ELECTRICITY USAGE AS A PROXY INDICATOR FOR POVERTY TARGETINC

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Abstract

This perspective demonstrates that household electricity usage is a good proxy for poverty and a quick, efficient, and effective targeting mechanism for welfare benefits. As Sri Lanka's economic crisis continues, up to 50% or more of the population will likely need state support, yet the existing welfare benefit scheme falls far short of its goals. Current targeting through *Samurdhi* reaches just about a quarter of all households and only 40% of the poorest decile of individuals. The analysis presented in this perspective shows that the alternative of using a threshold of 60kwh of electricity usage per month as a preliminary eligibility criterion will reach approximately 50% of the population and over 80% of the poorest among them and performs best among a set of alternatives, including *Samurdhi.*

JEL Codes: H53, I32, I38

Keywords*: Social protection, Targeting efficiency, Household electricity consumption, Samurdhi, Welfare benefits, Sri Lanka*

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INTRODUCTION

As Sri Lanka's economic crisis continues, with year-on-year headline inflation of almost 70% and food inflation of almost95% in September 2022, citizens continue to grapple with an exorbitant cost of living, compounded in many cases with a loss of wages and livelihoods (Central Bank of Sri Lanka, 2022). In 2019, the latest year for which a nationally representative household income and expenditure was conducted, 14.3% of the population had consumption below the poverty line (Department of Census and Statistics, 2022a). Even above the poverty line, incomes were relatively low: the average monthly income of the middle 60% of households was just 56,000 rupees (Department of Census and Statistics Sri Lanka, 2022b). Both these statistics are based on the 2019 Household Income and Expenditure Survey (HIES), which surveyed the population before the onset of the Covid-19 pandemic and the economic crisis. It is estimated that as a direct result of the current economic crisis, 66% of households have reduced the number of meals eaten daily, and up to 50% of children in the country will require emergency assistance (UNICEF, 2022; World Food Programme, 2022).

These figures highlight that a large proportion of Sri Lankans are struggling to make ends meet. As indicated in UNICEF (2022) and World Food Program (2022), half or more of the population is likely to need state support. This includes the 14.3% of the population estimated to be living in absolute poverty in 2019, as well as a significant segment of the population living above the poverty line that has had their incomes/consumption affected by the pandemic as the current economic crisis. A broadly targeted social protection scheme that reaches all vulnerable populations must be implemented without delay. However, the government's response to this need has been to increase allowances to 3.3 million existing welfare recipients under the new interim budget for 2022. Monthly allowances between Rs. 5,000-7,500 were disbursed from May 2022 to Samurdhi recipient families, low-income families, elderly and disabled persons and kidney patients. While these recipients are likely to be among the needy, many more families need public support and need to be identified as such.

Can the Samurdhi programme be geared up to meet this challenge? Existing studies show that the answer is a clear 'no'. The programme has been well researched and found to be woefully inadequate even before the pandemic and the economic crisis (Kidd et al., 2020; MaddumaBandara,2016; Ramos, Melissa and Karimi, 2020; World Bank, 2016a; World Bank 2016b; Godamunne 2016; Gunatilaka 2010). The main criticisms of Samurdhi are (1) its high administrative cost and (2) significant errors in targeting, mainly the exclusion of vulnerable households. According to its performance report, 22% of the Samurdhi budget is spent on administrative expenses, primarily the wage bill for its staff of over 27,000 individuals, including an approved cadre of over 22,000 Samurdhi Development Officers (Department of Samurdhi Development, 2018). Despite this high administrative cost, the programme covers just 27% of households in Sri Lanka and systematically excludes over 58% of eligible recipients (Ramos, Melissa and Karimi, 2020). The latter

is attributed mainly to the prevalence of political patronage and bureaucratic malpractice because the implementation process for selecting eligible households is based on a subjective assessment (Madduma Bandara, 2016; World Bank, 2016b). Revisions have been made from time to time to Samurdhi targeting criteria; the latest circular dated March 2021 includes several indicators from 6 dimensions: education, health, economic level (including utilities as a proxy), assets, household composition and a sixth dimension with several exclusion criteria and exit mechanisms (Ministry of Finance, 2021). However, the basic problem with these criteria remains; they are to be verified by a third party and are vulnerable to manipulation and outright falsification. A better targeting mechanism that can be objectively verified is needed.

