

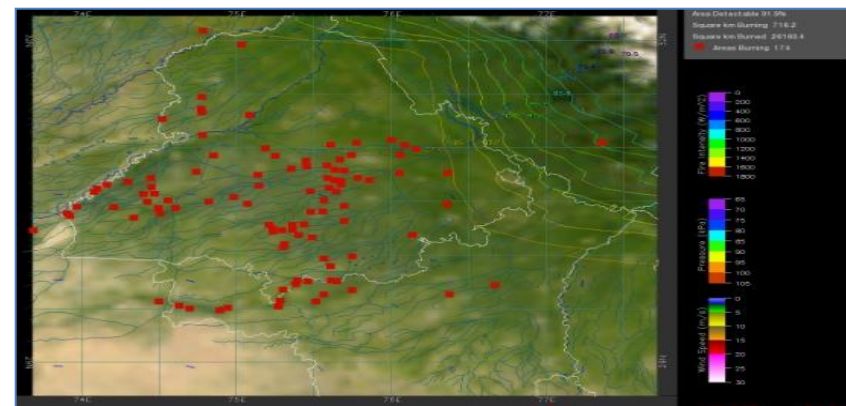
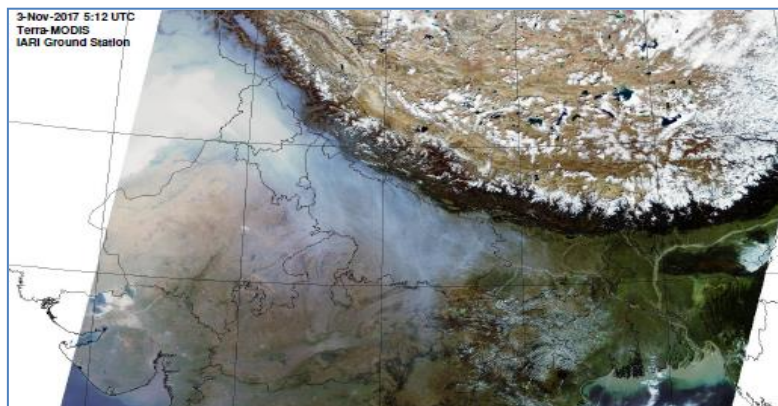


