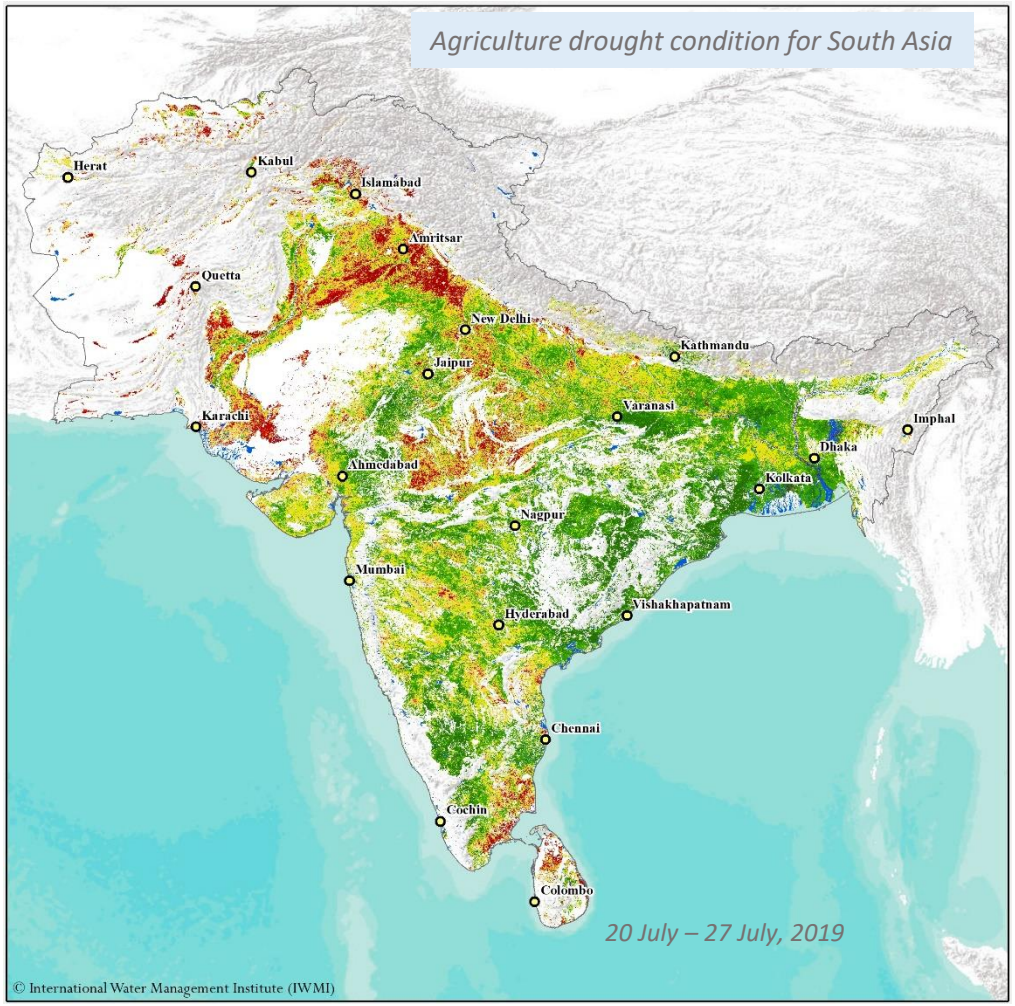
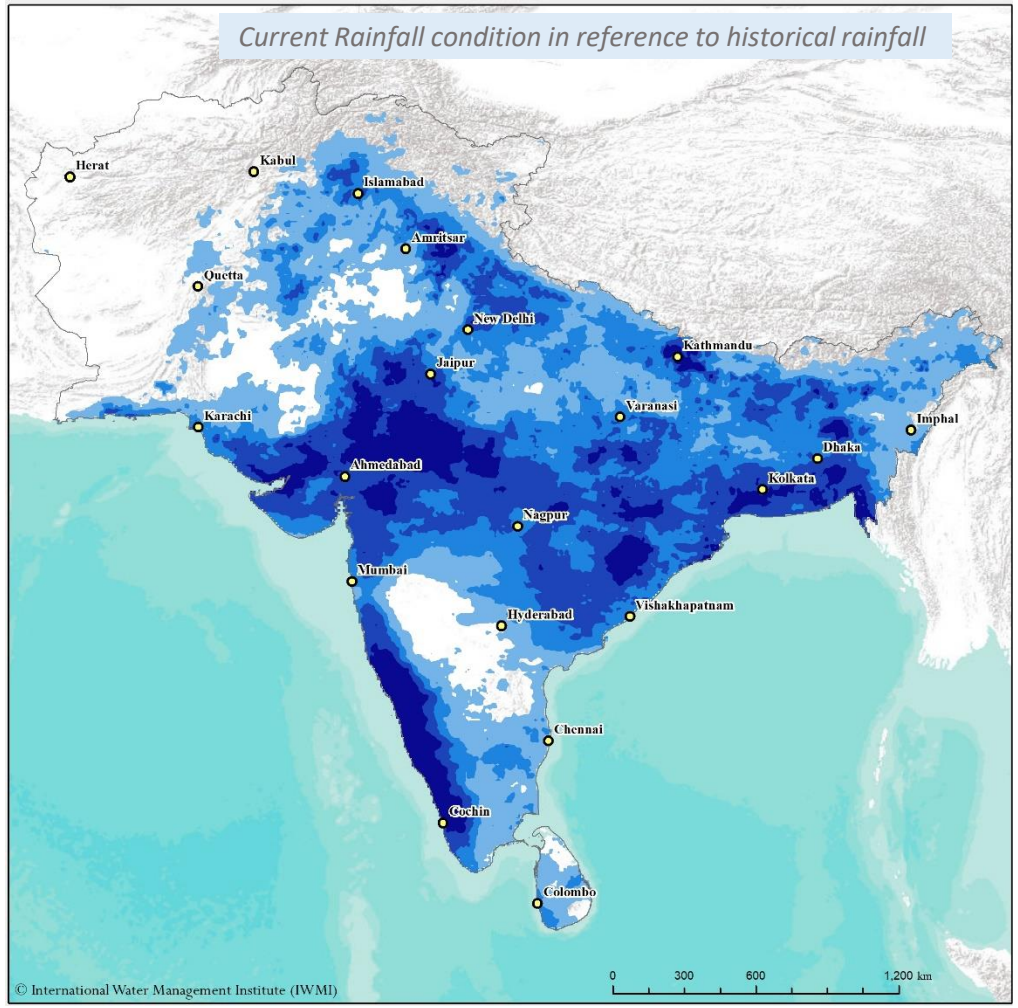
SADMS DROUGHT BULLETIN

20 August 2019 | ISSUE 10



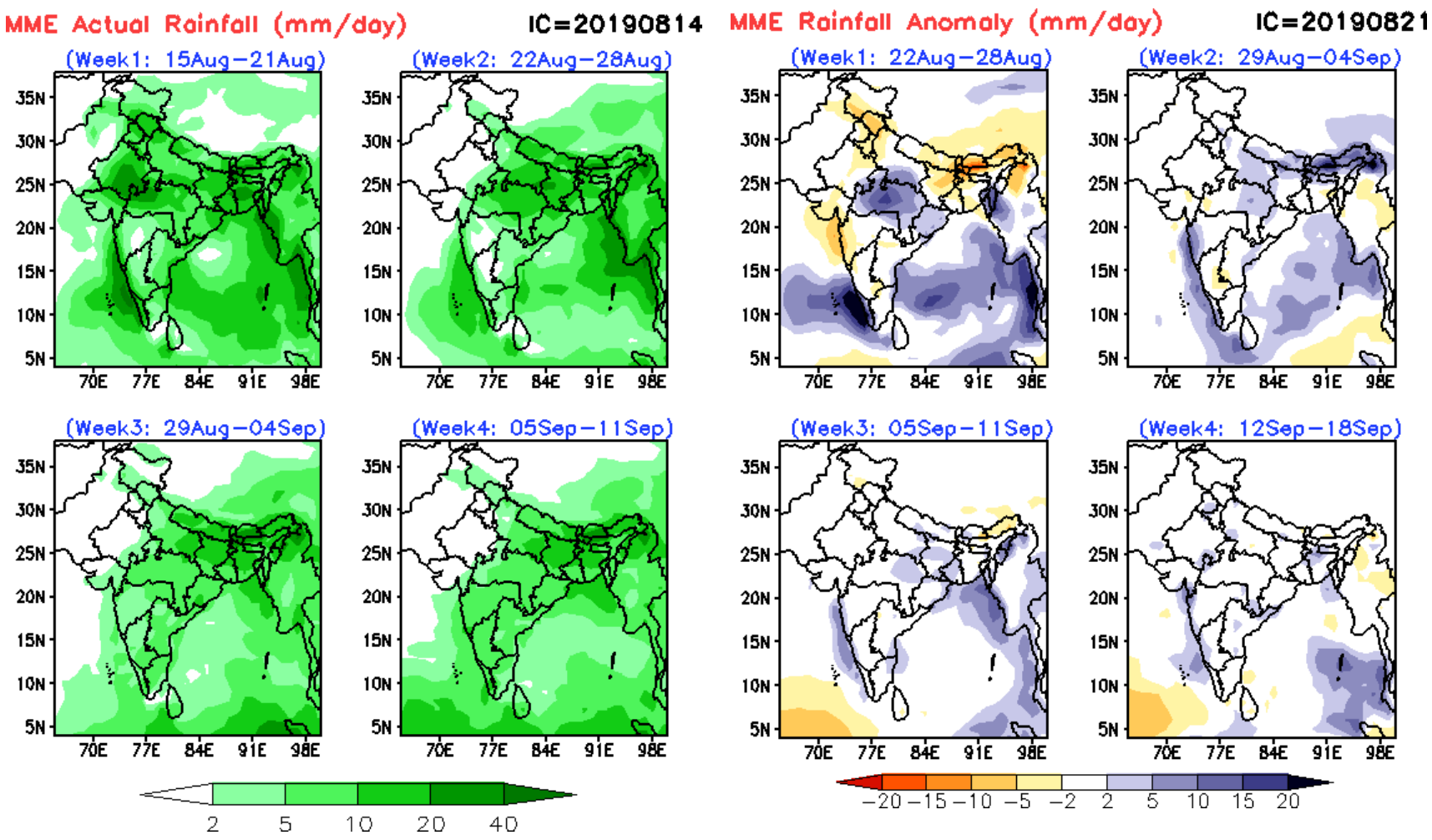


South Asia Drought Monitoring System (SADMS) drought weekly bulletin is produced by International Water Management Institute (IWMI) and is funded by the Indian Council of Agricultural Research (ICAR), the CGIAR Research Program on Water, Land and Ecosystems (WLE) and the Ministry of Agriculture, Forestry 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: 23 August 2019

Rainfall Summary - Predicted week wise rainfall for South Asia

Multi Model Ensemble *(MME) Seasonal Prediction System for 2019 Monsoon Season*



- Relatively less rainfall when compare the last week for UP and Bihar experience in the next week;
- Nepal, Bhutan, south Assam, North and north east Arunachal might experience a decrease in rainfall, however the rainfall anomaly explains deficit rainfall in last week of Aug.
- Most of India might experience decreasing in rainfall by ending of August.
- Maharashtra, Gujarat, Karnataka and Tamil Nadu may experience decreasing rainfall from 29th August to 18st August.
- Sri Lanka for Northern, North Central and Eastern province explains less rainfall on beginning Sep. and will be increased on ending. western might experience excess rainfall in month of ending of Aug to mid September.
- Nepal rainfall anomaly explains a normal rainfall but in Bhutan it will slightly increase in end of August.
- Overall Pakistan shows normal 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.

