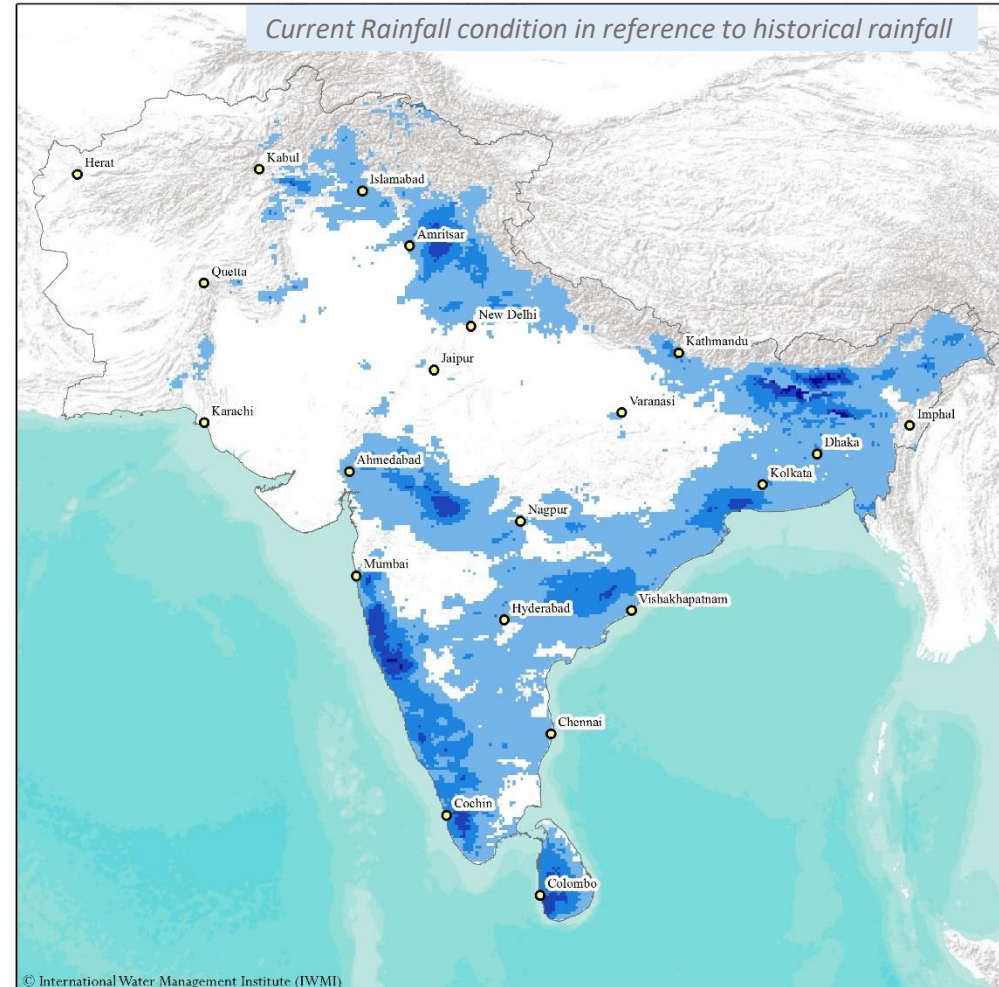
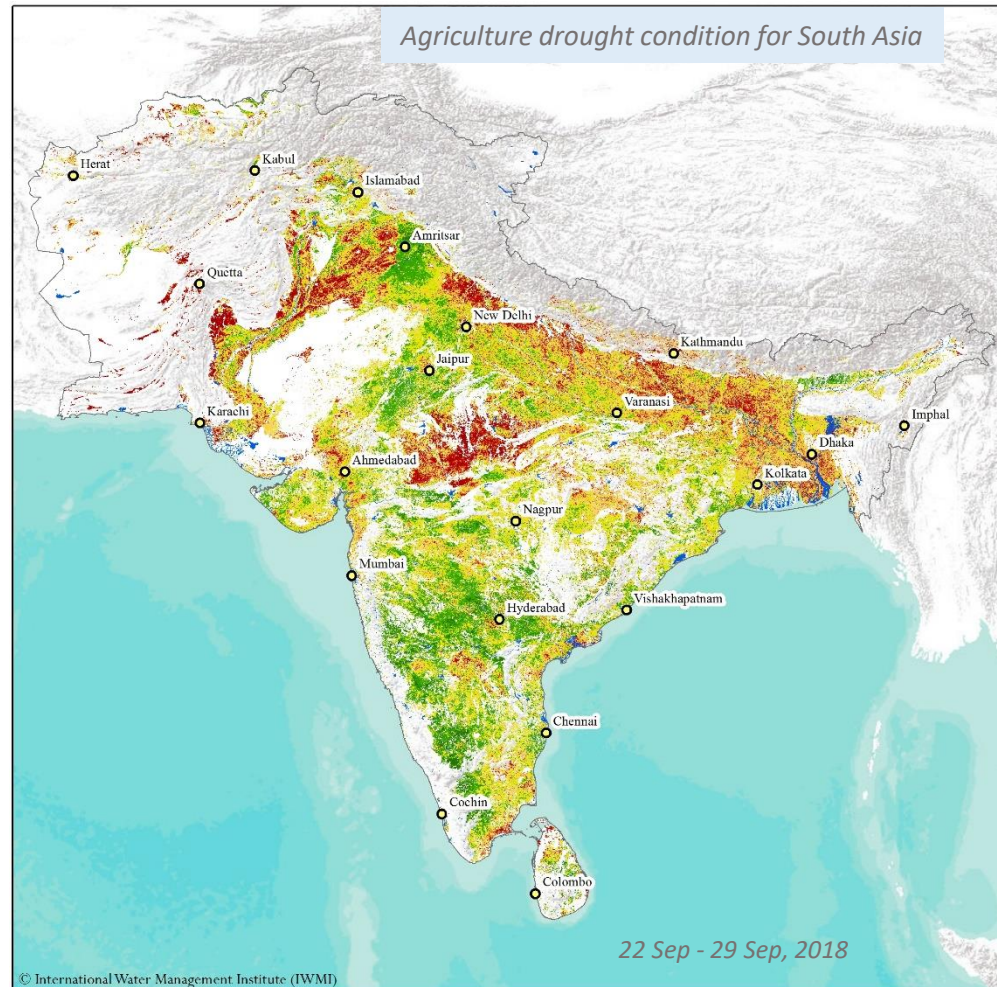


SADMS DROUGHT BULLETIN

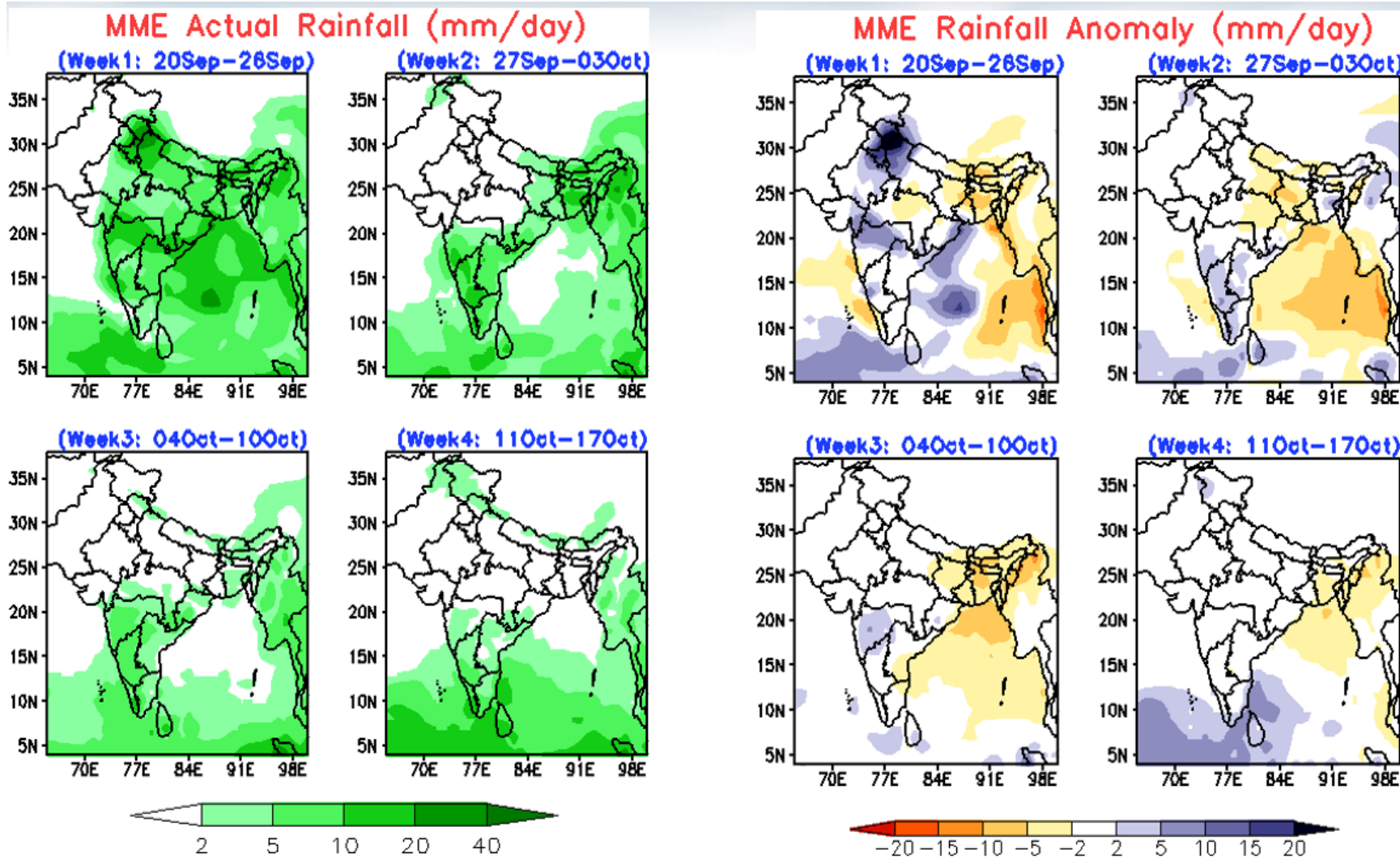
13 Oct 2018 | ISSUE 11



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.

