selected through linear programming to provide the least costly nutritious diet: Rice, Dhal, Cowpea, Eggplant, Bean (Yard Long), Kathurumurunga, Dried Anchovy, Coconut oil, Chicken, Dried Sardinella.

Non-Affordability of Nutritious Diets

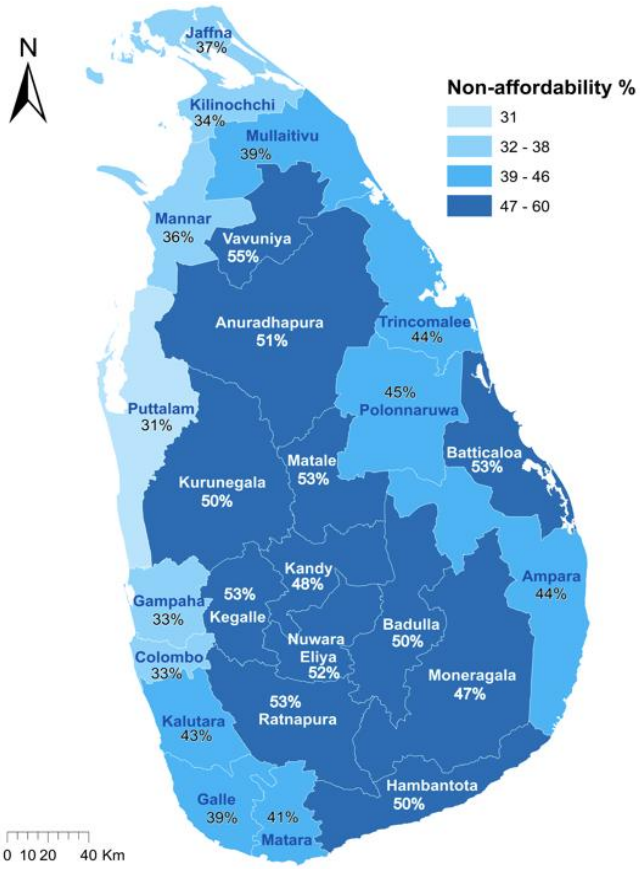


Figure 8: The national distribution of the non-affordability of a Nutritious Diet, Source: Household Food Security Survey (WFP, 2023)

In 2023, 47% of the population in Sri Lanka is unlikely to be able to afford a nutritious diet, Vavuniya representing the highest non-affordability rate (55%), followed by Matale (53%), Batticaloa (53%) Rathnapura (53%) and Kegalle (53%).

Note:

When the level of unaffordability reported in 2022 was adjusted using the 2023 food expenditure survey data conducted by the World Food Programme (WFP), the value increased from 47% to 87.3%. However, compared to this corrected 2022 value, the reported unaffordability level for 2023 was significantly lower (47%). This trend aligns with the decline in food inflation and oil prices, the recovery of agricultural production supported by the importation of inorganic fertilizer and the reintroduction of the fertilizer subsidy, as well as the overall stabilization of the macroeconomy.

FOOD ITEMS SELECTED FOR NUTRITIOUS DIETS IN SELECTED DISTRICTS								
District	**Cereals**	**Pulses**	**Vegetables**	**Meat**	**Fish**	**Oil & Fats**	**Fruits**	**Roots & Tubers**
Ampara	Rice (red, kekulu), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Kathurumurunga	Chicken	Dried Anchovy, Raw Sardinella goldstripe,	Coconut Oil	Avocado, Ambul Banana, Anamalu	Cassava
Anuradhapura	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Kathurumurunga,		Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe,	Coconut Oil	Avocado, Ambul	Potato
Badulla	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Kathurumurunga, Cabbage		Dried Anchovy, Raw Sardinella goldstripe	Coconut Oil	Avocado, Anamalu	Radishes
Batticaloa	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Kathurumurunga		Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe, Trenched Sardine, Raw	Coconut Oil	Anamalu, Orange	Potato
Colombo	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Eggplant, Kathurumurunga	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coconut Oil	Avocado, Ambul Banana	Potato
Galle	Rice (red, kekulu), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Eggplant, Kathurumurunga	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe,	Coconut Oil	Avocado, Ambul Banana, Anamalu	Potato
Gampaha	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Eggplant, Kathurumurunga	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coconut Oil	Anamalu	Potato
Hambantota	Rice (red, kekulu), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Eggplant, Kathurumurunga, Okra		Dried Skipjack Tuna, Dried Anchovy, Raw Sardinella goldstripe	Coconut Oil	Avocado, Ambul Banana	Potato, Cassava, Radishes
Jaffna	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Amaranthus, Ash Plantain, Bean (yard long), Kathurumurunga, Okra, Cabbage, Kankun,		Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe, Trenched Sardine, Raw	Coconut Oil	Ambul Banana, Papaya	Potato, Sweet Potato, Radishes, Cassava
Kalutara	Rice (red, kekulu), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Banana blossom, Bean (yard long), Kathurumurunga, Mukunuwenna, Cabbage, Okra	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coconut Oil		Potato, Sweet potato
Kandy	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Eggplant, Kathurumurunga, Mukunuwenna, Okra, Cabbage	Chicken	Dried Anchovy, Raw Sardinella goldstripe,	Coconut Oil	Avocado	Potato, Sweet potato
Kegalle	Rice (red, kekulu), Rice (samba, raw), Rice (nadu, white), Wheat flour, Bread (white)	Cowpea, Dhal, Green gram	Bean (yard long), Kathurumurunga	Chicken	Dried Anchovy, Raw Sardinella goldstripe,	Coconut Oil	Avocado, Ambul Banana, Anamalu	Potato

Source: CotD analysis -2023

Overall, the limited variation in selected food items across districts highlights the impact of elevated food prices on household purchasing power, resulting in constrained food choices and reduced dietary diversity.

