

Effects of Food Price Inflation on Cost and Affordability of Nutritious Diets in Sri Lanka: The Role of Cash Transfers

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Abstract

Ensuring economic access to nutritious diets is crucial during times of economic crises. This study assesses the cost and affordability of diets and the impact of short-term nutrition-sensitive cash transfers on affordability. Secondary data on weekly retail prices of 86 food commodities from 25 districts in 2022 were collected from the Hector Kobbekaduwa Agrarian Research and Training Institute. The minimum cost of a nutritious diet, its affordability, and targeted interventions were simulated using Cost of Diet software. Affordability estimates were derived from the Household Income and Expenditure Survey of 2019 inflated to 2022. The average daily cost per household for an energy-only diet is LKR 468.00, while a nutritious diet is LKR 1,707.00. Household non-affordability for a nutritious diet was 47%, with the highest (73%) being reported in the Moneragala district. The targeted intervention of cash transfers of LKR 5000.00 to LKR 15,000.00 per month per household has improved nutrition inclusion and improved affordability by 6%-24%. Short-term nutrition-sensitive social protection programs for the most vulnerable prove to be an effective policy tool for ensuring economic access to nutritious diets.

Key Words: *Diets Costs, Economic Crisis, Food Prices, Food Security, Non-Affordability, Nutrition Interventions*

Introduction

Food and nutrition security of a population is influenced by food availability, access, utilization, and affordability at both the country and household levels (FAO, 2009). However, the world still grapples with hunger, food insecurity, and malnutrition; approximately one in three individuals lacks sufficient access to food (Rana *et al.*, 2023). Food access can be constrained by changes in food price and affordability. An increase in food prices can exacerbate food insecurity and increase the likelihood of

malnutrition (Martin-Prevel *et al.*, 2012) because the cost of food is the main factor affecting food purchasing choices (Lo *et al.*, 2009). Since Independence, Sri Lanka's economy has experienced the most acute financial crisis in recent years. Prices for all goods and services spiked due to the devaluation of the Sri Lankan rupee against the United States dollar. Food inflation rates began to rise in April 2022 and peaked (95%) in September, 2022 (CBSL, 2023). According to Samantha *et al.* (2023), 54% of the households faced food insecurity in 2022, impacting the food consumption patterns, particularly those in lower-income brackets and marginalized communities. Consuming food high in calories but low in nutrients has become a top priority, which has lowered the quality of their diet and ultimately raised the rate of malnutrition.

The disparity between household earnings and the fast-rising cost of food has caused income inequality to expand. Through poverty and malnutrition, it has dealt a severe blow to the stability of the economy and the well-being of the poor. Food inflation, worsened by the threat of malnutrition, is one of the biggest challenges faced by authorities and people (Vellakkal *et al.*, 2015). The term social safety net is used in a broader context to refer to any program that benefits individuals or families. Social safety net programs shield the public from the effects of natural disasters, economic shocks, and other crises. To assist low-income families and other vulnerable groups in society, the government is thinking of extending its social safety net owing to the soaring cost of living combined with rising food inflation. The primary problem that numerous studies have highlighted is the necessity of determining the appropriate target audience and intervention strategy (Kuran *et al.*, 2020; Hanafi, 2023).

To study diverse implications of food prices on food security and nutrition in distinct regions and households, various methods have been applied. A way to assess the impact of escalating food prices on the affordability of a nutritionally adequate diet and its potential nutritional consequences is to estimate the cost of such a diet using linear programming and household income levels. The Cost of Diet (CoD) is a technique that models the minimum cost of a theoretical, simulated diet that satisfies all the nutritional requirements of a specific household composition, based on the availability, price, and nutrient content of local foods. The CoD can be used in tandem with data on household expenditures to determine the proportion of households that could potentially afford the nutritious diet. Thus, the CoD tool helps determine the economic accessibility of a nutritious diet and whether the lack of availability to nutrient-rich food is the primary cause of malnutrition and micronutrient deficiencies.

The CoD analysis is a valuable resource for evaluating the variation of CoD across different regions and seasons, apart from identifying specific geographic areas and demographics that require food security and market interventions. Regular comparisons of affordability and changes in CoD can serve as an indicator of how economic downturns affect population food consumption patterns. By determining

the lowest cost for a nutritious diet, the CoD approach can also be used to model the impact of social safety nets on the affordability of a nutritious diet. This, in turn, can be used as an advocacy tool to compare the cost-effectiveness of various potential nutrition interventions and strategies (Frega *et al.*, 2012; Baldi *et al.*, 2013). Therefore, this study aims to estimate the minimum cost and affordability of a nutritious diet, as well as the effect of short-term nutrition-sensitive cash transfers as a social safety net measure on affordability. It is conducted in the context of increasing food costs with the goal of influencing policy to address undernutrition in Sri Lanka and shedding light on the overlooked role of affordability in nutrition access.