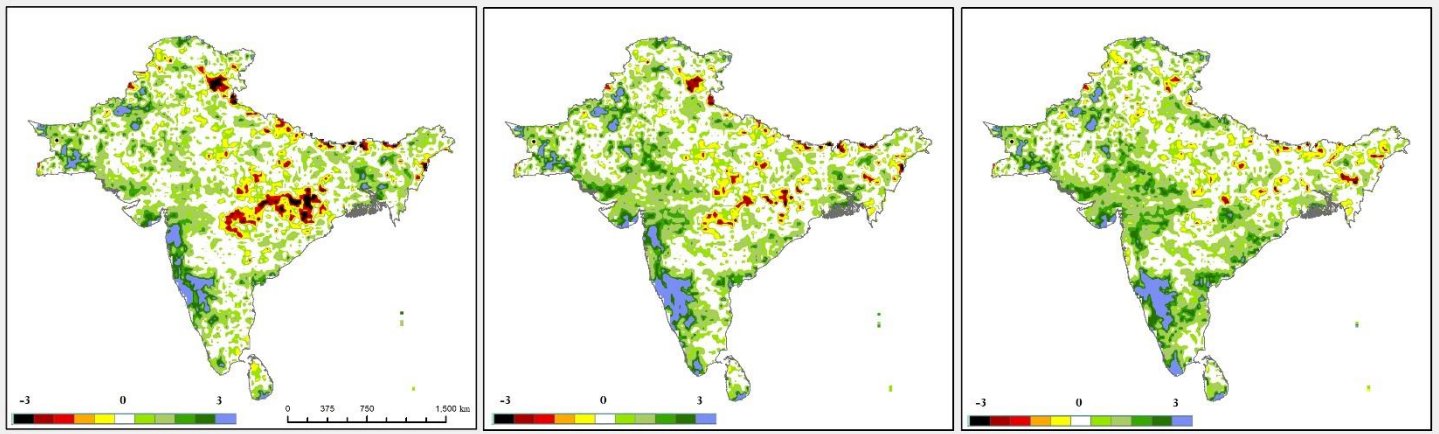
Image Source: Indian Institute of Tropical Meteorology (IITM) and India Meteorological Department (IMD) Pune, India

SOUTH ASIA DROUGHT EARLY WARNING SYATEM (SADEWS)

Current Condition: 20th Aug. 2019
Forecast Period : 20th Aug. and 05 Sep. 2019
Standardized Soil Moisture and Runoff Index for regional drought and early warning

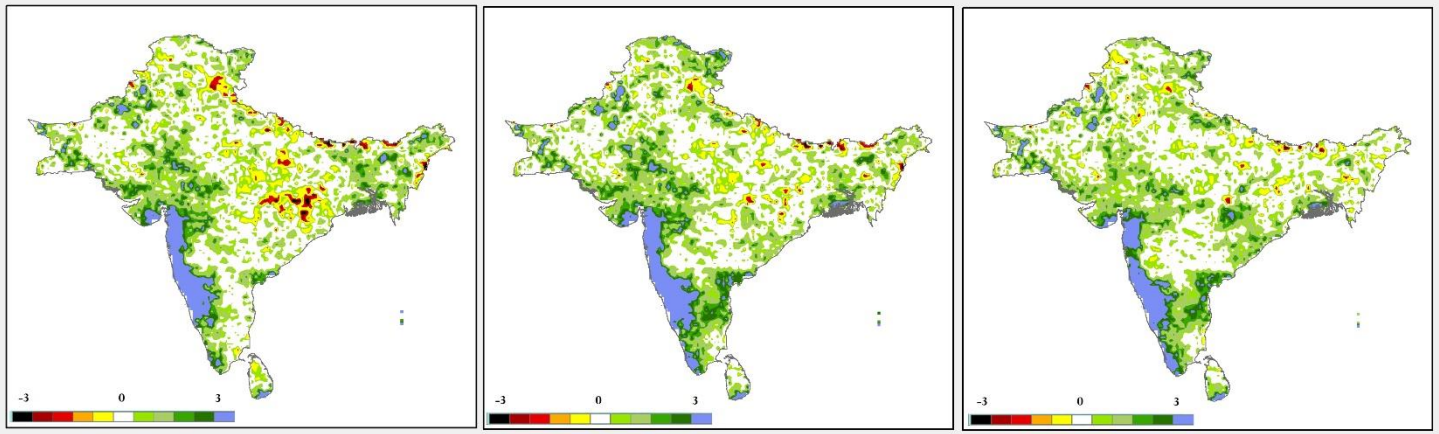
SOIL MOISTURE PERCENTILE (SMP)

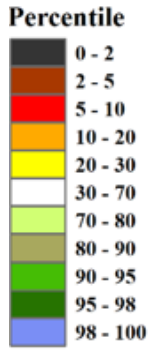
7-day Percentile 20th August 2019 | 7-day Forecast Percentile 27th August 2019 | 15-day Forecast Percentile 4th September 2019



SOIL RUNOFF PERCENTILE (SRP)

7-day Percentile 20th August 2019 | 7-day Forecast Percentile 27th August 2019 | 15-day Forecast Percentile 04th September 2019





Summary:

The experimental drought forecast products for research/scientific use based on 20th August 2019 initial condition. These forecast products are based on the real time weekly operational forecast generated by Global ENSemble (GEFS), 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:

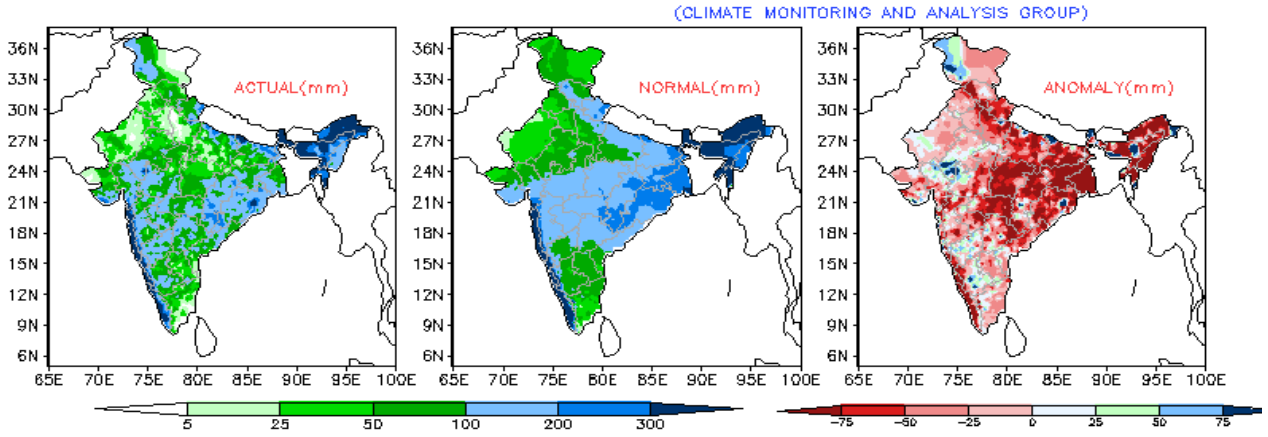
- Rainfall of Karnataka, Maharashtra will slightly decreased from excess and some parts of states which are Odisha, MP will be some increased level
- Initial condition on the Soil Runoff Index (SRI) explains similar trend to SSI.
- Dryness and wetness are keep moderate level beginning of Sep.
- Patches of South East of Sri Lanka will get more rain when rainfall.

- 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.

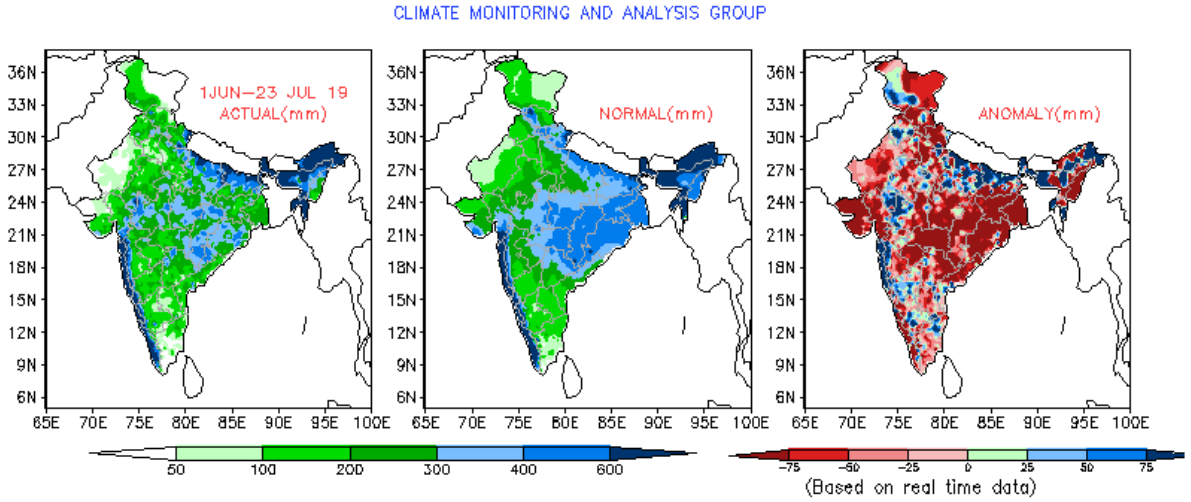
The SADEWS is regional scale early warning system developed as a collaborative project between International Water Management Institute (IWMI) and Indian Institute of Technology – Gandhinagar (IIT-GN).

INDIA – Monthly Rainfall Condition (Actual vs. Anomaly)

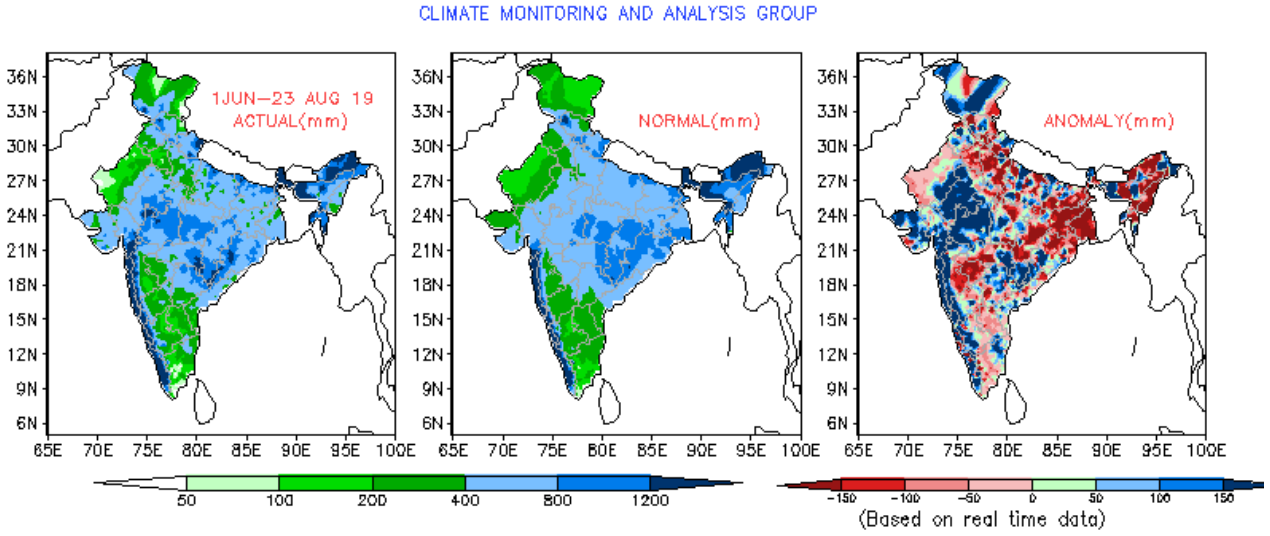
Actual Rainfall – June 2019



Actual Rainfall – Jul 2019



Actual Rainfall – Seasonal 2019 (till 20th Aug.)



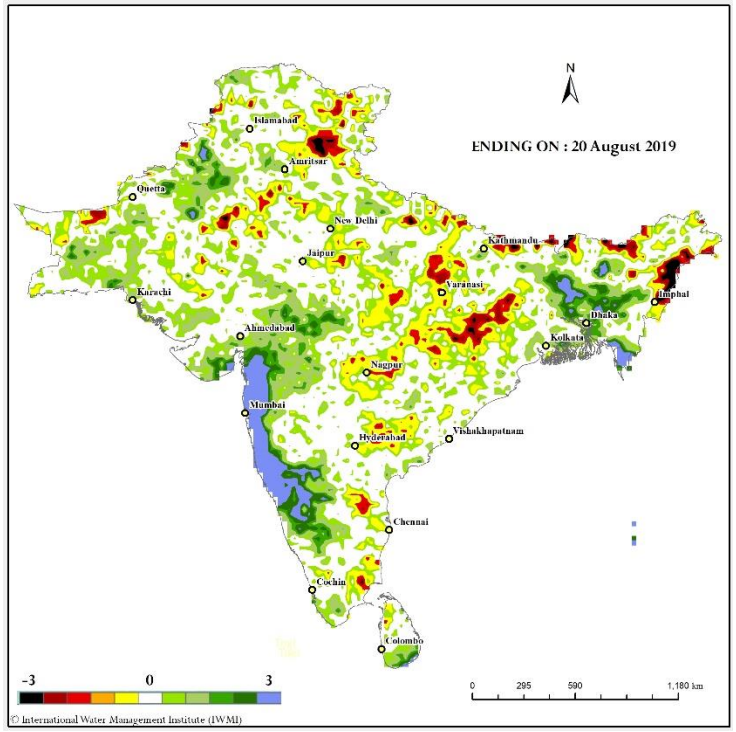
Data Source: IMD

- Several parts of the India there is an decrease in rainfall for the month of July compared to the long-term anomaly, however South, North and North west districts specially in Karnataka, Maharashtra, Odisha, Bihar, South Rajasthan, Assam had excess rainfall in July.
- Month of June has experienced mostly negative anomalies across India except some patches of western and northern terrestrial area.
- There has a reduction and slightly decreased in rainfall in the month of June. It has been increased from third week of August most part over the India.
- Overall there has been an slightly excess rainfall.

