



**Drought Condition Assessment based on Drought indices generated at India  
Meteorological Department**

**Period – September 2023 and June- September 2023**

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## **Summary**

- The Drought Indicator assessment has been done for 30 states and 11 union territories (718 districts) for the month of September 2023 and the period June to September 2023 using the drought monitoring indices viz, Standardized Precipitation Index (SPI), Standardized Precipitation Evapotranspiration Index (SPEI) and Aridity Anomaly Index (AAI).
- 220 districts are in deficient/ large deficient category for the period June to September 2023 whereas 258 districts are in deficient/ large deficient category for the month of September 2023 based on rainfall percentage departure from normal.
- For the month of September 2023, 74 districts are in moderately/ severely/ extremely dry condition or moderately/ severely Arid condition in any two of three drought indices (SPI, SPEI, AAI) and 25 districts are in aforementioned dry condition in all the three drought indices.
- For the period June to September 2023, 58 districts (6.9% area of the country) are in moderately Arid condition and 14 districts (0.9% area of the country) are in severely Arid condition.
- For the period June to September 2023, 125 districts (14.8% area of the country) are in moderately/ severely/ extremely dry condition or moderately/ severely Arid condition in any two of three drought indices (SPI, SPEI, AAI) and 48 districts (5.9% area of the country) are in aforementioned dry condition in all the three drought indices.
- Maximum number of districts in dry/ arid condition as per the three drought indices are in Bihar and Uttar Pradesh states for the period June to September 2023.

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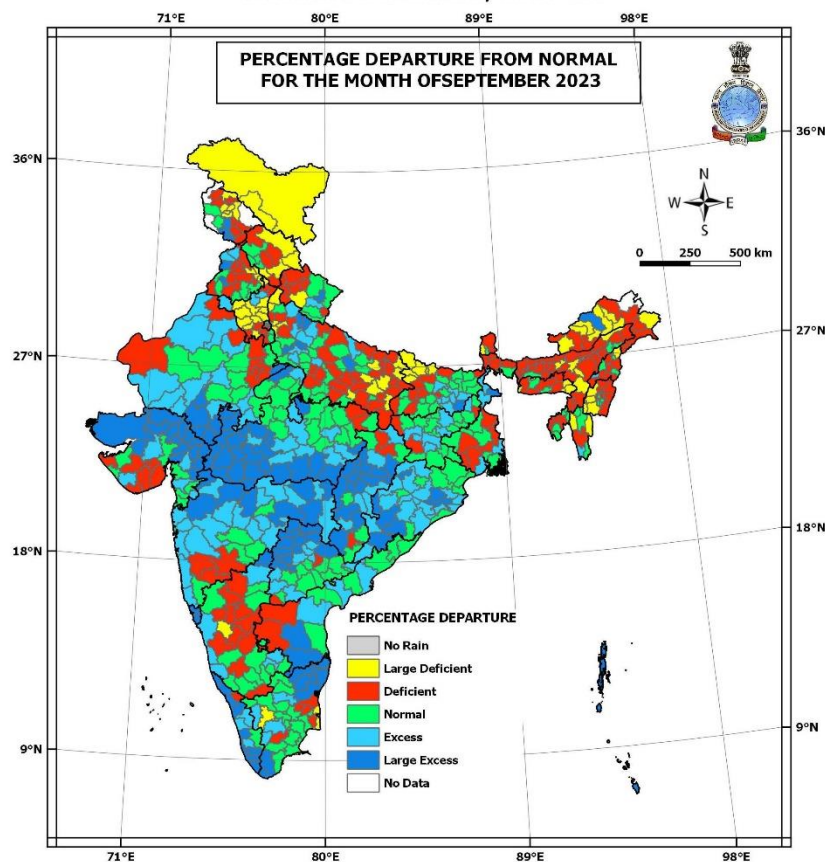


Figure 1 : Rainfall Percentage departure from Normal for the month of September 2023

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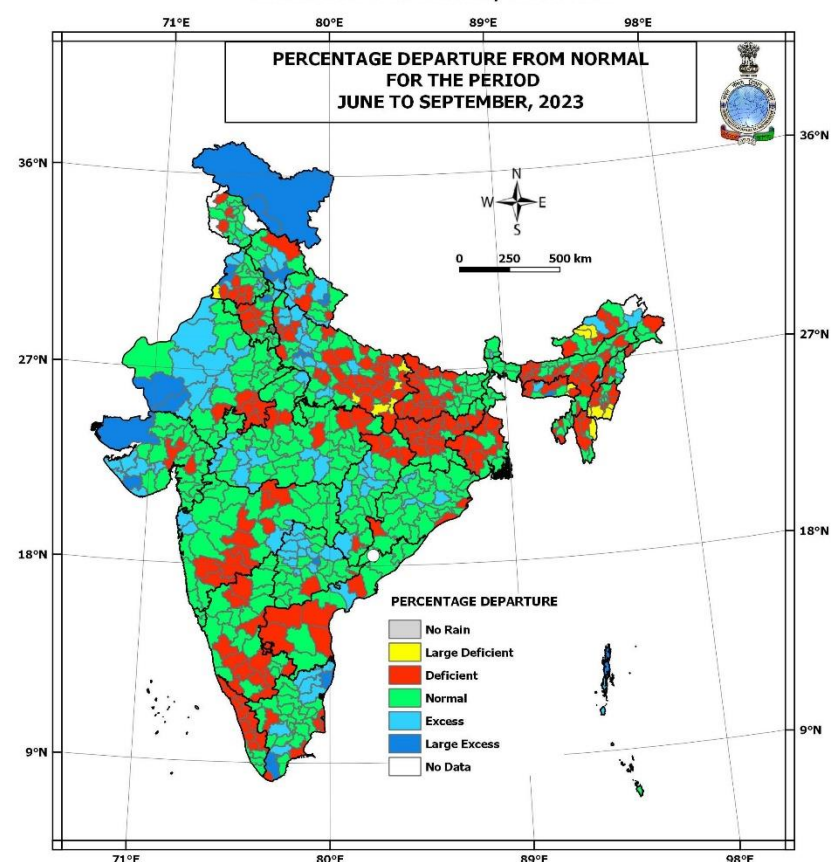


