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DESERT ENVIRONMENT NEWSLETTER

EIACP RP on Combating Desertification

ICAR-CAZRI

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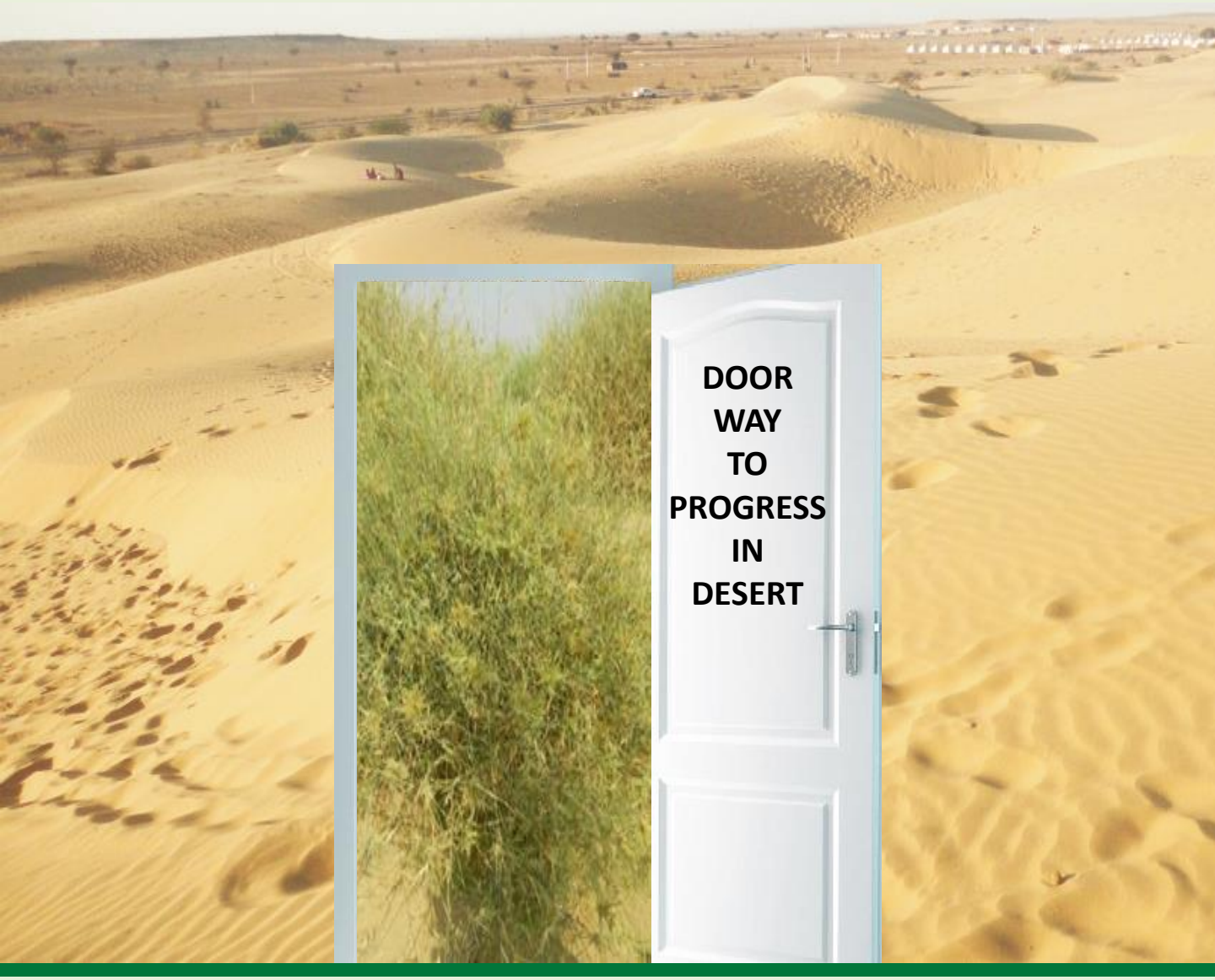

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From the desk of chairman

Dear Readers,

Climate variability and frequently occurring hydro-meteorological extreme events at both country and world level are major concerns considering their impact on water resources, soil erosion processes, agriculture and overall impact on Nation's economy. As per reports, extreme weather events (ranging from a few hours to a few days) are becoming more frequent and intense in recent decades as visible indicators of climate change. The present volume of DEN has aptly discussed scenario of rainfall variability and its impact on the cropping in both hot arid (Rajasthan) and Cold arid (Ladakh) situations for the year 2023. Case studies on the occurrence and impact of extreme weather events that took place during the year; impact of "Biporjoy" : A very Severe Cyclonic Storm over Northeast Arabian Sea" on the weather and crops in the state of Rajasthan and the impact of heat waves as well as rising trends of flash flood events in Kutch District of Gujarat have been well described. Hope, such factful information will be useful for further studies related to climate change. Regular columns on events organized by EIACP unit are also included.

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Knowledge Corner

Rainfall and cropping scenario in Rajasthan and UT of Ladakh in kharif 2023

Normal arrival date of monsoon in Rajasthan is 20 June and it covers the state by 8 July. This year, monsoon arrived late by 5 days (on 25 June) but covered the entire Rajasthan by 2 July. Usually some pre-monsoon rains are received in isolated areas in June and sowing of kharif season crops begins in such areas in early or mid-June. However, most of the sowing is done in late June and July, after arrival of monsoon rains.

The situation was quite different this season. After crossing Gujarat cost around mid-June, the cyclone Biparjoy arrived in south-west Rajasthan as tropical storm and moved slowly across the state as depression and low pressure area (Fig. 1). As a result, pre-monsoon rains were very widespread in the state, except in some north-western parts including Jaisalmer district. Rains were very heavy in south-western parts (its entry area) during 17-19 June and 112 stations recorded very heavy rainfall (>115.6 mm in one day) during these three days. One station in Pali recorded 530 mm rainfall on 19 June, two stations in Jalore district recorded 471 and 456 mm rainfall on 18 June, 15 stations received 300-400 mm rains and 35 stations recorded 200-300 mm rainfall during 17-19 June. As the system moved eastwards, the intensity of rains reduced but large tracts received fairly good rains. Rainfall activities continued after arrival of monsoon on 25 June and district-level average June rainfall was 2 to 10 fold (137 to 504 mm) in 12 districts (5 arid, 7 non-arid) of Rajasthan (Fig. 2, Table 1). Monsoon was fairly active in Rajasthan during July as well. Therefore, the seasonal rains (1 June onwards) up to 2 August are normal (±19%) in 10 districts, excess (20-59%) in 9 districts and very excess (>59%) in 13 districts of Rajasthan. Only Jaisalmer district has received deficit (-34%) rains during this period (Table 1).