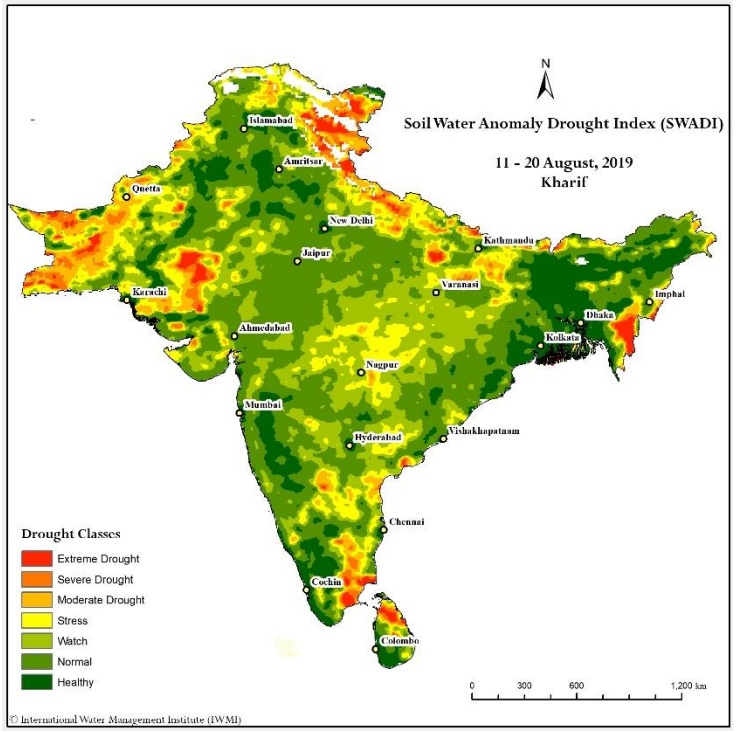
Note: Simple qualitative assessment on the performance on rainfall condition was described here to cross compare with SADMS – IDSI products for evaluation purpose only.

South Asia Drought Indices – A Comparison & Assessment

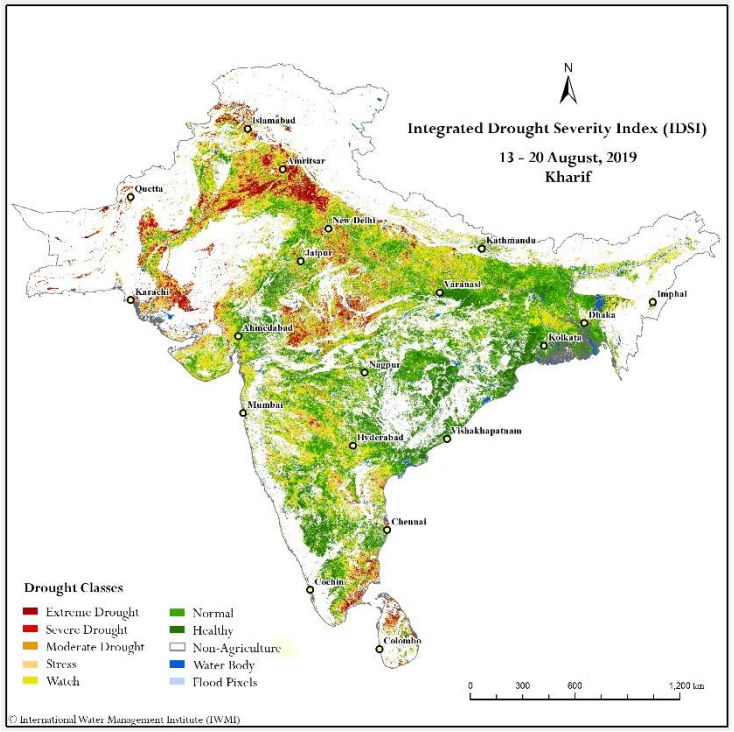
SA-DEWS



SWADI

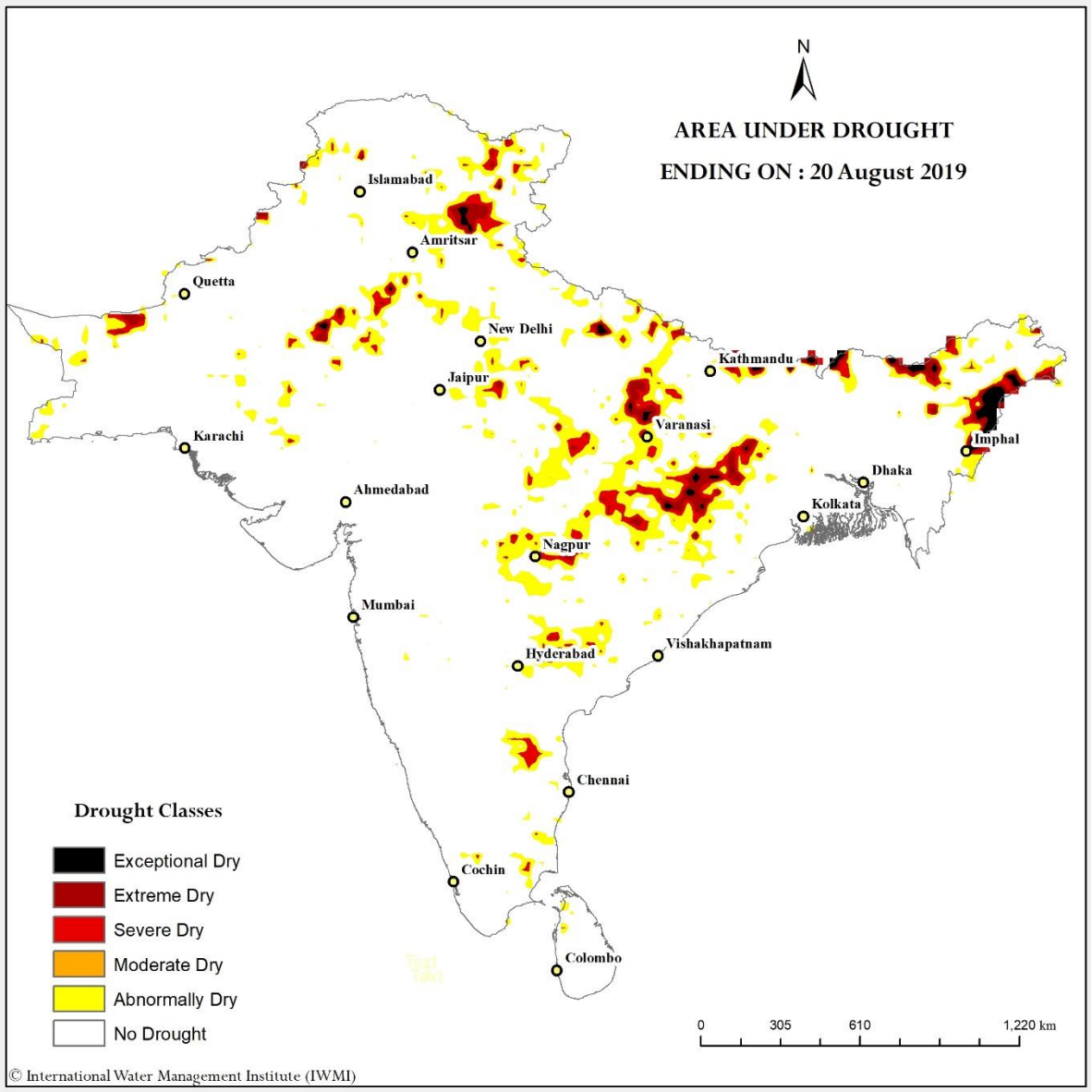


IDSI



- 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 shows a relation with each other. The peninsular India is reviving from the drought situation to good condition except Tamilandu state and North and Northeast of Sri Lanka .

South Asia Drought Forecast

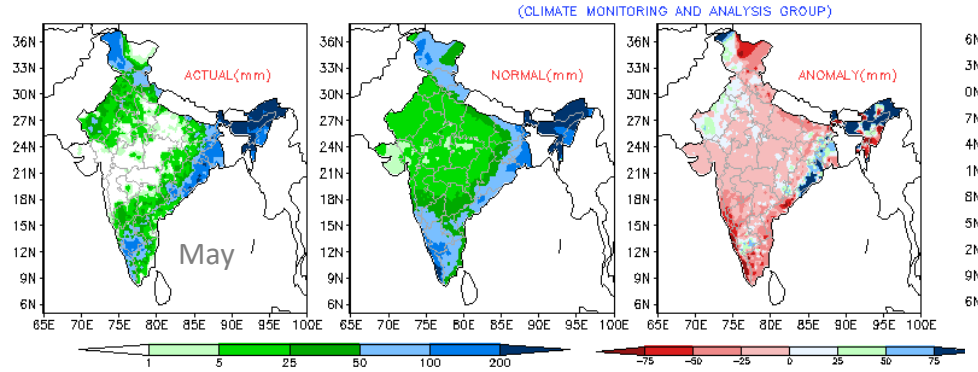


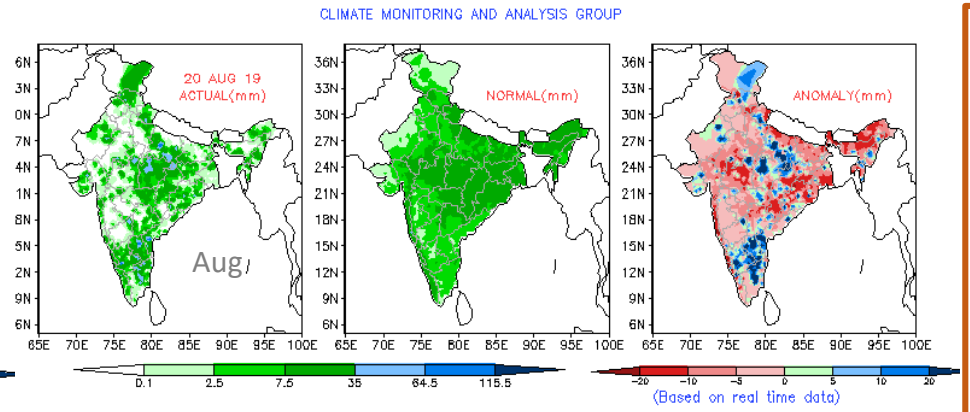
Summary:

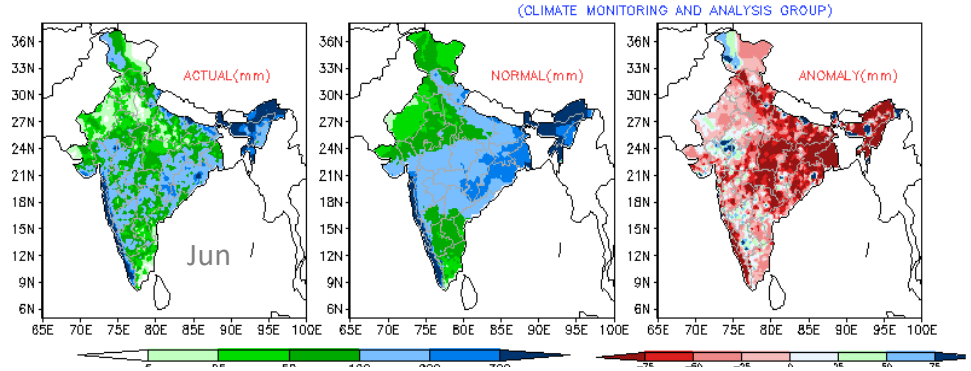
- Using the initial condition i.e. 20th Aug 2019 based on satellite rainfall estimates of 3B42RT daily time-step integrates in the VIC model and the derived outputs namely Standardized Precipitation Index (3-Month), Standardized Soil Moisture Index (SSI) and Standardized Runoff Index (SRI)
- The extreme values of all three conditions are statistically combined to generated areas under drought for entire South Asia
- Extreme dry condition of North of Telangana, North Rajasthan, Nagaland and Manipur have certain level same pattern of last week.
- Part of Jammu & Kashmir, and parts of northeastern belt are observed to have dry condition like previous week. Also, North east of Sri Lanka are under Abnormally/moderate dry condition.
- *Reference to IMD SPI data is well correlated to the area under drought predicted by drought algorithm.*