Figure 2: Rainfall Percentage departure from Normal for the period June to September 2023

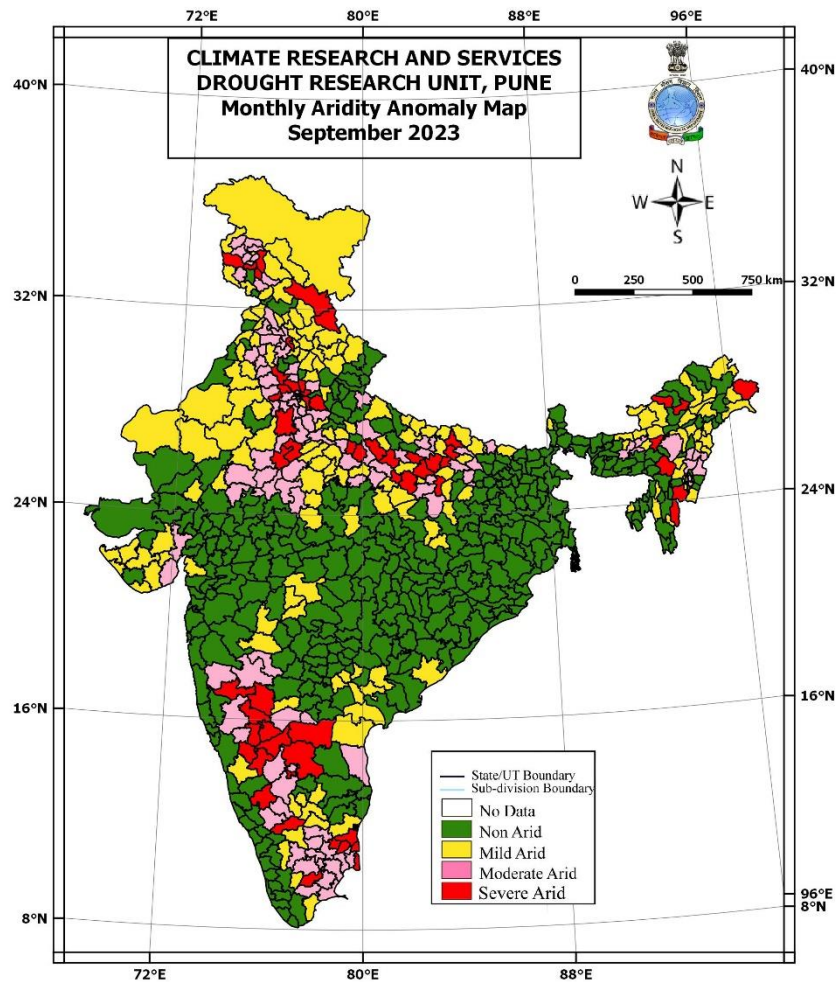


Figure 3: Map based on Aridity Anomaly Index (AAI) for September 2023

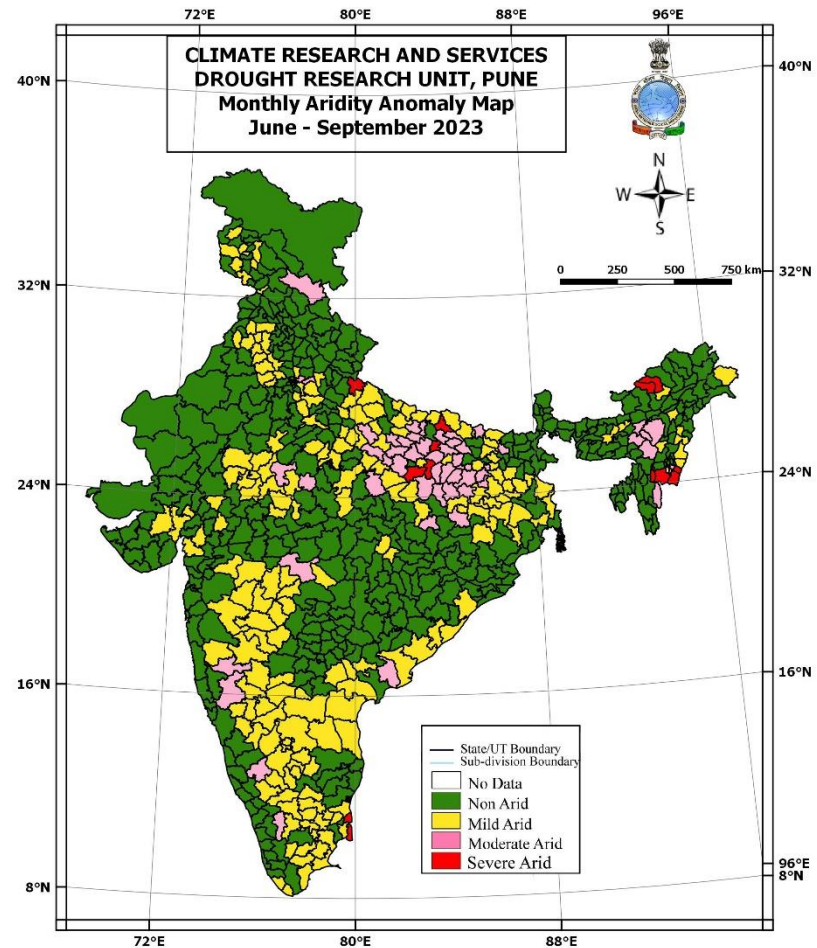


Figure 4: Map based on Aridity Anomaly Index for the period June to September 2023

State	Districts Moderately Dry	Districts Severely Dry
Andhra Pradesh	Nellore	Ananthapur, Kurnool
Arunachal Pradesh		Anjaw, Kurung Kumey, Lower Subansiri
Assam	Darrang, Kamrup Rural, Karbi Analog, Kamrup Metro	N.C Hills, Nagaon
Bihar	Bhojpur, Gopalganj, Saran, Sitamarhi, Arwal	
Delhi	New Delhi, North Delhi, North West Delhi, South Delhi, South West Delhi, North East Delhi	West Delhi
Gujarat	Ahmadabad, Bhavnagar	
Haryana	Gurgaon, Hisar, Karnal, Mahendragarh, Mewat, Bhiwani, Panipat, Rewari, Fatehabad, Jhajjar, Palwal	Jind, Rohtak, Sonipat, Charkhi Dadri
Himachal Pradesh		Kinnaur, Lahul & Spiti
Jammu & Kashmir	Baramula, Doda, Udhampur, Badgam, Kupwara, Pulwama, Shopian, Bandipore, Ganderbal, Rajouri	Anantnag, Poonch, Ramban, Kulgam
Karnataka	Belgaum, Chitradurga, Dharwad, Mandya, Mysore, Raichur, Tumkur	Bagalkot, Bellary, Bijapur, Chamarajanagar, Davangere, Gadag, Hassan, Haveri, Koppal
Madhya Pradesh	Guna, Sheopur	
Maharashtra	Osmanabad, Satara, Solapur	Sangli
Manipur	Imphal East, Senapati, Thoubal, Ukhrul	Churachandpur
Mizoram		Champhai
Nagaland	Kohima, Phek	
Puducherry		Karaikal
Punjab	Bathinda, Hoshiarpur, Jalandhar, Mansa, Ludhiana, Patiala, Rupnagar, Nawanshahr, Fatehgarh Sahib, Barnala	SAS Nagar

Rajasthan	Bharatpur, Bhilwara, Bundi, Chittaurgarh, Kota, Tonk, Baran, Dausa	Alwar, Sawai Madhopur, Karauli
