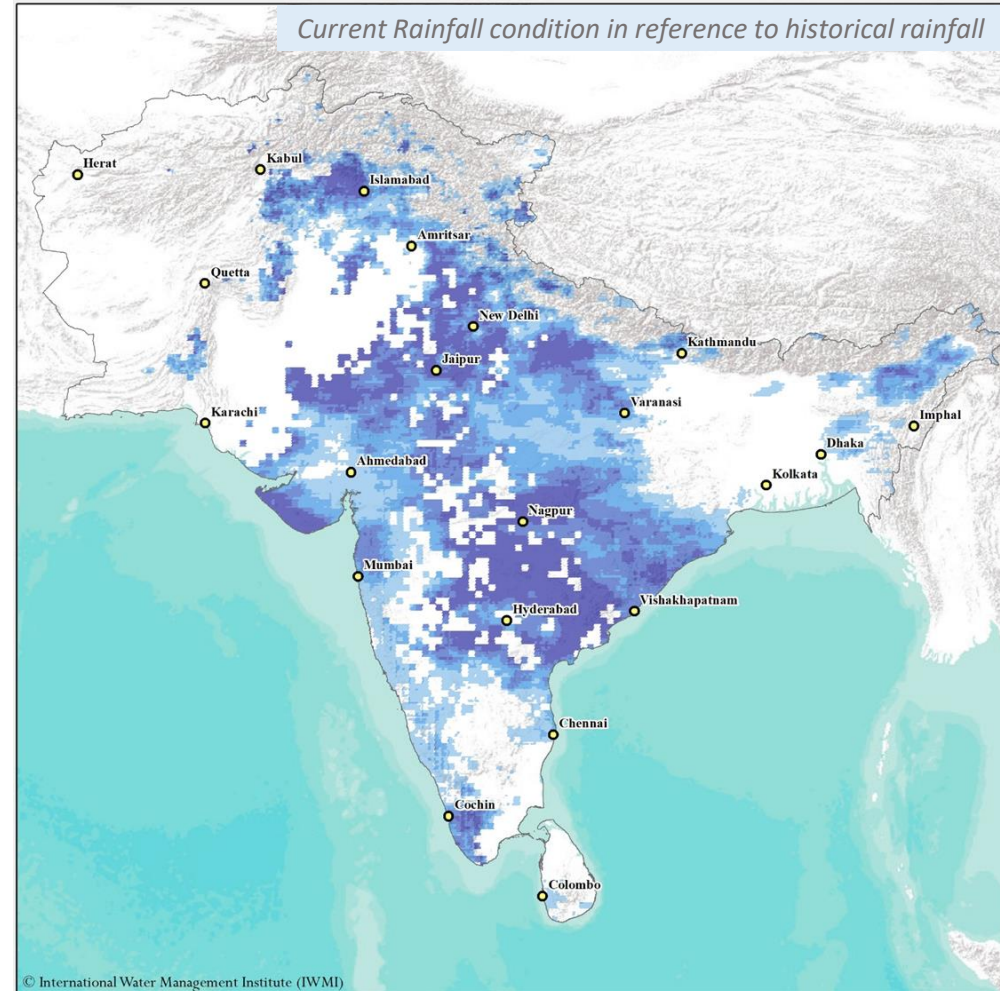
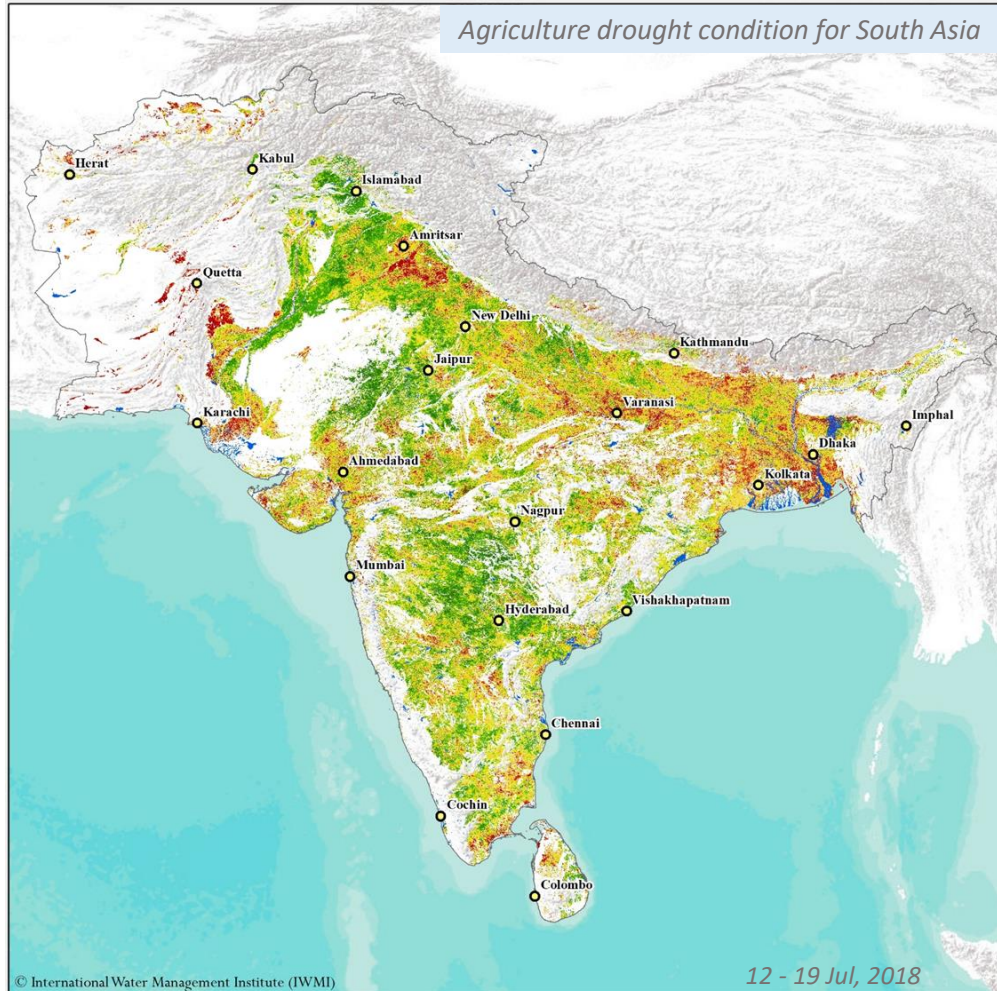


# SADMS DROUGHT BULLETIN

26 July 2018 | ISSUE 2



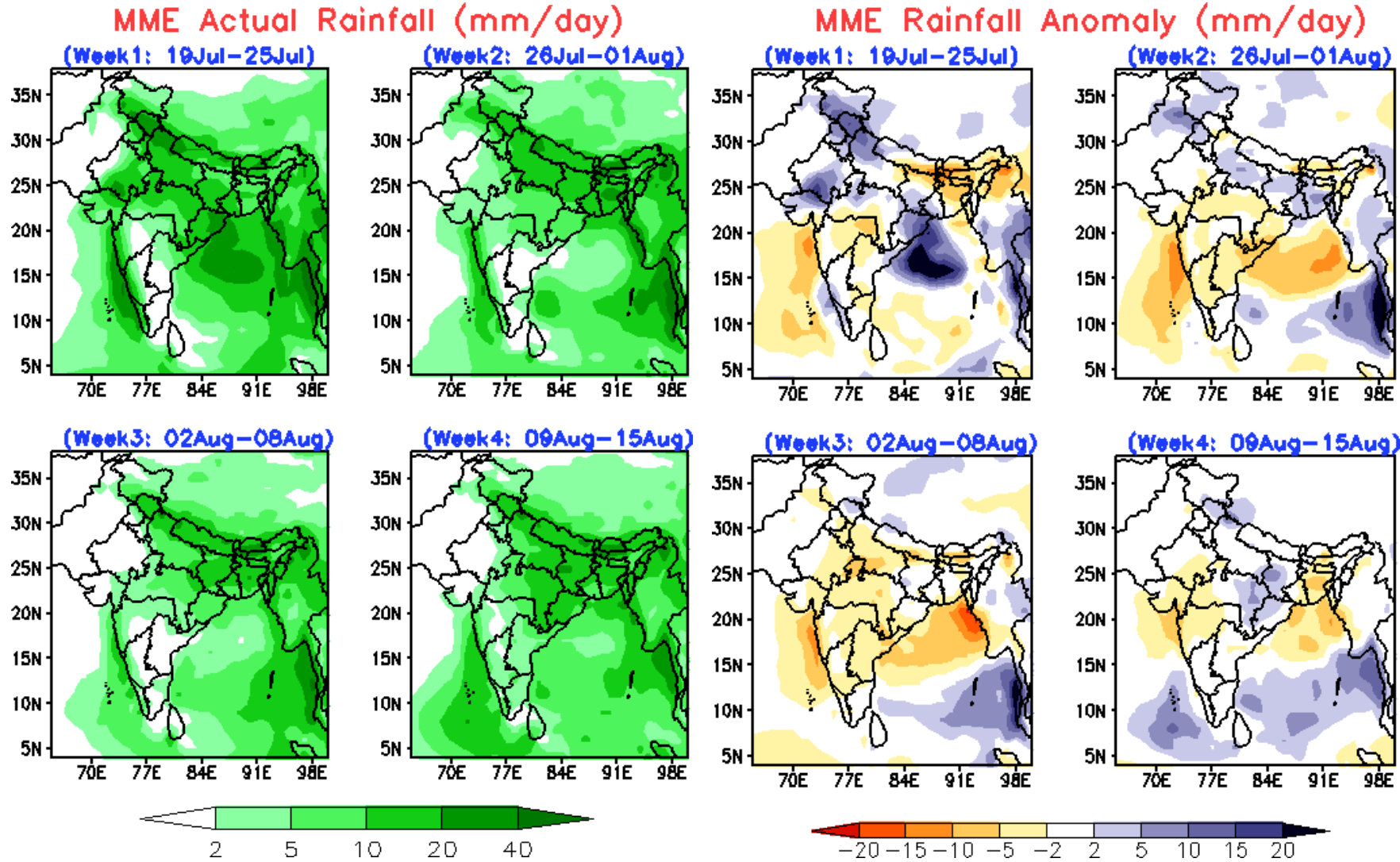
RESEARCH PROGRAM ON  
Water, Land and  
Ecosystems