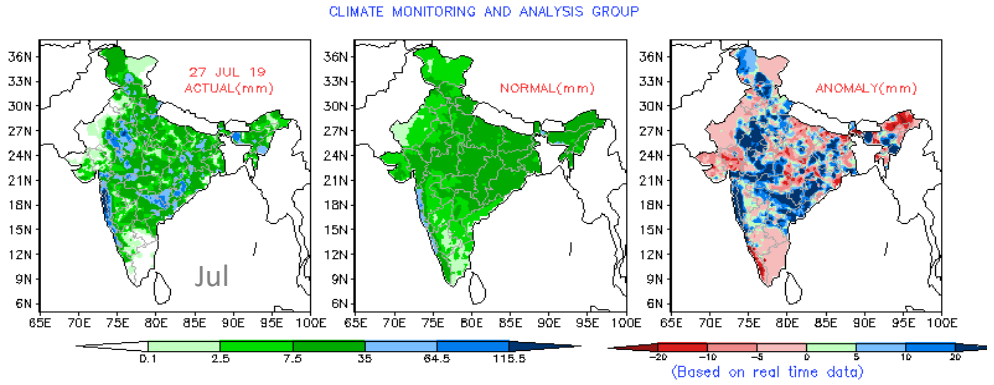
India – State wise analysis

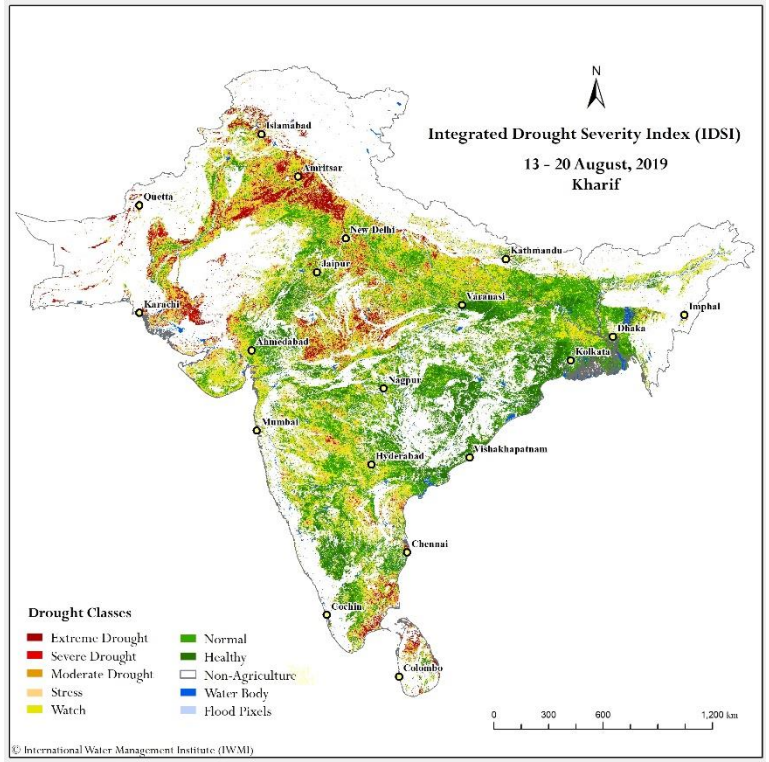
India Monthly Rainfall Comparison & Assessment









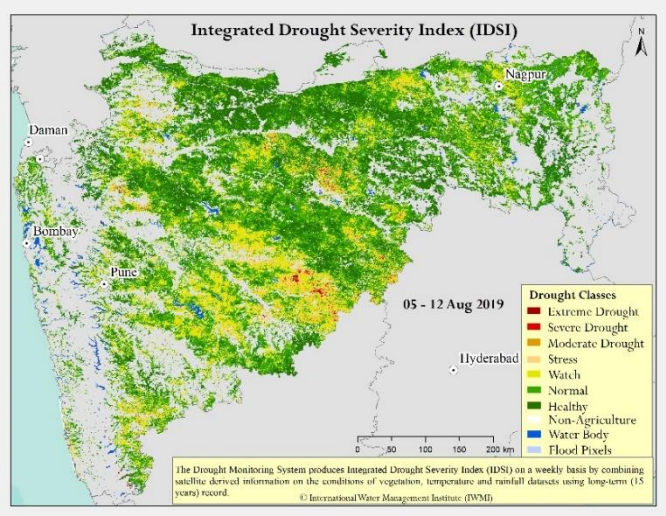


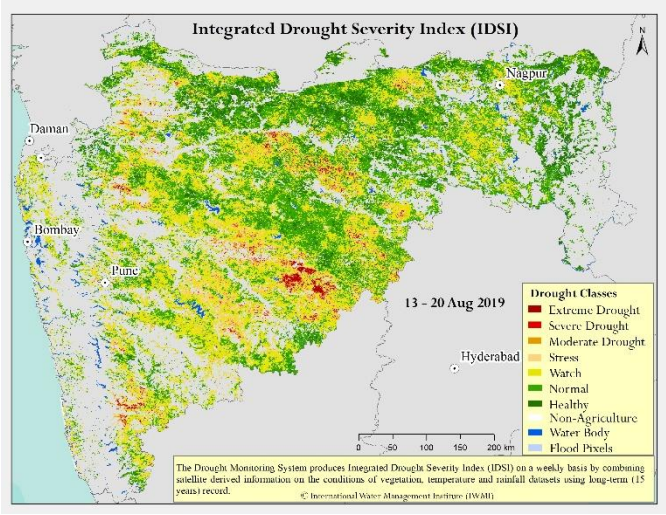
Summary:

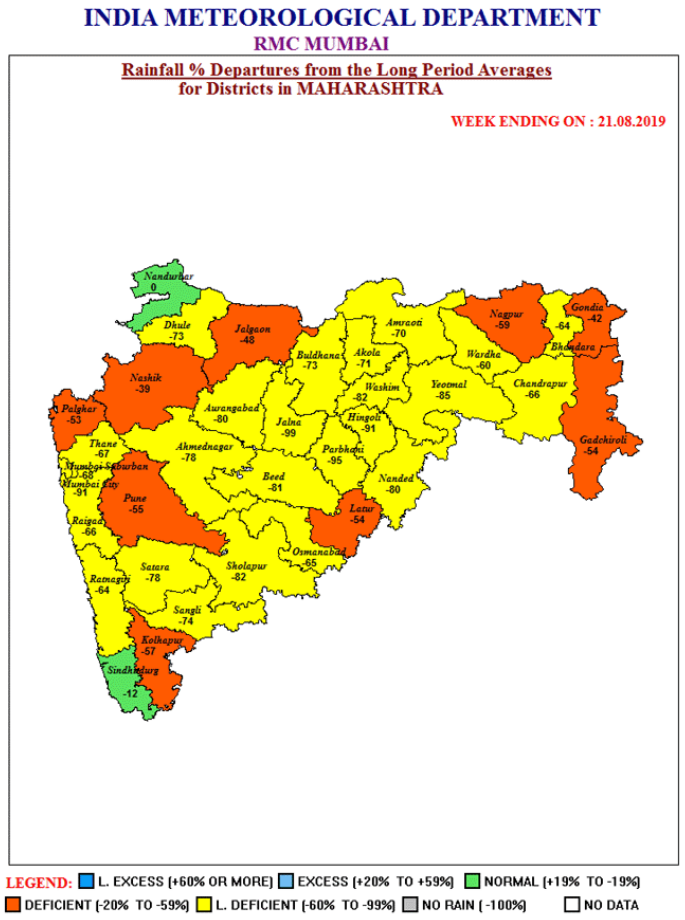
Rainfall deficit in whole India from April is recovered mostly on July month. However on July; the rainfall excess level of some area became much higher when compared with June. In many states of the country and the reduced the vegetation stress while converting severe drought to normal and healthy condition in the agricultural land, which is clearly reflected in the IDSI.

Similar pattern has been revealed by monthly rainfall anomaly report from IMD.

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



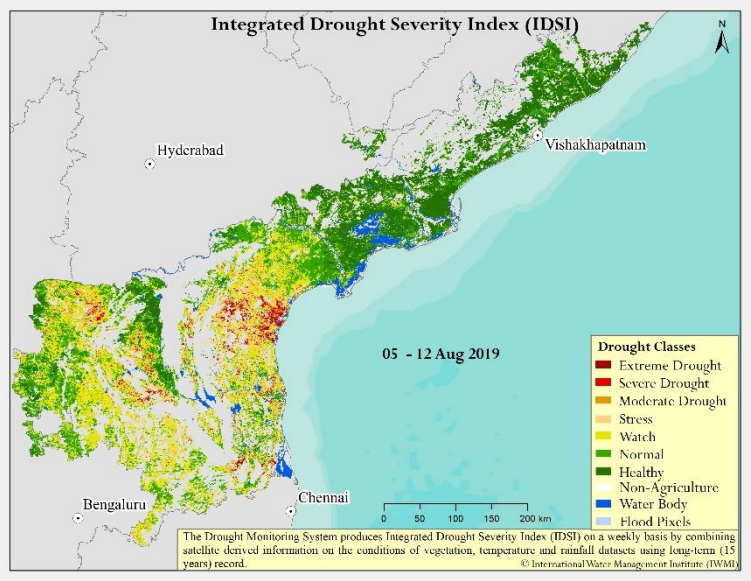


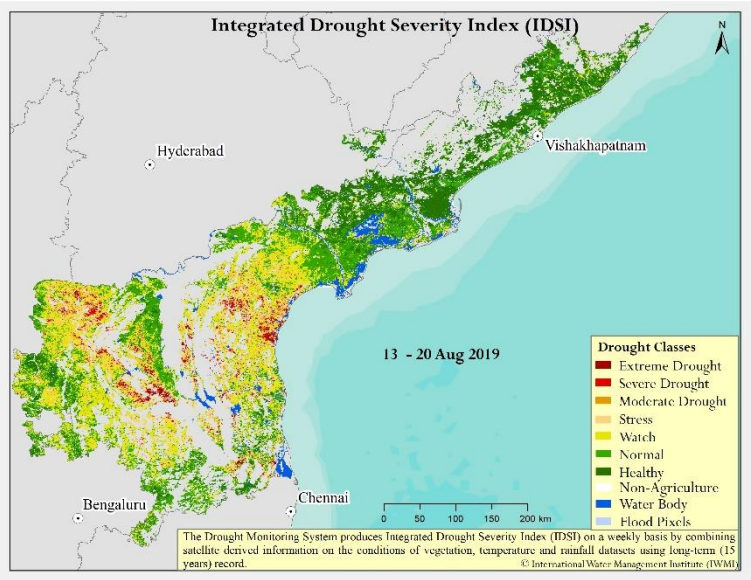


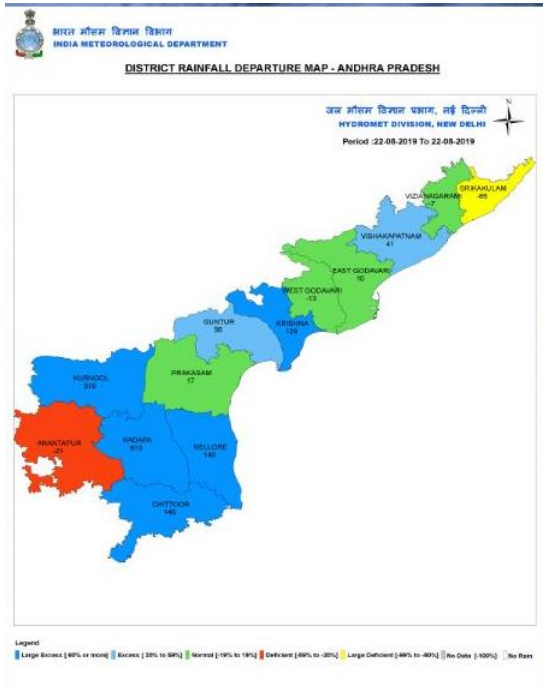
Summary:

- 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.
- Several districts are denoted Watch and Severe level of drought at the mid of Aug 2019. Also it is clearly indicate from rainfall anomaly.
- Decrease of rainfall in state has increased the vegetation stress in the agricultural land and the deficient rainfall caused to crop stress which is clearly reflected in the IDSI. Normal to Watch and Severe drought condition has improve in to normal most of the State. Similar pattern has been revealed by seasonal rainfall report from IMD.