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2023

Bulletin
No. 16

Events Date:
30-Sep-2023

Issued on:
30-Sep-2023



Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

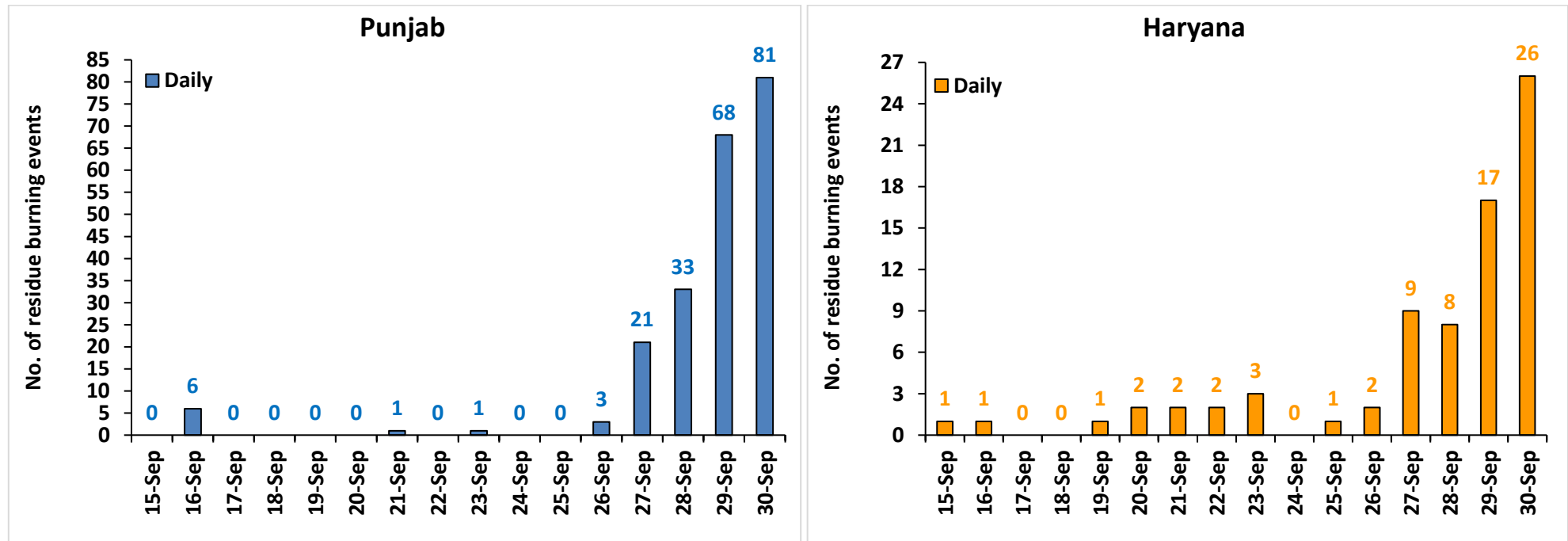
<http://creams.iari.res.in>



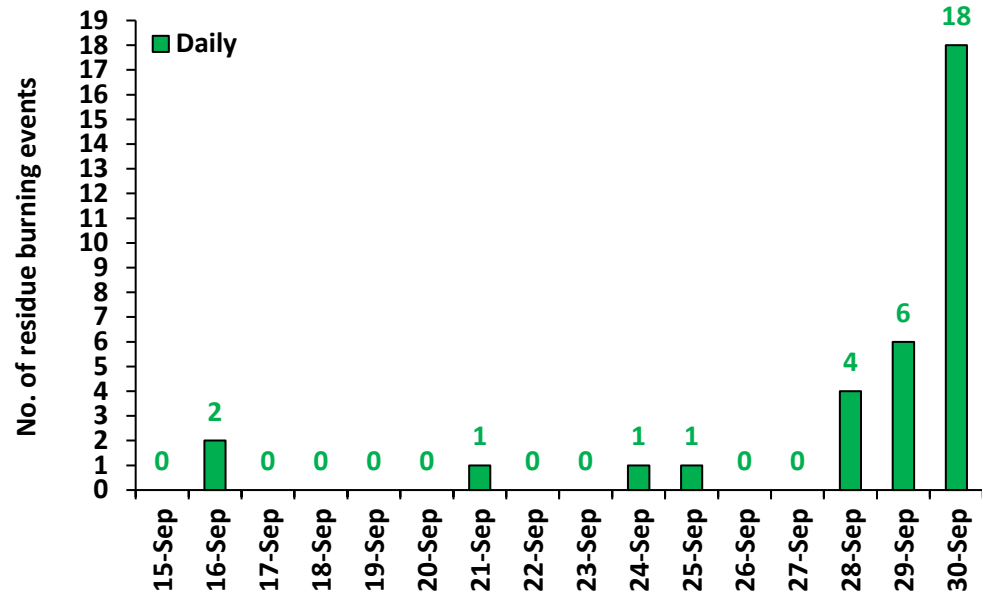
Highlights for 30-Sep-2023

- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **140** residue burning events in the six study States on 30-Sep-2023.
- The state wise events detected on 30-Sep-2023 were **81** in Punjab, **26** in Haryana, **18** in UP, **00** in Delhi, **04** in Rajasthan and **11** in MP.
- Total **354** burning events were detected in the six states between 15-Sep-2023 and 30-Sep-2023, which are distributed as **214**, **75**, **33**, **01**, **10** and **21** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.

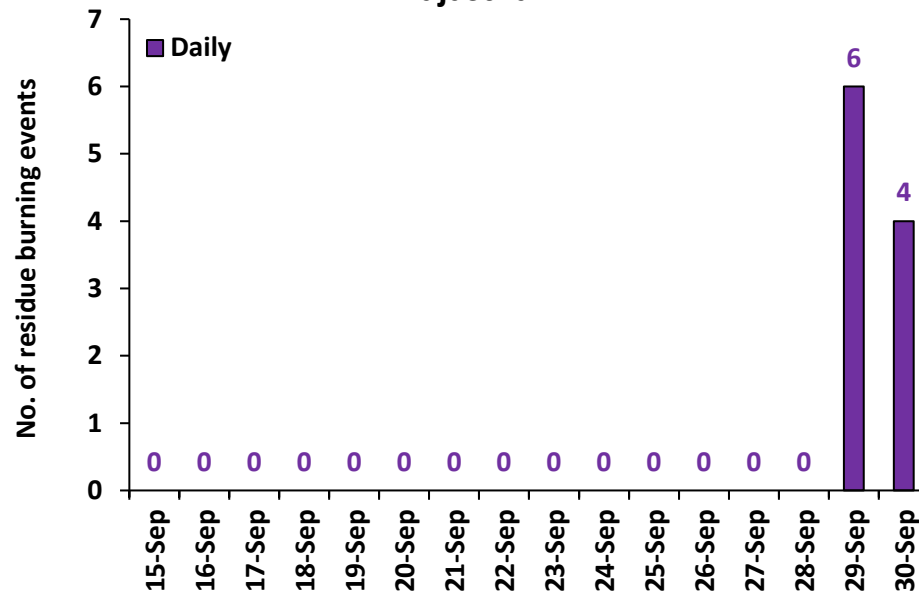
Temporal distribution of rice residue burning events for the study States in 2023



