

Poverty Based on Earning Stratum: A New Dimension for Poverty Analysis in Sri Lanka

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Abstract: *The poverty headcount ratio shows the number of people below the poverty line, who represent the most vulnerable sector of the population. However, the number of people marginally above the poverty line is also very important because these people are at risk of slipping back into poverty and this segment of the population is highly vulnerable to economic shocks. Thus, this study focuses on both of these population groups by taking 10 per cent sample around the national poverty line in Sri Lanka. The HIES data 2006/7 has been used for this analysis. Results confirm that there are no purely agricultural households in extreme poverty, as most agricultural households are diversified in their sources of income. Thus, the highest poverty rate in the country is found in this diversified income group and also poor households in Sri Lanka mostly depend on unskilled wage labour, followed by transfers. However the highest poverty elasticity was observed in the agricultural stratum under the \$2/day poverty line.*

Key Words: Earning strata, Poverty headcount, Poverty elasticity, Poverty line, Sri Lanka

I. INTRODUCTION

As poverty can be identified using average income and the inequality in income distribution, the impact of trade liberalization on poverty need to be examined through the changes of the income distribution of the households. Simply poverty headcount ratio shows the number of poor in the economy though; it does not exactly penetrate the poverty profile of the country, because poverty at present is considered as a multidimensional phenomenon.

However, using the elasticity of poverty headcount ratio in various income stratum of the households, it can be examined the household poverty of a country against the income change more deeply. Thus, poverty elasticities support to depict the income changes with regard to different policy changes of a country. The poverty headcount is a common and well-established measurement that has been used for measuring poverty impacts in many studies examining households at or below the poverty line [2][3][10][11]. The poverty headcount ratio shows the number of people below the poverty line, who represent the most vulnerable sector of the population. According to the HDR 2014, despite recent progress in poverty reduction, more than 15 per cent of the world's population remains vulnerable to poverty [12]. However, the number of people marginally above the poverty line is also important because those who are just above the poverty line can also be very vulnerable [4]. These people are at risk of slipping back into poverty and this segment of the population is highly vulnerable to economic shocks [13]. Thus, we need to find effective strategies to prevent this group from falling back into poverty, as well as to bring the current poor out of poverty. This study focuses on both of these

population groups by taking 10 per cent (5 per cent of the population above the poverty line and 5 per cent of the population below the national poverty line) sample around the national poverty line in Sri Lanka. According to the World Bank and ADB poverty calculations based on 2005 international prices, the poverty headcount ratio in Sri Lanka in 2007 was 7.01 per cent under US\$1.25 and 29.11 per cent under US\$2. We used these poverty headcount ratios for all the poverty calculations and used the national poverty line for 2006/7 for the national poverty calculations. For the analysis we use arc elasticities and tabulations based on poverty stratum using disaggregated poverty data form HIES 2006/7 conducted by the Department of Census and Statistics, Sri Lanka.

II. STRUCTURE OF POVERTY BASED ON EARNING STRATUM IN SRI LANKA

Table 1 shows the poverty headcount in Sri Lanka in each stratum, as a percentage (poverty headcount share of total poverty for each stratum) and the poverty headcount share in the total population for each stratum. Further, Table 1 shows that poverty is largely concentrated in the rural diversified stratum, followed by the urban diversified stratum. In comparison to some developing countries such as Cambodia and Lao PDR [6], Sri Lanka shows a very different structure of poverty headcount by earning-based strata. Interestingly, no households could be found in the agricultural earning-based stratum under the UD\$1.25/day poverty line. However, looking at the real picture of poverty in Sri Lanka, this does not mean that there are no families in extreme poverty in the agricultural sector in Sri Lanka. The HIES data 2006/7 indicates that there are no purely agricultural households (A pure agricultural household means that more than 95% of household income is received from agriculture-related activities) in extreme poverty, as most agricultural households are diversified in their sources of income due to the unpredictable nature of agricultural earnings in Sri Lanka. The highest poverty rate in the country is found in this diversified income group. The reason that the lowest poverty rate occurs in the agricultural household stratum in Sri Lanka is that most agricultural families are included in the diversified income group as they do not gain 95 per cent or more of their income from purely agricultural activities. Similarly, poverty is largely concentrated in the rural diversified stratum under both the US\$2/day poverty line and the national poverty line, because there are very few households in the purely agricultural stratum.

III. AVERAGE FACTOR INCOME SHARES AT POVERTY LINES IN SRI LANKA

The average factor income shares in the total household income were estimated in the neighbourhood of each poverty line based on the poverty income levels. Usually, poverty measures consider extremely poor households or the moderately poor household group. However, there is a huge risk that those households which

are just above poverty line will fall back into poverty, and they are considered highly vulnerable to any external shocks. Therefore, this analysis used 10 per cent of the population around the poverty line for each stratum [6][11].

