

RAINFALL, MOISTURE INDEX, RESERVOIR LEVELS, MINOR IRRIGATION, IN KARNATAKA – 2023

1. ANNUAL RAINFALL

1.1. Introduction :

The State receives an Annual normal rainfall of **1153 mm** out of which the **Pre-Monsoon season** contributes about **10%**, the **South-West Monsoon** season contributes about **74%** and the **North-East Monsoon** season contributes to about **16%**. The spatial and temporal distribution of rainfall varies significantly across the State, i.e., from West to East. **Udupi District** which lies in the extreme western part of the State receives maximum annual rainfall of **4,535 mm** and **Chitradurga District** which lies in the eastern part of the State receives minimum annual rainfall of **540 mm**.

During **2023**, the **State** as a whole recorded **872 mm** of rainfall as against the Normal Annual rainfall of **1153 mm** with a departure from Normal being **(-) 24%**. Thus the Annual rainfall over the State is considered as **Deficit** Rainfall. Among the **31** Districts, **12** Districts recorded **Normal** and **19** Districts recorded **Deficit** rainfall.

During the **Pre-Monsoon 2023**, the State has recorded **117 mm** of rainfall as against the Normal rainfall of **120 mm** showing **(-2) %** departure from Normal. Therefore, the Pre-Monsoon rainfall is considered as **Normal** in the State. Among the **31** Districts, **4** Districts recorded **Large Excess**, **6** Districts recorded **Excess**, **8** Districts recorded **Normal**, **11** Districts recorded **Deficit** and **2** Districts recorded to **Large Deficit**.

During the **South-West Monsoon 2023**, the State has recorded **642 mm** of rainfall as against the Normal rainfall of **852 mm** showing **(-)25%** departure from Normal. Thus, the South-West Monsoon rainfall is considered as **Deficit** in the State. Among the **31** Districts, **8** Districts recorded **Normal** and **23** Districts recorded **Deficit** rainfall.

During the **North-East Monsoon 2023**, the State has recorded **114 mm** of rainfall as against the Normal rainfall of **182 mm** showing **(-) 38%** departure from Normal. Thus, the North-East Monsoon rainfall is considered as **Deficit** in the State. Among the **31** Districts, **1** District recorded **Excess**, **6** Districts recorded **Normal** rainfall, **13** Districts recorded **Deficit** rainfall and **11** Districts recorded **Large Deficit** rainfall.

The report provides the details on Rainfall distribution pattern, Agriculture status, Status of Reservoir levels, Seismic activity in the State and the response of the Government to the Flood & Drought condition in the State.

1.2 Annual Rainfall in the State during 2023

During 2023, the State received a total rainfall of **872 mm (-24%)** out of which the **Pre-Monsoon season** contributed **-2% (117 mm)**, the **South-West Monsoon** season contributed **-25% (642 mm)** and the **North-East Monsoon** season contributed **-38% (114 mm)** to the Annual rainfall of the State.

Rainfall distribution during different seasons of 2023 in different met divisions of the State is as below:

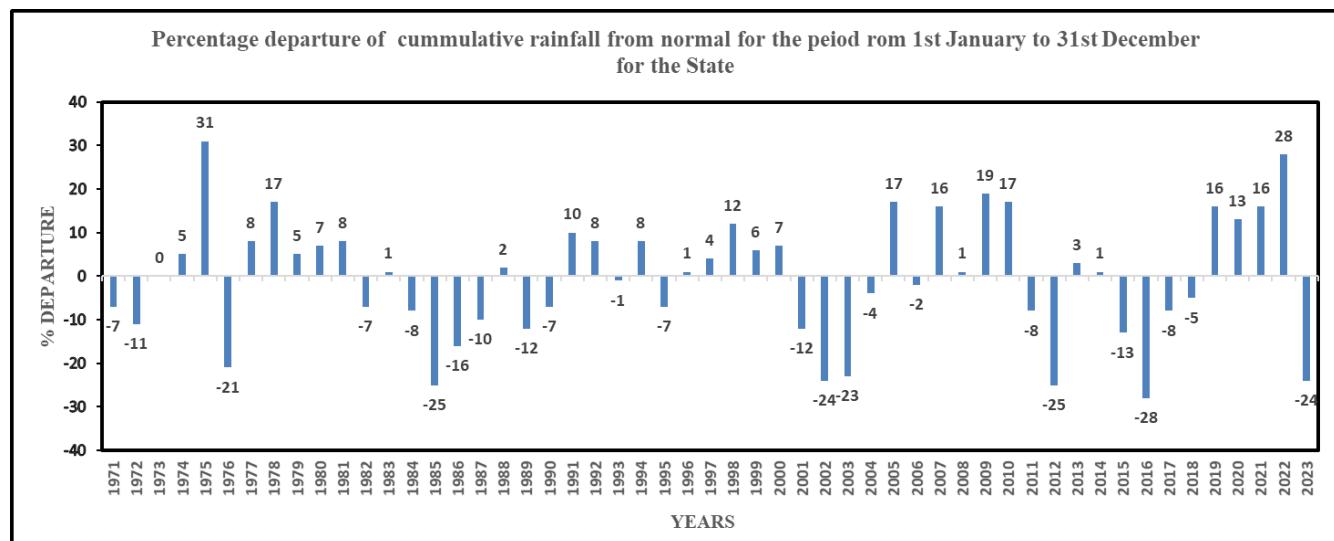
Region/ State	Pre-Monsoon			South-West			North -East			Annual		
	Normal (mm)	Actual (mm)	Dep (%)									
1.SIK	143	163.5	14	369	271	-26	202	139	-32	714	572	-20
2.NIK	83	95.4	15	479	386	-19	140	43	-70	702	524	-25
3.MALNAD	168	132.2	-21	1556	956	-39	226	191	-15	1950	1275	-35
4.COASTAL	158	62.2	-61	3101	2514	-19	259	272	6	3518	2848	-19
STATE	120	117.4	-2	852	642	-25	182	114	-38	1153	872	-24

The comparision of Zone-wise rainfall pattern during Annual 2023 with the rainfall of the last 4 years is as follows:

Region/State	Normal (mm)	2019		2020		2021		2022		2023	
		Actual (mm)	Dep (%)								
SIK	714	828	16	869	22	1050	47	1246	75	572	-20
2.NIK	702	746	6	882	26	780	11	915	30	524	-25
3.MALNAD	1950	2302	18	1827	-6	2100	8	2303	18	1275	-35
4.COASTAL	3518	4359	24	3936	12	3784	8	3672	4	2848	-19
State	1153	1337	16	1307	13	1337	16	1474	28	872	-24

The percentage departure of rainfall from Normal during 2023 is (-) 24% which is **bad** when compared to the rainfall of the **last** year.

The percentage departure of Annual rainfall from Normal for the State as a whole since 1971 is given in the following Figure 1.1:



The above figure shows that the percentage departure of Annual rainfall for the State since 1971. The Rainfall recorded during 2023 is (-) 24% which is **less** than the corresponding period of the **last** year.

District wise rainfall pattern during the Year 2023 is given in the following Table.

Sl. No.	District	Normal (mm)	Actual (mm)	Departure (%)
1	Bidar	838	840	0
2	Kolar	735	689	-6
3	Kalaburagi	770	716	-7
4	Bengaluru Rural	798	701	-12
5	Tumakuru	669	574	-14
6	Mandya	699	580	-17
7	Mysuru	837	690	-18
8	Belagavi	826	679	-18
9	Uttara Kannada	2936	2408	-18
10	Dakshina Kannada	4006	3284	-18
11	Bengaluru Urban	846	689	-18
12	Yadgir	719	582	-19
13	Chikkaballapura	736	586	-20
14	Udupi	4535	3525	-22
15	Ramanagara	840	647	-23
16	Chamarajanagara	787	601	-24
17	Hassan	1142	859	-25
18	Raichur	654	479	-27
19	Vijayapura	591	422	-29
20	Davanagere	659	470	-29
21	Dharwad	787	552	-30
22	Chitradurga	540	353	-35
23	Chikkamagaluru	1833	1193	-35
24	Gadag	624	399	-36
25	Shivamogga	2325	1479	-36
26	Koppala	614	383	-38
27	Kodagu	2729	1690	-38
28	Haveri	800	483	-40
29	Bagalkote	582	341	-42
30	Vijayanagar	643	338	-47
31	Ballari	599	266	-56
	STATE	1153	872	-24

Large Excess (>=60%)	Nil
Excess (+20 to +59%)	Nil
Normal (-19 to +19%)	12 Districts
Deficit (-20 to -59%)	19 Districts

Large Deficit (-60 to -99%)	Nil
No rain (<=-100%)	Nil

During the preceding year (2022) the Annual rainfall was **Large Excess** in **7** Districts **Excess** in **17** Districts and **Normal** in **7** Districts.

Taluk wise Annual Rainfall pattern of 2023 is given in the following table (**Total 236 Taluks in the State**):

Large Excess (>=60%)	Nil
Excess (+20 to +59%)	2 Taluks
Normal (-19 to +19%)	80 Taluks
Deficit (-20 to -59%)	151 Taluks
Large Deficit (-60 to -99%)	3 Taluks
No rain (<=-100%)	Nil

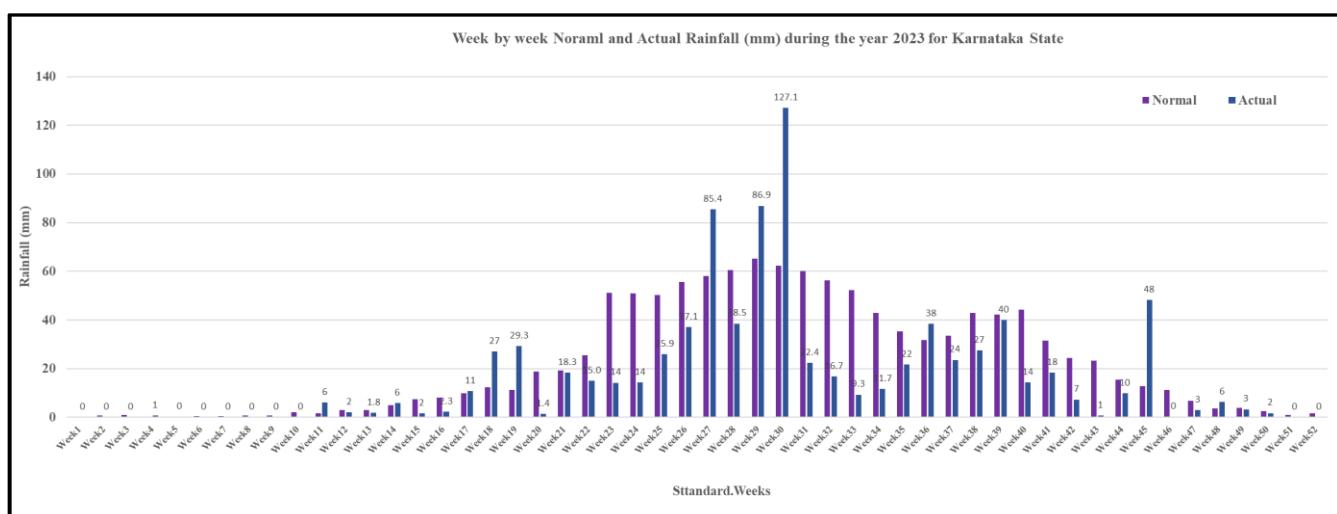
During the preceding year (2022) the Annual rainfall was **Large Excess** in **68** Taluks, **Excess** in **95** Taluks and **Normal** in **164** Taluks.

Hobli wise Rainfall pattern during 2023 is given in the following table (**Total 850 Hoblis in the State**):

Large Excess (>=60%)	Nil
Excess (+20 to +59%)	15 Hoblis
Normal (-19 to +19%)	316 Hoblis
Deficit (-20 to -59%)	509 Hoblis
Large Deficit (-60 to -99%)	10 Hoblis
No rain (<=-100%)	Nil

During the preceding year (2022) the annual rainfall **Large Excess** in **341** Hoblis, **Excess** in **284** Hoblis, **Normal** in **217** Hoblis and **Deficit** in **8** Hoblis.

Weekly Rainfall pattern for the State during 2023 is given in the following Figure 1.2.



1.3 Rainfall in 4 meteorological sub-Divisions of the State during 2023.

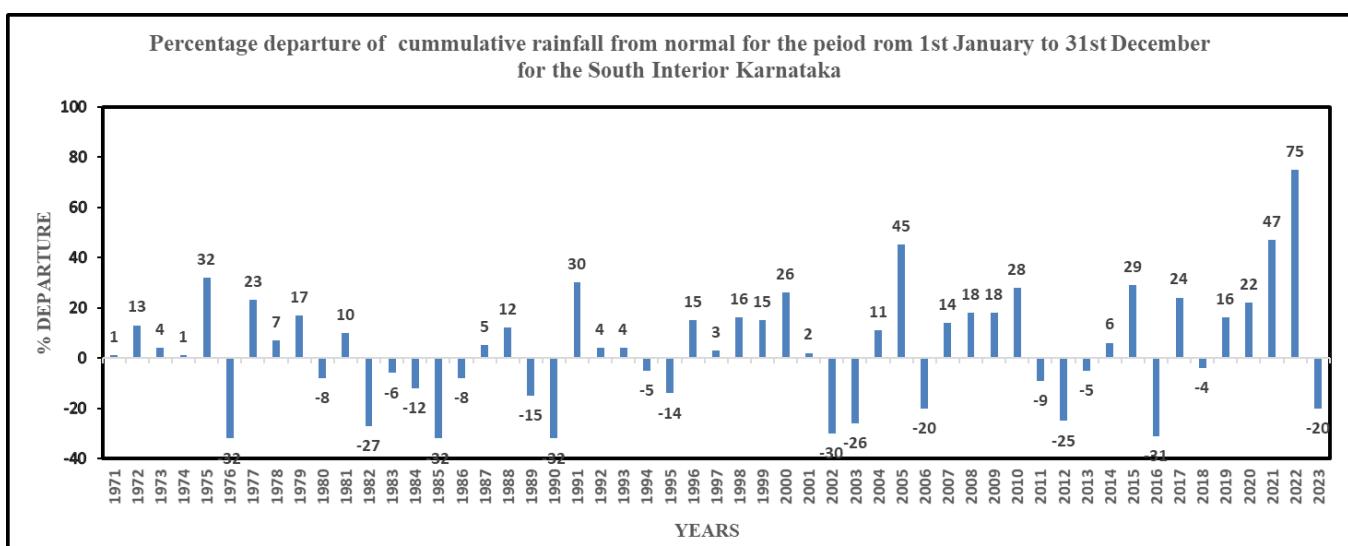
1.3.1 South-Interior Karnataka (SIK):

During 2023, the Annual rainfall was **Normal** in **Bengaluru Rural, Bengaluru Urban, Kolar, Mandya, Mysuru and Tumakuru** Districts, **Deficit** in **Chamarajanagara, Chitradurga, Chikkaballapura, Davanagere and Ramanagara** Districts. During the preceding year (2022), the Annual rainfall was **Large Excess** in **6** Districts and **Excess** in **5** Districts.

Among the **69** Taluks in **SIK**, the Annual rainfall was **and Normal** in **24** Taluks and **Deficit** in **45** Taluks. During the preceding year (2022), the Annual rainfall was **Large Excess** in **43** Taluks, **Excess** in **22** Taluks and **Normal** in **2** Taluks.

Among the **336** Hoblis in **SIK**, the Annual rainfall was **Excess** in **5** Hoblis, **Normal** in **151** Hoblis and **Deficit** in **180** Hoblis. During the preceding year (2022), the Annual rainfall was **Large Excess** in **249** Hoblis, **Excess** in **84** Hoblis and **Normal** in **3** Hoblis.

The departure (%) of the Annual rainfall from Normal in South-Interior Karnataka since 1971 is given in the following Figure 1.3:



The figure shows that, during 2023, the **South-Interior Karnataka** recorded a rainfall **(-)20% less** than the Normal which is **less** than the corresponding period from the **last** year.

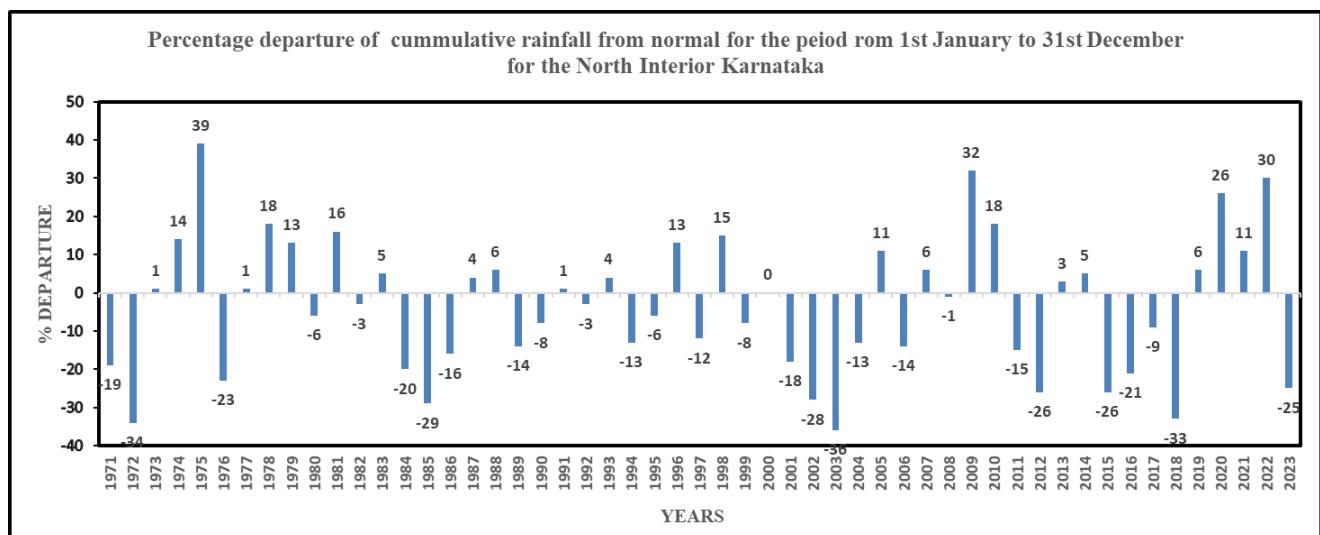
1.3.2 North-Interior Karnataka (NIK):

During 2023, the Annual rainfall was **Normal** in **Belagavi, Bidar, Kalaburagi and Yadgir** Districts and **Deficit** in **Bagalkote, Ballari, Dharwad, Gadag Koppala, Haveri, Raichur, Vijayanagara, and Vijayapura** Districts. During the preceding year (2022), the Annual rainfall was **Large Excess** in **1** District, **Excess** in **10** Districts and **Normal** in **2** Districts.

Among the **110** Taluks, the Annual rainfall was **Excess** in **2** Taluks, **Normal** in **27** Taluks, **Deficit** in **78** Taluks and **Large Deficit** in **3** Taluks. During the preceding year (2022), the Annual rainfall was **Large Excess** in **19** Taluks, **Excess** in **52** Taluks, and **Normal** in **37** Taluks.

Among the **316** Hoblis, the Annual rainfall was **Excess** in **9** Hoblis, **Normal** in **88** Hoblis, **Deficit** in **212** Hoblis and **Large Deficit** in **7** Hoblis. During the preceding year (2022), the Annual rainfall was **Large Excess** in **47** Hoblis, **Excess** in **150** Hoblis, **Normal** in **118** Hoblis and **Deficit** in **1** Hobli.

Percentage departure of the Annual rainfall from Normal in North-Interior Karnataka since 1971 is given in the following Figure 1.4:



The figure indicates that, during 2023, the **North-Interior Karnataka** recorded a rainfall (-)25% less than the Normal which is **relatively less** than the corresponding period from the **last year**.

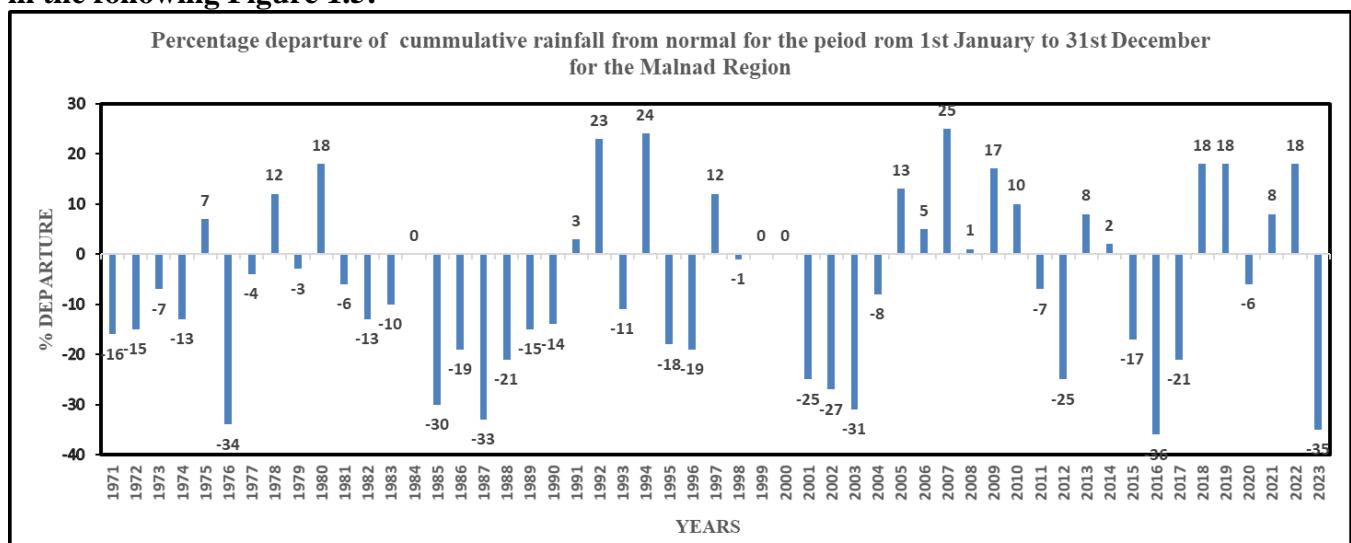
1.3.3 Malnad Region:

During 2023, the Annual rainfall was **Deficit** in **Chikkamagaluru, Hassan, Kodagu** and **Shivamogga** Districts. During the preceding year (2022), the Annual rainfall was **Excess** in **2** Districts and **Normal** in **2** Districts.

Among the **29** Taluks, the Annual rainfall was **Normal** in **9** Taluks and **Deficit** in **20** Taluks. During the preceding year (2022), the Annual rainfall was **Large Excess** in **6** Taluks, **Excess** in **16** Taluks and **Normal** in **4** Taluks.

Among the **131** Hoblis, the Annual rainfall was **Excess** in **1** Hobli, **Normal** in **38** Hoblis, **Deficit** in **89** Hoblis and **Large Deficit** in **3** Hoblis. During the preceding year (2022), the Annual rainfall was **Large Excess** in **45** Hoblis, **Excess** in **40** Hoblis, **Normal** in **42** Hoblis and **Deficit** in **4** Hoblis.

Percentage departure of the Annual rainfall from Normal in Malnad Region since 1971 is given in the following Figure 1.5:



The Figure shows that, during 2023, the Malnad Region recorded a rainfall **(-)35% less** than the Normal, which is **less** than the corresponding period from the **last** year.

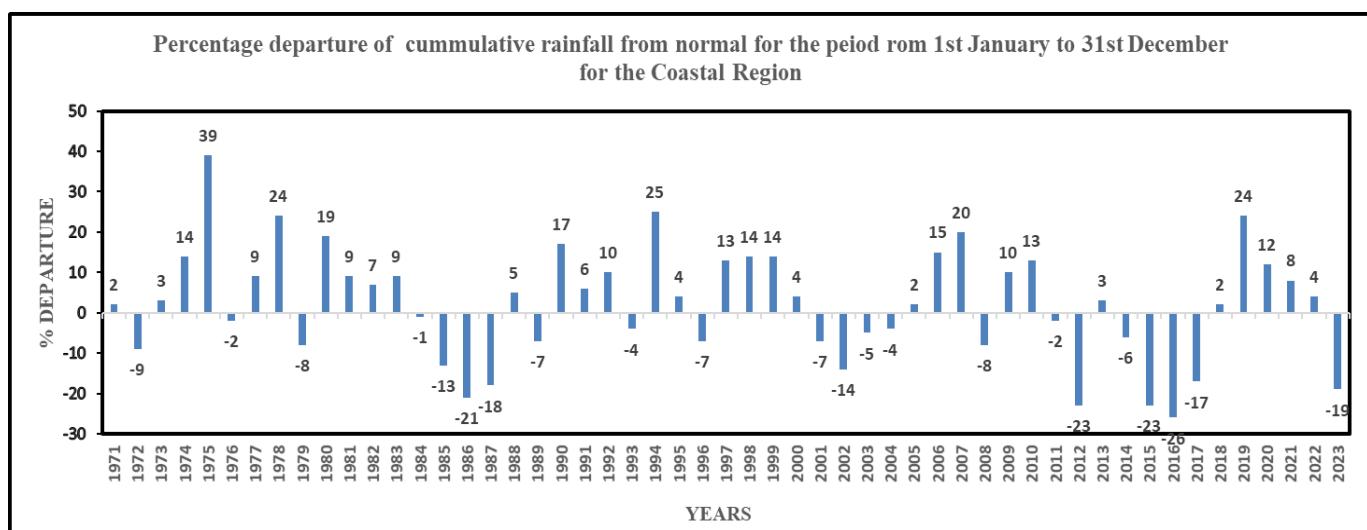
1.3.4 Coastal Region:

During 2023, the Annual rainfall was **Normal** in **Dakshina Kannada** and **Uttara Kannada** Districts and **Normal** in **Udupi** District. During the preceding year (2022), the Annual rainfall was **Normal** in **3** Districts.

Among the **28** Taluks, the Annual rainfall was **Normal** in **20** Taluks and **Deficit** in **8** Taluks . During the preceding year (2022), the Annual rainfall was **Excess** in **5** Taluks and **Normal** in **21** Taluks.

Among the **67** Hoblis, the Annual rainfall was **Normal** in **39** Hoblis and **Deficit** in **28** Hoblis. During the preceding year (2022), the Annual rainfall was **Excess** in **10** Hoblis, **Normal** in **54** Hoblis and **Deficit** in **3** Hoblis.

Percentage departure of the Annual rainfall from Normal in Coastal Region since 1971 is given in the following Figure 1.6:



The figure shows that, during 2023, the **Coastal Region** recorded a rainfall **(-)19% less** than the Normal and which is **less** than the corresponding period of the **last** year.

Number of Taluks falling under different Rainfall Categories during 2023 and 2022.

Division	Total No Taluks	Large Excess		Excess		Normal		Deficit		Large Deficit		No Rain	
		2023	2022	2023	2022	2023	2022	2023	2022	2023	2022	2023	2022
1.SIK	69	0	43	0	22	24	2	45	0	0	0	0	0
2.NIK	110	0	19	2	52	27	37	78	0	3	0	0	0
3.MALNAD	29	0	6	0	16	9	4	20	0	0	0	0	0
4.COASTAL	28	0	0	0	5	20	21	8	0	0	0	0	0
State	236	0	68	2	95	80	64	151	0	3	0	0	0

Table: 1.1: District / Taluk / Hobli / Region rainfall Pattern in Karnataka State during 2023.

