ISSN 3051-5920

MINIMUM COST OF NUTRITIOUS DIET & AFFORDABILITY ANALYSIS: SRI LANKA

Cost of Diet Bulletin January – December 2024

Hector Kobbekaduwa Agrarian Research and Training Institute

WFP World Food Programme

Table of Contents....

List of Figures....

COST OF DIET AND AFFORDABILITY

The Cost of Diet Bulletin 2024 presents updated evidence on the cost and affordability of nutritious diets in Sri Lanka, set against an evolving macroeconomic and food-security landscape, and includes a comparative analysis of diet cost and affordability for 2022–2024.

The cost of diet (CotD) and diet affordability in Sri Lanka deteriorated markedly during 2022–2024, as economic crisis triggered a sharp spike in food inflation, driven by currency depreciation, import dependence, and supply disruptions, which together pushed up the prices of staples, oils, fruits, and proteins while real incomes eroded under shifting wage dynamics. Households responded by reducing dietary diversity, substituting animal-source foods with plant-based options, and prioritizing calorie-dense, cheaper items, with rural and lower-income groups bearing the greatest burden. Seasonal price volatility, supply chain disruptions, and energy shortages exacerbated affordability challenges, limiting access to nutritious diets. Policy responses for 2023-2024 aimed to mitigate these effects, but coverage gaps and leakage hampered their protective impact.

In 2024, Sri Lanka experienced partial macroeconomic stabilization accompanied by uneven income growth, with food prices remaining elevated relative to pre-crisis levels.

The Cost of Diet (CotD) is a method to model the cost of a theoretical, simulated diet (food basket) which satisfies all nutritional requirements of a household of specific composition of interest at the minimal possible cost, based on the availability, price, and nutrient content of local foods. Any other food basket at the same price will be less nutritious, and any other food basket of the same nutrient value will be more expensive. 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.

In this analysis, we focus exclusively on the Energy-Only Diet and the Nutritious Diet.

Use of CotD in Estimating Nutritional Affordability

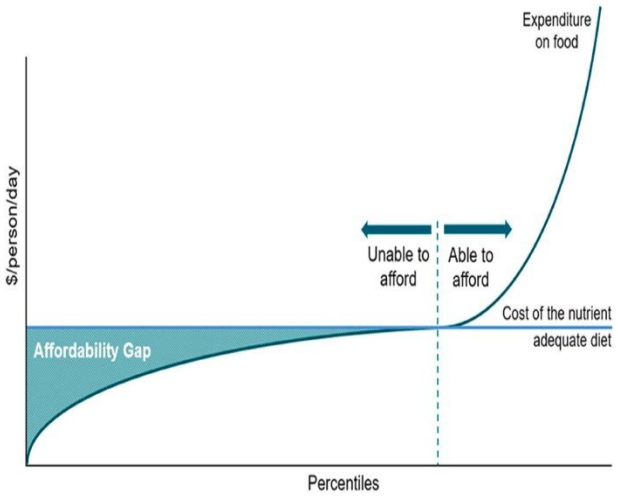


Figure 1: Visualization of the affordability gap, Source: Balagamwala et al. (2024)

Using estimations of household food expenditure data, the CotD can be used to estimate the proportion of households that could theoretically afford a nutritious diet. The underlying assumption is that members of households that cannot afford the cheapest possible nutritious diet are more likely to be malnourished.

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 of 113 food items from Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) used to calculate cost of the diets. Household Food Security Survey (WFP 2024), collected in November–December 2024, used for affordability analysis.
- Four-member typical family (school-going child (6-7 years), adolescent girl (14 years), adult woman and adult man was considered.
- All 25 districts were included.
- The minimum cost of Energy only and Nutritious diets were calculated.
- Affordability was calculated by comparing per-capita energy-only and nutritious-diet measures to the district's per-capita food expenditure data.
- Calculated diets are economic benchmarks derived from market-available foods that satisfy nutrient requirements at the lowest attainable cost.
- The measure does not represent actual dietary intake and is not intended to yield recommendations on what individuals should eat.

