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Water Insecurity in Sri Lanka, 2024-2025:

Evidence from the 2024-2025 BRIGHT Survey

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Key findings and policy implications

We assess water insecurity in Sri Lanka using the BRIGHT Integrated Household Survey data for 2024-2025.

Key Findings

- Compared to the 2016 DHS data, the 2024 BRIGHT results show moderate improvements in access to improved drinking water sources. Estate sector households show the greatest relative improvement, with the share using improved water sources increasing by approximately five percentage points. This shift is driven primarily by a 15-percentage-point rise in the use of protected wells, although nearly half (49%) of estate households continue to rely on rivers, springs, or tank water.
- Most households in Sri Lanka report few insecurity experiences, and are therefore mostly water secure, with 90% not experiencing water insecurity.
- Differences between groups are subtle and occur mainly between marginal and low levels of water security, rather than between fully secure and insecure households.
- 68% of estate households (households on plantations), experienced at least water insecurity experience compared to only 28% of urban households and 33% of rural households.
- Households in dry agroecological zones face slightly higher risks water insecurity (11%) compared to 9% of in both intermediate and wet zones.
- Poverty is a key predictor of water insecurity. The poorest households are 6.8 times more likely to experience extreme water insecurity than the richest households.
- Sri Lanka has lower levels of water insecurity than most other lower-middle income countries but needs to address poor water security in populations left behind. Improving water security in estate areas and in the dry zone should be national water security priorities

Introduction

Reliable year-round access to drinking water of sufficient quantity and quality is a fundamental human right and is recognized as such as in the Sustainable Development Goals (SDG 6). Safe and affordable water is critically important for health both directly and indirectly. Contaminated water can lead to a wide variety of life-threatening health problems including diarrhea and chronic enteric infections, cancer, and various forms of poisoning.

Relative to many other lower-middle income countries, most of Sri Lanka is blessed with abundant rainfall or about 2000mm of rain annually, although there is seasonal and spatial variation in rainfall as well as other issues with physical accessibility, such as the remoteness of certain rural or estate populations. As a result of these challenges, as well as institutional problems in water supply, Sri Lanka has long been characterized by highly unequal access to improved water sources. The 2016 Demographic Health Survey (DHS), for example, found that while 90.2% of Sri Lankans had access to improved drinking water sources overall, this fell to just 43% among Estate populations, most of whom still relied on river/spring or tank water (Table 1).

Moreover, a microbiological study funded by the World Bank (2017) tested drinking water samples in 170 estate locations and sampled – in each location – the point of water distribution to the community (water tanks, spring, etc.), randomly selected households, and the child development centre (CDC) of the estate or division. The study found that more than 92 percent of the estate sector water supplies were contaminated with fecal E. coli, a dangerous pathogenic bacteria, and well-known cause of diarrhoea and malnutrition in young children especially.

Although data on sources of drinking water are important, they do not directly indicate experiences of water insecurity. Recognizing that limitation, international researchers developed the Household Water Insecurity Experiences Scale (HWIES) 12-question module, and its corresponding international classifications, to categorize households as experiencing high, moderate, low, or zero/marginal water insecurity (Young et al., 2024). The WIES framework was originally developed and validated by Sera et al. (2019), with subsequent studies examining cross-country comparability and differences in water insecurity, and exploring critical relationships between water insecurity, food insecurity, and dietary diversity (Stoler et al., 2021; Young et al., 2022, Miller et al., 2024). Until now, however, nationally-representative in-person surveys did not include data to measure water insecurity in Sri Lanka. As a result, there has been only a fragmented understanding of water insecurity across the country.

This study therefore used the BRIGHT Sri Lanka Survey data to address this knowledge gap by measuring the prevalence of different forms of water insecurity and examining how water insecurity varies across key demographic and geographic dimensions, as well as trends in different sources of drinking water, with comparisons to the 2016 DHS. Because of the spatial and socioeconomic inequality in access to water in Sri Lanka, our analysis reports the prevalence of different forms of water insecurity at the national level and examine variations by urban, rural, and estate locations, agroclimatic zones, household socioeconomic status (wealth), and access to improved water infrastructure.