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
1	BENGALURU URBAN	219	156	-29
1	Anekal	244	146	-40
1	Anekal_1	244	142	-42
2	Attibele_1	224	94	-58
3	Jigani_1	222	155	-30
4	Sarjapura_1	208	120	-42
5	Anekal_2	237	116	-51
6	Jigani_2	220	198	-10
7	Attibele_2	227	144	-36
8	Sarjapura_1	226	224	-1
9	Sarjapura_3	219	102	-54
2	Bengaluru North	248	147	-41
1	Bengaluru North_1	248	152	-39
2	Dasanapura_1	228	130	-43
3	Yashavantapura_1	213	168	-21
4	Bengaluru North_2	223	146	-35
5	Yashavantapura_2	209	157	-25
6	Dasanapura_2	217	154	-29
7	Dasanapura_3	222	114	-49
3	Bengaluru South	183	138	-25
1	Beguru_3	183	188	3
2	Kengeri_1	232	185	-20
3	Tavarekere_1	164	127	-22
4	Uttarahalli_4	220	158	-28
5	Uttarahalli_1	219	141	-36
6	Uttarahalli_2	210	126	-40
7	Uttarahalli_3	219	96	-56
8	Uttarahalli_5	235	122	-48
9	Beguru_1	238	151	-37
10	Beguru_2	229	162	-29
11	Kengeri_2	211	130	-38
12	Kengeri_3	205	121	-41
13	Kengeri_4	197	177	-10
14	Tavarekere_2	240	116	-52
15	Tavarekere_3	210	117	-44
4	Bengaluru East	217	170	-21
1	Mahadevpura_1	217	107	-51
2	Bidarahalli_2	231	171	-26
3	Varturu_1	219	193	-12

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
4	K R Pura_2	228	155	-32
5	K R Pura_3	223	132	-41
6	Varturu_2	231	217	-6
7	Bidarahalli_1	224	166	-26
8	Mahadevapura_2	233	88	-62
9	Marathahalli	234	146	-38
10	Bidarahalli_3	219	236	8
5	Yelahanka	208	186	-11
1	Yelahanka_1	208	214	3
2	Yelahanka_2	213	185	-13
3	Yelahanka_3	214	185	-14
4	Jala_1	208	208	0
5	Jala_2	208	193	-7
6	Jala_3	214	198	-7
7	Hesarughatta_1	188	164	-13
8	Hesarughatta_2	208	161	-23
2	BENGALURU RURAL	213	131	-38
6	Devanahalli	215	159	-26
1	Devanahalli	215	193	-10
2	Channarayapatna	219	135	-38
3	Kundana	215	175	-19
4	Vijaypura	217	125	-42
7	Doddaballapura	229	138	-40
1	Dodballapur	229	175	-23
2	Dodda Belavangala	204	148	-27
3	Madure	207	108	-48
4	Sasalu	185	104	-44
5	Tubagere	219	149	-32
8	Hosakote	257	127	-51
1	Hosakote	257	132	-48
2	Anugondhalli	207	97	-53
3	Jadigenhalli	231	125	-46
4	Nandagudi	223	138	-38
5	Sulibele	227	136	-40
9	Nelamangala	248	96	-61
1	Nelamangala	248	97	-61
2	Sompura	188	99	-47
3	Tyamagondal	204	103	-50
4	Nelamangala_2	220	97	-56
5	Sompura_2	197	148	-25
6	Tyamagondal_2	205	73	-64

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
3	RAMANAGARA	226	155	-31
10	Channapatna	239	140	-42
1	Channapatna	239	154	-36
2	Maluru	233	112	-52
3	Virupakshipura	234	157	-33
11	Kanakapura	226	198	-13
1	Kanakapura	226	247	9
2	Kodihalli	229	205	-11
3	Satnuru	230	155	-32
4	Uyyamballi	231	184	-21
12	Magadi	254	110	-57
1	Magadi	254	125	-51
2	Kuduru	201	96	-52
3	Madabal	246	120	-51
4	Solur	202	120	-40
5	Tippasanara	201	66	-67
13	Ramanagara	245	168	-32
1	Ramanagara_1	245	199	-19
2	Bidadi	217	137	-37
3	Kailancha	234	214	-9
4	Kutgallu	237	140	-41
5	Ramanagara_2	231	190	-18
6	Kailancha_2	237	174	-27
14	Harohalli	226	133	-41
1	Harohalli	226	104	-54
2	Dodda Maralavadi	224	148	-34
4	KOLAR	219	120	-45
15	Bangarapet	226	88	-61
1	Bangarapet	226	91	-60
2	Budikote	187	68	-64
3	Kamsandra	222	81	-64
4	Robertsonpet	234	122	-48
16	Kolar	240	125	-48
1	Kolar	240	86	-64
2	Holuru	226	103	-54
3	Huttur	235	108	-54
4	Narasapura	218	173	-21
5	Sugaturu	228	139	-39
6	Vakkaleri	215	119	-44
7	Rajakallahalli Vemagal	221	165	-25
17	Malur	230	153	-34

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
1	Malur	230	122	-47
2	Lakkur	166	158	-4
3	Masathi	175	219	25
4	Tyakal	176	123	-30
18	Mulabagilu	270	135	-50
1	Mulbagal	270	157	-42
2	Avani	246	107	-56
3	Bairakur	234	155	-34
4	Duggasandra	239	110	-54
5	Tayilur	228	163	-29
19	Srinivasapura	226	84	-63
1	Srinivasapura	226	126	-44
2	Nelavanki	190	78	-59
3	Ronuru	208	85	-59
4	Rayalpadu	179	57	-68
5	Yelldur	212	81	-62
20	K.G.F	247	137	-45
1	Betamangala	240	98	-59
2	Kyasamballi	237	166	-30
3	Robertsonpet	247	134	-46
5	CHIKKABALLAPURA	211	108	-49
21	Bagepalli	215	96	-55
1	Bagepalli	215	100	-53
2	Chelur	209	79	-62
3	Guluru	213	95	-55
4	Mittemari	207	125	-40
5	Pathapalya	207	90	-57
22	Chikkaballapura	223	109	-51
1	Chikballapura	223	99	-56
2	Mandikal	196	110	-44
3	Nandi	220	118	-46
23	Chintamani	249	103	-59
1	Chintamani	249	140	-44
2	Ambajidurga	234	87	-63
3	Chilakalanerpu	214	99	-54
4	Kaiwara	209	117	-44
5	Munganahalli	217	85	-61
6	Murugamale	227	95	-58
24	Gauribidanur	189	109	-42
1	Gauribidanur	189	84	-56
2	D.Palya	193	109	-44

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
3	Hosur	195	131	-33
4	Manchenahalli	215	98	-55
5	Nagaragere	186	102	-45
6	Tondebavi	205	134	-35
25	Gudibanda	185	102	-45
1	Gudibanda	185	98	-47
2	Somenahalli	208	107	-49
26	Sidlaghatta	224	125	-44
1	Sidlaghatta	224	139	-38
2	Bashattahalli	218	120	-45
3	Jangamakote	221	99	-55
4	Sadali	211	135	-36
6	TUMAKURU	186	105	-44
27	Chikkanayakanahalli	218	149	-32
1	Chiknayakanahalli	218	130	-41
2	Handanakere	184	162	-12
3	Huliyaru	143	179	25
4	Kandikere	177	114	-36
5	Shettikeri	204	119	-42
28	Gubbi	217	125	-42
1	Gubbi	217	153	-29
2	Chandrashekerapura	186	84	-55
3	Chelur	198	120	-40
4	Hagalavadi	184	117	-36
5	Kadaba	191	126	-34
6	Nittur	208	136	-34
29	Koratagere	206	79	-62
1	Koratagere	206	62	-70
2	Chennarayadurga	202	85	-58
3	Holanahalli	224	85	-62
4	Kolala	180	79	-56
30	Kunigal	208	121	-42
1	Kunigal	208	113	-46
2	Amrutar	197	148	-25
3	Huliyurudurga	211	131	-38
4	Huttariduraga	211	104	-51
5	Kottagere	192	93	-52
6	Yedeyur	197	121	-39
31	Madhugiri	207	69	-67
1	Madhugiri	207	54	-74
2	Dodderi	160	43	-73

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
3	Itakadibbanahalli	180	70	-61
4	Kodigenahalli	179	83	-53
5	Midigesi	172	90	-48
6	Puravara	191	94	-51
32	Pavagada	184	64	-65
1	Pavagada	184	69	-62
2	Nagalamadike	174	34	-81
3	Nidagal	146	86	-41
4	Yellappanayakana Hosakote	154	73	-52
33	Sira	175	81	-54
1	Sira	175	76	-57
2	Bukkaptna	175	87	-50
3	Gowdagere	161	93	-42
4	Hulikunta	135	72	-47
5	Kallambella	158	76	-52
34	Tiptur	234	124	-47
1	Tiptur	234	119	-49
2	Honnnavalli	223	102	-54
3	Kibbanahalli	172	163	-5
4	Nonavinakere	209	124	-41
35	Tumakuru	211	128	-39
1	Tumakuru North	211	137	-35
2	Bellavi	210	132	-37
3	Guluru	227	123	-46
4	Hebbur	150	108	-28
5	Uradigere	157	138	-12
6	Kora	210	102	-51
7	Tumakuru East	219	185	-15
8	Tumakuru West	221	221	0
9	Tumakuru South	217	164	-24
36	Turuvekere	239	122	-49
1	Turuvekere	239	128	-47
2	Dabbegatta	182	112	-38
3	Dandinasivara	203	118	-42
4	Mayasandra	200	126	-37
7	CHITRADURGA	155	96	-38
37	Challakere	141	78	-45
1	Challakere	141	57	-59
2	Nayakanahatti	135	123	-9
3	Parasurampura	98	43	-56
4	Thalku	109	96	-12

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
38	Chitradurga	210	95	-55
1	Chitradurga	210	80	-62
2	Bharmasagara	146	89	-39
3	Hire Guntanur	147	118	-19
4	Turuvanur	185	108	-42
39	Hiriyur	175	81	-54
1	Hiriyur	175	77	-56
2	Aymangala	147	74	-50
3	Dharmapura	128	86	-33
4	Javanagondanahalli	163	87	-47
40	Holalkere	199	89	-55
1	Holalkere	199	86	-57
2	Bharmanaikanadurga	170	53	-69
3	Ramagiri	144	107	-26
4	Talya	182	103	-43
41	Hosadurga	194	158	-19
1	Hosadurga	194	176	-9
2	Madadhakeri	172	129	-25
3	Mathodu	177	168	-5
4	Srirampura	176	167	-6
42	Molakalmuru	164	53	-68
1	Molakalmuru	164	54	-67
2	Devasamudra	118	52	-56
8	DAVANAGERE	161	97	-40
43	Channagiri	180	120	-33
1	Channagiri	180	140	-22
2	Basavapatna_1	173	107	-38
3	Basavapatna_2	170	73	-57
4	Santebannur_1	181	65	-64
5	Santebannur_2	177	89	-50
6	Ubrani	173	164	-5
44	Davanagere	167	62	-63
1	Davangere	167	51	-69
2	Anogodu	151	66	-56
3	Mayakonda	160	70	-56
45	HARIHARA	164	91	-45
1	Harihara	164	93	-44
2	Malebennur	147	89	-39
46	Honnali	184	102	-45
1	Honnali	184	105	-43
2	Govinakovi_2	183	82	-55

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
3	Sasavehalli_1	180	128	-29
4	Sasavehalli_2	161	75	-54
47	Jagalur	141	79	-44
1	Jagalur	141	104	-26
2	Bilichodu	122	65	-47
3	Sokke	133	62	-53
48	Nyamati	176	144	-18
1	Belagutti	176	142	-19
2	Govinakovi_1	183	149	-18
9	CHAMARAJANAGARA	263	175	-33
49	Chamarajanagara	254	135	-47
1	Chamarajanagara	254	148	-42
2	Chandakavadi	259	125	-52
3	Haradanhalli	255	113	-56
4	Harve	238	154	-35
5	Santemarahalli	263	141	-47
50	Gundlupet	282	140	-50
1	Gundlupet	282	148	-48
2	Begur	190	111	-42
3	Terakanambi	254	123	-52
4	Hangala	254	154	-39
51	Kollegal	276	144	-48
1	Kollegala	276	136	-51
2	Palya	260	147	-43
52	Yelandur	272	148	-46
1	Yelandur	272	129	-53
2	Agara	240	157	-34
53	Hanur	278	222	-20
1	Hanur	278	216	-22
2	Lokkanahalli	278	210	-24
3	Ramapura	292	228	-22
10	MYSURU	214	215	1
54	Heggadadevanakote	194	250	29
1	Heggadadevanakote	194	265	37
2	Antarasante	206	236	14
3	Hampapura	184	249	36
55	Hunsur	223	243	9
1	Hunsur	223	237	6
2	Bilikere	218	244	12
3	Gowdargyare	214	178	-17
4	Hanagoadu	215	273	27

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
56	Krishnarajanagar	221	231	5
1	Krishnarajanagar	221	187	-15
2	Hebbalu	218	297	36
3	Hasa Agrahar	220	206	-6
57	Mysuru	234	189	-19
1	Mysuru	234	225	-4
2	Elivala	228	182	-20
3	Jayapura	208	163	-22
4	Varuna	214	189	-12
58	Nanjanagud	207	181	-13
1	Nanjangud	207	173	-16
2	Biligere	201	199	-1
3	Chikkayyana Chattra	208	215	3
4	Hullahalli	201	173	-14
5	Doddakowlande	220	163	-26
59	Periyapatna	209	221	6
1	Periyapatna	209	250	20
2	Bettadpur	207	239	15
3	Haranahalli	211	210	-1
4	Ravanduru	211	177	-16
60	T.Narasipura	222	161	-27
1	T.Narasipur	222	176	-21
2	Bannur	219	175	-20
3	Muguru	238	169	-29
4	Sosale	222	148	-33
5	Talakad	238	145	-39
61	Saraguru	219	215	-2
1	Saraguru	219	204	-7
2	B.Matakere	219	223	2
62	Saligrama	196	262	34
1	Saligram	196	252	29
2	Mirale	214	284	33
3	Chanachanakatte	207	251	21
11	MANDYA	217	192	-11
63	Krishnarajpet	233	229	-2
1	Krishnarajpet	233	249	7
2	Akkihebalu	223	235	6
3	Bukanakere	220	201	-9
4	Kikkeri	218	188	-14
5	Santebachahalli	205	265	30
6	Silanare	218	234	7

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
64	Maddur	239	142	-40
1	Madduru_2	239	179	-25
2	Koppa_2	248	127	-49
3	Chikkaarasinakere_1	231	116	-50
4	Autaguru	231	147	-36
5	Madduru_1	233	162	-30
6	Koppa_2	215	166	-23
7	Koppa_1	237	155	-35
8	Koppa_3	233	124	-47
9	Chikaarasinakere_2	228	105	-54
10	Chikaarasinakere_3	229	147	-36
65	Malavalli	216	152	-30
1	Malavalli_1	216	97	-55
2	Halaguru	237	195	-18
3	Kirgavalu_1	222	151	-32
4	B G Pura_2	249	142	-43
5	Malavalli_2	232	141	-39
6	Malavalli_3	234	134	-43
7	Kirgavalu_2	222	159	-29
8	Kirgavalu_3	220	142	-35
9	B G Pura_1	240	142	-41
66	Mandyā	229	178	-22
1	Mandyā_1	229	87	-62
2	Basaralu_1	189	243	29
3	Dudda_1	205	250	22
4	Keragodu_1	222	122	-45
5	Kottatti_1	224	142	-37
6	Mandyā_2	228	142	-38
7	Kottatti_2	227	167	-27
8	Keragodu_2	227	146	-36
9	Dudda_2	217	143	-34
10	Basaralu_2	231	187	-19
67	Nagamangala	248	220	-12
1	Nagamangala	248	241	-3
2	Belluru	167	178	7
3	Bendaganavele	187	182	-2
4	Devalapura	209	198	-5
5	Honakere	161	294	82
68	Pandavapura	220	228	4
1	Pandavapura_1	220	194	-12
2	Chinkurali	216	236	9

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
3	Melukote	214	250	17
4	Pandavapura_2	211	202	-4
69	Srirangapatna	197	164	-17
1	Srirangapatna	197	186	-6
2	Arakere	218	156	-29
3	Belagola	229	162	-29
4	K Shettihalli_2	203	150	-26
5	K Shettihalli_1	199	157	-21
12	BALLARI	159	24	-85
70	Ballari	145	26	-82
1	Ballari	145	10	-93
2	Moka	147	36	-76
3	Rupanagudi	143	38	-74
4	Koluru	151	26	-83
71	Sandur	186	18	-91
1	Sandur	186	15	-92
2	Choranuru	150	31	-79
3	Toranagallu	159	5	-97
72	Siruguppa	167	32	-81
1	Siruguppa	167	22	-87
2	Hachcholli	159	23	-86
3	Karuru	158	39	-75
4	Tekkalakote	166	39	-76
73	Kurugodu	156	13	-92
1	Kurugodu	156	13	-92
2	Koluru	152	13	-92
74	Kampli	160	18	-89
1	Kampli	160	14	-91
2	Kurugodu	158	37	-76
13	KOPPALA	149	47	-68
75	Gangavathi	139	31	-78
1	Gangavathi	139	30	-79
2	Marali	149	35	-77
3	Venkatagiri	151	29	-81
76	Koppala	147	45	-69
1	Koppal	147	26	-82
2	Alawandi	145	60	-59
3	Hitnal	149	34	-77
4	Irkalgada	149	52	-65
77	Kushtagi	154	30	-81
1	Kushtagi	154	21	-86

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
2	Hanumanhal	143	37	-74
3	Hanamsagar	136	28	-79
4	Tavaragera	151	37	-75
78	Yelburga	134	58	-56
1	Yelburga	134	59	-56
2	Hire Wankalkunti	147	57	-62
79	Karatagi	179	48	-73
1	Karatgi	179	61	-66
2	Siddapur	164	34	-79
80	Kukanuru	157	69	-56
1	Kukanoor	157	70	-55
2	Manglur	146	65	-55
81	Kanakagiri	143	58	-59
1	Kanakagiri	143	56	-61
2	Hulihaider	146	69	-53
3	Nauli	161	51	-68
14	RAICHUR	146	22	-85
82	Deodurga	160	12	-93
1	Devadurga	160	4	-97
2	Arakeri	135	18	-87
3	Gabbur	130	18	-86
4	Jalihalli	148	7	-95
83	Lingsugur	155	33	-79
1	Lingasuguru	155	39	-75
2	Gurgunta	146	19	-87
3	Mudgal	155	48	-69
84	Manvi	141	19	-86
1	Manvi	141	20	-85
2	Hire Katankal	145	14	-90
3	Kurdi	130	22	-83
85	Raichur	144	11	-92
1	Raichur	144	10	-93
2	Chandrabanda	137	7	-95
3	Devarsugur	132	8	-94
4	Gilasuguru	120	23	-81
5	Kalmali	132	12	-91
6	Yergara	120	10	-92
86	Sindhanur	180	36	-80
1	Sindhanur	180	28	-84
2	Badarli	167	21	-87
3	Gorebal	174	53	-69

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
4	Gunjihalli	168	41	-75
5	Hadganhal	158	12	-92
6	Huda	169	27	-84
7	Jalihal	174	81	-53
8	Jawalgeri	169	33	-81
9	Kunatgi	172	26	-85
10	Salgundi	168	37	-78
11	Turvihal	166	56	-66
12	Walkamdinni	156	12	-92
87	Maski	149	20	-87
1	Maski	149	29	-81
2	Halapur	151	6	-96
3	Pamankallur	150	10	-93
4	Balganur	155	20	-87
5	Gunjihalli	159	23	-86
6	Turvihal	156	27	-83
7	Gudadur	152	18	-88
8	Lingsugur	152	11	-93
88	Sirivara	124	18	-86
1	Sirwar	124	19	-85
2	Kallur	131	23	-83
3	Mallat	131	16	-88
4	Kavital	145	14	-91
15	KALABURAGI	127	42	-67
89	Afzalpur	121	39	-68
1	Afzalpur	121	41	-66
2	Atanur	124	44	-65
3	Karajgi	121	32	-74
90	Aland	123	33	-73
1	Aland	123	29	-76
2	Khajuri	120	36	-70
3	Madana Hipparga	123	41	-66
4	Narona	123	35	-72
5	Nimbarga Tanda	125	29	-77
91	Chincholi	136	34	-75
1	Chincholi	136	22	-84
2	Ainapur	108	20	-82
3	Sulepet	130	69	-47
4	Kodli Chincholi	133	22	-84
92	Chittapur	117	55	-53
1	Chittapur	117	59	-49

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
2	Gundgurti	126	69	-45
3	Nalavara	140	46	-67
93	Kalaburagi	127	46	-64
1	Kalaburagi	127	52	-59
2	Aurad	123	49	-60
3	Farhatabad	136	40	-71
4	Pattan	125	44	-65
94	Jevargi	149	29	-80
1	Jewargi	149	31	-79
2	Andola	146	36	-75
3	Nelogi	138	21	-85
95	Sedam	126	71	-43
1	Sedam	126	88	-30
2	Adki	128	87	-32
3	Kodla	129	63	-51
4	Mudhol	126	49	-61
96	Kalagi	118	25	-79
1	Kalagi	118	26	-78
2	Kodli	118	21	-82
3	Gundgurti	122	27	-78
97	Kamalapura	112	41	-63
1	Kamalapur	112	52	-54
2	Mahagaon Tanda	117	30	-75
3	Narona	114	41	-64
4	Ainapur	112	33	-70
98	Yadrami	130	23	-82
1	Yadrami	130	24	-81
2	Ijeri	142	20	-86
99	Shahbadha	152	61	-60
1	Shahabad	152	61	-60
16	BIDAR	117	46	-60
100	Aurad	106	47	-56
1	Aurad	106	49	-54
2	Chintaki	115	39	-66
3	Santpur	116	52	-55
101	Bidar	140	52	-63
1	Bidar	140	51	-64
2	Bagadhal	119	35	-71
3	Bidar South	139	49	-65
4	Janwada	131	62	-53
5	Kamthana	131	55	-58

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
6	Manalli	129	65	-49
102	Bhalki	117	38	-68
1	Bhalki	117	41	-65
2	Halburga	120	31	-74
3	Khatak Chincholi	115	30	-74
4	Lakangaon	124	53	-58
5	Nittur Buzurg	117	53	-55
6	Saigaon	108	23	-79
103	Basavakalyan	112	45	-60
1	Basavakalyan	112	32	-71
2	Kohinoor	116	61	-47
3	Matala	114	39	-66
4	Mudabi	111	41	-63
5	Rajeshwar	112	56	-50
104	Humnabad	114	48	-58
1	Humnabad	114	57	-50
2	Dubalgundi	113	36	-68
3	Hallikheda	114	51	-55
105	Chittaguppa	101	16	-84
1	Chitguppa	101	14	-86
2	Bhimalkhed	120	18	-85
3	Nirna	110	16	-85
106	Kamalanagara	131	74	-43
1	Kamalnagar	131	77	-41
2	Dabaka C.	118	81	-31
3	Thanakushanur	117	61	-48
107	Hulasuru	105	19	-82
1	Hulsoor	105	19	-82
17	BELAGAVI	133	72	-46
108	Athani	134	56	-58
1	Athani	134	37	-72
2	Anantapur	121	95	-22
3	Telsang	124	41	-67
109	Bailhongal	137	86	-37
1	Bailhongal	137	73	-46
2	Nesargi	137	99	-28
110	Belagavi	162	90	-44
1	Belagavi	162	79	-51
2	Hirebagevadi	141	71	-50
3	Kakti	150	98	-35
4	Uchagaon	151	106	-30

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
111	Chikkodi	132	94	-28
1	Chikkodi	132	92	-30
2	Nagaramonnali	131	97	-26
3	Sadalgi	126	96	-24
112	Gokak	130	76	-42
1	Gokak	130	83	-36
2	Kowjalgi	128	54	-58
3	Arbhavi	129	80	-38
113	Hukkeri	145	95	-34
1	Hukkeri	145	97	-33
2	Sankeswar	160	98	-39
3	Yamkanmardi	130	91	-30
114	Khanapur	157	142	-10
1	Khanapur	157	102	-35
2	Bidi	142	72	-49
3	Gunji	151	145	-4
4	Jamboti	143	195	37
115	RAMADURGA	136	25	-81
1	Ramdurg	136	23	-83
2	Bidki	127	27	-79
3	Katkol	128	27	-79
4	Mudkavi	131	22	-83
116	Raibagh	111	50	-55
1	Raibagh	111	61	-45
2	Kudchi	111	40	-64
117	Soundatti	129	39	-70
1	Savadatti	129	26	-80
2	Manoli	130	25	-80
3	Muragoda	129	70	-46
118	Kitthuru	142	72	-49
1	Kittur	142	70	-51
119	Nippani	125	62	-50
1	Nippani	125	68	-45
2	Sadalgi	129	54	-58
120	Kagavada	103	85	-17
1	Kagwad	103	85	-17
121	Mudagali	129	44	-66
1	Arbhavi	129	50	-61
2	Kowjalgi	128	37	-71
122	Yargatti	123	49	-60
1	Yargatti	123	49	-60

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
18	BAGALKOTE	141	29	-79
123	Badami	142	29	-80
1	Badami	142	34	-76
2	Kerur	138	32	-77
3	Kulgeri	136	20	-86
124	Bagalkote	159	23	-85
1	Bagalkote	159	24	-85
2	Kaladgi	137	18	-87
3	Rampura	139	27	-81
125	Bilgi	156	33	-79
1	Bilgi	156	31	-80
2	Anagvadi	152	35	-77
126	Hungund	156	32	-79
1	Hungund	156	35	-78
2	Amingarh	146	16	-89
3	Karadi	156	43	-73
127	Jamkhandi	138	32	-77
1	Jamakhandi	138	38	-72
2	Savalagi	132	29	-78
3	Terdal	136	18	-87
128	Mudhol	128	22	-83
1	Mudhol	128	27	-79
2	Lokapur	123	17	-86
129	Guledagudda	135	20	-85
1	Guledagudda	135	20	-85
130	Ilkal	146	28	-81
1	Ilkal	146	27	-82
2	Amingarh	141	29	-79
3	Karadi	155	30	-80
131	Rabakavi Banahatti	131	25	-81
1	Terdal	131	24	-82
2	Mudhol	127	29	-77
19	VIJAYAPURA	133	36	-73
132	BAGEVADI	156	36	-77
1	Basavana Bagewadi	156	38	-75
2	Huvin Hippargi	151	24	-84
3	Managuli	146	45	-69
133	Vijayapura	159	27	-83
1	Vijayapura	159	16	-90
2	Nagathan	107	43	-59
134	Indi	121	39	-68

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
1	Indi	121	31	-75
2	Ballolli	113	47	-59
135	Muddebihal	169	26	-84
1	Muddebihal	169	24	-86
2	Dhavalagi	158	33	-79
3	Nalatvad	163	22	-87
136	Sindgi	128	24	-81
1	Sindhagi	128	24	-81
137	Babaleshwara	144	29	-80
1	Babaleshwara	144	31	-79
2	Mamdapur	143	26	-82
138	Chadachana	108	77	-28
1	Chadchan	108	77	-29
139	Nidagundi	139	19	-86
1	Nidagundi	139	18	-87
2	Basavana Bagewadi	147	12	-92
3	Huvin Hippagi	149	18	-88
4	Muddebihal	138	36	-74
5	Dhavalagi	146	45	-70
140	Talikote	148	42	-72
1	Talikoti	148	45	-70
2	Devarhipargi	134	27	-80
3	Dhavalagi	151	52	-66
4	Huvinippargi	142	40	-72
141	Tikota	93	44	-53
1	Tikota	93	44	-53
142	Kolhara	151	32	-79
1	Kolhar	151	32	-79
143	Devara Hippagi	132	31	-76
1	Devar Hippagi	132	32	-76
2	Huvinhiprgi	138	29	-79
144	Almela	124	21	-83
1	Almel	124	21	-83
20	GADAG	147	50	-66
145	Gadag	159	53	-67
1	Gadag	159	60	-62
2	Betageri	158	47	-70
146	Mundargi	143	65	-54
1	Mundargi	143	43	-70
2	Dambal	116	78	-33
147	Naragund	131	39	-70

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
1	Naragund	131	52	-60
2	Konnur	136	22	-84
148	Ron	154	42	-73
1	Ron	154	45	-71
2	Hole Alur	142	30	-79
3	Nargil	149	59	-61
149	Shirahatti	173	36	-79
1	Shirahatti	173	36	-79
150	Gajendragad	143	39	-73
1	Rona	143	28	-80
2	Nargil	147	42	-71
151	Laxmeshwar	147	51	-65
1	Laxmeshwar	147	51	-65
21	HAVERI	166	51	-69
152	Byadgi	147	39	-73
1	Byadgi	147	33	-78
2	Kaginelli	166	48	-71
153	Hanagal	167	56	-67
1	Hangal	167	46	-72
2	Akki Alur	167	51	-69
3	Bommanhalli	172	70	-59
154	Haveri	173	34	-80
1	Haveri	173	40	-77
2	Guttal	161	33	-80
3	Karajgi	163	31	-81
155	Hirekerur	176	36	-80
1	Hirekerur	176	38	-78
2	Haunsbhavi	187	34	-82
156	Ranebennur	148	51	-66
1	Ranebennur	148	26	-82
2	Kuppelur	168	74	-56
3	Meddleri	158	58	-64
157	Savanur	153	33	-79
1	Savanur	153	26	-83
2	Hatti Mattur	159	38	-76
158	Shiggaon	166	61	-63
1	Shiggaon	166	56	-67
2	Bankapur	168	66	-61
3	Dhundsi	168	62	-63
159	Ratteehalli	190	100	-48
1	Rattihalli	190	108	-43

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
2	Hirekerur	177	67	-62
22	DHARWAD	148	63	-58
160	Dharwad	153	70	-54
1	Dharwad	153	93	-39
2	Aminbhavi	148	35	-76
3	Garag	143	70	-51
161	Hubballi	155	56	-64
1	Chabbi	155	74	-52
2	Shirguppi	151	45	-70
162	Kalghatgi	166	74	-55
1	Kalghatgi	166	79	-52
2	Dummavada	154	76	-51
3	Tabkad Honnihalli	161	65	-60
163	Kundgol	151	84	-44
1	Kundgol	151	83	-45
2	Saunshi	154	85	-45
164	Navalgund	129	33	-74
1	Moraba	129	33	-74
165	Hubballi Nagara	164	56	-66
1	Hubballi Urban	164	56	-66
166	Alnavara	139	70	-50
1	Alnavar	139	70	-50
167	Annigeri	138	47	-66
1	Annigeri	138	47	-66
23	SHIVAMOGGA	205	146	-29
168	Bhadravathi	174	121	-31
1	Bhadravathi_1	174	146	-16
2	Bhadravathi_2	185	185	0
3	Hole Honnuru_1	189	123	-35
4	Hole Honnuru_3	183	111	-39
5	Hole Honnuru_2	183	105	-42
6	Kudligere	184	81	-56
169	Hosanagara	223	211	-5
1	Hosanagar	223	195	-12
2	Huncha	207	224	9
3	Kerehalli	208	158	-24
4	Nagar	293	246	-16
170	Sagara	210	166	-21
1	Sagar	210	123	-42
2	Anandapuram	197	138	-30
3	Baragadde	215	182	-16

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
4	Anahalli	220	210	-5
5	Karauru	260	181	-31
6	Talguppa	190	163	-14
171	Shikaripura	155	88	-43
1	Shikaripur	155	80	-48
2	Anjanapura	175	113	-35
3	Husuru	170	120	-30
4	Udagani	160	66	-59
5	Talagunda	162	40	-75
172	Shivamogga	186	135	-27
1	Shivamogga_2	186	110	-41
2	Shivamogga_1	183	119	-35
3	Haranahalli	172	157	-9
4	Holalur_1	185	136	-26
5	Holalur_2	191	138	-28
6	Kumsi	149	93	-38
7	Nidige_1	190	173	-9
8	Nidige_2	196	127	-35
9	Ayanuru	174	170	-2
173	SORABA	178	64	-64
1	Sorab	178	73	-59
2	Anavatti	169	23	-87
3	Chandragutti	184	99	-46
4	Jade	167	50	-70
5	Kuppagadde	172	30	-82
6	Ulvi	181	90	-50
174	Tirthahalli	198	182	-8
1	Thirthahalli	198	215	9
2	Agrahara	211	192	-9
3	Agumbe	356	258	-28
4	Mandagadde	192	120	-38
5	Malur	201	127	-37
24	HASSAN	220	197	-10
175	Alur	207	233	13
1	Alur	207	192	-7
2	Kencharman Hoskota	233	283	21
3	Kundur	203	211	4
4	Palya	208	228	9
176	Arkalgud	209	174	-17
1	Arkalgud	209	157	-25
2	Doddamagge	218	159	-27

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
3	Konanuru	218	204	-7
4	Mallipatna	230	168	-27
5	Ramanathapura	217	178	-18
177	Arasikere	215	137	-36
1	Arasikere	215	144	-33
2	Banavara	174	143	-18
3	Gandasi	200	140	-30
4	Javagal	205	147	-28
5	Kanakatte	208	117	-44
178	Belur	239	181	-24
1	Belur	239	190	-21
2	Arehalli	236	233	-1
3	Bikkodu	228	217	-4
4	Halebeedu	213	131	-39
5	Madihalli	222	153	-31
179	Channarayapatna	219	158	-28
1	Channarayapatna	219	152	-30
2	Baguru	241	139	-42
3	Dandiganahalli	201	160	-21
4	Hirisave	234	184	-21
5	Nuggehalli	199	148	-25
6	Shravan Belgola	204	168	-18
180	Hassan	222	154	-31
1	Hassan	222	169	-24
2	Dudda	210	109	-48
3	Katty	151	173	14
4	Salagame	191	182	-5
5	Shantigrama	180	152	-15
181	Holenarasipura	234	199	-15
1	Holenarasipur	234	219	-6
2	Halekote	205	192	-6
3	Halli Mysore	225	191	-15
182	Sakaleshpura	244	359	47
1	Sakaleshpur	244	356	46
2	Balegodu	228	277	22
3	Hanbalu	236	381	62
4	Hettur	257	433	69
5	Yaslur	231	268	16
25	CHIKKAMAGALURU	221	199	-10
183	CHIKKAMAGALURU	206	159	-23
1	Chikkamagaluru	206	134	-35