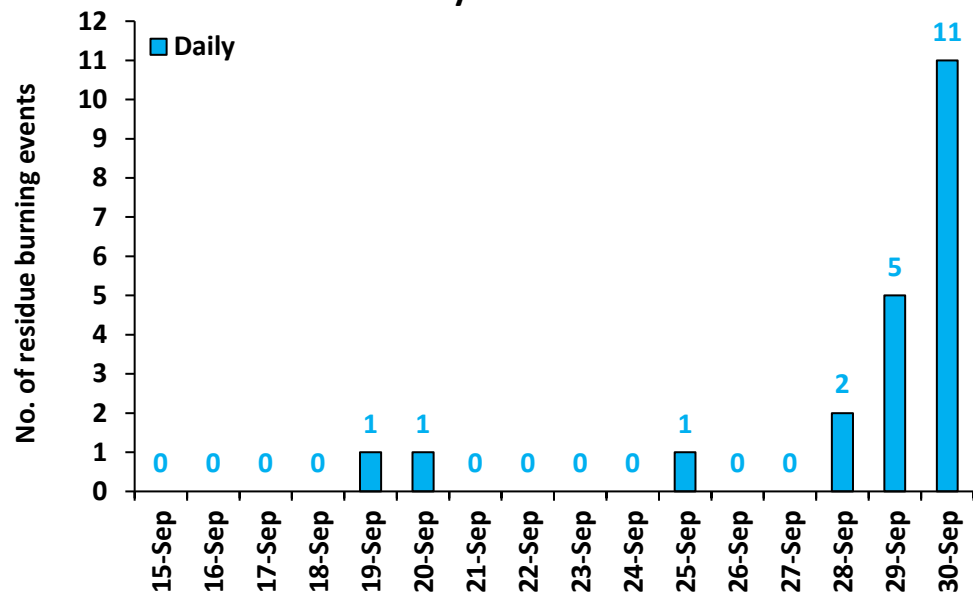
Uttar Pradesh



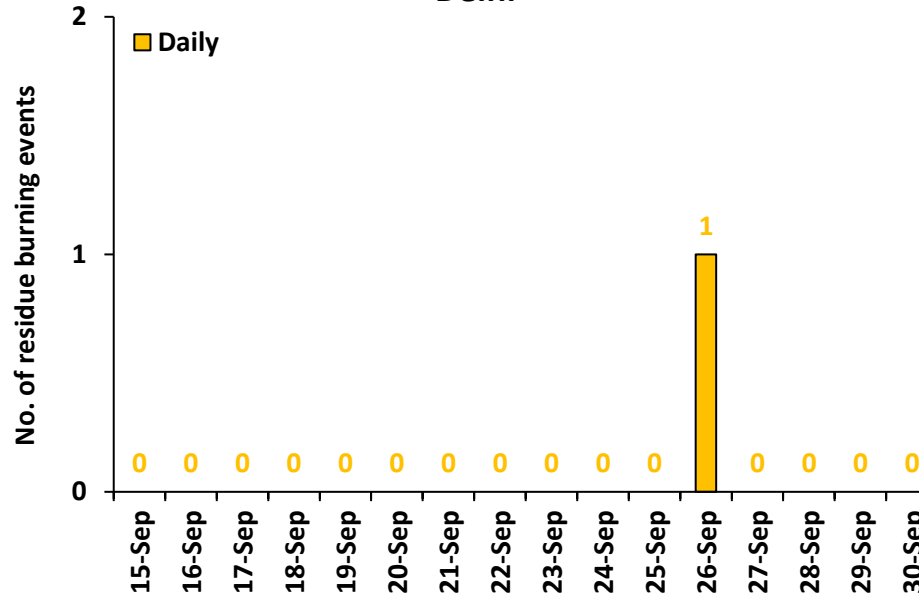
Rajasthan



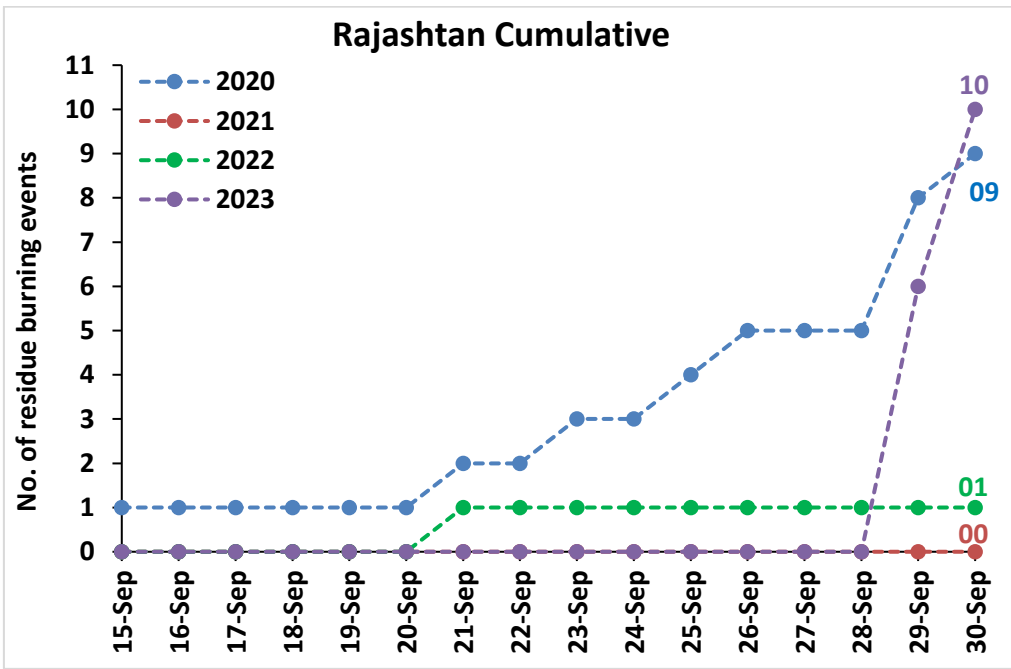