The BRIGHT Integrated Household Survey of Sri Lanka 2024-2025

In March 2024, the Sri Lankan Prime Minister requested CGIAR support "for economic revival … including innovations that integrate livelihoods, food and nutrition security, and resilience." In response, The International Food Policy Research Institute (IFPRI) and The International Water Management Institute (IWMI) launched The Building Resilient and Inclusive Growth and Holistic Transformation (BRIGHT) Project under the CGIAR Science Program on Policy Innovations. Given the absence of recent survey data on Sri Lanka's economic and social welfare since the onset of the 2022 economic crisis, the BRIGHT project implement the first ever truly multi-thematic household survey, The BRIGHT Integrated Household Survey of Sri Lanka.

The survey interviewed male and female members from 6,850 households across all provinces and districts of Sri Lanka between November 2024 and March 2025. The BRIGHT survey is representative of urban, rural and estate populations, and of each of Sri Lanka's provinces, and was also implemented in each of Sri Lanka's 25 districts. The survey is representative through both its three-stage cluster sampling approach and the use of subnational population data from the DCS. Content-wise, the BRIGHT survey builds on large-scale surveys conducted by IFPRI in Bangladesh, India, Myanmar and dozens of other countries (see https://www.ifpri.org/publications/datasets/). However, the BRIGHT survey was uniquely multi-thematic in the Sri Lanka context, covering household food and non-food expenditure, monetary poverty, education, health, housing, assets, employment and livelihoods, farm and non-farm businesses, women's empowerment, psychological wellbeing, nutrition knowledge and anthropometry, social protection, food, water and energy insecurity, debt, migration, climate change adaptation, and exposure to shocks, among other topics. More details can be found on the BRIGHT website: https://www.ifpri.org/project/bright-sri-lanka/.

Measurement of the Household Water Insecurity Scale (HWISE)

This analysis uses the HWIES module administered to 3,328 households or half of the total sample (the remaining households answered experimental questions designed to assess water insecurity through alternative methods). This dataset enables examination of water insecurity within the broader context of household welfare and livelihood strategies in Sri Lanka. The WIES assessment asks 12 questions to assess the impacts of water insecurity on daily habits, sanitation, and stress outcomes. Responses to these water insecurity experiences are categorized based on frequency: never (0 points), 1-2 months per year (1 point), in some but not every month (2 points), and in almost every month or every month (3 points). **Household scores are ranked on a 0-36 scale with those scoring above 12 considered water insecure (Young et al., 2022).**

Trends in Sources of Drinking Water

Compared to the 2016 DHS data, the 2024 BRIGHT results show moderate improvements in access to improved drinking water sources. Estate sector households show the greatest relative improvement, with the share using improved water sources increasing by approximately five percentage points. This shift is driven primarily by a 15-percentage-point rise in the use of protected wells, although nearly half (49%) of estate households continue to rely on rivers, springs, or tank water.

In urban areas, the proportion of households accessing improved sources increased slightly, from 98.7% in 2016 to 98.9% in 2024. Use of tap water rose over the last 8 year period by 13%, shifting away from reliance on protected and semi-protected wells and bottled water. indicating shifts within improved source use.

In rural areas, overall access to improved sources also slightly increased. For example, the share of rural households using tap water increased by 14 percentage points, while reliance on semi-protected wells declined by approximately nine percentage points, suggesting gradual improvements in the reliability and reach of rural water infrastructure. Estate households also now have slightly better access to improved sources, with a large portion now relying on protected wells. Though over half of estate households rely on unimproved sources, with the percentage of households relying on rivers, springs, or tanks slightly increasing.