Tamilnadu	Dindigul, Karur, Namakkal, Pudukkottai, Ramanathapuram, Salem, Sivaganga, Thanjavur, Tiruchirappalli, Thiruvarur, Virudhunagar, Tiruppur	Cuddalore, Madurai, Nagapattinam, Perambalur, Ariyalur
Telangana	Jogulamba Gadwal	
Uttar Pradesh	Agra, Aligarh, Ambedkar Nagar, Ballia, Banda, Basti, Etawah, Fatehpur, Hardoi, Jalaun, Kanpur, Mathura, Meerut, Mirzapur, Pilhibhit, Sant Kabir Nagar, Sonbhadra, Varanasi, Mahoba, Amethi	Allahabad, Auraiya, Azamgarh, Baghpat, Bulandshahar, Chandauli, Deoria, Gautambudh Nagar, Ghaziabad, Jaunpur, Kanpur Dehat, Kaushambi, Kushinagar, Mau, Raibaraeli, Sultanpur, Unnao

*Table 1: Districts in Moderately/ Severely Arid conditions based on AAI for September 2023*

State	Districts Moderately Dry	Districts Severely Dry
Andhra Pradesh	West Godavari	
Arunachal Pradesh		Kra Daadi, Kurung Kumey
Assam	N.C Hills, Hojai, Nagaon, Karbi Analog, West Karbi Analog	
Bihar	Aurangabad, Bhabua, Bhojpur, Gaya, Gopalganj, Jahanabad, Nawada, Rohtas, Saharsa, Saran, Sitamarhi, Sheikhpura, Siwan, Arwal	
Chhattisgarh	Surguja	
Delhi	North East Delhi	
Himachal Pradesh	Lahul & Spiti	
Jharkhand	Chatra, Garhwa, Gumla, Kodarma, Palamu	
Karnataka	Belgaum, Hassan	
Madhya Pradesh	Satna, Ashoknagar	
Maharashtra	Amaravati, Sangli	
Manipur	Kakching, Thoubal	Chandel, Tengnoupal, Churachandpur, Pherzawl
Mizoram	Champhai	
Puducherry	Puducherry	Karaikal, Yanam
Rajasthan	Baran	
Tamil Nadu	Coimbatore	Nagapattinam
Uttar Pradesh	Allahabad, Ambedkar Nagar, Azamgarh, Ballia, Basti, Deoria, Fatehpur, Ghaziabad, Panchshil Nagar, Gazipur, Jaunpur, Kaushambi, Pratapgarh, Sant Kabir Nagar, Sultanpur, Sonbhadra, Unnao, Amethi	Chandauli, Kushinagar, Mau, Mirzapur, Pilibhit