Note:

Household Food Security Survey (WFP,2024)

The WFP Household Food Security Survey 2024 was conducted in Sri Lanka between November and December 2024 to provide up-to-date evidence on food security across the country. Covering 15,000 households, including Aswesuma programme beneficiaries, the survey used a stratified two-stage cluster sampling design with each of the 25 districts treated as a separate stratum to ensure representation across urban, rural, and estate sectors. To ensure representativeness, base weights were calculated incorporating selection probabilities and adjusted for non-response, and a GN-level post-stratification factor corrected for differences between estimated and actual measure of size, ensuring the findings reflect true population distribution.

RESULTS

Cost of Energy-only Diet

The composition of 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 cost of an Energy-only diet is LKR 454 (*1.5 USD) per household per day. The cost of an Energy-only diet is highest in the Kegalle District (LKR 499 /day). The lowest cost of Energy only diet is observed in Hambantota district (LKR 424/day).

**The average USD to LKR exchange rate in 2024 was 301.8049 LKR per USD*

Cost of Energy-only Diet by Family Members

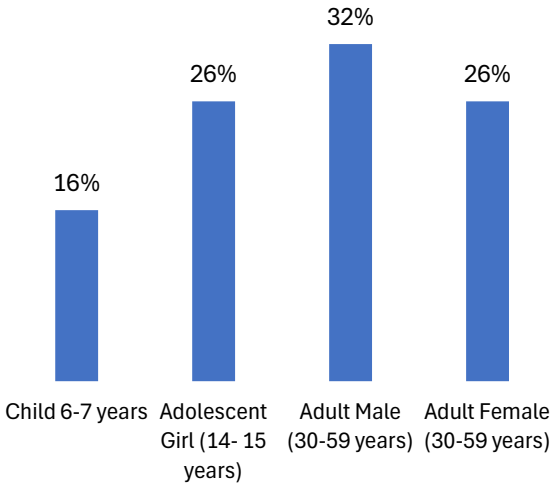


Figure 2: The cost of an Energy-only Diet by family members, Source: CotD analysis -2024

Cost of Energy-only Diet by Food Categories

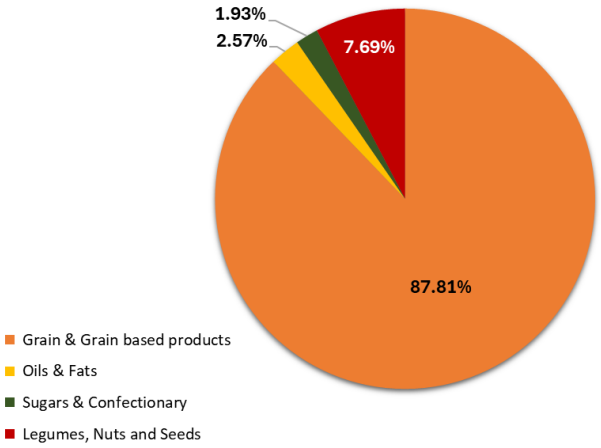


Figure 3: The cost of an Energy-only Diet by Food Categories, Source: CotD analysis -2024

Affordability of Energy-only Diet

In 2024, an Energy-only diet was affordable for the entire population, with 100% affordability recorded on average across all 25 districts.