Table 1. Trends drinking water sources from the 2016 Demographic Health Survey and BRIGHT in 2024-2025

	URBAN		RURAL		ESTATE		NATIONAL	
	2016	**2024**	**2016**	**2024**	**2016**	**2024**	**2016**	**2024**
Improved source	***98.7%***	***98.9%***	***91.0%***	***91.3%***	***43.0%***	***45.0%***	***90.2%***	***90.8%***
Tap water	73.5%	86.8%	28.3%	42.4%	19.2%	20.8%	35.1%	49.2%
Protected well*	13.9%	7.0%	37.6%	35.8%	8.5%	23.4%	32.7%	30.4%
Semi-protected well	3.4%	1.6%	13.1%	3.5%	4.3%	0.0%	11.2%	3.0%
Rural water project	4.3%	2.9%	8.7%	2.5%	11.0%	0.0%	8.1%	2.5%
Bottled water	3.5%	0.5%	3.2%	7.1%	0.1%	0.9%	3.1%	5.7%
Unimproved source	***1.0%***	***1.2%***	***8.2%***	***8.3%***	***56.7%***	***55.0%***	***9.1%***	***8.9%***
River/spring/tank	0.5%	0.0%	5.2%	5.4%	53.6%	54.4%	6.4%	6.3%
Other unprotected	0.8%	1.2%	3.8%	3.0%	3.3%	0.6%	3.3%	2.6%

Source: 2016 Sri Lanka Demographic Health Survey, 2024 BRIGHT Survey

Key Findings on Water Security in Sri Lanka

The results in Table 3 reveal that worry and minor behavioural adaptations are more common than severe deprivation, as expected based on the ordering/scaling of severity assumed to apply to the 12 different questions in the WIES. For example, 26% of households worried they would not have enough water for their household needs either rarely (5%), sometimes (17%) or often (2%), and 15% of households have had to change their schedules due to water problems, with similar proportions having had to modify their washing and bathing routines. In contrast, severe impacts, such as going to bed thirsty, were reported by fewer than 4% of households, suggesting that while water stress exists, extreme water insecurity remains limited.

Table 2: Household-Level Statistics for the WIES 12-Question Survey

How frequently did your household…	Never	Rarely	Some-times	Often
1. Worry you would not have enough water for all your household needs?	76%	5%	17%	2%
2. Experience interruption or limitations to your main water source?	76%	5%	17%	2%
3. Have problems with water that meant clothes could not be washed?	83%	4%	12%	1%
4. Have to change schedules or plans due to problems with your water situation?	85%	3%	11%	1%
5. Change what was being eaten because there were problems with water (eg, for washing foods, cooking, etc.)?	89%	2%	8%	1%
6. Go without washing hands after dirty activities because of problems with water?	92%	1%	6%	0%
7. Go without washing their body because of problems with water (eg, not enough water, dirty, unsafe)?	87%	3%	10%	1%
8. Not have as much water to drink as you would like for you or anyone in your household?	93%	1%	6%	1%
9. Feel angry about your water situation?	86%	3%	10%	1%
10. Go to sleep thirsty because there wasn't any water to drink?	96%	1%	3%	0%
11. Have no useable or drinkable water whatsoever in your household?	92%	2%	6%	1%
12. Have problems with water that caused you or anyone in your household to feel ashamed/excluded/stigmatized?	94%	1%	5%	1%

Most Sri Lankan households are relative water-secure, with 90% of households scoring below 12 points (low/marginal/zero insecurity). However, the remaining 10% of households do experience moderate or severe water insecurity, with 8.3% facing moderate water insecurity (12-23 points) and 1.7% experiencing high water insecurity (24-36 points).

Water insecurity across urban, rural and estate areas

These classifications reveal important geographic disparities across Sri Lanka (Table 4).[1] Estate areas have a much higher proportion of households with any form of water insecurity with low insecurity (59%) versus rural areas (33%) and urban areas (28%) areas, though essentially all of this difference stems from a much higher prevalence of Estate households with low levels of water insecurity (34% vs 16% in rural and 12% in urban areas). More modest differences emerge across agroecological zones, though households in the wet zone have slightly lower water insecurity than the intermediate or dry zones.