Table 2: Districts in Moderately/ Severely Arid conditions based on AAI for June to September 2023



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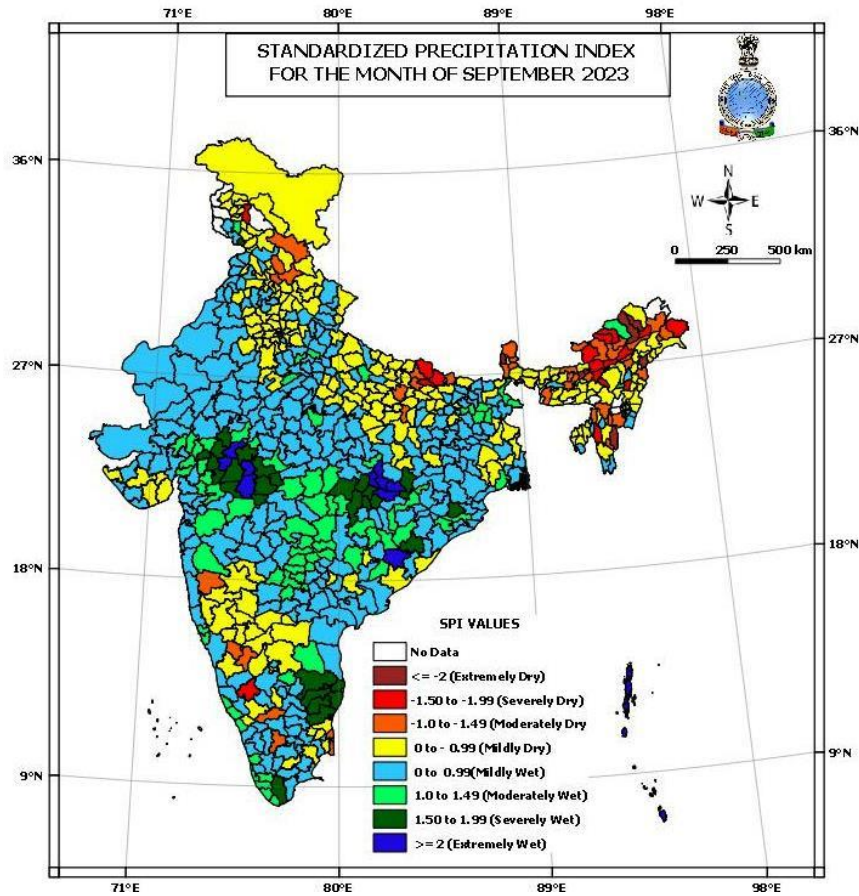


Figure 5: Map based on Standardized Precipitation Index (SPI) for September 2023

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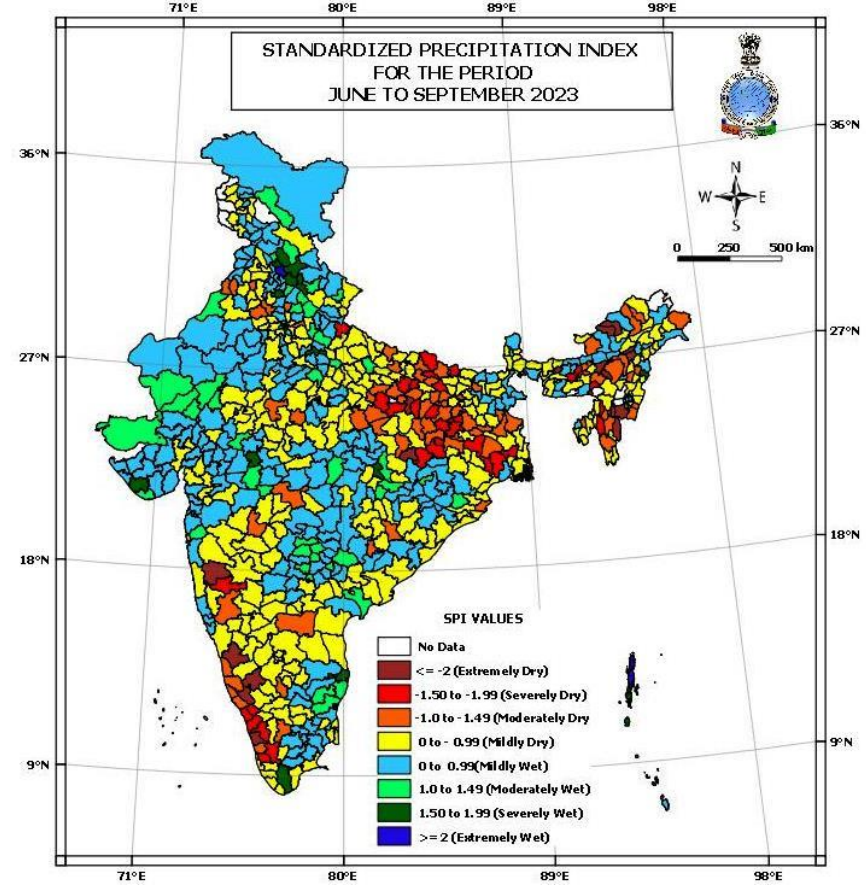