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
2	Amble	214	181	-16
3	Aldur	236	216	-8
4	Sangmeswrpet	236	197	-16
5	Lakya	217	150	-31
6	Avathi	226	166	-27
7	Jagar	211	121	-43
8	Vasthare	224	198	-12
184	Kadur	206	185	-10
1	Kadur	206	218	6
2	Birur	195	166	-15
3	Hirenalluru	166	272	64
4	Sakkarepatna	202	148	-27
5	Shingatagere	192	201	5
6	Yagati	183	186	2
7	Panchanahalli	202	165	-18
185	Koppa	214	200	-6
1	Koppa	214	156	-27
2	Hariharpur	209	186	-11
3	Meguda	244	247	1
186	Mudigere	267	275	3
1	Mudigere	267	227	-15
2	Bankal	283	307	9
3	Gonibidu	242	222	-8
4	Baluru	291	344	18
187	Narasimharajapura	178	155	-13
1	Narasimharajapur	178	134	-25
2	Balehonnur	243	180	-26
188	Sringeri	269	279	4
1	Sringeri	269	209	-22
2	Kigga	284	301	6
189	Tarikere	198	126	-37
1	Tarikere	198	112	-44
2	Amrutapur	191	147	-23
3	Lakavalli	219	99	-55
4	Lingadahalli	194	138	-29
190	Ajjampura	151	209	38
1	Ajjampura	151	185	22
2	Chowlahiriyur	182	252	38
3	Shivani	148	209	41
4	Amrutpura	163	144	-11
5	Hirenalluru	161	226	40

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
191	Kalasa	299	388	30
1	Kalasa	299	388	30
26	KODAGU	288	259	-10
192	Madikeri	292	324	11
1	Madikeri	292	322	10
2	Bhagamandala	465	345	-26
3	Napoklu	297	270	-9
4	Sampaje	418	376	-10
193	Somwarpet	252	270	7
1	Somwarpet	252	253	0
2	Kodlipet	223	197	-12
3	Sanivarsante	227	156	-31
4	Santhahalli	262	390	49
5	Suntikoppa	213	291	37
194	Virajpet	291	288	-1
1	Virajpet	291	278	-5
2	Ammati	264	301	14
195	Kushalanagara	207	196	-5
1	Kushalnagar	207	196	-5
196	Ponnampete	243	182	-25
1	Ponnampet	243	194	-20
2	Blale	242	109	-55
3	Hudakere	257	150	-42
4	Srimangala	249	214	-14
27	DAKSHINA KANNADA	376	549	46
197	Beltangadi	395	562	42
1	Belthangady	395	452	14
2	Kokkada	437	666	53
3	Venur	369	592	61
198	Bantwal	330	549	66
1	Bantwal	330	598	81
2	Pane Mangalore	336	555	65
3	Vittal	371	503	35
199	Mangaluru	284	325	14
1	Mangaluru_A	284	340	20
2	Gurpur	311	339	9
3	Suratkal	309	301	-3
200	Puttur	393	590	50
1	Puttur	393	594	51
2	Uppinangadi	429	574	34
201	Sulya	393	546	39

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
1	Sullia	393	541	38
2	Panaje	408	557	36
202	Mudabidri	342	462	35
1	Mudbidri	342	462	35
203	Kadaba	417	697	67
1	Kadaba	417	742	78
2	Panaje	425	608	43
3	Uppinangadi	347	664	91
204	Mulki	303	298	-2
1	Mulki	303	298	-2
205	Mangaluru (Ullala)	284	490	73
1	Mangaluru_B	305	490	61
28	UDUPI	312	316	1
206	Karkala	438	479	9
1	Karkala	438	461	5
2	Ajekar	375	511	36
207	Kundapur	233	224	-4
1	Kundapur	233	211	-9
2	Vandse	260	231	-11
208	Udupi	281	279	-1
1	Udupi	281	283	1
2	Brahmavara	318	270	-15
209	Bynduru	267	230	-14
1	Bainduru	267	230	-14
210	Bramhvara	315	235	-25
1	Brahmavara	315	259	-18
2	Kota	240	211	-12
211	Kapu	303	295	-3
1	Kapu	303	295	-3
212	Hebri	331	478	44
1	Ajekar	331	496	50
2	Kundapur	311	414	33
29	UTTARA KANNADA	187	126	-32
213	Ankola	230	154	-33
1	Ankola	230	151	-35
2	Belikere	226	120	-47
3	Basagod	234	200	-14
4	Blale	237	181	-24
214	Bhatkal	281	162	-42
1	Susgadi	281	146	-48
2	Mavalli	257	181	-29

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
215	Haliyal	135	81	-40
1	Haliyal	135	105	-22
2	Murkvad	130	84	-35
3	Sambrani	131	65	-50
4	Dandeli	134	115	-15
216	Honnavar	254	184	-28
1	Honnavar	254	155	-39
2	Manki	240	203	-16
3	Mavinakurvei	240	189	-21
217	Karwar	219	164	-25
1	Baad	219	171	-22
2	Ghadasaya	199	180	-9
3	Kinnar	208	148	-29
4	Savantvada	214	122	-43
218	Kumta	229	162	-29
1	Kumta	229	182	-20
2	Gokarna	246	195	-21
3	Kujahalli	225	169	-25
4	Mirjan	232	144	-38
219	Mundgod	197	64	-68
1	Mundgod	197	64	-68
2	Pala	169	64	-62
220	Siddapur	201	145	-28
1	Umbalamani	204	135	-34
2	Siddapura	201	121	-40
3	Kodkani	202	170	-16
221	Sirsi	194	122	-37
1	Sirsi	194	97	-50
2	Banavasi	169	67	-60
3	Hulekal	166	151	-9
4	Sampakanda	201	148	-26
222	Supa	134	142	6
1	Supa	134	139	4
2	Kasalrock	167	149	-11
3	Kumbarawada	154	139	-9
223	Yellapur	176	93	-47
1	Yellapur	176	101	-43
2	Manchikeri	122	87	-29
224	Dandeli	131	103	-21
1	Dhandeli	131	103	-21
30	YADGIR	134	16	-88

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
225	Shahapur	161	16	-90
1	Shahpur	161	12	-93
2	Doranahlli	154	40	-74
3	Gogi	149	9	-94
4	Hayyalbuzurg	150	4	-97
226	Shorapur	151	10	-94
1	Shorapur	151	5	-97
2	Kakkeri	135	3	-98
3	Kembhavi	114	19	-83
227	Yadgir	150	20	-86
1	Yadgir	150	18	-88
2	Balichakra	124	27	-78
3	Hattikuni	141	22	-84
4	Saidapur	111	16	-86
228	Gurumithakala	121	17	-86
1	Gurmitakal	121	22	-82
2	Konakal	122	14	-88
3	Balichakra	119	12	-90
229	Vadagera	104	13	-87
1	Wadagera	104	14	-86
2	Doranahlli	124	16	-87
3	Hayyala Buzurg	139	9	-93
230	Hunisigi	124	13	-90
1	Hunasagi	124	8	-93
2	Kodekal	151	18	-88
3	Kakkera	140	8	-94
31	VIJAYANAGAR	155	40	-74
231	Hosapete	184	25	-87
1	Hospet	184	61	-67
2	Kamalapura	168	27	-84
3	Mariyammanahalli	160	10	-94
232	Hadagali	161	27	-83
1	Hadagali	161	17	-90
2	Hirehadagalli	161	35	-78
3	Ittigi	150	35	-77
233	Hagaribommanahalli	147	20	-86
1	Hagaribommanahalli	147	18	-87
2	Hampa Sagara	149	21	-86
3	Tambarahalli	144	19	-87
4	Kogali	137	22	-84
234	Harappanahalli	190	42	-78

Sl.No	District/Taluk/Hobli	Northeast Monsoon 2023 (1 st October to 31 st December)		
		Normal (mm)	Actual (mm)	%DEP
1	Harapanahalli	190	23	-88
2	Arasikere	154	61	-60
3	Chigateri	156	40	-74
4	Telagi	165	43	-74
235	Kotturu	107	44	-59
1	Kotturu	107	45	-58
2	Kogali	141	33	-76
3	Hoshalli	136	54	-60
236	Kudligi	136	61	-55
1	Kudligi	136	39	-72
2	Gudekote	141	72	-49
3	Hosahalli	141	58	-59
I	1.SIK	202	139	-32
II	2.NIK	140	43	-70
III	3.MALNAD	226	191	-15
IV	4.COASTAL	259	272	6
V	State	182	114	-38

LE : Large Excess (=>60%) E: Excess (20 to +59%) N: Normal (-19 to +19%) D: Deficit (-20 to -59%) D: Large Deficit (-60 to -99%) NR : No Rainfall (-100 %)).

Figure 1.7: District wise Rainfall (mm) pattern during 2023.

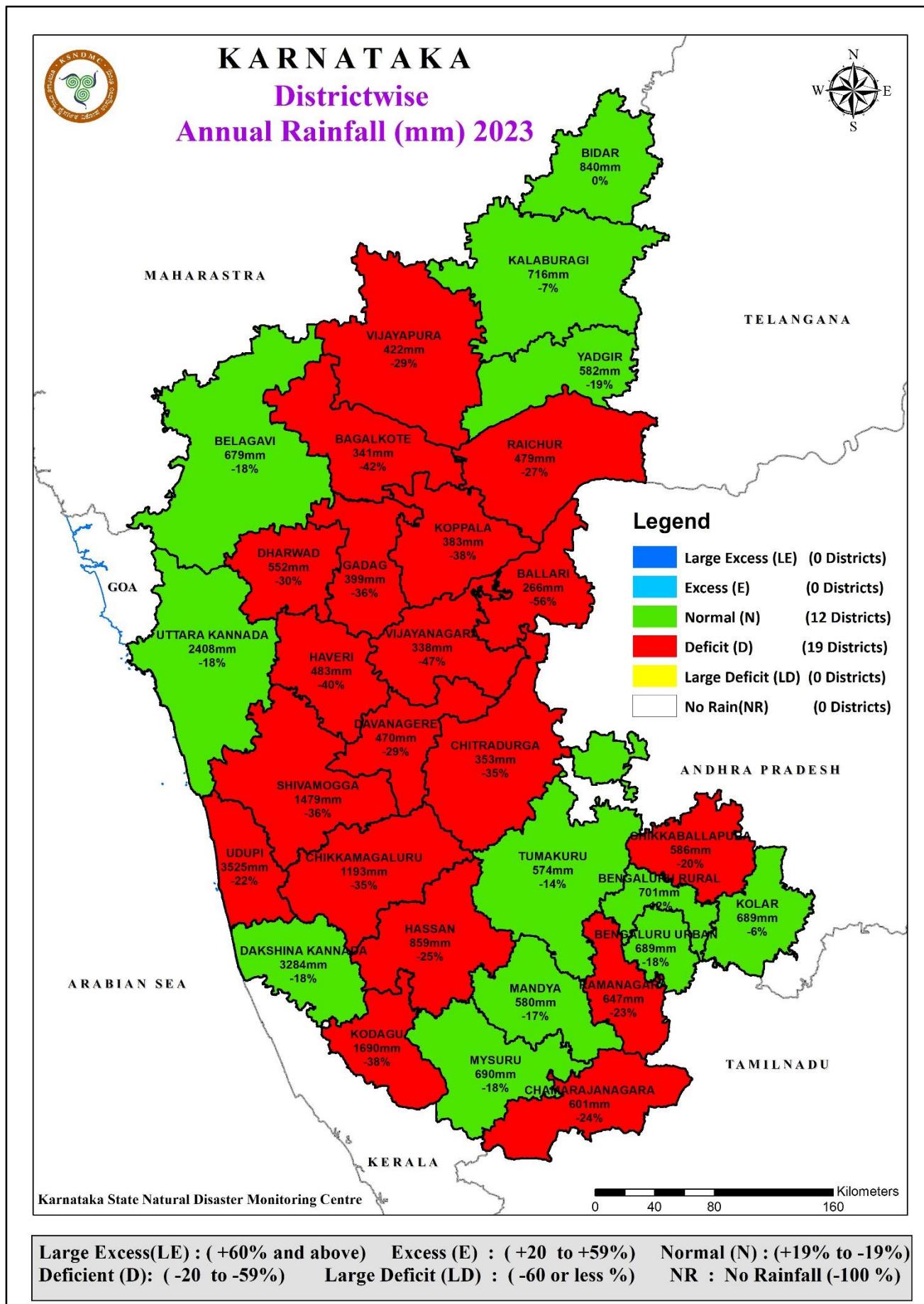


Figure 1.8: Taluk wise Rainfall (mm) pattern during 2023.

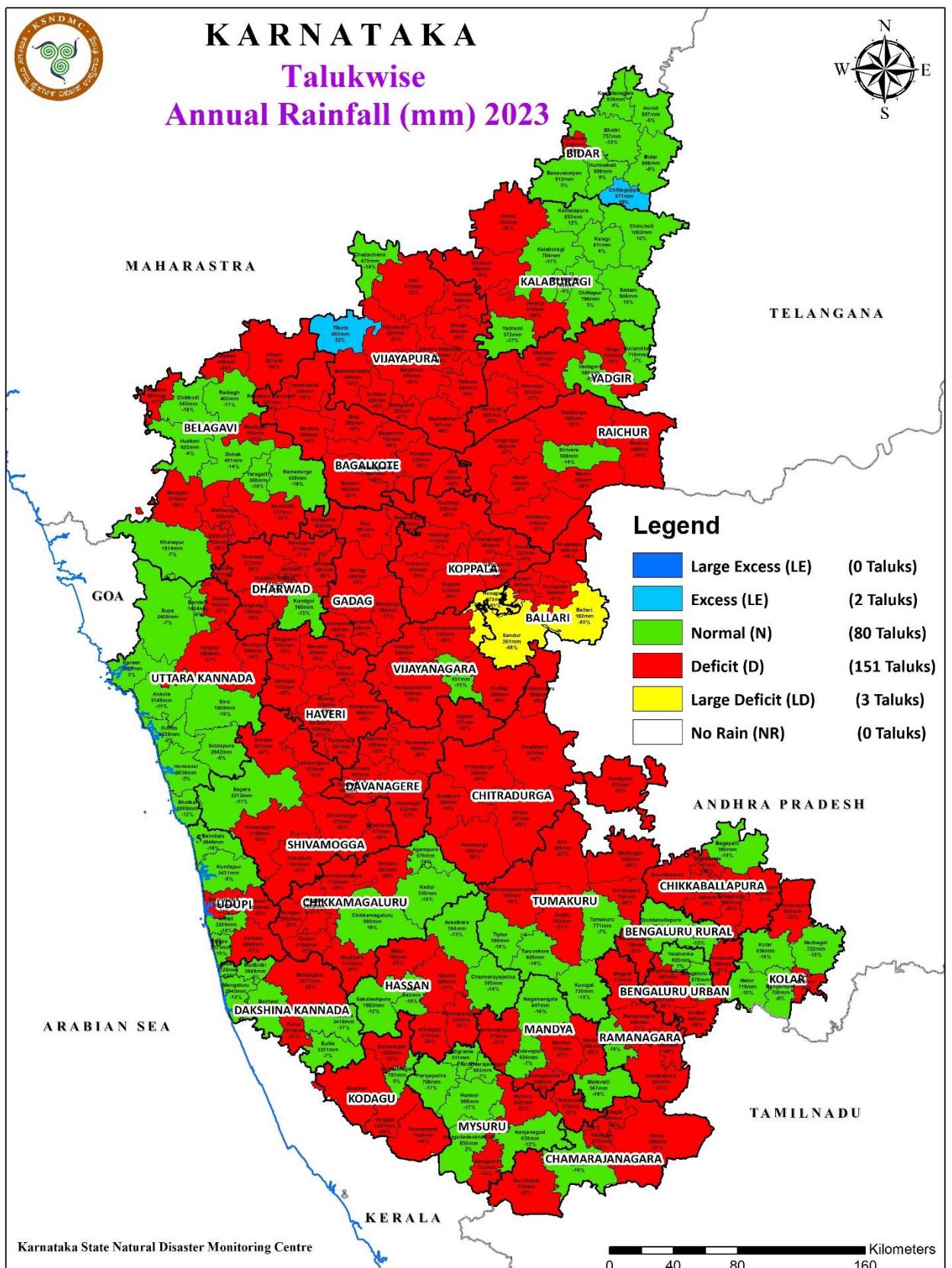
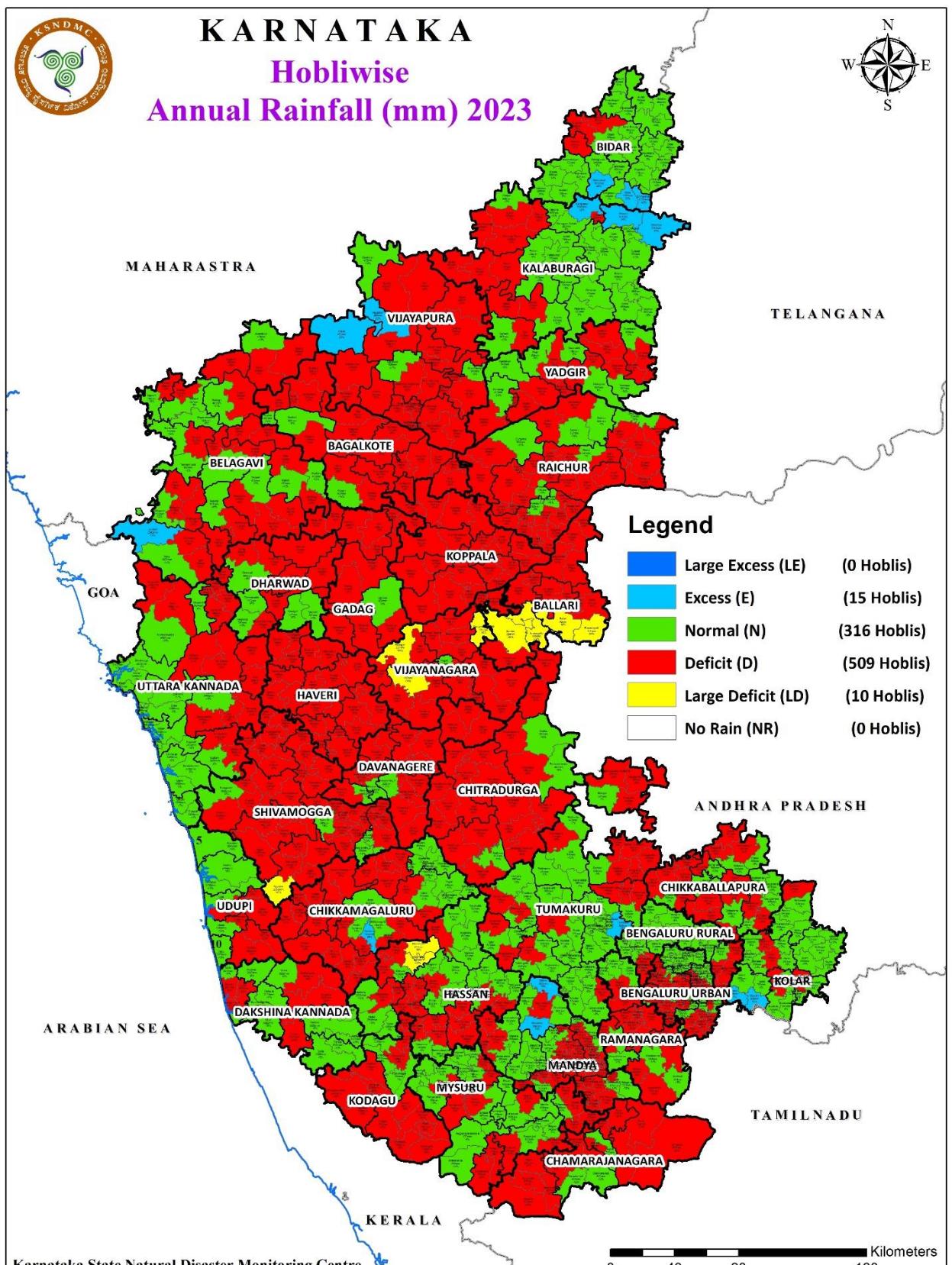


Figure 1.9: Hobli wise Rainfall (mm) pattern during 2023



Large Excess(LE) : (+60% and above)	Excess (E) : (+20 to +59%)	Normal (N) : (+19% to -19%)
Deficient (D): (-20 to -59%)	Large Deficit (LD) : (-60 or less %)	NR : No Rainfall (-100 %)

Table: 1.2: Classification of Taluk wise Rainfall pattern (1st January to 31st December)

Sl.No.	District	Total Taluks \ Hoblis	Large Excess		Excess		Normal		Total		Deficit		Large Deficit		No Rain		Total	
			Taluks	Hoblis	Taluks	Hoblis	Taluks	Hoblis	Taluks	Hoblis	Taluks	Hoblis	Taluks	Hoblis	Taluks	Hoblis	Taluks	Hoblis
1	BENGALURU URBAN	5/49	0	0	0	0	1	10	1	10	4	39	0	0	0	0	4	39
2	BENGALURU RURAL	4/20	0	0	0	1	3	12	3	13	1	7	0	0	0	0	1	7
3	RAMANAGARA	5/20	0	0	0	0	0	3	0	3	5	17	0	0	0	0	5	17
4	KOLAR	6/28	0	0	0	1	4	18	4	19	2	9	0	0	0	0	2	9
5	CHIKKABALLAPURA	6/26	0	0	0	0	2	11	2	11	4	15	0	0	0	0	4	15
6	TUMAKURU	10/53	0	0	0	1	3	30	3	31	7	22	0	0	0	0	7	22
7	CHITRADURGA	6/22	0	0	0	0	0	4	0	4	6	18	0	0	0	0	6	18
8	DAVANAGERE	6/20	0	0	0	0	3	8	3	8	3	12	0	0	0	0	3	12
9	CHAMARAJANAGARA	5/16	0	0	0	0	0	1	0	1	5	15	0	0	0	0	5	15
10	MYSURU	9/33	0	0	0	0	3	5	3	5	6	28	0	0	0	0	6	28
11	MANDYA	7/49	0	0	0	1	0	5	0	6	7	41	0	2	0	0	7	43
	South Interior Karnataka	69/336	0	0	0	4	19	107	19	111	50	223	0	2	0	0	50	225
12	BALLARI	5/15	0	0	0	0	0	2	0	2	3	9	2	4	0	0	5	13
14	KOPPALA	7/20	0	0	0	0	0	2	0	2	7	18	0	0	0	0	7	18
15	RAICHUR	7/40	0	0	0	0	4	18	4	18	3	22	0	0	0	0	3	22
16	KALABURAGI	11/36	0	0	1	5	7	19	8	24	3	12	0	0	0	0	3	12
18	BIDAR	8/30	0	0	1	3	4	21	5	24	3	6	0	0	0	0	3	6
19	BELAGAVI	15/38	0	0	0	1	11	26	11	27	4	11	0	0	0	0	4	11
20	BAGALKOTE	9/22	0	0	0	0	0	2	0	2	9	20	0	0	0	0	9	20
21	VIJAYAPURA	13/28	0	0	1	2	2	3	3	5	10	22	0	1	0	0	10	23
22	GADAG	7/13	0	0	0	0	3	4	3	4	4	9	0	0	0	0	4	9
23	HAVERI	8/20	0	0	0	0	2	3	2	3	6	17	0	0	0	0	6	17
24	DHARWAD	8/14	0	0	0	0	3	7	3	7	5	7	0	0	0	0	5	7
17	YADGIR	6/20	0	0	0	1	4	13	4	14	2	6	0	0	0	0	2	6
13	VIJAYANAGAR	6/20	0	1	0	0	1	5	1	6	5	11	0	3	0	0	5	14
	North Interior Karnataka	110/316	0	1	3	12	41	125	44	138	64	170	2	8	0	0	66	178
25	SHIVAMOGGA	7/41	0	0	0	0	2	3	2	3	5	37	0	1	0	0	5	38
26	HASSAN	8/38	0	0	0	1	3	8	3	9	5	27	0	2	0	0	5	29
27	CHIKKAMAGALURU	9/36	0	0	1	4	1	4	2	8	7	25	0	3	0	0	7	28
28	KODAGU	5/16	0	0	0	0	1	4	1	4	4	11	0	1	0	0	4	12
	Malnad	29/131	0	0	1	5	7	19	8	24	21	100	0	7	0	0	21	107
29	DAKSHINA KANNADA	7/19	0	0	0	0	6	10	6	10	3	9	0	0	0	0	3	9
30	UDUPI	7/12	0	0	0	0	4	6	4	6	3	6	0	0	0	0	3	6
31	UTTARA KANNADA	12/36	0	0	0	0	9	23	9	23	3	13	0	0	0	0	3	13
	Coastal	28/67	0	0	0	0	19	39	19	39	9	28	0	0	0	0	9	28
	STATE	236/850	0	1	4	21	86	290	90	312	144	521	2	17	0	0	146	538

1.4 SEASONAL RAINFALL DURING 2023

1.4.1. PRE-MONSOON SEASON RAINFALL:

Pre-Monsoon covers five months from January to May of which January and February pertain to winter season while the later three months (March to May) represent hot weather period. The amount of Normal Pre-Monsoon rainfall for the State is **120 mm** which constitutes only **10%** of the annual rainfall. The Normal Pre-Monsoon rainfall varies from **63 mm** in **Vijayapura** district to **253 mm** in **Kodagu** district. The Normal rainfall for the State during **January to March** is only **13 mm**, whereas the same during **April and May** are **32 mm** and **74 mm** respectively.

1.2 Rainfall pattern during Pre-Monsoon-2023

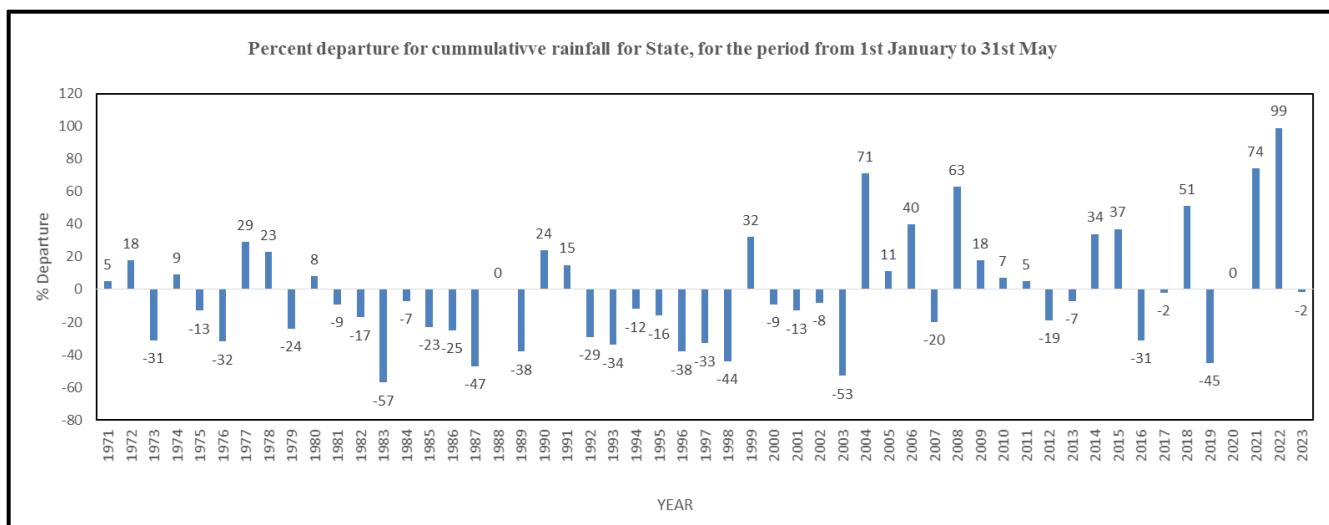
During Pre-Monsoon season 2023 the state as a whole recorded an actual amount of **117.4 mm** of rainfall as against the Normal rainfall of **120 mm** with percentage departure from Normal being **(-2%)**. Thus the State as whole is classified under **Normal Category**.

The comparison of Zone wise rainfall pattern during the period from **Pre- Monsoon 2023** with the rainfall of corresponding week in the last **4** years is as follows

Region/State	Normal (mm)	2019		2020		2021		2022		2023	
		Actual (mm)	Dep%	Actual (mm)	Dep%	Actual (mm)	Dep%	Actual (mm)	Dep%	Actual (mm)	Dep%
1.SIK	143.3	121	-20	168	17	180.7	26	283.8	98	163.5	14
2.NIK	83.2	38	-60	81	-2	121.5	46	152.6	83	95.4	15
3.MALNAD	167.5	90	-51	183	9	338.2	102	355.2	112	132.2	-21
4.COASTAL	158.2	44	-74	149	-6	514.7	225	340.8	115	62.2	-61
State	120	71	-45	120	0	207	74	238	99	117.4	-2

The percentage departure of rainfall from Normal for the state during Pre-Monsoon which is **good** when compared to the corresponding period of **last 4** years.

The percentage departure of rainfall from Normal for the state as a whole, during the period **Pre-Monsoon** since 1971, in given figure below:



The figure shows that the percentage departure of rainfall from **Normal** for the **State** which is **less** in the corresponding period of **last 3 years**.

District wise Rainfall pattern during Pre-Monsoon 2023 is given in the following :
(Total 31 Districts in the State):

SI. No.	District	Normal	Actual	% Dep
1	Bidar	70.9	201.0	183
2	Kalaburagi	67.0	125.3	87
3	Kolar	117.2	213.5	82
4	Raichur	68.5	111.3	62
5	Yadgir	67.5	97.8	45
6	Vijayapura	62.8	89.3	42
7	Tumakuru	124.9	172.0	38
8	Bengaluru Urban	156.1	209.5	34
9	Chikkaballapura	108.1	143.7	33
10	Ramanagara	177.5	213.8	20
11	Bengaluru Rural	141.3	164.0	16
12	Chamarajanagara	203.4	225.7	11
13	Hassan	168.3	177.8	6
14	Mandya	166.2	175.3	5
15	Mysuru	205.2	211.5	3
16	Belagavi	94.8	86.9	-8
17	Bagalkote	79.8	70.3	-12
18	Koppala	81.7	66.8	-18
19	Chikkamagaluru	164.3	125.3	-24
20	Ballari	74.4	55.7	-25
21	Dharwad	125.4	90.6	-28
22	Chitradurga	103.3	74.6	-28
23	Haveri	121.5	83.1	-32
24	Kodagu	252.8	168.5	-33
25	Shivamogga	129.0	84.0	-35
26	Vijayanagar	98.6	63.3	-36
27	Davanagere	105.0	65.9	-37
28	Gadag	105.5	64.5	-39
29	Dakshina Kannada	242.5	119.4	-51
30	Uttara Kannada	103.0	38.9	-62
31	Udupi	200.8	53.4	-73
	STATE	120	117.4	-2

The district wise rainfall pattern indicates: (**Total 31 Districts in the State**):

Rainfall category	No. of Districts
Large Excess (>=60%)	4 Districts
Excess (+20 to +59%)	6 Districts
Normal (-19 to +19%)	8 Districts
Deficit (-20 to -59%)	11 Districts
Large Deficit (-60 to -99%)	2 Districts
No rain (<=-100%)	Nil

During **Pre-Monsoon 2023**, the above data shows that, the rainfall was **Large Excess** in **4** Districts, **Excess** in **6** Districts, **Normal** in **8** Districts, **Deficit** in **11** Districts and **Large Deficit** in **2** Districts . During the corresponding period of the preceding year (2022), the rainfall was **Large Excess** in **25** Districts, **Excess** in **5** Districts and **Normal** in **1** District.