Table 3: Water Security Statistics

	Any form of water insecurity	Water Insecure (moderate/high)	Low	Moderate	High
Urban	28%	9%	12%	7%	2%
Rural	33%	10%	16%	8%	2%
Estate	59%	9%	34%	9%	0%
Dry	29%	11%	19%	9%	2%
Intermediate	28%	9%	19%	8%	1%
Wet	23%	9%	13%	8%	2%
National	34%	10%	16%	8%	2%

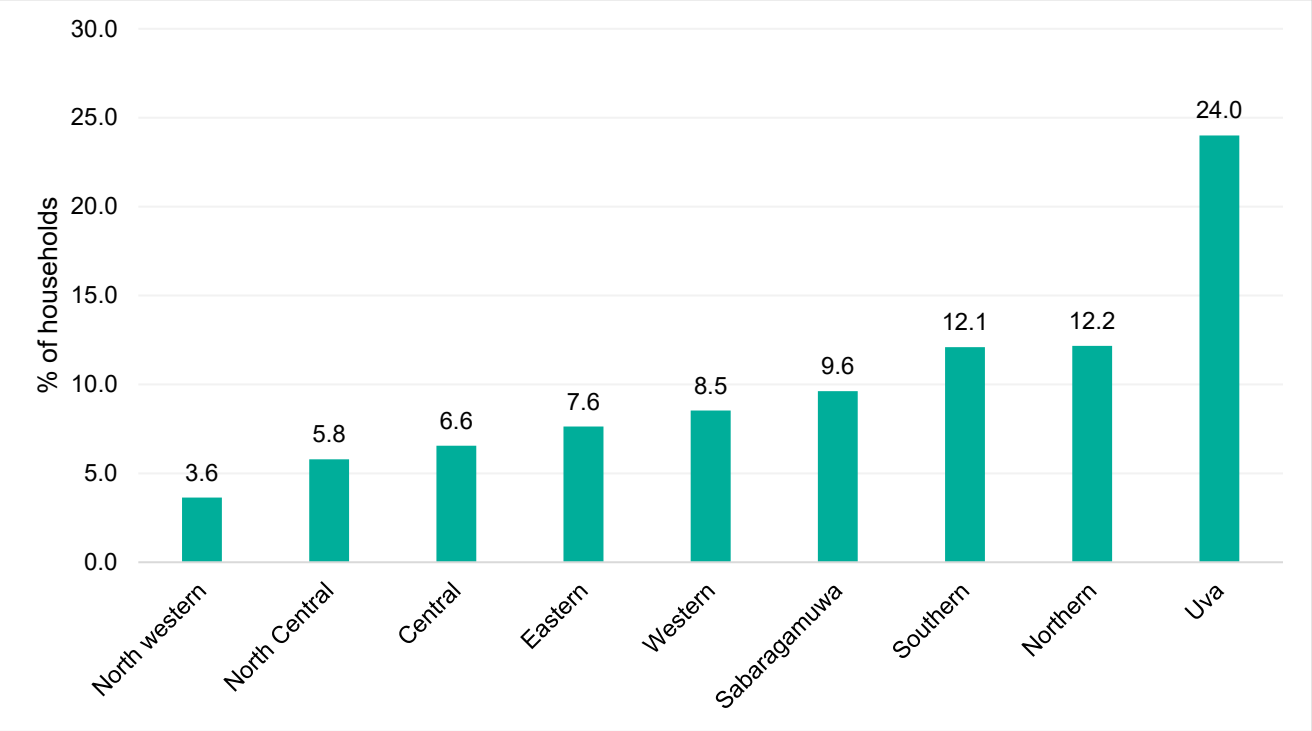
Source: BRIGHT Integrated Household Survey, 2024-2025

Water insecurity across by province

Figure 1 reports moderate/severe water insecurity by province. Here, the most striking result is the high levels of water insecurity reported in Uva province (24%), much higher than the national average of 10%. Uva has a relatively large estate population and a large rural population, with only a modest urban population. Water insecurity is also relatively high in the Northen and Southern provinces, both of which are relatively dry.

[1] Because we aggregated data from 50% of the households, there may be imprecision at the subnational levels.