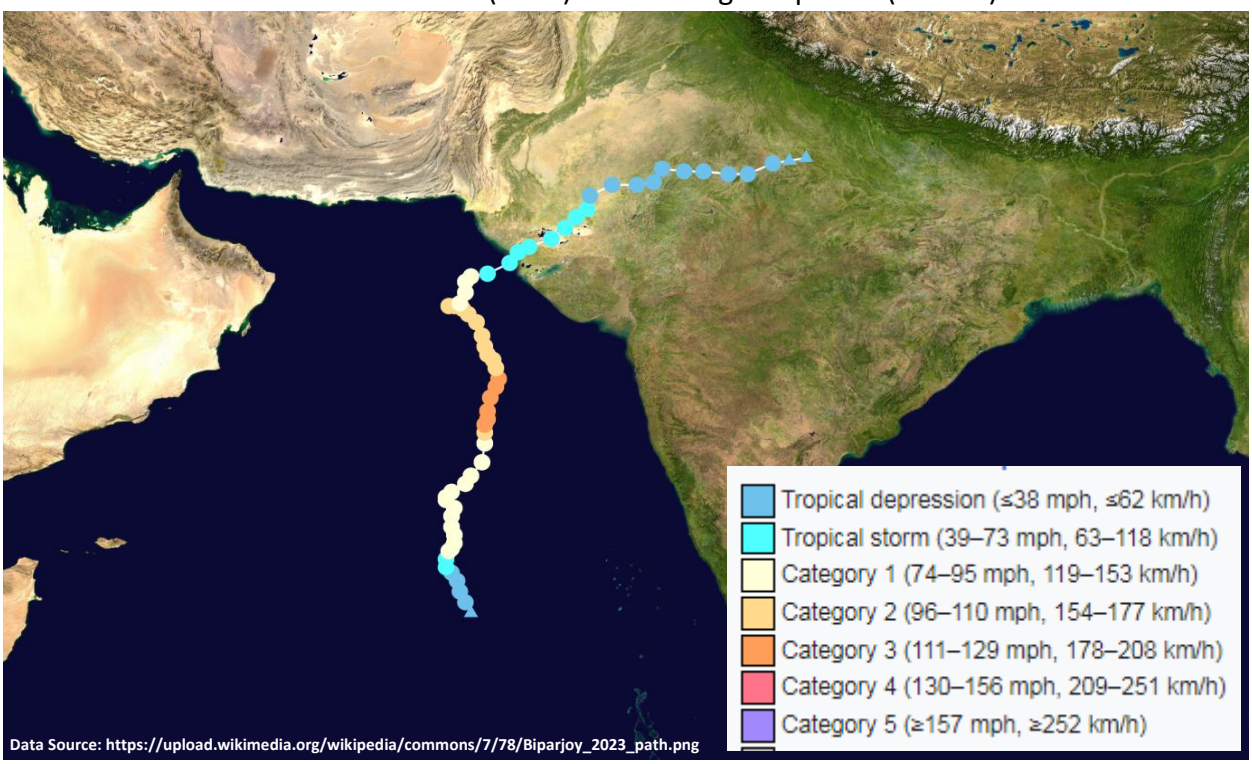

Fig. 1. Track of cyclone Biparjoy

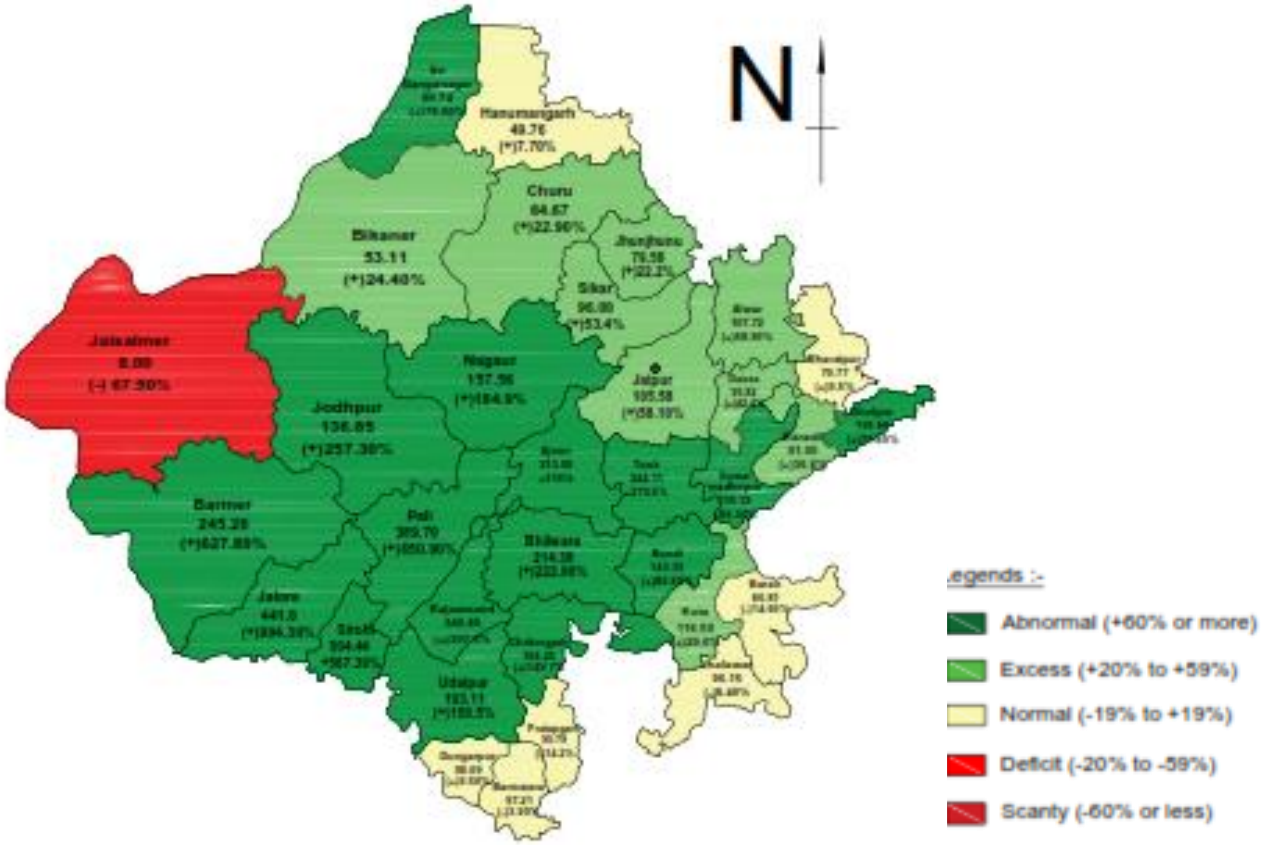

Fig. 2. District-wise June 2023 rainfall (mm) in Rajasthan

Because of early rainfall, about 40% target of kharif season sowing was achieved in the state by June end (Table 2). Among different categories of crops, 59% target area of cereals, and 37% of both pulses and oilseeds was achieved. First preference of farmers after early or timely rains is cereals and millets and it is also evident from data in Table 1 as 66% target of pearl millet sowing and 57% target of sorghum sowing was achieved by 30 June. Subsequently, sowing targets of 94 and 104% for cereals, 84 and 96% of pulses, and 87 and 99% of oilseeds were achieved in the state as a whole by 14 July and 2 August 2023, respectively (Table 2). About 56 and 45% sowing targets were achieved in arid and non-arid parts of Rajasthan in June itself (Table 3). There were, however wide variations among districts as sowing target achievement varied from 11% (Jaisalmer) to 83% (Sikar) in arid districts and 2% (Dungarpur) to 93% (Ajmer) in non-arid districts (Table 3). By 2 August, target of sowing area coverage was achieved almost completely in both arid and non-arid parts of the state.

There are no reports of large scale damage to crops due to excess or deficit rains in the state.

Ladakh

As per the India Meteorological Department, both the districts of UT of Ladakh have received 'Large Excess' rainfall (>60% of normal) so far (1 June to 3 August). Normal rainfall of the UT for this period is 12.9 mm, while the average rainfall in the UT has been 44.7 mm. Rainfall received from 1 June to 3 August was 48.7 mm in Leh and Ladakh district and 31.8 mm in Kargil district, while normal rainfall for these districts for this period is 15.1 and 5.9 mm, respectively.

Since, the cropping season in Ladakh starts from April-May, and the agriculture is almost entirely irrigated, the effect of this rainfall (otherwise also low in magnitude) is not expected on cropping area or crop growth.

Table 1. Normal and actual rainfall in mm (up to specified date), deviation from normal (%) in arid and non-arid districts of Rajasthan

	01-06-23 to 16-06-23			01-06-23 to 20-06-23			01-06-23 to 30-06-23			01-06-23 to 14-07-23			01-06-23 to 02-08-23					
District	Normal Rainfall (mm)	Actual Rainfall (mm)	Deviation (%)	Normal Rainfall (mm)	Actual Rainfall (mm)	Deviation (%)	Normal Rainfall (mm)	Actual Rainfall (mm)	Deviation (%)	Normal Rainfall (mm)	Actual Rainfall (mm)	Deviation (%)	Normal Rainfall (mm)	Actual Rainfall (mm)	Deviation (%)	Average Monsoon rainfall, mm (June-Sept)	% of Monsoon rainfall (up to 2 Aug 23)	Dev. from monsoon rainfall (%)
