

# METHODOLOGY FOR COMPUTATION OF POVERTY LINE AND POVERTY STATISTICS for Sri Lanka<sup>1</sup>

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## ABSTRACT

### Introduction

A number of poverty lines had existed for Sri Lanka. But no official poverty line existed. Therefore to adopt an official poverty line a detailed analysis was undertaken by the poverty study group of the Department of Census and Statistics (DCS), using Household Income and Expenditure Survey (HIES) of 2002, 1995/96 and 1990/91.

The DCS chooses the “absolute” poverty line approach.

### A nutrition-based anchor for the poverty line

Nutritional anchor of 2030 kilocalories per person per day in 2002.

### Choice of the method:

The “cost-of-basic-needs” (CBN) method.

### How the food poverty line is derived

- (i) households in 2<sup>nd</sup> to 4<sup>th</sup> deciles ranked by real per-capita total consumption expenditure are chosen;
- (ii) cost per calorie is derived;
- (iii) food poverty line is defined at Rs. 973 per capita per month.

### How the non-food component of the poverty line is derived

Lower bound and upper bound of the non-food poverty lines calculated.

### The National Poverty Line

National poverty line = food poverty line + non-food poverty line

Then this was adjusted for price differences over time and across districts.

### Table: Poverty lines at 2002 national prices

Poverty line	Rs./month
1. Food poverty line	973
2. Lower poverty line	1267
3. Upper poverty line	1579
4. Official poverty line (average of 2. and 3.)	1423

Source: HIES 2002

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## **1. Introduction**

A number of poverty lines had existed in the past in studies conducted by different organizations, including the Department of Census and Statistics (DCS) in Sri Lanka. To resolve the question of which poverty line should be adopted as the Official Poverty Line, a consultative approach was adopted, involving stakeholders within the country as well as donor organizations. A workshop was conducted to understand the methodological issues, where best practices from other countries were presented and discussed. Based on recommendations that emerged from the workshop, a detailed analysis was undertaken by the poverty study group of the DCS. This involved detailed analysis of Household Income and Expenditure Survey (HIES) data conducted in 2002, 1995/96 and 1990/91, based on which an acceptable methodology was determined to construct consistent poverty trends across time and space.

This paper briefly outlines the methodology and the results thus obtained.

## **2. Rationale for the chosen approach**

There are two broad classes of methodologies for estimating a poverty line: a “relative” poverty line and an “absolute” poverty line. The “relative” poverty line is defined in terms of some percentage cut-off point in a welfare distribution, such as the bottom three deciles of per capita total consumption expenditure distribution. The “absolute” poverty line is explicitly fixed at a specific welfare level. In comparison to the “absolute” poverty line, the “relative” poverty line is appealing in that it is both simple and transparent; however, it provides little on poverty profiles over time and across districts (sub national level – 25 districts) because there is always a bottom 30 percent of the population irrespective of changes in living standards.

**The DCS chooses the “absolute” poverty line approach, as is the practice adopted in most** developing countries, so that changes in poverty over time or across regions can be easily checked with reference to this same fixed poverty line.

## **3. Construction of the official poverty line**

### **3.1 Choice of a nutrition-based anchor:**

There are many other important nutritional inputs, such as proteins, micronutrients etc., but it is natural to assume that the minimum requirements of these nutrients will be met if calorie requirements are met. Nutritional requirements vary from person to person depending on the age, gender and also activity level of the person.

The Medical Research Institute of Sri Lanka (1989) has provided a study that lists the daily allowances of calories for Sri Lankans by age and gender, shown in Table 1, which forms the basis for the official poverty line.

Based on Table 1 and country's population by age and sex, elicited from HIES 2002, the per capita calorie requirement is calculated as follows.

First, the national aggregate of daily calorie allowances is calculated by summing up the nutritional allowances across all individuals in different age and sex groups. Average calorie allowance is then calculated by dividing the national aggregate of daily calorie allowances with the total population. The average per capita calorie allowance thus obtained is the nutritional anchor for the poverty line – 2030 kcal per capita per day in 2002.