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







Rainfall Status (Avg from 01-06-2019 to till date)
Actual 303.5mm, Deviation -17.0%

District-Wise, Month-Wise Rainfall Status from 01/06/2019

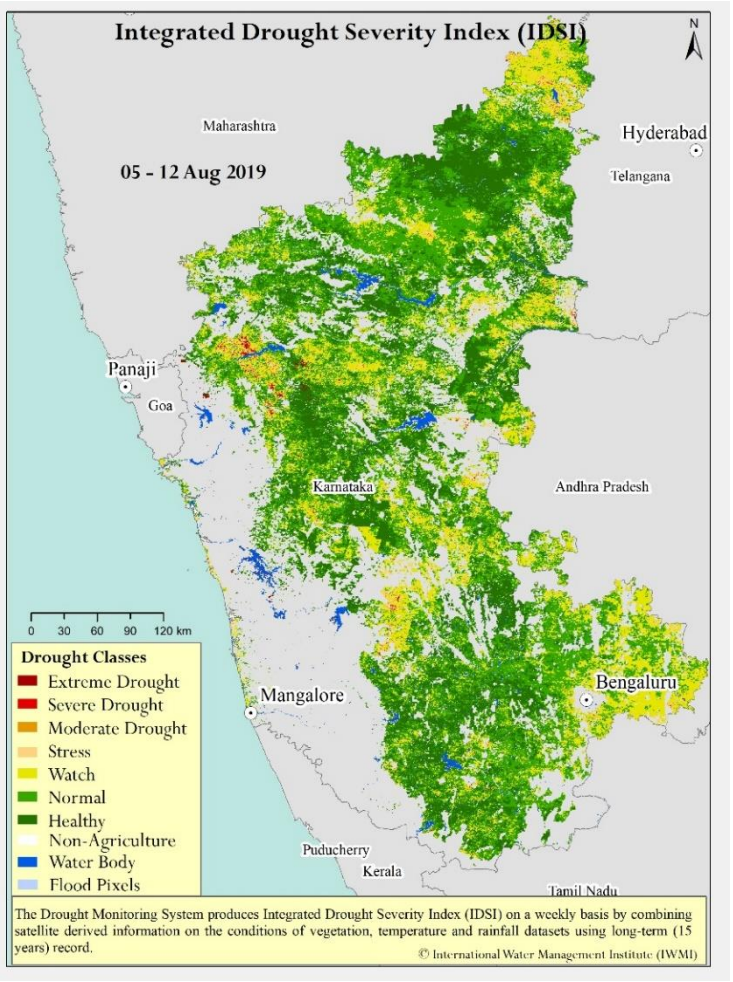
District	Actual	Normal	Deviation(%)	Status
Srikakulam	350.7	465.0	-24.6	Deficient
Vizianagaram	379.2	459.5	-17.5	Normal
Vishakapatnam	459.7	478.5	-3.9	Normal
East Godavari	483.7	534.7	-9.5	Normal
West Godavari	437.4	558.4	-21.7	Deficient
Krishna	378.9	470.2	-19.4	Deficient
Guntur	304.1	346.7	-12.3	Normal
Prakasham	222.7	221.5	0.5	Normal
Nellore	177.5	211.1	-15.9	Normal
Chittoor	276.4	277.5	-0.4	Normal
Kadapa	185.2	247.8	-25.3	Deficient
Anantapur	133.8	194.5	-31.2	Deficient
Kurnool	229.1	290.2	-21.1	Deficient
State	**303.5**	**365.8**	**-17.0**	**Normal**

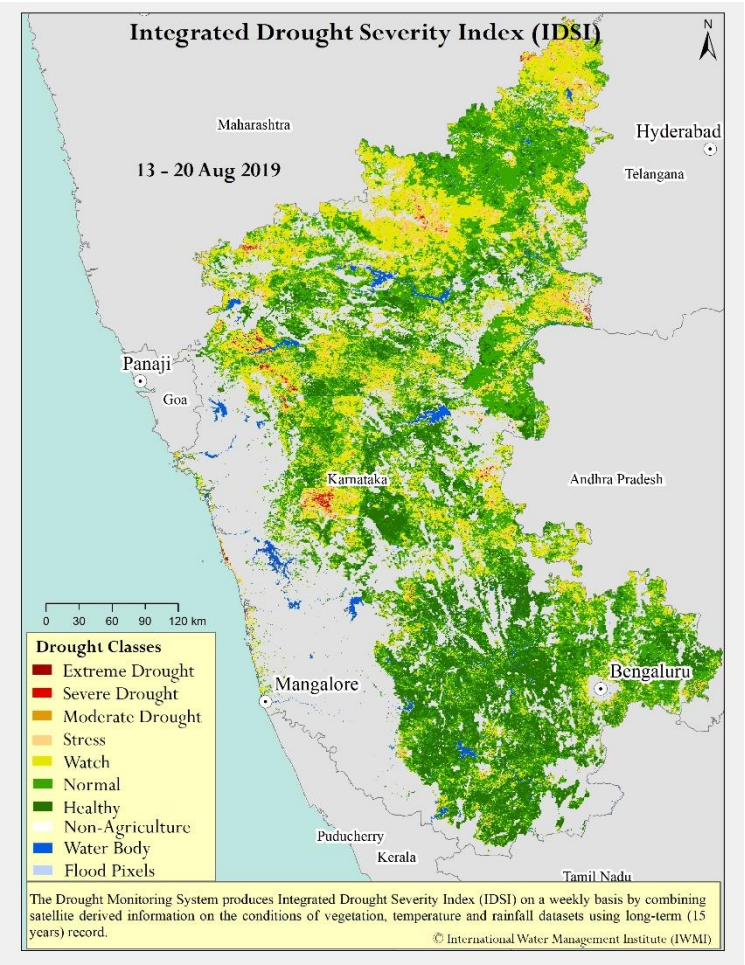
Data Source: APSDPS

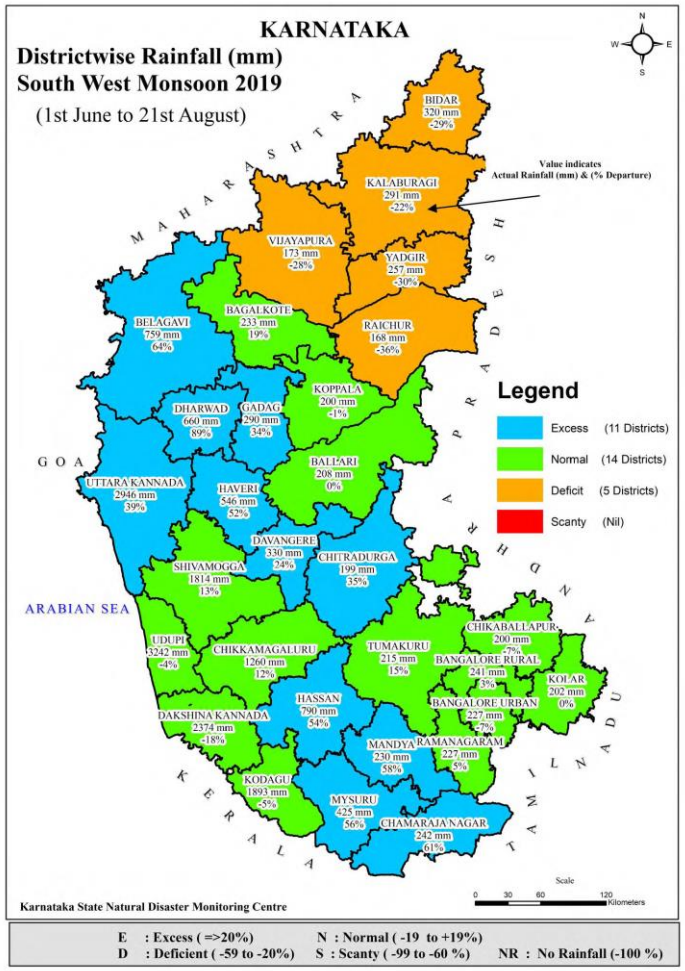
Summary:

- Out of the 13 districts in A.P., only six (06) districts had deficient rainfall from June 1 to 20th Aug 2019;
- "Watch" category is remain and most probably same all over the district from previous week in IDSI.
- Negative rainfall anomalous condition has reduced from 01 June to 20th Aug 2019. it is the indication of reducing the extreme drought condition in to watch to normal category. Still few patches observed the extreme drought condition in near eastern boundary of the state.

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



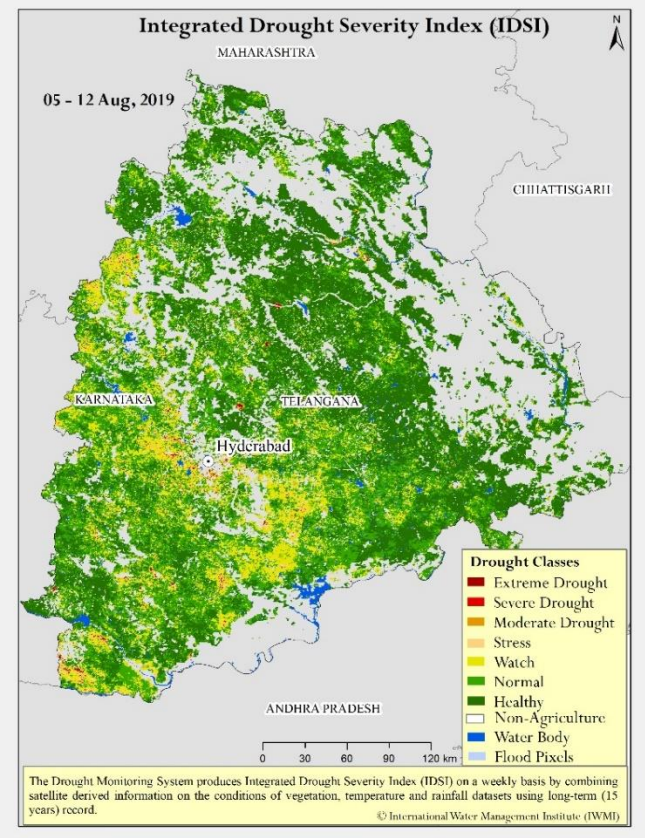


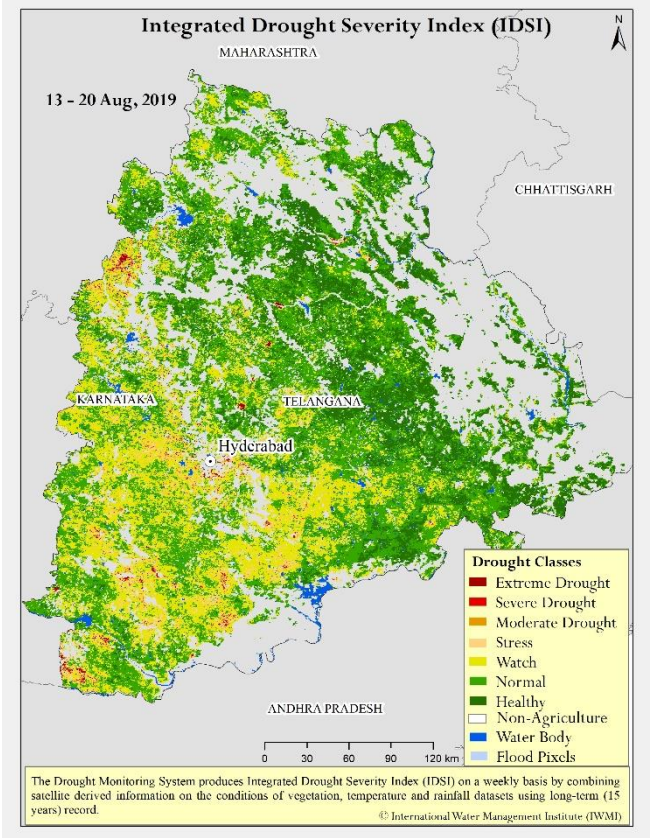


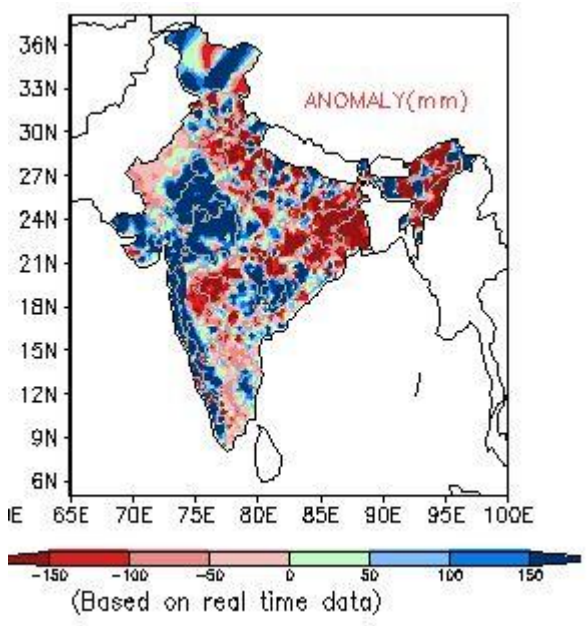
The Integrated Drought Severity Index (IDSI) for Karnataka were assessed at district level. All over the State reduce the drought condition due continues rainfall. Specially in majority of IDSI category of all districts are Normal to Healthy.