41.1.2 Taluk wise Rainfall pattern during Pre-Monsoon 2023 is given in the following table. (**Total 227 Taluks in the State**):

Rainfall category	No. of Taluks
Large Excess (>=60%)	25 Taluks
Excess (+20 to +59%)	34 Taluks
Normal (-19 to +19%)	80 Taluks
Deficit (-20 to -59%)	70 Taluks
Large Deficit (-60 to -99%)	18 Taluks
No rain (<=-100%)	Nil

During **Pre-Monsoon 2023**, the above data shows that, the rainfall was **Large Excess** in **25** Taluks, **Excess** in **34** Taluks, **Normal** in **80** Taluks, **Deficit** in **70** Taluks and **Large Deficit** in **18** Taluks. During the preceding year (2022), the rainfall was **Large Excess** in **160** Taluks, **Excess** in **47** Taluks, **Normal** in **17** Taluks and **Deficit** in **3** Taluks.

The Hobli-wise rainfall pattern during **Pre-Monsoon 2023** is given in the following table (**Total 850 Hoblis in the State**):

Rainfall category	No. of Hoblis
Large Excess (>=60%)	138 Hoblis
Excess (+20 to +59%)	188 Hoblis
Normal (-19 to +19%)	261 Hoblis
Deficit (-20 to -59%)	200 Hoblis
Large Deficit (-60 to -99%)	63 Hoblis
No rain (<=-100%)	Nil

During **Pre-Monsoon 2023**, the above data shows that, the rainfall was **Large Excess** in **628** Hoblis, **Excess** in **146** Hoblis, **Normal** in **54** Hoblis, **Deficit** in **21** Hoblis and **Large Deficit** in **1** Hobli. During the preceding year (2022), the rainfall was **Large Excess** in **628** Hoblis, **Excess** in **146** Hoblis, **Normal** in **54** Hoblis, **Deficit** in **21** Hoblis and **Large Deficit** in **1** Hobli.

Figure 1.10: District wise Rainfall (mm) pattern during the Pre-Monsoon Season 2023

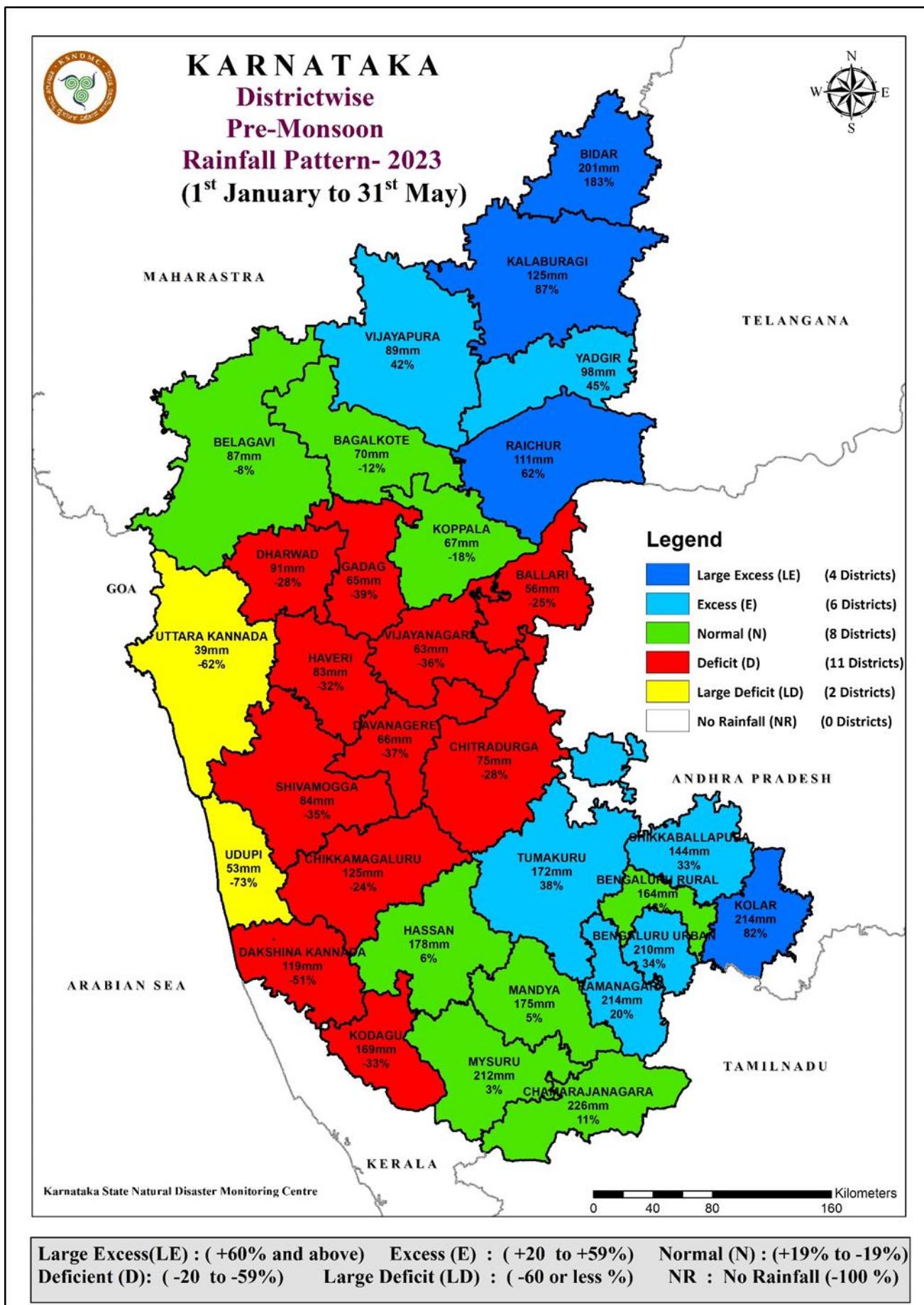


Figure 1.11: Taluk wise Rainfall (mm) pattern during the Pre-Monsoon Season 2023

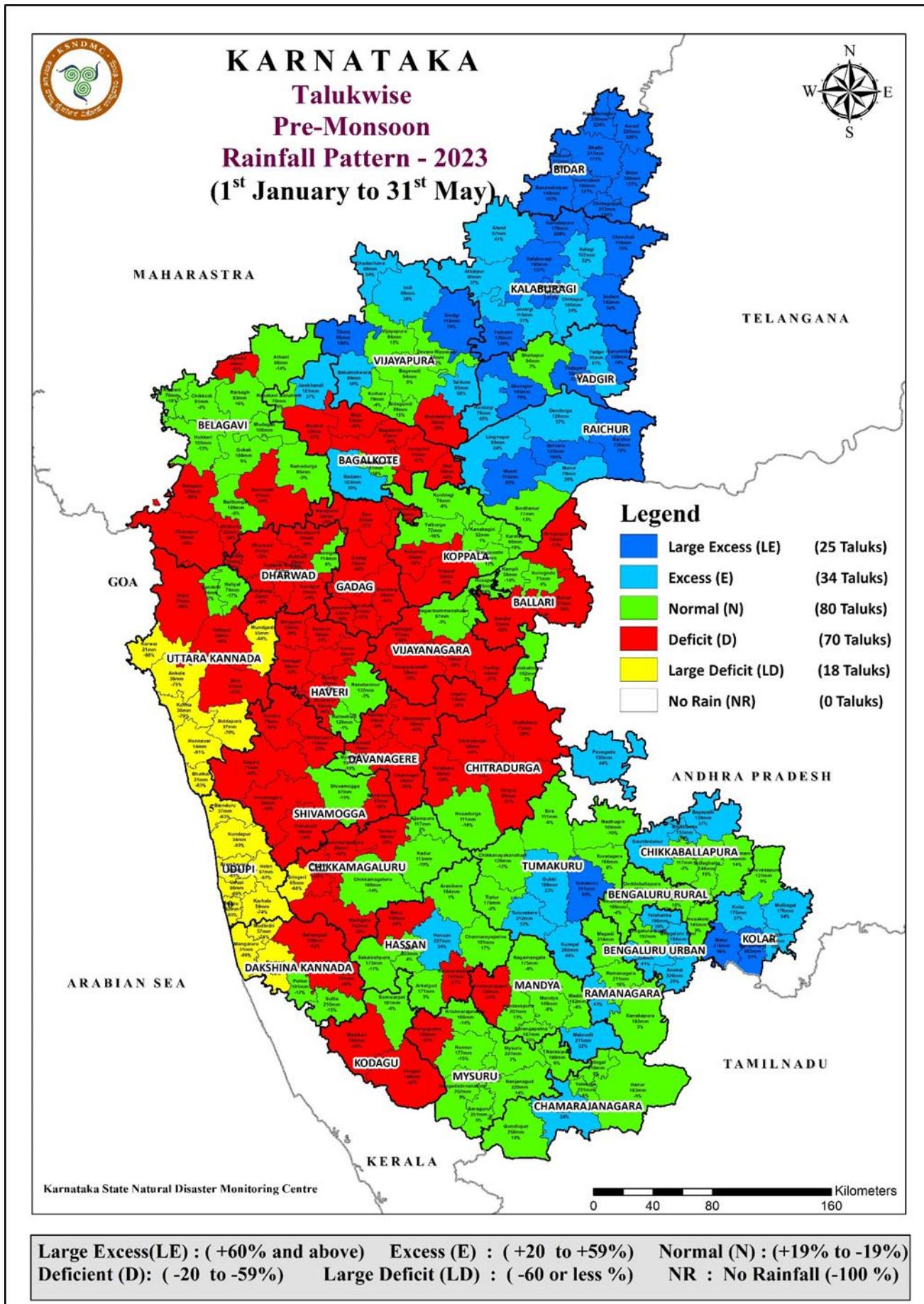
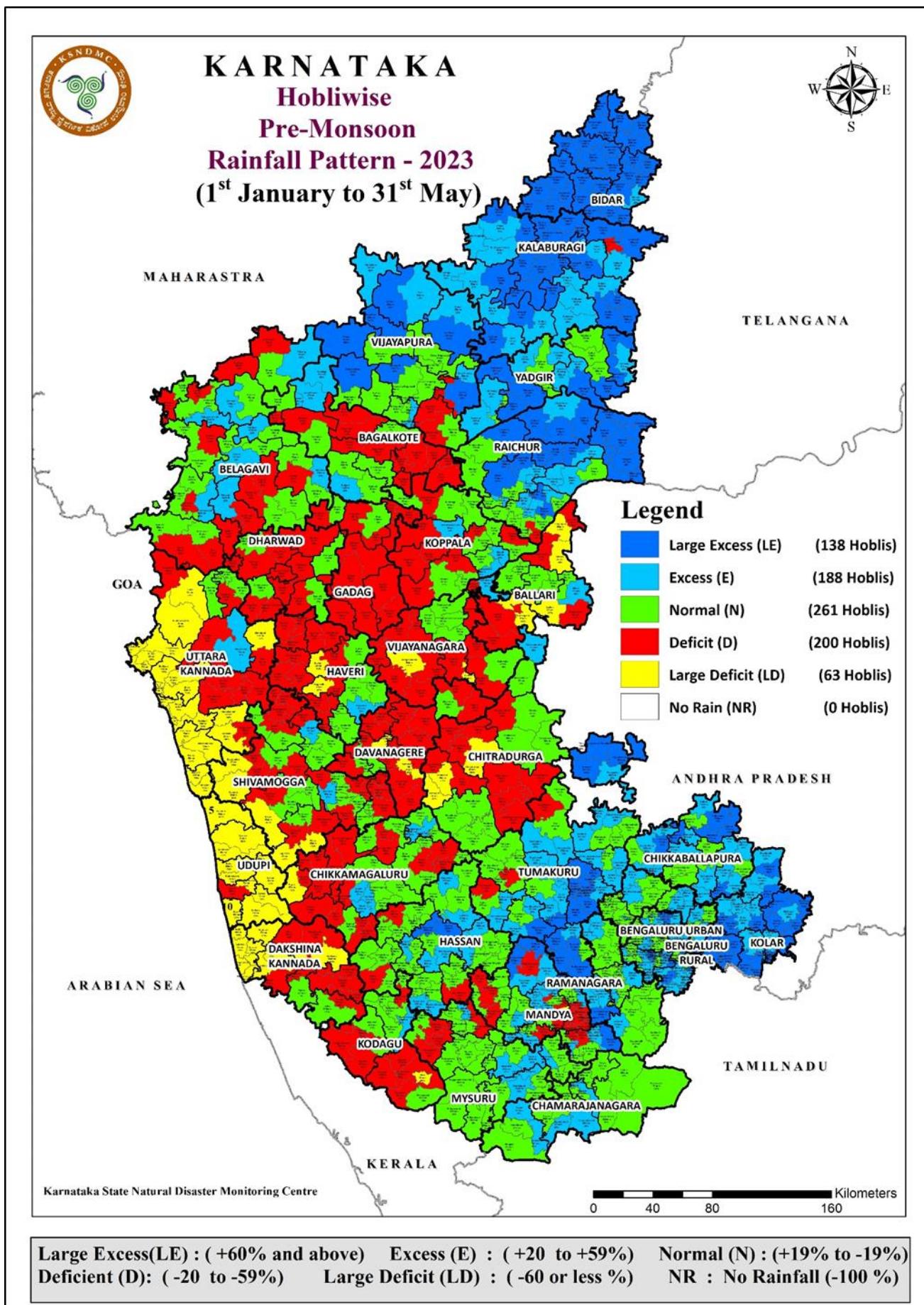


Figure 1.12: Hobli-Wise Rainfall (mm) pattern during the Pre-Monsoon Season 2023



1.4.2. SOUTH WEST (SW) MONSOON SEASON 2023 RAINFALL:

The **South-West (SW) Monsoon (June to September)** contributes **74%** of the Normal Annual rainfall of the State. The onset of **SW-Monsoon** over the State normally takes place by the first week of June. The Normal SW-Monsoon season rainfall varies from as low as **282 mm** in **Chitradurga** District to as high as **4,022 mm** in **Udupi** District. The Kharif agricultural production in the State heavily depends on the timeliness, quantum and distribution of the SW-Monsoon season rainfall.

Rainfall Condition during the South West Monsoon 2023:

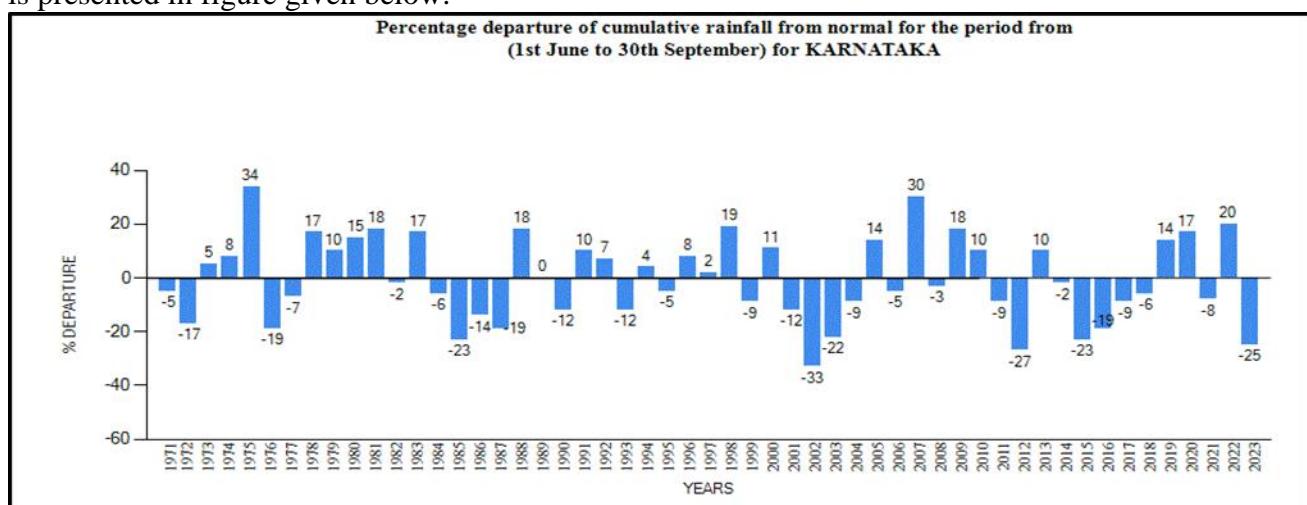
During **South-West season 2023** the State as a whole recorded an actual amount of **642 mm** of rainfall as against the Normal rainfall of **852 mm** with percentage departure from Normal being **(-) 25%**. Thus the State as whole is classified under **Deficit Category**.

The comparision of Zone-wise rainfall pattern during the SW-Monsoon season **2023** with the rainfall of corresponding season in the last 4 years is as follows.

Region/State	Normal (mm)	2019		2020		2021		2022		2023	
		Actual (mm)	% Dep								
1.SIK	369	411.2	11	511.6	39	384.5	4	660	79	271	-26
2.NIK	479	506.4	6	650.1	36	496.1	4	602.2	26	386	-19
3.MALNAD	1556	1833.8	18	1447.7	-7	1283.4	-18	1725	11	956	-39
4.COASTAL	3101	3733.7	20	3457.8	12	2692	-13	3107	0	2514	-19
State	852	975	14	992.6	17	787.2	-8	1019	20	642	-25

The percentage departure of rainfall from normal during **1st June to 30th September 2023** is **(-) 25%** which is **bad** when compared to the corresponding period of last year.

The percentage departure of rainfall from Normal during South-West Monsoon for the state as a whole is presented in figure given below:



The figure shows that the percentage departure of cumulative rainfall from the Normal for the State, during the **1st June to 30th September 2023** is **(-) 25%**, which is **relatively less** than the cumulative rainfall for the corresponding period of last year.

District wise Rainfall pattern during South-West Monsoon 2023

SL. No.	District	Normal	Actual	Percentage Departure
1	Kalaburagi	576	549	-5
2	Bidar	650	595	-9
3	Bengaluru Rural	444	406	-9
4	Yadgir	517	468	-10
5	Kolar	399	355	-11
6	Belagavi	599	520	-13
7	Uttara Kannada	2647	2244	-15
8	Tumakuru	358	297	-17
9	Chikkaballapura	416	334	-20
10	Raichur	440	346	-21
11	Udupi	4022	3156	-22
12	Davanagere	393	308	-22
13	Dharwad	514	399	-22
14	Dakshina Kannada	3388	2616	-23
15	Gadag	372	285	-23
16	Vijayapura	396	297	-25
17	Koppala	383	269	-30
18	Bengaluru Urban	471	324	-31
19	Haveri	512	350	-32
20	Mandya	316	213	-33
21	Bagalkote	362	242	-33
22	Chitradurga	282	183	-35
23	Hassan	754	484	-36
24	Mysuru	419	267	-36
25	Ramanagara	436	278	-36
26	Chamarajanagara	320	202	-37
27	Shivamogga	1991	1251	-37
28	Vijayanagar	389	235	-40
29	Chikkamagaluru	1447	872	-40
30	Kodagu	2188	1278	-42
31	Ballari	366	187	-49
	State	851.6	642	-25

The District wise rainfall pattern indicates

Rainfall category	Number of District(s)
Large Excess (>=60%)	Nil
Excess (+20 to +59%)	Nil
Normal (-19 to +19%)	8 Districts
Deficit (-20 to -59%)	23 Districts
Large Deficit (-60 to -99%)	Nil
No rain (<=-100%)	Nil

During the corresponding period of the preceding year (2022), the rainfall was **Large Excess** in **8** Districts, **Excess** in **12** Districts and **Normal** in **11** Districts.

Taluk wise cumulative rainfall pattern during 1st June to 30th September 2023 is given in the following table. (**Total 236 Taluks in the State**):

Rainfall category	Number of Taluk(s)
Large Excess (>=60%)	Nil
Excess (+20 to +59%)	4 Taluks
Normal (-19 to +19%)	86 Taluks
Deficit (-20 to -59%)	144 Taluks
Large Deficit (-60 to -99%)	2 Taluks
No rain (<=-100%)	Nil

During the preceding year (2022), the rainfall was **Large Excess** in **75** Taluks, **Excess** in **70** Taluks, **Normal** in **82** Taluks and **Deficit** in **25** Taluks.

The Hobli-wise rainfall pattern during **1st June to 30th September 2023** is given in the following table(**Total 850 Hoblis in the State**):

Rainfall category	Number of Hobli(s)
Large Excess (>=60%)	1 Hobli
Excess (+20 to +59%)	21 Hoblis
Normal (-19 to +19%)	290 Hoblis
Deficit (-20 to -59%)	521 Hoblis
Large Deficit (-60 to -99%)	17 Hoblis
No rain (<=-100%)	Nil

During the preceding year (2022), the rainfall **Large Excess** in **331** Hoblis **Excess** in **259** Hoblis, **Normal** in **246** Hoblis, **Deficit** in **13** Hoblis and **Large Deficit** in **1** Hobli.

Figure 1.14: District wise Rainfall (mm) pattern during the Southwest Monsoon Season 2023:

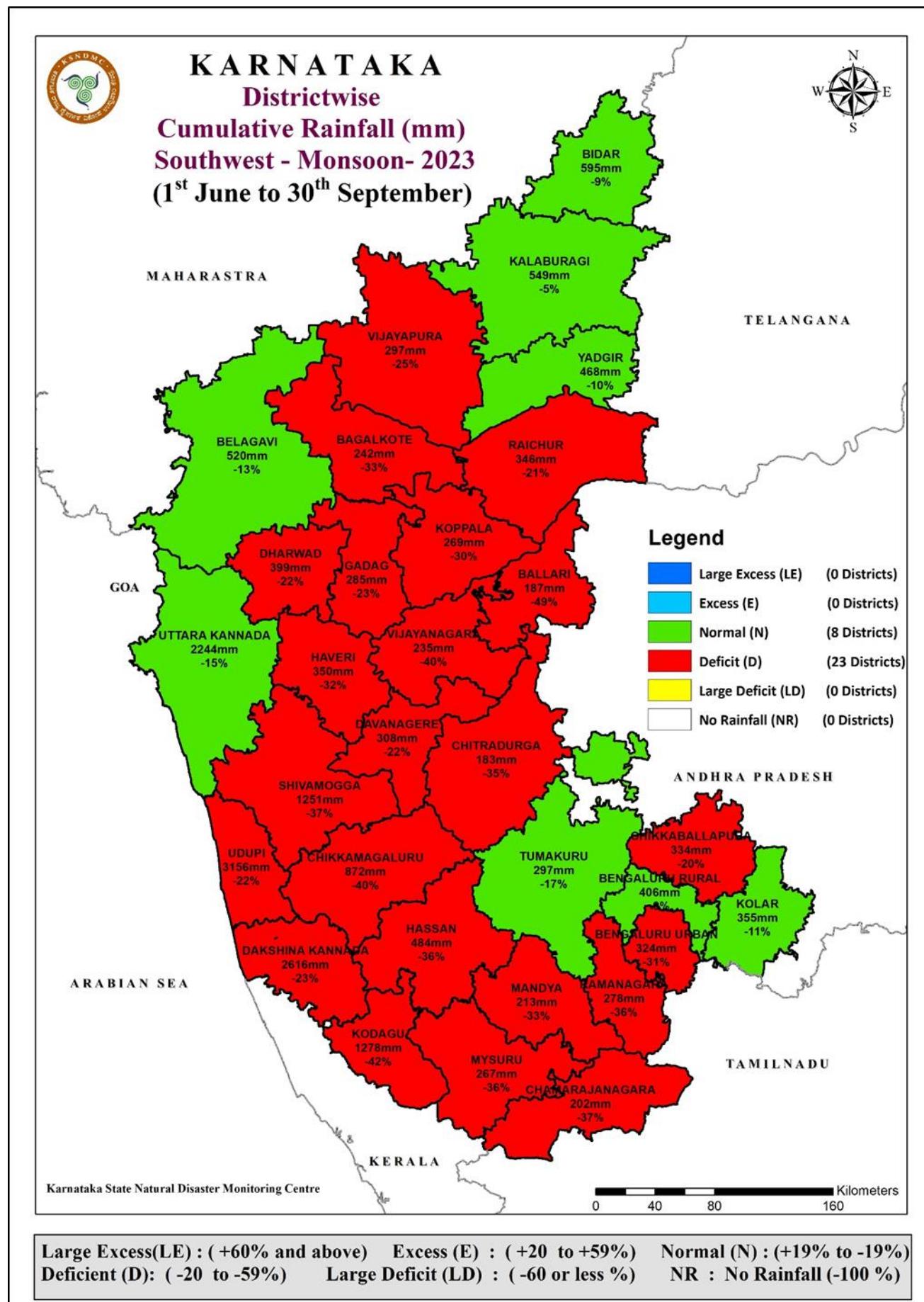
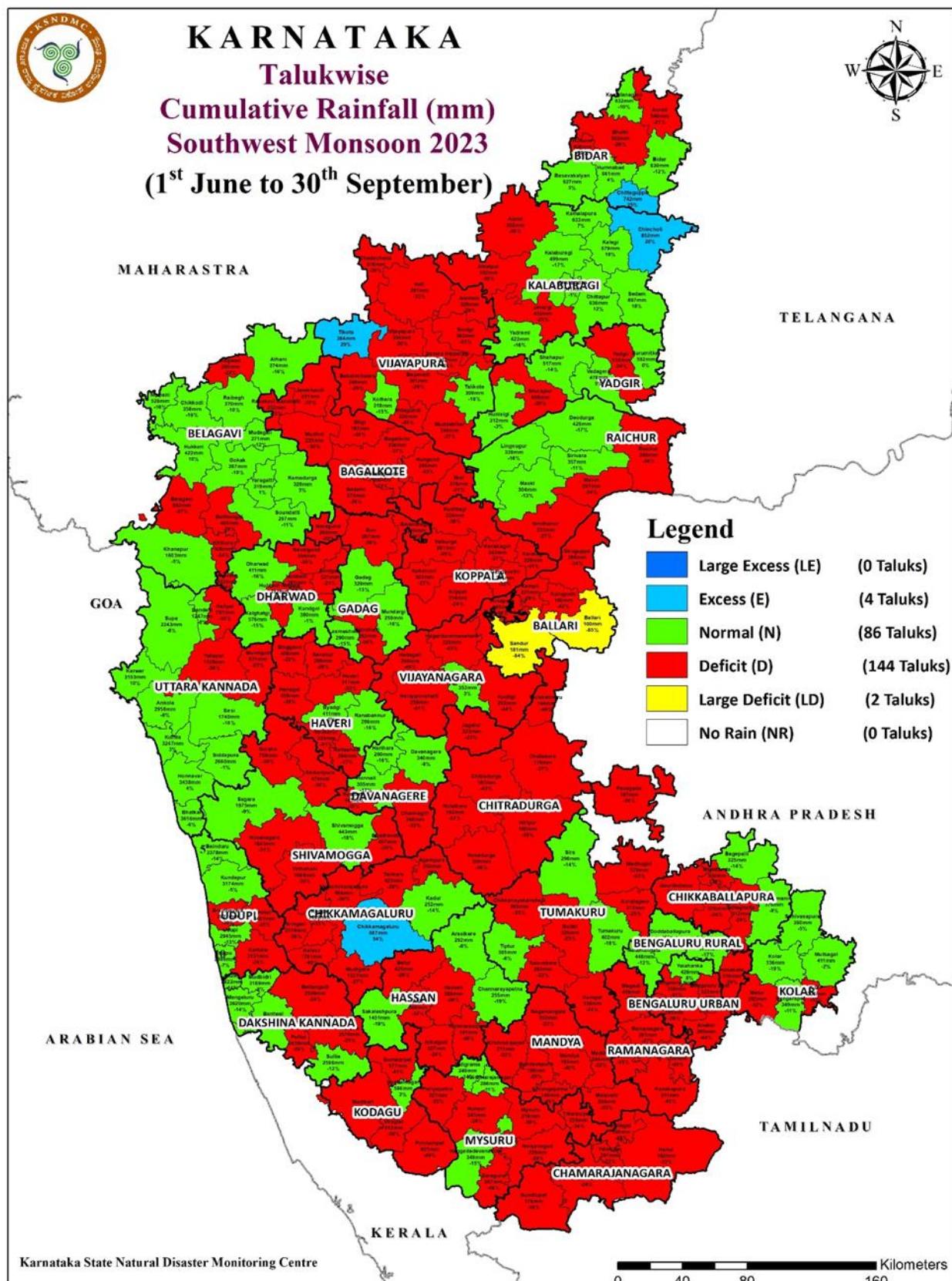
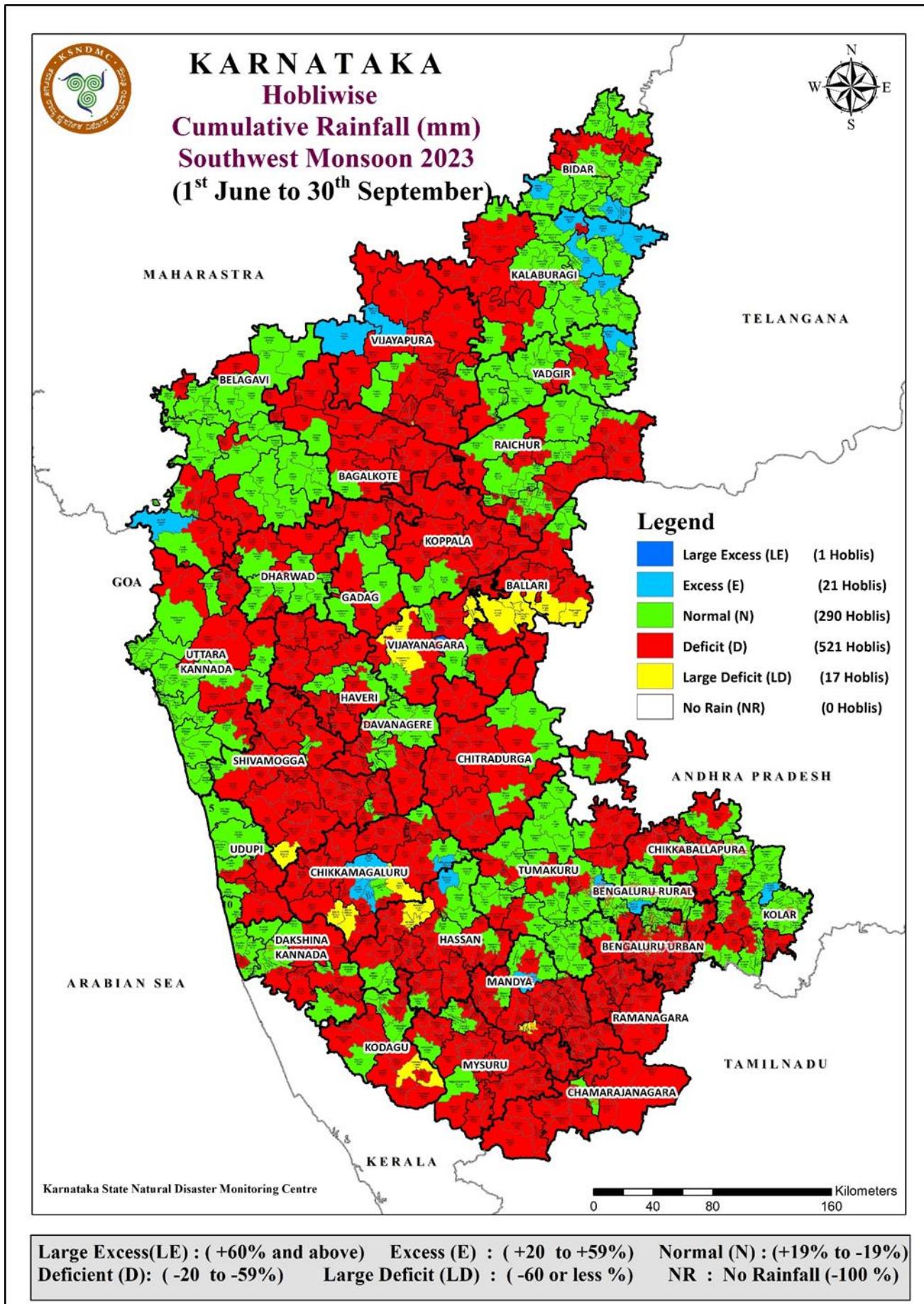


Figure 1.15: Taluk wise Rainfall (mm) pattern during the Southwest Monsoon Season 2023:



Large Excess(LE) : (+60% and above)	Excess (E) : (+20 to +59%)	Normal (N) : (+19% to -19%)
Deficient (D): (-20 to -59%)	Large Deficit (LD) : (-60 or less %)	NR : No Rainfall (-100 %)

Figure 1.16: Hobli-wise Rainfall pattern during the Southwest Monsoon Season 2023:



1.4.3. NORTH EAST (NE) MONSOON RAINFALL:

The **North-East (NE) Monsoon (October to December)** contributes about **16%** of rainfall to the Annual Normal rainfall for the State. Regionally, the NE-Monsoon season rainfall contributes about **8%** to the Annual Normal rainfall in the Coastal area, **12%** in Malnad region, about **20%** in NIK and **29%** in SIK. The rainfall during the NE-Monsoon season is very important for the later stages of Kharif crops and for the Rabi crops as well in the State.