**Table 1: Daily recommended nutrient allowances for Sri Lanka**

Age group	Kilo calorie	
	Male	Female
< 1 Year	818	818
1 - 3 Years	1212	1212
4 - 6 Years	1656	1656
7 - 9 Years	1841	1841
10 - 12 Years	2414	2238
13 - 15 Years	2337	2300
16 - 19 Years	2500	2200
20 - 39 Years	2530	1900
40 - 49 Years	2404	1805
50 - 59 Years	2277	1710
60 - 69 Years	2024	1520
70 Years +	1771	1330

Source: The Medical Research Institute of Sri Lanka (1989) (simplified version)

Note: The number of groups is reduced from the original table.

The next step is to define the poverty line corresponding to the nutritional anchor – 2030 kcal per capita per day. This is done using the Cost of Basic Needs (CBN) approach.

### **3.2 Choice of the “Cost of Basic Needs” method:**

The objective of a poverty line is to capture the basic needs necessary to meet minimum living standards. The cost-of-basic-needs (CBN) method addresses this objective through defining a consumption bundle – incorporating food and non-food items – that is adequate to meet the nutritional requirements, and estimates the cost of purchasing that consumption bundle.

The standard approach for poverty line estimation using the CBN method is to first find a food consumption bundle of the population likely to be poor (called “reference group”), and then estimate the cost of consuming this bundle using the prices faced by the reference group. The food expenditure thus derived constitutes what is referred to as the food poverty line. This method is described in detail below.

### **3.3 How the food poverty line is derived**

In Sri Lanka, the method outlined above is implemented to derive the food poverty line in the following way:

- (i) the households in the 2<sup>nd</sup> to 4<sup>th</sup> deciles ranked by real per-capita total consumption expenditure are chosen as the reference group;
- (ii) all food items for which information on expenditure, quantity and estimated calorie value are available are selected;
- (iii) the aggregates of food expenditures and calorie intakes in the reference group are calculated;
- (iv) the cost per calorie is derived by dividing the former with the latter;
- (v) **the food poverty line is defined at Rs. 973 per capita per month** by multiplying the per calorie cost with the nutritional anchor per month (2030\*30 kcal).

The food poverty line obtained above has to be translated into a poverty line that also incorporates the expenditure required to attain basic non-food needs. How this is done is described below.

### **3.4 How the non-food component of the poverty line is derived**

Deriving the non-food component of the poverty line is less straightforward than deriving the food poverty line, since it is not clear what level of non-food expenditures should be defined as basic needs. Important literature in this area proposes a range of seemingly appropriate nonfood poverty lines by linking non-food expenditures to food expenditures.

**The lower bound of the non-food poverty line is defined as the *average per capita non-food expenditure of households whose per capita total expenditure is close to the food poverty line* .**

The logic behind this definition is as follows. Such households' non-food expenditure should be considered as absolutely necessary for sustaining the minimum living standards, simply because any amount of spending on non-food items for such households necessarily reduces their food expenditure below what is required to attain the minimum calorie requirement.

**The upper bound is defined as the *average per -capita non -food expenditure of households whose per -capita food expenditure is close to the food poverty line* .**

The rationale for such an “upper bound” is as follows. The average non-food expenditures among households whose food expenditure is around the food poverty line is applicable to households that no longer need to sacrifice food expenditures necessary to meet the minimum calorie requirement in order to consume non-food items. As long as the non-food poverty line is chosen from the range between the above lower and upper bounds, such an approach is justifiable.

### **3.5 The National Poverty Line**

We avoid the two extremes for the non-food line – the upper and lower bounds – and instead select the average. Taking the average of the upper and lower bounds is a simple and straightforward selection, and acceptable as a practical solution.

Table 2 summarizes all poverty lines, where the upper (lower) poverty line denotes a sum of the food poverty line with the upper (lower) bound of non-food poverty line. The national official poverty line for Sri Lanka is an arithmetic mean of the lower and upper bounds.