Figure 1: Percentage of Households Experiencing Water Insecurity by Province

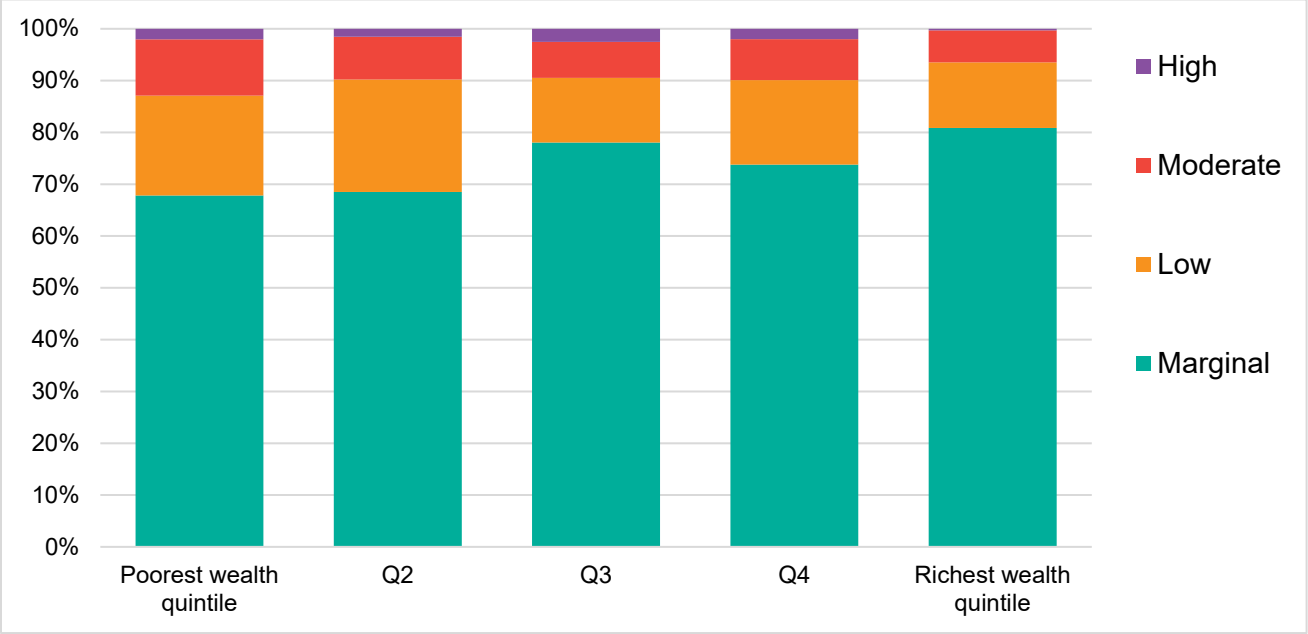


Source: BRIGHT Integrated Household Survey, 2024-2025

Drivers of Multidimensional Poverty & Vulnerability

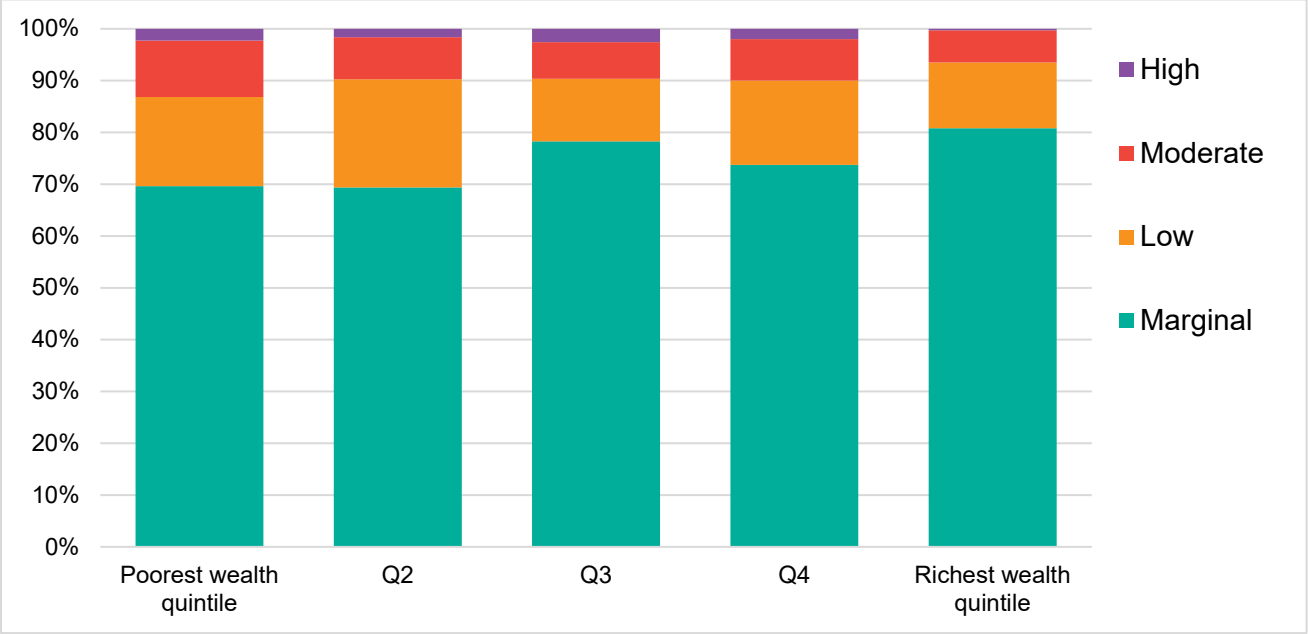
In Figure 2 we examine whether wealth is an important determinant of water insecurity for all households, while Figure 3 excludes estate households who clearly have distinctively poor water supply problems relative to th result of the population. Among all households, whereas 81% of households in the top wealth quintile report marginal water security, only 68% of households in