Arid Districts																		
BARMER	12	30	144	17	192	1006	34	245	628	67	318	377	140	442	216	273	162	62
BIKANER	20	31	55	25	44	73	43	53	24	75	116	56	146	272	86	247	110	10
CHURU	19	23	25	27	39	47	53	65	23	101	142	41	194	265	37	334	79	-21
GANGANAGAR	12	35	195	21	35	70	34	61	79	62	86	39	115	218	90	205	106	6
HANUMANGARH	19	22	14	28	23	-19	46	50	8	86	97	12	146	182	24	254	72	-28
JAISALMER	11	4	-68	13	4	-73	25	8	-67	45	13	-72	93	62	-34	177	35	-65
JALORE	14	37	163	21	419	1858	40	441	994	98	548	457	223	692	210	418	166	66
JHUNJHUNU	26	19	-27	34	33	-2	65	80	22	125	204	63	225	382	69	409	93	-7
JODHPUR	16	30	87	21	100	388	38	137	257	74	205	177	155	315	103	293	108	8
NAGAUR	15	28	85	21	83	286	55	158	185	103	253	145	210	390	86	370	106	6
PALI	17	23	35	23	329	1323	52	390	651	118	539	355	254	629	148	492	128	28
SIKAR	19	30	55	28	53	90	63	96	53	122	206	69	237	385	62	407	95	-5
Avg. Arid Dist.	17	26	64	23	113	421	46	149	238	90	227	143	178	353	92	323	109	9
Non-arid Districts																		
AJMER	16	4	-75	21	143	578	52	214	310	114	330	190	236	457	94	458	100	0
ALWAR	19	9	-52	29	31	5	68	108	59	145	218	50	272	351	29	546	64	-36
BANSWARA	32	2	-92	45	19	-57	101	97	-4	223	250	12	426	421	-1	886	48	-52
BARAN	23	9	-59	38	37	-2	102	87	-15	209	241	15	425	347	-18	832	42	-58
BHARATPUR	15	9	-38	25	22	-12	65	71	10	143	183	28	261	294	13	543	54	-46
BHILWARA	20	5	-77	28	109	289	66	214	223	155	306	98	302	439	45	605	73	-27
BUNDI	18	6	-69	27	80	193	80	143	80	167	187	12	330	373	13	644	58	-42
CHITTAURGARH	24	30	23	33	85	159	79	198	150	177	303	71	356	414	16	727	57	-43
DAUSA	18	5	-71	28	24	-13	67	96	42	152	205	35	301	375	25	595	63	-37
DHAULPUR	17	3	-82	28	77	170	62	106	72	148	196	33	279	288	3	584	49	-51
DUNGARPUR	30	4	-86	40	54	33	90	98	9	192	222	16	354	328	-7	707	46	-54
JAIPUR	18	10	-42	26	34	33	67	106	58	139	242	75	281	432	54	524	82	-18
JHALAWAR	28	6	-79	40	14	-66	105	96	-8	221	243	10	427	430	1	884	49	-51
KARAULI	15	0	-100	25	44	79	67	91	37	143	212	49	289	352	22	596	59	-41
KOTA	23	3	-87	35	21	-41	90	117	30	190	268	40	372	422	13	732	58	-42
PRATAPGARH	36	9	-75	48	25	-49	106	91	-14	228	295	29	445	464	4	914	51	-49
RAJSAMAND	24	16	-32	32	257	715	70	350	398	145	483	233	274	611	123	538	114	14
SAWAI MADHOPUR	18	14	-20	28	88	209	72	135	89	159	309	95	334	421	26	662	64	-36
SIROHI	25	28	14	36	465	1209	76	504	567	200	791	296	457	1051	130	873	120	20
TONK	16	7	-55	23	165	629	64	244	280	132	394	199	286	479	67	567	84	-16
UDAIPUR	26	21	-19	35	102	195	77	193	150	163	301	85	317	429	35	618	69	-31
Avg. non-arid Dist.	22	10	-56	32	90	203	77	160	120	169	294	80	334	437	33	668	65	-35
State	20	16	-19	29	92	220	66	153	133	140	263	88	278	400	44	543	74	-26