Cost of Nutritious Diet

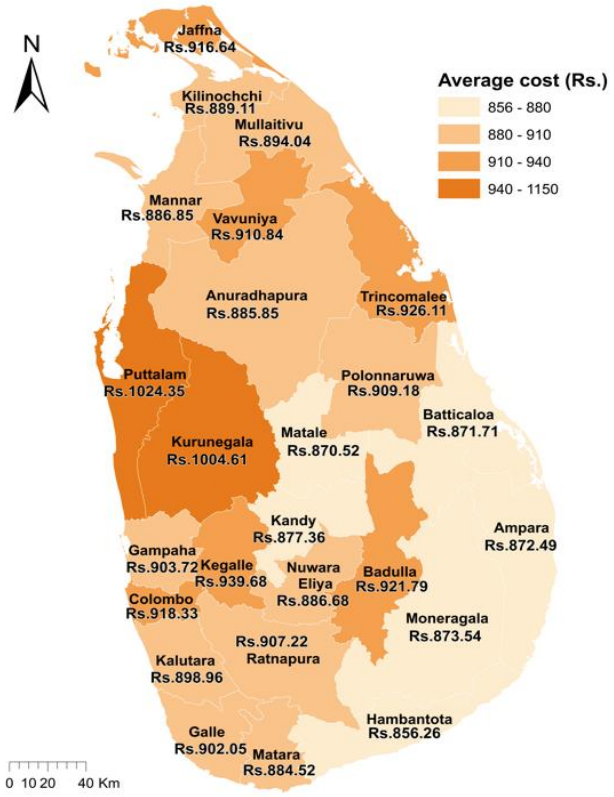


Figure 4: The national distribution of the minimum cost of a Nutritious Diet, Source: CotD analysis -2024

A Nutritious diet comprises both nutrient-dense and staple foods, representing more than five food groups. The largest proportion is contributed by grains and grain-based products, followed by legumes and vegetables.

The average cost of a Nutritious diet is LKR 905 (*3.0 USD) per household per day. The cost of a nutritious diet is highest in the Puttalam District (LKR 1024) while the lowest in the Hambantota District (LKR 856)

**The average USD to LKR exchange rate in 2024 was 301.8049 LKR per USD*

Cost of Nutritious Diet by Family Members

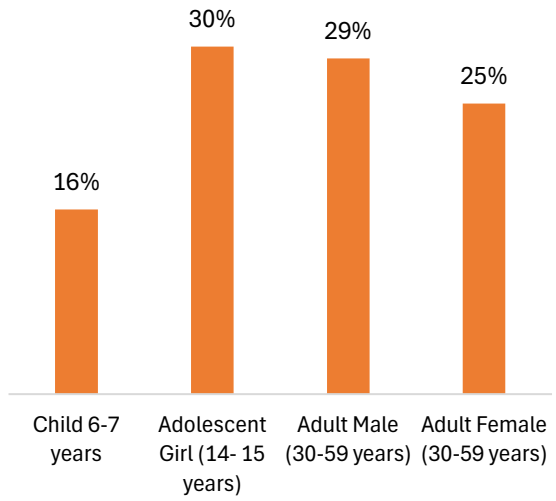
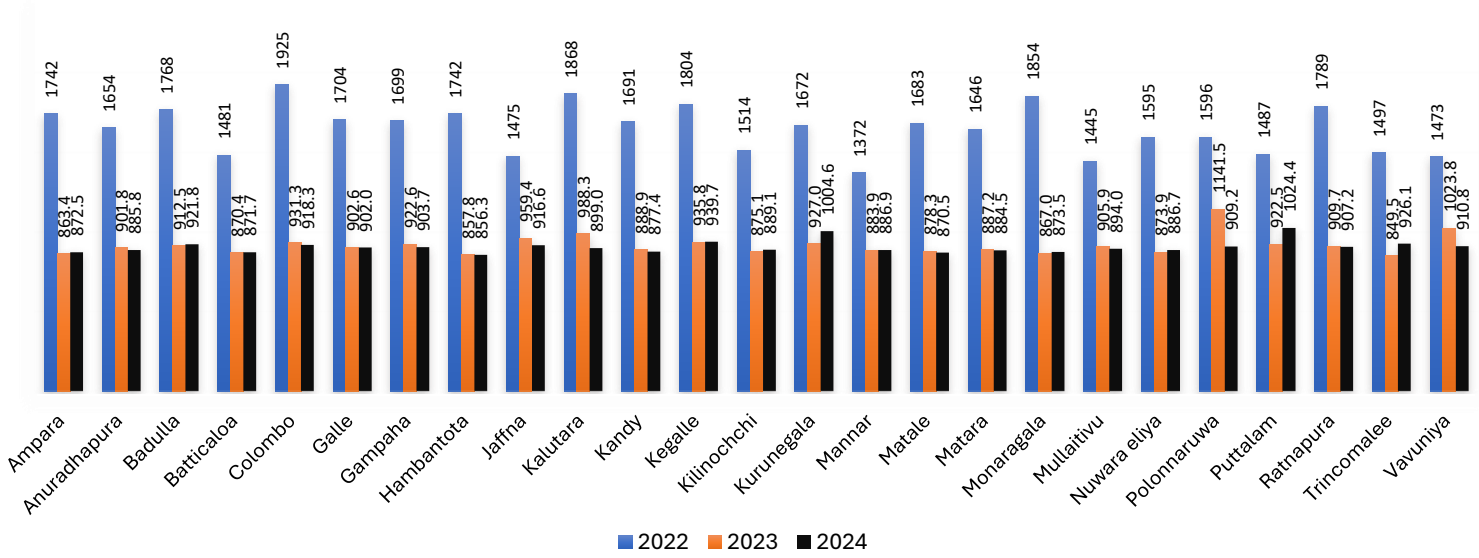