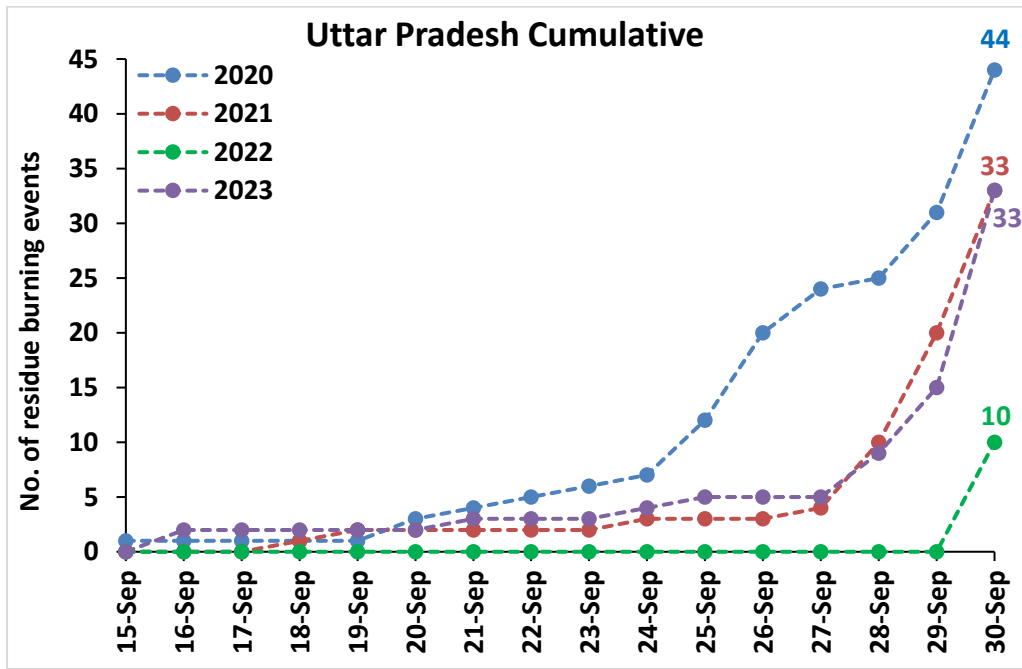
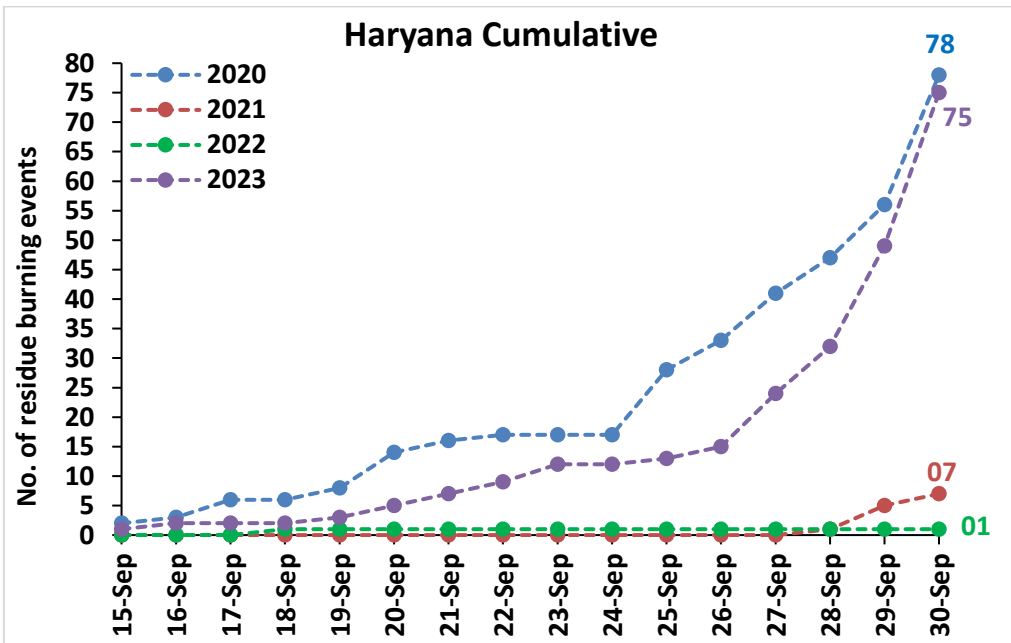
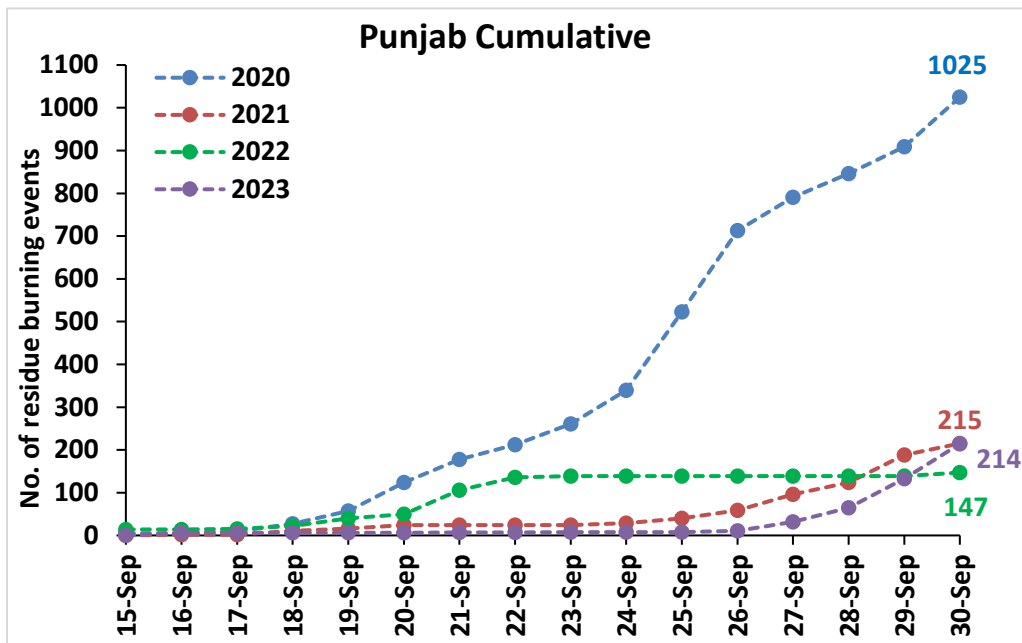
Madhya Pradesh