Table 1: Poverty headcount by household earnings-based strata in Sri Lanka (percent)

	Agriculture	Non agriculture	Urban labour	Rural labour	Transfer	Urban Diversified	Rural Diversified	Total
1.25US\$/Day								
Poverty rate in stratum	0.00	1.83	5.62	3.22	20.00	4.00	8.21	7.01
Share in total poverty	0.00	0.18	0.67	0.73	0.27	14.16	83.98	100
Share in total population	0.00	0.01	0.05	0.05	0.02	0.99	5.89	7.01
2US\$/Day								
Poverty rate in stratum	7.33	18.13	23.1	34.49	33.33	19.87	32.43	29.11
Share in total poverty	0.06	0.43	0.67	1.88	0.11	16.93	79.92	100
Share in total population	0.02	0.13	0.19	0.55	0.03	4.93	23.26	29.11
National poverty line								
Poverty rate in stratum	3.14	10.62	19.3	21.3	26.67	12.87	22.47	19.92
Share in total poverty	0.04	0.37	0.81	1.7	0.13	16.03	80.92	100
Share in total population	0.01	0.07	0.16	0.34	0.03	3.19	16.12	19.92

Source: Author's calculations using HIES data 2006/7

Note: Conversion factor has been adjusted to meet World Bank poverty ratio to link GTAP data (\$1.25/day=7% and \$2/day=29%). Sample included 78,342 people in the calculations from HIES 2006/7 by excluding zero income households.

The trends in Table 2 show that poor households in Sri Lanka mostly depend on unskilled wage labour, followed by transfers. For instance, 50 per cent of the total income of rural diversified households around the US\$1.25/day poverty line comes from unskilled wages.

IV. POVERTY ELASTICITIES IN SRI LANKA

Poverty arc elasticities(ϵ_{rs})for the seven income strata in Sri Lanka were computed by shocking income by one per cent and then calculating the change in poverty based on the methods of [5][6]. Compared to normal poverty elasticity, poverty arc elasticity is a more realistic approach where there is a gap between income levels at the poverty line, as it focuses on changes in the neighbourhood of the poverty line and increases the range

over which poverty impacts can be measured. Arc elasticity shows the change in poverty headcount with respect to the change in the real income of the households in each stratum in the neighbourhood of the poverty line. This elasticity was calculated using 10 per cent of the population around the poverty line, using the method suggested by Hertel [5] and Komoto [6]¹.

Poverty arc elasticity calculations are done by adopting

$$\varepsilon_{rs} = - \frac{dF_{rs}(\bar{y}_r^p) / d\bar{y}_r^p}{F_{rs}(\bar{y}_r^p) / \bar{y}_r^p},$$

where $F_{rs}(\bar{y}_r^p)$ is the cumulative distribution function that computes poverty headcount ratio when \bar{y}_r^p is the poverty income level in country r [5]. This arc elasticity calculation uses the following procedure: firstly, line up the stratum population from lowest to highest household income/expenditure; secondly, taking 10 per cent of the households around the poverty line (5% from each side of the poverty line), compute the elasticity using the above formula (the slope of the cumulative distribution).

Table 3 reports the stratum-specific poverty elasticities under international standard poverty lines and the national poverty line in Sri Lanka. These poverty elasticities were obtained through changes in household income across the poverty line in each stratum. Poverty arc elasticities were above 1.0 for all strata except the transfer-income household stratum. The highest poverty elasticity was seen in the agricultural stratum under the US\$2/day poverty line while the second highest poverty elasticity was in the rural labour stratum (under both the US\$1.25/day poverty line and the national poverty line). The lowest poverty elasticities (below 1.0) were reported in the transfer stratum, where there were very limited numbers of households in the neighbourhood of the poverty line. There were no households at all in the agricultural stratum under the US\$1.25/day poverty line. However the highest poverty elasticity was observed in the agricultural stratum under the \$2/day

¹ In particular, we selected the poverty line in domestic currency that is required to give the poverty headcount estimated by the World Bank (Implied exchange rate conversion factors: \$1.25/day= Rupees 47.38, \$2/day=Rupees 91.32).