**Table 2: Summary of poverty lines at 2002 national prices**

<b>Poverty line</b>	<b>Rs./ month</b>
1. Food poverty line	973
2. Lower poverty line	1267
3. Upper poverty line	1579
4. Official poverty line (average of 2. and 3.)	1423

Source: HIES – 2002, Department of Census and Statistics

In applying this poverty line, one has to ensure that the line represents the same standard of living across time and accounts for variations in cost of living in different areas.

#### **4. How to adjust for price differences over time and across districts**

The national poverty line is defined at the 2002 national prices. The line needs to be deflated with the CCPI (Colombo Consumer Price Index which is used as official index) to obtain the official poverty at the current prices for other survey years. Using the CCPI, the national poverty lines for 90-91 and 1995-96 are Rs. 475 and Rs. 833 respectively (at current prices). Also using SLCPI (Sri Lanka Consumer Price Index which is the new price index covering the entire country started since January 2002, which is going to be considered as the official index), the **official poverty line for May 2004 is Rs 1526** at current prices.

Price differences exist not only over time, but also across districts, which are accommodated by adjusting the national poverty line with spatial price indices computed for each district (see Box 1 for details).

##### **Box 1: Constructing spatial price indices**

*The challenge in constructing spatial price indices is to find the appropriate reference group of households, which will minimize the chance of obtaining biased poverty estimates. The spatial price index is computed here as a Laspeyeres' index using implicit prices of food items from the household survey – for a reference group that consists of households belonging to the 2nd to 4th decile of nominal per capita consumption. Even though the price index is based only on prices faced by the reference group, it is used to adjust consumptions of the entire population. This is however unlikely to affect poverty estimates, since the groups whose consumptions are most likely to be distorted by this choice, namely the rich or the very poor, will remain poor or rich irrespective of small perturbations in the price index. More importantly, the selected reference group is the most appropriate group for computing the price index, since even small errors in the price index could change their position vis-à-vis the poverty line, leading to biased estimates. The spatial price index is constructed at the district level.*

As Table 3 shows, the poverty line for Colombo, after adjusting for price differences across districts, is higher than the national poverty line. It is also higher than poverty lines for all other districts for every survey year, reflecting higher prices in Colombo

district. On the other hand, Hambantota and Anuradhapura record significantly lower poverty lines than the national poverty line. This implies that the same level of nominal consumption expenditures imply much better living standards in Hambantota and Anuradhapura than in Colombo, since the residents in the former districts can afford to purchase more goods than those in the latter.

**Table 3: Nominal poverty lines by district.**

<b>District</b>	<b>PL 1990-91</b>	<b>PL 1995-96</b>	<b>PL 2002</b>
Sri Lanka	475	833	1423
Colombo	518	908	1537
Gampaha	489	875	1508
Kalutara	494	866	1523
Kandy	485	850	1451
Matale	466	816	1395
Nuwara Eliya	494	841	1437
Galle	489	833	1466
Matara	470	816	1395
Hambantota	470	791	1338
Kurunegala	456	791	1352
Puttalam	461	841	1423
Anuradhapura	456	816	1380
Polonnaruwa	475	783	1366
Badulla	485	850	1409
Moneragala	480	791	1366
Ratnapura	494	833	1451
Kegalle	466	858	1437

Source: HIES – 1990/91, 1995/96, 2002, Department of Census and Statistics

### **5. Poverty estimates using official poverty line**

Using the poverty line obtained above, poverty headcount ratio is computed for 1990-91, 1995- 96 and 2002. Headcount ratio is defined as the percentage of the population whose monthly per capita total consumption expenditure falls below the district level poverty line. Table 4 provides these estimates for the 17 districts included in the survey. Table 5 provides estimates nationally and for different sectors, namely urban, rural and estates<sup>8</sup>.