The introduction section of this paper presents the background and study objectives, while the literature review presents an overview of research on the affordability and CoD in light of rising food inflation. The methodology section contains the materials and methods used to achieve the study objectives. The fourth section focuses specifically on presenting the findings and presenting a critical analysis. The final section presents the conclusion and recommendations.

Literature review

Relatively higher cost of nutritious foods leads to reduced consumption of nutrients, resulting in compromised diets and micronutrient inadequacy. Therefore, the cost of a diet is considered a key factor in determining the overall quality of the diet and its nutritional results. The study by Islam *et al.* (2023) estimated the minimum cost and affordability of the recommended diet based on the updated food-based dietary guidelines in Bangladesh. According to the authors' findings, the cost of the recommended diet was out of reach for almost 43% of Bangladeshi households, with rural areas bearing of the brunt of the burden. These findings further emphasized the need for immediate implementation of policies aimed at lowering the cost of the recommended diet and reworking legal mechanisms to create a sustainable food system.

According to Bai *et al.* (2021), the goal of numerous legislation and initiatives is to make nutrient-dense diets more affordable for the underprivileged. The authors analyzed retail prices and nutrient composition of 671 foods and beverages to calculate the daily cost of essential nutrients needed for an active and healthy life in 177 countries worldwide. The study compares the minimum cost of nutrient adequacy with the subsistence cost of dietary energy and per-capita spending on all goods and services to offer insights on how diet cost and affordability are linked to economic development and nutrition outcomes. These findings suggest opportunities for targeted policies and initiatives to reduce market prices and the cost of nutritious

foods while improving affordability through safety nets, nutrition support, and increased incomes for low-income households.

Kachwaha *et al.* (2020) conducted surveys in 24 markets and 125 households in Uttar Pradesh, India, to study food prices and consumption patterns. The CoD software was utilized to simulate scenarios of home production and social protection measures to improve affordability. The study also assessed the lowest cost of different diets and the feasibility of nutrient-dense meals. Encouragement of kitchen gardens as a means of diversifying diets, enhancement of food transfers methods and quality, and strengthening of the financial framework for cash transfers are a few policy initiatives that could be taken in this regard. The authors propose further research to explore the practicality and effectiveness of specific interventions in different contexts to make nutrient-rich diets more accessible.

The CoD method and software not only influence policy and advocacy discussions on the financial burden of meeting energy and nutrient specifications but also inform programme design and behaviour change communication in the areas of nutrition, food security, livelihoods, and social protection (Deptford, 2017). Linear programming has been utilized to plan and estimate the cost of a nutritionally adequate diet for children, men, and women (Briend *et al.*, 2001; Darmon *et al.*, 2006; Rambelison *et al.*, 2008; Dibari *et al.*, 2012). The CoD tool can be used to assess the affordability and cost of a household's diet as well as assist with family diet designing, which may comprehend the potential consequences of a crisis on the nutritional well-being of households with distinct socioeconomic backgrounds (Save the Children UK, 2009; Save the Children UK, 2011). Recent studies have shown that CoD can serve as an advocacy tool to promote food-based interventions or social safety net programs, depending on the specific context (Save the Children UK 2009; Frega *et al.*, 2012; Baldi *et al.*, 2013; Save the Children UK 2013; Geniez *et al.*, 2014; Termote *et al.*, 2014; Biehl *et al.*, 2016).

The report of Minimum Cost of a Nutritious Diet (2015) in Sri Lanka has computed the CoD for every province by taking into account both cultivation and harvest periods. It is observed that expenses tend to rise significantly in all provinces during the *Yala* harvest season, resulting in a surge of 2% to 16% in the costs associated with maintaining a nutritious diet compared to the *Maha* planting season, which marks the period of the year when food prices are at their lowest. In the year 2012, more than half of the households in the Eastern Province faced difficulties in affording a diet that is adequately nutritious, with the affordability rates ranging from 39% to 48% in the Uva Province and from 27% to 36% in the North and Central Provinces.