Figure 5: The cost of Nutritious Diet by family members, Source: CotD analysis -2024

Cost of the Nutritious diet by family members indicate the highest cost percentage for the adolescent girl, proven by her higher nutritional requirements.

Comparative Overview of the Average Cost of a Nutritious Diet (2022–2024)

Figure 6: The Average Cost of a Nutritious Diet (2022–2024), Source: CotD analysis -2022, 2023 & 2024



When comparing the three consecutive years, the average cost of a nutritious diet shows a pronounced surge in 2022, recording nearly twofold higher relative to the subsequent years. In contrast, during 2023 and 2024, the cost levels have been stagnated, within the range of Rs. 800 to Rs. 1,000, indicating a relative price equilibrium with no substantial year-on-year variation.

Composition of Nutritious Diet by Food Group

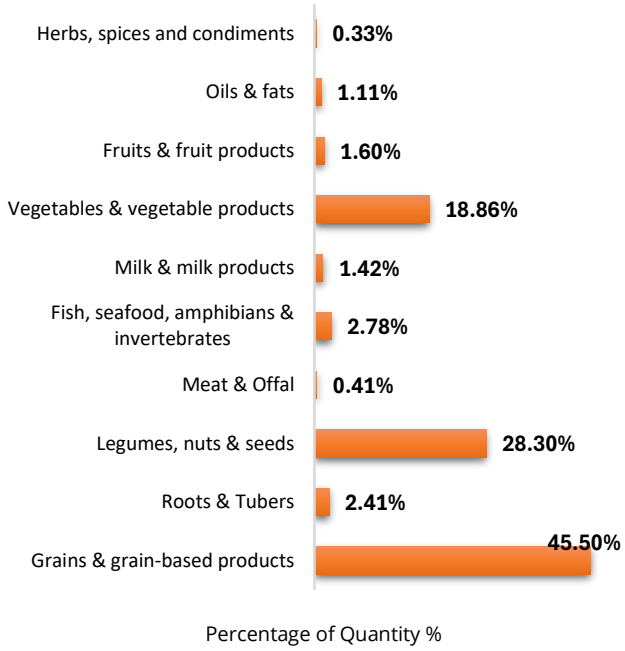


Figure 7: The Composition of Nutritious Diet by Food Group, Source: CotD analysis -2024

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 (46%), followed by legumes, nuts, and seeds (28%), with dhal being the main vegetable protein source. Vegetables and vegetable products contribute 19%, with kathurumurunga being the primary vegetable in the diet.