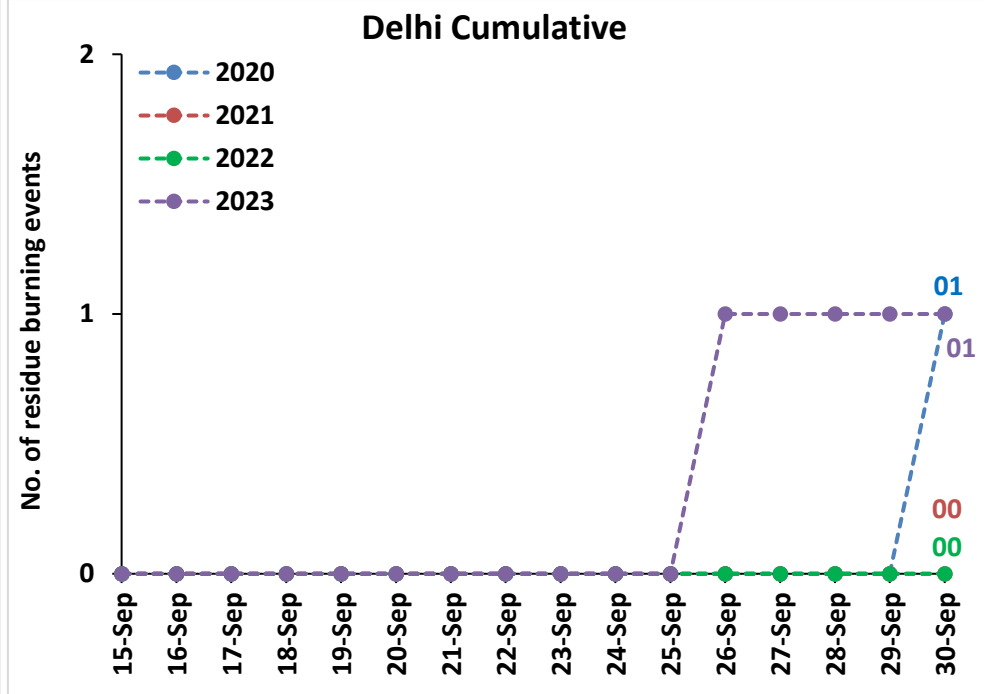
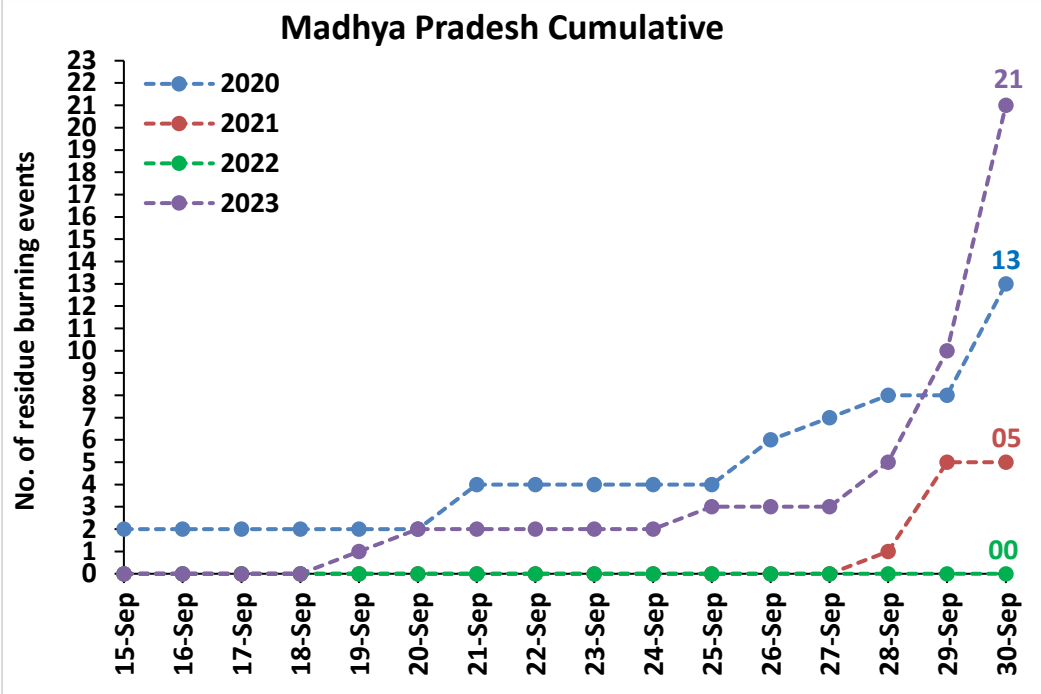