Electricity use as an eligibility determinant for social protection

Given the historically poor performance of the Samurdhi programme and the large number of citizens made vulnerable by the crisis, ensuring efficient targeting must be a key priority for any new social protection measures. Household electricity consumption can be utilized as a determinant of eligibility for welfare benefits. This is one of several indicators previously identified by the Sri Lankan government, through a gazette notification in 2019, as potential components of a proxy means test to identify low-income families for welfare benefit payments (Department of Government Printing, 2019). A preliminary consumption threshold of 60kWh is proposed as a criterion for eligibility. Expenditure on electricity usage is also included among the proxies to determine the economic standard of beneficiaries in the latest Samurdhi circular (Ministry of Finance, 2021).

In the case of Sri Lanka, 99% of households are connected to the national grid, and 48% of the population lives in households that consume 60kWh or less of electricity in a month[1]. Using this threshold to determine eligibility for cash transfers or other welfare benefits would ensure coverage of approximately 50% of the population, thus creating a much-needed expansion of social protection.

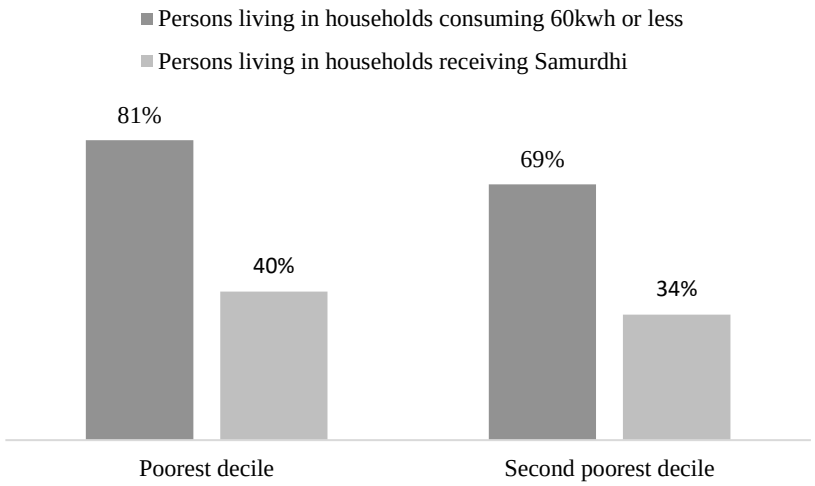
A targeting mechanism that closely proxies poverty and minimizes errors of exclusion

Will a criterion based on electricity use of 60kWh or less reach the most vulnerable segment of the population? Focusing on the poorest 20% of the population, Figure 1 indicates that the electricity use criterion includes a greater proportion of the vulnerable population than the existing Samurdhi programme. For the poorest 10% of the population, i.e., the most vulnerable group, targeting via the electricity use criterion captures 81% of households, whereas the Samurdhi system only captures 40%. More than twice as many

[1]Author's calculations using unit data from the Household Income and Expenditure Survey 2016, a nationally representative sample survey conducted every three years. It covers over 20,000 households and is anonymized.

households are captured through this improved targeting mechanism. This pattern is repeated at the second poorest decile as well.

Figure 1: Percentage of population in the poorest two per capita consumption deciles (i.e. the poorest 20%) eligible to receive cash transfers according to (I) the electricity use criterion and (II) the Samurdhi programme



Source: Author's own calculations from unit data of Sri Lanka HIES, 2016

The same conclusion can be reached by examining the poorest districts on the Island, as measured by the number of people in poverty.[2] Four of the five districts with the largest number of poor people are among the five with the most living in households with low electricity use. The overlap between districts with the highest numbers of people in poverty and the highest numbers of households receiving Samurdhi benefits is much lower (Table 1). This supports the argument that household electricity use is a much better indicator of poverty than being a Samurdhi recipient.

Figure 2 presents the percentage of the population in all ten (real per capita) consumption deciles that would be eligible to receive cash transfers according to the 60kwh electricity use criterion. The electricity use criterion overlaps to a high degree with per capita consumption, especially in the poorer deciles. Calculations from household survey data indicate that 74% of the poorest 60% of the population will receive benefits according to the electricity use criterion (with an exclusion error of only 26%), whereas only 32% of the same group receive Samurdhi benefits - with an exclusion error of 68%.[3]

[2]These are people who fall below the national poverty line, measured as spatially adjusted consumption poverty.