Rainfall during North-East Monsoon season 2023 in the State.

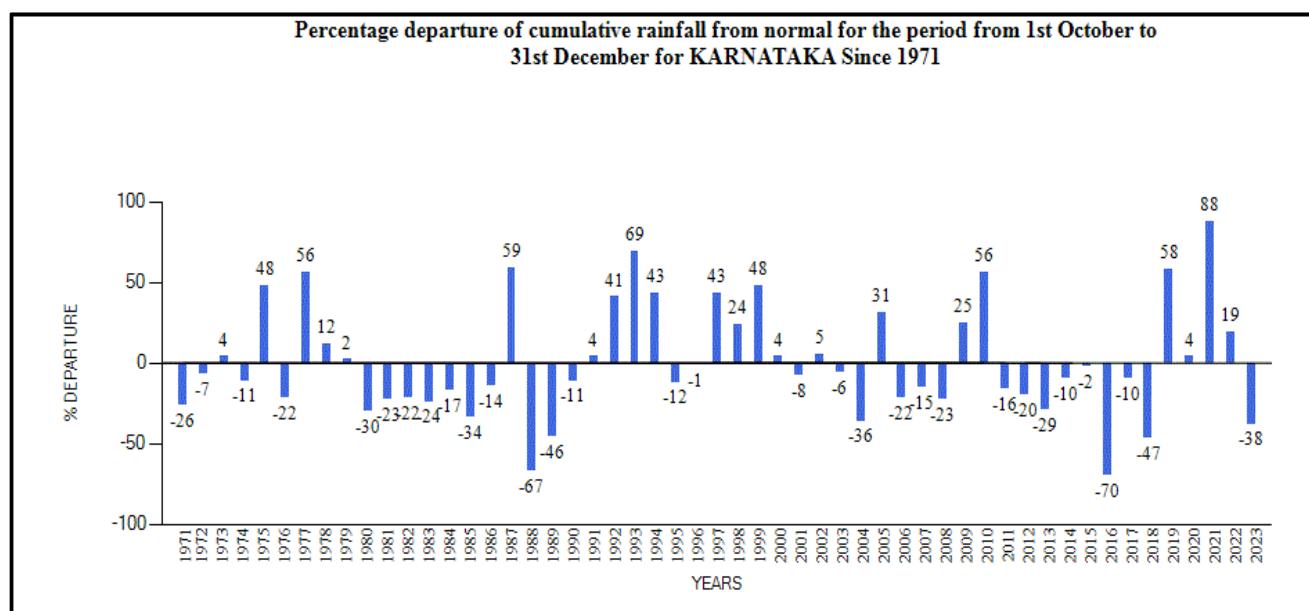
During the period from **1st October 31st December 2023** the State as a whole recorded **114 mm** of Rainfall as against the Normal Rainfall of **182 mm** with (-) **38%** departure from Normal. Thus the State as whole is classified under **Deficit** Rainfall category.

The comparison of Zone-wise Cumulative Rainfall pattern during the period from **1st October to 31st December 2023** is compared to corresponding period of past **4** years and is given below:

Region/State	Normal (mm)	2019		2020		2021		2022		2023	
		Actual (mm)	Dep %	Actual (mm)	Dep %	Actual (mm)	Dep %	Actual (mm)	Dep %	Actual (mm)	Dep %
1.SIK	201.9	287.4	42	196.4	-3	485	140	302	50	139	-32
2.NIK	139.7	201.5	44	150.8	8	162.9	17	160	15	43	-70
3.MALNAD	225.7	376.2	67	207.3	-8	477.8	112	223	-1	191	-15
4.COASTAL	259.4	579.8	124	330	27	577.1	122	224	-14	272	6
State	182.2	287.8	58	190	4	342	88	217	19	114	-38

The percentage departure of Cumulative Rainfall from Normal during **1st October to 31st December 2023** is **(-) 38%** which is **bad** when compared to the corresponding period of **last year**.

The percentage departure of Cumulative Rainfall from Normal, for the State as a whole, during the period from **1st October to 31st December 2023** since 1971, is given below:



The figure shows that the percentage departure of Cumulative Rainfall is (-) **38%** less than the Normal for the State, during the **1st October to 31st December 2023** is and which is **less** the Rainfall of corresponding period of **last year**.

1.2.1 District wise Cumulative Rainfall pattern during 1st October to 31st December 2023 is given in the following Table: (Total 31 Districts in the State):

SL. No.	District	Normal(mm)	Actual(mm)	Percentage Departure
1	Dakshina Kannada	376	549	46
2	Udupi	312	316	1
3	Mysuru	214	215	1
4	Chikkamagaluru	221	199	-10
5	Kodagu	288	259	-10
6	Hassan	220	197	-10
7	Mandy	217	192	-11
8	Shivamogga	205	146	-29
9	Bengaluru Urban	219	156	-29
10	Ramanagara	226	155	-31
11	Uttara Kannada	187	126	-32
12	Chamarajanagara	263	175	-33
13	Chitradurga	155	96	-38
14	Bengaluru Rural	213	131	-38
15	Davanagere	161	97	-40
16	Tumakuru	186	105	-44
17	Kolar	219	120	-45
18	Belagavi	133	72	-46
19	Chikkaballapura	211	108	-49
20	Dharwad	148	63	-58
21	Bidar	117	46	-60
22	Gadag	147	50	-66
23	Kalaburagi	127	42	-67
24	Koppala	149	47	-68
25	Haveri	166	51	-69
26	Vijayapura	133	36	-73
27	Vijayanagar	155	40	-74
28	Bagalkote	141	29	-79
29	Raichur	146	22	-85
30	Ballari	159	24	-85
31	Yadgir	134	16	-88
	State	186	114	-38

The District wise Rainfall pattern indicates:

Rainfall category	No. of Districts
Large Excess (>=60%)	Nil
Excess (+20 to +59%)	1 District
Normal (-19 to +19%)	6 Districts
Deficit (-20 to -59%)	13 Districts
Large Deficit (-60 to -99%)	11 Districts
No rain (<=-100%)	Nil

During the corresponding period of the preceding year (2022), the Rainfall was **Large Excess** in **4** Districts, **Excess** in **10** Districts, **Normal** in **16** Districts and **Deficit** in **1** District.

1.2.2 Taluk wise Cumulative Rainfall pattern during 1st October to 31st December 2023 is given in the following table. (**Total 236 Taluks in the State**):

Rainfall category	No. of Taluks
Large Excess (>=60%)	3 Taluks
Excess (+20 to +59%)	10 Taluks
Normal (-19 to +19%)	38 Taluks
Deficit (-20 to -59%)	94 Taluks
Large Deficit (-60 to -99%)	91Taluks
No rain (<=-100%)	Nil

During the preceding year (2022), the Rainfall was **Large Excess** in **31** Taluks, **Excess** in **79** Taluks, **Normal** in **85** Taluks and **Deficit** in **32** Taluks.

The Hobli-wise Rainfall pattern during **1st October to 31st December 2023** is given in the following Table (**Total 850 Hoblis in the State**):

Rainfall category	No. of Hoblis
Large Excess (>=60%)	10 Hoblis
Excess (+20 to +59%)	36 Hoblis
Normal (-19 to +19%)	148 Hoblis
Deficit (-20 to -59%)	380 Hoblis
Large Deficit (-60 to -99%)	276 Hoblis
No rain (<=-100%)	Nil

During the preceding year (2020), the Rainfall was **Large Excess** in **185** Hoblis, **Excess** in **267** Hoblis, **Normal** in **293** Hoblis, **Deficit** in **101** Hoblis and **Large Deficit** in **4** Hoblis.

Figure 1.18: District wise Rainfall (mm) pattern during the Southwest Monsoon Season 2023:

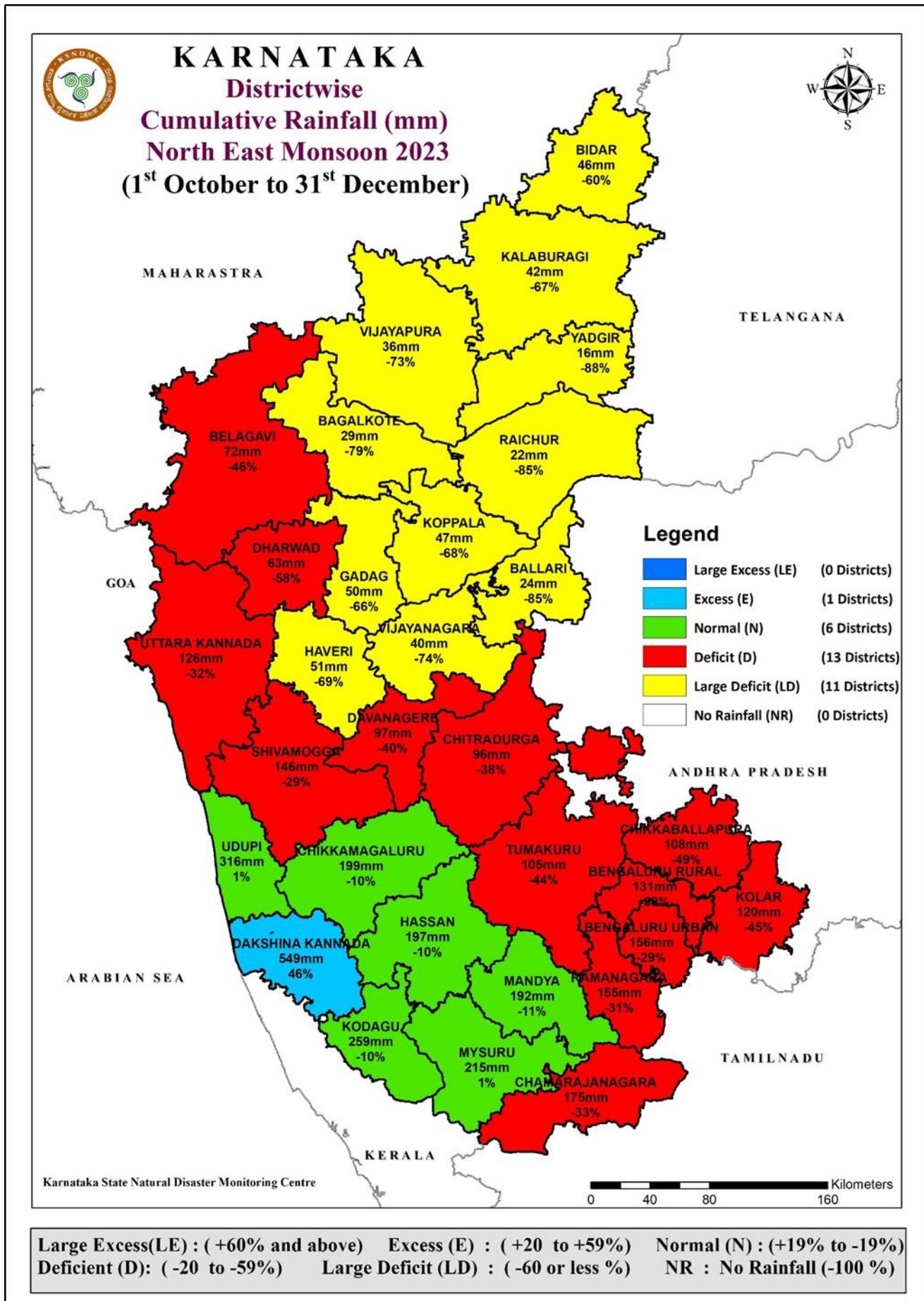


Figure 1.19: Taluk wise Rainfall (mm) pattern during the Southwest Monsoon Season 2023:

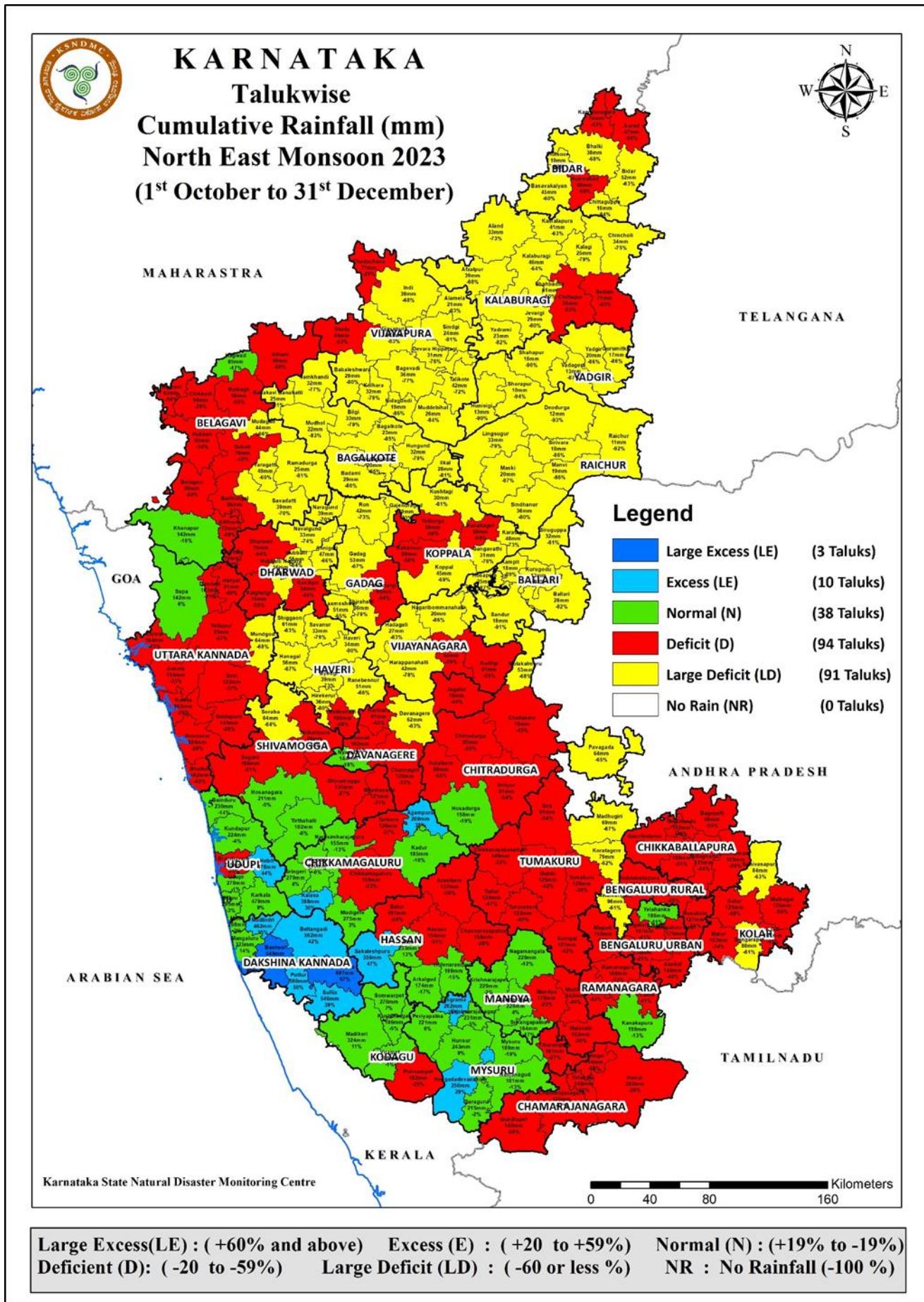
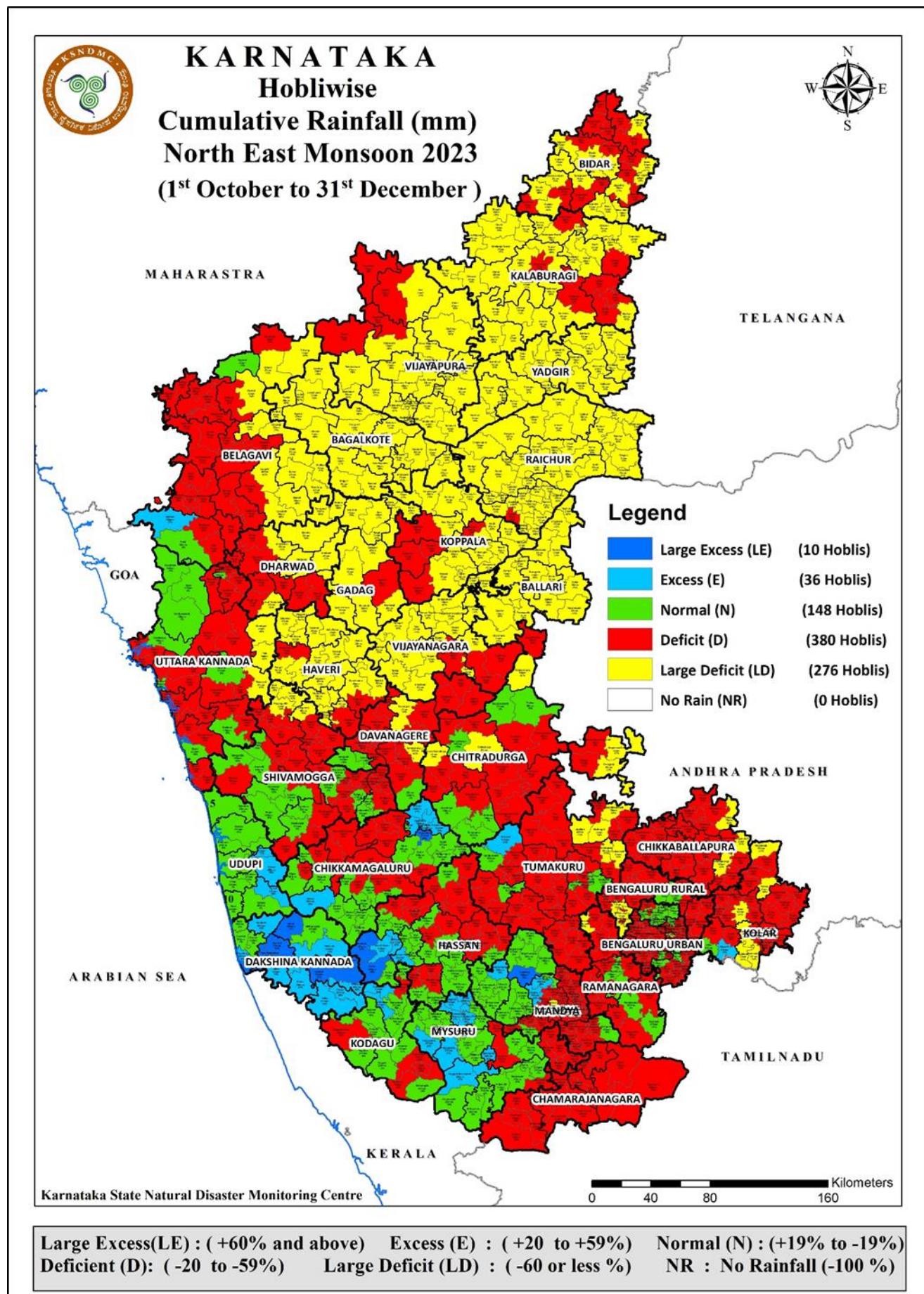


Figure 1.20: Hobli-wise Rainfall pattern during the North East Monsoon Season 2023:



2. WATER BALANCE METHODOLOGY FOR MONITORING OF DROUGHT PERIODS AND THEIR SEVERITIES DURING AGRICULTURAL GROWING SEASON

The understanding of agricultural drought pattern requires not only analysis of rainfall records but also adequacy of soil moisture patterns and deficiencies of the same during the crop growing season of a particular year or between different years. It is more realistic to adopt a suitable method of water budgeting and deal with the soil moisture available in a crop growing season. Drought occurs when there is insufficient moisture in the root zone of the crop. Where direct measurement of soil moisture and its determination are not possible, the concept of potential evapo-transpiration and the water budgeting provide an indirect method for determining actual evapo-transpiration (AE) and changes in soil moisture.

Moisture Adequacy Index:

The ratio AE / PE expressed in percentage known as Moisture Adequacy Index (MAI) is a useful index for scientific crop planning and drought monitoring. The systems analysis approach using the distribution of Moisture Adequacy Index within crop growing season would help in determining optimum times for sowing, selection of suitable crop varieties and other cultural operations for specific regions.

Decrease of MAI from 100% would indicate soil moisture stress conditions experienced by the crops. Up to MAI value of 75%, there would be hardly any moisture stress. So period with MAI >75% can be denoted as humid period. Many dry land crops would experience only slight moisture stress even up to MAI of 50%. So period for which MAI is 50% -75% or above is considered as agricultural condition. When MAI is between 25% and 50% crops would experience only moderate drought conditions. So some of the drought resistant crops like Jowar, Ragi, Bajra, Minor millets, Groundnut, Sunflower and Pulses etc., would be able to withstand such droughts for a limited period. But when MAI becomes less than 25% severe drought would set in. The results of moisture adequacy index studies at the end of the South-West Monsoon season are presented in the figures 4.1

The Salient findings are as follows:

At the end of **September 2023**, due to **Normal** rainfall over major parts of the State, **68.5%** of the geographical area is falling under **Moderate to Severe** condition and remaining **31.5%** of the geographical area is falling under **Normal agriculturally favorable** condition.

At the end of **December 2023**, due to **Normal** rainfall over major parts of the State **99%** of the area is falling under **Moderate to Severe** condition and remaining **1%** of the geographical area is falling under **Normal agriculturally favorable** condition.

Figure 2.1: Moisture Adequacy Index (MAI) for SW Monsoon 2023

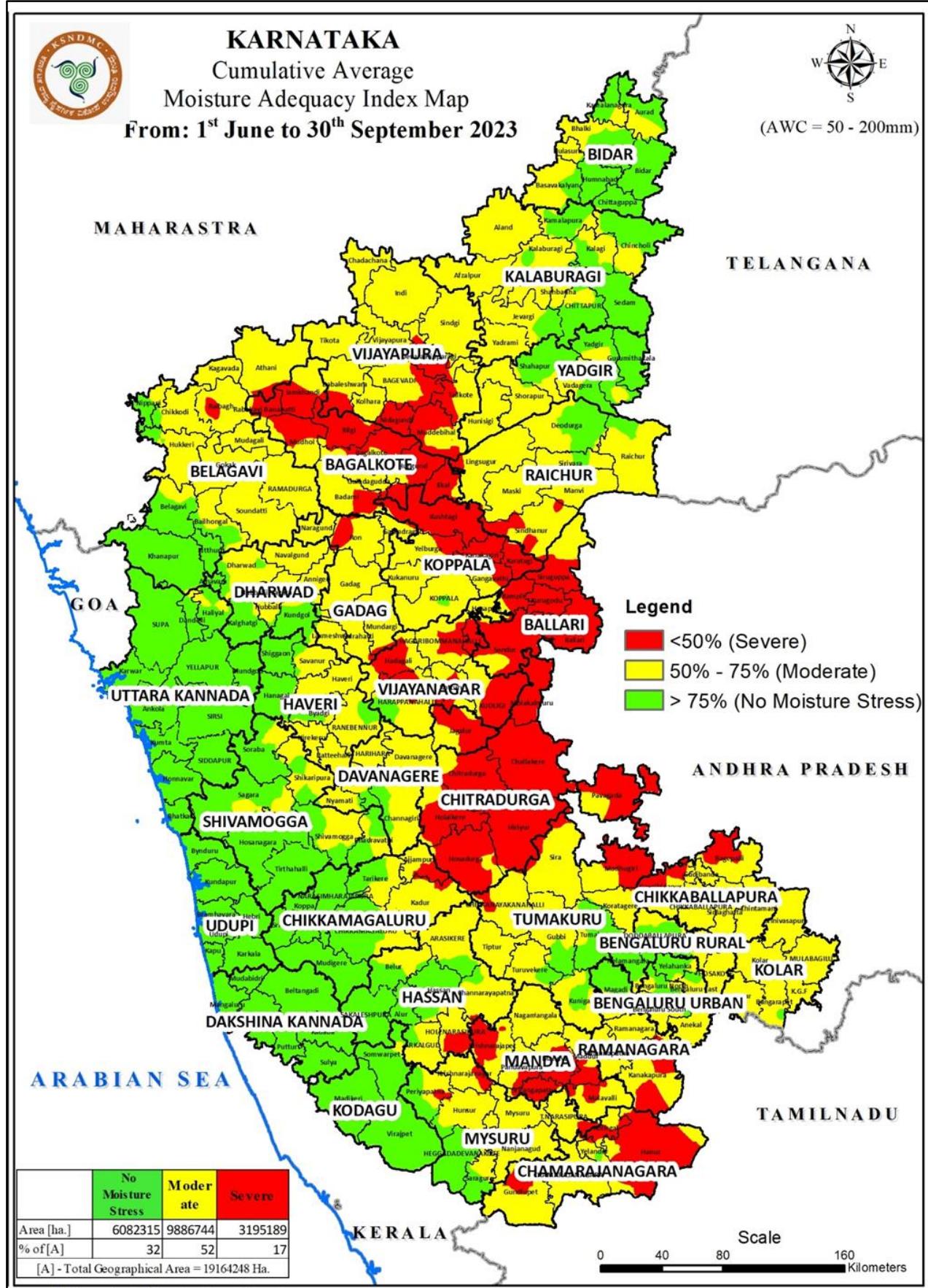
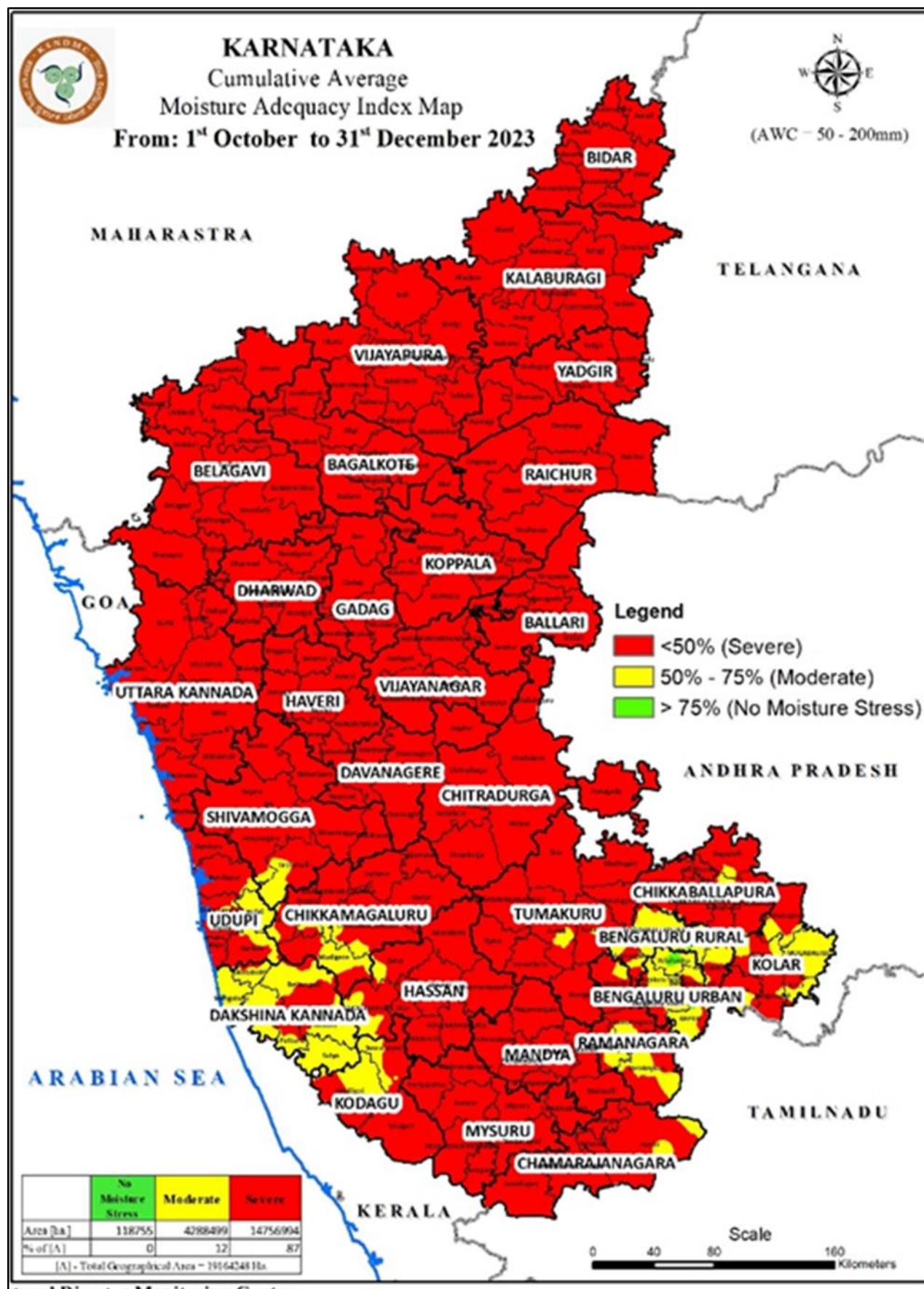


Figure 2.2: Moisture Adequacy Index (MAI) for NE Monsoon 2023



3.MAJOR RESERVOIR LEVELS IN THE STATE

The position of reservoir levels from 23rd standard week (01.06.2023) to 52nd standard week (31.12.2023), their respective maximum levels, previous year levels reservoir level during recent 10 years depicting maximum, minimum and average levels during particular standard weeks, difference in RL compared to the 10 years average level and difference in RL compared to the previous year level are given in table no. 5.2 to 5.14

Hydel generation reservoirs: **Linganamakki, Supa and Varahi** are the three main Hydel generation reservoirs of the state which come under west coast basin. The state receives maximum rainfall in the catchments of these basins and the annual rainfall is about 3000 to 4000 mm.

