



Sri Lanka Drought Outlook

Sep 2023 | Issue 2









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, north-central, and eastern provinces are recording normal to below average rainfall received from August to October.
- Short-term forecast till 12th September shows a reduction of rainfall including northern, north-central, and eastern provinces. However, the western, southern and central parts of the country will significant rainfall 7 days;
- With the significant reduction in rainfall in 25 out of 25 districts last month, fears of drought have been raised in many parts of the island.
- SPI 3-month for August 2023 explains the drier condition in the entire country and the dry spell has become more than 15 days in Uva, Eastern, North Central, North and Northwestern provinces of the country.
- Vegetation conditions in reference to 16th July to 15th August 2023 are poor condition in most of the provinces in the entire country.
- It is important the stakeholders adopt 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 September to November. Meanwhile, the northern, north-central, and eastern provinces of Sri Lanka are expected to experience normal rainfall.

06th to 12th September 2023



08th to 17th September 2023



Short-term rainfall forecast data from Open Weather represent lack of rainfall in north, north-central, eastern and south-eastern provinces for the next 7 days and Western and Southern Province will continue to have rainfall in the next 7-10days.

Similarly, short-term forecasts from IMD also represent low rainfall for the next 7 days in the northern, and eastern regions of the country.

Actual Rainfall Distribution





552

5

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 of August 2023 of Sri Lanka has received significantly low rainfall in reference to August 2022 across the country and dry zone are experience drought like situation.

Hanwella station in Kelani river





Rainfall and River discharge



With the recent wet spell since early September, across western, southern, and central provinces of the country, resulting in a significant rise in river water levels, with some basins reporting flood alert for a brief period.

12.00

Dunamale in Attanagalu Oya

Source: https://slirrigation.maps.arcgis.com/apps/

Manampitiya in Mahaweli Gaga





While the western, southern, and central provinces of Sri Lanka have experienced substantial rainfall, the other provinces have not received comparable precipitation.

Consequently, the rivers in the dry and intermediate zones of Sri Lanka continue to face water stress, with current water levels reported as very low in several minor tanks which are the key sources for minor irrigation among smallholder farmers.

Rainfall and River Discharge



Source: Irrigation Department https://slirrigation.maps.arcgis.com/apps/

5th Aug to 6th Sep 2022 (<2.5mm)

Dry Spell



5th Aug to 6th Sep 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 an agriculture contingency plan depending on the crop type and its condition.

August 2022



malee

ticaloa

Standardize Precipitation Index (3-month SPI)

August 2023

-3



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.

3

16th July to 15th Aug 2023

Normalized Difference Vegetation Index (NDVI)

-0.16

Laitivu malee icaloa lombo



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 Sentinel-2 high resolution (10m) satellite data, a significant decline in the NDVI becomes evident of the increasing Agriculture stress when comparing mid-August to end-August and 2023. Notably, districts such as Anuradhapura, Polonnaruwa, Monaragala, Hambantota, Vavuniya, and Kilinochchi stand out as regions impacted by agricultural drought.

0.6



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.

When compared with the NDVI index calculated from 16th July to 15th August 2023, a significant reduction observed from 16th August to 4th September 2023 indicates the impact of agricultural drought on the area.

In addition, compared to mid-August, a significant drop in the water surface area is observed at the end-August year 2023 (especially in the Samanala wewa and Udawalawa reservoirs).

16th June to 15th July 2022



16th July to 15th Aug 2023



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

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

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

Data : 3rd September 2023





Data : 1st September 2023 (Balangoda – Rathnapura district)

Photo on the left explains drier condition across the landscape leading to forest fire due to lack of rainfall for several weeks.

Field Photo (below) taken on 5th September 2023 - (Thambutthe wewa, Galagamuwa) shows dried lake



Map as of Sept 3, 2023, explains only five major reservoirs have water levels exceeding 70%, while nearly 50% of the tanks hold less than 25% of their water capacity.

- <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



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Disclaimer

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Thank You