Rainfall Summary - Predicted week wise rainfall for South Asia

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



- Indian peninsula might experience in 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, Uttaranchal 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.

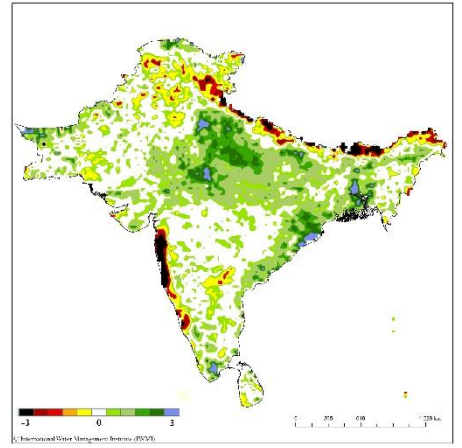
Note: The summary on country specific details described above based on the ERPAS MME information product do not imply the expression of any opinion whatsoever on the part of the IWMI and its partners as well the data provided by IITM.

SOUTH ASIA DROUGHT EARLY WARNING SYTEM (SADEWS)

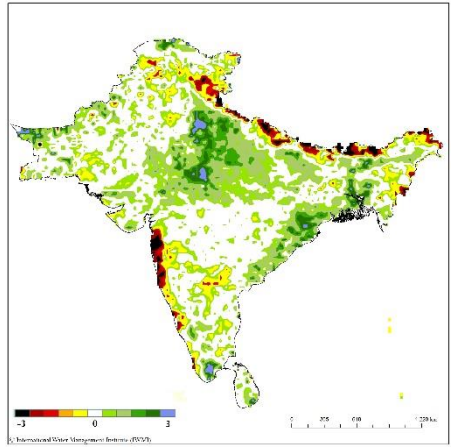
Current Condition: 29 Sep 2018
Forecast Period : 06 Oct and 14 Oct 2018
Standardized Soil Moisture and Runoff Index for regional drought and early warning

SOIL MOISTURE PERCENTILE (SMP)

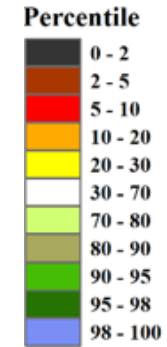
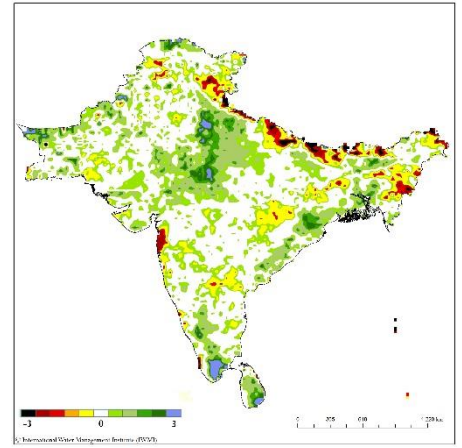
7-day Percentile 29th Sep 2018



7-day Forecast Percentile 06th Oct 2018

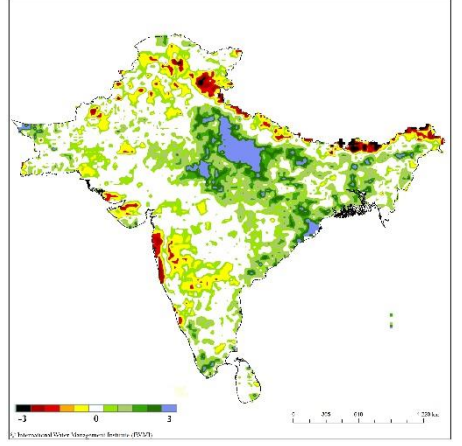


7-day Forecast Percentile 14th Oct 2018

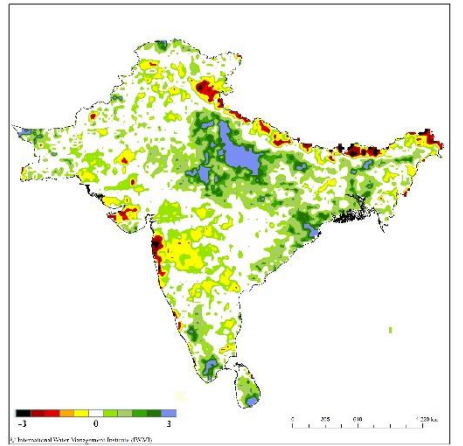


SOIL RUNOFF PERCENTILE (SRP)

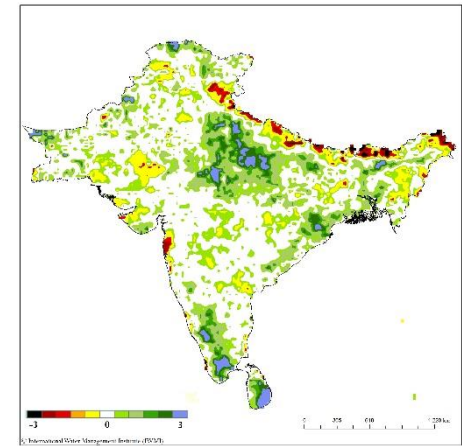
7-day Percentile 29th Sep 2018



7-day Forecast Percentile 06th Oct 2018



7-day Forecast Percentile 14th Oct 2018



SOIL RUNOFF PERCENTILE (SRP)

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).

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.

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.

INDIA – Monthly Rainfall Condition (Actual vs. Anomaly)

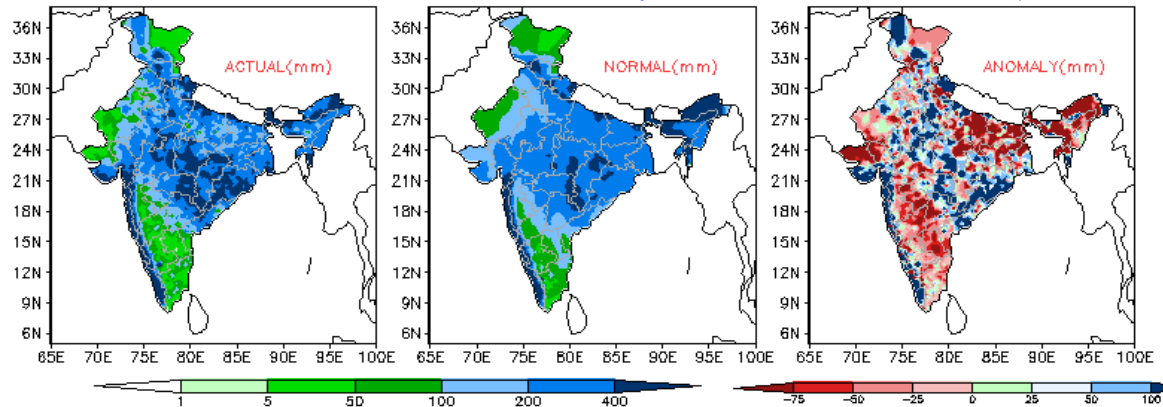
Actual Rainfall – July 2018

RAINFALL OVER THE COUNTRY FOR JUL 2018

ACTUAL – 272.4 mm NORMAL – 289.2 mm (94.2 % of Long Period Average)

(Based on real time data)

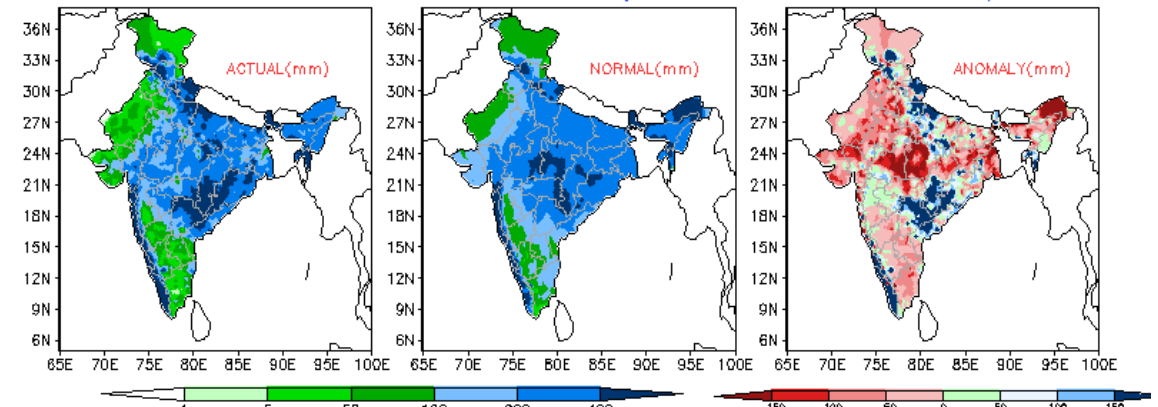
(CLIMATE MONITORING AND ANALYSIS GROUP)



Actual Rainfall – Aug 2018

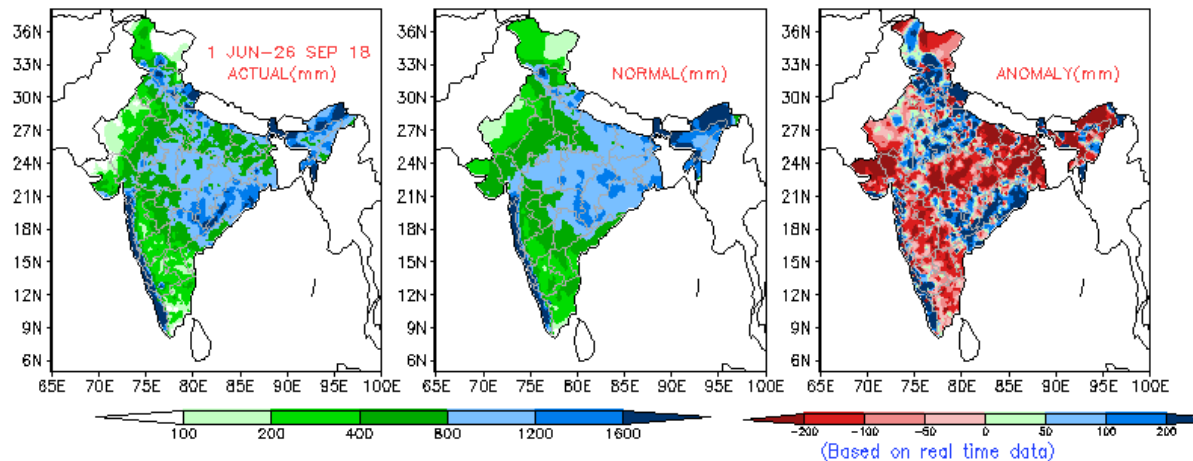
RAINFALL OVER THE COUNTRY FOR AUG 2018

(CLIMATE MONITORING AND ANALYSIS GROUP)