Cost of Nutritious Diet by Food Group

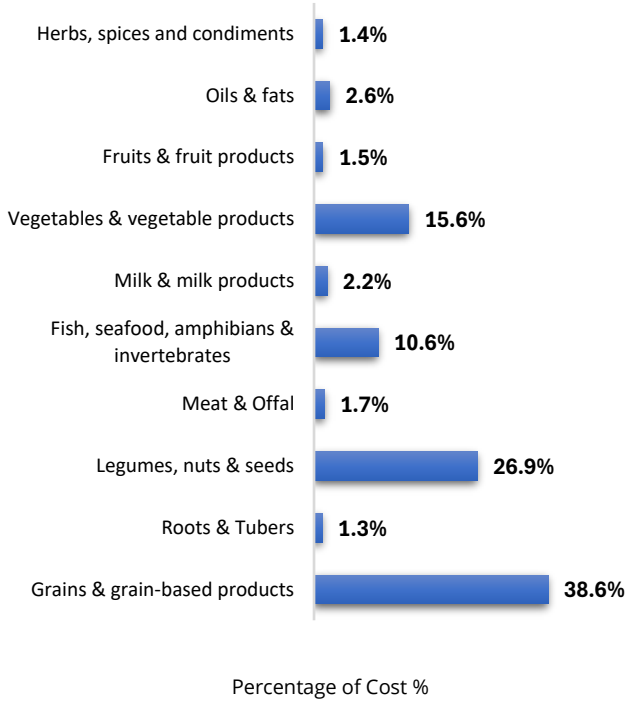


Figure 8: The Cost of Nutritious Diet by Food Group, Source: CotD analysis - 2024

The cost data percentages align with the composition of the diet, hence indicating the highest cost percentage for the grain & grain-based products. The cost of protein sources (legumes, meat, milk and dairy, fish and seafood) constitutes approximately 41% of the total expenditure on the diet, representing the highest cost percentage of the diet.

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, Mukunuwenna, Bean (Yard Long), Kathurumurunga, Coconut oil, Chicken, Dried Sardinella.

FOOD ITEMS SELECTED FOR NUTRITIOUS DIETS IN SELECTED DISTRICTS								
District	**Cereals**	**Pulses**	**Vegetables**	**Meat**	**Fish**	**Oil & Fats**	**Fruits**	**Roots & Tubers**
Ampara	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga	Chicken	Dried Anchovy, Raw Sardinella goldstripe, Dried Sardinella	Coco-nut Oil	Avocado, Ambul Banana	Cassava
Anura-dhapura	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga,		Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe,	Coco-nut Oil	Anamalu	
Badulla	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga, Kankun, Eggplant	Chicken	Dried Anchovy, Raw Sardinella goldstripe, Dried Sardinella	Coco-nut Oil	Avocado, Anamalu	Potato
Batticaloa	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coco-nut Oil	Anamalu	
Colombo	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coco-nut Oil	Avocado	
Galle	Rice (red, kekulu), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Eggplant, Kathu-rumurunga, Mukunuwanna, Okra	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe,	Coco-nut Oil	Avocado, Ambul Banana	
Gam-paha	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Eggplant, Kathu-rumurunga, Kankun, Mukunu-wanna, Okra	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coco-nut Oil	Anam-alu, Am-bul, Avo-cado, Pa-paya	
Ham-bantota	Rice (red, kekulu), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga, Okra, Banana blossom		Dried Skipjack Tuna, Dried An-chovy, Raw Sar-dinella goldstripe	Coco-nut Oil	Avocado, Ambul Banana, Anamalu	
Jaffna	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal,	Ash Plantain, Bean (yard long), Kathurumurunga,		Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coco-nut Oil	Ambul Banana, Papaya	Cassava
		Green gram	Eggplant, Kankun, Okra					
Kalutara	Rice (red, kekulu), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga	Chicken, Beef	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coco-nut Oil		
Kandy	Rice (red, kekulu), Rice (samba, raw), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga, Okra	Chicken	Dried Sardinella, Dried Anchovy, Raw Sardinella goldstripe	Coco-nut Oil	Avocado	Potato, Sweet potato
Kegalle	Rice (red , kekulu), Rice (samba, raw), Rice (Nadu, white), Wheat flour, Bread (white)	Cow-pea, Dhal, Green gram	Bean (yard long), Kathurumurunga	Chicken	Dried Anchovy, Raw Sardinella goldstripe,	Coco-nut Oil	Avocado, Ambul Banana, Anamalu	

Source: CotD of Diet analysis -2024

This pattern underscores that, although dietary needs vary, the high cost of food forces many districts to depend on a narrow set of low-cost staples, reducing opportunities for dietary diversity and nutritional adequacy.

Non-Affordability of Nutritious Diets

The expenditure data used for the affordability analysis is based on the Food Security Survey conducted by the World Food Programme in November and December 2024, and it has been assumed to be applicable for the entire year.