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.

Published Date: 26 July 2018

# Rainfall Summary - Predicted week wise rainfall for South Asia

Multi Model Ensemble (MME) Seasonal Prediction System for 2018 Monsoon Season



- Rainfall condition for UP, Bihar and MP might increase in the next week. There might be some increase trend by beginning of July.
- The North-eastern States of India might experience a increase in rainfall for the next two weeks.
- Madhya Pradesh and eastern Rajasthan, Gujarat and Orissa seems to have above normal rainfall during this month.
- Sri Lanka for Southern and Western Provinces are with normal and moderate rainfall, however the east-central and North provinces experiencing limited or deficit rainfall.
- Nepal far west and mid-west will have high rainfall condition, Bhutan will experience increase rainfall till first week of July.
- Overall Pakistan might experience below to average rainfall during extended prediction till 15 August

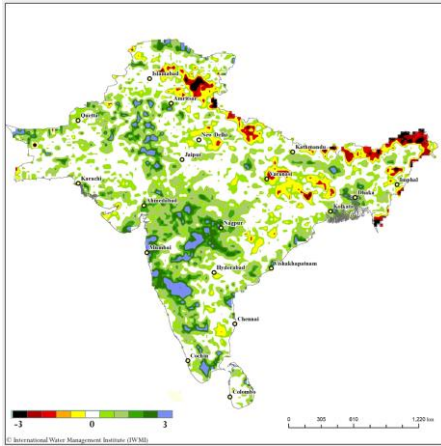
*Note: The summary on country specific details described above based on the ERPAS MME information product do not imply the expression of any opinion whatsoever on the part of the IWTM and its partners as well the data provided by IITM.*

# SOUTH ASIA DROUGHT EARLY WARNING SYTEM (SADEWS)

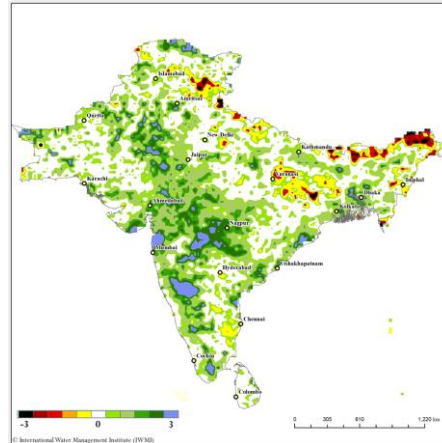
**Current Condition: 24 July 2018**  
**Forecast Period : 24 July and 8 Aug 2018**  
**Standardized Soil Moisture and Runoff Index**  
**for regional drought and early warning**

SOIL MOISTURE PERCENTILE (SMP)

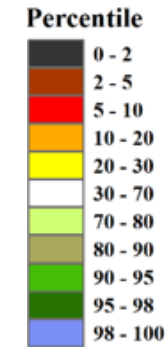
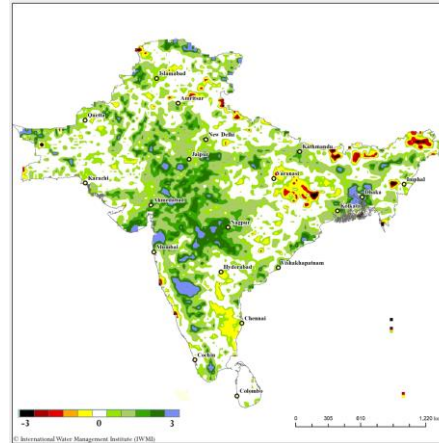
7-day Percentile 24<sup>th</sup> Jul 2018



7-day Forecast Percentile 31<sup>st</sup> Jul 2018



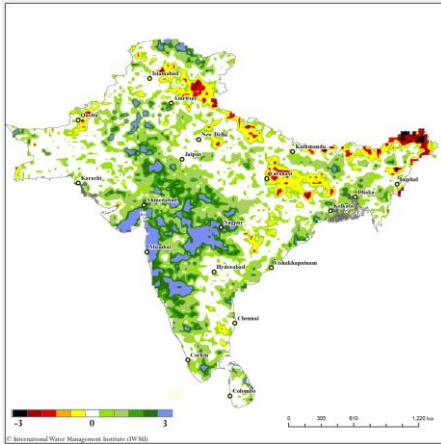
7-day Forecast Percentile 8<sup>th</sup> Aug 2018



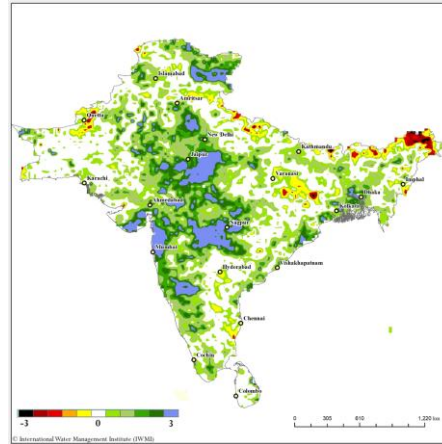
## SOIL RUNOFF PERCENTILE (SRP)

SOIL RUNOFF PERCENTILE (SRP)

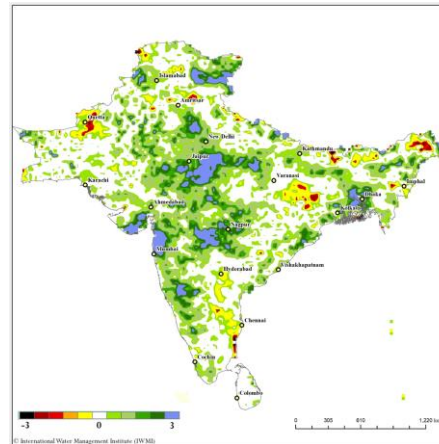
7-day Percentile 24<sup>th</sup> Jul 2018



7-day Forecast Percentile 31<sup>st</sup> Jul 2018



7-day Forecast Percentile 8<sup>th</sup> Aug 2018



### Summary:

The experimental drought forecast products for research/scientific use based on 03<sup>rd</sup> July 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:

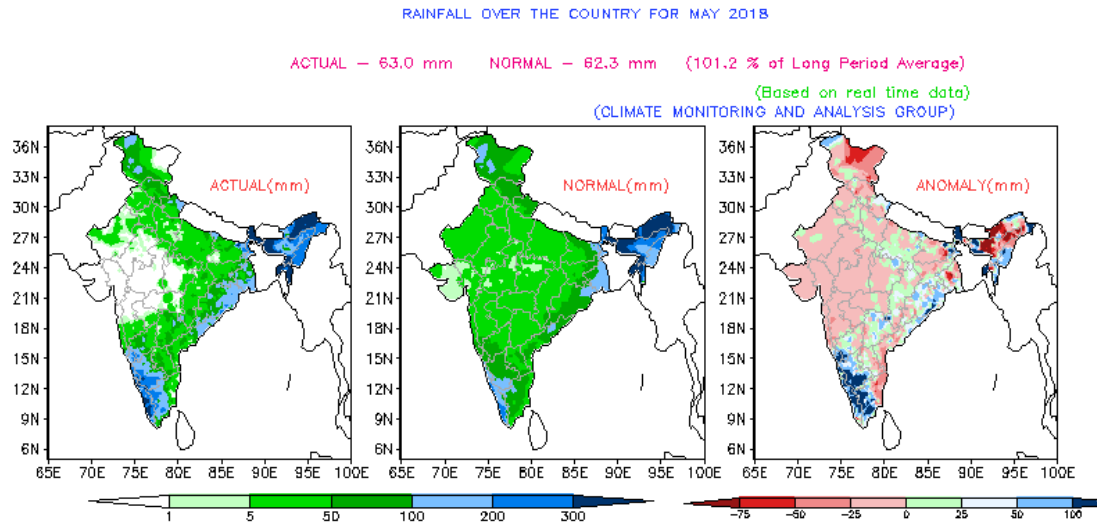
- The initial condition has improved over Karnataka, Maharashtra, Rajasthan, Western UP and North-eastern states.
- Initial condition on the Soil Runoff Index (SRI) explains similar trend to SSI.
- Some level of dryness is expected in the following weeks over central parts of the region such as western Andhra Pradesh, Jharkhand, Coastal Tamil Nadu.
- The leeward side of the western ghats along the southern Maharashtra seems to be progressing towards wetness.
- In reference to IMD actual rainfall for India, several east-central states are in deficit rainfall condition which is affecting 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 – Gandhi Nagar (IIT-GN).