Table 2. Targeted and sown area ('000 ha) this year vis-à-vis last year as on 30 June, 14 July and 2 Aug in Rajasthan state

Area in '000 ha

Crops	5 yr. Avg. Area (2017-2021)	Target 2023 ('000 ha)	Area sown last year by 30.06.22	Area Sown by 30-06-23	Achievement (%)	Area sown last year by 14.07.22	Area Sown by 14-07-23	Achievement (%)	Area sown last year by 02.08.22	Area Sown by 02-08-23	Achievement (%)
(a) CEREALS											
Paddy	207	210	32	28	13	123	179	85	216	237	113
Sorghum	580	620	142	353	57	432	568	92	628	621	100
Pearl millet	4282	4400	1354	2922	66	2645	4155	94	4441	4492	102
Maize	906	950	52	367	39	525	904	95	935	941	99
Small Millets	7	6	0	1	10	1	4039	67	3	8	125
TOTAL (a)	5982	6186	1580	3670	59	3726	5810	94	6222	6298	102
(b) PULSES											
Mung bean	2430	2430	623	1048	43	1279	1809	74	2005	2153	89
Moth bean	1000	1000	183	288	29	590	603	60	942	909	91
Urad bean	586	500	69	118	24	240	305	61	313	318	64
Cowpea	69	65	16	36	55	46	58	88	67	63	97
Others	1	1	0	0	5	0	1	88	1	1	107
Kh. Pulses	4085	3996	892	1490	37	2155	2775	69	3329	3445	86
Pigeon pea	9	8	0	2	27	4	7	90	9	9	114
TOTAL (b)	4094	4004	892	1492	37	2160	2783	69	3338	3454	86
TOT. Foodgrains (a+b)	10076	10190	2472	5162	51	5885	8593	84	9560	9752	96

Table 2. Targeted and sown area ('000 ha) this year vis-à-vis last year as on 30 June, 14 July and 2 Aug in Rajasthan state

Area in '000 ha

Crops	5 yr. Avg. Area (2017-2021)	Target 2023 ('000 ha)	Area sown last year by 30.06.22	Area Sown by 30-06-23	Achievement (%)	Area sown last year by 14.07.22	Area Sown by 14-07-23	Achievement (%)	Area sown last year by 02.08.22	Area Sown by 02-08-23	Achievement (%)
(c) OILSEEDS											
Sesamum	274	270	26	57	21	99	189	70	248	232	86
Groundnut	741	750	441	570	76	640	751	100	784	844	113
Soybean	1044	1170	337	260	22	988	1084	93	1133	1143	98
Caster	161	190	0	2	1	1	46	24	114	137	72
TOT. OILSEEDS	2221	2380	804	889	37	1728	2070	87	2278	2356	99
(d) OTHER Crops											
Sugarcane	5	4	3	3	82	5	3	94	5	4	99
Cotton	708	770	573	733	95	614	773	100	647	788	102
Clusterbean	2848	2700	475	712	26	1421	1726	64	2951	2532	94
Others	493	425	100	153	36	219	306	72	407	381	90
Total Cropped Area											
(a+b+c+d)	16350	16469	4427	7652	46	9872	13471	82	15847	15813	96

Table 3. District-wise targeted and sown area('000 ha) this year vis-à-vis last year as on 30 June, 14 July and 2 Aug in Rajasthan