**Table 4: Poverty headcount ratio by district (%).**

<b>District</b>	<b>1990-91 (%)</b>	<b>1995-96 (%)</b>	<b>2002 (%)</b>
Sri Lanka	26.1	28.8	22.7
Colombo	16	12	6
Gampaha	15	14	11
Kalutara	32	29	20
Kandy	36	37	25
Matale	29	42	30
Nuwara Eliya	20	32	23
Galle	30	32	26
Matara	29	35	27
Hambantota	32	31	32
Kurunegala	27	26	25
Puttalam	22	31	31
Anuradhapura	24	27	20
Polonnaruwa	24	20	24
Badulla	31	41	37
Moneragala	34	56	37
Ratnapura	31	46	34
Kegalle	31	36	32

Source: HIES – 1990/91, 1995/96, 2002, Department of Census and Statistics

<sup>8</sup> There are two ways of making consumption expenditures comparable to poverty lines: 1) evaluating both poverty lines and consumption expenditures at *area-specific* prices, 2) evaluating both poverty lines and consumption expenditures at *national* prices. For the district level poverty headcounts in Table 4, the first method is used: poverty headcount ratios are calculated by comparing *nominal* consumption expenditures with *district* poverty lines reported in Table 3. For the sector level poverty headcounts in Table 5, the second method is used: poverty headcount ratios are calculated by comparing *real* consumption expenditures with the *national* poverty line. This is done because the national poverty line cannot be adjusted for sectoral price differences, as the spatial price index is computed at district level.

**Table 5: Poverty headcount ratio National and by sector (%).**

Sector	Survey period		
	1990-91 (%)	1995-96 (%)	2002 (%)
<b>Sri Lanka</b>	<b>26.1</b>	<b>28.8</b>	<b>22.7</b>
Urban	16.3	14.0	7.9
Rural	29.4	30.9	24.7
Estate	20.5	38.4	30.0

Source: HIES – 1990/91, 1995/96, 2002, Department of Census and Statistics  
Finally, Table 6 and 7 shows the proportion of households that are poor – nationally, and for different sectors, provinces and districts.

## **6. Sensitivity Analysis**

This section examines how sensitive the results on poverty lines and poverty profiles are to methodologies chosen in the process. There is no single ideal methodology for setting poverty lines and estimating poverty profiles. Although selected methodologies are considered as the best option, the credibility of the resulting poverty measures would be enhanced if the results do not change much under alternative methodologies.

### **6.1 Sensitivity analysis on spatial price index**

As describe above, a Laspeyres price index is chosen for adjusting spatial price differences. There are at least two issues in this index. First, this index includes only food items due to unavailability of unit values in non-food items, although non-food items affect the living standards of the poor, especially in urban areas such as the Colombo district. Second, a Laspeyres price index uses the national basket, which does not necessarily reflect some district specific consumption patterns. There are two questions examined in this subsection: whether poverty profiles change dramatically if non-food items are included, and also whether they vary substantially if the reference food basket changes.

### **6.2 Including housing rents**

The HIES surveys include data on housing rents. If a household rents a house, the household reports the rent; but if a household does not rent a house, the interviewer imputes the rent using in the neighborhood or nearby villages. The housing rents are not included in the spatial price index mainly because the imputations done by interviewers especially in rural areas can not expected to be reliable as renting a house is not a common practice is rural or estate areas. It is examined whether poverty profiles change significantly by including the housing rents into spatial price index.

Table 6 compares spatial price indices between with and without housing rents. Including housing rents raises the spatial price index by about 5 percent points for the Colombo district for all survey years, and reduces it for Badulla and Ratnapura. These are consistent with available evidence that urban areas usually have higher housing rents than rural areas because the Colombo district includes the largest urban areas in the country but Badulla and Ratnapura districts include large poor rural areas. However, Moneragala one of the poorest districts, rather increases its price indices or keeps it constant after housing rents are included.

## **7. Conclusion**

In Sri Lanka, many poverty estimates have been reported in the 1990's, but they were based on different poverty lines. Each of them contains high quality analysis as well as many useful policy insights. But policy makers and other users were confused as to which line should be used to depict poverty situation in Sri Lanka.

To resolve this problem, the new official poverty line is set at Rs.1423 per capita per month at the national prices of year 2002, which can be easily calculated at the district prices of other survey years. It is expected to lead debates on poverty more constructive, provide a clear picture of poverty in Sri Lanka, and facilitate on-going poverty reduction measures.