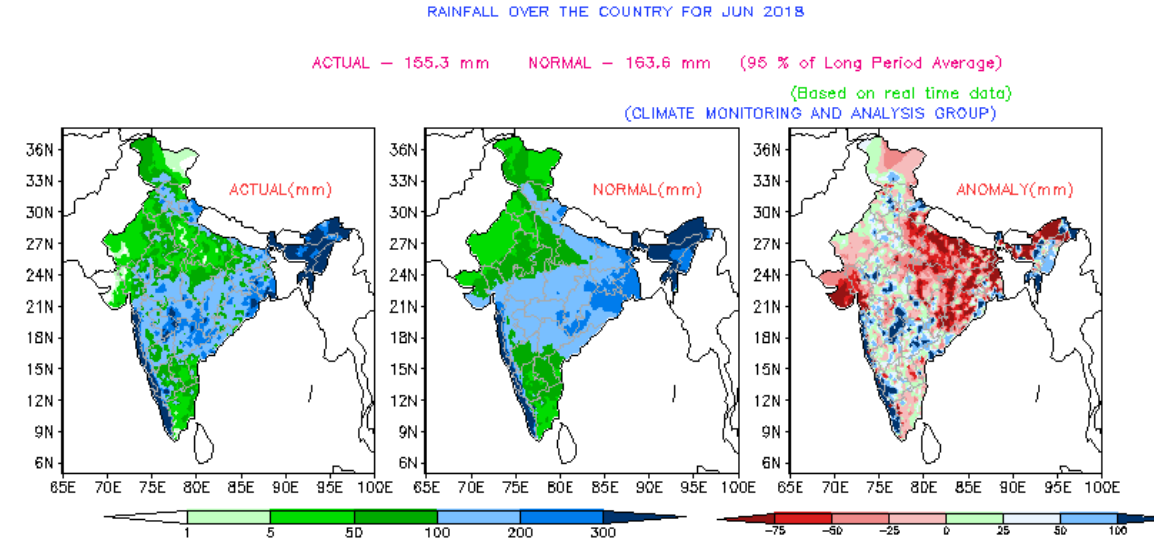
*Disclaimer: The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the International Water Management Institute (IWMI) and its partners concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of IWMI.*

# INDIA – Monthly Rainfall Condition (Actual vs. Anomaly)

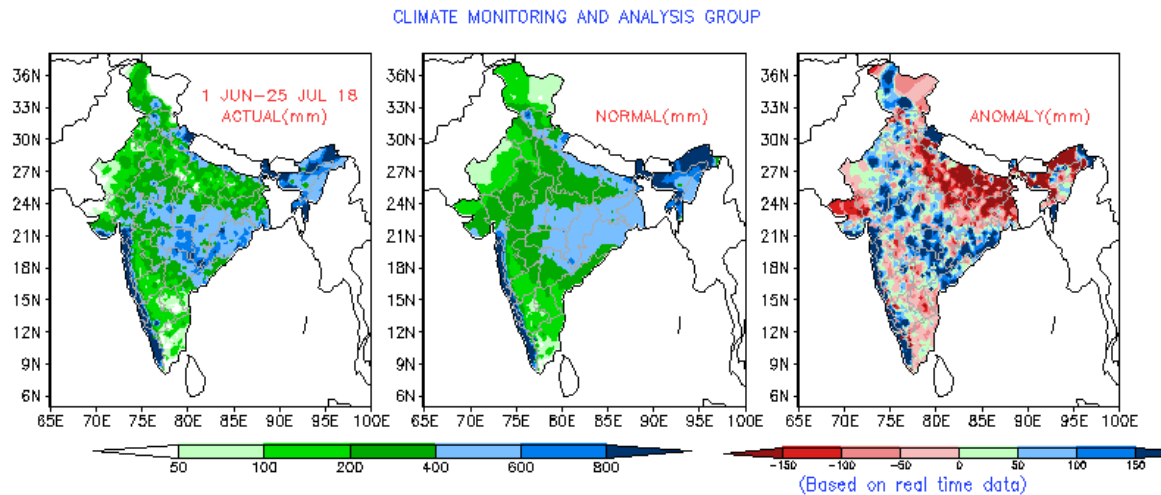
## Actual Rainfall – May 2018



## Actual Rainfall – Jun 2018



## Actual Rainfall – Seasonal 2018



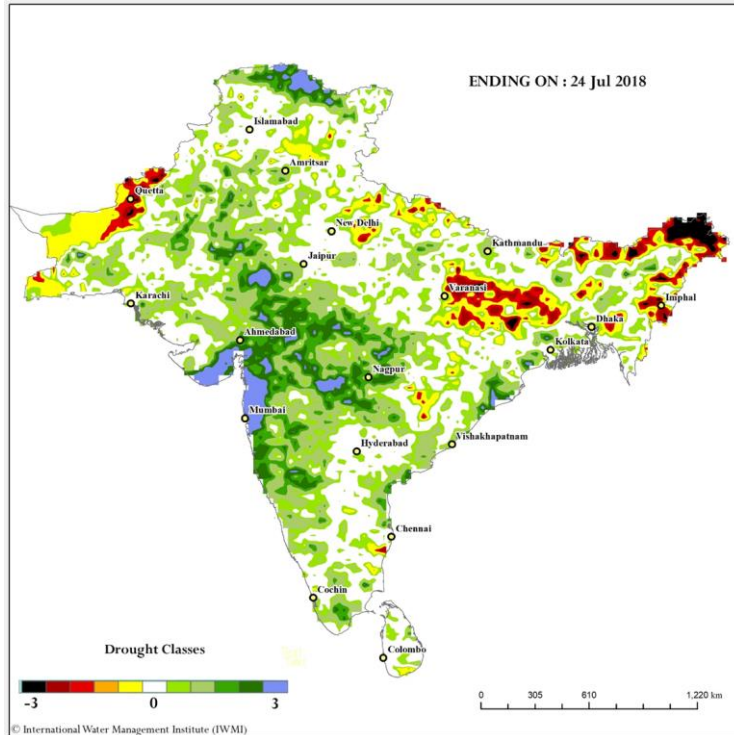
Data Source: IMD

- Overall there is an increase in rainfall for the month of July compared to the long-term anomaly, however some coastal areas in Kerala, Orissa and NE States had excess rainfall.
- Month of June has experienced normal rainfall over peninsular India and Chhattisgarh and Orissa experience higher rainfall.
- There has been a deficit of rainfall in the month of June over Bihar and UP.
- Overall there has been a good rainfall along western coast of India.
- North Central part of the region is facing serious deficit of rainfall including MP and Bihar. This might highly affect the crop productivity during this year's kharif season.