[3]Author's calculations based on unit data from HIES 2016.

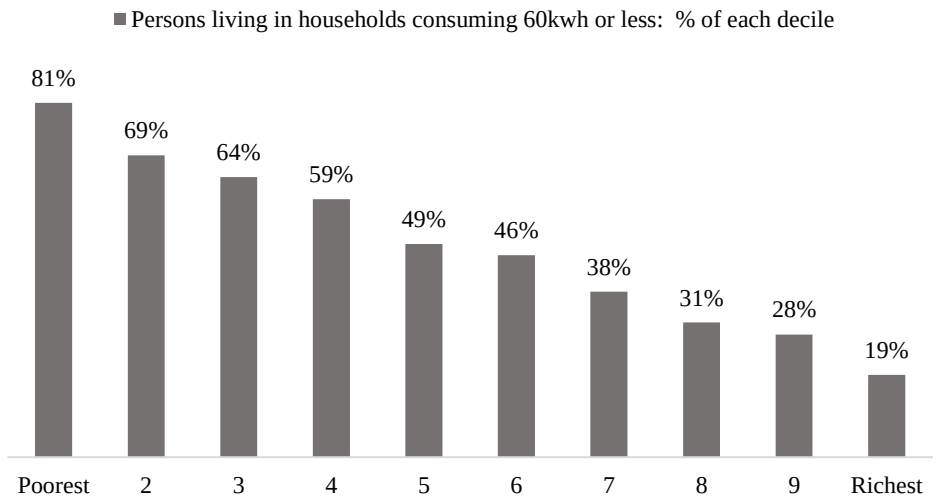
The calculation in Figure 2 is based on expenditure data obtained from the HIES 2016 and not on actual electricity usage (see Appendix for methodology and underlying assumptions). As a result, many eligible individuals in the top few deciles are likely to be those with solar connections. We propose that in implementation, the eligibility criteria would use electricity usage data, not expenditure data. Households with solar connections can be easily identified by the CEB and made ineligible.

Table 1: District rankings according to the number of people classified as poor correspondence with electricity use criterion and Samurdhi beneficiary criterion

Districts with the greatest number of poor people	Ranking by Consumption poverty [a]	Ranking by Electricity use criterion [b]	Ranking by Samurdhi beneficiary criterion [c]
Ratnapura	1	3	3
Badulla	2	5	9
Kurunegala	3	1	1
Kandy	4	2	5
Nuwara Eliya	5	6	18

Source: a. Department of Census and Statistics, 2022. Poverty Indicators – 2019. Colombo: DCS. b. Authors' calculation from unit data of Sri Lanka HIES 2016. c. Department of Samurdhi Development, 2022, Number of beneficiaries, April 2022.

Figure 2: Percentage of each decile that would receive cash transfers by using criterion of electricity use of 60kWh or less