Figure 6: Map based on Standardized Precipitation Index (SPI) for the period June to September 2023



State	Districts Moderately Dry	Districts Severely Dry	Districts Extremely Dry
Arunachal Pradesh	East-Kameng, Lohit, Lower-Dibang-Valley, Lower-Subansiri, Namsai, Papumpara, Tawang	Anjaw, East-Siang, Kradaadi, Kurung-Kumey, West-Kameng	Siang, West-Siang
Assam	Baksha, Cachar, Dhemaji, Jorhat, Kamrup, Karimganj, Majuli, Morigaon, Nalbari	Biswanath, Hojai, Lakhimpur, Nagaon, Sonitpur	Darang
Bihar	Shivhar, Sitamarhi	Gopalganj, West-Champaran, East-Champaran	
Himachal Pradesh	Lahaul-Spiti, Mandi, Shimla, Solan		
Jammu And Kashmir		Anatnag	
Karnataka	Chamarajnagar, Devangere, Haveri	Hassan	
Maharashtra	Satara		
Manipur	Churachandpur, Pherzawl		
Meghalaya	West-Garo-Hills		
Mizoram	Serchhip	Mamit	Champhai
Nagaland	Tuensang	Kohima	Mon
Sikkim	East-District, North-District		West-District
Tamil Nadu	Nagapattinam, Tiruppur		
Union Territory	Karaikal		
Uttar Pradesh	Azamgarh, Chandauli, Deoria, Kushinagar		
West Bengal	Darjeeling, Kalimpong		

Table 3: Districts in Moderately/ Severely/ Extremely dry conditions based on SPI for September 2022

State	Districts Moderately Dry	Districts Severely Dry	Districts Extremely Dry
Andhra Pradesh	Kurnool		
Arunachal Pradesh	Anjaw, Siang, West-Kameng, West-Siang		Kradaadi, Kurung-Kumey
Assam	Darang, Golaghat, Kamrupmetro, Karbi-Anglong, W Karbi Anglong	Hailakandi, Kamrup	Bongaigaon, Hojai, Jorhat, Majuli, Nagaon
Bihar	Arwal, Bhojpur, Gaya, Jahanabad, Nawada, Patna, East-Champaran, Rohtas, Saharsa, Shivhar, Siwan	Aurangabad, Bhabua, Gopalganj, West-Champaran, Saran, Sitamarhi	
Chhathisgarh	Dantewada, Surajpur	Jashpur	Surguja
Haryana	Hissar, Jind		
Jharkhand	Dhanbad, Garhwa, Giridih, Jamtara, Latehar, Pakaur, Palamau, Ramgarh, Ranchi	Chatra, Gumla, Hazaribagh, Koderma, Lohardaga	
Karnataka	Belgaum, Dakshina-Kannada, Ramnagar, Udupi		Hassan, Kodagu, Shimoga
Kerala	Ernakulam, Kannur, Kasaragod	Idukki, Kottayam, Kozhikode, Malappuram, Palakkad, Wayanad	Thrissur
Madhya Pradesh	Ashoknagar, Rewa, Satna, Siddhi		
Maharashtra	Amravati, Jalna	Sangli	Satara
Manipur	Chandel, Tengnoupal		Churachandpur , Pherzawl
Meghalaya		Jaintia-Hills	
Mizoram	Aizwal, Kolasib, Lunglei	Mamit	Champhai
Nagaland	Kohima, Zunheboto		
Odisha	Kendrapara, Nabarangpur		

Punjab	Barnala, Fazilika, Muktsar		
Rajasthan	Baran		
Tamilnadu	Tiruppur		
Tripura	Khowai		
Uttar Pradesh	Balrampur, Basti, Deoria, Ghazipur, Panchshil-Nagar, Jaunpur, Kaushambi, Kushinagar, Pratapgarh, Shamli, Varanasi	Allahabad, Azamgarh, Maunath, Mirzapur, Pillibhit	Chandauli
West Bengal	Bankura, Birbhum, Murshidabad	Hugli, Jhargram, Pashchim- Midnapore, Purulia	

*Table 4: Districts in Moderately/ Severely/ Extremely dry conditions based on SPI for June to September 2023*