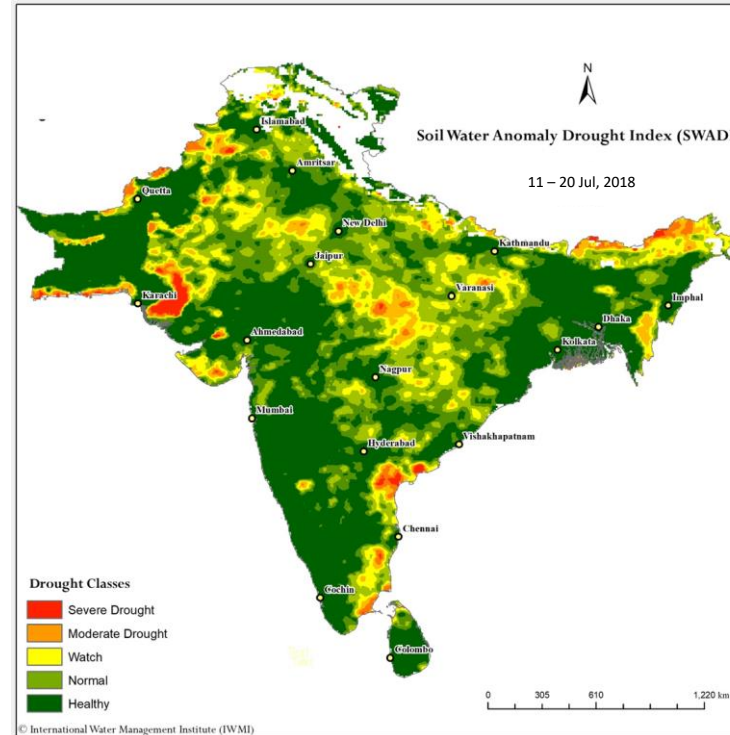
*Note: Simple qualitative assessment on the performance on rainfall condition was described here to cross compare with SADMS – IDSI products for evaluation purpose only.*

# South Asia Drought Indices – A comparison & Assessment

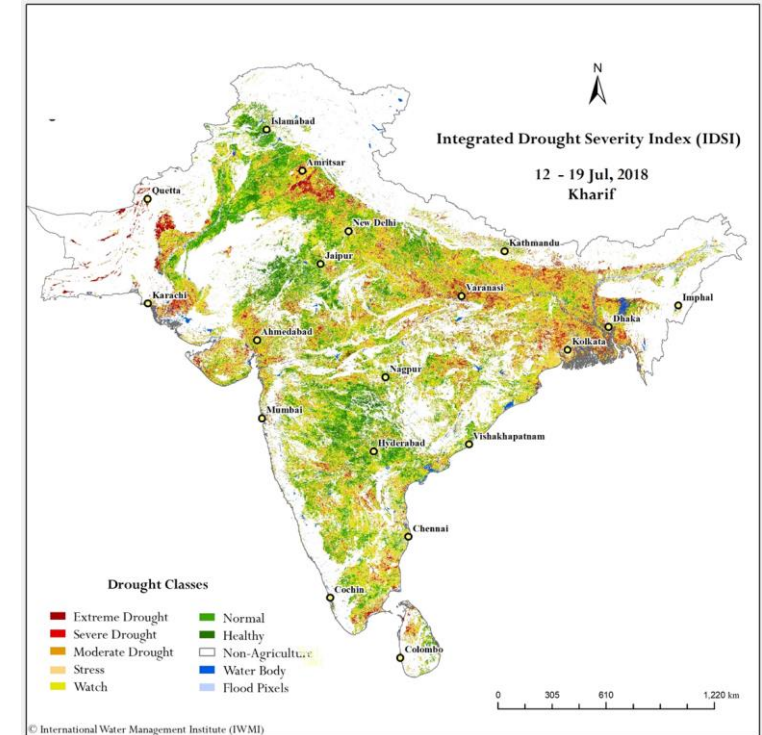
## SA-DEWS



## SWADI

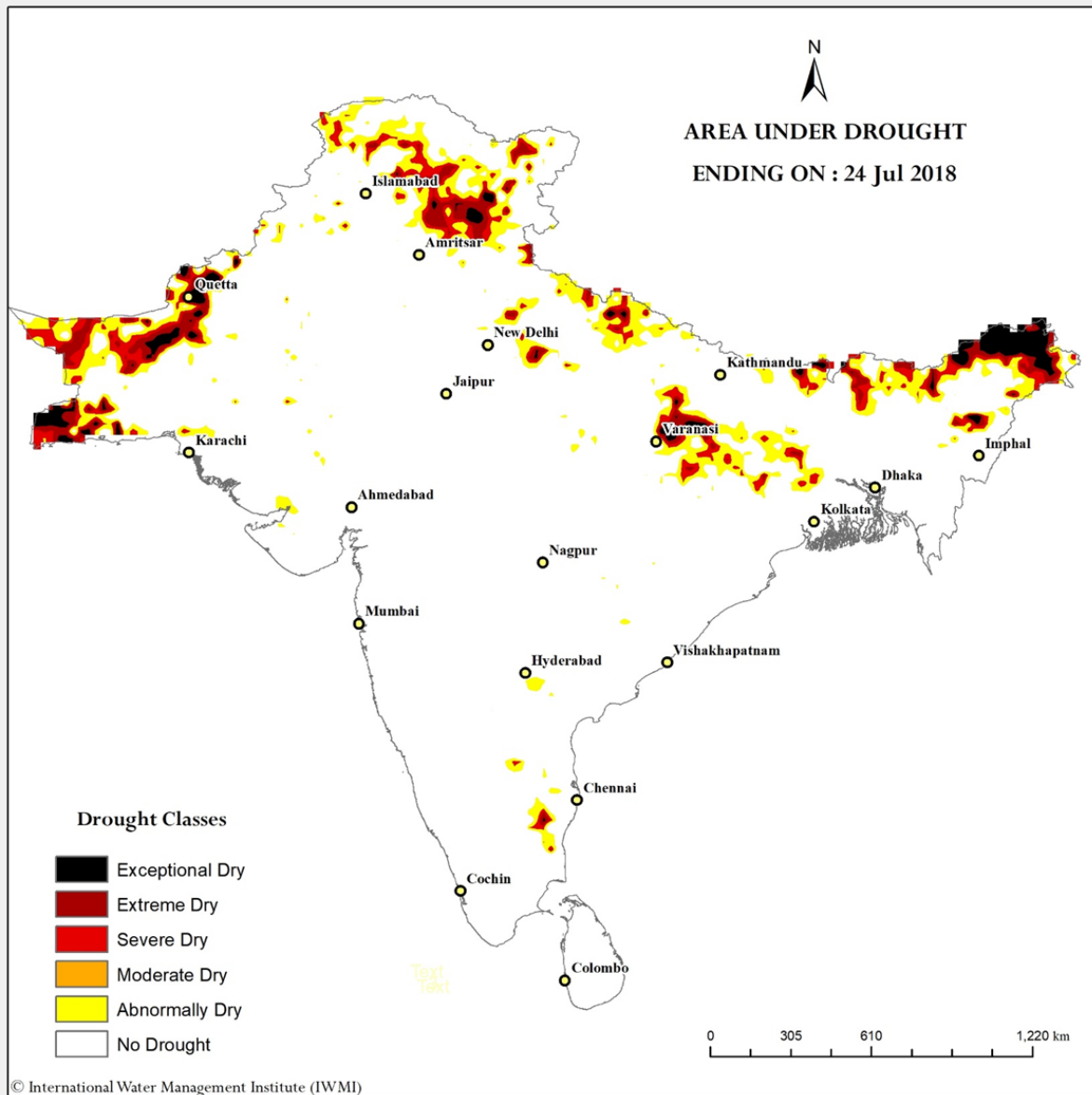


## IDS



- 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 (IDS) 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 shows a close relation between each other. The peninsular India has reviving well from the drought situation. Parts of Bihar, Jharkhand and Eastern UP is facing some scarcity of rainfall which is well reflected in all the three indices. Also, parts of Tamil Nadu is still facing moderate drought like scenario.

# South Asia Drought Forecast



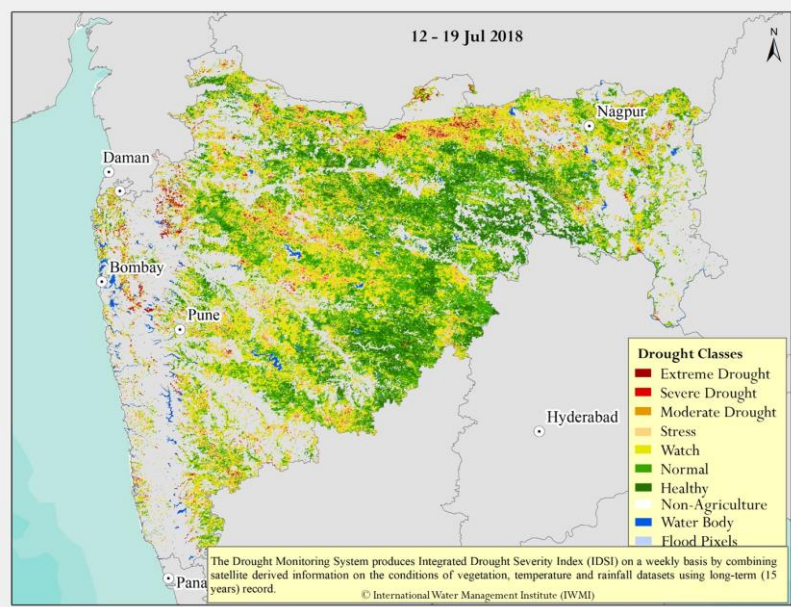
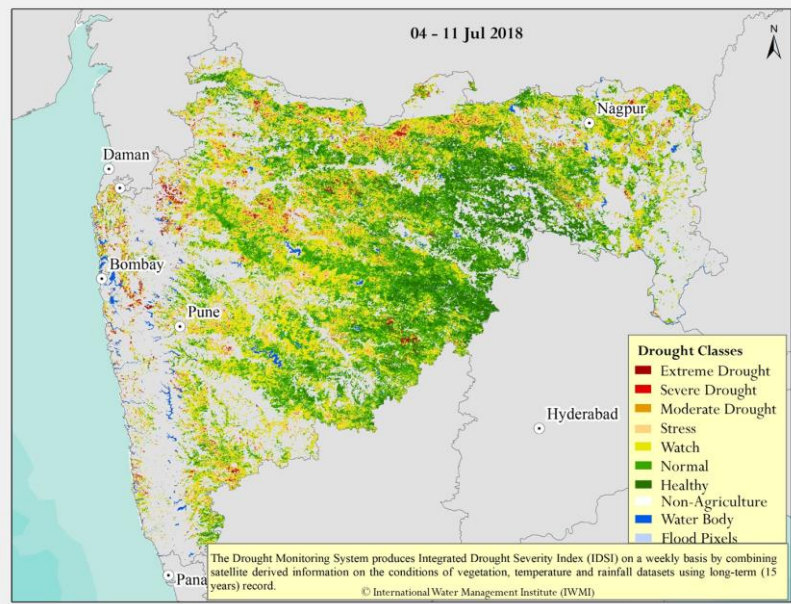
## Summary:

- Using the initial condition i.e. 24<sup>th</sup> Jul 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
- Easter Uttar Pradesh shows some level of stress condition which seems to be rising towards severity. Most of the other regions in India and all the parts western Sri Lanka is not under extreme drought condition.
- *Reference to IMD SPI data is well correlated to the area under drought predicted by drought algorithm.*

# India – State wise analysis



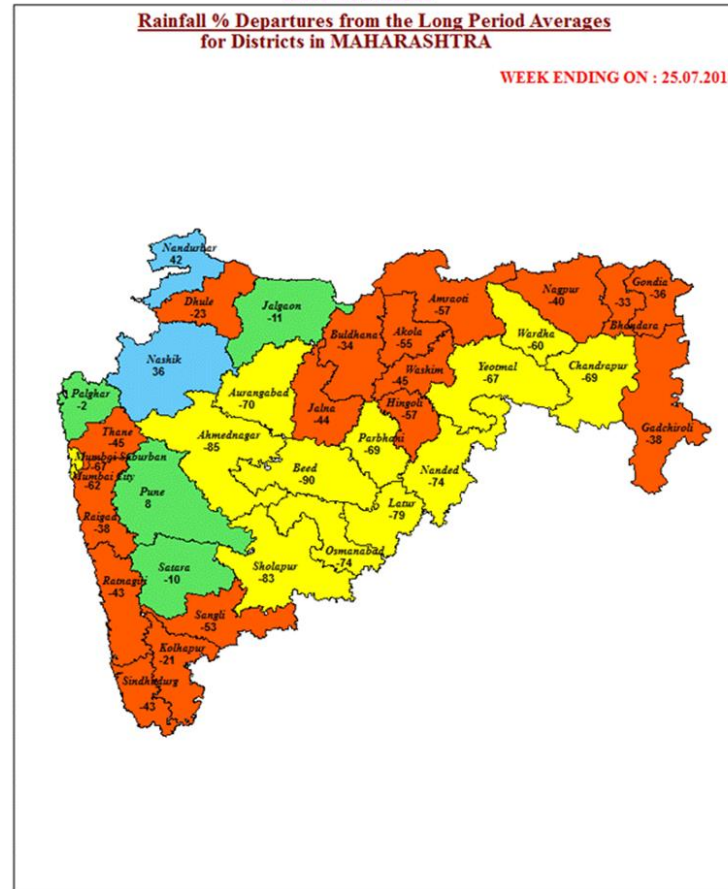
# South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Maharashtra)



## INDIA METEOROLOGICAL DEPARTMENT RMC MUMBAI

### Rainfall % Departures from the Long Period Averages for Districts in MAHARASHTRA

WEEK ENDING ON : 25.07.2018



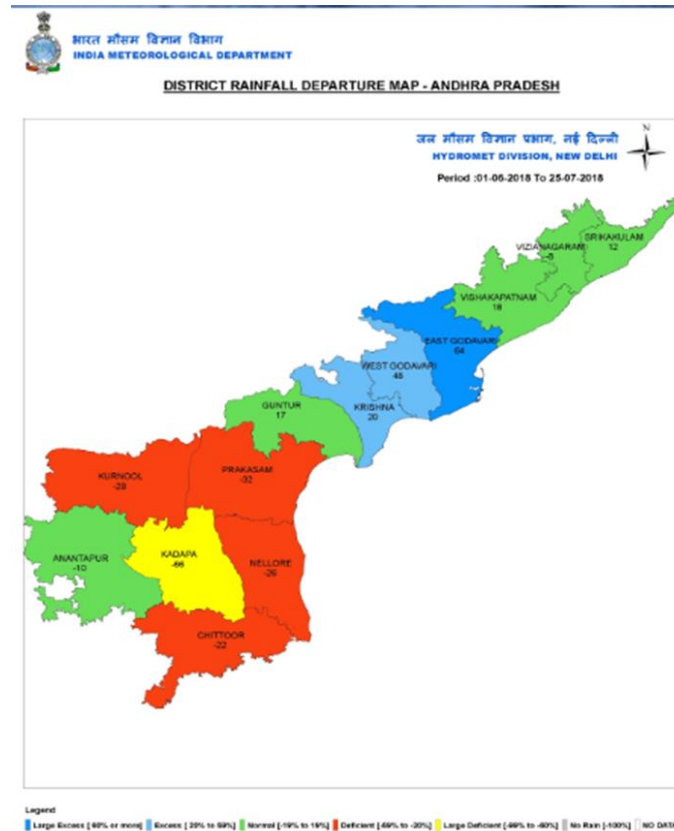
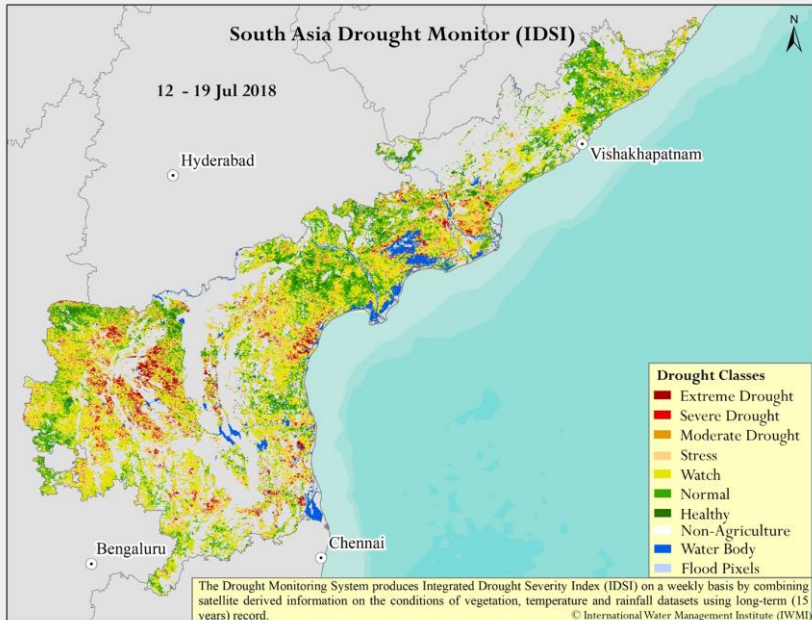
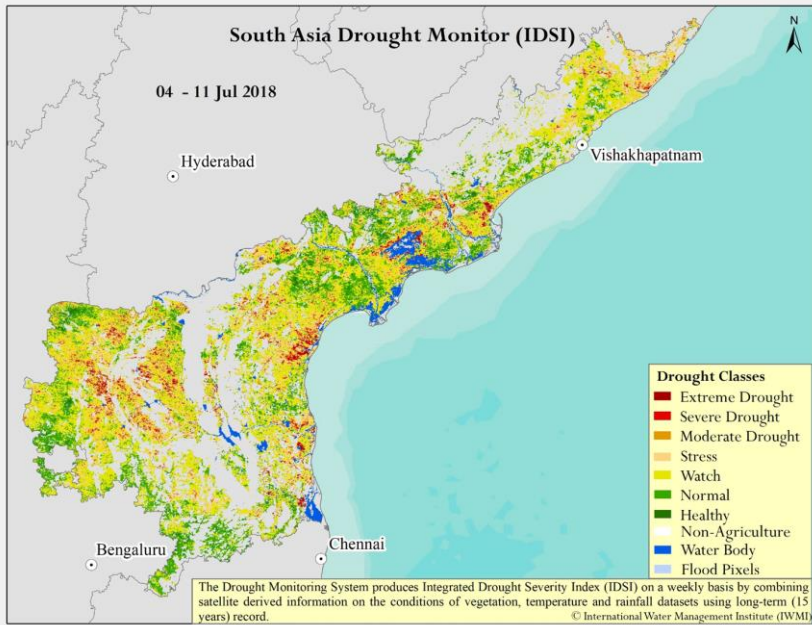
**LEGEND:** ■ L. EXCESS (+60% OR MORE) ■ EXCESS (+20% TO +59%) ■ NORMAL (+19% TO -19%)  
 ■ DEFICIENT (-20% TO -59%) ■ L. DEFICIENT (-60% TO -99%) ■ NO RAIN (-100%) ■ NO DATA