Actual Rainfall – Seasonal 2018

CLIMATE MONITORING AND ANALYSIS GROUP



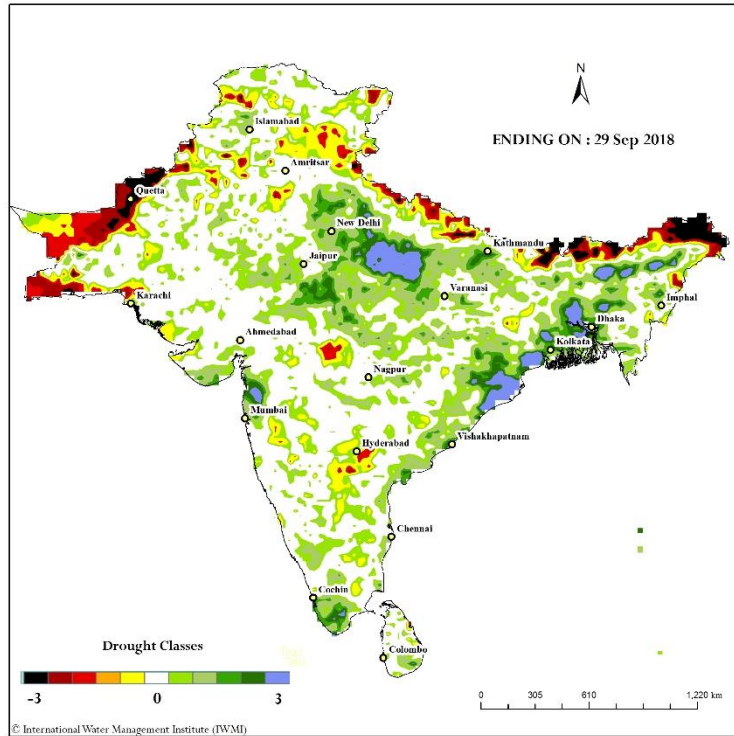
- Overall there is an decrease in rainfall for the month of August compared to the long-term anomaly, however some coastal areas in Kerala, southern Gujarat, Odisha, Chhattisgarh, along with south of Jammu & Kashmir had excess rainfall.
- Month of July has experienced both positive and negative anomalies across India. An excess rain fall was received along the southwest coastal line till Gujarat and some parts of central India (Odisha, Chhattisgarh, MP, UP, Uttaranchal) 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.

Data Source: IMD

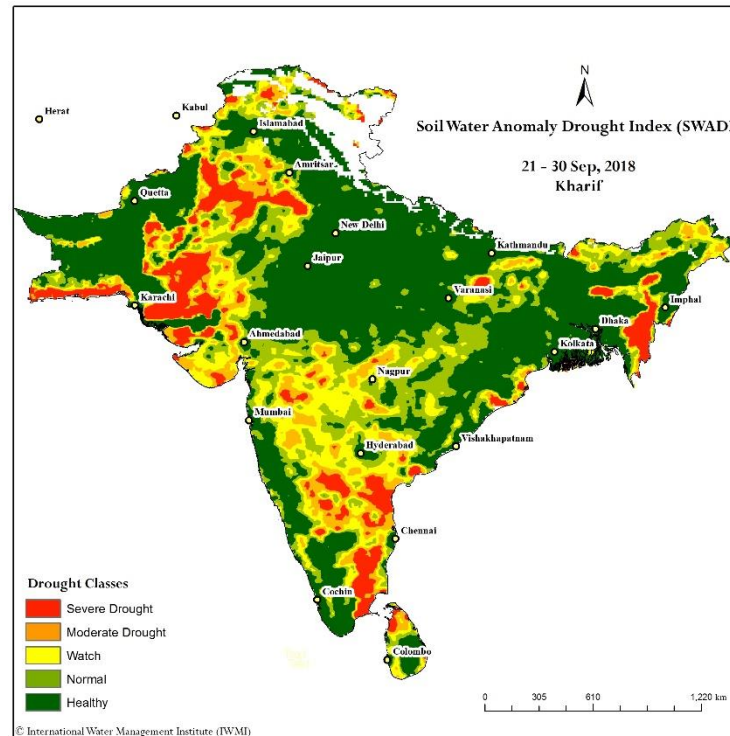
Note: Simple qualitative assessment on the performance on rainfall condition was described here to cross compare with SADMS – IDSI products for evaluation purpose only.

South Asia Drought Indices – A Comparison & Assessment

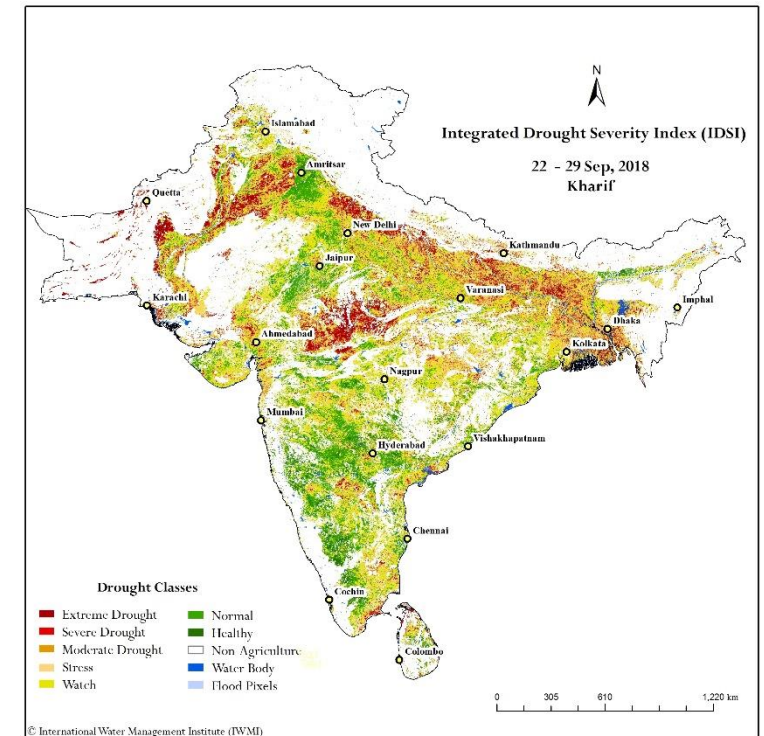
SA-DEWS



SWADI

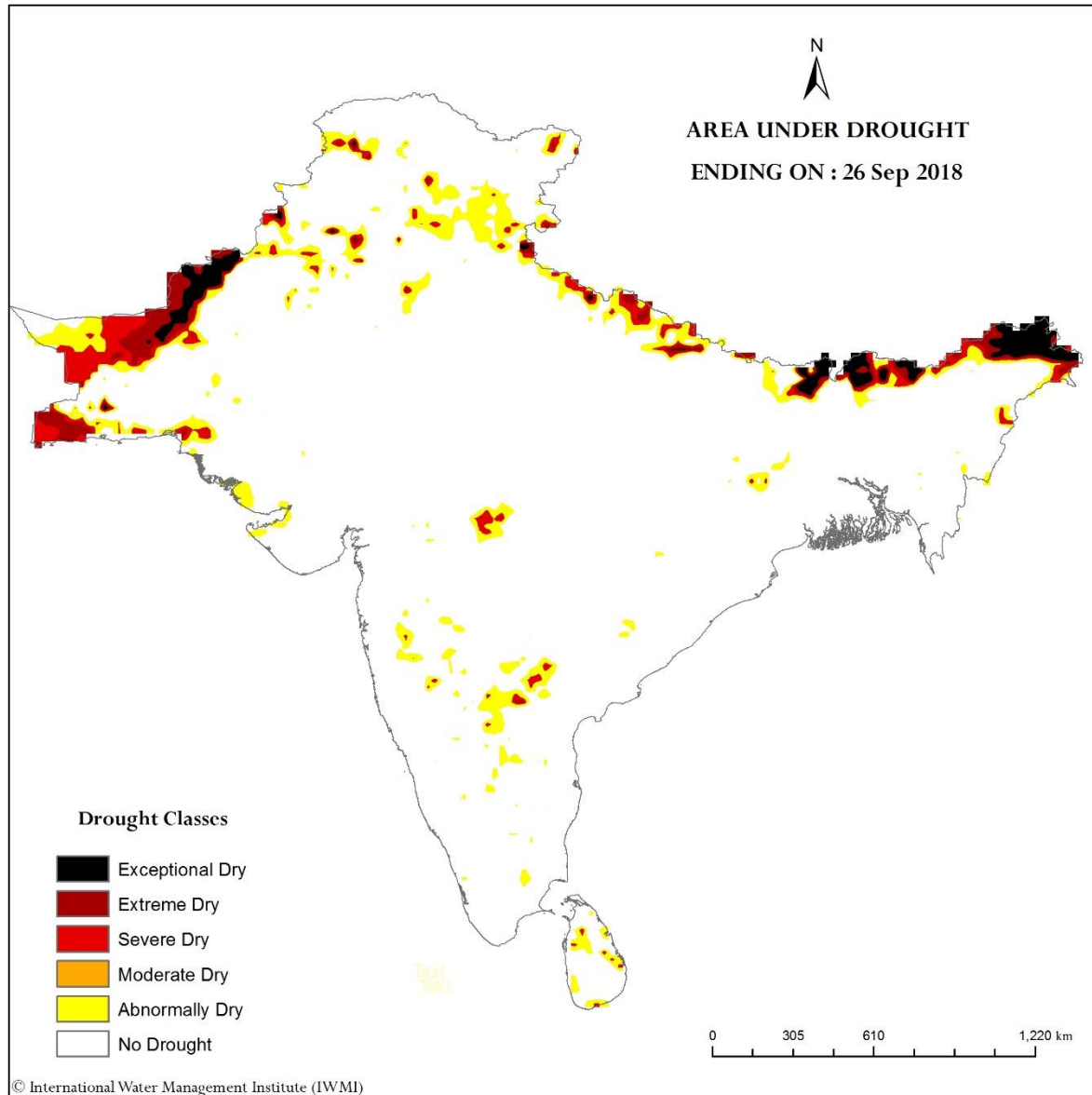


IDS



- 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 relation with each other. The peninsular India is reviving from the drought situation, including Tamil Nadu, Karnataka and AP.