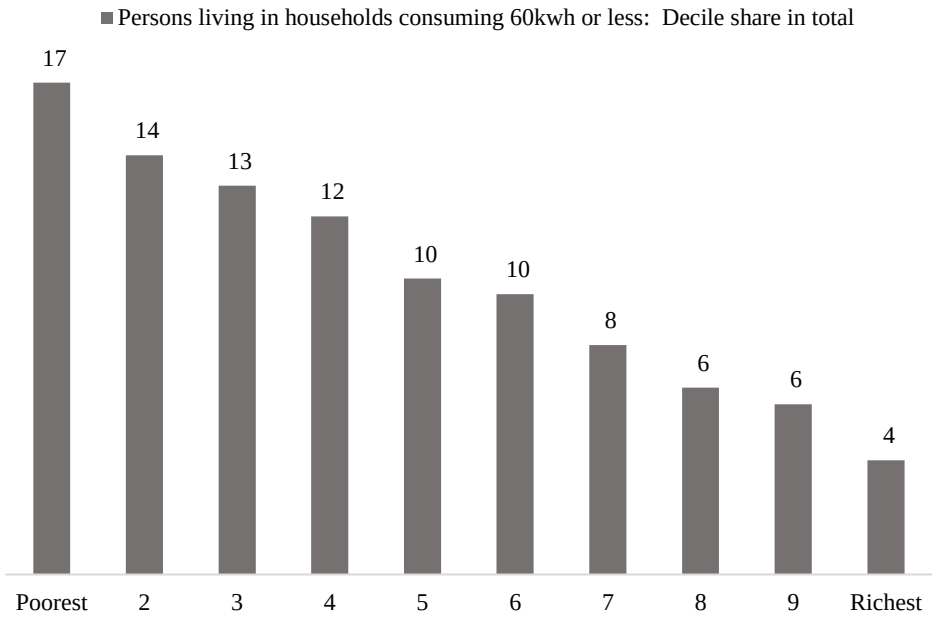


Source: Author's own calculations from unit data of HIES 2016

How much of the cash transfer budget would be spent on the vulnerable population if the electricity use criterion is employed? We define the 'vulnerable' as the poorest 60% of

households (or lowest six deciles).[4] They would receive 76% of the cash transfer budget (Figure 3). This can be compared with 78% of the Samurdhi budget available for reaching the poor after the salary component is deducted.[5]

Figure 3: Decile distribution of cash transfers budget using criterion of electricity use of 60kWh or less



Source: Author's own calculations from unit data of Sri Lanka Household and Expenditures Survey 2016.

Thus, household electricity usage is a good indicator of poverty, and a budget based on this criteria is likely to reach the poorest segments of the population. There are three other reasons for the Government of Sri Lanka to adopt it:

1) It can be implemented quickly, easily and cheaply.

Ninety-nine per cent of households are connected to the Ceylon Electricity Board (CEB) grid, and their monthly electricity use is already tracked and available in digital form. No additional information burden is imposed. Moreover, the 1% of households not connected to the grid would also be relatively easy to identify as they are small in number and likely to be geographically clustered.

[4]While this definition is somewhat arbitrary, it corresponds closely to the percentage of households reducing meals per day because of the crisis (World Food Programme, 2022).

[5]While this definition is somewhat arbitrary, it corresponds closely to the percentage of households reducing meals per day because of the crisis (World Food Programme, 2022).

2) **Eligibility can be adjusted regularly to reflect changes in household circumstances.**

Data for eligibility is based on real-time administrative data. Households could be moved in or out of the programme as their levels of electricity use change at regular intervals, and this too can be carried out with a low administrative burden and on an objective basis.

3) **Politicisation and corruption can be largely eliminated.**

Eligibility is measured by an objective criterion; by eliminating subjective assessment, it reduces the possibility of political patronage and institutional corruption. This is perhaps the most important reason to implement this eligibility criterion.

Reducing errors of inclusion

The efficiency of this mechanism can be further improved by implementing agencies identifying and excluding from the cash transfer programme households that rely on solar power generation for household use and thereby consume less than 60kWh from the national grid. This is easily done; households with solar electrification have a special meter that identifies imports from the grid and exports to the grid. Electricity usage can be determined based on imports over the previous month's imports, which determines units consumed. Similarly, households with two or more electricity meters on different floors can also be identified and excluded. These two corrective measures would reduce the number of households among the wealthiest 20% of households who might otherwise wrongly receive cash transfers.

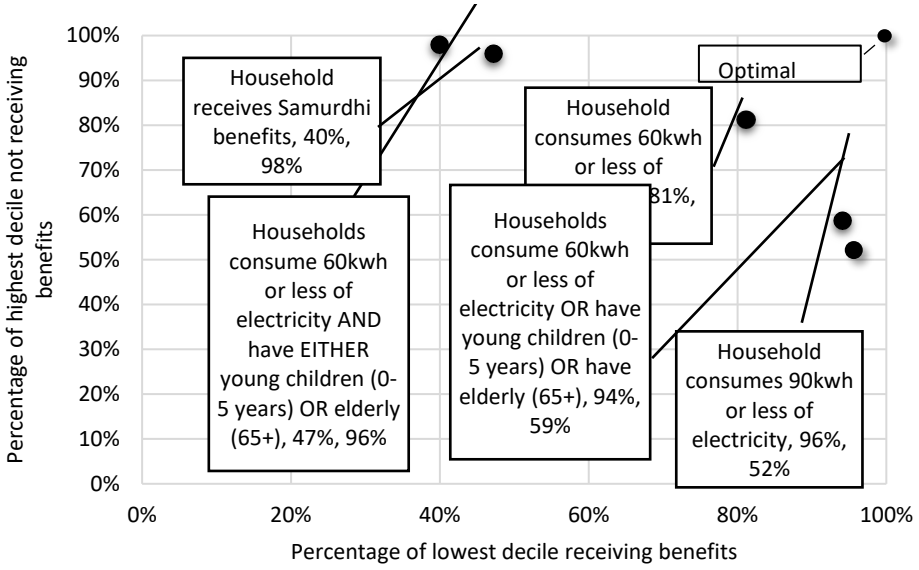
Expanding criteria and assessing comparative performance