## 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.
- Excess rainfall in the month of June has reduced the vegetation stress in the agricultural land, which is clearly reflected in the IDSI. North-Eastern parts of state shows some stress, all other districts shows progress in the agricultural growth. Same has been revealed by seasonal rainfall report from IMD.
- In reference to SADEWS till mid July, both the SSI and SRI are favourable using the precipitation forecast data with initial condition from 24<sup>th</sup> July 2018.



# South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Andhra Pradesh)



**Rainfall Status (Avg from 01-06-2018 to till date)**  
 Actual **208.8mm**, Deviation **-7.4%**

District-Wise, Month-Wise Rainfall Status from 01/06/2018

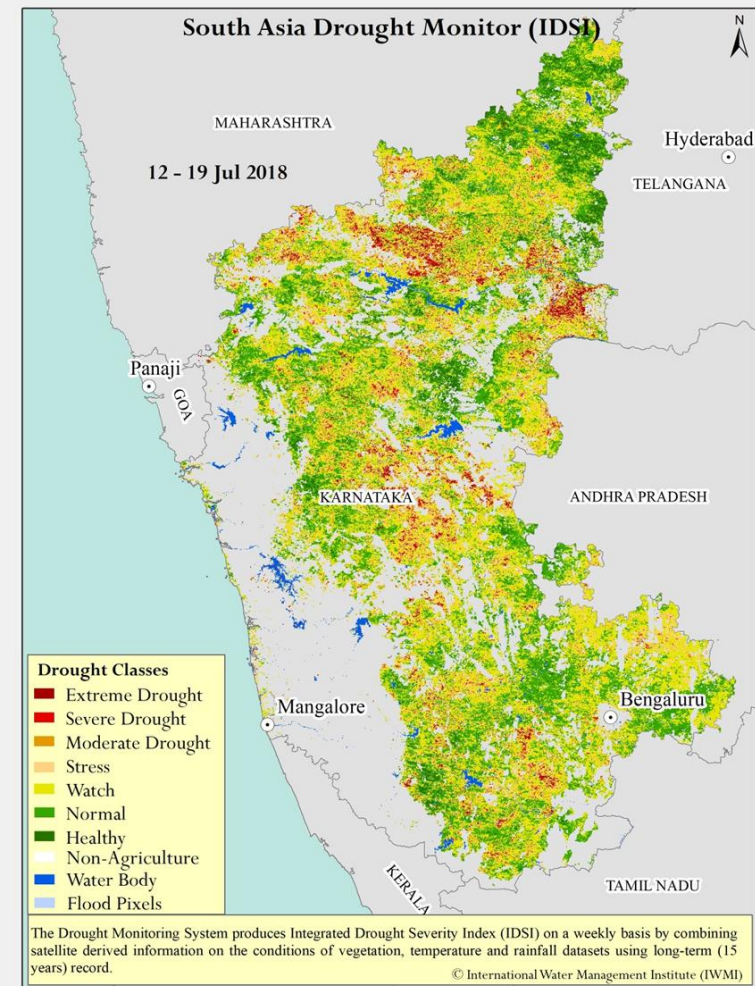
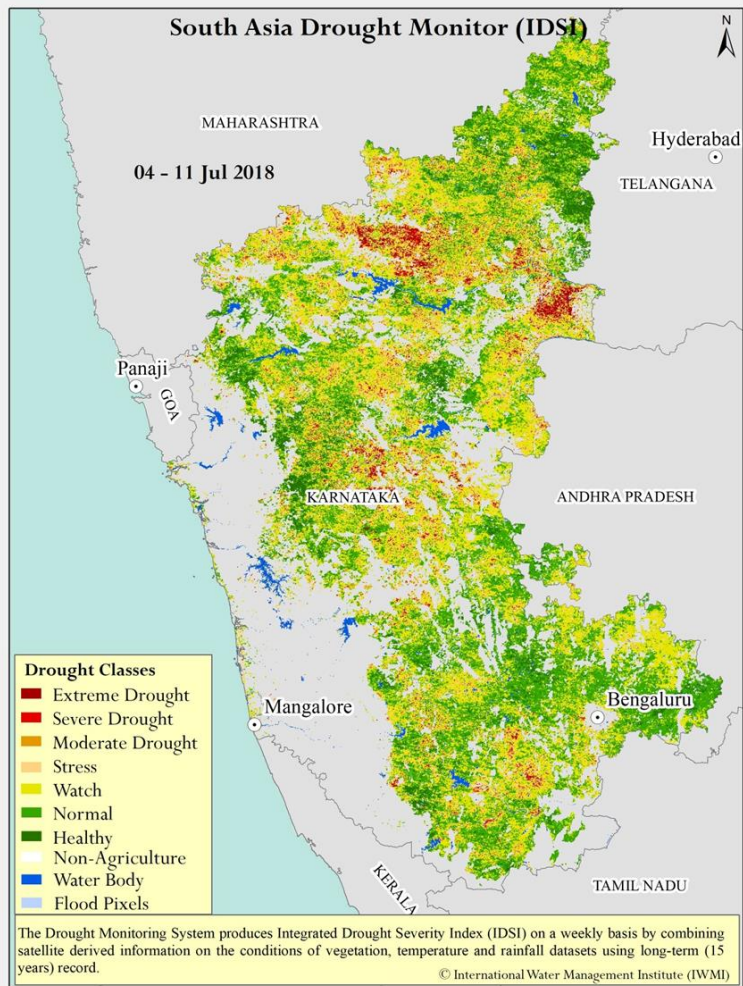
District	Actual	Normal	Deviation(%)	Status
Srikakulam	293.6	289.8	1.3	Normal
Vizianagaram	229.3	279.3	-17.9	Normal
Vishakapatnam	323.7	294.0	10.1	Normal
East Godavari	472.3	332.6	42.0	Excess
West Godavari	460.5	336.1	37.0	Excess
Krishna	317.8	285.0	11.5	Normal
Guntur	169.2	216.5	-21.8	Deficient
Prakasham	76.7	137.5	-44.2	Deficient
Nellore	69.4	136.0	-49.0	Deficient
Chittoor	114.5	169.7	-32.5	Deficient
Kadapa	53.3	153.7	-65.3	Scanty
Anantapur	82.7	122.9	-32.7	Deficient
Kurnool	114.8	177.8	-35.4	Deficient
State	208.8	225.5	-7.4	Normal

Data Source: APSDPS

## Summary:

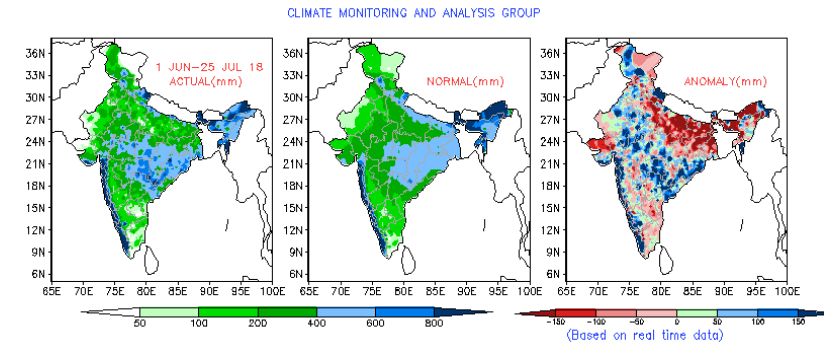
- Out of the 13 districts in A.P. 4 districts had low rainfall.
- From IDS, western districts are in moderate to severe category and the northern districts shows some improvement with new satellite observations determining the rainfall deviation last week.