According to the ‘Filling the Nutrition Gap’ report in Sri Lanka, FNG (2018), the estimated daily cost of an energy only diet for a five-person household was LKR 209.00, while a diet meeting nutrient requirements for all household members would cost LKR 454.00. Interestingly, in most districts, fewer than 20% of households were unable to afford a nutritious diet. However, the Central region experienced slightly higher non-affordability rates, with 22% and 23% of households in Monaragala and Rathnapura districts, respectively, unable to purchase a nutritious diet in 2018. However, there are only few studies that focus on the cost and affordability of nutrient-rich diets in the face of rising food prices in Sri Lanka with current economic crisis. Save the Children Report (2022) emphasized the need for location-specific interventions due to the inflationary nature of food costs and currency devaluation, which may widen the affordability gap. Further, the report recommends regular and continuous updates to the CoD results using up-to-date information to inform policy interventions and advocacy efforts.

Materials and methods

This study estimated the cost of a nutritious diet in different scenarios using the CoD research methodology and CoD software developed by Save the Children United Kingdom. By utilizing three quantitative datasets (food composition tables, individual nutritional requirements, and food price data) along with qualitative insights on local dietary preferences, the CoD software uses linear programming to understand how poverty, food availability and prices may impact households' ability to meet their nutritional needs. Using price data collected from secondary sources, the software calculates the amount, combination and cost of local foods that required to meet individuals or households' energy needs and recommended intakes of protein, fat, and micronutrients.

The CoD analysis relies on secondary price data from Hector Kobbekaduwa Agrarian Research and Training Institute (HARTI) and food expenditure data from the Household Income and Expenditure Survey-2019 (HIES, 2019), Department of Census and Statistics, adjusted to 2022. District retail price data for 86 food items from 25 districts representing 39 markets was averaged monthly and used to calculate food prices and availability. Food expenditure data was used to estimate the affordability of a nutritious diet. This study spans from January to December 2022 and is centered on a standard household with an assumed size of four: an adult man, an adult woman, a child aged 6-7, and an adolescent girl aged 14–15.

This article discusses two diets: (i) Energy-Only Diet: The lowest-cost diet that only meets the average energy requirements of the members of the household; and (ii) Nutritious Diet: The lowest-cost diet that meets the average energy and the recommended nutrient requirements of the members of the household. Using

estimations of household food expenditure data, estimate the proportion of households that could theoretically afford a nutritious diet. The CoD approach used to model the effect of cash transfers on the affordability of nutritious diets. In this study, several different cash transfer interventions or ‘what if’ scenarios were modelled to examine the effects on the individual’s cost of nutritious diets and the household’s affordability of them. This modelling exercise aimed to estimate the potential effect of three different cash transfer amounts (LKR 5,000/month, LKR 10,000/month, and LKR 15,000/month) on household affordability in the most vulnerable groups. The model assumes that the additional income will only be spent on food items to meet the nutritional requirements of the household, and the household income remains stable.

Results and discussion

This sub-section of the paper presents the findings of diet costs, compositions, affordability, and their variations over time and in different districts in Sri Lanka. All costs are calculated and shown in Sri Lankan rupees. Findings are based on the standard family size of four people, which includes a man, a woman, and two children. The energy-only diet consists mainly of energy-dense foods, with grains and grain-based products (84%), oils and fats (14%), and sugar and confectionery (2%) being the primary food groups. In Sri Lanka, grains and grain-based products make up nearly 92% of the total cost of this diet. The annual average daily cost of an energy-only diet is LKR 468.00 for a four-member household in 2022, and 98% of Sri Lankan households could afford it. The daily cost of an energy-only diet ranged from LKR 358.00 to LKR 528.00 from January to December 2022, with July having the highest value of LKR 528.00. The daily cost of an energy-only diet ranged from LKR 449.00 to LKR 487.00 while taking into account 25 districts in Sri Lanka. The highest and the lowest daily costs of energy-only diets are found in the Colombo and Hambantota districts respectively.

The average daily cost of a nutritious diet in the country was LKR 1707.00, which is 3.6 times higher than an energy-only diet. Within households, daily costs for nutritious diets vary: a child aged 6-7 years’ costs LKR 250.00, an adolescent girl (13–14 years) costs LKR 482.00, an adult woman costs LKR 444.00, and an adult man costs LKR 471.19. The expenses for meeting the nutrient requirements of the adolescent girl and adult woman make up approximately two-thirds of the total household cost. In 2022, around half of the population could not afford a nutritious diet (47%), with the highest percentage in July at 54% mainly because of the high food inflation.