Delhi

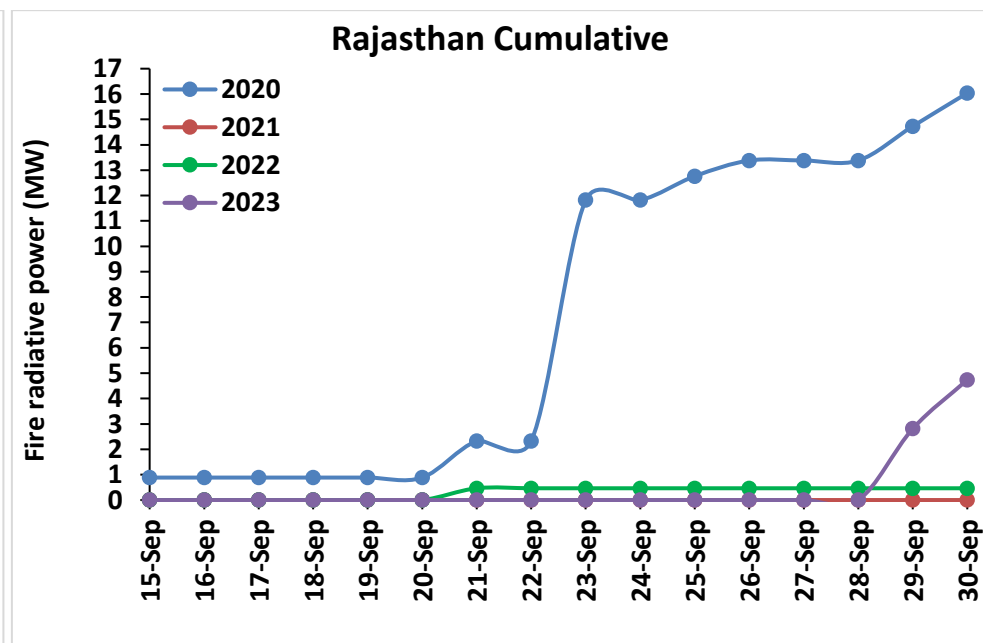
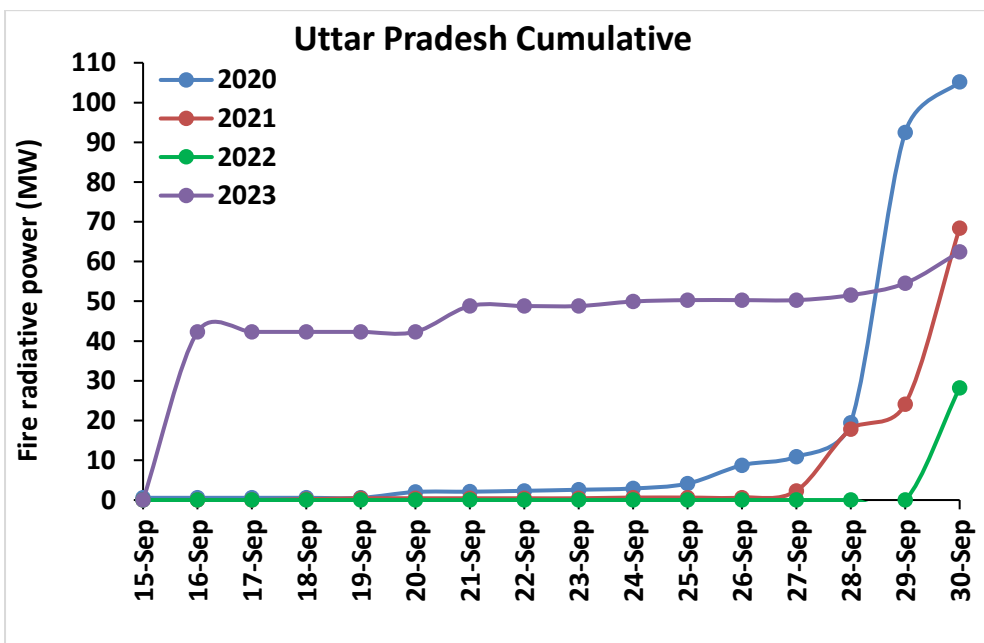
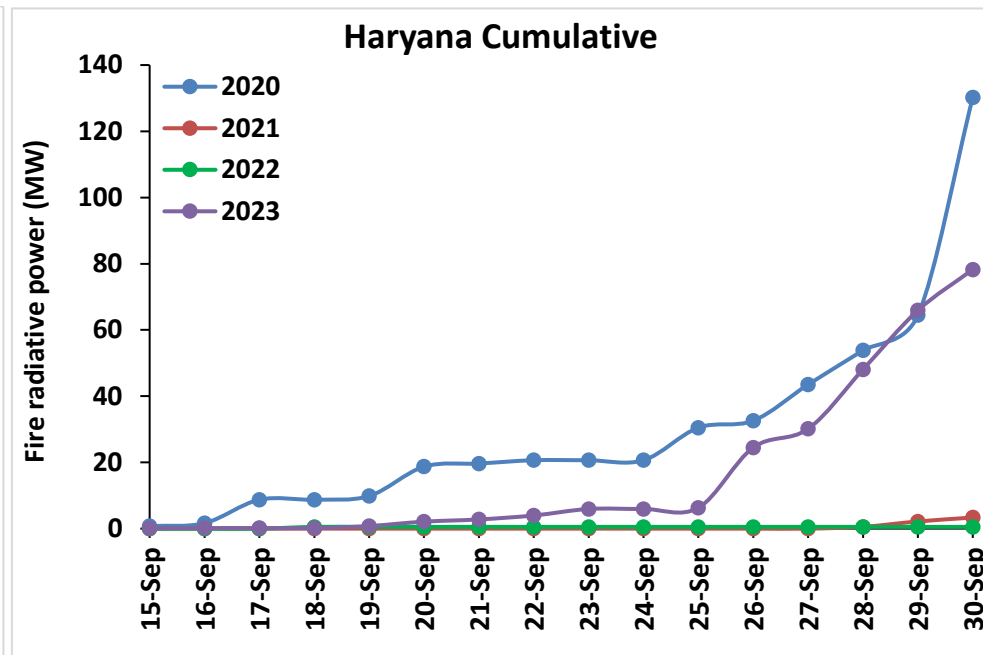
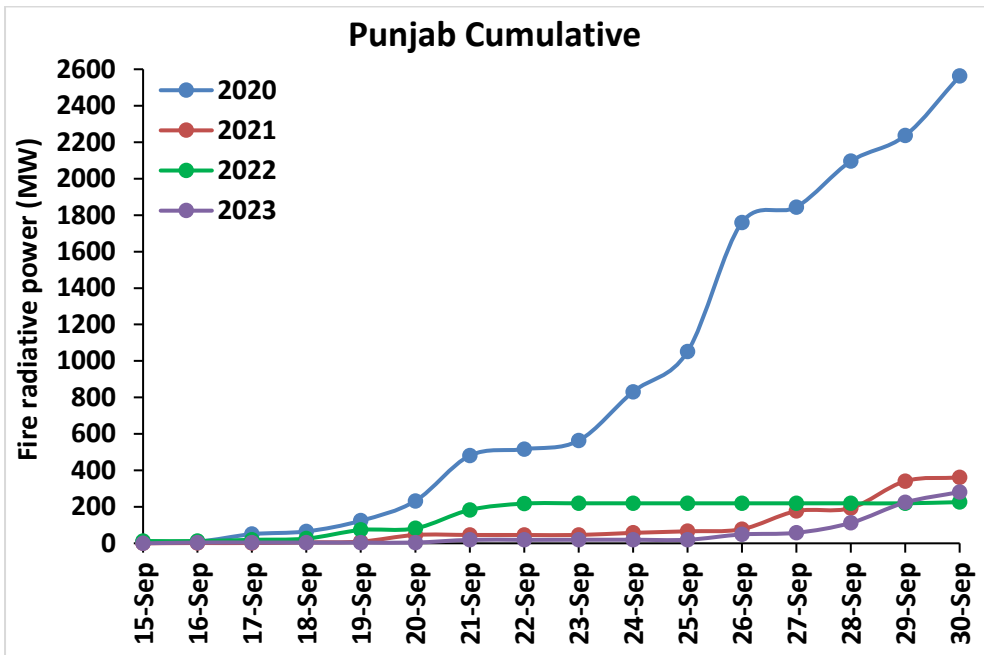