# South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Karnataka)



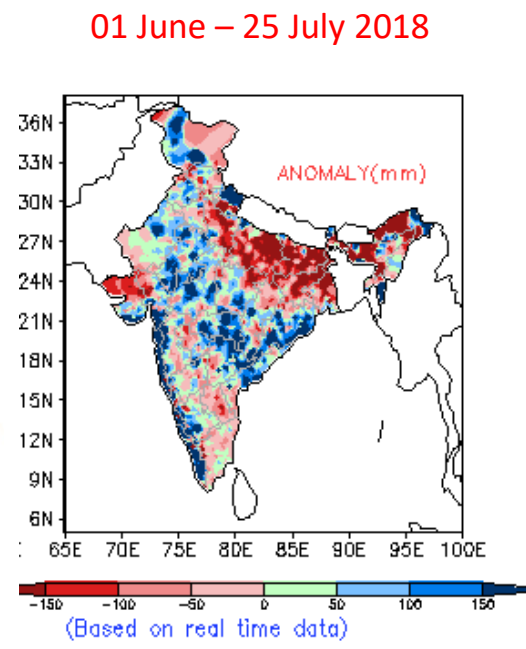
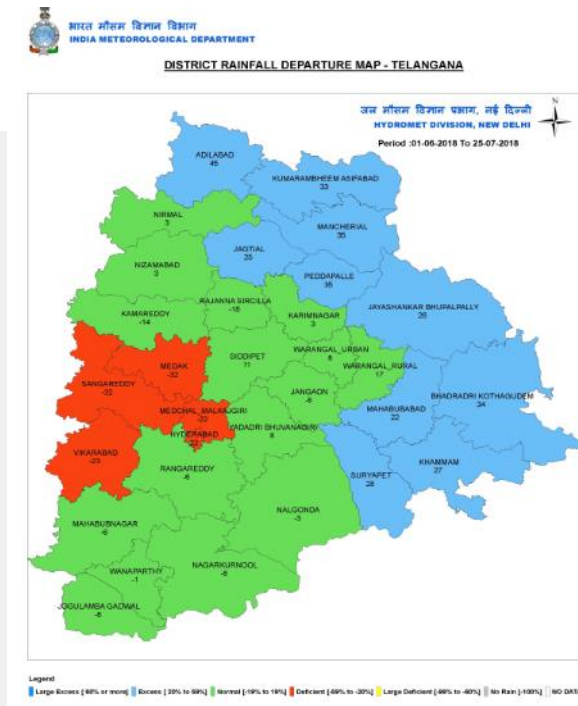
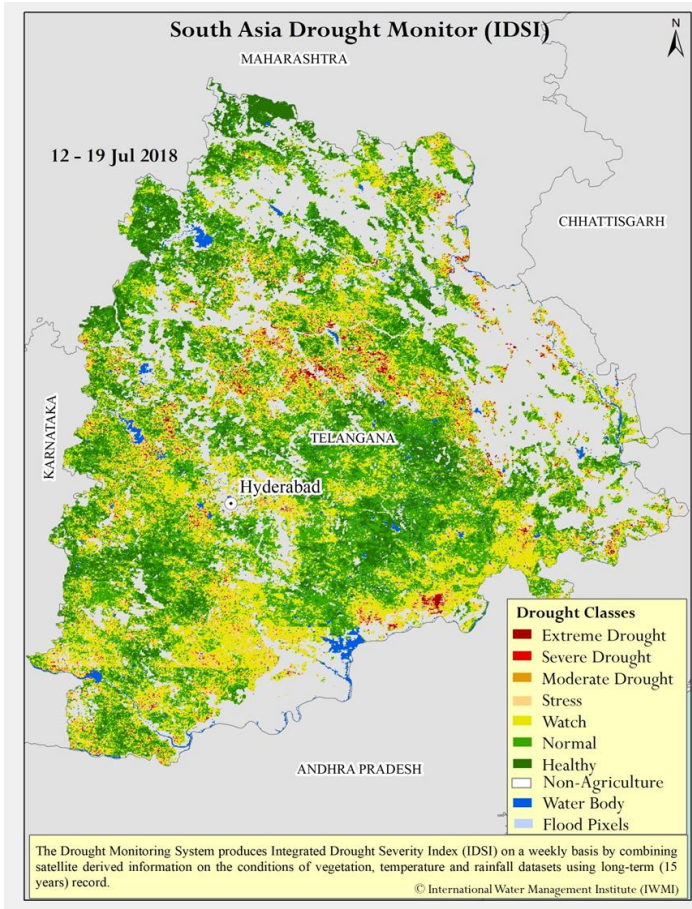
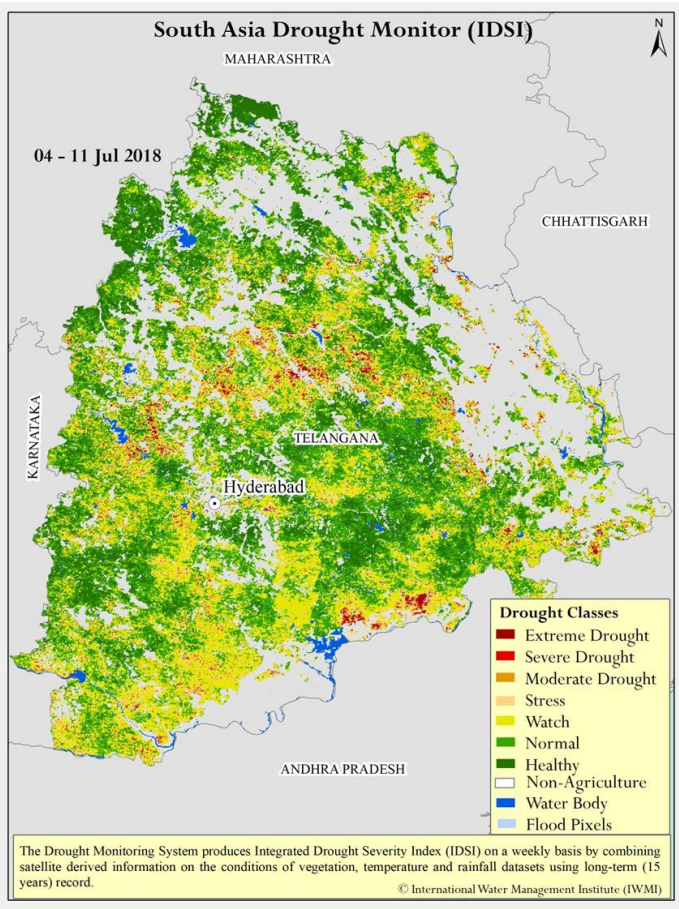
## Summary:

The Integrated Drought Severity Index (IDSI) for Karnataka were assessed at district level. The condition of vegetation is almost same as compared to previous timeframe in most parts of the state except small part of central Karnataka. But stress situation seems to be increasing in most of the districts. The Southern Karnataka is under watch category now compared to the Northern parts, which clearly correlates with the rainfall anomaly provided by IMD.



IMD rainfall for the season and anomaly rainfall over Karnataka shows closer agreement to the IDSI product. More analysis on the deficit analysis will be presented for the end of July which is crucial for crop planting and planning.