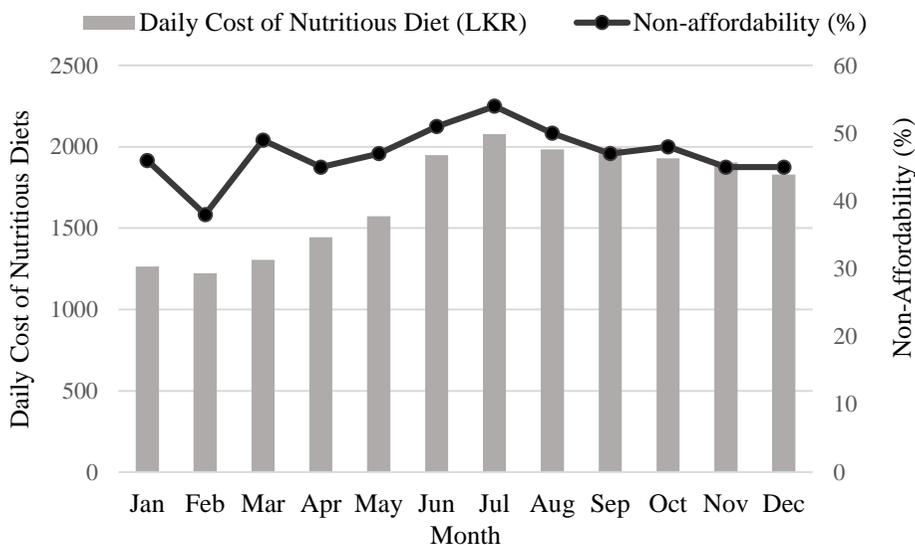


Figure 1: Change in the daily cost and non-affordability of a nutritious diet for the standard four-person family in Sri Lanka 2022.

The minimum cost of a nutritious diet is made up of nutrient-dense and staple foods, with more than five food groups representing root and tubers (25%), grain and grain-based products (24%), vegetable and vegetable products (23%), legumes, nuts, and seeds (10%), oil and fats (8%), fish, seafood, amphibians, and invertebrates (8%), fruit and fruit products (2%), milk and milk products (1%), and meat and offal (1%). However, animal-sourced food represents almost 46% of the cost of the nutritious diet in Sri Lanka but only 10% of its composition. It is important to stress that a nutritious diet only reflects the cheapest way for the typical household to meet its macro and micro-nutrient requirements. During the analysis, CoD software considered the price and nutrient content of all available food items (86 food items) and did not apply any constraints.

The monthly cost of a nutritious diet for the model Sri Lankan household varies from LKR 41646.17 in the Mannar district to LKR 58446.83 in the Colombo district. That difference is much smaller for the energy-only diet, ranging from LKR 13641.17 in Hambantota to LKR 14790.67 in the Colombo district. Differences across districts are more pronounced when comparing the affordability of the energy-only diet and nutritious diets. Even though the cost of a nutritious diet is highest in the Colombo district, yet the people there have considerable purchasing power. As a result, only 38% of households were unable to afford for a nutritious diet. However, in the Moneragala district, where the cost of a nutritious diet is rather expensive (LKR 56242.50), up to 73% of households do not have economic access to nutritious foods due to their extremely low purchasing power. Regionally, out of 25 districts, more

than 50% of the households in 11 districts could not afford an adequately nutritious diet during 2022. The highest non-affordability of nutritious diets was found in the Moneragala district, where 73% of households are below the nutrient poverty line, followed by Badulla district (69%), Ratnapura district (65%), and Hambantota district (60%).