Percentage of children under 5 years with wasting (SAM + MAM) – 2023

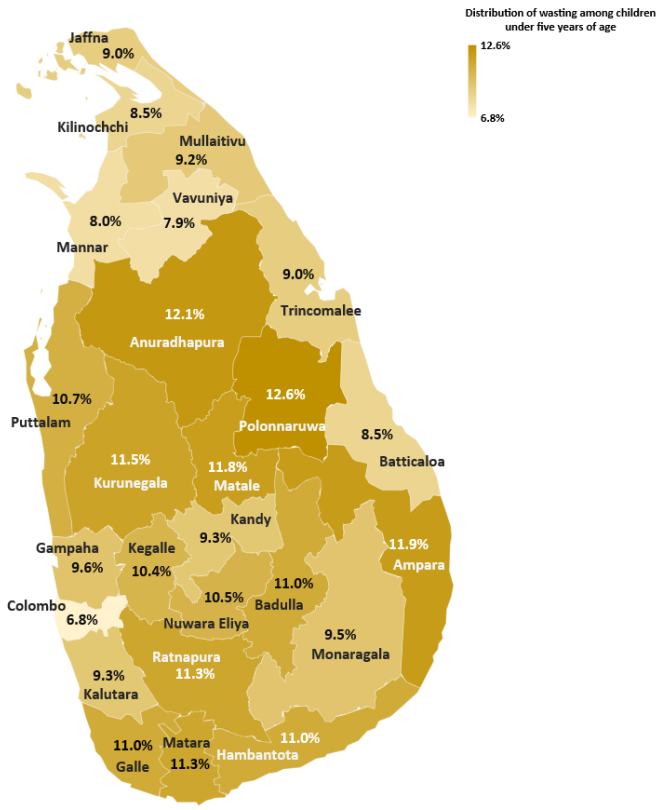


Figure 9: The national distribution of the Percentage of children under 5 years with wasting (SAM + MAM) – 2024, Source: Summary Report, National Nutrition Month 2023; FHB

Note: *Although the typical family profile does not include an under-five child, the national distribution of wasting will be used as a proxy to illustrate the burden of acute malnutrition, which is most likely influenced by the limited affordability of nutritious diets across the country.*

CONCLUSION

In 2023, a nutritious diet in Sri Lanka was nearly 2.2 times more expensive than a diet that meets only energy needs.

In 2022, nutritious diet was 3.5 times more expensive than an energy-sufficient diet due to inclusion of higher percentage of animal sourced proteins. Hence, from 2022 to 2023, quality of the nutritious diet has decreased.

Compared to 2022, the inflation of animal protein sources was notably high in 2023. Overall price inflation for animal proteins reached 15%, with egg prices increasing by 21%, meat prices rising by 19%, and fish prices experiencing a 5% increase. In contrast, the prices of plant protein sources, primarily dhal, decreased significantly by 31%. This substantial decline in plant protein prices likely contributed to the increased substitution of animal protein sources with plant proteins in 2023.

In 2023, 47% of the population could not afford a nutritious diet, reflecting an improvement compared to the higher non-affordability observed in 2022 (87%).

Nevertheless, an energy-only diet remained affordable for all, with 100% of the population able to meet basic energy requirements that year.

RECOMMENDATIONS

- The study recommends implementing policy and programmatic decisions, along with targeted intervention programs, to improve access to and affordability of animal protein sources.
- Further, analysis on policy interventions is to be combined with long-term development perspectives that raise economic access and nutritional inclusion of the most vulnerable.
- Designing and the implementation of the Nutrition Sensitive social protection programmes targeting the most vulnerable groups to promote nutritious diet intake with affordable costs.

LIMITATIONS

- The intra-household distribution of foods (within household members) may be unequal and was not taken into account in the analysis.
- Depending on the food availability and their cost, the software does not include animal-sourced foods if nutrients can be obtained from plant-based foods at a lower cost.
- A key limitation of this study is that the estimated diet costs are based on modelled scenarios and do not necessarily reflect actual or recommended household consumption patterns. These diets serve as scientific estimates of the minimum cost to meet energy and nutrient needs and should not be interpreted as practical or prescriptive amounts for daily living or decision-making, but as analytical benchmarks to understand affordability and guide policy discussions.

Research Team:

Hector Kobbekaduwa Agrarian Research and Training Institute:

Dr.N.P.G. Samantha, Ms. P.A. Jayamini Champika, Ms. U.D.R. Udari, Ms. Kushani Sewwandi, Ms. Mayumi Apsara

Nutrition Division, Ministry of Health

Dr. Aravinda Wickramasinghe, Dr. Amila Liyanage, Dr. Wathsala Abeysinghe

University of Peradeniya

Dr. Dilini Hemachandra

Wayamba University of Sri Lanka

Dr. Thushanthi Perera

Department of Census and Statistics

Ms. Gayani Manamperi

Medical Research Institute Sri Lanka – Ministry of Health

Dr. Hashan Amarathunga, Dr. Heshan Randika Manikgama Arachchi

World Food Programme

Ms. Dilka Peiris, Mr. Shehan Fernando, Ms. Sachini Pinnagoda, Ms. Hansika Chandrathilake, Ms. Keshini Soza

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Published by Hector Kobbekaduwa Agrarian Research and Training Institute, 114, Wijerama Mawatha, Colombo 07, Sri Lanka.

Tel: +94 112696981 Fax: +94 112692423

Email: director@harti.gov.lk Web: www.harti.gov.lk

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