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

01st June – 20th Aug 2019



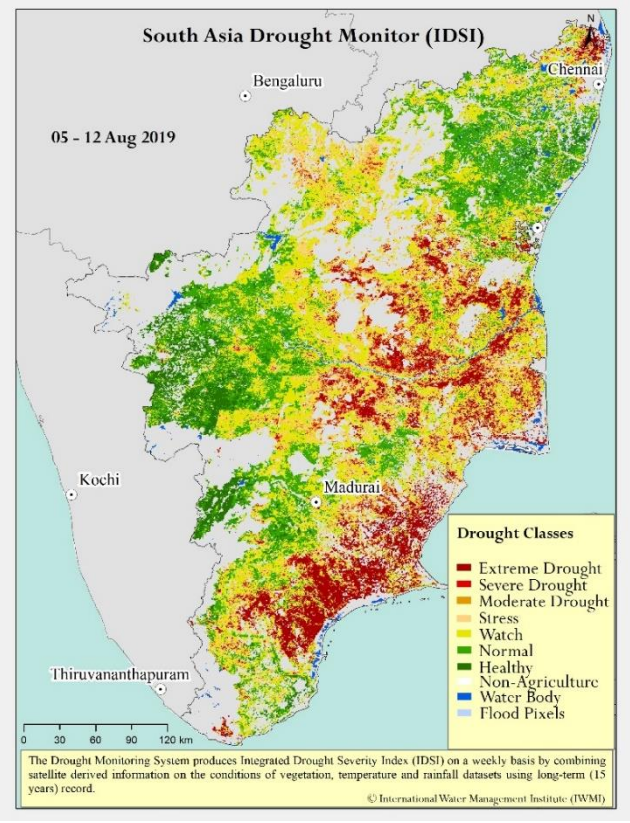


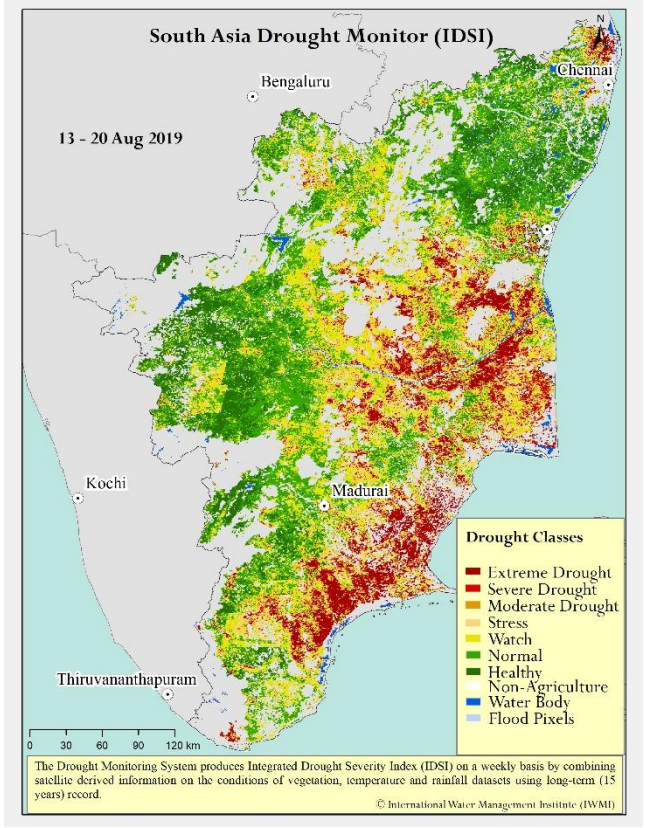


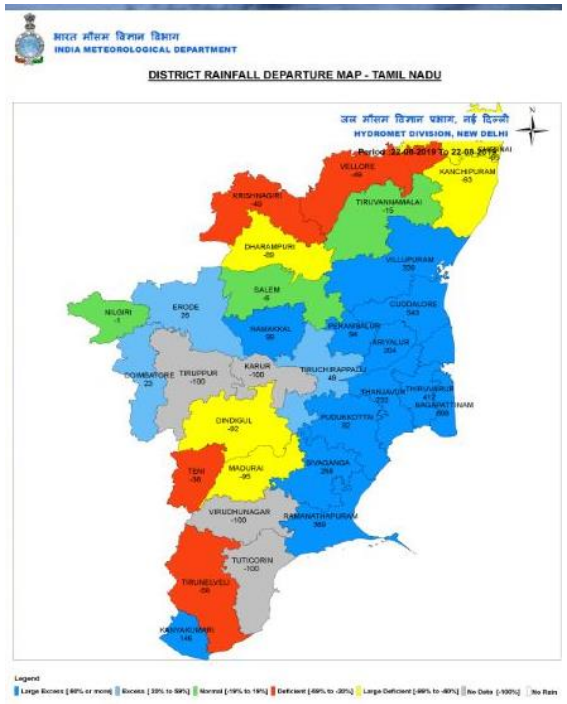
Summary:

The Integrated Drought Severity Index (IDSI) for Telangana was assessed at district level. There seems to increased of crop stress condition compare to previous week. Considerable area the state is recovering watch to normal drought condition from last week. However, most of the districts in states are observed to L. Excess to Excess category.

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



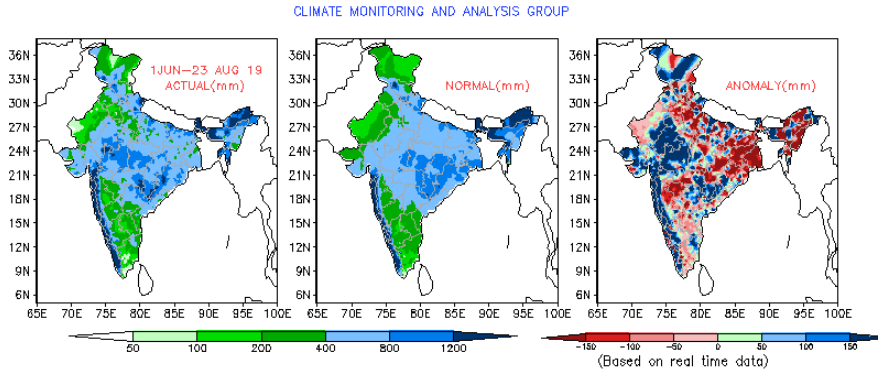




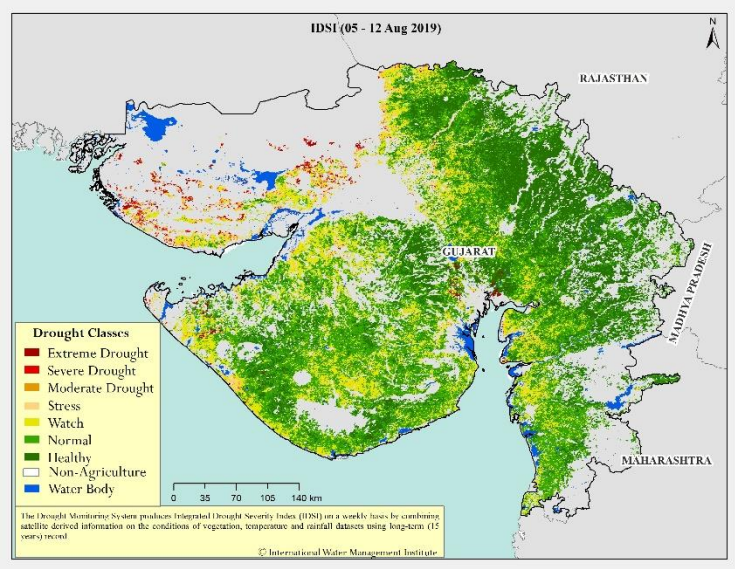
01 June – 20 Aug 2019

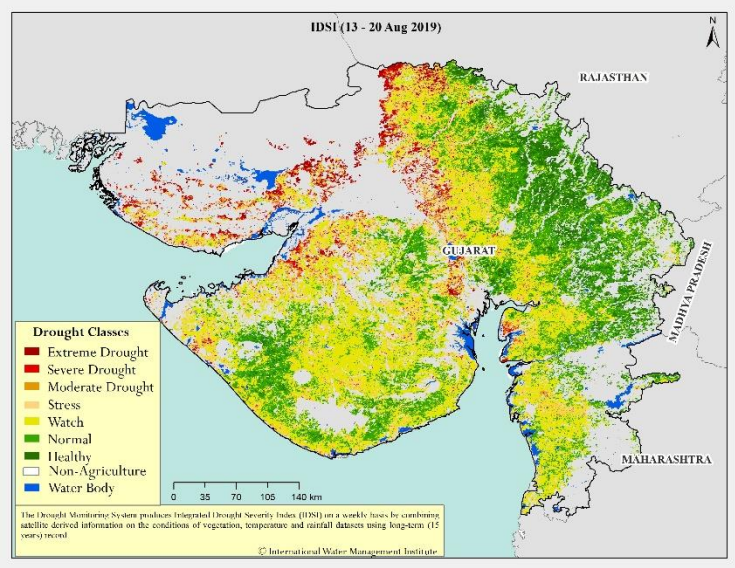
Summary:

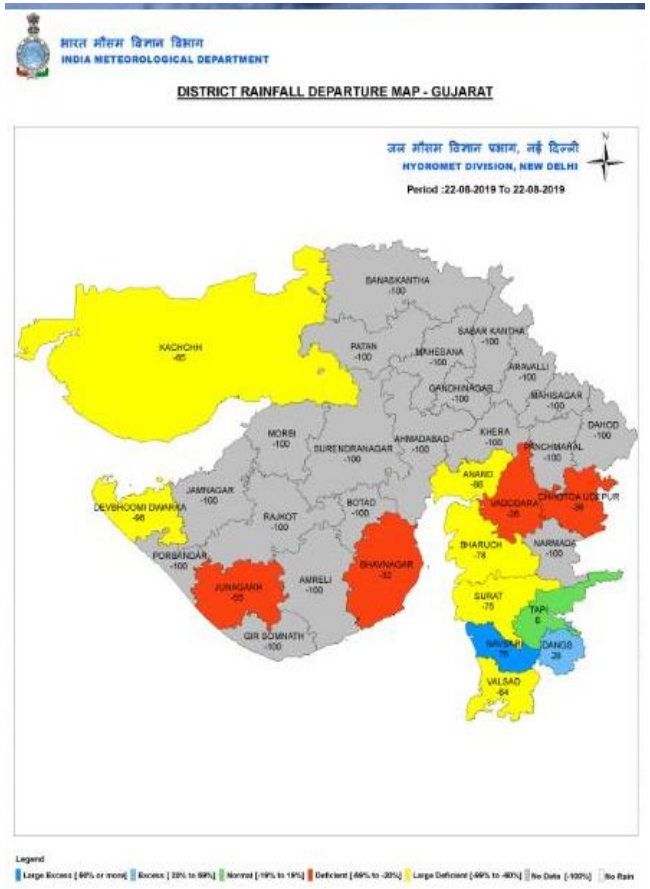
- Overall drought condition is still same condition from previous analysis cycle. Also south, South-East, quarter of Tamil Nadu seems to have 'moderate' to 'severe' drought at the week ending on 20th of Aug 2019. Most of Nothern western districts are under recovering as watch to normal and healthy. in IDSI which is giving the good correlation with rainfall anomaly as well.
- Overall, it can be observed that drought classes and same spatial pattern is continue from previous week.