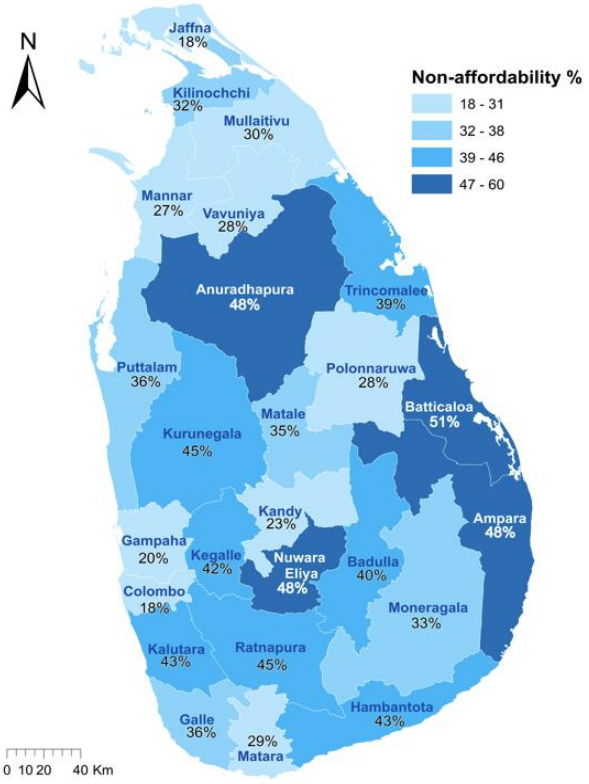


Figure 9: The national distribution of the non-affordability of a Nutritious Diet, Source: Household Food Security Survey (WFP, 2024)

In 2024, 37% of the population is unlikely to be able to afford a nutritious diet, Batticaloa representing the highest non affordability rate (51%), followed by Ampara (48%), Nuwara Eliya (48%) and Anuradhapura (48%).

The relatively high non-affordability rates of nutritious diets initially observed in Ampara and Batticaloa in 2024 can be partly attributed to the timing of data collection. Although the expenditure data were assumed to represent the entire year, they in fact correspond to November and December, when both districts experienced flooding events that likely suppressed household expenditure capacity. Consequently, the recorded expenditures may not accurately reflect typical levels, leading to unusually high non-affordability estimates.

To correct for this and ensure comparability, the non-affordability rates for Ampara and Batticaloa; which otherwise appeared abnormally high, were recalculated after adjusting the 2024 household expenditure for 2023 food inflation rates. Deflating by inflation enables the inter-year comparison to be made in real terms, accurately reflecting changes in households' capacity to afford a Nutritious diet.

Percentage of children under 5 years with wasting (SAM + MAM) – 2024

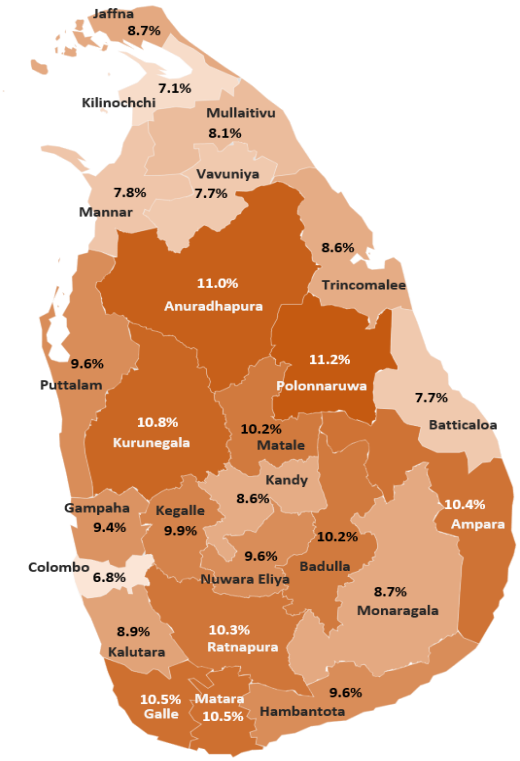


Figure 10: The national distribution of the Percentage of children under 5 years with wasting (SAM + MAM) – 2024, Source: Summary Report, National Nutrition Month 2024; FHB

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.*

Comparison of the affordability of a Nutritious Diet of the year 2022, 2023 & 2024

For this specific comparison, the non-affordability figures corresponding to the year 2022 will be adjusted using the expenditure data from 2023. This adjustment is made under the assumption that the overall economic conditions and disparities across districts have remained relatively consistent over the last two years (2022,2023), primarily influenced by the inflationary trends and their subsequent impacts on household purchasing power and expenditure patterns.