Area in '000 ha

District	Target (000ha)	Area sown last year up to	Area Sown ('000ha)	Target achieved (%)	Area sown last year up to	Area Sown ('000ha)	Target achieved (%)	Area sown last year up to	Area Sown ('000ha)	Target achieved (%)
		30.06.22	30.06.23		14.07.22	14.07.23		02.08.22	02.08.23	
Arid Districts										
BARMER	1513	147	959	63	275	1282	85	1498	1479	98
BIKANER	981	423	389	40	1047	654	46	1670	1296	91
CHURU	1092	126	479	44	673	889	81	1010	1066	98
GANGANAGAR	571	251	415	73	391	494	86	530	554	97
HANUMANGARH	769	382	471	61	643	600	78	704	697	91
JAISALMER	555	62	60	11	225	495	59	735	895	107
JALORE	609	0	251	41	93	389	64	556	549	90
JHUNJHUNU	374	49	304	81	292	343	92	366	371	99
JODHPUR	1299	245	434	33	375	1234	95	1277	1294	100
NAGAUR	1226	883	864	70	1116	1088	89	1182	1216	99
PAli	552	9	74	13	195	425	77	551	453	82
SIKAR	482	372	401	83	459	470	98	476	472	98
Tot. Arid Dist.	10022	2948	5100	51	5784	8363	83	10554	10343	103
Non-arid Districts										
AJMER	425	211	396	93	425	424	100	440	435	102
ALWAR	422	147	234	55	330	391	93	345	392	93
BANSWARA	233	0	31	13	115	220	94	228	235	101
BARAN	360	224	80	22	327	311	86	339	333	92
BHARATPUR	237	105	95	40	167	186	79	202	229	97
BHILWARA	452	0	164	36	50	403	89	371	414	91
BUNOI	310	60	19	6	211	213	69	245	256	83
CHITTORE	335	0	269	80	304	321	96	330	336	100
DAUSA	195	124	160	82	163	184	95	182	184	95
DHOLPUR	103	20	47	45	79	93	90	96	103	100
DUNGARPUR	133	0	2	2	72	124	93	137	134	101
JAJPUR	581	179	396	68	516	501	86	556	558	96
JHALAWAR	341	58	39	11	323	309	91	335	322	94
KAROLI	163	92	95	58	161	161	99	162	163	100
KOTA	278	96	32	11	230	237	85	257	256	92
PRATAPGARH	182	1	44	24	133	186	102	181	186	102
RAJSAMAND	90	0	53	58	21	93	103	92	95	106
S.MADHOPUR	173	110	94	54	150	158	91	160	166	96
SIROHI	156	0	25	16	1	115	73	152	144	92
TONK	316	52	212	67	230	280	89	261	289	91
UDAIPUR	232	0	65	28	81	198	85	223	238	102
Tot. Non-arid Dist.	5719	1479	2551	45	4088	5107	89	5293	5470	102
STATE	16469	4427	7652	46	9872	13471	82	15847	15813	96

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Unprecedented Extremes: A Closer Look at Recent Weather Events in the Arid Region of Kutch, Gujarat, India

The reports of the Intergovernmental Panel on Climate Change (IPCC) have documented the warming of the Earth's climate system due to an upsurge in greenhouses gases (GHGs) caused by increased anthropological activities. This is causing great variation in climate across the world, particularly, increase in mean surface temperatures and also affects the type, frequency, and intensity of weather events, which ultimately leads to the loss of lives and infrastructure. In recent years, "extremes of water scarcity and excess" have been identified as the greatest threat that climate change will present to South Asia in the 21st century (*World Bank, 2013*). The arid region of Kutch in Gujarat, India, has been witness to an alarming surge in extreme weather events in recent times. From scorching heatwaves to erratic monsoons and severe droughts, the region's climatic patterns have been undergoing rapid changes, leaving its inhabitants grappling with unprecedented challenges. In this article, we delve into the significant weather events that have impacted the Kutch region during the last three decades.

I. The Wrath of Heatwaves

Qualitatively, heat wave is a condition of air temperature that becomes fatal to the human body when exposed. Quantitatively, it is defined based on the temperature thresholds over a region in terms of actual temperature or its departure from normal (*Ray et al., 2013*). As per the Indian Meteorological Department (IMD), it is considered a heat wave if the maximum temperature of a station reaches at least 40°C or more for plains and at least 30°C or more for hilly regions, for at least two consecutive days and is declared on the second day.

Kutch, known for its blistering temperatures during the summer months, has experienced an intensified series of heatwaves in recent years. The soaring mercury levels have not only disrupted daily life, but have also posed health risks to the population and adversely affected agricultural production. Most of the heatwaves were generally observed from March to June. Data from IMD shows that in the last three decades (1994-2022), several heatwaves were observed in the Kutch region of Gujarat. From 1994 to 2010, Kutch has faced at least one heatwave event every year except in 2006, whereas the year 2004 encountered 10 heatwaves (7 in March, 2 in May, and 1 in June). However due to changing climatic conditions, an increase in the number of these events was recorded after 2010, as depicted in Fig.1. The data shows that after 2010, the heatwave events occured at least twice in a year with a maximum record of 10, 12, 14 and 17 in 2020, 2018, 2015, and 2022, respectively.

In 2023, heatwave events were recorded as early as the month of February in Kutch. Such events increase water demand for irrigation, which can strain water resources in affected areas, which is a major concern for arid regions; in addition to effects like reduced crop yields, droughts, increased pest and disease pressure, and soil degradation. Research found that for every 1 degree increase in temperature, the yields of wheat, soybean, mustard, groundnut, and potato are expected to decline by 3-7%. These silent killers increase evaporation rates over water resources, thereby depleting resources and trapping radiation over dry soil. Severe heat waves cause forest fires and can be largely detrimental for urban spaces, leading to the urban heat Island phenomenon due to heat-absorbing surfaces trapping hot air between architectural spaces and poor vegetation cover.