## 8. Poverty Profile

### 8.1 Income Inequality and Poverty

**Table 1: Household size and income receivers per household by household income decile - 2002**

Household income decile	Mean household size	Number of income receivers per household	Share of income
	(persons)	(persons)	
<b>Sri Lanka</b>	<b>4.2</b>	<b>1.8</b>	100.0
1	3.2	1.3	1.7
2	3.7	1.6	3.1
3	3.9	1.6	4.1
4	4.1	1.7	5.0
5	4.2	1.8	6.0
6	4.4	1.8	7.3
7	4.5	2.0	8.8
8	4.5	2.1	11.2
9	4.7	2.2	15.4
10	4.9	2.4	37.4

Source: HIES – 2002, Department of Census and Statistics

**Table 2: Household income (%) by source of income and household income decile - 2002**

Household income decile	Total household income	Source of income (%)			
		Wages and Salaries	Non-agricultural activities	Agricultural activities	Other income
<b>Sri Lanka</b>	<b>100.0</b>	<b>42.0</b>	<b>17.4</b>	<b>9.9</b>	<b>30.7</b>
1	100.0	28.0	4.3	21.1	46.6
2	100.0	45.6	6.9	15.4	32.2
3	100.0	49.4	8.3	14.4	27.8
4	100.0	49.4	9.7	13.7	27.2
5	100.0	48.3	9.8	13.2	28.7
6	100.0	49.1	11.7	10.7	28.5
7	100.0	48.1	12.3	10.2	29.3
8	100.0	48.0	12.7	9.8	29.5
9	100.0	47.0	13.6	7.9	31.5
10	100.0	32.9	27.4	8.1	31.7

Source: HIES – 2002, Department of Census and Statistics

**Table 3: Gini coefficient for household income by sector and survey period**

Sector	Survey period				
	2002	1995/96	1990/91	1985/86	1980/81
Sri Lanka	0.48	0.46	0.47	0.46	0.43
Urban	0.51	0.47	0.62	0.48	0.44
Rural	0.46	0.46	0.42	0.43	0.38
Estate	0.32	0.34	0.25	0.31	0.27

Source: HIES – 2002, Department of Census and Statistics

## 8.2 Consumption Expenditure and Poverty

**Table 4: Household expenditure (%) by major expenditure group and by household expenditure decile - 2002**

Household expenditure decile	Household expenditure per month	Major expenditure group		
		Food expenditure (%)	Non food expenditure (%)	Liquor, Narcotic drugs and Tobacco (%)
<b>Sri Lanka</b>	<b>100.0</b>	<b>44.5</b>	<b>53.2</b>	<b>2.3</b>
1	100.0	67.9	28.4	3.7
2	100.0	66.7	29.7	3.6
3	100.0	64.9	31.6	3.4
4	100.0	63.2	33.1	3.7
5	100.0	60.8	35.8	3.4
6	100.0	58.2	38.8	3.0
7	100.0	53.3	43.6	3.1
8	100.0	48.8	48.6	2.6
9	100.0	41.0	57.1	1.9
10	100.0	25.3	73.5	1.2

Source: HIES – 2002, Department of Census and Statistics

**Table 5: Food ratio by sector and survey period**

Sector	Survey period				
	2002	1995/96	1990/91	1985/86	1980/81
Sri Lanka	43.8	54.4	59.2	57.6	65.0
Urban	35.9	42.8	47.1	50.2	58.4
Rural	45.3	57.0	63.9	60.7	66.8
Estate	60.1	69.1	69.4	61.8	71.9