South Asia Drought Forecast



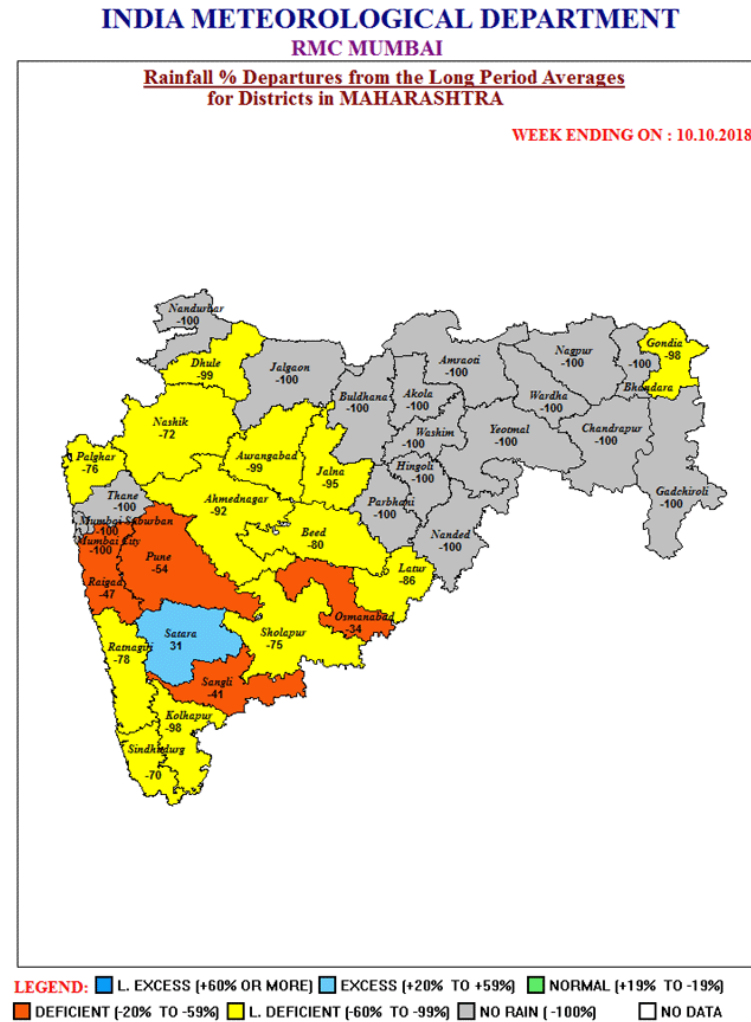
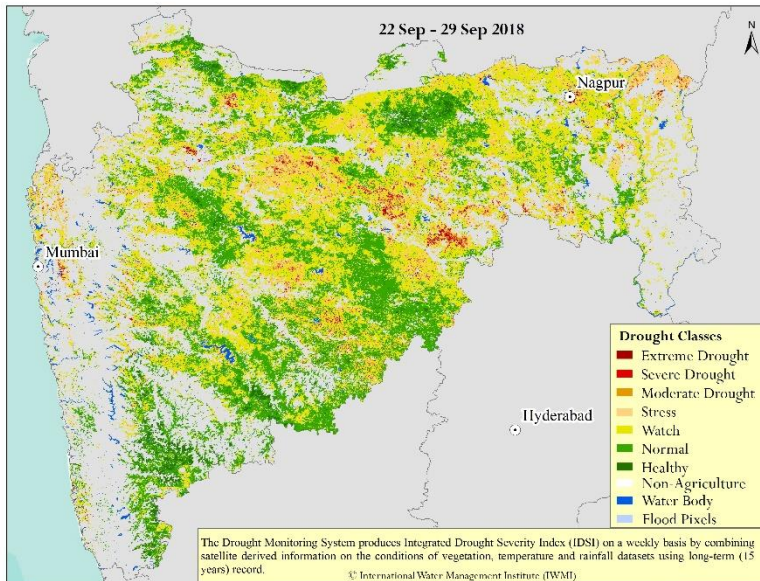
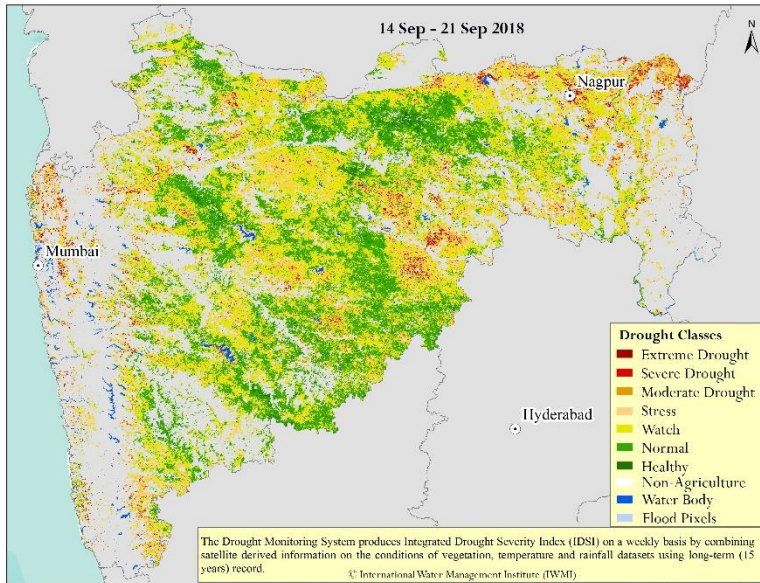
Summary:

- 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



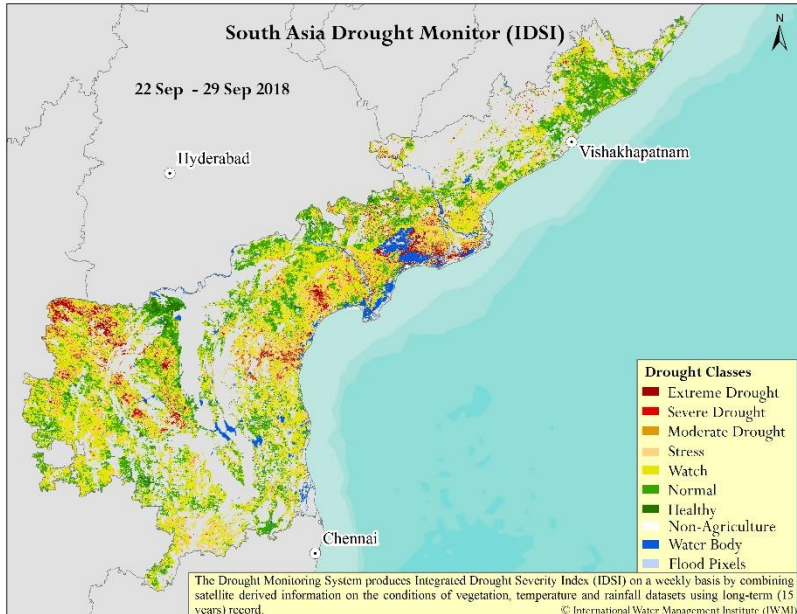
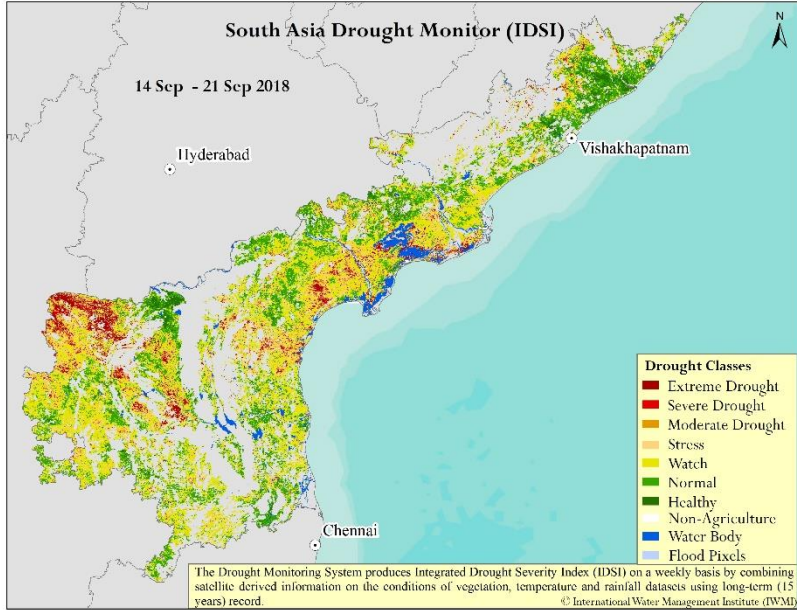
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Maharashtra)



Summary:

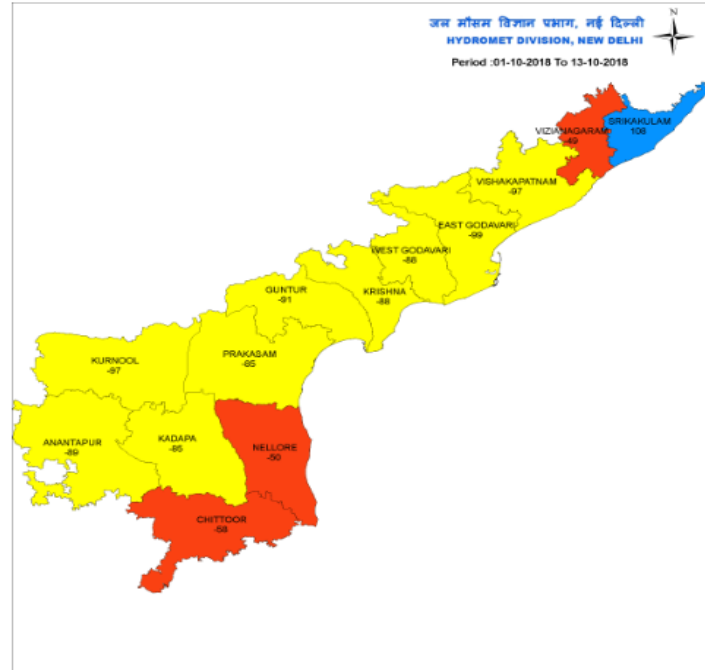
- SADMS framework was applied for the agriculture drought monitoring in Maharashtra for current obtained mainly from satellite remote sensing data. The index (Integrated Drought Severity Index – IDSI), Indian Meteorological Rainfall maps were analysed to understand rainfall deficit which could help in 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, Jalagaon, 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.