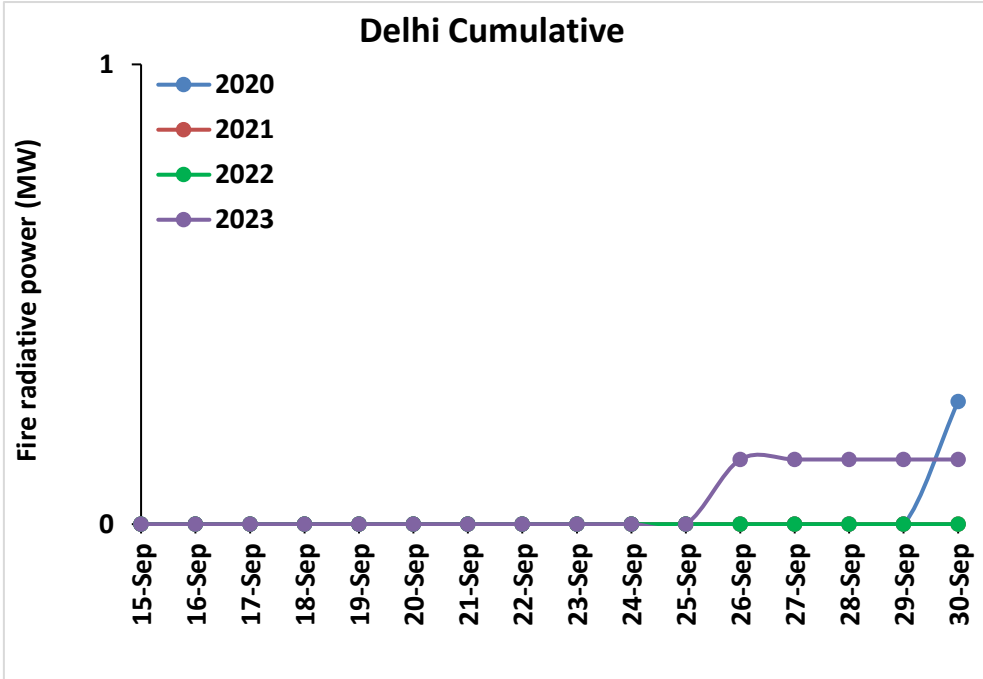
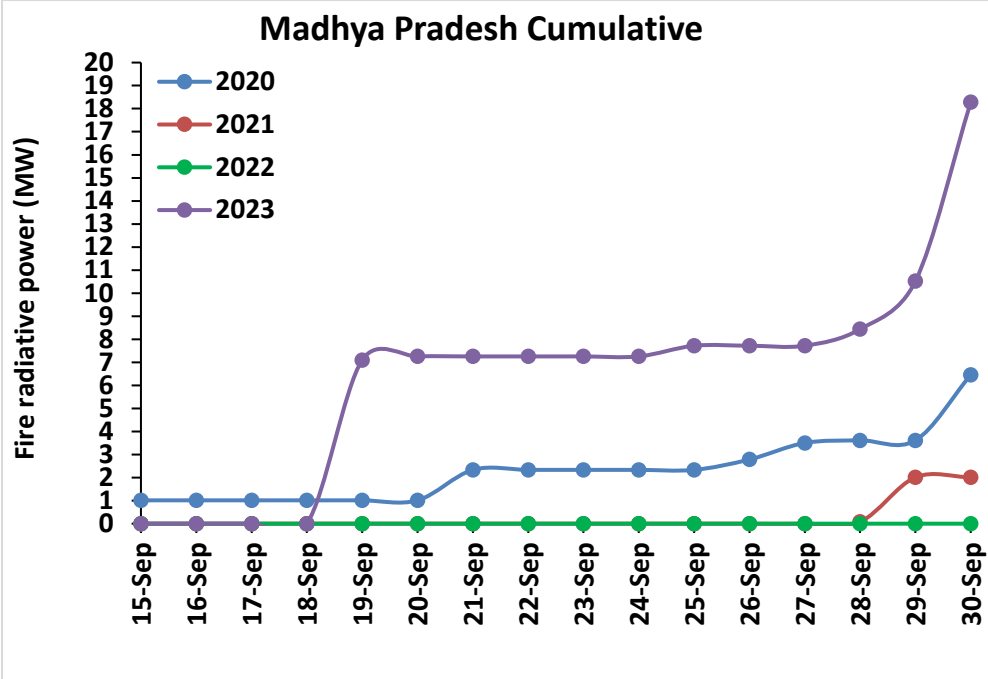
Comparison of residue burning events in current year (2023) with previous years (2020, 2021 and 2022) for the study State