Source: HIES – 2002, Department of Census and Statistics

### 8.3 Poor and Non-poor

**Table 6: Household expenditure as a % to total expenditure (per month) on major groups - 2002**

Item	All households	Poor households	Non poor households
	Expenditure as a % to total expenditure	Expenditure as a % to total expenditure	Expenditure as a % to total expenditure
Total household expenditure	100.0	100.0	100.0
Household expenditure on food	44.5	68.4	42.4
Expenditure on housing	12.6	7.8	13.1
Expenditure on fuel for lighting and cooking	4.2	5.4	4.1
Personal expenditure per month	1.4	2.0	1.4
<b>Expenditure on health</b>	<b>3.0</b>	<b>1.6</b>	<b>3.1</b>
<b>Expenditure on transport</b>	<b>5.7</b>	<b>2.2</b>	<b>6.0</b>
Expenditure on communication	1.3	0.1	1.4
<b>Expenditure on education</b>	<b>2.4</b>	<b>1.5</b>	<b>2.5</b>
<b>Expenditure on recreation cultural etc.</b>	<b>1.1</b>	<b>0.2</b>	<b>1.2</b>
Expenditure on non durable goods	1.1	1.6	1.0
Expenditure on household services	0.4	0.0	0.4
Expenditure on cloths	2.5	2.5	2.4
Expenditure on foot wear	0.5	0.3	0.5
Expenditure on semi - durables	0.3	0.2	0.4
Expenditure on durables	2.1	0.2	2.2
Expenditure on other expenditure	14.3	2.8	15.3
Expenditure incurred on non-food by boarders and domestic servants	0.3	0.0	0.3
<b>Household expenditure on liquor and tobacco</b>	<b>2.3</b>	<b>3.2</b>	<b>2.3</b>

Source: HIES – 2002, Department of Census and Statistics

## 8.4 Historical data

**Table 7: National level findings by the Survey period**

Variable	Survey period				
	2002	1995/96	1990/91	1985/86	1980/81
Gini coefficient of household income	0.48	0.46	0.43	0.46	0.43
Household size	4.2	4.5	4.9	5.1	4.9
Number of income receivers per household	1.8	1.8	2.0	2.0	1.6
Gini coefficient of income receivers income	0.53	0.52	0.52	-	0.43
Monetary income (as a % to total household income)	81.1	81.3	83.5	66.3	85.0
Non-monetary income (as a % to total household income)	18.9	18.7	16.5	33.7	15.0
Wages and salaries (as a % to total monetary income)	51.0	56.8	49.8	51.9	55.8
Agricultural activities (as a % to total monetary income)	12.0	10.0	3.5	14.7	11.6
Non-agricultural activities (as a % to total monetary income)	21.0	19.0	31.2	22.6	17.9
Other monetary income (as a % to total monetary income)	16.0	14.2	15.5	10.8	14.7
Total household expenditure	100.0	100.0	100.0	100.0	100.0
Food and drink (as a % to total expenditure)	44.5	54.4	64.6	57.6	65.0
Liquor & Tobacco (as a % to total expenditure)	2.3	3.4	-	3.8	4.4
Housing (as a % to total expenditure)	12.6	12.6	8.7	7.1	5.4
Fuel and light (as a % to total expenditure)	4.2	4.5	4.6	5.0	5.4
Clothing and personnel effects (as a % to total expenditure)	3.0	4.3	4.1	4.6	4.3

**Table 7: National level findings by the Survey period (continued)**

Variable	Survey Period				
	2002	1995/96	1990/91	1985/86	1980/81
Personnel care and health (as a % to total expenditure)	4.4	4.7	3.8	3.8	2.9
Transport and communication(as a % to total expenditure)	7.1	5.9	4.9	5.1	5.0
Consumer durables (as a % to total expenditure)	2.4	1.9	1.4	1.9	2.0
Non-durable household goods (as a % to total expenditure)	1.1	1.3	1.5	-	1.5
Education (as a % to total expenditure)	2.4	2.0	1.7	1.4	1.4
Cultural & entertainment (as a % to total expenditure)	1.1	1.1	0.8	-	0.9
Other non consumer expenditure (as a % to total expenditure)	14.9	3.9	3.9	9.7	1.8
CCPI (average for the survey period)	3176	1859	1066	569	338

Source: HIES – 1980/81, 1985/86, 1990/91, 1995/96, 2002,  
Department of Census and Statistics