the bottom two quintiles reach this level. The disparity is even more pronounced when examining moderate/severe water insecurity rates: 14% of households in the bottom quintile are water insecure compared to just 7% in each of the top three quintiles. However, when we exclude non-estate households in Panel B, the wealth-insecurity relationship is weaker.

Figure 2: Water Insecurity by Wealth Quintile, all households



Source: BRIGHT Integrated Household Survey, 2024-2025

Figure 3: Water Insecurity by Wealth Quintile, Excluding Estate Households



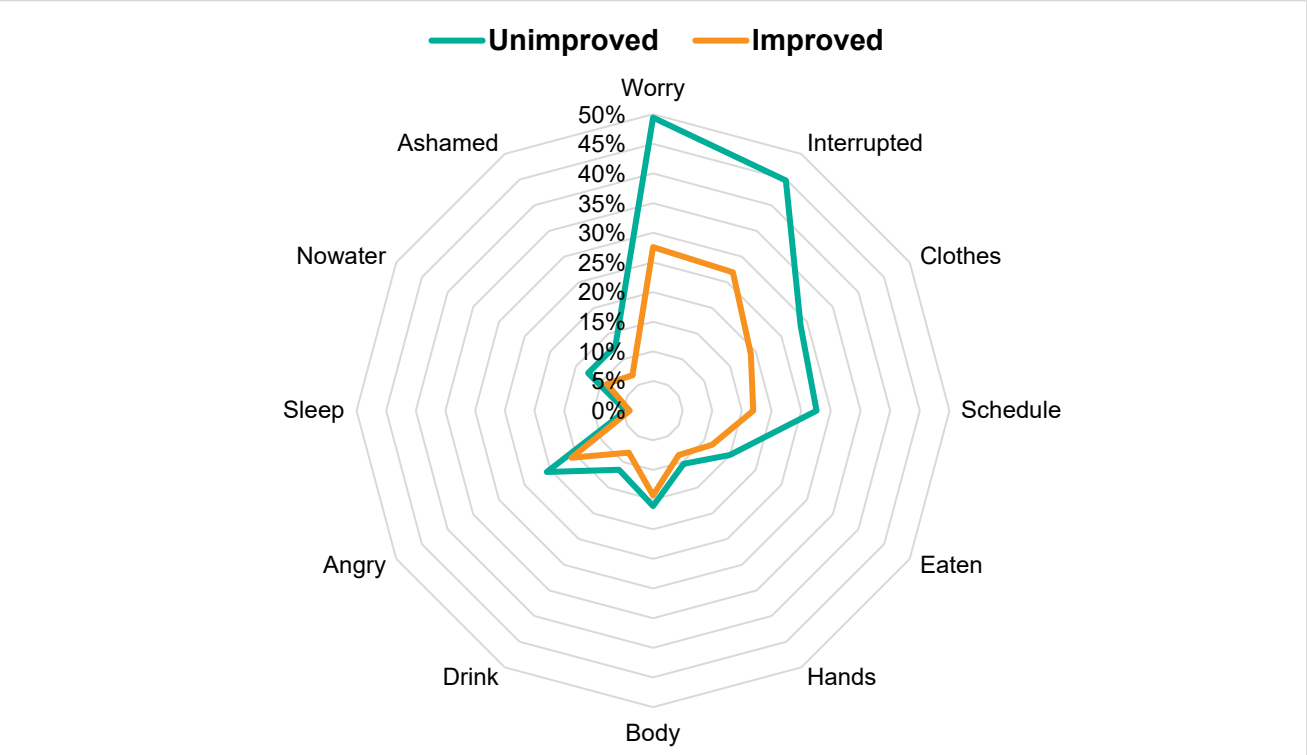
Source: BRIGHT Integrated Household Survey, 2024-2025