During the water year 2023, the levels in **Linganamakki** reservoir levels in most of the standard weeks were **highest** compared to the recent 10 years average levels. Maximum rise in reservoir level of **19.00** feet was during **30th std week**. The highest level of **1790.70 feet** was reached during **32nd std. week** against full reservoir level of **1819** feet. The level during the season was **less by 3.61 feet** compared to the average level and also **less by 7.55** feet compared to previous year level.

In the **Supa** reservoir, levels in most of the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **31.50 feet** was during **30th week**. The highest level of **1793.53** feet was reached during **32nd std. week** against full reservoir level of **1850.48 feet**. The level during the season was **more by 3.08 feet** compared to the average level and also **more by 32.81 feet** compared to previous year level.

In the **Varahi** reservoir, levels in most of the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **12.01 feet** was during **30th week**. The highest level of **1907.51 feet** was reached during **40th std. week** against full reservoir level of **1950.10** feet. The level during the season was **less by 7.98** feet compared to the average level and **more by 2.79** feet compared to previous year level.

Reservoirs Cauvery Basin: The 4 major reservoirs of **Cauvery basin viz., Harangi, Hemavathi, K.R.S and Kabini** are used for irrigation purpose.

In the **Harangi** reservoir, levels in most of the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **13.04 feet** was during **27th week**. The highest level of **2858.83** feet was reached during **32nd std. week** against full reservoir level of **2859.00 feet**. The level during the season was **more by 15.48 feet** compared to the average level and **more by 4.25 feet** compared to previous year level.

In the **Hemavathi** reservoir, levels in all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **14.20 feet** was during **30th week**. The highest level of **2916.21 feet** was reached during **32nd std. week** against full reservoir level of **2922.00 feet**. The level during the season was **more by 20.55** feet compared to the average level and also **less by 5.39 feet** compared to previous year level.

In the **K.R.S** reservoir, levels in all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **20.76 feet** was during **30th week**. The full reservoir level of **113.44 feet** was reached during **31st std. week**. The level during the season was **more by 4.23** feet compared to the average level and **less by 9.16** feet compared to previous year level.

In the **Kabini** reservoir, levels in all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **12.26 feet** was during **27th std. week**. The full reservoir level of **2282.84 feet** was reached during **31st std. week**. The level during the season was **more** by **4.05 feet** compared to the average level and **more** by **2.70 feet** compared to previous year level.

Krishna Basin reservoirs: Bhadra, Tungabhadra, Ghataprabha, Malaprabha, Alamatti and Narayanapura are the major irrigation reservoirs under **Krishna basin**.

In **Bhadra** reservoir, levels during all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **16.17 feet** was during **30th week**. The full reservoir level of **2139.00 feet** was reached during **32nd std. week**. The level during the season was **more** by **11.21 feet** compared to the average level and **less** by **13.31 feet** compared to previous year level.

In **Tungabhadra** reservoir, levels in all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **28.92 feet** was during **30th week**. The full reservoir level of **1628.70 feet** was reached during **32nd std. week**. The level during the season was **more** by **4.47 feet** compared to the average level and **less** by **3.17 feet** compared to previous year level.

In **Ghataprabha** reservoir, levels in all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **11.09 feet** was during **52nd std. week**. The full reservoir level of **2170.75 feet** was reached during **40th std. week**. The level during the season was **more** by **11.09 feet** compared to the average level and **less** by **0.58 feet** compared to previous year level.

In **Malaprabha** reservoir, levels in all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **4.47 feet** was during **23rd week**. The full reservoir level of **2067.20 feet** was reached during **34th std. week**. The level during the season was **more** by **4.47 feet** compared to the average level and **less** by **5.60 feet** compared to previous year level.

In the **Alamatti** reservoir, levels in all the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **16.07 feet** was during **30th week**. The full reservoir level of **1704.70 feet** was reached during **33rd std. week**. The level during the season was **more** by **3.15 feet** compared to the average level and also **more** by **2.99 feet** compared to previous year level.

In the **Narayanapura** reservoir, levels in most of the standard weeks were **higher** compared to the recent 10 years average levels. Maximum rise in reservoir level of **14.57 feet** was during **30th week**. The full reservoir level of **1614.48 feet** was reached during **32nd std. week** against full reservoir level of **1615.00 feet**. The level during the season was **more** by **3.48 feet** compared to the average level and **more** by **10.76 feet** compared to previous year level.

The Levels at Linganamakki, Supa, Varahi, Harngi, Hemavathi, K.R.S., Kabini, Bhadra, Tungabhadra, Ghataprabha, Malaprabha, Almatti and reservoirs were lesser when compared to the recent 10 years average levels and previous year levels.

Table-3.1**Name of the Reservoir: (1) LINGANAMAKKI****Basin: HYDEL GENERATION RESERVOIR****Full Reservoir Level: 1819.12****Unit: in feet****Reservoir level (RL): above mean sea level**

Std. Week No	Reservoir Level information during recent 10 years			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022.	Difference in RL of 2023 compared Maximum
	Maximum	Minimum	Average 10 years				
23	1776.00	1742.40	1754.74	1744.60	-10.14	1752.15	-7.55
24	1779.25	1744.65	1755.60	1741.80	-13.79	1750.00	-8.20
25	1785.60	1744.10	1757.49	1740.20	-17.29	1750.05	-9.85
26	1785.05	1746.55	1761.71	1740.35	-21.36	1754.95	-14.60
27	1784.50	1748.55	1768.99	1749.35	-19.64	1772.60	-23.25
28	1792.45	1756.70	1776.15	1755.30	-20.85	1789.70	-34.40
29	1801.35	1767.75	1784.08	1767.30	-16.78	1798.50	-31.20
30	1811.50	1771.00	1789.91	1786.30	-3.61	1798.40	-12.10
31	1817.00	1777.60	1795.20	1789.55	-5.65	1800.50	-10.95
32	1818.00	1784.45	1802.79	1790.70	-12.09	1810.55	-19.85
33	1819.00	1785.45	1805.58	1790.20	-15.38	1813.00	-22.80
34	1819.00	1787.07	1807.07	1789.40	-17.67	1814.15	-24.75
35	1818.90	1787.24	1808.25	1787.80	-20.45	1814.70	-26.90
36	1818.95	1787.20	1808.69	1787.15	-21.54	1814.80	-27.65
37	1818.75	1787.94	1809.33	1786.75	-22.58	1816.60	-29.85
38	1819.00	1790.95	1810.20	1787.30	-22.90	1816.50	-29.20
39	1818.80	1791.79	1810.40	1787.50	-22.90	1815.65	-28.15
40	1818.65	1792.44	1810.41	1788.20	-22.21	1815.09	-26.89
41	1818.80	1793.01	1810.24	1787.35	-22.89	1814.40	-27.05
42	1818.95	1792.98	1810.05	1786.75	-23.30	1814.00	-27.25
43	1818.50	1793.04	1809.44	1785.85	-23.59	1813.20	-27.35
44	1818.40	1793.01	1809.05	1785.25	-23.80	1812.00	-26.75
45	1817.95	1793.24	1808.34	1785.80	-22.54	1810.95	-25.15
46	1817.25	1793.25	1807.61	1785.30	-22.31	1809.75	-24.45
47	1816.30	1793.19	1806.83	1784.55	-22.28	1808.85	-24.30
48	1815.40	1793.00	1805.95	1784.09	-21.86	1807.40	-23.31
49	1814.40	1792.25	1804.99	1783.15	-21.84	1806.15	-23.00
50	1813.25	1791.70	1804.10	1782.45	-21.65	1805.20	-22.75
51	1812.10	1791.10	1803.08	1781.50	-21.58	1803.70	-22.20
52	1810.65	1790.25	1801.75	1780.25	-21.50	1801.85	-21.60

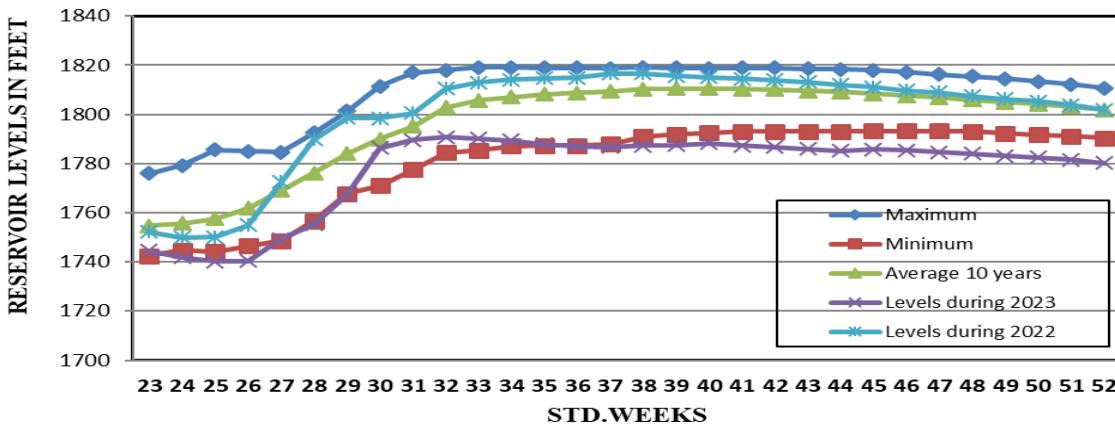
Fig - 3.1: Weekly Reservoir Level : Linganamakki Reservoir (Hydel-West Flowing)
River : Sharavathi
Location: Linganamakki, Shivamogga district

Table-3.2

Name of the Reservoir: (2) SUPA
Basin: HYDEL GENERATION RESERVOIR
Full Reservoir Level: 1850.48

Unit: in feet

Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during recent 10 years			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022.	Difference in RL of 2023 compared Maximum
	Maximum	Minimum	Average 10 years				
23	1757.70	1703.69	1737.98	1736.50	-1.48	1703.69	32.81
24	1759.93	1700.38	1738.50	1732.27	-6.23	1700.38	31.89
25	1768.98	1700.64	1736.80	1727.64	-9.16	1700.64	27.00
26	1767.87	1702.28	1738.60	1725.35	-13.25	1702.28	23.07
27	1764.69	1714.46	1745.71	1727.68	-18.03	1727.12	0.56
28	1784.65	1719.87	1757.40	1731.65	-25.75	1759.27	-27.63
29	1803.18	1742.99	1768.72	1753.04	-15.68	1763.54	-10.50
30	1811.87	1751.03	1781.45	1784.54	3.08	1777.58	6.96
31	1824.07	1757.75	1789.68	1791.26	1.58	1778.86	12.40
32	1839.82	1772.20	1801.73	1793.53	-8.20	1792.74	0.79
33	1845.30	1774.69	1808.20	1792.41	-15.78	1799.53	-7.12
34	1846.34	1772.49	1811.50	1791.79	-19.72	1804.06	-12.27
35	1846.97	1770.66	1813.95	1790.05	-23.90	1806.42	-16.37
36	1848.35	1764.88	1815.13	1789.85	-25.28	1807.93	-18.08
37	1846.64	1769.94	1817.07	1789.98	-27.09	1815.48	-25.49
38	1846.64	1772.02	1819.19	1789.79	-29.40	1817.90	-28.12
39	1846.48	1772.09	1819.95	1789.65	-30.29	1816.98	-27.33
40	1846.64	1772.53	1820.08	1792.44	-27.64	1816.62	-24.18
41	1846.77	1773.38	1820.25	1790.28	-29.98	1816.72	-26.44
42	1846.90	1773.06	1819.62	1788.31	-31.31	1817.18	-28.87
43	1848.80	1773.39	1819.57	1787.75	-31.81	1817.08	-29.33
44	1848.58	1773.66	1818.98	1786.70	-32.27	1815.77	-29.07
45	1848.28	1773.96	1818.12	1786.77	-31.35	1814.59	-27.82
46	1847.23	1773.99	1817.04	1786.70	-30.34	1813.77	-27.07
47	1845.92	1774.00	1815.89	1786.01	-29.88	1812.62	-26.61
48	1844.15	1774.00	1814.52	1785.91	-28.61	1811.44	-25.53
49	1842.84	1774.02	1813.15	1785.22	-27.92	1810.65	-25.43
50	1840.80	1773.98	1811.86	1784.70	-27.16	1809.93	-25.23
51	1838.37	1773.43	1810.37	1783.72	-26.66	1808.22	-24.51
52	1834.70	1772.45	1808.24	1782.44	-25.80	1805.17	-22.74

Fig - 3.2: Weekly Reservoir Level: Supa Reservoir (Hydel - West Flowing)

River : Kali

Location: Supa, Uttara Kannada district

RESERVOIR LEVELS IN FEET

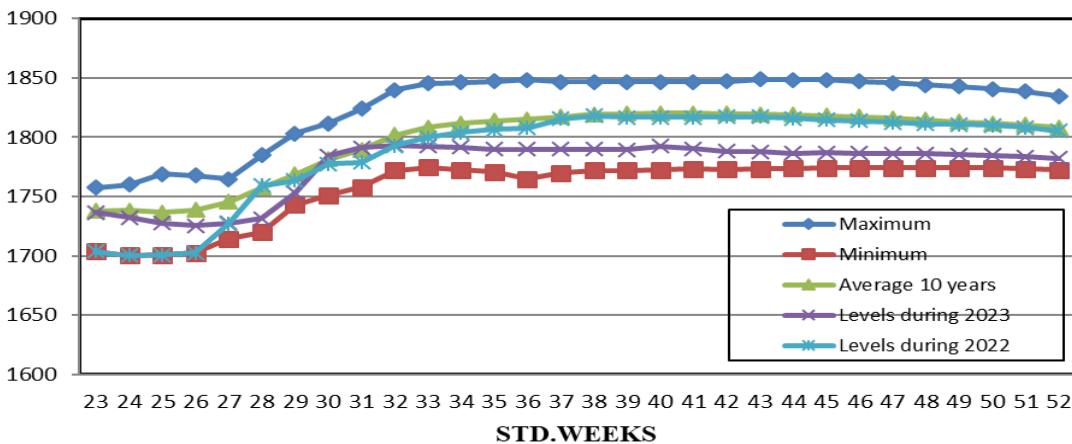


Table-3.3

Name of the Reservoir: (3) VARAHI
Basin: HYDEL GENERATION RESERVOIR
Full Reservoir Level: 1950.10

Unit: in feet

Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022	Difference in RL of 2023 compared Maximum				
	recent 10 years										
	Maximum	Minimum	Average 10 years								
23	1886.41	1866.95	1877.73	1869.74	-7.98	1866.95	2.79				
24	1893.74	1867.45	1879.25	1869.94	-9.31	1867.45	2.49				
25	1893.48	1868.35	1881.01	1870.40	-10.61	1868.40	2.00				
26	1898.79	1870.17	1884.34	1871.22	-13.12	1870.17	1.05				
27	1907.39	1878.39	1890.86	1877.52	-13.34	1890.64	-13.12				
28	1914.86	1885.44	1897.56	1882.70	-14.86	1907.57	-24.87				
29	1923.72	1889.15	1905.11	1891.50	-13.61	1914.79	-23.30				
30	1933.72	1890.46	1911.68	1903.50	-8.18	1916.76	-13.26				
31	1939.69	1896.43	1916.11	1907.25	-8.87	1918.53	-11.29				
32	1941.83	1909.94	1923.09	1906.59	-16.50	1927.19	-20.60				
33	1947.66	1915.06	1927.15	1905.67	-21.48	1929.16	-23.49				
34	1948.45	1918.67	1929.14	1902.99	-26.15	1931.20	-28.21				
35	1948.52	1919.62	1930.36	1901.11	-29.25	1932.05	-30.94				
36	1948.42	1920.11	1931.84	1901.41	-30.44	1932.77	-31.37				
37	1947.66	1920.11	1933.02	1903.31	-29.72	1935.72	-32.42				
38	1947.66	1921.42	1934.17	1905.21	-28.96	1936.18	-30.97				
39	1947.70	1923.06	1934.38	1906.39	-27.99	1935.86	-29.46				
40	1947.96	1923.12	1934.29	1907.51	-26.78	1935.40	-27.89				
41	1947.37	1922.74	1933.86	1906.85	-27.01	1935.00	-28.15				
42	1946.61	1921.75	1933.44	1906.13	-27.31	1934.35	-28.22				
43	1946.02	1920.70	1932.95	1906.26	-26.69	1933.59	-27.33				
44	1945.83	1920.31	1932.51	1906.26	-26.25	1932.71	-26.44				
45	1945.04	1919.62	1931.72	1906.52	-25.19	1931.33	-24.80				
46	1943.27	1919.03	1930.69	1906.29	-24.40	1929.88	-23.59				
47	1941.66	1918.73	1929.89	1906.26	-23.62	1928.44	-22.18				
48	1940.38	1918.01	1928.79	1906.46	-22.33	1927.29	-20.83				
49	1938.97	1917.00	1928.14	1906.23	-21.92	1926.21	-19.98				
50	1937.23	1916.57	1926.68	1905.34	-21.34	1925.23	-19.88				
51	1935.20	1916.24	1925.72	1904.62	-21.10	1923.91	-19.29				
52	1933.43	1915.39	1924.13	1904.29	-19.84	1921.29	-17.00				

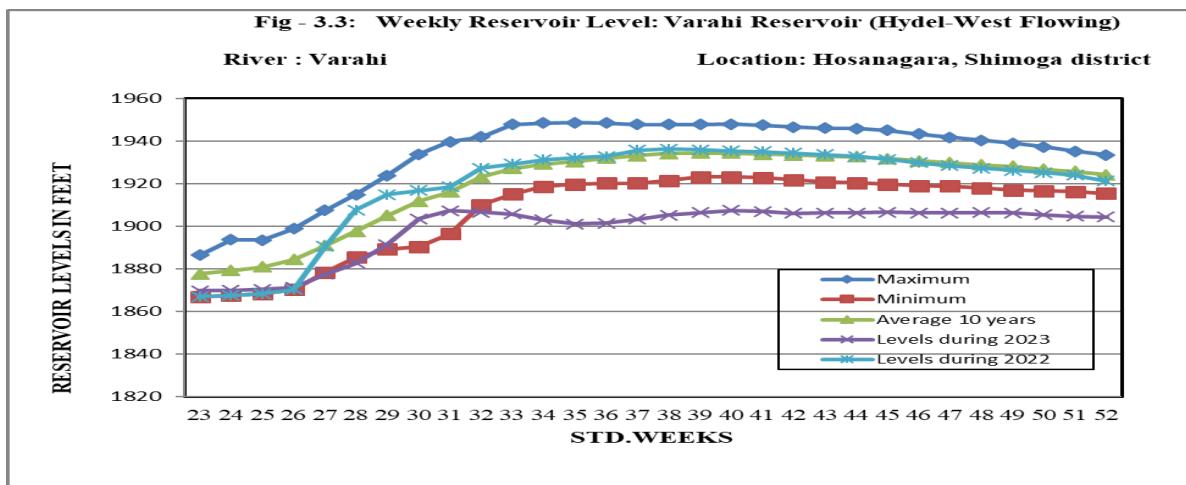


Table-3.4

Name of the Reservoir: (4) HARANGI

Basin: CAUVERY GENERATION RESERVOIR

Full Reservoir Level: 2859.13

Unit: in feet

Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during recent 10 years			Levels during 2023	Difference in	Levels during 2022	Difference in RL of 2023 compared Maximum
	Maximum	Minimum	Average		RL of 2023 compared to the		
			10 years		Average level		
23	2850.75	2797.77	2813.47	2818.91	5.44	2850.75	-31.84
24	2851.45	2801.28	2820.34	2818.95	-1.39	2851.45	-32.50
25	2852.67	2806.81	2826.37	2819.34	-7.03	2852.67	-33.33
26	2857.14	2808.07	2836.62	2820.69	-15.93	2855.48	-34.79
27	2856.73	2812.30	2841.90	2833.73	-8.17	2853.69	-19.96
28	2857.30	2818.81	2847.88	2842.74	-5.14	2853.81	-11.07
29	2858.26	2827.56	2853.20	2853.11	-0.09	2856.00	-2.89
30	2858.53	2833.79	2854.59	2856.51	1.92	2857.35	-0.84
31	2858.41	2833.29	2854.70	2858.65	3.95	2856.28	2.37
32	2858.26	2854.39	2856.50	2858.83	2.33	2854.58	4.25
33	2858.21	2851.72	2856.77	2858.14	1.37	2856.73	1.41
34	2858.26	2854.88	2857.15	2857.90	0.75	2857.39	0.51
35	2858.40	2853.84	2856.73	2855.63	-1.10	2855.76	-0.13
36	2858.75	2851.40	2856.19	2856.44	0.25	2856.63	-0.19
37	2858.56	2843.79	2855.57	2858.19	2.62	2858.00	0.19
38	2858.63	2842.58	2855.12	2856.41	1.29	2857.73	-1.32
39	2858.88	2841.17	2855.18	2854.02	-1.16	2856.25	-2.23
40	2858.22	2835.59	2853.62	2855.82	2.20	2854.08	1.74
41	2858.50	2833.25	2852.60	2856.99	4.39	2853.32	3.67
42	2858.39	2829.05	2851.91	2855.00	3.09	2855.49	-0.49
43	2858.15	2823.31	2849.94	2850.87	0.93	2855.23	-4.36
44	2857.15	2816.06	2844.97	2848.36	3.40	2851.94	-3.58
45	2857.67	2809.62	2841.24	2848.64	7.40	2848.02	0.62
46	2858.04	2802.06	2835.98	2846.91	10.93	2845.36	1.55
47	2857.51	2792.63	2831.76	2841.98	10.22	2841.02	0.96
48	2856.87	2787.80	2827.35	2836.54	9.19	2837.56	-1.02
49	2855.16	2784.78	2822.75	2834.06	11.31	2833.61	0.45
50	2853.96	2783.47	2818.83	2833.37	14.55	2831.11	2.26
51	2854.09	2783.26	2816.32	2830.33	14.01	2828.19	2.14
52	2854.98	2785.41	2815.19	2830.67	15.48	2828.08	2.59

Fig - 3.4: Weekly Reservoir Level: Harangi Reservoir (Cauvery Basin)

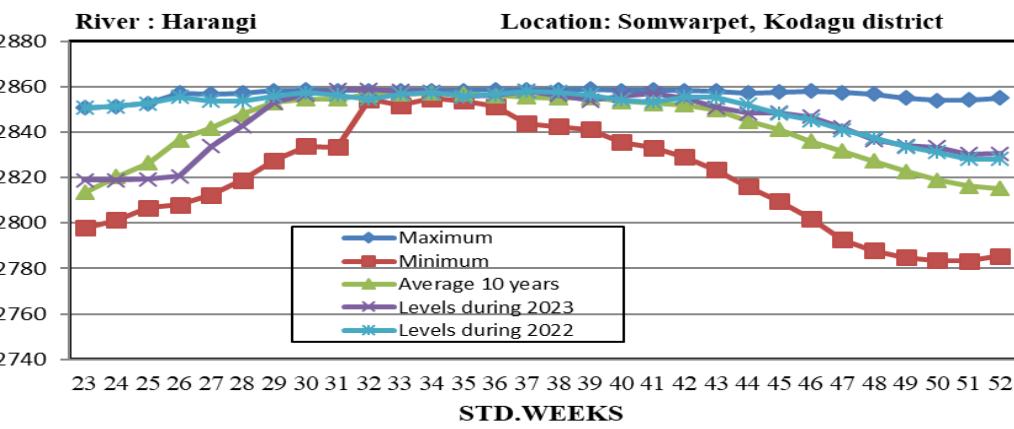


Table-3.5**Name of the Reservoir: (5) HEMAVATHI****Basin: CAUVERY GENERATION RESERVOIR****Full Reservoir Level: 2922.16**

Unit: in feet

Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during			Levels during 2023	Difference in	Levels during 2022	Difference in RL of 2023 compared Maximum	
	recent 10 years				RL of 2023			
	Maximum	Minimum	Average 10 years		compared to the Average level			
23	2905.09	2852.70	2871.32	2891.87	20.55	2905.09	-13.22	
24	2905.25	2855.93	2875.67	2891.31	15.64	2905.25	-13.94	
25	2905.47	2858.10	2880.00	2891.00	11.00	2905.47	-14.47	
26	2907.92	2865.29	2886.35	2890.25	3.90	2907.92	-17.67	
27	2915.44	2870.30	2892.61	2891.20	-1.41	2915.44	-24.24	
28	2920.40	2874.18	2898.10	2893.25	-4.85	2920.40	-27.15	
29	2921.50	2885.72	2903.87	2898.30	-5.57	2921.50	-23.20	
30	2922.00	2892.33	2908.58	2912.50	3.92	2922.00	-9.50	
31	2921.75	2894.27	2910.76	2915.05	4.29	2921.75	-6.70	
32	2921.71	2895.83	2915.61	2916.21	0.60	2921.60	-5.39	
33	2921.97	2893.50	2915.47	2913.54	-1.93	2921.95	-8.41	
34	2921.81	2893.58	2914.95	2910.28	-4.67	2921.80	-11.52	
35	2921.93	2894.20	2914.00	2906.30	-7.70	2921.90	-15.60	
36	2921.82	2890.40	2912.47	2901.69	-10.78	2921.82	-20.13	
37	2921.95	2877.50	2910.70	2896.50	-14.20	2921.95	-25.45	
38	2921.95	2873.41	2909.76	2896.90	-12.86	2921.95	-25.05	
39	2921.75	2876.35	2909.42	2898.01	-11.41	2921.68	-23.67	
40	2921.45	2875.33	2908.19	2900.40	-7.79	2921.45	-21.05	
41	2921.85	2871.70	2906.85	2901.35	-5.50	2921.85	-20.50	
42	2921.75	2872.25	2906.08	2901.47	-4.61	2921.75	-20.28	
43	2921.71	2870.81	2904.84	2897.76	-7.08	2921.37	-23.61	
44	2921.04	2868.02	2902.84	2892.05	-10.79	2920.25	-28.20	
45	2919.75	2868.04	2901.39	2894.15	-7.24	2919.00	-24.85	
46	2917.75	2864.81	2899.68	2893.86	-5.82	2917.55	-23.69	
47	2916.00	2864.93	2898.45	2892.75	-5.70	2916.00	-23.25	
48	2914.40	2864.94	2896.96	2892.22	-4.74	2914.40	-22.18	
49	2913.58	2864.95	2894.87	2892.07	-2.80	2912.40	-20.33	
50	2912.51	2865.06	2892.57	2892.13	-0.44	2911.02	-18.89	
51	2911.04	2865.10	2890.33	2891.91	1.58	2909.73	-17.82	
52	2909.57	2865.08	2888.07	2891.63	3.56	2908.47	-16.84	

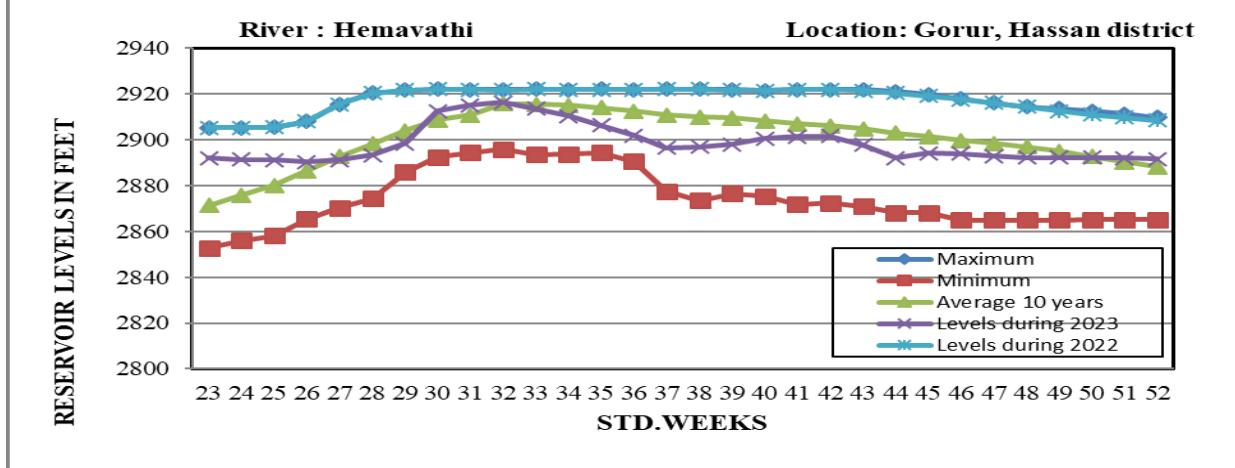
Fig - 3.5: Weekly Reservoir Level: Hemavathi Reservoir (Cauvery Basin)