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



भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT

DISTRICT RAINFALL DEPARTURE MAP - ANDHRA PRADESH



Rainfall Status (Avg from 01-06-2018 to till date)
Actual **479.6mm**, Deviation **-27.1%**

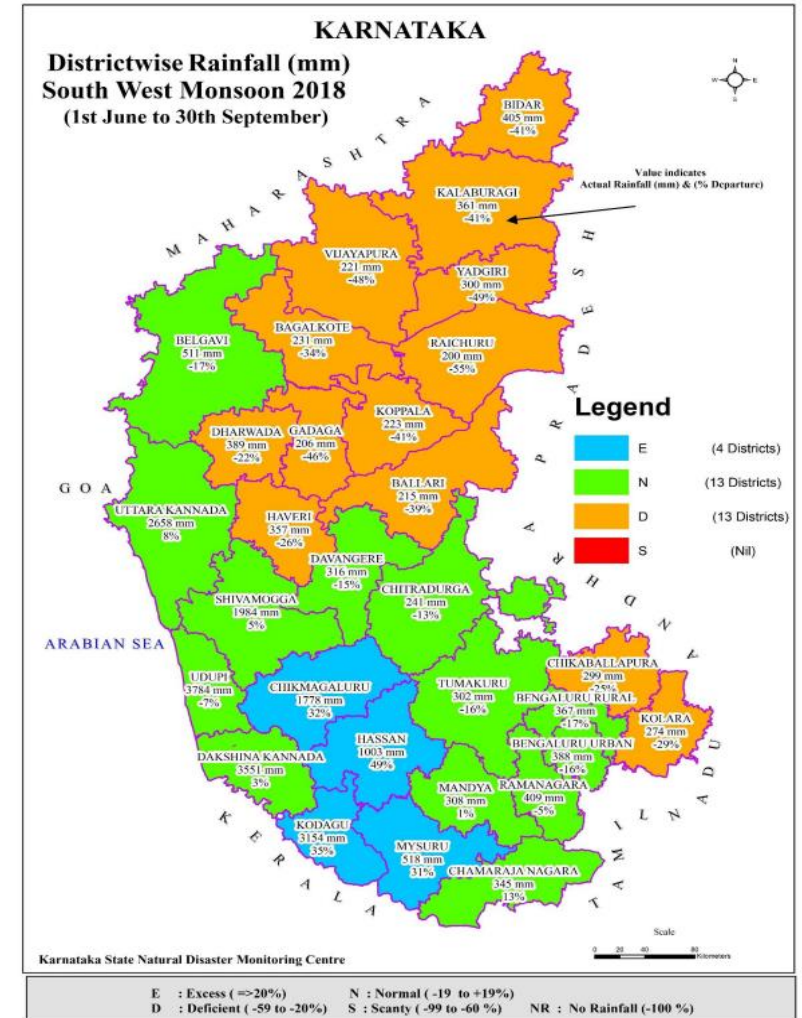
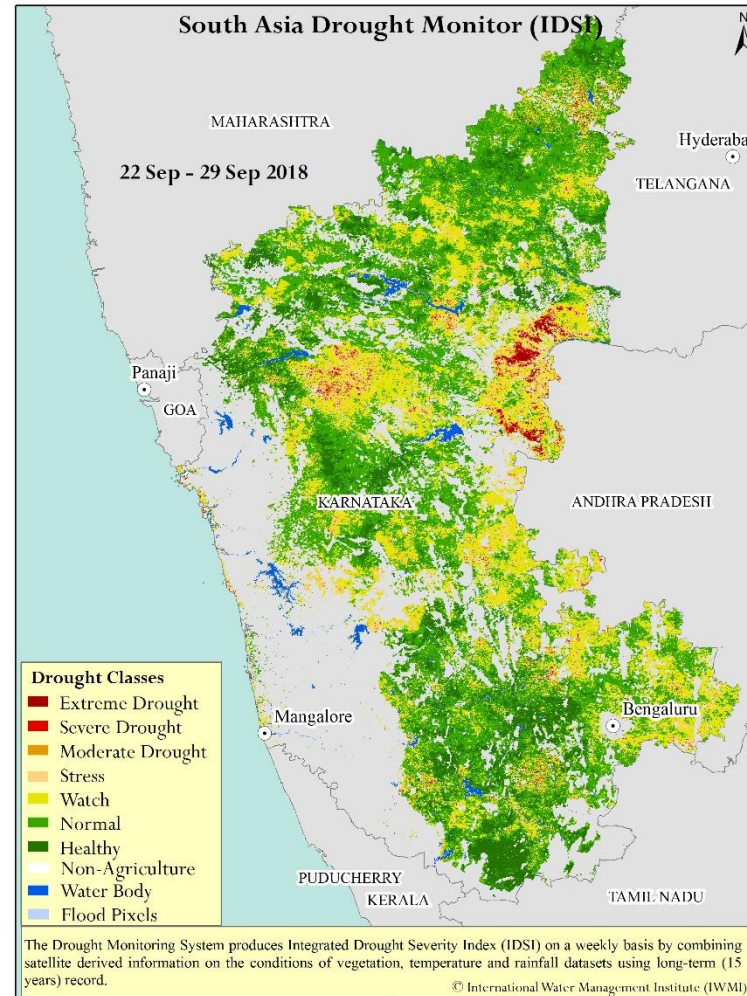
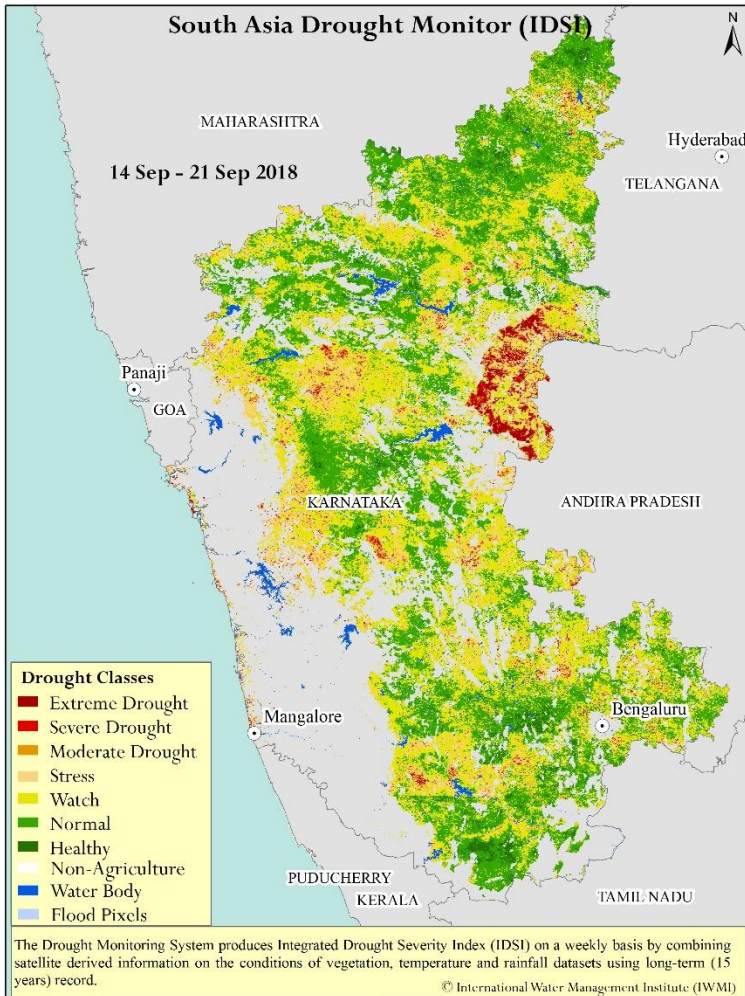
District-Wise, Month-Wise Rainfall Status from 01/06/2018				
District	Actual	Normal	Deviation(%)	Status
Srikakulam	930.7	839.9	10.8	Normal
Vizianagaram	672.4	817.8	-17.8	Normal
Vishakapatnam	702.1	852.8	-17.7	Normal
East Godavari	810.6	903.0	-10.2	Normal
West Godavari	900.4	900.5	0.0	Normal
Krishna	650.3	784.5	-17.1	Normal
Guntur	403.1	609.0	-33.8	Deficient
Prakasham	233.6	500.1	-53.3	Deficient
Nellore	203.8	419.4	-51.4	Deficient
Chittoor	314.8	514.6	-38.8	Deficient
Kadapa	213.1	460.5	-53.7	Deficient
Anantapur	219.5	404.3	-45.7	Deficient
Kurnool	267.2	541.1	-50.6	Deficient
State	479.6	657.5	-27.1	Deficient

Data Source: APSDPS

Summary:

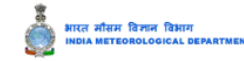
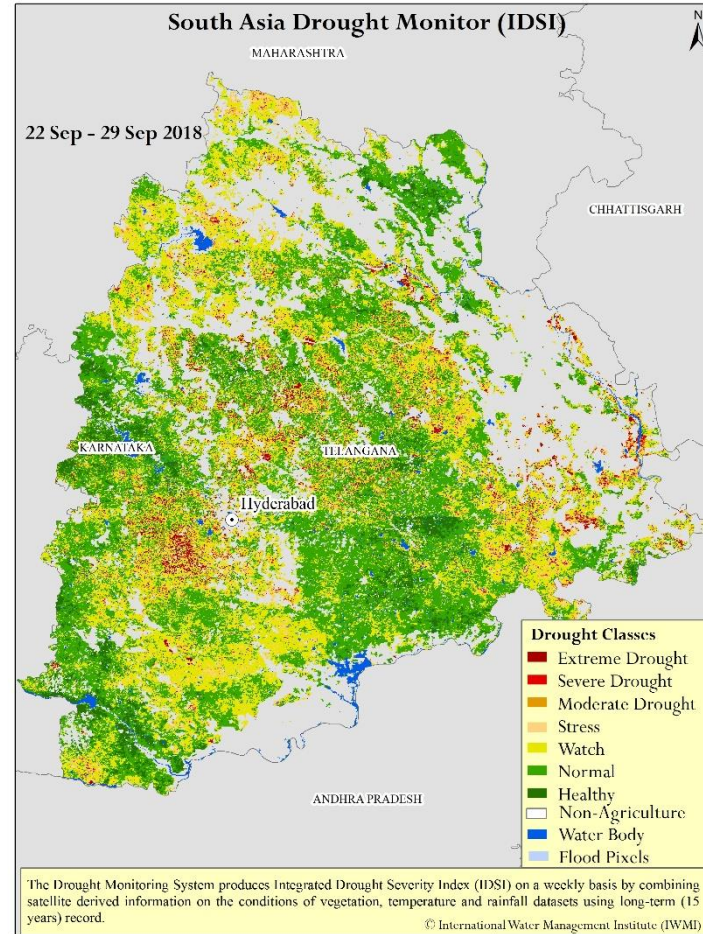
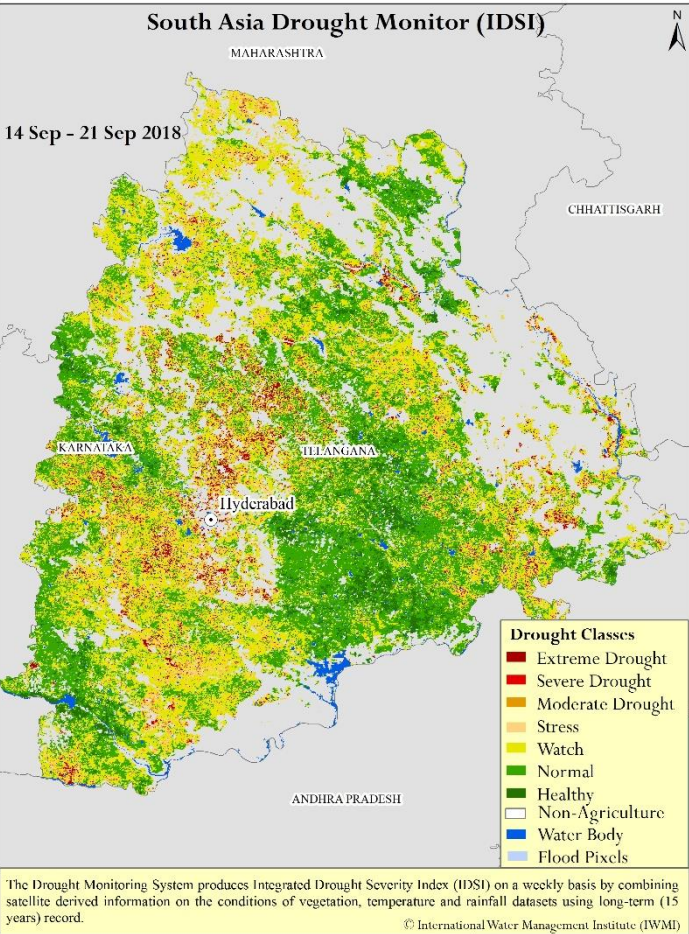
- Out of the 13 districts in A.P., 7 districts had low rainfall (Guntur, Prakasham, Nellore, Chittoor, Kadapa, Anantapur and Kurnool) from June 1 to 13 Oct 2018;
- ‘Stress’ category has been reduced in west part of the district from the previous map.
- Kurnool, Cuddapah, Anantpur, North Prakasham, North 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.

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

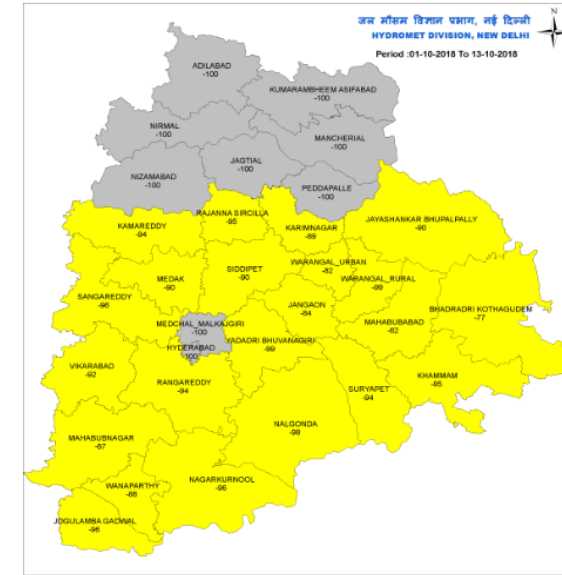


The Integrated Drought Severity Index (IDS) for Karnataka were assessed at district level. Karnataka district has well revived from the stress condition. “Extreme” drought condition in the central eastern districts has reduced slightly. There can be seen few patches of extreme drought class in Dharwad, Gadag, Koppal and Bagalkot while South and South east parts of Raichur and North east part of Bellary are still in “Extreme” drought class.

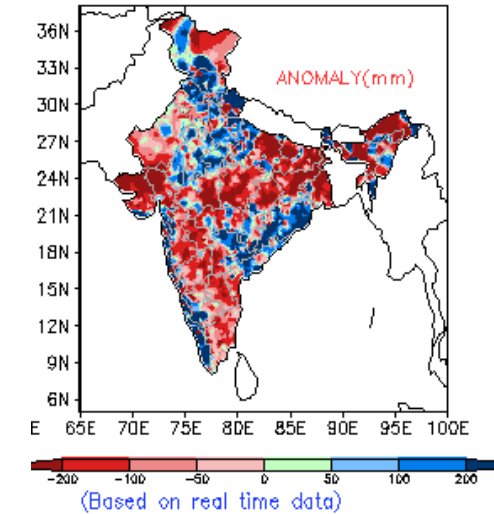
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Telangana)



DISTRICT RAINFALL DEPARTURE MAP - TELANGANA



01 June – 26 Sep 2018

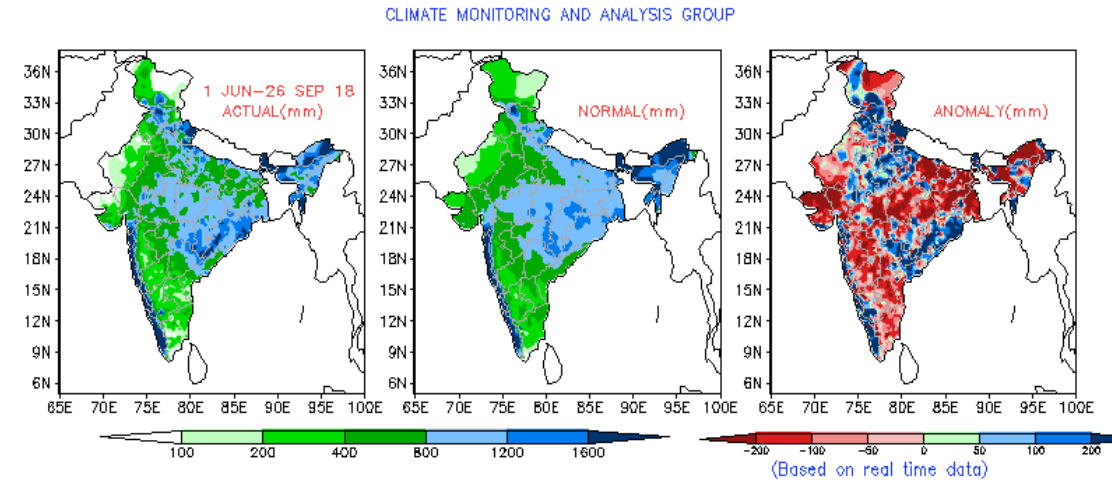
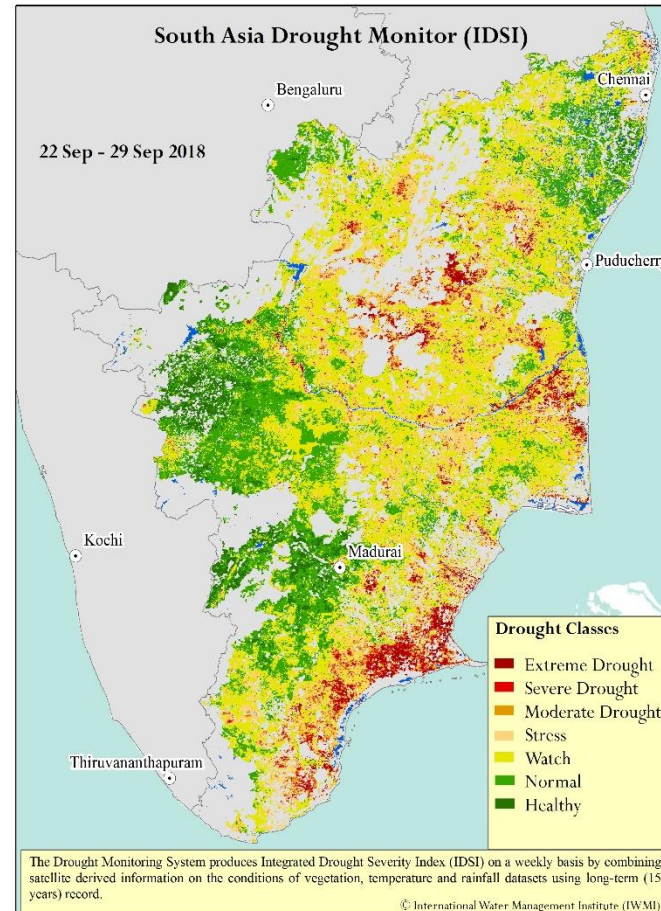
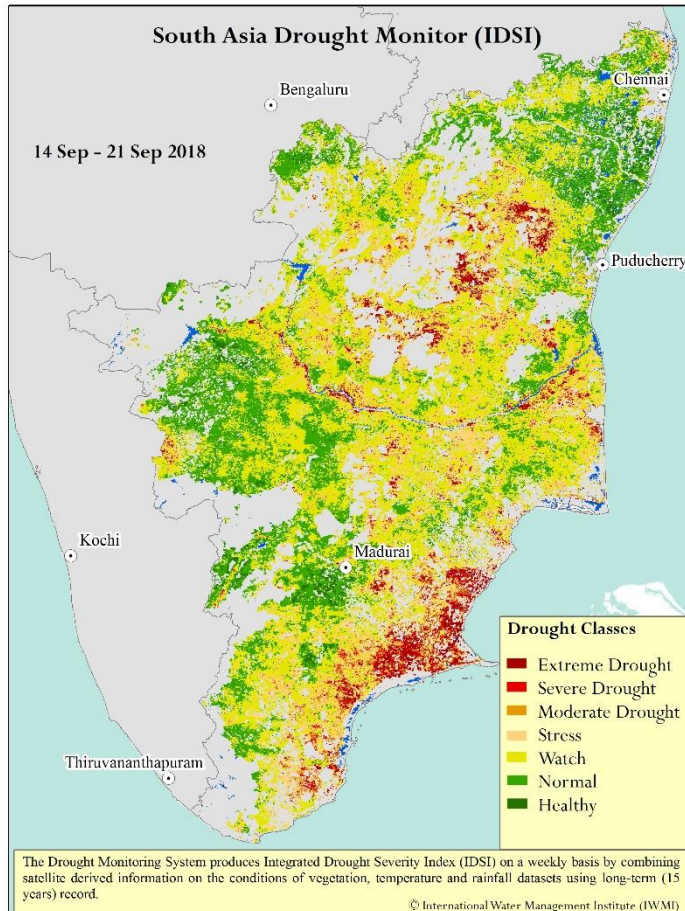