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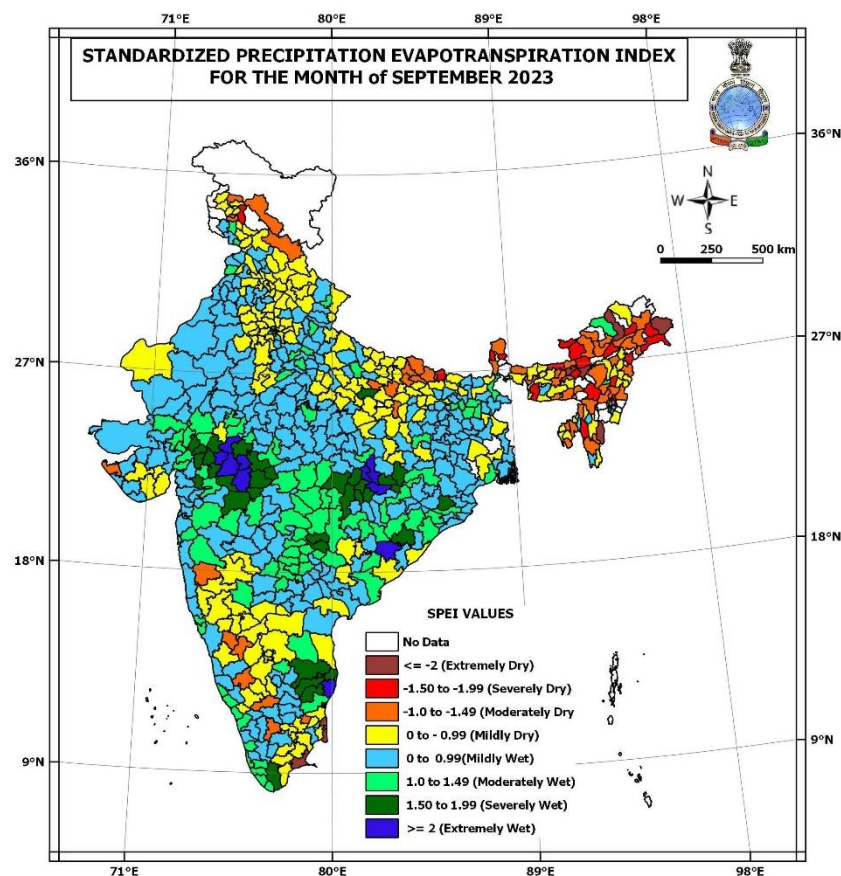


Figure 7: Map based on Standardized Precipitation Evapotranspiration Index (SPEI) for September 2023

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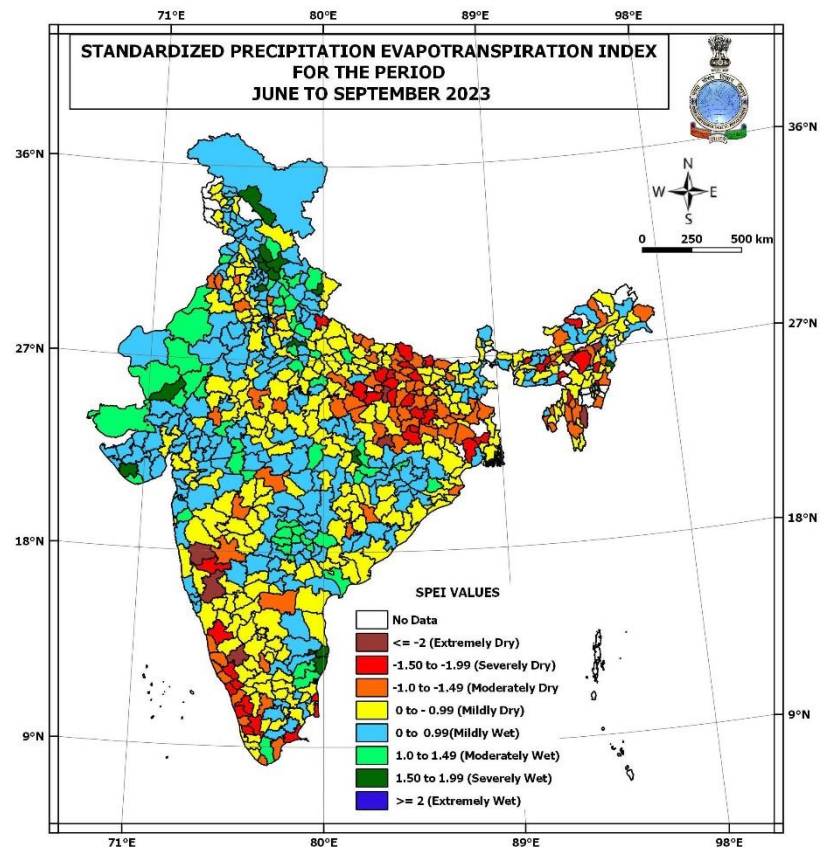


Figure 8: Map based on Standardized Precipitation Evapotranspiration Index (SPEI) for June to September 2023

State	Districts Moderately Dry	Districts Severely Dry	Districts Extremely Dry
Arunachal Pradesh	East-Kameng, Kurung-Kumey, Lower-Dibang-Valley, Lower-Subansiri, Papumpara, Tirap	Changlang, East-Siang, Lohit, Tawang, West-Kameng	Anjaw, West-Siang
Assam	Cacher, Demaj, Dhubri, Dibrugarh, Jorhat, Kamrupmetro, Kamrup, Karbi-Anglong, Karimganj, Nalbari, Tinsukia, Udalguri	Baksa, Lakhimpur, Marigaon, N.C.Hills, Sonitpur	Darang, Nagaon
Bihar	Gopalganj, West-Champaran, East-Champaran, Shivhar	Sitamarhi	
Gujarat	Devbhoomi Dwarka		
Himachal Pradesh	Lahaul-Spiti		
Jammu And Kashmir	Bandipora, Kargil, Kulgam, Shopian	Anantnag	
Karnataka	Chamarajnagar, Devangere, Hassan, Haveri		
Maharashtra	Satara		
Manipur	East-Imphal, Senapati, Tamenglong, Ukhul	Kangpokri	
Meghalaya	East-Khasi-Hills, Swest-Khasi-Hill, Jaintia-Hills	West-Garo-Hills	
Mizoram	Lunglei, Serchhip	Mamit	Champhai
Nagaland	Peren, Tuensang	Kohima, Mon	
Sikkim	North-District	East-District, West-District	
Tamilnadu	Perambalur, Tiruppur		Nagapattinam, Ramanathapuram