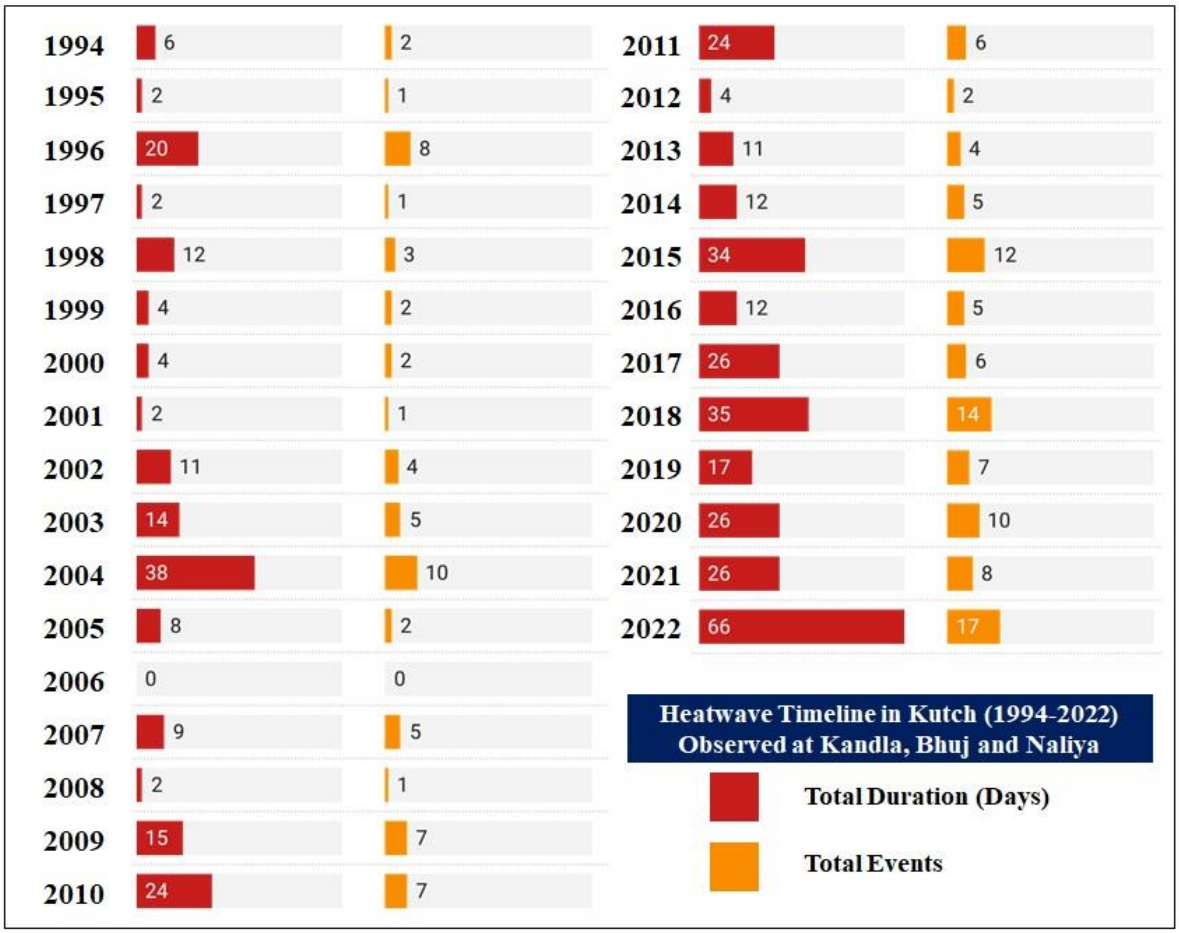

Fig.3. Heatwave events and duration of the heatwave condition from 1994-2022 in Kutch, Gujarat

II. The Elusive Monsoons

As per the IMD, the new all India annual rainfall normal is recorded as 1160.1 mm (benchmark 1971-2020 data) compared to the earlier normal of 1176.9 mm (benchmark 1961-2010 data). Similarly, the new all-India Southwest monsoon rainfall normal calculated in 2022 over the benchmark period (50 year 1970-2020) is found to be 868.6 mm, which is less than the previous 880.6 mm. A gradual decrease in the average rainfall due to the natural multi-decadal epochal variability of dry and wet epochs of all India rainfall is observed. However, IMD is predicting the next decade i.e. 2021-30 will come closer to normal, and the south-west monsoon is likely to enter the wet epoch in the decade of 2031-40. This indicates the extensive impact of changing climate on weather events, making them unpredictable and erratic. For example, arid Kutch receives an annual rainfall as low as 400–700 mm with high standard deviation (200-250 mm). As a result of that, the median rainfall remains low in Kutch in comparison to that of other regions of India for annual as well as seasonal (wet and dry) rainfall. The monsoon season in Kutch has become increasingly erratic, with irregular patterns of rainfall, prolonged dry spells, and even flash floods (Fig.4). The agriculture-dependent communities in the region face significant challenges due to the unpredictable monsoons, leading to fluctuations in crop yields and water scarcity. Traditional farming practices may no longer be viable in the face of such climatic uncertainties, necessitating the adoption of climate-smart agricultural techniques to ensure food security and sustainable livelihoods.

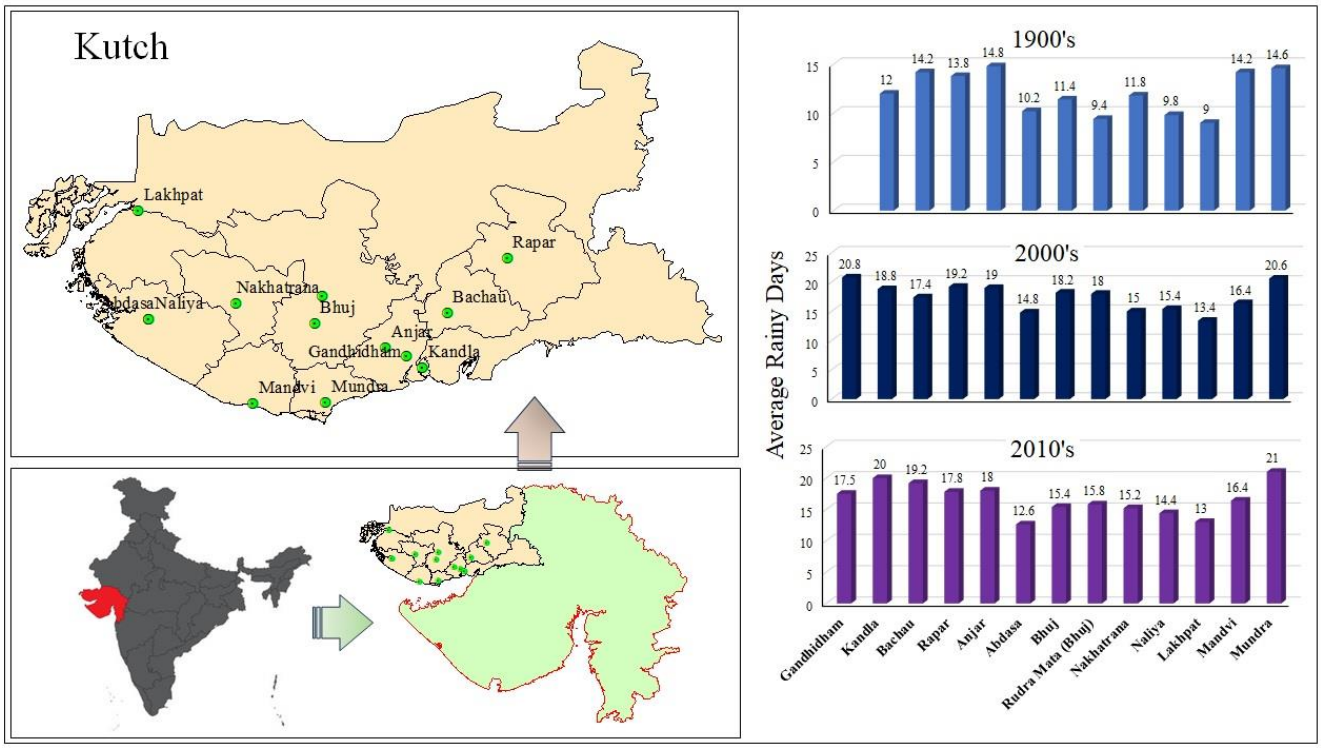

Fig.4. Variation in average rainy days during 1990's, 2000's and 2010's in arid Kutchh