Summary:

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.

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

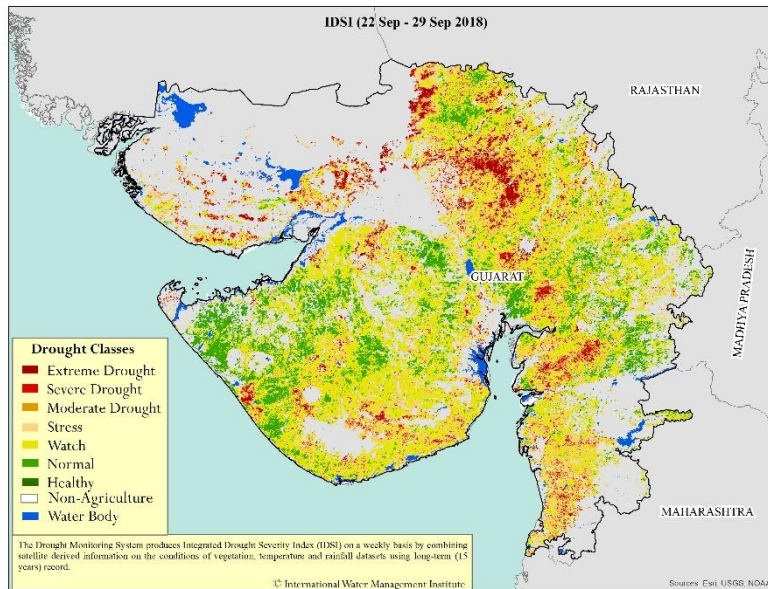
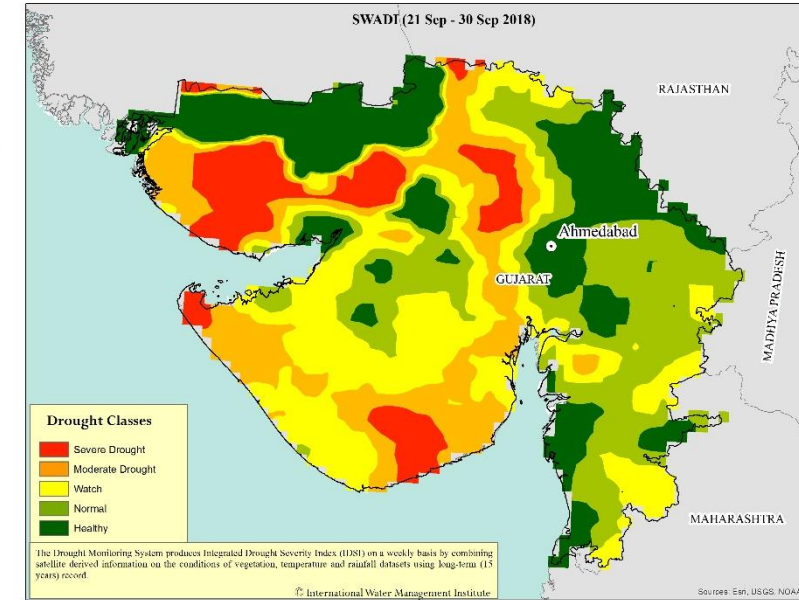
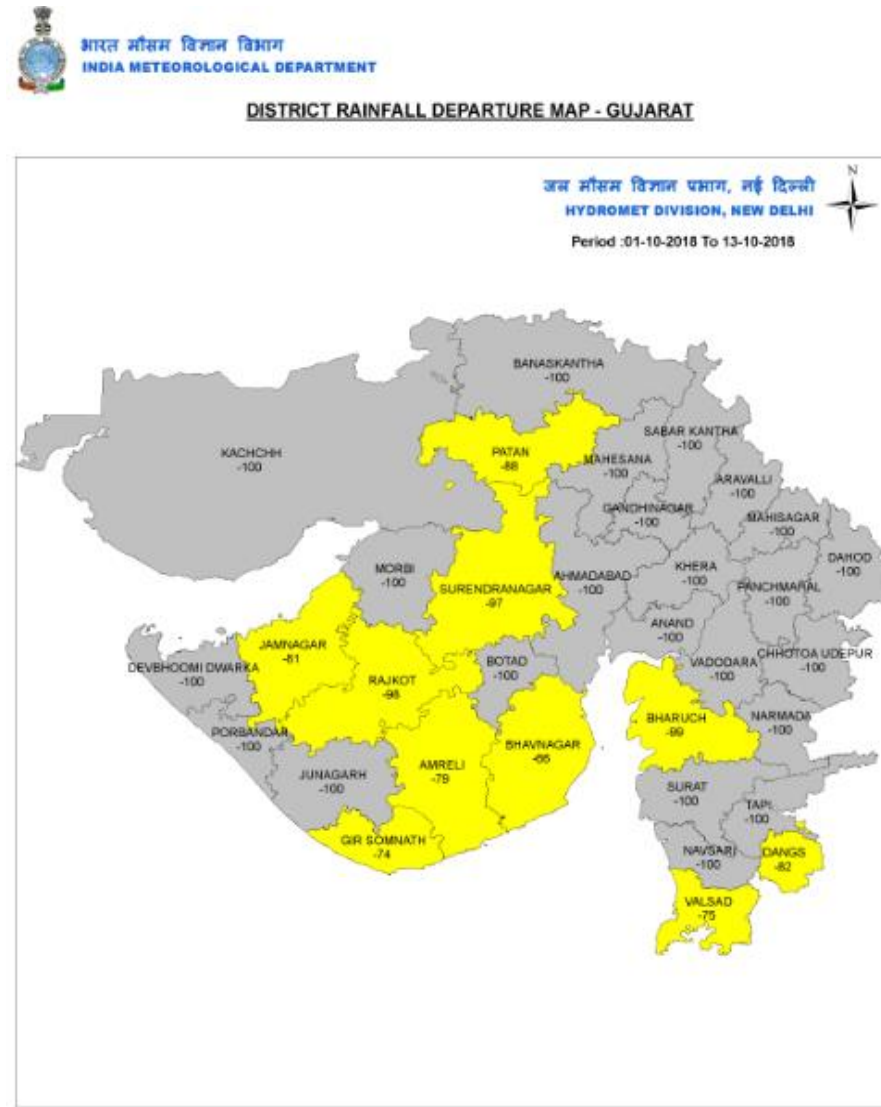
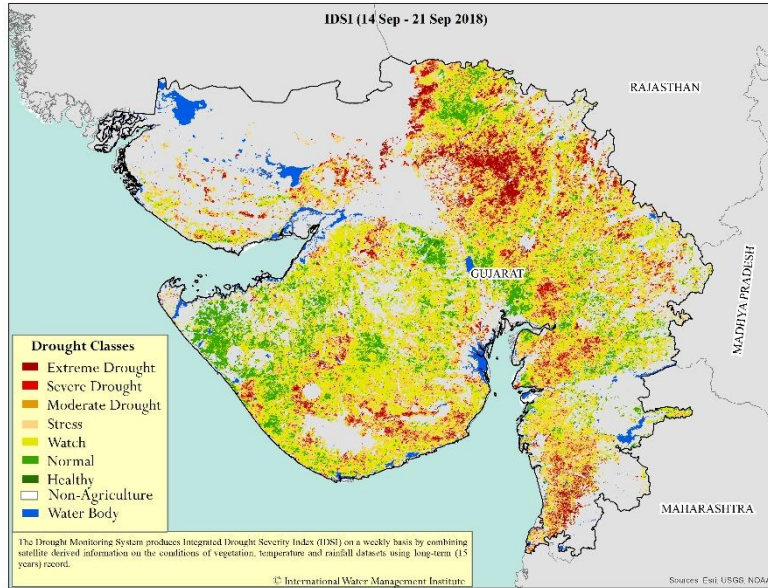
01 June – 26 Sep 2018



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.