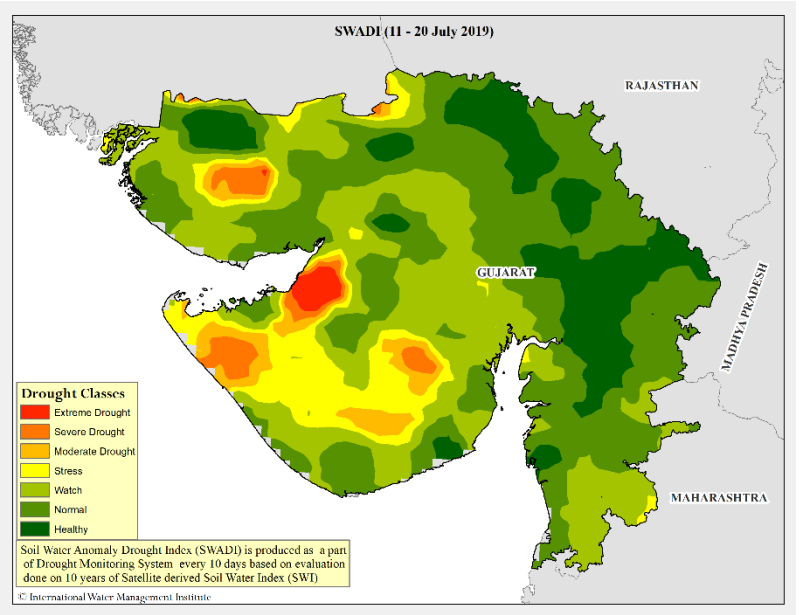


South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Gujarat)





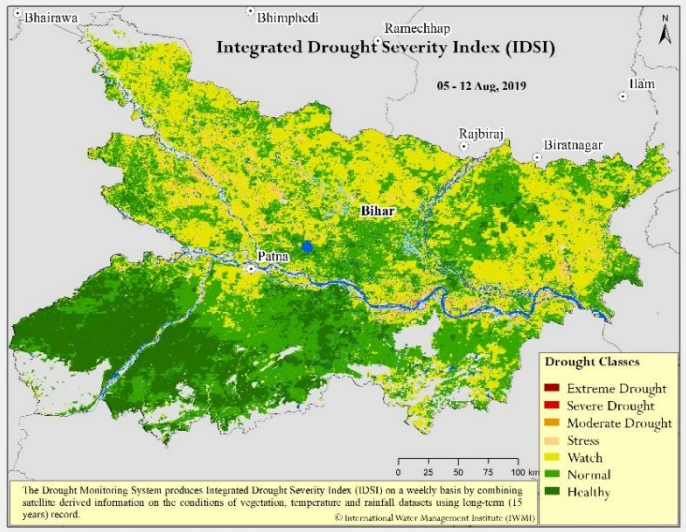


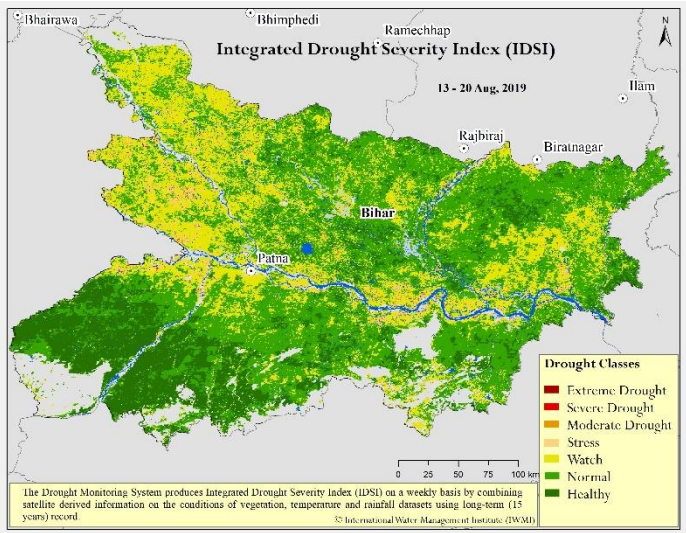


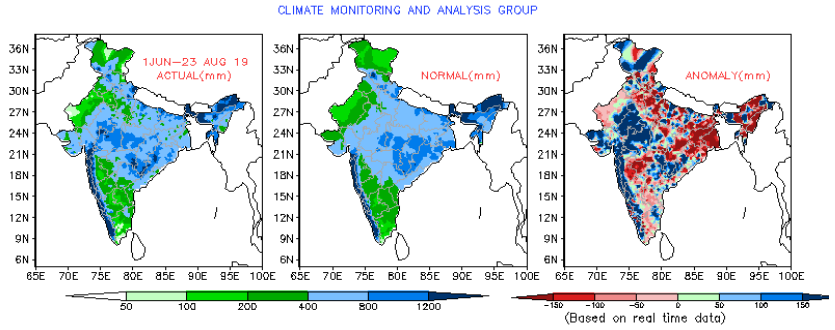
Summary:

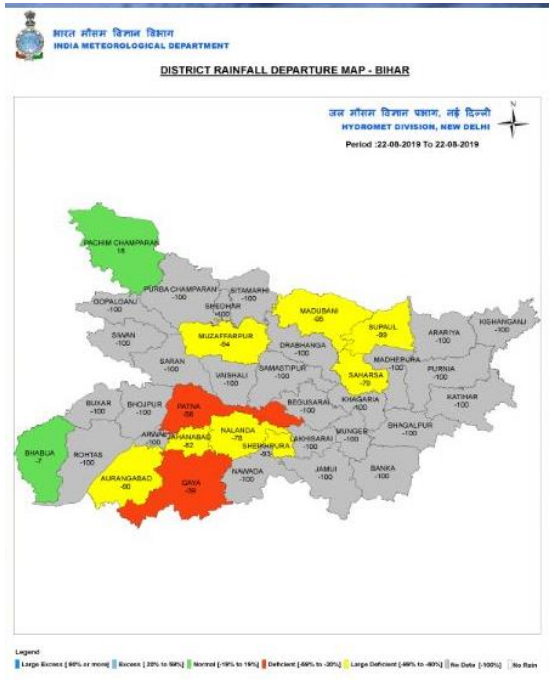
- Overall the state is under normal to watch drought condition form previous to resent week.
- The issue is no data from considerable amount of the area and still there are some districts with below excess and normal rainfall from 22nd June to 22th Aug.

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









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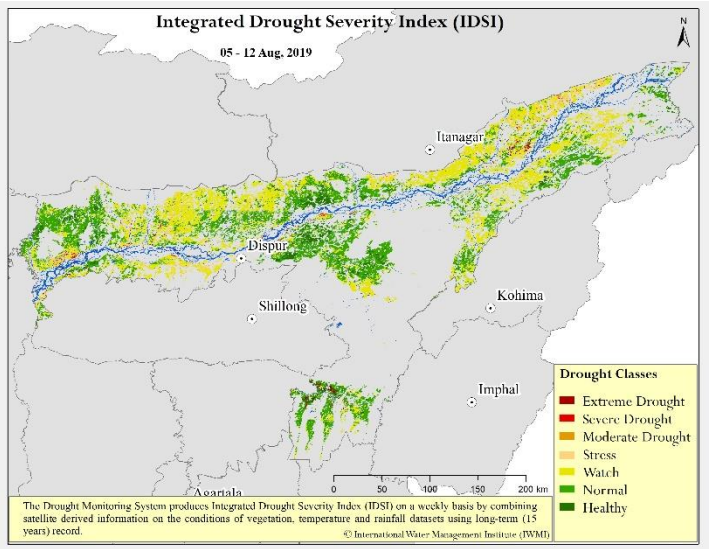
DISTRICT-WISE RAINFALL DISTRIBUTION

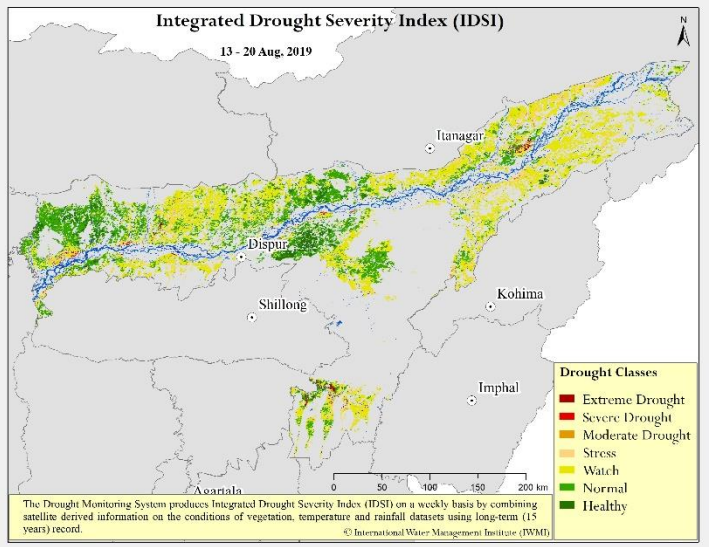
S NO	MET. SUBDIVISION/UT/STATE/DISTRICT	Day :22-08-2019 ACTUAL (mm)	NORMAL (mm)	%DEP.	CAT.	Period:01-06-2019 To 22-08-2019 ACTUAL (mm)	NORMAL (mm)	% DEP.	CAT.
	SUBDIVISION : BIHAR	2.1	11.4	-81%	LD	629.4	719.5	-13%	N
1	ARARIYA	0.0	13.2	-100%	NR	932.1	961.0	-3%	N
2	ARWAL	0.0	15.4	-100%	NR	266.7	530.2	-50%	D
3	AURANGABAD	2.5	12.3	-80%	LD	466.4	604.5	-23%	D
4	BANKA	0.0	11.3	-100%	NR	412.4	641.7	-36%	D
5	BEGUSARAI	0.0	16.0	-100%	NR	310.3	730.5	-58%	D
6	BHABUA	12.6	13.6	-7%	N	638.1	630.3	1%	N
7	BHAGALPUR	0.0	11.4	-100%	NR	556.5	684.0	-19%	N
8	BHOJPUR	0.0	10.3	-100%	NR	463.1	639.4	-28%	D
9	BUXAR	0.0	9.7	-100%	NR	681.8	573.2	19%	N
10	DRABHANGA	0.0	7.2	-100%	NR	604.7	641.2	-6%	N
11	GAYA	8.2	13.3	-39%	D	446.6	621.2	-28%	D
12	GOPALGANJ	0.0	12.8	-100%	NR	848.7	682.3	24%	E
13	JAHANABAD	2.1	11.4	-82%	LD	404.5	575.8	-30%	D
14	JAMUI	0.0	7.1	-100%	NR	469.9	642.4	-27%	D
15	KATIHAR	0.0	10.7	-100%	NR	593.9	758.9	-22%	D
16	KHAGARIA	0.0	7.3	-100%	NR	521.9	683.6	-24%	D
17	KISHANGANJ	0.0	13.8	-100%	NR	1320.2	1282.1	3%	N
18	LAKHISARAI	0.0	8.9	-100%	NR	406.5	591.4	-31%	D
19	MADHEPURA	0.0	13.5	-100%	NR	789.8	778.5	1%	N
20	MADUBANI	0.5	10.0	-95%	LD	625.0	719.2	-13%	N
21	MUNGER	0.0	10.7	-100%	NR	514.6	712.4	-28%	D
22	MUZAFFARPUR	0.6	9.7	-94%	LD	665.4	696.4	-4%	N
23	NALANDA	3.2	14.4	-78%	LD	411.0	603.6	-32%	D
24	NAWADA	0.0	11.1	-100%	NR	467.7	603.6	-23%	D
25	PACHIM CHAMPARAN	14.0	11.8	18%	N	1140.8	925.3	23%	E
26	PATNA	6.0	13.8	-56%	D	392.9	646.0	-39%	D
27	PURBA CHAMPARAN	0.0	7.9	-100%	NR	795.2	758.8	5%	N
28	PURNIA	0.0	14.2	-100%	NR	776.3	1038.3	-25%	D
29	ROHTAS	0.0	12.8	-100%	NR	401.7	600.5	-33%	D
30	SAHARSA	1.9	8.9	-79%	LD	640.6	922.8	-31%	D
31	SAMASTIPUR	0.0	10.2	-100%	NR	645.0	676.6	-5%	N
32	SARAN	0.0	13.0	-100%	NR	637.5	650.3	-2%	N
33	SHEIKHPURA	0.8	10.9	-93%	LD	336.5	597.2	-44%	D
34	SHEOHAR	0.0	5.4	-100%	NR	693.0	720.5	-4%	N
35	SITAMARHI	0.0	11.1	-100%	NR	763.4	782.1	-2%	N
36	SIWAN	0.0	12.0	-100%	NR	848.2	667.0	27%	E
37	SUPAUL	0.1	11.0	-99%	LD	788.7	782.9	1%	N
38	VAISHALI	0.0	12.0	-100%	NR	469.2	674.7	-30%	D

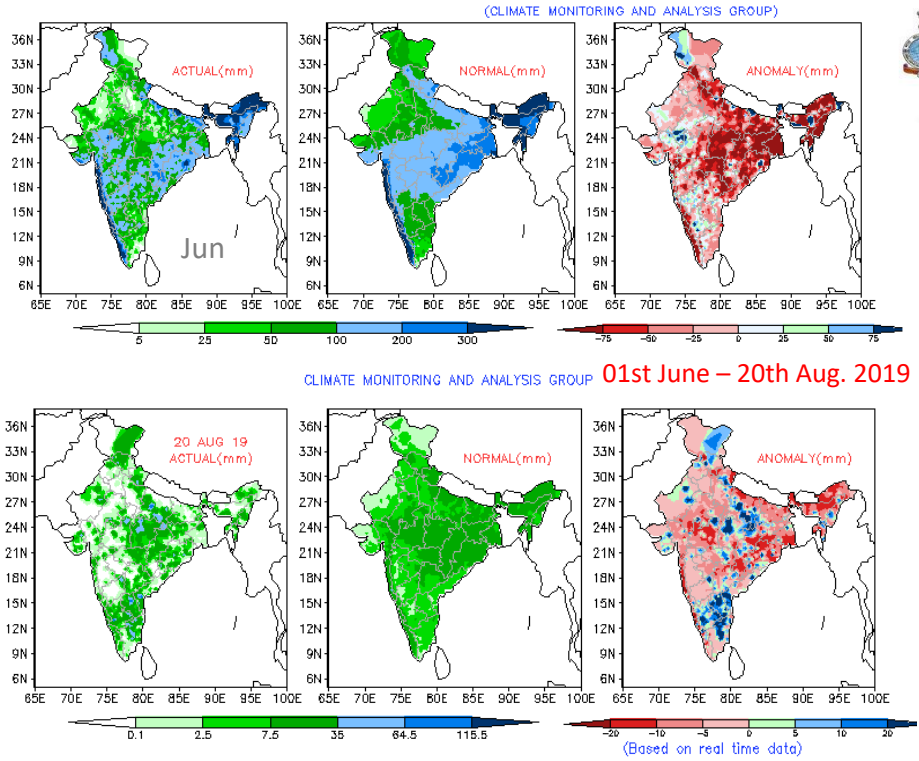
Summary:

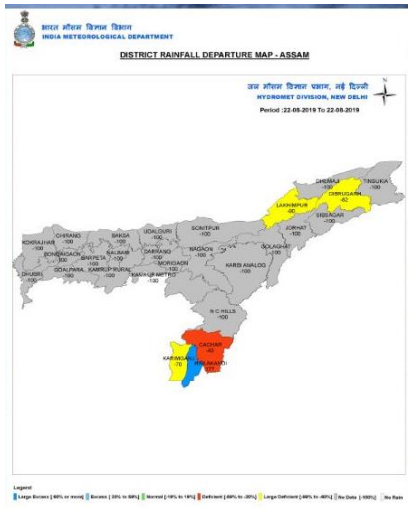
- The drought severity in all parts of Bihar seems to be stable level in weeks are ending on 20th of Aug. Most of the districts are stable with normal and watch level.