Table 2: Average factor income shares of Sri Lankan households around poverty line (10 % of the population), by income stratum

Strata	Agriculture Skilled	Agriculture Unskilled	Non-agriculture Skilled	Non-agriculture Unskilled	Wage Skilled	Wage Unskilled	Agriculture Capital	Land	Non-Agriculture Capital	Transfer	Total
US\$1.25/day poverty line											
Agriculture	0.00	29.76	0.00	0.00	0.00	0.00	39.33	30.91	0.00	0.00	100
Non Agriculture	0.00	0.00	33.33	16.67	0.00	0.00	0.00	0.00	50.00	0.00	100
Urban Labour	0.00	0.00	0.00	0.00	16.67	83.33	0.00	0.00	0.00	0.00	100
Rural Labour	0.00	0.00	0.00	0.00	5.88	94.12	0.00	0.00	0.00	0.00	100
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100	100
Diversified Urban	0.00	1.88	6.46	14.13	1.72	49.37	0.70	0.55	1.33	23.87	100
Diversified Rural	0.27	14.78	3.70	5.89	0.96	50.24	3.16	2.48	0.73	17.80	100
TOTAL	0.19	12.38	4.07	6.76	1.38	51.14	2.55	2.00	0.99	18.54	100
US\$2/day poverty line											
Agriculture	0.00	48.55	0.00	0.00	0.00	0.00	28.62	22.49	0.00	0.34	100
Non Agriculture	0.00	0.00	41.26	42.31	0.00	0.00	0.00	0.00	16.10	0.32	100
Urban Labour	0.00	0.00	0.00	0.00	14.56	85.18	0.06	0.05	0.00	0.16	100
Rural Labour	0.00	0.00	0.00	0.00	4.71	95.29	0.00	0.00	0.00	0.00	100
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100
Diversified Urban	0.22	1.13	8.09	11.61	6.30	54.27	1.16	0.91	3.57	12.74	100
Diversified Rural	0.59	9.22	4.55	6.84	2.56	55.87	3.45	2.71	2.23	11.98	100
TOTAL	0.48	7.31	5.31	7.87	3.62	55.72	2.94	2.31	2.62	11.82	100
National poverty line											
Agriculture	0.00	49.19	0.00	0.00	0.00	0.00	28.39	22.31	0.00	0.11	100
Non Agriculture	0.00	0.00	37.98	31.07	0.00	0.00	0.00	0.00	30.65	0.30	100
Urban Labour	0.00	0.00	0.00	0.00	4.76	95.24	0.00	0.00	0.00	0.00	100
Rural Labour	0.00	0.00	0.00	0.00	9.41	90.52	0.00	0.00	0.00	0.07	100
Transfers	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	100.00	100
Diversified Urban	0.23	1.36	6.92	8.13	5.59	59.23	0.89	0.70	2.87	14.08	100
Diversified Rural	0.39	10.15	3.52	6.96	2.01	55.34	3.96	3.11	1.96	12.57	100
TOTAL	0.35	8.35	4.18	7.14	2.78	56.46	3.34	2.62	2.21	12.57	100

Source: Author calculations using HIES 2006/7 data

poverty line, with a low poverty headcount. The results also showed comparatively lower poverty elasticity in the rural diversified stratum under the US\$2/day poverty line, where there is the highest level of poverty in Sri Lanka.

Table 3: Poverty elasticity around the poverty lines by income stratum

Stratum	US\$1.25/ day	US\$2/day	National Poverty
Agriculture	2.28	3.88	1.97
Non - Agriculture	2.21	2.20	1.67
Urban Labour	2.47	1.11	1.47
Rural Labour	2.87	2.06	2.41
Transfers	0.52	0.95	0.74
Urban - Diversified	1.00	2.14	2.26
Rural - Diversified	2.34	1.65	1.94

Source: Author calculations using Sri Lanka HIES data 2006/7

Note: Conversion Factor has been adjusted to meet World Bank poverty ratio (\$1.25/day=7% and \$2/day=29%)

* Note: As there were no households below the US\$1.25/day poverty line in the Agriculture stratum, it was impossible to calculate the exact arc elasticity for the group. Thus, we used the poverty arc elasticity figure for the total population under the poverty line as a proxy.

Note: In both the non-agricultural stratum and the rural labour stratum, those below the US\$1.25/day poverty line were less than 5 per cent. Thus it was not possible to get 5 per cent on each side of the poverty line.

This study considered only 10 per cent of the households in the neighborhood of the poverty lines and there were an inadequate percentage of households available in some strata.

For example, no households could be found below the extreme poverty line (US\$1.25/day) in the agriculture stratum, therefore total poverty elasticity was used here as a proxy.

IV. CONCLUSION

Although Sri Lanka has a very detailed and constantly updated poverty profile, very limited attempts have been made to study poverty within different income groups, other than the urban and the rural sector low income and high income groups and the estate sector low income groups [7] and expenditure deciles [1][8][9]. The HIES data 2006/7 indicates that there are no purely agricultural households in extreme poverty, as most agricultural households are diversified in their sources of income due to the unpredictable nature of agricultural earnings in

Sri Lanka. The highest poverty rate in the country is found in this diversified income group. Further, results confirm that poor households in Sri Lanka mostly depend on unskilled wage labour, followed by transfers. Observing poverty changes using poverty elasticities in specific income groups (over seven income strata in this analysis) is a new dimension for poverty analysis in Sri Lanka and this will lead better policy implications for poverty reduction.

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