



Sri Lanka Drought Outlook

August 2023 | Issue 1



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How to use the bulletin?

- Tracks how likely the weather forecast for the next four weeks will have the dry spell or droughts, and to a lesser extent of lesser rainfall
- Maps drought situations at national levels and for a range of products from accumulated rainfall, SPI, vegetation indices and VHI
- Determine areas of short and long-term drought outlooks and drought alert maps
- Briefing of media reporting on drought impacts affecting the region's

The SADMS bulletin is published between the 15th to the 17th of each month during the drought period.

View and download the latest issues at :

https://www.iwmi.cgiar.org/resources/drought-monitoring-system/droughtbulletin/

- Despite a revival of the Southwest Monsoon forecast, several provinces, including northern, northcentral, and eastern provinces, are recording normal to below average rainfall received from August to October.
- Seasonal forecast for August indicates below-normal rainfall in the northern, north-central, and eastern provinces.
- Several districts across northern, north-central, and eastern provinces had three to four-week periods of extended dry spells resulting in a meteorological drought that will impact agriculture, energy, and water sectors.
- Maps from the dry spell and SPI 3-month for 16th July to 15th August 2023 explain the drier condition in several provinces in Uva, Eastern, North Central, North, and Northwestern.
- Vegetation conditions monitored using satellite data in reference to 16th July to 15th August 2023 shows poor condition in several provinces explaining a significant impact on food security among smallholder farmers.
- It is important that the stakeholders adopt an anticipatory drought action plan for timely drought relief and response strategies to mitigate drought risks.



The projected seasonal rainfall forecast for the western and southern regions of Sri Lanka indicates an above-normal rainfall from August to October. Meanwhile, the northern, north-central, and eastern provinces of Sri Lanka are expected to experience normal rainfall.

Seasonal climate forecast



Short-term rainfall forecast data from Open Weather represent there is no significant rainfall for the next 7 days.

Similarly, short-term forecasts from IMD also represent low (less than 35mm) rainfall for the next 7 days in the northern, central and eastern regions of the country.

Weather forecast (short-term)

16th July to 15th Aug 2022



11

150





The Global Precipitation Measurement (GPM) data provided free of charge from the National Aeronautics and Space Administration (NASA) Goddard Space Flight Center sources was used to generate the spatial distribution of the monthly rainfall.

The GPM-derived monthly rainfall distribution from 16th July to 15th August 2023 of Sri Lanka has received significantly low rainfall compared to 16th July to 15th August 2023.

Especially, the maximum rainfall received in 2023 (16th July to 15th August) is similar to the minimum rainfall received in 2022 same time period.

Source: https://dmsdemo.iwmi.org/

July 16 to Aug 15, 2022 (<2.5mm)

July 16 to Aug 15, 2023 (<2.5mm)



The dry-Spell is a good indicator of the likelihood of a drought as well as the presence of a prolonged period of drought. Similarly, this indicator reflects the tendency of rainfall over a period of time (short-term, medium-term or long-term).

A dry spell is defined as the number of consecutive days with a daily precipitation amount below a certain threshold, such as 0.1, 1, 5, 10 mm, preceded and followed by at least one day with rainfall exceeding the threshold. The maps uses rainfall product from GPM to calculate the dry spell for July at 2.5 mm and 10 mm

The sub seasonal forecast and the dry spells can help users to develop agriculture contingency plan depending on the crop type and its condition.

3-month SPI – Jul 16 to Aug 15, 2022

3-month SPI – Jul 16 to Aug 15, 2023



Standardize Precipitation Index (3-month SPI)



The Standardized Precipitation Index (SPI) the measure of the number of standard deviations of observed cumulative precipitation deviates from the climatological average.

The SPI values are range from -3 to +3 and Negative values indicate droughts, while positive values indicate wet conditions. Severe drought conditions are determined by high negative values.

The current SPI condition and sub-seasonal rainfall forecast together provide a better understanding of future drought occurrences.

Compared to the SPI index of 2022, a distinct commencement of meteorological drought becomes evident across the entirety of the country in 2023.



Normalized Difference Vegetation Index (NDVI) is the simplest, most efficient and widely used index used to monitor changes in vegetation cover Also, NDVI data can be used to study the trend of agricultural drought based on changes in vegetation cover.

Upon analyzing the nationwide NDVI index derived from ESA Sentinel-2 high resolution (10m) satellite data, a significant decline in the NDVI becomes evident of the occurrence of Agriculture stress when comparing the years 2022 and 2023. Notably, Anuradhapura, districts such as Monaragala, Polonnaruwa, Hambantota, Vavuniya, and Kilinochchi stand out as regions impacted by agricultural drought.



Normalized Difference Vegetation Index (NDVI) is the simplest, most efficient and widely used index to monitor vegetation cover changes. Using the European Space Agency (ESA) Sentinel-2 based NDVI map shows widespread agricultural drought that will likely impact the food security and livelihood of smallholder farmers.

When compared with the NDVI index calculated from 16th July to 15th August 2022, a significant reduction observed from 16th July to 15th August 2023 indicates the impact of agricultural drought on the area.

It is also evident in reference to 2022 for the same period, the land surface changes are quite significant with a reduction in surface water bodies, and crop conditions noticed for the current year. (Closer view of Samanala wewa and Udawalawa reservoirs).

Source: https://eo4arm-demo.iwmi.org/

Vegetation Condition Index (VCI)





Satellite-based Vegetation Health Index (VHI) is a potential agricultural drought monitoring and forecasting index. The VHI was developed using MODIS 16day data with a spatial resolution of 250m.

VHI characterizes the vegetation's health by integrating NDVI and Temperature. The VHI is used for monitoring the phenomenon of drought.

The impact of agricultural drought is confirmed by a significant decrease in VHI in July 2023 compared to July 2022.



Water extent on 09 Aug 2023

Maximum water capacity

During the ongoing hydrological drought conditions in Sri Lanka, the surface water extent of Anuradhapura district has experienced a reduction of over 65% when compared to the full capacity of all the tanks. This situation carries the potential to negatively affect drinking water and agricultural irrigation.

By August 9th, 2023, the surface water extent in the Victoria Reservoir has reduced by more than 60%, significantly compromising its capacity for hydroelectric power generation.

- <u>https://reliefweb.int/report/sri-lanka/national-disaster-relief-services-centre-ndrsc-drought-situation-report-04-august-2023</u>
- <u>https://www.linkedin.com/pulse/growing-drought-crisis-threatens-sri-lankas-sector-s-t-/</u>
- https://www.sundaytimes.lk/230709/business-times/maha-rice-season-to-be-hit-by-drought-524639.html
- <u>https://www.daily-sun.com/post/704554/90000-Sri-Lankans-affected-by-droughts</u>



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Disclaimer

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Thank You