III. Parched Earth: The Drought Conundrum

Persistent droughts have become a recurring nightmare for the people of arid Kutch, where agriculture and animal husbandry are the predominant economic activities. Rainfall variability map prepared using the rainfall data from 1990-2014 indicated that the entire Kutch shows different levels of stress, with Rann of Kutch and some other blocks being severely stressed by precipitation (12-97 mm yearly), central part showing moderate stress (337-375 mm yearly), and Rapar and Mundra being relatively less stressed (>375 mm yearly). The study also recorded that the Rann of Kutch, Abdasa, Rapar, Bhachau and Lakhpat are the most drought prone areas. Historically, Kutch has a drought-frequency of one in two-and-a-half years. The worst drought was experienced latest in 2018-19. The diminishing water sources and depleting groundwater have placed immense stress on both human populations and the local ecosystem. As water scarcity looms large, conflicts over water resources may escalate, further exacerbating the challenges faced by the region. To mitigate the impact of droughts, it is crucial to promote water conservation, efficient irrigation methods, and rainwater harvesting initiatives.

IV. Unusual Deluges: The Rising Trend of Flash Floods

As per IMD, flash Floods are highly localized events of short duration with a very high peak and usually have less than six hours between the occurrence of the rainfall and the peak flood. Surprisingly, amidst the arid landscape, Kutch has occasionally experienced sudden and intense flash floods, causing widespread damage to property and infrastructure. The changing weather patterns, combined with unplanned urbanization and inadequate drainage systems, have contributed to the vulnerability of the region to these extreme events. Disaster preparedness and risk reduction measures must be integrated into urban planning and infrastructure development to mitigate the impact of flash floods and protect communities from future disasters.

Conclusion

The arid region of Kutch, Gujarat, India, has faced a series of unprecedented weather events that have disrupted the lives of its inhabitants and posed significant challenges to the region's socio-economic well-being. While climate change plays a pivotal role in driving these extreme events, human activities such as deforestation, unplanned urbanization, and overexploitation of natural resources have exacerbated the situation. To secure a resilient future for Kutch, collective efforts from the government, local communities, and relevant stakeholders are required. Implementing climate adaptation and mitigation strategies, preserving ecological balance, and fostering sustainable practices will be crucial steps towards building a more climate-resilient and environmentally conscious Kutch for generations to come.

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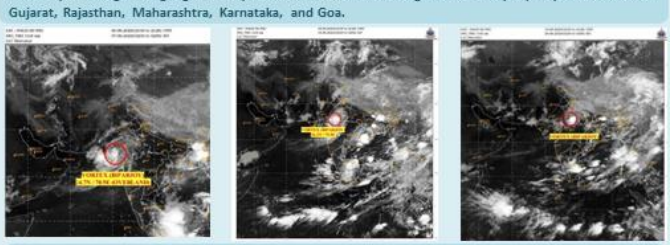
Knowledge Product

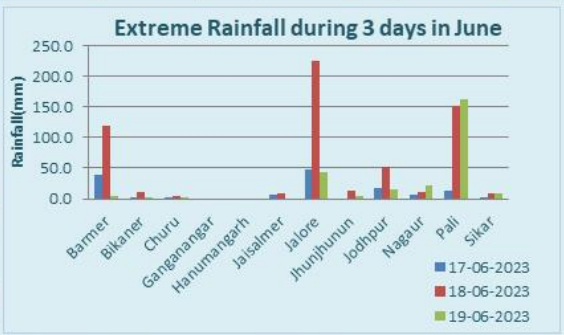
Biporjoy Cyclone Effects in Western Rajasthan, June-2023

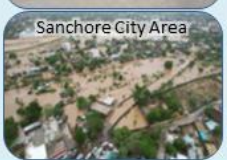
Biporjoy : A powerful tropical cyclone that formed over the east-central Arabian Sea, meaning 'calamity' in Bengali language. This cyclone caused severe damage to life and property in the state of Gujarat, Rajasthan, Maharashtra, Karnataka, and Goa.



OBSERVED AND FORECAST TRACK OF DEPRESSION (REMANANT OF CYCLONIC STORM BIPARJOY) OVER CENTRAL PARTS OF SOUTH RAJASTHAN AND NEIGHBOURHOOD BASED ON 0000 UTC (0530 IST) OF 17TH JUNE 2023 to 19TH JUNE 2023 .

Days	17-06-2023		18-06-2023		19-06-2023	
District	Actual (mm)	Normal	Actual (mm)	Normal	Actual (mm)	Normal
Barmer	39.7	1.3	118.0	1.2	4.4	1.0
Bikaner	1.4	1.0	11.9	2.1	3.4	1.2
Churu	0.7	1.3	4.1	1.1	1.5	3.5
Ganganangar	0.0	1.0	0.0	3.2	0.0	2.1
Hanumangarh	0.0	1.0	0.0	3.1	0.0	3.3
Jaisalmer	6.8	1.0	7.8	0.6	0.0	0.5
Jalore	46.8	2.6	225.9	1.0	44.4	2.3
Jhunjhunu	0.0	2.2	14.0	1.9	5.5	2.1
Jodhpur	18.5	1.0	51.4	1.5	16.1	1.0
Nagaur	7.7	1.4	10.7	0.6	22.8	2.0
Pali	14.1	1.7	151.9	1.0	162.5	1.7
Sikar	0.1	2.5	8.9	1.7	8.4	2.7





Extreme Rainfall during Biporjoy cyclone

- Barmer(54.03 mm) , Jalore(105.7 mm), Pali(109.5 mm)
- Cyclonic wind speed often reached 60-80 km h^{-1}
- Disruption in Inter village road connectivity and continuous Blackouts reported from Pali, Jalore, Sirohi and Barmer.