Tripura	Dhalai, Khowai, South-Tripura		
Uttar Pradesh	Azamgarh, Chandauli, Deoria, Kushinagar, Sultanpur		
West Bengal	Alipurduar, Darjeeling		

*Table 5: Districts in Moderately/ Severely/ Extremely dry conditions based on SPEI for September 2022*

<b>State</b>	<b>Districts Moderately Dry</b>	<b>Districts Severely Dry</b>	<b>Districts Extremely Dry</b>
Andhra Pradesh	Kurnool		
Arunachal Pradesh	Anjaw, West-Kameng, West-Siang	Kurung-Kumey	
Assam	Darang, Golaghat, Kamrupmetro	Bongaigaon, Hailakandi, Kamrup, Karbi-Anglong	Jorhat, Nagaon
Bihar	Arwal, Bhojpur, Gaya, Jahanabad, Madhubani, Nawada, Patna, East-Champaran, Rohtas, Saharsa, Shivhar, Siwan	Aurangabad, Bhabua, Gopalganj, West-Champaran, Saran, Sitamarhi	
Chhathisgarh	Dantewada, Jashpur, Surajpur		Surguja
Haryana	Hissar		
Jharkhand	Dhanbad, Garhwa, Giridih, Jamtara , Koderma, Latehar, Pakaur, Palamau, Ramgarh, Ranchi	Chatrai, Gumla, Hazaribagh, Lohardaga	
Karnataka	Dakshina-Kannada, Ramnagar, Udupi	Kodagu, Shimoga	Belgaum, Hassan
Kerala	Ernakulam, Kannur, Kasaragod, Malappuram	Idukki, Kottayam, Kozhikode, Palakkad, Thrissur, Wayanad	



Madhya Pradesh	Ashoknagar, Rewa, Satna, Siddhi		
Maharashtra	Amravati, Jalna, Sholapur	Sangli	Satara
Manipur	Chandel, Ukhrul	Kangpokri	
Meghalaya		Jaintia-Hills	
Mizoram	Aizwal, Kolasib, Lunglei, Mamit		Champhai
Nagaland	Zunheboto	Kohima	
Odisha	Kendrapara, Nabarangpur		
Punjab	Barnala, Fazilika, Muktsar		
Rajasthan	Baran		
Tamil Nadu	Kanyakumari, Tuticorin, Tiruppur	Nagapattinam, Ramanathapuram	
Tripura	Khowai, Sepahijala, South-Tripura		
Uttar Pradesh	Ballia, Balrampur, Basti, Deoria, Fatehpur, Noida, Panchshil-Nagar, Jaunpur, Kaushambi, Kushinagar, Pratapgarh, Shamli, Shravasti-Nagar, Varanasi	Allahabad, Azamgarh, Ghazipur, Maunath, Mirzapur, Pillibhit	Chandauli
West Bengal	Bankura, Birbhum, Murshidabad, Purulia	Hugli, Pashchim-Midnapore	

Table 6: Districts in Moderately/ Severely/ Extremely dry conditions based on SPEI for June to September 2023

State	Districts in Moderately/ Severely/ Extremely dry / Moderately/ Severely Arid condition in any two of the Indices (AAI, SPEI and SPI)
Arunachal Pradesh	Anjaw, Kradaadi, Kurung-Kumey, Lohit, Namsai, Lower-Subansiri, Siang, West-Siang, East-Kameng, East-Siang, Lower-Dibang-Valley, Papumpara, Tawang, West-Kameng
Assam	Darang, Kamrup, Hojai, Nagaon, Jorhat, Majuli, Biswanath, Sonitpur, Cachar, Nlakhimpur, Karimganj, Nalbari, Marigaon, Dhemaji, Baksha, N.C Hills, Karbi Anglong, Kamrup Metropolitan
Bihar	Gopalganj, Sitamarhi, East-Champaran, West-Champaran , Shivhar
Himachal Pradesh	Lahaul-Spiti
Jammu And Kashmir	Anatnag, Baramula, Shopian, Bandipore, Kulgam
Karnataka	Chamarajnagar, Devangere, Hassan, Haveri
Maharashtra	Satara
Manipur	Kangpokri, Senapati, Imphal East, Ukhrul
Meghalaya	West-Garo-Hills
Mizoram	Champhai, Mamit, Serchhip
Nagaland	Kohima, Tuensang, Mon
Sikkim	North-District, West-District, East-District
Tamil Nadu	Nagapattinam, Tiruppur, Perambalur, Ramanathapuram
Union Territory	Karaikal
Uttar Pradesh	Azamgarh, Chandauli, Deoria, Kushinagar, Sultanpur
West Bengal	Darjeeling, Kalimpong

Table 7: List of districts in any two of the three Drought indices viz SPI, SPEI and AAI for September 2023

<b>State</b>	<b>Districts in Moderately/ Severely/ Extremely dry / Moderately/ Severely Arid condition in all the three Indices (AAI, SPEI and SPI)</b>
Arunachal Pradesh	Anjaw, Kradaadi, Kurung-Kumey, Lower-Subansiri
Assam	Darang, Kamrup, Hojai, Nagaon
Bihar	Gopalganj, Sitamarhi
Himachal Pradesh	Lahaul-Spiti
Jammu And Kashmir	Anatnag
Karnataka	Chamarajnagar, Devangere, Hassan, Haveri
Maharashtra	Satara
Mizoram	Champhai
Nagaland	Kohima
Tamil Nadu	Nagapattinam, Tiruppur
Uttar Pradesh	Azamgarh, Chandauli, Deoria, Kushinagar