Table-3.6

Name of the Reservoir: (6) K.R.S

Basin: CAUVERY GENERATION RESERVOIR

Full Reservoir Level: 124.8 0

Unit: in feet

Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during recent 10 years			Levels during 2023	Difference in	Levels during 2022	Difference in RL of 2023 compared Maximum	
	Maximum	Minimum	Average 10 years		RL of 2023 compared to the Average level			
23	105.46	63.35	79.59	82.80	3.21	105.46	-22.66	
24	105.66	67.86	82.26	81.20	-1.06	105.66	-24.46	
25	106.56	68.00	86.06	77.70	-8.36	106.56	-28.86	
26	108.20	72.40	90.93	78.06	-12.87	107.60	-29.54	
27	119.44	77.70	96.72	82.00	-14.72	119.44	-37.44	
28	123.43	78.35	101.49	89.00	-12.49	123.40	-34.40	
29	124.65	84.70	106.08	91.24	-14.84	124.65	-33.41	
30	124.74	87.13	108.94	112.00	3.06	124.74	-12.74	
31	123.86	83.10	109.21	113.44	4.23	123.86	-10.42	
32	124.80	92.80	115.54	112.82	-2.72	121.98	-9.16	
33	124.80	90.60	115.91	107.66	-8.25	123.88	-16.22	
34	124.80	92.12	115.92	102.22	-13.70	124.42	-22.20	
35	124.80	93.03	115.76	99.86	-15.90	124.56	-24.70	
36	124.80	91.22	115.89	98.06	-17.83	124.16	-26.10	
37	124.80	86.10	115.61	97.16	-18.45	124.28	-27.12	
38	124.80	87.15	115.46	96.90	-18.56	124.36	-27.46	
39	124.80	89.35	115.99	97.78	-18.21	123.64	-25.86	
40	124.80	86.85	116.37	101.22	-15.15	123.72	-22.50	
41	124.80	81.40	116.54	101.24	-15.30	124.24	-23.00	
42	124.80	81.96	117.12	100.60	-16.52	124.80	-24.20	
43	124.80	78.30	116.90	99.48	-17.42	124.80	-25.32	
44	124.80	81.65	116.62	99.42	-17.20	124.44	-25.02	
45	124.80	81.64	116.53	101.00	-15.53	123.88	-22.88	
46	124.80	77.23	115.72	100.62	-15.10	122.90	-22.28	
47	124.80	78.05	115.05	98.58	-16.47	121.56	-22.98	
48	124.64	78.61	113.58	97.08	-16.50	120.86	-23.78	
49	124.80	78.75	113.62	96.34	-17.28	119.52	-23.18	
50	124.80	78.90	113.51	96.58	-16.93	120.40	-23.82	
51	124.52	79.30	112.99	96.86	-16.13	119.94	-23.08	
52	123.22	79.48	112.06	96.78	-15.28	118.80	-22.02	

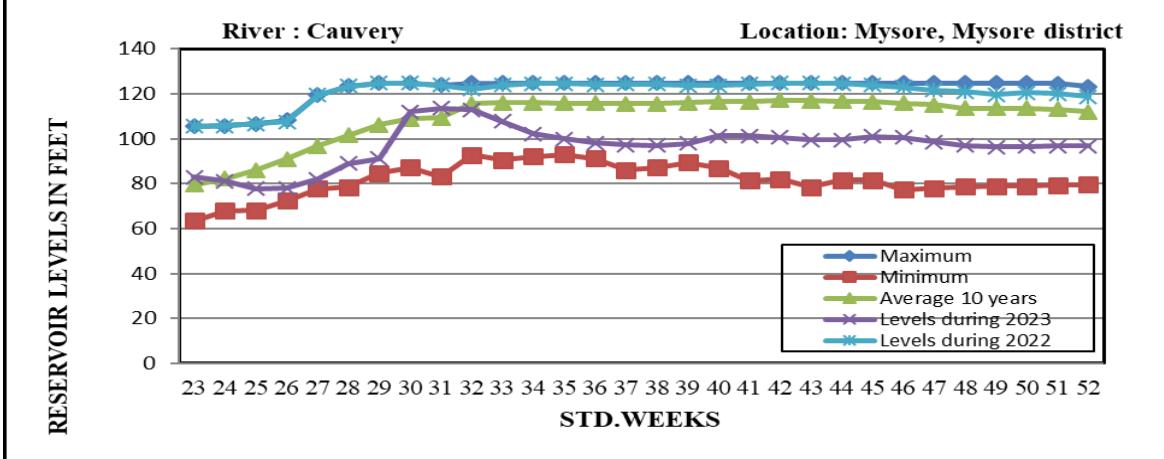
Fig - 3.6: Weekly Reservoir Level: K.R.S. Reservoir (Cauvery Basin)

Table-3.7**Name of the Reservoir: (7) KABINI****Basin: CAUVERY GENERATION RESERVOIR****Full Reservoir Level: 2284****Unit: in feet****Reservoir level (RL): above mean sea level**

Std. Week No.	Reservoir Level information during recent 10 years			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022	Difference in RL of 2023 compared Maximum
	Maximum	Minimum	Average				
	10 years						
23	2265.52	2241.75	2257.27	2250.13	-7.14	2261.60	-11.47
24	2279.80	2242.18	2260.73	2250.36	-10.36	2260.96	-10.60
25	2280.70	2244.85	2264.69	2250.65	-14.04	2261.05	-10.40
26	2282.35	2257.51	2269.34	2251.62	-17.72	2265.09	-13.47
27	2282.82	2263.30	2273.12	2263.88	-9.24	2279.03	-15.15
28	2282.78	2264.53	2275.67	2269.95	-5.72	2282.07	-12.12
29	2284.00	2271.19	2278.72	2273.85	-4.87	2284.00	-10.15
30	2283.58	2272.75	2278.76	2282.81	4.05	2283.58	-0.77
31	2283.17	2269.60	2279.09	2282.84	3.75	2283.07	-0.23
32	2283.23	2269.56	2279.73	2281.68	1.95	2283.23	-1.55
33	2283.79	2267.01	2280.15	2277.82	-2.33	2283.41	-5.59
34	2284.00	2270.16	2280.58	2274.76	-5.82	2284.00	-9.24
35	2283.87	2275.74	2280.54	2273.78	-6.76	2283.10	-9.32
36	2283.96	2274.55	2280.67	2275.14	-5.53	2283.53	-8.39
37	2284.00	2270.27	2280.73	2276.26	-4.47	2283.00	-6.74
38	2284.00	2269.88	2281.21	2275.01	-6.20	2283.04	-8.03
39	2284.00	2271.26	2280.47	2273.29	-7.18	2282.69	-9.40
40	2283.76	2269.71	2279.89	2276.51	-3.38	2282.22	-5.71
41	2283.73	2267.23	2279.66	2275.91	-3.75	2282.23	-6.32
42	2284.00	2267.60	2280.18	2274.61	-5.57	2283.79	-9.18
43	2283.94	2266.01	2279.89	2273.22	-6.67	2282.91	-9.69
44	2284.00	2265.76	2278.84	2273.01	-5.83	2281.27	-8.26
45	2283.91	2265.26	2277.84	2275.72	-2.12	2279.36	-3.64
46	2284.00	2263.94	2276.79	2275.08	-1.71	2278.21	-3.13
47	2283.89	2263.68	2275.61	2273.66	-1.95	2275.85	-2.19
48	2283.63	2263.11	2274.28	2273.85	-0.43	2273.61	0.24
49	2283.73	2262.69	2273.55	2273.98	0.43	2271.80	2.18
50	2283.55	2262.05	2273.34	2273.75	0.41	2271.18	2.57
51	2283.45	2261.46	2273.10	2273.52	0.42	2270.82	2.70
52	2283.31	2260.76	2273.07	2273.26	0.19	2271.41	1.85

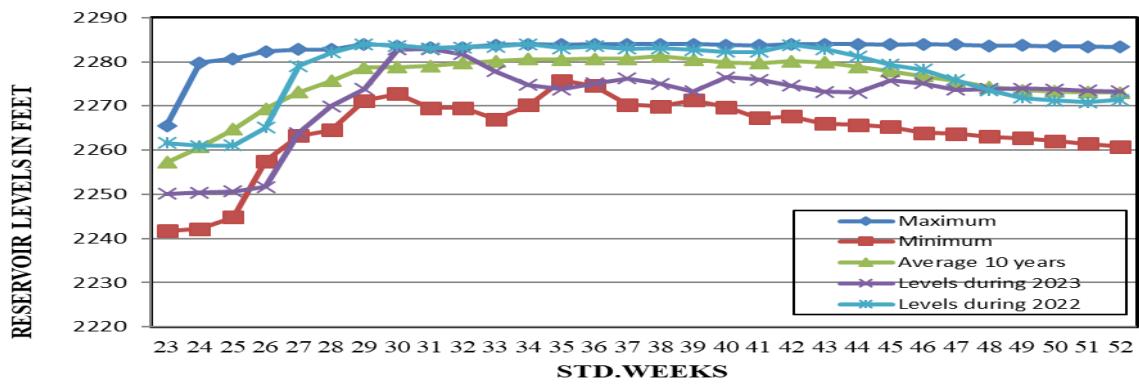
Fig - 3.7: Weekly Reservoir Level: Kabini Reservoir (Cauvery Basin)**River : Kabini****Location: H.D. Kote, Chamarajanagara district**

Table-3.8**Name of the Reservoir: (8) BHADRA****Basin: KRISHNA GENERATION RESERVOIR****Full Reservoir Level: 2158**

Unit: in feet

Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during recent 10 years			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022	Difference in RL of 2023 compared Maximum
	Maximum	Minimum	Average 10 years				
			10 years				
23	2122.68	2073.29	2098.16	2109.37	11.21	2122.68	-13.31
24	2122.75	2079.25	2101.96	2109.22	7.26	2122.75	-13.53
25	2125.33	2084.00	2105.48	2109.08	3.60	2122.81	-13.73
26	2126.75	2092.00	2110.62	2108.93	-1.69	2125.08	-16.15
27	2138.33	2096.70	2117.40	2111.66	-5.74	2138.33	-26.67
28	2156.14	2098.83	2124.74	2113.25	-11.49	2156.14	-42.89
29	2155.79	2108.75	2131.96	2115.58	-16.38	2155.79	-40.21
30	2156.83	2113.50	2137.78	2131.75	-6.03	2155.95	-24.20
31	2156.85	2116.50	2140.37	2136.08	-4.29	2156.33	-20.25
32	2157.06	2119.91	2146.39	2139.00	-7.39	2156.00	-17.00
33	2157.56	2122.50	2148.27	2138.14	-10.13	2156.00	-17.86
34	2158.00	2127.16	2149.64	2137.45	-12.19	2156.93	-19.48
35	2158.00	2129.83	2150.48	2135.75	-14.73	2157.54	-21.79
36	2158.00	2130.41	2150.86	2134.10	-16.76	2157.06	-22.96
37	2158.00	2129.58	2151.00	2132.83	-18.17	2156.72	-23.89
38	2158.00	2129.20	2150.98	2132.43	-18.55	2156.83	-24.40
39	2158.00	2130.25	2151.13	2131.77	-19.36	2156.89	-25.12
40	2158.00	2129.52	2151.36	2130.39	-20.97	2157.81	-27.42
41	2158.00	2127.79	2151.20	2128.93	-22.27	2158.00	-29.07
42	2158.00	2125.91	2150.84	2128.00	-22.84	2157.50	-29.50
43	2158.00	2124.79	2150.32	2127.10	-23.22	2157.21	-30.11
44	2157.75	2121.58	2149.52	2125.14	-24.38	2157.20	-32.06
45	2157.60	2119.25	2148.68	2124.58	-24.10	2156.29	-31.71
46	2158.00	2116.95	2147.58	2123.91	-23.67	2154.85	-30.94
47	2157.91	2116.02	2146.98	2122.68	-24.30	2153.75	-31.07
48	2157.95	2116.02	2146.85	2122.91	-23.94	2153.83	-30.92
49	2158.00	2116.00	2146.77	2123.12	-23.65	2153.87	-30.75
50	2158.00	2116.18	2146.81	2123.33	-23.48	2154.27	-30.94
51	2158.00	2116.22	2146.70	2123.35	-23.35	2154.31	-30.96
52	2157.97	2116.27	2146.28	2123.37	-22.91	2154.35	-30.98

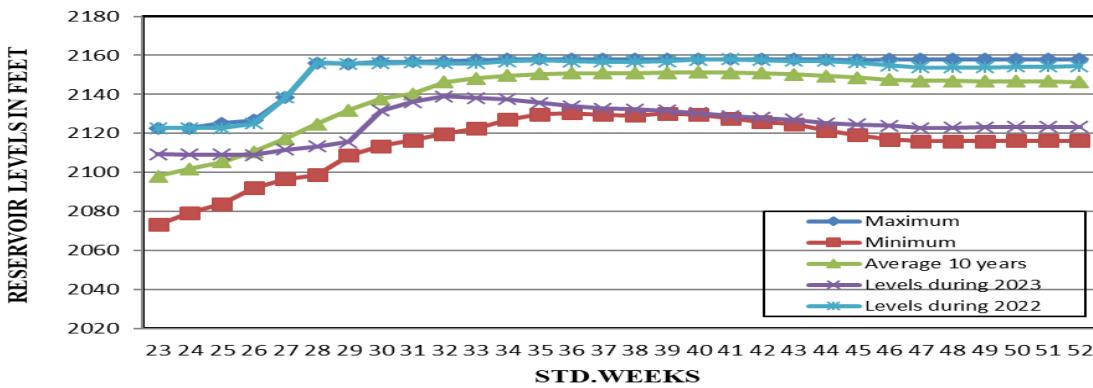
Fig - 3.8: Weekly Reservoir Level: Bhadra Reservoir (Krishna Basin)
River : Bhadra **Location: Tarikere, Chikkamagalur district**


Table-3.9**Name of the Reservoir: (9) TUNGABHADRA****Basin: KRISHNA GENERATION RESERVOIR****Full Reservoir Level: 1633.94**

Unit: in feet
Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022	Difference in RL of 2023 compared Maximum				
	recent 10 years										
	Maximum	Minimum	Average 10 years								
23	1612.40	1568.85	1583.87	1581.07	-2.80	1612.40	-31.33				
24	1612.60	1568.95	1586.49	1580.74	-5.75	1612.60	-31.86				
25	1613.10	1569.15	1589.84	1579.36	-10.48	1613.10	-33.74				
26	1614.12	1573.38	1595.17	1576.75	-18.42	1614.12	-37.37				
27	1621.19	1572.91	1601.23	1576.72	-24.51	1621.19	-44.47				
28	1630.40	1593.03	1609.81	1587.43	-22.38	1630.40	-42.97				
29	1632.00	1597.54	1616.39	1595.88	-20.51	1632.00	-36.12				
30	1632.75	1603.57	1621.59	1621.80	0.21	1632.34	-10.54				
31	1632.58	1609.78	1622.84	1627.31	4.47	1631.83	-4.52				
32	1633.00	1616.15	1627.55	1628.70	1.15	1631.87	-3.17				
33	1633.00	1617.80	1628.86	1627.78	-1.08	1633.00	-5.22				
34	1633.00	1617.89	1629.35	1626.15	-3.20	1632.81	-6.66				
35	1633.00	1616.80	1629.60	1624.66	-4.94	1632.38	-7.72				
36	1633.00	1614.86	1629.36	1623.14	-6.22	1632.14	-9.00				
37	1633.00	1612.77	1629.20	1621.49	-7.71	1632.74	-11.25				
38	1633.00	1612.90	1628.98	1620.06	-8.92	1633.00	-12.94				
39	1633.00	1614.49	1629.06	1618.23	-10.83	1633.00	-14.77				
40	1633.00	1614.69	1629.16	1616.54	-12.62	1633.00	-16.46				
41	1633.00	1611.65	1628.89	1614.42	-14.47	1632.87	-18.45				
42	1633.00	1608.24	1628.56	1611.77	-16.78	1633.00	-21.23				
43	1633.00	1604.71	1627.62	1608.83	-18.79	1632.20	-23.37				
44	1633.00	1599.37	1626.42	1605.65	-20.77	1632.51	-26.86				
45	1633.00	1593.60	1624.80	1602.83	-21.97	1631.79	-28.96				
46	1633.00	1589.31	1623.35	1600.87	-22.47	1631.08	-30.21				
47	1633.00	1589.13	1622.18	1596.07	-26.11	1630.18	-34.11				
48	1633.00	1589.94	1621.16	1592.70	-28.46	1629.31	-36.61				
49	1633.00	1589.64	1620.18	1591.68	-28.50	1628.58	-36.90				
50	1632.95	1588.60	1618.99	1590.67	-28.32	1627.58	-36.91				
51	1632.34	1588.08	1617.84	1589.64	-28.20	1626.65	-37.01				
52	1631.37	1587.94	1616.38	1589.09	-27.29	1624.90	-35.81				

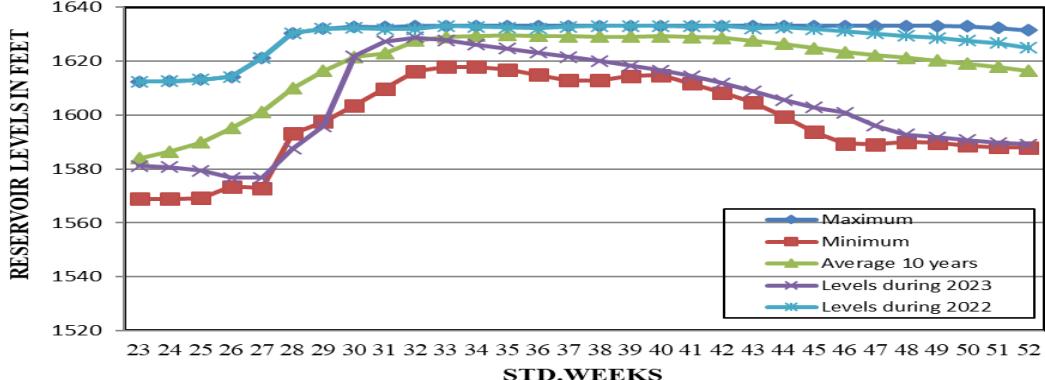
Fig - 3.9: Weekly Reservoir Level: Tungabhadra Reservoir (Krishna Basin)**River : Tungabhadra****location: Hospet, Bellary district**

Table-3.10
Name of the Reservoir: (10) GHATAPRABHA
Basin: KRISHNA GENERATION RESERVOIR
Full Reservoir Level: 2175.11

Unit: in feet
Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during recent 10 years			Levels during 2023	Difference in	Levels during 2022	Difference in RL of 2023 compared Maximum
	Maximum	Minimum	Average		RL of 2023		
			10 years		compared to the		
					Average level		
23	2096.70	2067.28	2079.68	2078.28	-1.40	2096.23	-17.95
24	2098.96	2067.11	2081.09	2077.93	-3.16	2096.00	-18.07
25	2129.47	2066.66	2086.87	2077.58	-9.29	2095.77	-18.18
26	2134.60	2066.25	2092.82	2077.23	-15.59	2094.10	-16.87
27	2136.33	2069.18	2104.24	2078.25	-25.99	2097.88	-19.63
28	2139.88	2072.71	2120.43	2089.07	-31.36	2132.20	-43.13
29	2161.78	2110.05	2135.08	2115.58	-19.50	2152.08	-36.50
30	2172.86	2117.21	2147.08	2150.95	3.87	2156.47	-5.52
31	2173.80	2121.05	2155.91	2159.08	3.17	2159.67	-0.58
32	2175.00	2125.80	2163.67	2165.42	1.74	2173.17	-7.75
33	2175.00	2129.43	2165.08	2165.43	0.36	2173.83	-8.40
34	2175.00	2130.60	2165.55	2163.02	-2.53	2175.00	-11.98
35	2175.00	2130.20	2166.45	2162.52	-3.93	2175.00	-12.48
36	2175.00	2128.05	2166.90	2162.85	-4.05	2175.00	-12.15
37	2175.00	2127.71	2166.42	2163.47	-2.95	2174.13	-10.67
38	2175.00	2127.71	2166.72	2166.80	0.08	2175.00	-8.20
39	2175.00	2127.70	2166.81	2166.75	-0.06	2174.76	-8.01
40	2175.00	2127.73	2166.75	2170.75	4.00	2174.62	-3.87
41	2175.00	2128.15	2166.39	2170.65	4.26	2174.90	-4.25
42	2175.00	2128.11	2166.15	2167.37	1.22	2175.00	-7.63
43	2175.00	2127.93	2165.97	2162.95	-3.02	2175.00	-12.05
44	2175.00	2127.76	2165.72	2161.55	-4.17	2174.88	-13.33
45	2175.00	2127.58	2164.33	2161.43	-2.90	2174.88	-13.45
46	2175.00	2127.41	2162.24	2161.32	-0.93	2173.40	-12.08
47	2175.00	2123.38	2158.95	2161.20	2.25	2169.65	-8.45
48	2174.61	2122.81	2156.24	2161.08	4.84	2165.57	-4.48
49	2172.21	2116.35	2153.83	2160.97	7.14	2164.02	-3.05
50	2168.65	2114.80	2152.88	2160.85	7.97	2163.90	-3.05
51	2167.33	2114.56	2151.28	2159.40	8.12	2162.43	-3.03
52	2164.92	2113.61	2147.37	2158.47	11.09	2159.50	-1.03

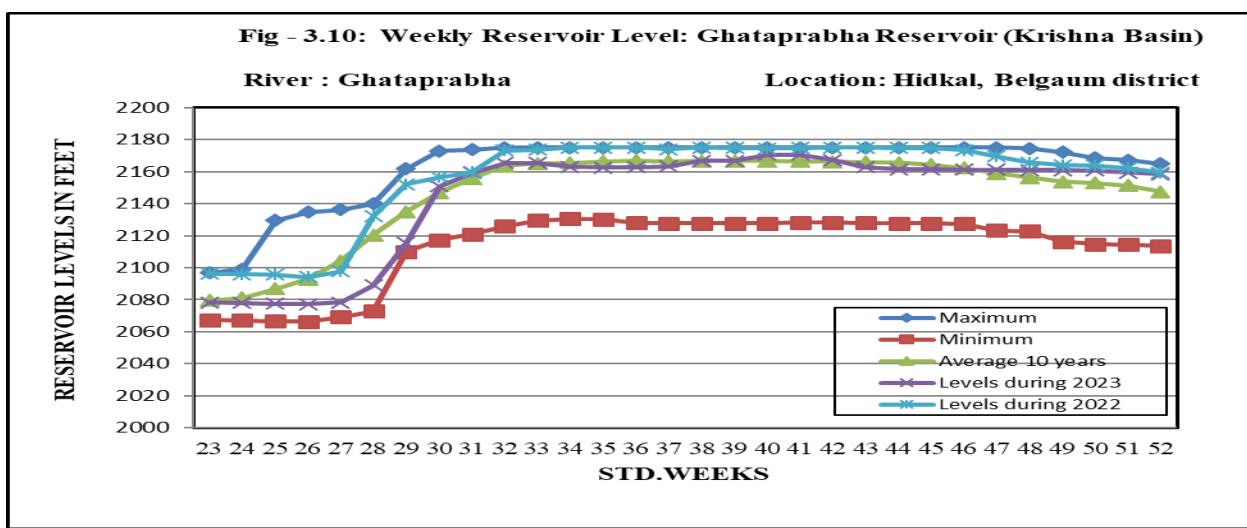


Table-3.11

**Name of the Reservoir: (11) MALAPRABHA
Basin: KRISHNA GENERATION RESERVOIR
Full Reservoir Level: 2079.60**

**Unit: in feet
Reservoir level (RL): above mean sea level**

Std. Week No.	Reservoir Level information during			Levels during 2023	Difference in	Levels during 2022.	Difference in RL of 2023 compared Maximum	
	recent 10 years				RL of 2023			
	Maximum	Minimum	Average		compared to the			
			10 years		Average level			
23	2054.26	2033.30	2041.23	2045.70	4.47	2053.01	-7.31	
24	2053.77	2032.88	2041.09	2044.48	3.39	2053.00	-8.52	
25	2062.00	2032.39	2042.36	2044.00	1.64	2053.20	-9.20	
26	2062.75	2031.90	2043.60	2043.66	0.07	2053.30	-9.64	
27	2063.10	2033.55	2045.66	2043.31	-2.35	2055.10	-11.79	
28	2064.00	2034.72	2050.38	2042.96	-7.42	2062.50	-19.54	
29	2068.20	2042.75	2054.80	2049.70	-5.10	2068.20	-18.50	
30	2074.10	2047.45	2059.04	2062.70	3.66	2069.20	-6.50	
31	2075.90	2051.60	2063.01	2065.00	1.99	2070.60	-5.60	
32	2077.00	2053.66	2066.81	2066.80	-0.01	2075.80	-9.00	
33	2079.20	2053.80	2068.24	2067.10	-1.14	2077.40	-10.30	
34	2079.50	2052.95	2068.74	2067.20	-1.54	2078.30	-11.10	
35	2079.50	2054.20	2069.22	2066.30	-2.92	2079.50	-13.20	
36	2079.50	2055.05	2069.52	2065.80	-3.71	2079.50	-13.70	
37	2079.50	2055.18	2069.73	2065.66	-4.07	2079.50	-13.84	
38	2079.50	2054.85	2069.82	2065.44	-4.38	2079.50	-14.06	
39	2079.50	2054.70	2069.96	2064.81	-5.15	2079.50	-14.69	
40	2079.50	2054.75	2070.35	2064.11	-6.24	2079.50	-15.39	
41	2079.50	2055.42	2070.43	2063.97	-6.46	2079.50	-15.53	
42	2079.50	2055.41	2070.26	2063.33	-6.93	2079.50	-16.17	
43	2079.50	2055.33	2070.12	2062.12	-8.00	2079.50	-17.38	
44	2079.50	2055.15	2069.65	2061.93	-7.72	2079.45	-17.52	
45	2079.50	2054.92	2069.05	2061.28	-7.77	2079.10	-17.82	
46	2079.50	2053.37	2068.20	2060.49	-7.71	2078.35	-17.86	
47	2079.50	2049.66	2067.05	2060.35	-6.70	2077.00	-16.65	
48	2079.00	2047.66	2065.48	2060.21	-5.27	2075.60	-15.39	
49	2078.17	2047.47	2064.22	2060.07	-4.15	2074.50	-14.43	
50	2077.17	2047.19	2062.91	2059.93	-2.98	2073.30	-13.37	
51	2076.23	2046.87	2061.69	2059.79	-1.90	2072.00	-12.21	
52	2074.96	2046.34	2060.41	2059.44	-0.97	2070.70	-11.26	

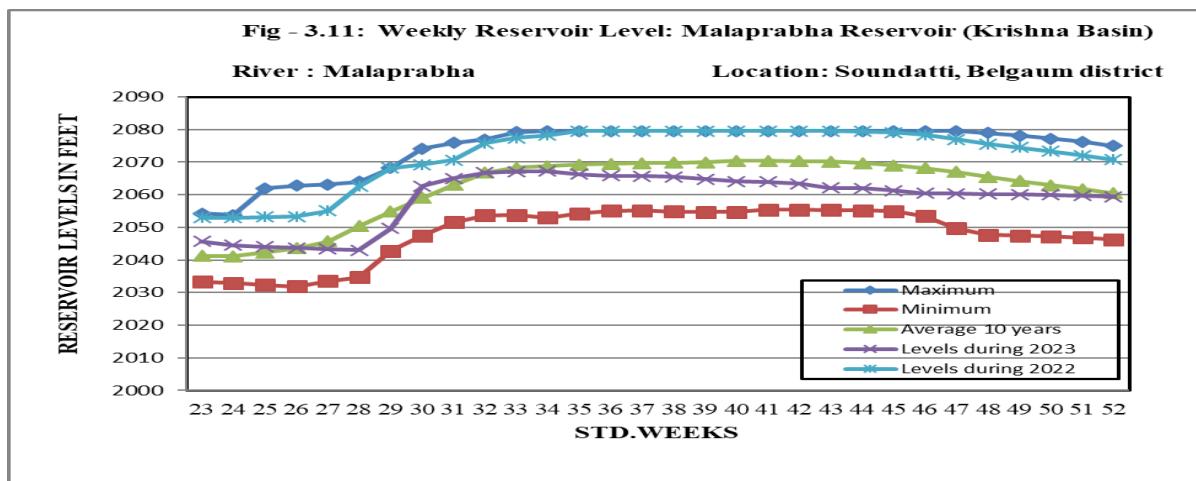


Table-3.12**Name of the Reservoir: (12) ALAMATTI****Basin: KRISHNA GENERATION RESERVOIR****Full Reservoir Level: 1704.81**

Unit: in feet

Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022	Difference in RL of 2023 compared Maximum				
	recent 10 years										
	Maximum	Minimum	Average 10 years								
23	1683.64	1652.38	1666.11	1666.05	-0.06	1683.64	-17.59				
24	1683.84	1652.18	1666.57	1665.60	-0.98	1683.84	-18.24				
25	1697.29	1654.44	1672.11	1665.17	-6.94	1683.61	-18.44				
26	1697.72	1658.78	1676.50	1664.81	-11.69	1683.54	-18.73				
27	1697.68	1664.55	1683.78	1664.48	-19.30	1689.87	-25.39				
28	1699.07	1664.48	1691.66	1668.61	-23.04	1696.99	-28.38				
29	1704.48	1684.47	1696.75	1681.61	-15.14	1699.26	-17.65				
30	1704.81	1686.29	1699.62	1697.68	-1.94	1701.10	-3.42				
31	1704.81	1689.72	1700.41	1703.56	3.15	1702.21	1.35				
32	1704.81	1692.29	1701.94	1704.64	2.70	1701.65	2.99				
33	1704.81	1692.76	1702.80	1704.70	1.90	1704.18	0.52				
34	1704.81	1692.21	1703.36	1704.57	1.21	1704.70	-0.13				
35	1704.81	1691.33	1703.44	1704.54	1.10	1704.70	-0.16				
36	1704.81	1688.94	1702.67	1703.39	0.73	1704.70	-1.31				
37	1704.81	1688.37	1702.77	1703.10	0.33	1703.49	-0.39				
38	1704.81	1690.73	1703.17	1702.93	-0.24	1704.70	-1.77				
39	1704.81	1692.38	1703.25	1701.84	-1.41	1704.70	-2.86				
40	1704.81	1691.81	1703.05	1703.00	-0.05	1704.70	-1.70				
41	1704.81	1692.15	1702.86	1703.26	0.40	1704.28	-1.02				
42	1704.81	1690.80	1702.31	1701.39	-0.92	1704.69	-3.30				
43	1704.81	1688.31	1701.33	1698.99	-2.34	1704.70	-5.71				
44	1704.81	1686.45	1700.57	1696.63	-3.94	1704.70	-8.07				
45	1704.81	1683.86	1699.83	1694.50	-5.33	1704.70	-10.20				
46	1704.81	1681.54	1698.83	1693.81	-5.02	1704.51	-10.70				
47	1704.81	1679.69	1698.17	1692.56	-5.60	1704.27	-11.71				
48	1704.74	1676.69	1697.19	1689.78	-7.42	1704.11	-14.34				
49	1703.79	1675.35	1696.57	1688.43	-8.14	1703.62	-15.19				
50	1703.79	1673.92	1695.69	1687.94	-7.75	1702.67	-14.73				
51	1703.06	1672.00	1694.51	1687.38	-7.13	1699.13	-11.74				
52	1703.03	1671.84	1692.68	1686.86	-5.82	1698.66	-11.80				