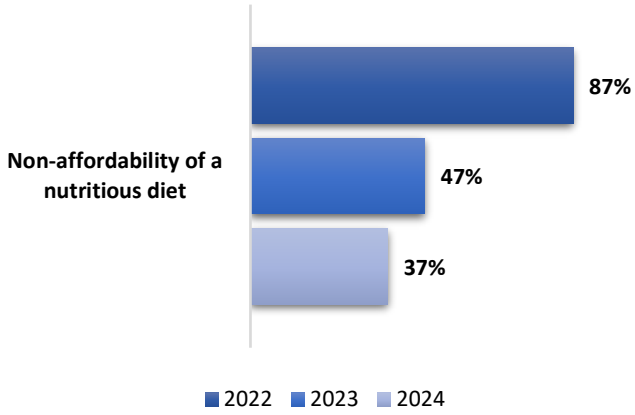


Figure 11: The national deviation in non-affordability levels of a Nutritious Diet across 2022, 2023, and 2024, Source: CotD analysis - 2022, 2023 & 2024

The comparison, after accounting for these assumptions, indicates that in 2022, the non-affordability rate of a Nutritious diet was extremely high (87%), primarily due to economic instabilities and the consequences of inflation. A comparatively lower rate was observed in 2023, which may still reflect residual effects of the previous year's inflation. By 2024, the non-affordability rate had further declined to an overall level of 37%.

Diet cost and affordability (Summary Table 2022-2024)

Year	Cost of an Energy-only Diet	Affordability of an Energy only Diet	Cost of a Nutritious Diet	Non-affordability of a Nutritious Diet
2022	LKR 468	98%	LKR 1,707	87%
2023	LKR 421	100%	LKR 915	47%
2024	LKR 454	100%	LKR 905	37%

Source: CotD analysis -2022, 2023 & 2024

CONCLUSION

- A diet that meets nutrient requirements for all members of this household would cost LKR 905, almost twice as much as a diet that only meets its energy needs in the year 2024.
- An Energy-only diet remained affordable for all, with 100% of the population able to meet basic energy requirements in 2024, and only 37% of the population could not afford a nutritious diet, reflecting an improvement compared to the higher non-affordability observed in 2023 (47%).
- Despite headline inflation declined from its 2022 peak, food inflation remained elevated compared to pre-crisis levels and uneven across districts. Hence, while diet costs decreased marginally, income growth, improved the affordability levels in 2024.
- The portion of animal protein in the diet expanded from 5% in 2023 to 15% in 2024, resulting in an enhancement of the diet's overall nutritional quality.

RECOMMENDATIONS

- Despite improvements in some regions, persistently high costs hinder access to a Nutritious diet for all, necessitating targeted interventions and policies.
- The study recommends short-term nutrition-sensitive social protection programs for the most vulnerable.
- In areas where CotD is relatively high, it is recommended to Implement context-specific strategies such as food fortification, supplementation, and improved market access, along with non-food measures like supporting income-generating opportunities and providing cash-based incentives to enhance dietary affordability and improve nutritional outcomes.
- Further, analysis on policy and nutritional interventions is to be combined with long-term development perspectives that raise economic access and nutritional inclusion of the most vulnerable.

LIMITATIONS

- Due to the adjustments made while conducting the comparisons, the affordability data of 2022 does not accurately reflect the data on food expenditure since it employs the 2023 data on expenditure rates.
- The intra-household distribution of foods (within household members) may be unequal and was not taken into account in the analysis.
- Depending on the foods available and their cost, the software may 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

This is a joint initiative of Hector Kobbekaduwa Agrarian Research and Training Institute, Ministry of Health, Department of Census and Statistics and World Food Programme.

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

3051-5920