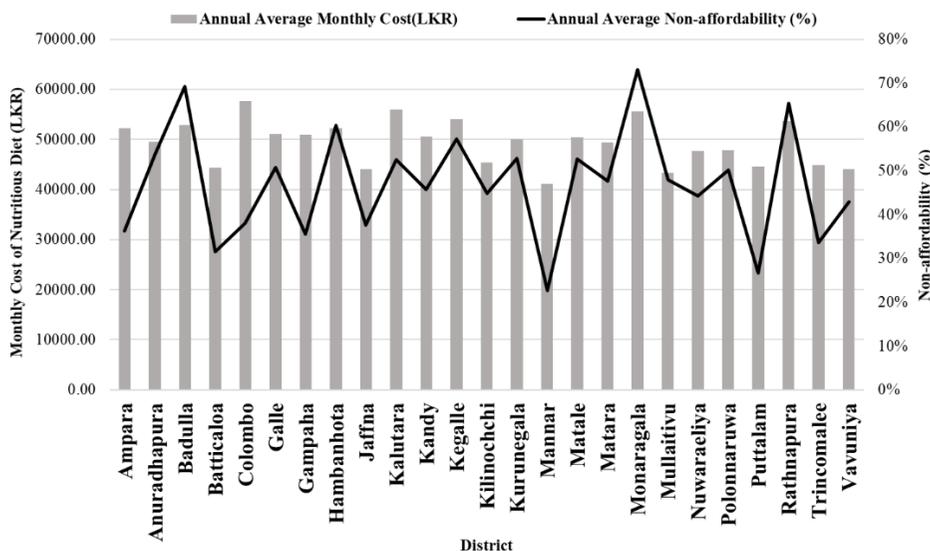


Figure 2: Change in the monthly cost and non-affordability of a nutritious diet in different districts in Sri Lanka 2022.

Beyond the standard analysis and affordability estimations, CoD software is used to model different interventions or hypothetical scenarios and assess the effect on the cost and affordability of diets. The CoD modelling was performed to determine the potential effectiveness of cash transfers to improve the affordability of nutritious diets by targeting households consisting of pregnant women in the most vulnerable districts. According to the results, the minimum monthly cost of a nutritious diet for an adult woman in a household in Moneragala, Badulla, and Ratnapura districts was LKR 15200.69, LKR 14539.72, and LKR 14606.90. However, the diet cost will increase, if she becomes pregnant by up to LKR 17787.00, LKR 16879.64, and LKR 16934.42, respectively, in all three districts. Thus, in these districts where households include pregnant women, the monthly cost of a nutritious diet will increase by an additional 4 to 5 percent. This study evaluated the impact of cash transfer amounts of LKR 5000/household/month, LKR 10,000/household/month, and LKR 15,000/household/month on households of pregnant women in the Moneragala district.

In the Moneragala district, a pregnant woman may increase a household's monthly cost for a nutritious diet up to LKR 58828.80, and the cost of a nutritious diet can become unaffordable by up to 76%. In the short term, amid Sri Lanka's crisis in 2022, cash transfers of LKR 5000 per household per month were started to be sent to the chosen individuals or households as nutrition inclusion. According to the findings, it will only lower the monthly expense of a nutritious family diet to about LKR 53828.80 and make it unaffordable for 70% of households in the Moneragala district, particularly those with expectant mothers.

We have simulated another two hypothetical cash transfers for these families and estimated the cost and affordability of nutritious diets. Cash transfers of LKR 10,000.00 reduce the nutritious diet cost up to LKR 48828.80 and non-affordability by up to 62%. Moreover, providing cash transfers of LKR 15,000.00 decreases the expense of a nutritious diet to LKR 43,828.80 and non-afford is lowered to 52%. Hence, cash transfer amounts have a considerable positive effect on a household's ability to afford a nutritious diet and can eliminate the existing affordability gaps.

Conclusion and recommendations

The results unequivocally demonstrate that the enormous escalation in food prices during 2022 has caused a significant (45%) increase in the price of a nutrient-dense diet in December 2022 as compared to January 2022. The minimum cost of a nutritious diet is over four times more expensive than a diet that only meets energy needs. However, the cost of meeting the energy needs alone has also risen by 35%, signifying a considerable increase in the price of staples and non-luxury food items. Most of the households in Sri Lanka (47%) could not afford the minimum cost of a nutritious diet with their current income levels in 2022. Therefore, failure to provide immediate assistance to the economically marginalized and biologically vulnerable groups may be detrimental to the nutritional status of the general populations, particularly the most vulnerable groups, such as children under the age of five, pregnant and breastfeeding women, and adolescent girls.

The cash transfer amounts have a considerable positive effect on a household's ability to afford a nutritious diet and reduce non-affordability. However, the target intervention of cash transfers of LKR 5000.00/month/household has improved nutrition inclusion and increased affordability only by 6%. When targeting the group of pregnant women, a cash transfer of more than LKR 15,000/month should be made in order to significantly lower non-affordability and diet costs for nutritious diets. Hence, this paper highlighted that the CoD method and software can be used to understand the effect of food price inflation on the cost and affordability of diets, help gauge the magnitude of the nutrient gap, and identify the barriers to achieving adequate nutrient intake among specific target groups within a context, and thereby

identify appropriate strategies to overcome these barriers. Hence, stakeholders can jointly identify the roles and responsibilities that each of these sectors can take to improve the nutrition situation in the country and ensure that their interventions are based on an in-depth understanding of the key constraints in a specific context for different subgroups.

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