*Table 8: List of districts in all three of the Drought indices viz SPI, SPEI and AAI for September 2023*

State	Districts in Moderately/ Severely/ Extremely dry / Moderately/ Severely Arid condition in any two of the Indices (AAI, SPEI and SPI)
Andhra Pradesh	Kurnool
Arunachal Pradesh	Kradaadi, Kurung-Kumey, Siang, West-Siang, Anjaw, West-Kameng
Assam	Hojai, Nagaon, Jorhat, Majuli, Karbi-Anglong, W.Karbi Anglong , Darang, Kamrup, Bongaigaon, Golaghat, Hailakandi, Kamrupmetro
Bihar	Aurangabad, Bhabua, Bhojpur, Gaya, Gopalganj, Jahanabad, Nawada, Rohtas, Saharsa, Saran, Sitamarhi, Siwan, Arwal, East-Champaran, West-Champaran, Patna, Shivhar
Chhathisgarh	Surguja, Dantewada, Jashpur, Surajpur
Haryana	Hissar
Jharkhand	Chatrai, Garhwa, Gumla, Koderma, Palamau, Dhanbad, Giridih, Hazaribagh, Lohardaga, Pakaur, Ranchi, Jamtara, Latehar, Ramgarh
Karnataka	Belgaum, Hassan, Dakshina-Kannada, Kodagu, Shimoga, Udupi, Ramnagar
Kerala	Kannur, Ernakulam, Kottayam, Kozhikode, Malappuram, Palakkad, Thrissur, Idukki, Kasaragod, Wayanad
Madhya Pradesh	Satna, Ashoknagar, Rewa, Siddhi
Maharashtra	Amravati, Sangli, Satara, Jalna
Manipur	Chandel, Tengnoupal
Meghalaya	Jaintia-Hills
Mizoram	Champhai, Aizwal, Kolasib, Lunglei, Mamit
Nagaland	Kohima, Zunheboto
Odisha	Kendrapara, Nabarangpur
Punjab	Muktsar, Barnala, Fazilika
Rajasthan	Baran
Tamil Nadu	Tiruppur, Nagapattinam

Tripura	Khowai
Uttar Pradesh	Allahabad, Azamgarh, Basti, Chandauli, Deoria, Ghazipur, Jaunpur, Kaushambi, Kushinagar, Maunath, Mirzapur, Pillibhit, Pratapgarh, Balrampur, Varanasi, Panchshil-Nagar, Shamli, Ballia, Fatehpur
West Bengal	Jhargram, Pashchim-Midnapore, Bankura, Birbhum, Hugli, Purulia, Murshidabad

Table 9: List of districts in any two of the three Drought indices viz SPI, SPEI and AAI for June to September 2023

State	Districts in Moderately/ Severely/ Extremely dry / Moderately/ Severely Arid condition in all the three Indices (AAI, SPEI and SPI)
Arunachal Pradesh	Kra Daadi, Kurung Kumey
Assam	Hojai, Nagaon, Karbi Analog, West Karbi Analog
Bihar	Aurangabad, Bhabua, Bhojpur, Gaya, Gopalganj, Jahanabad, Nawada, Rohtas, Saharsa, Saran, Sitamarhi, Siwan, Arwal
Chhathisgarh	Surguja
Jharkhand	Chatra, Garhwa, Gumla, Kodarma, Palamu
Karnataka	Belgaum, Hassan
Madhya Pradesh	Satna, Ashoknagar
Maharashtra	Amaravati, Sangli
Manipur	Chandel, Tengnoupal
Mizoram	Champhai
Rajasthan	Baran
Uttar Pradesh	Allahabad, Azamgarh, Basti, Chandauli, Deoria, Gazipur, Jaunpur, Kaushambi, Kushinagar, Mau, Mirzapur, Pillibhit, Pratapgarh

Table 10: List of districts in all three of the Drought indices viz SPI, SPEI and AAI for June to September 2023

	June-September 2023	
Categories (SPI range)	Percentage Area	No. of Districts
Extremely wet (2.00 or more)	0.17%	2
Severely wet (1.50 to 1.99)	1.45%	15
Moderately wet (1.00 to 1.49)	8.53%	49
Mildly wet (0 to 0.99)	34.21%	212
Mildly dry (0 to -0.99)	40.21%	298
Moderately dry (-1.00 to -1.49)	9.50%	76
Severely dry (-1.50 to -1.99)	3.88%	32
Extremely dry (-2.00 or less)	2.04%	17

	June-September 2023	
Categories (SPEI range)	Percentage Area	No. of Districts
Extremely wet (2.00 or more)	0%	0
Severely wet (1.50 to 1.99)	1.99%	15
Moderately wet (1.00 to 1.49)	10.31%	56
Mildly wet (0 to 0.99)	31.45%	200
Mildly dry (0 to -0.99)	39.47%	275
Moderately dry (-1.00 to -1.49)	10.45%	84
Severely dry (-1.50 to -1.99)	4.75%	37
Extremely dry (-2.00 or less)	1.58%	8

*Table 11: Percentage area and number of districts under each category of SPI and SPEI for the period Jun-Sep 2023*