South Asia Drought Monitoring System (SADMS) drought weekly bulletin is produced by International Water Management Institute (IWMI) and is funded by the Indian Council of Agricultural Research (ICAR), the CGIAR Research Program on Water, Land and Ecosystems (WLE) and the Ministry of Agriculture, Forestry and Fisheries (MAFF), Japan. Development of the beta-monitoring system was made possible at this inception through IDMP supported by WMO/GWP. The bulletin supports the government and other users to strengthen the potential use of satellite technology and modeling tools to reduce the impacts on agriculture risks and support in drought contingency plans and mitigation efforts.
Indian peninsula might experience rainfall till 10th October, however the rainfall anomaly explains deficit rainfall by 17th of October.

Jammu & Kashmir and Himachal Pradesh might experience slightly increase in rainfall by mid of the second week of October.

Gujarat, Rajasthan, Punjab, Haryana, Uttarakhan may experience deficit rainfall from end of September to mid of October.

Rainfall for Sri Lanka might experience and the condition exist ill mid of October.

Nepal rainfall anomaly explains a decrease in rainfall including Bhutan.

Overall Pakistan shows no anomaly in rainfall.

Note: The summary on country specific details described above based on the ERPAS MME information product do not imply the expression of any opinion whatsoever on the part of the IWMI and its partners as well the data provided by IITM.
**Summary:**

The experimental drought forecast products for research/scientific use based on 29th September 2018 initial condition. These forecast products are based on the real time weekly operational forecast generated by Global ENSemble (GENS), a weather forecast model made up of 21 separate forecasts, or ensemble members developed at The National Centers for Environmental Prediction (NCEP), NOAA.

**Drought Forecast Outlook:**

- Rainfall of UP, Bihar, Manipur, Chhattisgarh, Jharkhand, West Bengal, Manipur, Nagaland, Meghalaya will be decreasing while rainfall of Maharashtra, Karnataka, Arunachal Pradesh, Rajasthan and Haryana will be increasing slightly in coming week.
- Initial condition on the Soil Runoff Index (SRI) explains similar trend to SSI.
- Dryness is decreasing over western belt of India such as western Maharashtra and Karnataka till mid of October.
- Sri Lanka except north and west Sri Lanka will get more rain when rainfall in Jammu & Kashmir and Bhutan is increasing slightly while rainfall is decreasing in Nepal.
- The areas are in deficit rainfall condition which may affect the crop productivity and advance need for State and Local authorities for better planning and coordination on water resources management.

The SADEWS is regional scale early warning system developed as a collaborative project between International Water Management Institute (IWMI) and Indian Institute of Technology – Gandhinagar (IIT-GN).

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- Overall there is a decrease in rainfall for the month of August compared to the long-term anomaly, however some coastal areas in Kerala, southern Gujarat, Odisha, Chhattisgarh, along with south of Jammu & Kashmir had excess rainfall.
- Month of July has experienced both positive and negative anomalies across India. An excess rainfall was received along the southwest coastal line till Gujarat and some parts of central India (Odisha, Chhattisgarh, MP, UP, Uttarakhand) and isolated patches in northern and southern parts of Jammu & Kashmir.
- There has been a slight reduction in rainfall in the month of August over MP, Rajasthan and Gujarat.
- Overall there has been an excess rainfall along the western coast of India.
- Central, Western and Northeast (except Manipur) parts of the region are facing serious deficit of rainfall. This might highly affect the crop productivity during this year’s Kharif season.

Note: Simple qualitative assessment on the performance on rainfall condition was described here to cross compare with SADMS – IDSI products for evaluation purpose only.
South Asia Drought Indices – A Comparison & Assessment

South Asia Drought Early Warning System (SA-DEWS) is an integrated approach based on satellite estimates of rainfall, temperature, wind and soil type utilized in VIC model and the derived outputs namely Standardized Precipitation Index (3-Month), Standardized Soil Moisture Index (SSI) and Standardized Runoff Index (SRI).

Soil Water Anomaly Drought Index (SWADI) is derived from satellite-based decadal soil moisture product of ASCAT provided by EUMETSAT.

Integrated Drought Severity Index (IDSI) is an integrated index that has been formulated using VCI, TCI & PCI at 500m resolution for agricultural land-use over South Asia.

It can be observed that during this time period, all the three indices show a relation with each other. The peninsular India is reviving from the drought situation, including Tamil Nadu, Karnataka and AP.
Summary:

- Using the initial condition i.e. 29th September 2018 based on satellite rainfall estimates of 3B42RT daily time-step integrates in the VIC model and the derived outputs namely Standardized Precipitation Index (3-Month), Standardized Soil Moisture Index (SSI) and Standardized Runoff Index (SRI)

- The extreme values of all three conditions are statistically combined to generated areas under drought for entire South Asia

- Extreme dry condition of MP and Telangana have increased

- Jammu & Kashmir, and parts of northeastern belt are observed to have Severe to Extreme/Exceptional dry condition. Also, Bhutan, Pakistan, Nepal and few patches of Sri Lanka are under extremely/exceptionally severe drought condition.