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









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DISTRICT-WISE RAINFALL DISTRIBUTION

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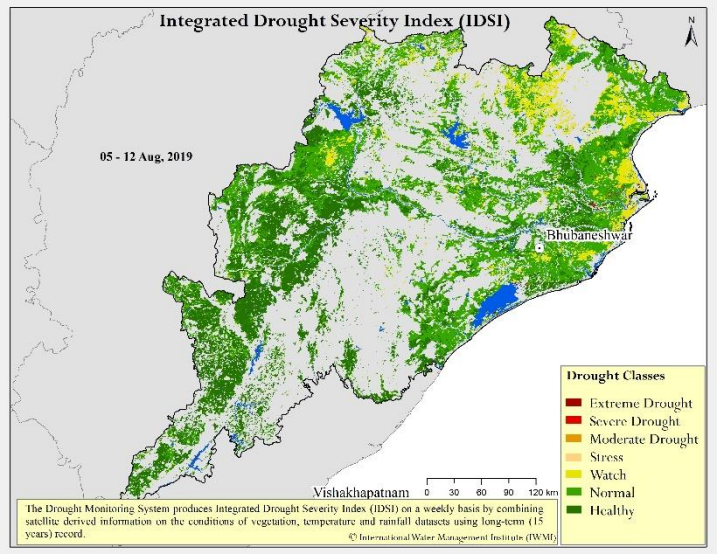
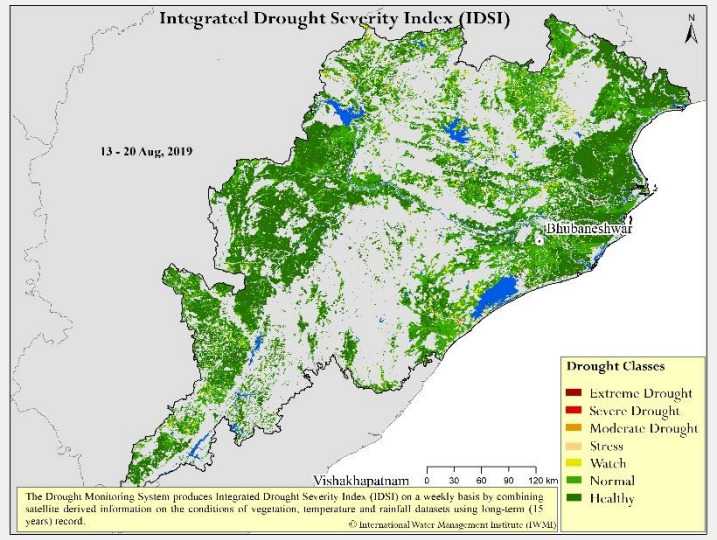
	STATE : ASSAM	1.0	11.0	-91%	LD	996.5	1110.0	-10%	N
1	BAKSA	0.0	10.0	-100%	NR	1500.3	967.3	55%	E
2	BARPETA	0.0	16.3	-100%	NR	1847.6	1772.5	4%	N
3	BONGAIGAON	0.0	23.8	-100%	NR	2024.5	1736.4	17%	N
4	CACHAR	8.5	15.0	-43%	D	1310.3	1383.7	-5%	N
5	CHIRANG	0.0	8.1	-100%	NR	2102.9	1786.5	18%	N
6	DARRANG	0.0	8.3	-100%	NR	199.2	951.8	-79%	LD
7	DHEMAJI	0.0	15.4	-100%	NR	1894.4	1326.2	43%	E
8	DHUBRI	0.0	17.5	-100%	NR	1233.8	1651.2	-25%	D
9	DIBRUGARH	2.6	14.4	-82%	LD	951.5	1185.3	-20%	D
10	GOALPARA	0.0	14.0	-100%	NR	1173.6	1388.4	-15%	N
11	GOLAGHAT	0.0	7.0	-100%	NR	554.3	777.1	-29%	D
12	HAILAKANDI	24.4	8.8	177%	LE	1111.9	1187.9	-6%	N
13	JORHAT	0.0	9.0	-100%	NR	791.6	901.2	-12%	N
14	KAMRUP METRO	0.0	8.3	-100%	NR	568.0	731.4	-22%	D
15	KAMRUP RURAL	0.0	7.6	-100%	NR	644.7	1009.3	-36%	D
16	KARBI ANALOG	0.0	5.2	-100%	NR	348.7	609.6	-43%	D
17	KARIMGANJ	4.7	15.7	-70%	LD	1527.6	1679.2	-9%	N
18	KOKRAJHAR	0.0	15.5	-100%	NR	2334.4	2015.8	16%	N
19	LAKHIMPUR	1.7	17.0	-90%	LD	1446.8	1487.3	-3%	N
20	MORIGAON	0.0	9.8	-100%	NR	547.1	853.2	-36%	D
21	N.C HILLS	0.0	9.1	-100%	NR	653.6	833.9	-22%	D
22	NAGAON	0.0	7.1	-100%	NR	494.7	737.8	-33%	D
23	NALBARI	0.0	14.7	-100%	NR	1473.8	1203.6	22%	E
24	SIBSAGAR	0.0	9.9	-100%	NR	575.3	894.2	-36%	D
25	SONITPUR	0.0	9.5	-100%	NR	894.0	868.2	3%	N
26	TINSUKIA	0.0	9.8	-100%	NR	1015.0	1130.2	-10%	N
27	UDALGURI	0.0	8.3	-100%	NR	1207.3	1095.2	10%	N

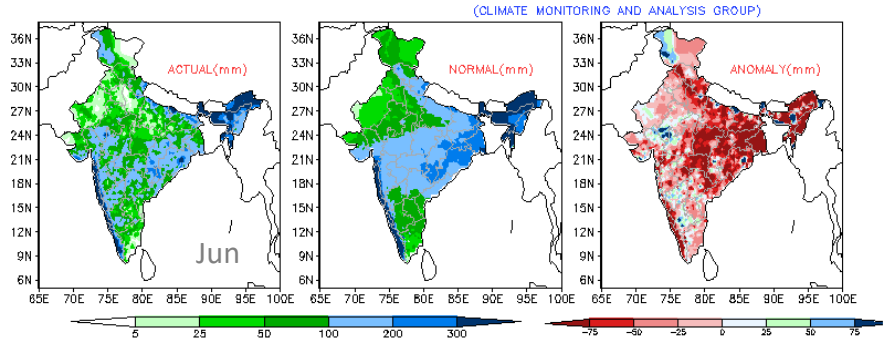
Summary:

- The drought severity in many parts of Assam seems to be slightly decreased compare to previous week. Normal in north-eastern districts, simultaneously normal to watch drought category observed rest of the area.

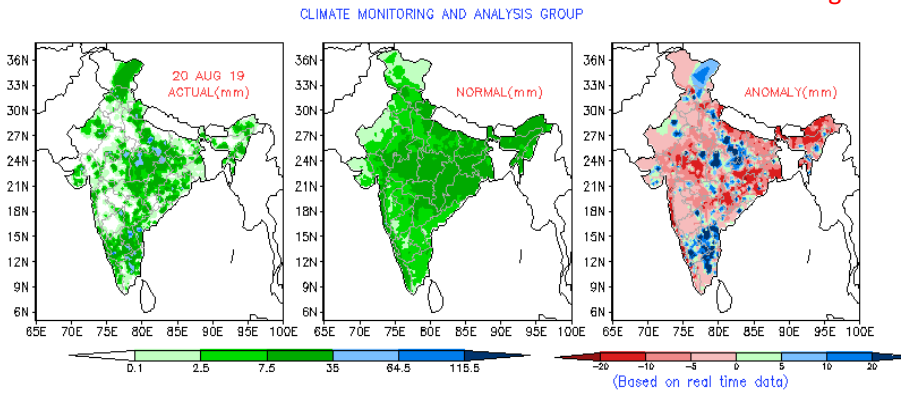
South Asia Drought Monitoring System (SADMS) – Agriculture Assessment (Odisha)







01st June – 20th Aug 2019



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	SUBDIVISION : ODISHA	13.0	13.2	-2%	N	808.0	836.2	-3%	N
1	ANUGUL	1.3	12.3	-89%	LD	601.9	797.8	-25%	D
2	BALANGIR	8.3	11.0	-24%	D	959.4	868.6	10%	N
3	BALESHWAR	0.0	14.8	-100%	NR	571.5	840.8	-32%	D
4	BARAGARH	5.5	14.5	-62%	LD	885.7	877.4	1%	N
5	BAUDA	1.0	19.0	-95%	LD	928.4	814.3	14%	N
6	BHADRAK	3.5	8.9	-61%	LD	639.0	732.8	-13%	N
7	CUTTACK	12.6	13.0	-3%	N	788.4	840.3	-6%	N
8	DEOGARH	0.0	13.4	-100%	NR	657.3	966.9	-32%	D
9	DHENKANAL	4.4	12.8	-66%	LD	755.1	802.9	-6%	N
10	GAJAPATHI	3.1	12.4	-75%	LD	511.0	704.4	-27%	D
11	GANJAM	8.3	9.4	-12%	N	610.9	599.1	2%	N
12	JAGATSINGHAPUR	0.6	13.5	-95%	LD	677.9	765.1	-11%	N
13	JAJAPUR	7.1	17.3	-59%	D	876.3	993.1	-12%	N
14	JHARSUGUDA	1.4	15.2	-91%	LD	974.6	875.9	11%	N
15	KALAHANDI	5.8	18.3	-68%	LD	1007.5	907.5	11%	N
16	KANDHAMAL	4.2	14.1	-70%	LD	875.9	843.6	4%	N
17	KENDRAPARHA	11.7	8.8	33%	E	661.5	773.4	-14%	N
18	KENDUJHAR	5.9	11.1	-47%	D	616.7	816.8	-24%	D
19	KHORDHA	18.2	12.0	52%	E	705.4	776.7	-9%	N
20	KORAPUT	26.5	9.9	168%	LE	1155.8	881.6	31%	E
21	MALKANGIRI	164.8	18.5	791%	LE	1164.3	918.4	27%	E
22	MAYURBHANJ	10.2	13.9	-27%	D	733.6	894.4	-18%	N
23	NABARANGAPUR	18.9	13.1	44%	E	1046.3	987.9	6%	N
24	NAYAGARH	5.7	9.7	-41%	D	706.1	791.5	-11%	N
25	NUAPARHA	5.7	16.1	-65%	LD	690.6	741.6	-7%	N
26	PURI	4.6	11.2	-59%	D	754.6	697.0	8%	N
27	RAYAGARHA	1.1	13.8	-92%	LD	746.5	704.7	6%	N
28	SAMBALPUR	1.5	13.4	-89%	LD	806.5	966.9	-17%	N
29	SUBARNAPUR	0.4	15.7	-98%	LD	942.2	905.2	4%	N
30	SUNDARGARH	0.2	11.6	-98%	LD	742.9	865.6	-14%	N

Summary:

Through out the Odisha state the drought condition ,most same in IDSI category when compare to previous week.

Most of the State observed large deficient but due to continues rainfall over the state change the vegetation condition to normal.

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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