This paper recommends that the threshold for eligibility for cash transfers and other benefits be 60kWh of monthly electricity use. This would cover 48% of the population. However, this threshold can and should be amended to reflect the vulnerability of different sections of the population as the economic crisis evolves. Perhaps households that use between 60 kWh and 90 kWh could also receive a payment, but a smaller one. This will cover an additional 30% of the population. Alternatively, the electricity use criterion could be used in conjunction with other criteria, such as the presence of young children (aged 0-5) or elderly dependent adults (65+) within the household. If any of these two additional criteria were applied, 22% of the population would become eligible for benefits. By contrast, if eligibility depended on meeting electricity use criteria and the presence of young children or an elderly dependent adult, then only 19% of the population would be eligible. The latter coverage is similar to that of Samurdhi, which covers 19% of the population according to our analysis of HIES 2016 data.

We perform a comparative analysis of several criteria using microdata from the HIES 2016. Figure 4 shows how well each of the five criteria performs in reaching the poorest 10% of the population and excluding the richest 10%. The criteria are: (1) receipt of

Samurdhi benefits, (2) electricity usage of 60kWh or less AND the presence of young or elderly (dependents) in the household, (3) electricity usage of 60kWh or less as the single criterion, (4) electricity usage of 60kWh or less OR the presence of young OR elderly (dependents) in the household and (5) household consumes 90kWh or less as the sole criterion.

Figure 4: How effective are the various eligibility criteria in including the poor and excluding the rich?



Assuming that the inclusion of the poorest decile and exclusion of the richest decile are the only objectives and are given equal weight, targeting improves as one moves to the right on the horizontal axis and upwards on the vertical axis in Figure 4. On this mapping, the targeting mechanism of household use of 60kWh or less is the best to use, covering 48% of the population, including 81% of the poorest decile and excluding 81% of the richest decile. Criterion (4), which supplements the household population with electricity usage of 60kWh or less with households with either young children or elderly and covers 70% of the population, includes 94% of the poorest decile and excludes 59% of the richest decile and is the second best criteria. Criterion (5) is the third best, covering 78% of the population and including 96% of the poorest decile and excluding 52% of the richest decile. Criterion (2), which determines eligibility on electricity usage and the presence of young or old dependents, is the fourth best of five criteria, covering 19% of the population and excluding 96% of the richest decile. However, it only includes 47% of the poorest decile. Samurdhi's performance turns out to be the worst, also covering 19% of the population and excluding 98% of the richest decile but only including 40% of the poorest decile.

SUMMARY AND CONCLUSIONS

This note highlighted the need to expand social protection to vulnerable population segments. It demonstrated that electricity usage is an effective, efficient and easy method to identify eligibility for welfare benefits. It performs better than the existing Samurdhi cash transfers scheme to reach the poorest, has a low administrative burden, and is an objective mechanism that is not easily manipulated.

REFERENCES

Central Bank of Sri Lanka (2022), September. CCPI based headline inflation recorded at 69.8% on year-on-year basis in September 2022. Retrieved 06October 2022, from https://www.cbsl.gov.lk/sites/default/files/cbslweb_documents/press/pr/press_20220930_inflation_in_september_2022_ccpi_e.pdf

Department of Census and Statistics (2022a). Poverty indicators – 2019. Retrieved 05 July 2022, from http://www.statistics.gov.lk/Poverty/StaticalInformation/PovertyIndicators-2019.