The BRIGHT survey also asked respondents whether their main water source had been limited or interrupted within the past year. Twenty-five percent of households reported interruptions or limitations in

water supply, and there were very strong associations between this simple indicators and WIES responses. For example, 84% of households that experienced interruptions reported worrying about having enough water, compared to just 9% of households who did not experience interruptions.

The main water source type was also strongly correlated with water insecurity (Figure 5). Improved water sources have the potential to deliver safe water by nature of their design and construction. These sources include piped water, boreholes or tubewells, protected dug wells, protected springs, rainwater, and packaged or delivered water. Households relying on unimproved water sources, like unprotected wells or rivers, dams, lakes, streams or irrigation canals, face substantially higher water insecurity across multiple measures, particularly in terms of worry about water availability, service interruptions, reduced clothes washing, and schedule modifications.

Figure 4: Water Insecurity by Access to Improved Water Source

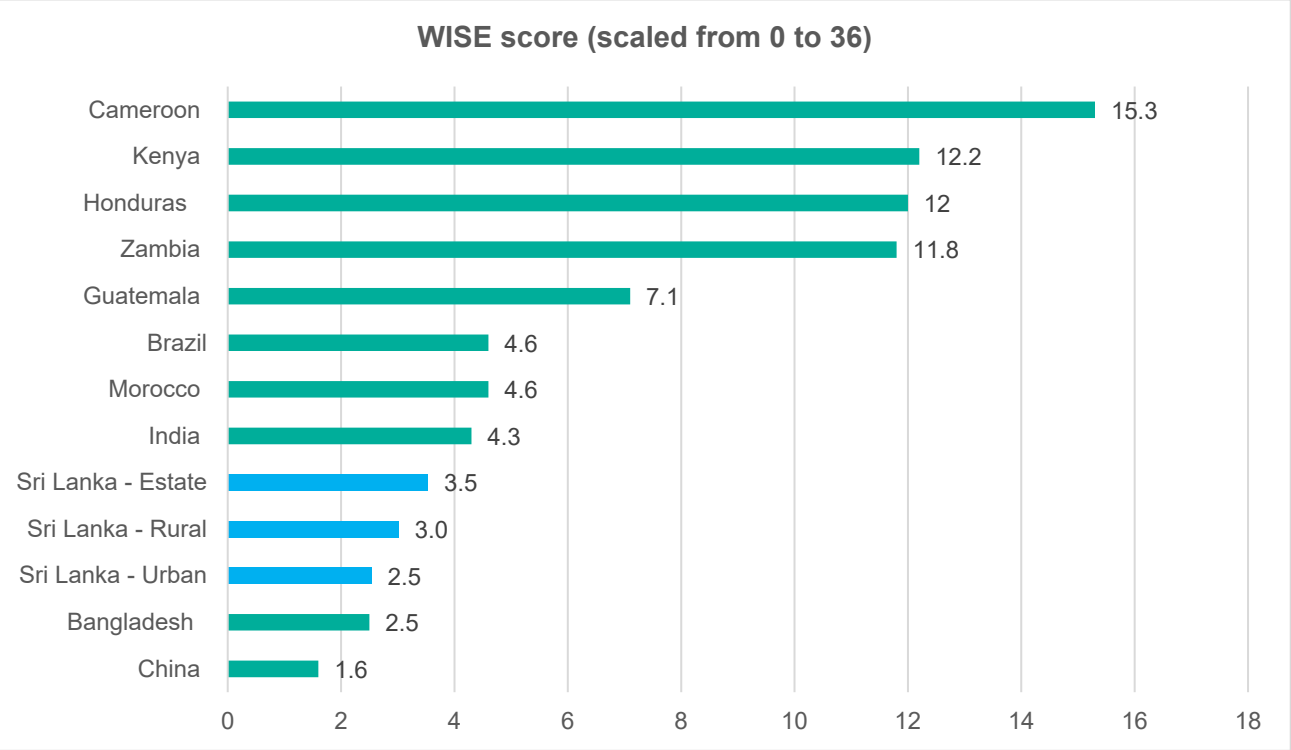


Source: BRIGHT Integrated Household Survey, 2024-2025

Comparing Sri Lankan Water Security to Other Low- and Middle- Income Countries

When placed in regional context, Sri Lanka experiences relatively lower water insecurity levels than its counterparts. With an average HWISE score of 2.9, Sri Lanka performs better than many other low- and middle-income countries in Asia, though direct comparisons are complicated by methodological differences between household and individual assessment approaches used in different studies, and the lack of nationally representative data in other Asian countries.

Figure 5: Sri Lankan Household Water Insecurity Scores (0-36) Compared to Other Countries



Source: https://iwaponline.com/washdev/article/14/11/1066/104925/Identifying-ordinal-categories-for-the-Water

Policy Implications for Sri Lanka