# South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Telangana)



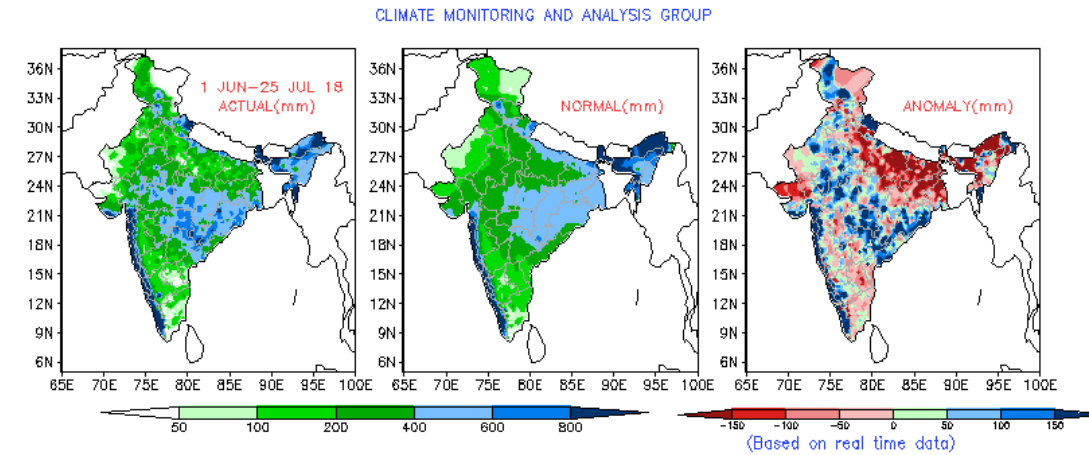
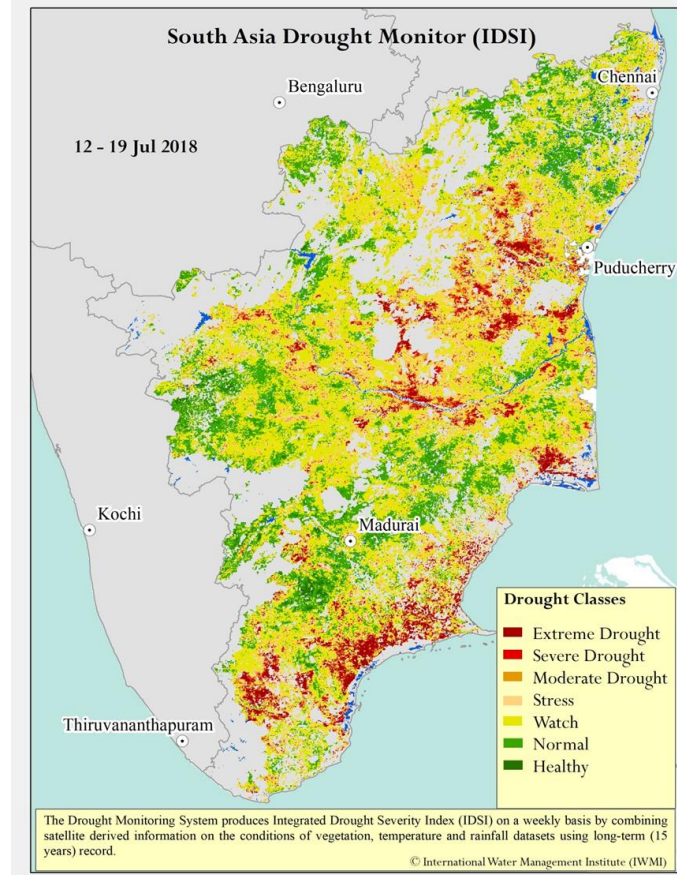
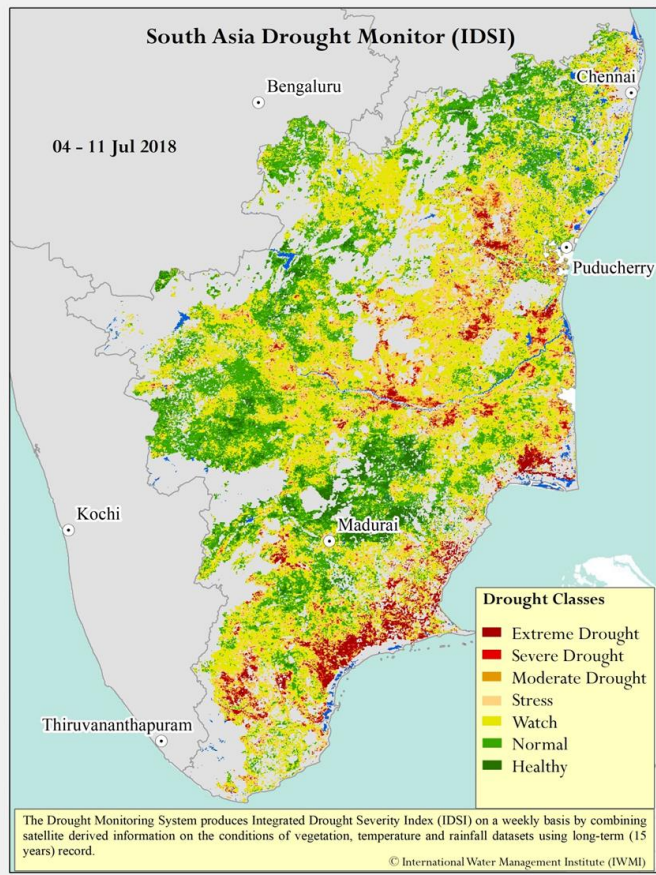
## Summary:

The Integrated Drought Severity Index (IDSI) for Telangana were assessed at district level. It can be noted that the agricultural system seems to be reviving this week after a good amount of rain last week in most parts of Telangana. Most of the districts seems to be under Healthy to watch category of drought except few southern and central districts. Overall condition seems to be as it was in 4-11 July 2018.

IMD seasonal rainfall and rainfall anomaly over Telangana shows closer agreement to the IDSI product.

# South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Tamil Nadu)

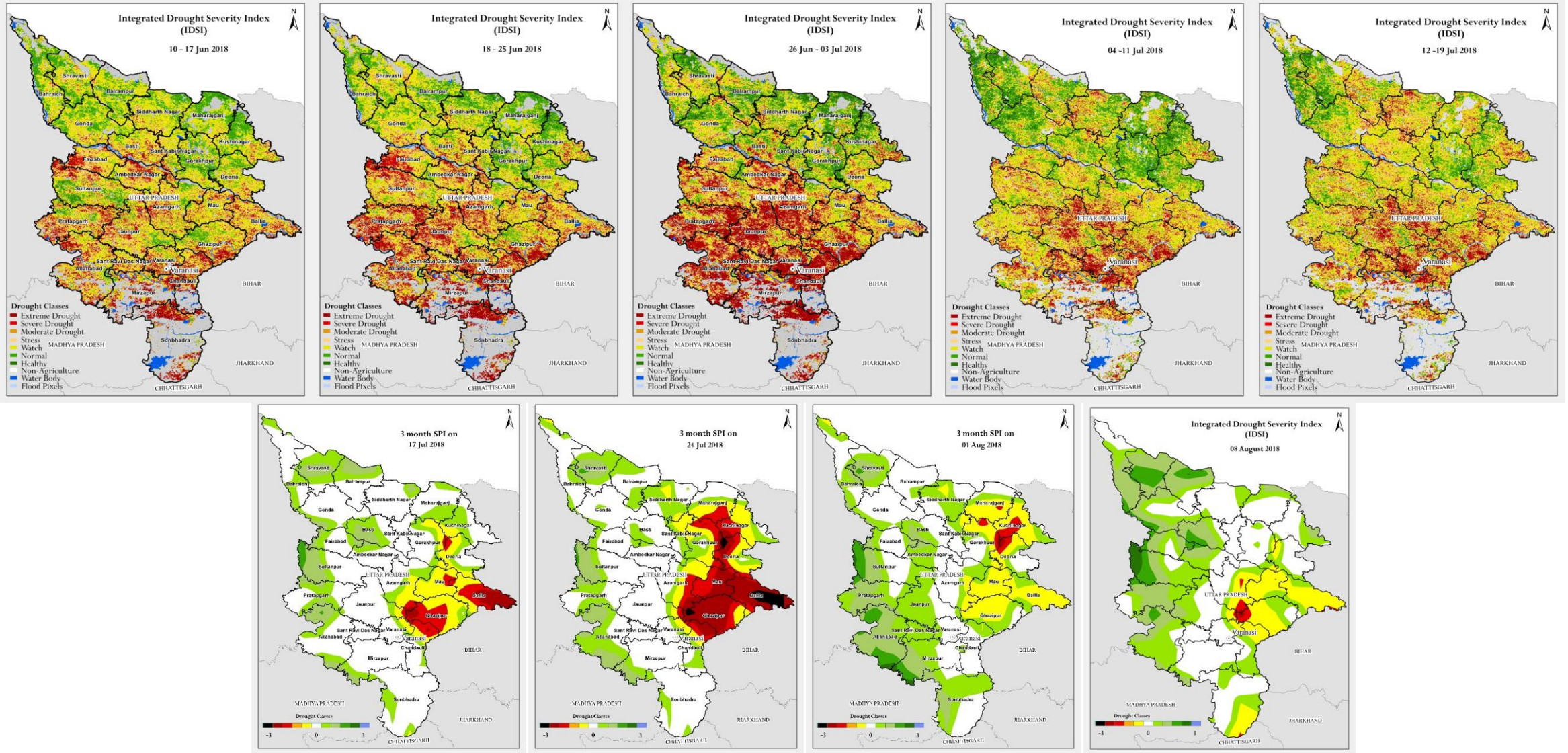
01 June – 25 July 2018



## Summary:

- Western part of Tamil Nadu shows increase in area under stress and watch category. Also Northern Eastern parts of Tamil Nadu seems to have higher stress as compared to week ending on 11<sup>th</sup> of July.
- Overall, it can be observed that all districts have moved towards higher drought classes as compared to the previous week.

# South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Eastern UP)



## Summary:

- There is increase in drought condition from 1<sup>st</sup> June to beginning of July but with onset of monsoon there is slight decrease in severity in the Southern part of Eastern Uttar Pradesh. As per the forecast outputs, these areas might experience stress till end of July and then intensity will be lower.

# *Thanks.....*

## *Disclaimer*

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.

For further information please contact the following:

Dr. Giriraj Amarnath

[a.giriraj@cgiar.org](mailto:a.giriraj@cgiar.org)

Mr. Niranga Alahacoon

[n.alahacoon@cgiar.org](mailto:n.alahacoon@cgiar.org)

Website: SADMS Drought Monitor ([Click here](#))

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