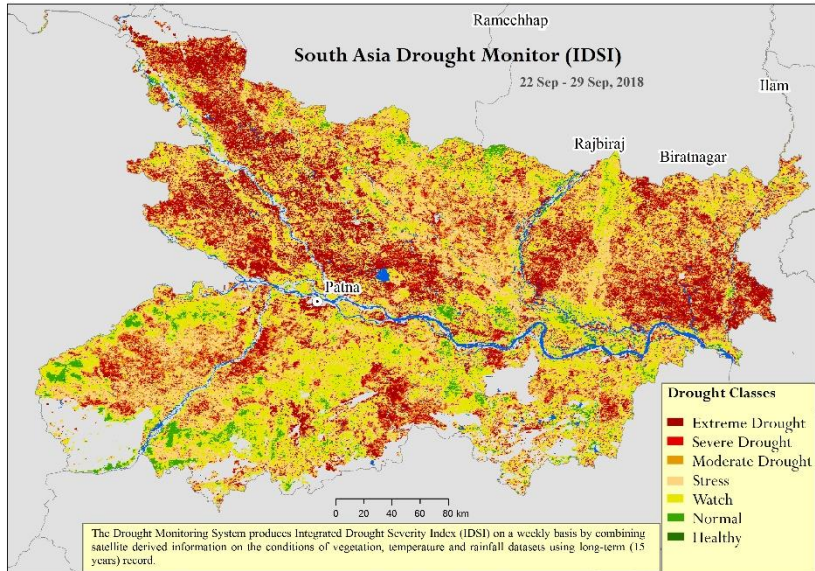
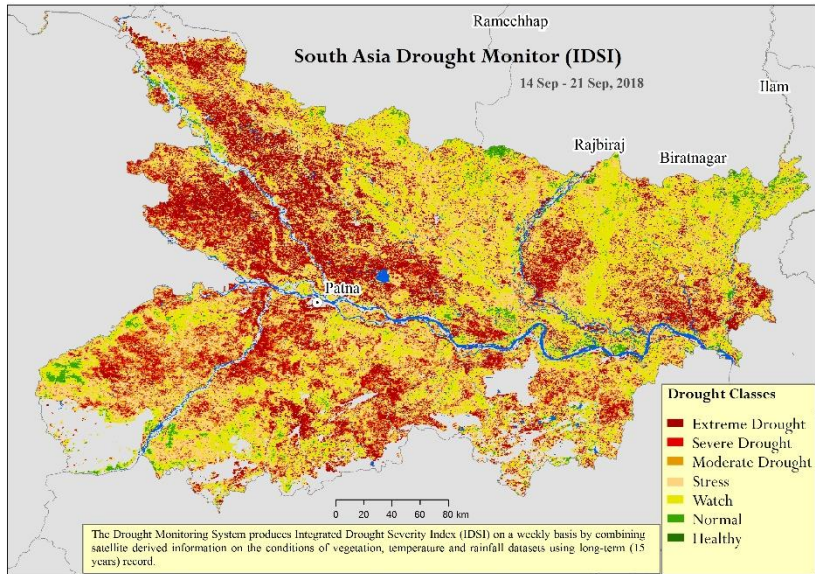
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Gujarat)



Summary:

- Overall condition of the stress is lower compared to the previous analysis
- Banas Kantha, Vadodara, Surat, Anand, Surengranagar, Jamanagar, 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)



DISTRICT RAINFALL DEPARTURE MAP - BIHAR



India Meteorological Department
Hydromet Division, New Delhi

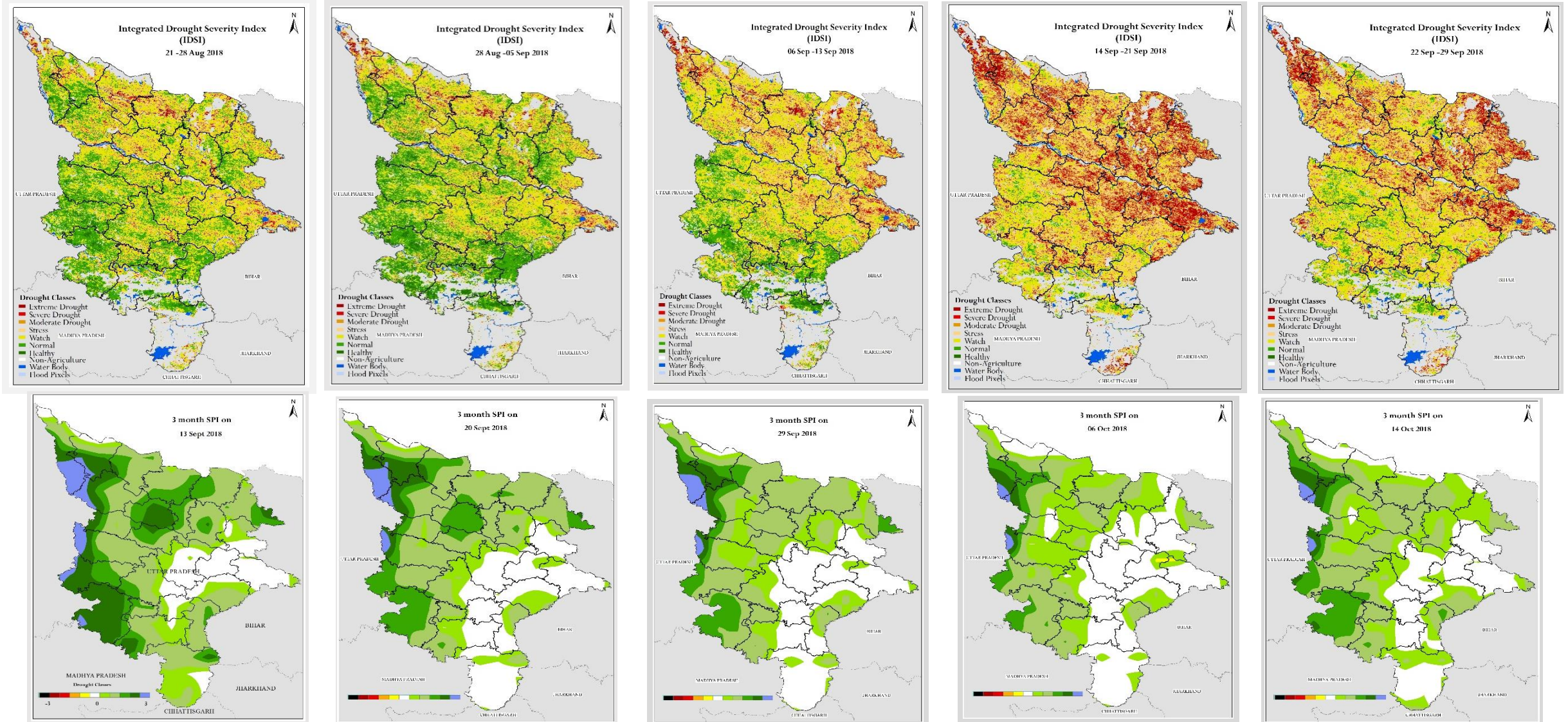
DISTRICT-WISE RAINFALL DISTRIBUTION

S NO	MET. SUBDIVISION/UT/STATE/DISTRICT	Week:13-09-2018 To 19-09-2018				Period:01-06-2018 To 19-09-2018			
		ACTUAL (mm)	NORMAL (mm)	%DEP.	CAT.	ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.
1	ARARIYA	62.7	73.1	-14%	N	998.2	1283.9	-21%	D
2	ARWAL	3.1	54.5	-94%	LD	485.5	745.3	-35%	D
3	AURANGABAD	0.0	52.3	-100%	NR	681.5	822.5	-17%	N
4	BANKA	0.0	48.8	-100%	NR	933.6	780.6	20%	E
5	BEGUSARAI	0.7	46.3	-99%	LD	597.9	850.2	-30%	D
6	BHABUA	0.0	71.5	-100%	NR	848.0	943.7	-10%	N
7	BHAGALPUR	11.0	53.3	-79%	LD	883.0	894.3	-1%	N
8	BHOJPUR	0.0	59.9	-100%	NR	550.4	875.8	-37%	D
9	BUXAR	0.0	62.4	-100%	NR	1046.3	833.6	26%	E
10	DRABHANGA	34.7	36.5	-5%	N	623.1	859.3	-27%	D
11	GAYA	0.0	40.5	-100%	NR	748.0	828.9	-10%	N
12	GOPALGANJ	0.0	76.9	-100%	NR	718.9	942.1	-24%	D
13	JAHANABAD	3.2	61.7	-95%	LD	478.7	787.5	-39%	D
14	JAMUI	0.0	49.2	-100%	NR	575.9	888.6	-34%	D
15	KATIHAR	13.8	59.7	-77%	LD	639.7	1007.2	-36%	D
16	KHAGARIA	8.3	73.7	-89%	LD	579.7	993.6	-40%	D
17	KISHANGANJ	82.5	84.0	-2%	N	1488.2	1648.8	-10%	N
18	LAKHISARAI	0.0	50.1	-100%	NR	594.7	890.0	-33%	D
19	MADHEPURA	33.9	57.7	-41%	D	841.0	1073.7	-22%	D
20	MADUBANI	51.2	41.2	24%	E	966.3	1000.7	-3%	N
21	MUNGER	1.2	50.1	-98%	LD	672.7	890.0	-24%	D
22	MUZAFFARPUR	1.4	57.4	-98%	LD	512.8	920.5	-44%	D
23	NALANDA	0.0	52.7	-100%	NR	588.3	816.6	-30%	D
24	NAWADA	0.0	41.7	-100%	NR	717.1	842.4	-15%	N
25	PACHIM CHAMPARAN	104.5	89.5	17%	N	1296.4	1210.6	7%	N
26	PATNA	1.2	55.1	-98%	LD	598.6	876.5	-32%	D
27	PURBA CHAMPARAN	7.8	52.5	-85%	LD	628.2	960.3	-35%	D
28	PURNIA	99.6	71.7	39%	E	1011.7	1212.5	-17%	N
29	ROHTAS	0.0	56.3	-100%	NR	653.6	795.1	-18%	N
30	SAHARSA	17.3	80.0	-78%	LD	591.4	1325.0	-55%	D
31	SAMASTIPUR	16.0	63.6	-75%	LD	748.8	940.5	-20%	D
32	SARAN	0.0	56.6	-100%	NR	432.6	913.8	-53%	D
33	SHEIKHPURA	0.2	42.5	-99%	LD	519.9	805.1	-35%	D
34	SHEOHAR	10.5	45.3	-77%	LD	688.7	1030.2	-33%	D
35	SITAMARHI	22.2	45.3	-51%	D	866.6	1030.2	-16%	N
36	SIWAN	0.2	76.8	-99%	LD	536.3	945.6	-43%	D
37	SUPAUL	47.8	57.4	-17%	N	781.3	988.0	-21%	D
38	VAISHALI	0.0	45.0	-100%	NR	491.4	945.5	-48%	D

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.

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



Summary:

- There can be seen decreasing of drought condition by 29st 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.

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.

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