Overall, self-reported water insecurity is relatively low in Sri Lanka, which is consistent with the country's relatively favorable rainfall, water availability and infrastructure for drinking water in most areas and sectors. However, the findings point to important gaps in water coverage and water security.

First, the most important gap in water security as well as in access to improved water sources is undoubtedly the estate populations. Furthermore, evidence from the World Bank (2017) suggests that bacterial contamination of water supplies (*E.* Coli) in Estate areas is high. In the past, the predominantly Tamil populations living on tea estates depended on the Estate management for all their basic infrastructure needs, which generally resulted in poor provision of basic services, whereas urban and rural non-estate populations were more directly serviced by the responsible government ministries. Plantation companies have long claimed they cannot afford social welfare programs. The result has been a hybrid system for supplying water and sanitation infrastructure, with responsibilities unsatisfactorily shared between Estate companies, the Plantation Human Development Trust (PHDT), and government ministries and local government agencies. While there has been an improvement in water infrastructure access over time, the results in this study indicate that sizable inequalities persist, and further investments and institutional reforms are required to ensure that Estate populations and other vulnerable rural populations have reliable access to clean and safe drinking water.

Finally, we note an important limitation of both water supply and water security indicators – it is almost impossible for individuals or households to assess the quality of their own water sources in terms of bacterial and other contamination. However, in addition to concerns regarding water quality in Estate areas, evidence from groundwater quality in Sri Lanka suggests that over 3 million mostly rural people may be regularly using contaminated groundwater (Shamsudduha, et al., 2025). More research and

better monitoring of water quality across Sri Lanka's diverse agroecological and socioeconomic contexts is therefore urgently needed to more rigorously inform appropriate policy actions to improve water supplies for all Sri Lankans.

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