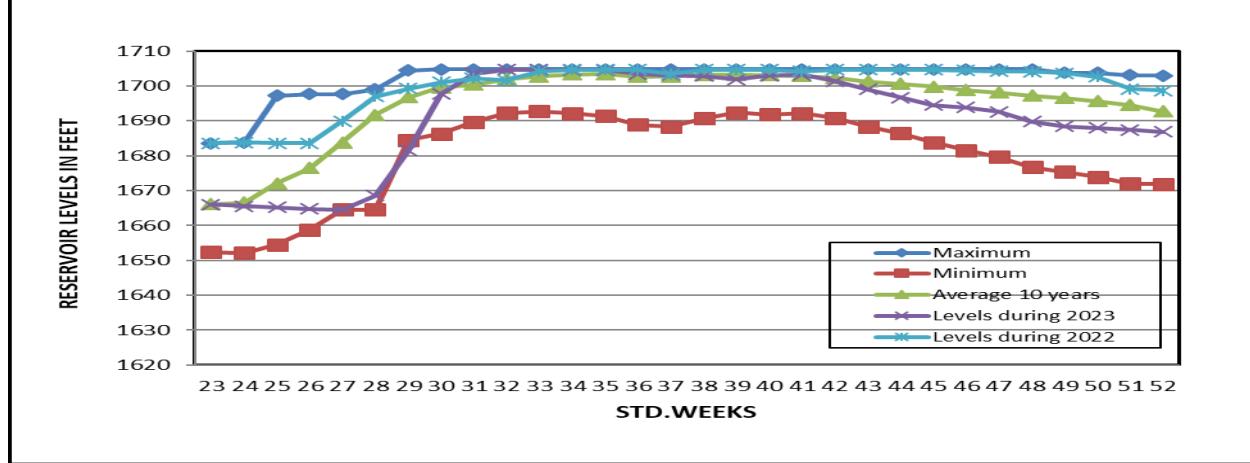
Fig - 3.12: Weekly Reservoir Level: Alamatti Reservoir (Krishna Basin)

Table-3.13

Name of the Reservoir: (13) NARAYANAPURA
Basin: KRISHNA GENERATION RESERVOIR
Full Reservoir Level: 1615 .08

Unit: in feet
Reservoir level (RL): above mean sea level

Std. Week No.	Reservoir Level information during recent 10 years			Levels during 2023	Difference in RL of 2023 compared to the Average level	Levels during 2022	Difference in RL of 2023 compared Maximum
	Maximum	Minimum	Average 10 years				
23	1610.15	1590.16	1600.38	1598.86	-1.52	1610.15	-11.29
24	1610.05	1592.29	1600.62	1598.41	-2.22	1610.05	-11.65
25	1610.87	1594.27	1601.10	1597.91	-3.19	1610.87	-12.96
26	1610.91	1594.21	1601.48	1597.55	-3.93	1610.91	-13.35
27	1610.97	1593.90	1602.02	1597.32	-4.69	1610.97	-13.65
28	1613.17	1593.88	1604.91	1597.13	-7.79	1611.63	-14.50
29	1613.84	1600.59	1609.64	1597.09	-12.55	1612.78	-15.69
30	1614.12	1606.31	1611.75	1611.66	-0.09	1613.66	-2.00
31	1614.42	1607.30	1611.83	1612.68	0.84	1613.50	-0.82
32	1615.00	1605.72	1611.77	1614.48	2.71	1610.91	3.58
33	1614.34	1607.79	1611.80	1610.77	-1.03	1613.07	-2.30
34	1614.63	1610.45	1613.46	1607.66	-5.80	1614.12	-6.46
35	1615.03	1610.93	1613.98	1605.00	-8.97	1614.65	-9.64
36	1615.01	1610.56	1613.17	1609.04	-4.14	1612.19	-3.15
37	1614.91	1608.10	1613.11	1608.67	-4.44	1611.33	-2.66
38	1614.97	1611.46	1613.96	1609.85	-4.11	1614.28	-4.43
39	1615.07	1610.70	1613.95	1612.64	-1.31	1614.48	-1.84
40	1615.07	1608.22	1613.82	1611.04	-2.78	1614.58	-3.54
41	1614.94	1608.25	1613.03	1610.38	-2.65	1612.51	-2.13
42	1614.94	1607.53	1612.88	1610.38	-2.50	1614.15	-3.77
43	1615.07	1607.25	1613.21	1612.02	-1.19	1614.80	-2.78
44	1615.07	1607.06	1612.41	1612.81	0.40	1614.35	-1.54
45	1615.07	1604.64	1610.81	1612.02	1.21	1611.59	0.43
46	1614.09	1604.77	1610.22	1611.56	1.34	1607.10	4.46
47	1614.22	1598.50	1609.16	1611.73	2.56	1603.32	8.40
48	1614.65	1599.19	1609.56	1612.28	2.72	1602.54	9.74
49	1614.38	1601.13	1608.50	1611.99	3.48	1601.23	10.76
50	1612.81	1598.20	1607.96	1609.07	1.11	1603.00	6.07
51	1612.74	1598.44	1608.64	1608.67	0.04	1612.12	-3.44
52	1612.81	1598.70	1609.79	1607.72	-2.07	1611.59	-3.87

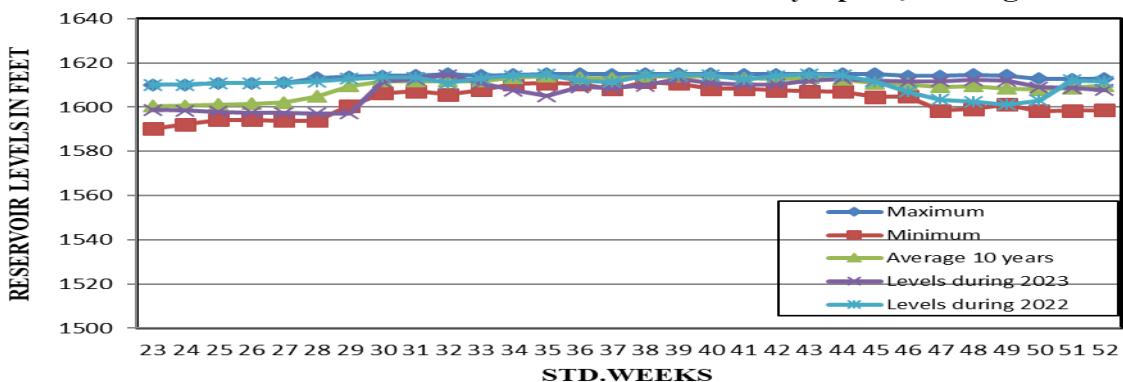
Fig - 3.13: Weekly Reservoir Level: Narayanapura Reservoir (Krishna Basin)**River : Krishna****Location: Narayanpura, Gulbarga district**

Table : (A)

MAJOR RESERVOIR LEVELS IN THE STATE

Units: in feet
Reservoir level (RL) above mean sea level

Sl. No .	Name of the Reservoir	Full Reservoi r Level (FRL) feet above mean see level	Reservoir level Information during recent 10 years (2013 to 2022) for the Annual (Water year) (01.06.2023 to 31.12.2023)			R.L. as on 01.06.202 3	R.L. as on 31.12.202 3	Increase/decreas e in R.L. from 01.06.2023 to 31.12.2023	R.L. of 2021 compa red to the Average R.L.	R.L. as on 31.12.2022	R.L. of 2023 compared to the R.L. of 2022.	Balance R.L. as on 31.12.2023
			Maximu m	Minimu m	Averag e							
1	2	3	4	5	6	7	8	9	10	11	12	13
(a) Hydel generation Reservoirs (Western Coast)												
1	Linganamakk i	1819.00	1810.65	1790.25	1801.75	1748.10	1780.25	32.15	-21.50	1801.85	-21.60	-38.75
2	Supa	1850.48	1834.70	1772.45	1808.24	1743.52	1782.44	38.91	-25.80	1805.17	-22.74	-68.05
3	Varahi	1950.10	1933.43	1915.39	1924.13	1870.50	1904.29	33.79	-19.84	1921.29	-17.00	-45.80
(b) Reservoirs of Cauvery Basin:												
4	Harangi	2859.00	2854.98	2785.41	2815.19	2819.46	2830.67	11.21	15.48	2828.08	2.59	-28.33
5	Hemavathi	2922.00	2909.57	2865.08	2888.07	2894.57	2891.63	-2.94	3.56	2908.47	-16.84	-30.37
6	K.R.S*	124.80	123.22	79.48	112.06	79.92	96.78	16.86	-15.28	118.80	-22.02	-28.02
7	Kabini	2284.00	2283.31	2260.76	2273.07	2251.05	2273.26	22.21	0.19	2271.41	1.85	-10.74
(c) Reservoirs of Krishna Basin:												
8	Bhadra	2158.00	2157.97	2116.27	2146.28	2109.56	2123.37	13.81	-22.91	2154.35	-30.98	-34.63
9	Tungabhadra	1633.00	1631.37	1587.94	1616.38	1580.62	1589.09	8.47	-27.29	1624.90	-35.81	-43.91
10	Ghataprabha	2175.00	2164.92	2113.61	2147.37	2083.97	2158.47	74.50	11.09	2159.50	-1.03	-16.53
11	Malaprabha	2079.50	2074.96	2046.34	2060.41	2046.94	2059.44	12.50	-0.97	2070.70	-11.26	-20.06
12	Almatti	1704.81	1703.03	1671.84	1692.68	1666.65	1686.86	20.21	-5.82	1698.66	-11.80	-17.95
13	Narayanapura	1615.00	1612.81	1598.70	1609.79	1599.13	1607.72	8.60	-2.07	1611.59	-3.87	-7.28

NOTE : Maximum, Minimum and Average levels are calculate by considering 10 years data.

Source: WRDO & KPCL, Govt. of Karnataka

4. Zonewise/ District-wise Status Of Minor Irrigation Tanks (Abstract)

Sl No.	DISTRICT	No Of Tanks	Full Capacity mcf.	Total area designed	No.of tanks not received water	30%	31-50%	51-99%	100 %
1	2	3	4	5	6	7	8	9	10
(a) Minor Irrigation South Zone as on 31.12.2023									
1	Bangalore Urban	46	1400	5045	0	10	10	20	6
2	Bangalore Rural	98	3107	9681	7	42	23	23	3
3	Ramanagara	101	4946	16669	14	23	39	22	3
4	Kolar	138	5182	12147	0	106	10	22	0
5	Chikkaballapura	201	7954	27107	25	94	65	16	1
6	Tumkur	371	16673	36939	105	188	53	25	0
7	Chitradurga	166	9131	21431	13	66	76	9	2
8	Davanagere	72	5121	8815	6	34	28	4	0
9	Shimoga	306	3556	22981	0	123	130	53	0
10	Mysore	50	1116	6781	1	11	11	19	8
11	Chamarajnagar	64	2360	13296	18	14	17	12	3
12	Mandya	48	1232	4319	1	23	16	8	0
13	Hassan	170	4946	12502	7	66	77	20	0
14	Chikkamagulur	124	4267	16846	22	38	19	44	1
15	Dakshina Kannada	2	7	131	0	0	1	1	0
16	Udupi	4	42	283	0	0	0	4	0
17	Kodagu	29	509	1948	0	13	7	9	0
	Total	1990	71548	216920	219	851	582	311	27
Minor Irrigation North Zone as on 31.12.2023									
1	Belgaum	290	3237	30813	121	64	80	25	0
2	Bijapur	157	3635	23384	40	14	21	51	31
3	Bagalkote	69	1838	12429	40	19	1	9	0
4	Dharwad	112	1739	14076	0	17	71	24	0
5	Gadag	32	1377	7741	2	18	7	5	0
6	Haveri	264	4010	23247	0	112	51	100	1
7	Uttara kannada	91	1773	13755	0	37	40	14	0
8	Gulburga	169	4954	28996	30	55	48	36	0
9	Yadgiri	71	2777	6549	3	0	22	46	0
10	Bidar	125	2958	21494	4	25	21	47	28
11	Bellary	36	766	3417	14	10	10	2	0
12	Vijayanagar	84	3450	13367	32	36	16	0	0
13	Koppala	122	1937	15837	49	62	3	8	0
14	Raichur	73	1789	8779	11	27	20	11	4
31	Total	1695	36240	223883	346	496	411	378	64
	State Total (a & b)	3685	107788	440803	565	1347	993	689	91

Minor Irrigation Department, Govt. of Karnataka

The above table shows the status of the Minor Irrigation (MI) Tanks in the State.

The **Southern zone** (comprises 17 Districts). There are **1990** MI tanks in the Southern zone Districts. Only 27 Tanks in this zone are filled upto their full capacity as on 31st December 2023.

The **Northern zone** (comprises 14 Districts). There are **1695** MI tanks in the Northern zone Districts. Only 64 tanks are filled upto their full capacity as on 31st December 2023.

Out of total 3685 MI tanks in the state, only **21%** of the tanks had storages more than 50% of their respective capacity, **64%** of the tanks were 30% to 50% storages of their respective capacity and the remaining **15%** of the tanks are dry or having insignificant storage.

5. MONITORING OF SEISMIC ACTIVITY IN THE STATE

Earthquakes are one of the most costliest natural hazards faced by the entire human & living kind, posing a significant risk. The risks that earthquakes pose to the society, including death, injury, and economic loss, can be greatly reduced by better planning, construction, and mitigation practices before earthquakes happen and providing critical and timely information to improve response after they occur.

The disastrous earthquake in Killari in the early hours of September 30, 1993 caused considerable damages especially in the districts of Bidar, Gulbarga and Vijayapura. The faults, shear zones and lineaments in Karnataka are considered to be potential risk zones of the Killari type of earthquakes which also caused damages in the adjacent villages of Karnataka.

In Historical years, the earthquakes were detected from the World Wide Seismic Stations Network (WWSSN) & United States Geological Survey (USGS). However, these stations are quite distant from the Peninsular India and hence were difficult to detect earthquakes with magnitudes less than 3.0. The lower magnitude earthquakes (2.0 and below) were reported by the local communities and recorded by the BARC seismic station (specially designed array of seismometers to detect nuclear explosions) at Gauribidanur but the location of these earthquakes are incomplete and highly biased as the tremors do not occur in the vicinity of this station.

The importance of seismological studies lies in the fact that information generated can be used to mitigate the earthquake hazards. Preparation of Seismo tectonic/seismic zonation maps is the first step in this direction. The basic data required for the preparation of these maps are:

- (i) A carefully compiled earthquake catalogue incorporating details about magnitude, location of epicenter, depth of focus etc.,
- (ii) Delineation of seismic source zones from all possible sources like recurrence relation, tectono-geological consideration, paleo-seismicity etc.,
- (iii) Estimation of upper bound magnitude through statistical procedure, cumulative Seismic energy release, active fault length etc., and
- (iv) Attenuation of ground shaking for better results.

Karnataka State Natural Disaster Monitoring Centre (KSNDMC) is the nodal agency in the State for monitoring of seismic activity. Scientific approaches currently adopted worldwide to enhance our resilience to the Earthquake hazard are of two types.

- The first is aimed at providing long term protection to life and property and involves estimation of the earthquake hazard in different areas of a region and its translation into engineering aspects for earthquake resistant structures and land use patterns in the area.
- The second adopted with the first is to keep a constant vigil on the evolving character of ground motion records emitted by small earthquakes from a wide area.

Taking these into considerations, KSNDMC has set up a GPRS Enabled & Solar Powered Permanent Seismic Monitoring Stations (PSMS) Network in Karnataka at 15 locations. The present setup of Stations established are equipped with the state-of-the-art solar powered VSAT technology which includes a Broadband Seismometer, Strong Motion Accelerograph and a Digitizer synchronised with

GPS along with associated accessories and GPRS Connectivity for data transmission to the Master Control Centre (MCC) at KSNDMC, Bengaluru on real time basis.

Table 7.1: Permanent Seismic Monitoring Observatories installed by KSNDMC

Sl. No.	District	Location of the Site
01.	Kalaburgi	Sharana Sirasagi Village-12 km from Gulbarga on Afzalpur Road
02.	Raichur	In the Permanent Observatory of KSNDMC, premises of Science Education Trust, Mantralaya Road
03.	Bellary	In the Permanent Observatory of KSNDMC, premises of T. B. Dam Site
04.	Vijayapura	In the existing Almatti Dam Site observatory
05.	Belagavi	In the existing Hidkal Dam Site observatory
06.	Uttara Kannada	In the existing Supa Dam Site observatory
07.	Shivamogga	In the existing Talakalale Dam Site observatory
08.	Hassan	In the existing Hemavathi Dam Site observatory
09.	Mandya	In the Permanent Observatory of KSNDMC, premises of K.R.S. Dam site
10.	Bangalore South	In the premises of T.G. Halli Dam site at the existing old I.B
11.	Kodagu	In the premises of Harangi Dam site at the existing Seismological Observatory, 11 kms from Kushalnagar
12.	Udupi	In the Premises of Zonal Agricultural & Horticultural Research Station, Brahmavara Taluk
13.	Bangalore North	In the premises of KSNDMC Campus

Table 7.2: Temporary Seismic Monitoring Observatories installed by KSNDMC

Sl. No.	District	Location of the Site
01.	Kalaburgi	Gadikeshwar GP Premises, Chinchodi Taluk
02.	Vijayapura	Ukkali GP Premises, Basavana Bagewadi Taluk

Table 7.3: Earthquakes recorded & reported by PSMS Network of Karnataka during 2023

Sl. No.	Duration	Local	Regional	Teleseismic	Total
01.	January	5	Nil	Nil	5
02.	February	1	Nil	Nil	1
03.	March	1	Nil	Nil	1
04.	April	1	Nil	Nil	1

Sl. No .	Duration	Local	Regional	Teleseismic	Total
05.	May	Nil	Nil	Nil	Nil
06.	June	1	Nil	Nil	1
07.	July	2	Nil	Nil	2
08.	August	Nil	Nil	Nil	Nil
09.	September	1	Nil	Nil	1
10.	October	1	Nil	Nil	1
11.	November	4	Nil	Nil	4
12.	December	1	Nil	Nil	1
Total Earthquakes		18	Nil	Nil	18

6. ASSESSMENT OF KHARIF DROUGHT 2023

- a.** The Southwest Monsoon (SWM) set in over the coast of Karnataka on 10th June 2023, as against the normal onset of 5th June. The SWM gradually advanced thereafter and covered the entire State on 24th June, as against the normal coverage date of 15th June. The delayed onset coupled with sluggish progress of SWM during June resulted in Malnad districts and North Interior Karnataka districts with large agriculture land such as Belagavi, Bagalkot, Haveri, Dharwad recorded large deficit rainfall. Karnataka as a whole recorded -56% deficit rainfall in June, which is the third lowest in the last 122 years for the State. Thereafter, there were spells of heavy rains during the 3rd and 4th week of July, which was only confined to 10 days, and the State as a whole recorded +29% for the month of July.
- b.** However, during August 2023, the crucial phase for agriculture and horticulture crops growth, Karnataka as a whole received 60 mm of rainfall, as against the Long Period Average of 220 mm, which is -73% of LPA with 29 districts out of 31 districts falling under large deficit category, which is the lowest in the last 122 years for the month of August. Deficit rainfall coupled with above normal temperature severely affected the standing crops in large part of rainfed areas.
- c.** During September 2023 , the State as a whole recorded an actual amount of 145 mm of rainfall as against the normal rainfall of 161 mm with a percentage departure from normal being (-) 10%.
- d.** Rainfall over the State as a whole during monsoon season (June-September), 2023 was -25% of its long period average (LPA), i,e., the State as a whole recorded an actual amount of 642 mm of rainfall as against the normal rainfall of 852 mm, which falls under deficit category. Overall rainfall pattern during Kharif 2023 was erratic with large temporal variation in the distribution of rainfall.
- e.** The South West Monsoon made its onset along the coast of Karnataka on the 10th of June 2023, marking a delay of five days from the usual onset of the 5th June. Likewise, the withdrawal of the Southwest Monsoon from Karnataka and the entire country occurred on the 19th of October 2023, deviating by four days from the typical withdrawal date of the 15th of October. This delayed onset of the South West Monsoon has impacted agricultural landscape of the state, affecting the optimal sowing window in certain taluks and leading to a delay in the sowing process.
- f.** Further, Climate Change has propelled erratic rainfall, concentrations of large spells of rainfall in a short span of time and intermittent dry-spells. Therefore, Karnataka witnessed a “Green drought” where the health and growth of vegetation is affected due to soil moisture stress, while not necessarily leading to immediate or obvious visual signs of stress, such as wilting or browning of

plants. In other words, during a green drought, the vegetation may appear green but there is stunted growth and soil moisture stress for more than a month impacting yields drastically. This phenomenon is particularly problematic because it can be challenging to detect and monitor.

Procedure for declaration of drought:

Procedure for declaration of drought is delineated in the Manual for Drought Management 2020: The Karnataka State Natural Disaster Monitoring Centre (KSNDMC) constantly monitors and assesses the Drought conditions during the Southwest Monsoon.

The complexity of drought cannot be captured with the aid of a single indicator, but requires a more comprehensive understanding of data on several parameters read in conjunction with rainfall, the most important and mandatory parameter in any determination of drought and bolstered by a field verification.

Step 1: Trigger 1: Rainfall Related Indices The total rainfall received during the Monsoon period or any declaration period during Monsoon is Deficit by 60% or more as compared to the normal rainfall accompanied or otherwise with 3 or more consecutive weeks of dry spell. If the above parameters indicate the Existence of Drought condition, then the following step to be followed to assess the drought

Step 2 : Trigger 2: Impact Indicators Once Trigger 1 is set off, select any three of the four Impact Indicators:

1. Area under Sowing.
2. Remote sensing based Indices.
3. Soil Moisture
4. Hydrological Indices.

After analyzing the Impact Indicators, the Drought Condition is categorized as Severe or Moderate

Step 3: In the event that trigger 2 is set off (severe or moderate), States will conduct sample survey for Ground Truthing (GT). The finding of field verification exercise (GT) will be final for judging the intensity of drought as ‘severe’ or ‘moderate’ depending on the crop loss. In case, 80% of ground truthing reveals crop loss of more than 50%, States have option to upgrade the intensity of drought from Moderate to Severe category. The criteria for declaration will be same

in case of consecutive drought. **The finding of field verification exercise (GT) will be final for judging the intensity of drought as “severe” or “moderate” depending on the crop loss.**

Ground Truthing: As mandated in the Manual for Drought Management 2020, a comprehensive ground-truthing exercise was undertaken through an exclusive mobile application developed by the e-Governance Department covering 2980 villages selected on random basis, which equates to 10% of villages situated across 223 taluks eligible for ground-truthing assessment. To carry out this extensive operation, a total of 2404 surveyor teams were deployed. The ground-truthing encompassed 22165 individual plots, each exceeding an acre in size.

The Cabinet Sub Committee on Natural Disasters under the Chairpersonship of Hon'ble Revenue has been evaluating drought conditions from July (almost every fortnightly) strictly as per Manual for Drought Management 2020, however, erratic rainfall pattern and stringent parameters constrained our efforts to a large extent to the point that Hon'ble Chief Minister wrote to the Union Agriculture Minister in August (probably 13th August) to amend the parameters to make it State specific.

The evolution of Drought Memoranda is as follows:

- The Cabinet Sub Committee on Natural Disasters chaired by Hon'ble Revenue Minister reviewed the seasonal condition on 22-08-2023. As per KSNDMC, 113 taluks have qualified for Ground Truthing (GT) following parameters prescribed in the Drought Management Manual 2020.
- Cabinet Sub Committee on Natural Disasters again reviewed the rainfall situation on 04-09-2023. After considering the rainfall status upto 2nd September and based on the parameters prescribed in the Drought Management Manual 2020, further 83 taluks qualified for Ground Truthing.
- The Ground Truthing report of 195 taluks were placed before the Cabinet Sub Committee on Natural Disaster meeting on 13-09-2023 reviewed the Ground truthing report and following approval of the Hon'ble Chief Minister and Chairperson, Karnataka State Disaster Management Authority (KSDMA) 195 taluks were declared as drought affected vide No. RD 449 TNR 2023; dated:13.9.2023, out which 161 taluks were categorized as severely Drought affected and 34 taluks as moderately Drought affected as per the procedure outlined in the Drought Management Manual 2020.

- Following declaration of drought, the information on crop loss and drought relief measures were collated from Agriculture, Horticulture, Animal Husbandry, RDPR, Water Resources Departments, etc and Memorandum was prepared by 21st September.
- The Memorandum was placed before the Cabinet in the meeting convened on 22nd September and it was decided to submit Memorandum to the Ministry of Agriculture and Farmers Welfare.
- Consequently, the Memorandum seeking Rs.4860.13 Crore from NDRF was submitted to Ministry of Agriculture and Farmers Welfare on 22nd September 2023.
- Following submission of Memorandum, the Ministry of Agriculture and Farmers Welfare constituted an Inter-Ministerial Central Team (IMCT) to assess the drought situation in Karnataka.
- The 10 member IMCT visited various drought affected districts from 4th to 9th October to make a comprehensive assessment of drought situation in the State.
- The seasonal conditions for the entire South West Monsoon season 2023 (1st June to 30 September) was again assessed. As per KSNDMC additional 21 qualified for Ground Truthing.
- In a subsequent Cabinet Sub Committee meeting convened on 09-10-2023, it was decided to undertake Ground Truthing in the additional taluks 21 that have qualified for Ground Truthing, as well as follow-up Ground Truthing in 22 out of 34 taluks which were previously declared as moderately effected vide No. RD 449 TNR 2023; dated:13.9.2023.
- Following the conclusion of the Ground Truthing process, 21 taluks were declared as drought affected vide vide No. RD 449 TNR 2023; dated:12.10.2023, out of which 17 are severely affected, with the remaining 4 as moderately affected. With respect to follow-up GT of the 22 taluks previously identified among the 34 moderately drought-affected taluks 11 taluks have been upgraded to severe category. In total, out of the 236 taluks, 216 are drought-affected, with 189 taluks falling into the severe affected category and 27 categorized as moderately drought-affected taluks. Hence the following order.
- Supplementary Memorandum was submitted to Ministry of Agriculture and Farmers Welfare on 20-10-2023 seeking Rs.17,901.73 Crore from NDRF, which includes claims of Rs.12,577.86 Crore towards Gratuitous relief.
- Cabinet Subcommittee on Natural Disasters led by Hon'ble Revenue Minister on 25-10-2023 appraised the Union Agriculture Secretary and Union Home Secretary on the prevailing drought condition and requested expediting the process for release of fund from NDRF.

- The rainfall over the State as a whole for the month of October 2023 recorded 47 mm of rainfall as against Long Period Average (LPA) of 131 mm the normal , i.e., a deficit of -65%, categorized as “large deficit.” This, coupled with above-normal temperatures during October, has severely affected the late-sown crops. Consequently, a thorough reassessment of seasonal conditions was conducted at the end of October and 7 taluks qualified for ground trothing. Following Ground Truthing the State Government, vide GO No. 449 TNR 2023 dated 04-11-2023, declared additional 7 taluks as severely drought-affected.
- Cabinet Sub Committee on Natural Disasters led by Hon’ble Revenue Minister met Union Agriculture Secretary and Union Home Secretary on 25-10-2023 and appraised them about the prevailing drought situation and memorandums submitted. Issue of reliance on 8-year-old Agriculture Census 2015 for computing input subsidy and necessity to provide Gratuitous relief was discussed extensively.
- Additional memorandum seeking financial assistance for 7 taluks was submitted to Ministry of Agriculture and Farmers Welfare on 15-11-2023.
- For the Kharif 2023 season as whole, a total of 223 out of 236 taluks are declared as drought-affected, with 196 taluks categorized as severely affected and the remaining 27 categorized as moderately affected.

In essence, during June to October 2023, the State has witnessed 4 spells of drought as below:

1st Assessment – 1st June to 19th August 2023, 2nd Assessment – 1st June to 2nd September 2023,
3rd Assessment- 1st June to 30th September, 4th Assessment- 1st June to 31st October

GO number and Date of declaration	No. of taluks	Memorandum submission date
RD 449 TNR 2023; dated:13.9.2023	195	22 nd September 2023.
RD 449 TNR 2023; dated:12.10.2023	21	20 th October 2023
RD 449 TNR 2023, dated: 04-11-2023	7	15 th November 2023
Total	223 (196 Severe, 27 Moderate)	

In total, the State Government is seeking Rs.18,171.44 crore from NDRF towards input subsidy, Gratuitous Relief and to undertake other immediate drought relief measures. The abstract of the claims of memorandum is as follows:

**SUMMARY OF LOSS AND RELIEF CLAIMED AS PER SDRF
NORMS DUE TO DROUGHT DURING KHARIF 2023**

(Rs. in Crore)

Sl. N o	Item	Total for 223 Taluks	
		Estimated Loss	Relief claimed
1	Agriculture Croploss (46.09 lakhs Ha)	32245.23	4431.39
2	Horticulture CropLoss (2.06 lakh ha)	2916.82	231.73
Sub Total		35162.05	4663.12
3	Animal Husbandry		
	Assistance for opening 223 cattle camps		119.31
	Assistance for opening 713 Fodder banks		144.37
	Medicines		25
	Nutritional supplements		25
	Fodder seed minikits		50
Sub Total			363.68
4	Drinking Water indrought taluks		
	a.Drinking watersupply in rural areas for 180 days		352.8
	b.Drinking watersupply in urban areas for 180 days		213.98
Sub Total			566.78
5	Gratuitous Relief tofamilies whose livelihood is seriously affecteddue to drought for 90days		12577.9
Total (Total of 1 to 5)		35,162.05	18171.44

Total estimated loss due to crop damage in the Stat: Rs. 35,162.05 crore

Assistance sought from Government of India under NDRF: Rs. 18,171.44 Crore

KHARIF 2023 – 223 TALUKS QUALIFIED AS DROUGHT AFFECTED