P.C. Moharana, Mayur Bhati, Sonali Bhargav, Narayan Lal

EIACP RP on Combating Desertification
ICAR – Central Arid Zone Research Institute ,Jodhpur

EIACP Activities

Republic Day

On the Occasion of **Republic Day EIACP-RP, ICAR-CAZRI** Organized a awareness programme under **Mission LiFE** for school students of class VI-X from Government Sec. School at Khejarli Khurd, Jodhpur**.** About 100 students along with school staff participated. Programme Officer detailed about the Mission LiFE activities of EIACP RP, ICAR-CAZRI, Jodhpur.



World Wetland Day

EIACP RP at ICAR-CAZRI, Jodhpur conducted an **outreach programme** at Swami Vivekanand Government Model School, Block Mandore, Barli, Jodhpur to celebrate the **World Wetland Day** on **02nd February, 2023**. EIACP Coordinator Dr. P.C. Moharana defined the meaning of wetlands and its significance related to water conservation and its aquatic environment. Dr. J.P. Singh, Principal Scientist, ICAR-CAZRI, Jodhpur elaborated the biodiversity and conservation of wetlands areas specifically in arid regions of western Rajasthan. A **poster competition** was conducted in school premises on the theme "**Wetland Restoration"** for the students of class IX and XI. A total of 40 students enthusiastically participated. A Cleanliness drive was also organized under Mission LiFE at nearby pond, Barli village along with the teachers and EIACP Coordinator and staff members. Knowledge on the importance of Mission LiFE was also disseminated among the students. Prizes were given to the winners.

World Environment Day

EIACP RP on Combating Desertification at ICAR-CAZRI, Jodhpur organized a **Guest Lecture** on the occasion of **World Environment Day** on **05th June, 2023**, on Theme "**People's Action on Plastic Pollution Matters"**. The lecture was delivered by Dr. Shiv Singh Rathore, Ex-Chairman (o) & Member, Rajasthan Public Service Commission (RPSC). Dr. N.V. Patil, Acting Director, ICAR-CAZRI, Jodhpur explained about the importance of Environment in daily life to the scientists and employees of the institute and encouraged them to take care of the environment.

Vote of thanks was extended by EIACP Coordinator Dr. P.C. Moharana. The lecture was attended by more than 80 participants.

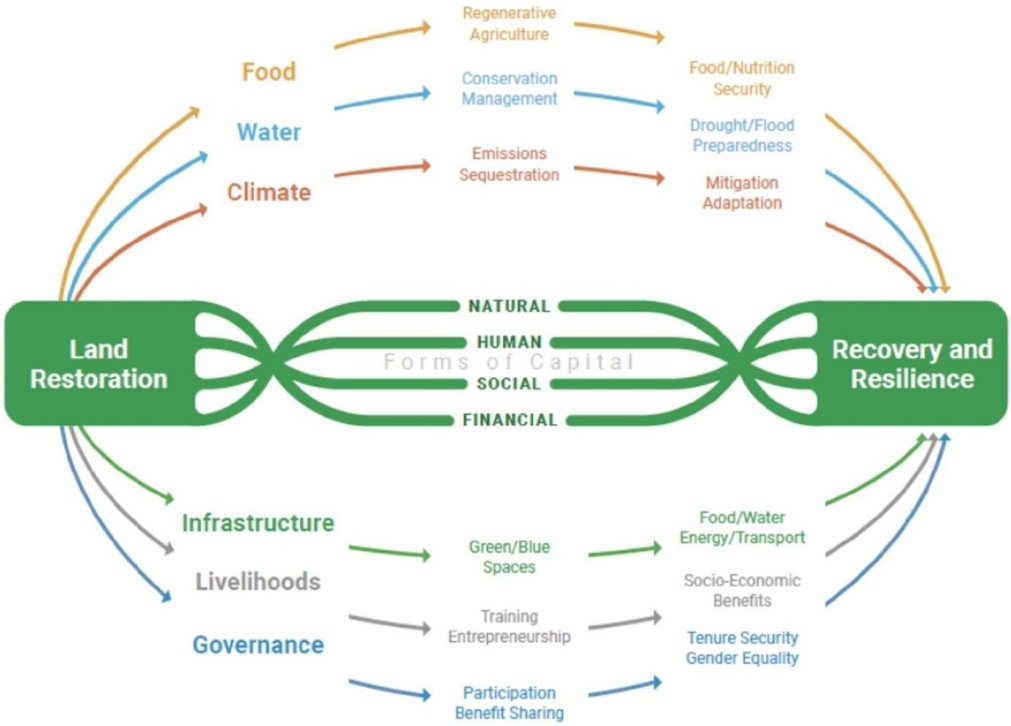
International Yoga Day

EIACP RP on Combating Desertification at ICAR-Central Arid Zone Research Institute, Jodhpur organized **a yoga session** on **International Yoga Day on 21st June, 2023**, on Theme "**Yoga for Vasudhaiva Kutumbakam**", "**One Earth, One Family and One Future**". The yoga session was instructed by **Mrs. Kajal Sagar Trivedi** from 7:00 AM to 8:00 AM at CAZRI Campus. After the yoga session, Dr. O.P. Yadav, Director, ICAR-CAZRI, Jodhpur explained the benefits of yoga to the scientists and employees of the institute and encouraged them to include yoga in their daily routine. The Director also told that every officer and employee of the institute should keep their thinking positive and positivity will come only when he is healthy which is possible if he does yoga daily.

Vote of thanks was extended by Mr. Dharmendra Bohra, Secretory CAZRI club. He profusely thanked to all Scientists, Technical Officers, Administrative and EIACP staffs of ICAR- CAZRI, Jodhpur for attending this yoga session. The yoga session was attended by more than 50 participants.

Information Around

Land Restoration pathways to recovery and resilience



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