Department of Census and Statistics (2022b). Household income and expenditure survey – 2019. Retrieved 05 July 2022, fromhttp://www.statistics.gov.lk/Resource/en/IncomeAndExpenditure/HouseholdIncomeandEHouseholdIncomea2019FinalResults.pdf.

Department of Government Printing (2019). Gazette extraordinary of the democratic socialist republic of Sri Lanka. No. 2128/24 of 20 June 2019.

Department of Samurdhi Development (2018). Performance report. Retrieved 05 July 2022, from https://www.parliament.lk/uploads/documents/paperspresented/performance-report-department-of-samurdhi-development-2018.pdf.

Kidd, S. et al. (2020). Tackling the COVID-19 economic crisis in Sri Lanka: providing universal, lifecycle social protection transfers to protect lives and bolster economic recovery. Retrieved 05 July 2022, from https://www.unicef.org/srilanka/media/1366/file/UN%20Brief%20Social%20Protection%20Response%20Sri%20Lanka%20Summary.pdf.

Madduma Bandara, N. D. (2016). Causes and consequences of poverty targeting failures: the case of the Samurdhi Program in Sri Lanka. Asian Politics & Policy, 8(2), 281-303.

Ministry of Finance, 2021. Guidelines for the implementation of eligibility criteria for Samurdhi welfare benefits based on Samurdhi circular 2021/03.

Ramos, S., Melissa, K. and Karimi, A.M. (2020). Social protection in Sri Lanka: an analysis of the social, economic, and political effectiveness of the Samurdhi programme. Munich Personal RePEc Archive.

UNICEF (2022), June. UNICEF appeals for US$25 million to meet the urgent needs of 1.7 million children affected by the economic crisis in Sri Lanka. Retrieved 05 July 2022, from https://www.unicef.org/rosa/press-releases/unicef-appeals-us25-million-meet-urgent-needs-17-million-children-affected-economic.

World Food Programme (2022), June. WFP says 66 % Sri Lankans reduced number of meals eaten daily. Retrieved 05 July 2022, from https://colombogazette.com/2022/06/15/wfp-says-66-sri-lankans-reduced-number-of-meals-eaten-daily/#:~:text=The%20World%20Food%20Programme%20(WFP,food%20security%20assessment%20in%20April.

World Bank (2016a). Poverty and welfare in Sri Lanka: recent progress and remaining challenges. Retrieved 05 July 2022, fromhttps://openknowledge.worldbank.org/handle/10986/23794.

World Bank (2016b). Social safety nets, project appraisal document. Retrieved 05 July 2022, from https://documents1.worldbank.org/curated/en/285991480906853560/pdf/Project-Appraisal-Document-Final-submitted-to-SECPO-1111

APPENDIX

Table 2, based on data from the Ceylon Electricity Board, presents tariffs that have been applied since 2014 and indicates that the two lowest slabs for electricity use are 0-30 kWh and 31-60 kWh in monthly consumption. Consumers within these slabs are charged at a lower subsidized rate than those who consume higher than 60kWh. A household with 60 kWh of domestic electricity consumption in June 2016 incurred a kWh charge of Rs. 475.30 and a fixed charge of Rs. 90 and paid a total bill of Rs. 565.30 (CEB Website). For this note, households represented in the Household Income and Expenditure Survey 2016 with a monthly electricity expenditure of Rs. 565.30 or less are considered to be consuming 60 kWh or less of electricity. Note that even though tariffs have since increased, this does not affect our results since the analysis is for electricity usage in 2016, not expenditure on usage *per se*. A demand response to increased tariffs might imply that fewer units will be consumed currently and in the future; however, it is reasonable to assume that there is greater inelasticity at the lower end of the electricity usage distribution, given households' minimum electricity requirements.

Table 2: CEB tariffs for electricity consumption

	Monthly consumption (1) kWh	Unit charge (Rs/kWh)	Fixed charge (Rs/month)
Consumption between 0-60kWh	0-30	2.50	30.00
	31-60	4.80	60.00
Consumption above 60kWh	0-60	7.85	N/A
	61-90	10.00	90.00
	91-120	27.75	480.00
	120-180	32.00	480.00
	>180	45.00	540.00