- Reference to IMD SPI data is well correlated to the area under drought predicted by drought algorithm.
India – State wise analysis
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Maharashtra)

Summary:
- SADMS framework was applied for the agriculture drought monitoring in Maharashtra for current obtained mainly from satellite remote sensing data. The index (Integrated Drought Severity Index – IDSI), Indian Meteorological Rainfall maps were analysed to understand rainfall deficit which could help in validating the drought maps with the absence of in-situ observations.
- “Normal” or “Healthy” category has increased in Pune, Satara, Sangli, Kolhapur, Ratnagiri, Solapur, Ahmednagar, Nashik, Nandurbar, Dhule, Jalgaon, Amravati, Chandrapur, South Nanded, Parbhani.
- Buldaun, Aurangabad, Jalaun, Hingoli, Washim, South & South West of Yavatmal districts are from “Normal” or “Healthy” drought category to “Moderate” or “Sever” drought category with few patches of Extreme drought category.
- Rainfall deficit in north and east parts of the state has increased the vegetation stress in the agricultural land, which is clearly reflected in the IDSI.
Summary:

- Out of the 13 districts in A.P., 7 districts had low rainfall (Guntur, Prakasham, Nellore, Chittoor, Kadapa, Anantapur and Kurnool) from June 1 to 13 Oct 2018;
- ‘Stress’ category has been reduced in west part of the district from the previous map.
- Kurnool, Cuddapah, Anantpur, North Prakasham, North Guntur has slightly change to “Normal” or “Healthy” category.
- South Prakasham, South Guntur, North Anantapur, North Cuddapah, Kurnool, sothern parts of West Godavari and Krishna show “Severe” or “Extreme” patches more than other districts cover, while Srikakulam is in “healthy” category.

Data Source: APSDPS
The Integrated Drought Severity Index (IDSI) for Karnataka were assessed at district level. Karnataka district has well revived from the stress condition. “Extreme” drought condition in the central eastern districts has reduced slightly. There can be seen few patches of extreme drought class in Dharwad, Gadag, Koppal and Bagalkot while South and South east parts of Raichur and North east part of Bellary are still in “Extreme” drought class.
Summary:
The Integrated Drought Severity Index (IDSI) for Telangana was assessed at district level. There seems to be decrease in stress levels in the State but there are patches of severe or extreme drought conditions most of the state. West part of the State is observed to have moved from stress, Moderate or “Severe” category to “Normal” category, while eastern part of Telangana moved from “Normal”/ “Watch” category to “Stress” category.
Summary:
• Thiruvallur, Kanchipuram, Vellore, Dharmapuri, eastern part of Tiruvannamalai, Villupuram, Cuddalore and Ariyalur are from “Normal” category to “watch” category while other districts are reviving from “Extreme” or “Severe” drought category.
• Eorde, Coimbatore, Dindigul, Theni, Madurai and Virudhunagar have changed to “Normal” or “Healthy” category.
• Ramanathapuram district is in “Extreme” drought category but “Extreme” drought condition has reduced in Northern part of the district.
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Gujarat)

Summary:

• Overall condition of the stress is lower compared to the previous analysis
• Banas Kantha, Vadodara, Surat, Anand, Surenganagar, Jamnagar, Rajkot, Jamnagar and Junagar have slightly changed to “Normal” category from “watch” or “stress” category.
• “Extreme” category can be seen as patches all over the state while Kachchh, Mahesana, Patan, West parts Banas Kantha & Vadodara and Bharuch is experienced “Extreme” drought condition most of themselves.
**South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Bihar)**

**Summary:**

- “Extreme” condition of the North half of the Bihar state has increased while South half of the Bihar state is from “stress” to “watch” condition.
- This has happened because of all the district shows deficit rainfall compared to normal for this monsoon season.
Summary:

- There can be seen decreasing of drought condition by 29th September all over the state but north half of the state is still in “extreme” drought category while south half of the district is experienced few patches of the “extreme” drought condition.
All content within this bulletin is based upon the most current available data. As the drought is a dynamic situation, the current realities may differ from what is depicted in this document. The product has not been validated and used only the weather forecast and remote sensing observation. We welcome the feedback from the end-users and request you to provide field observations and any other details which can improve the product quality and prediction skills in the near future.

Disclaimer

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