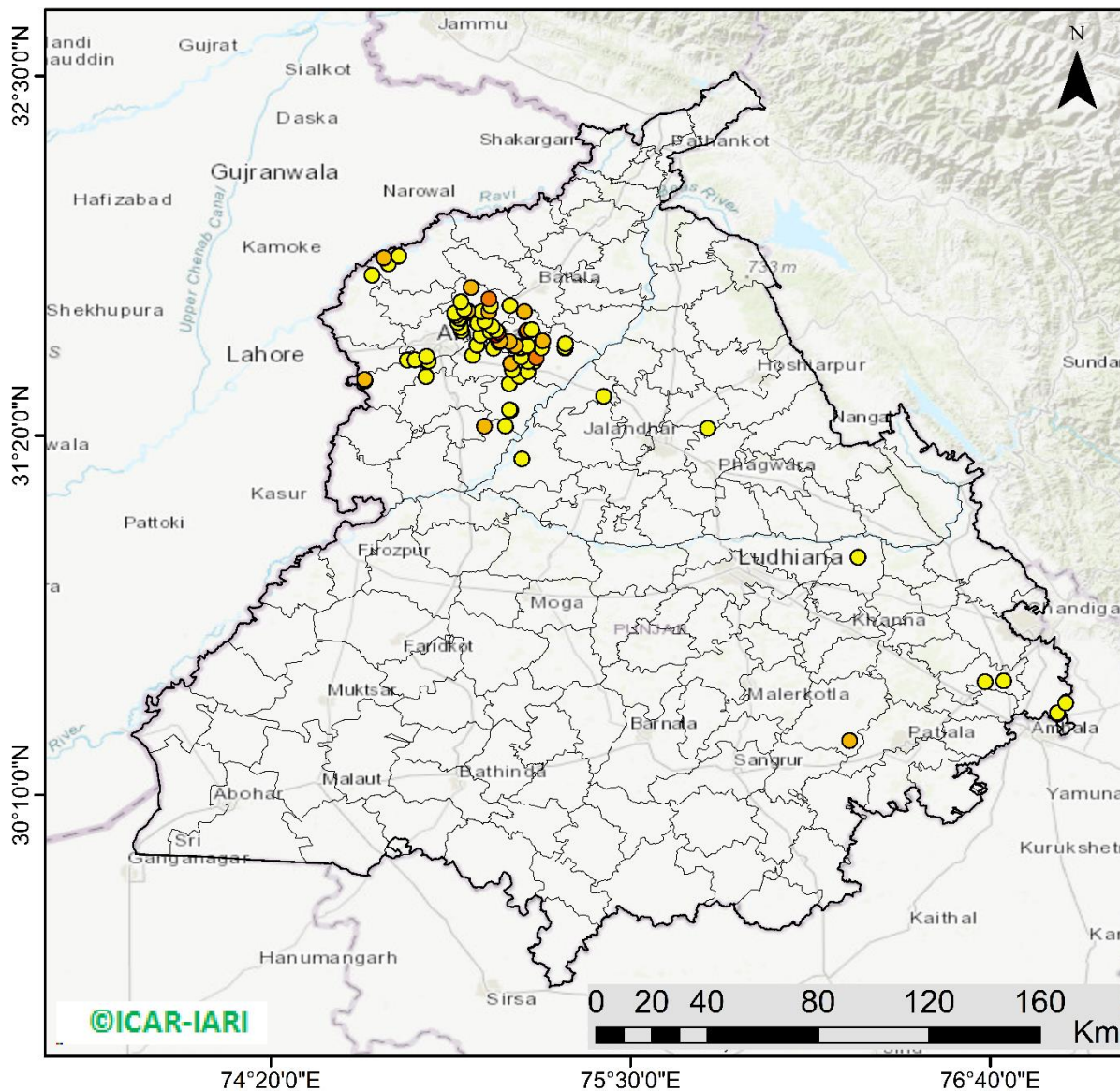
Comparison of residue burning fire power in current year (2023) with previous years (2020, 2021 and 2022) for the study States





Punjab

RICE RESIDUE BURNING IN PUNJAB



81 burning events detected in Punjab during (30th Sep 2023)

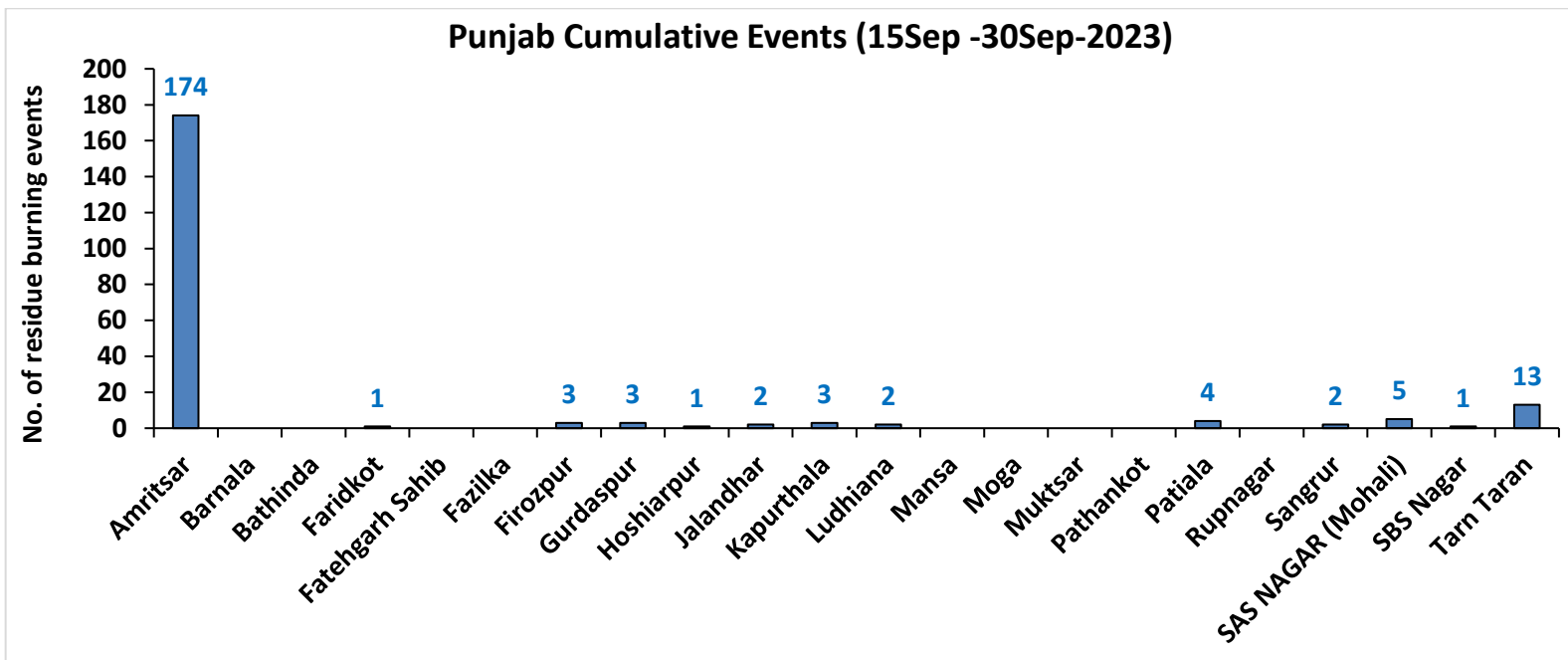
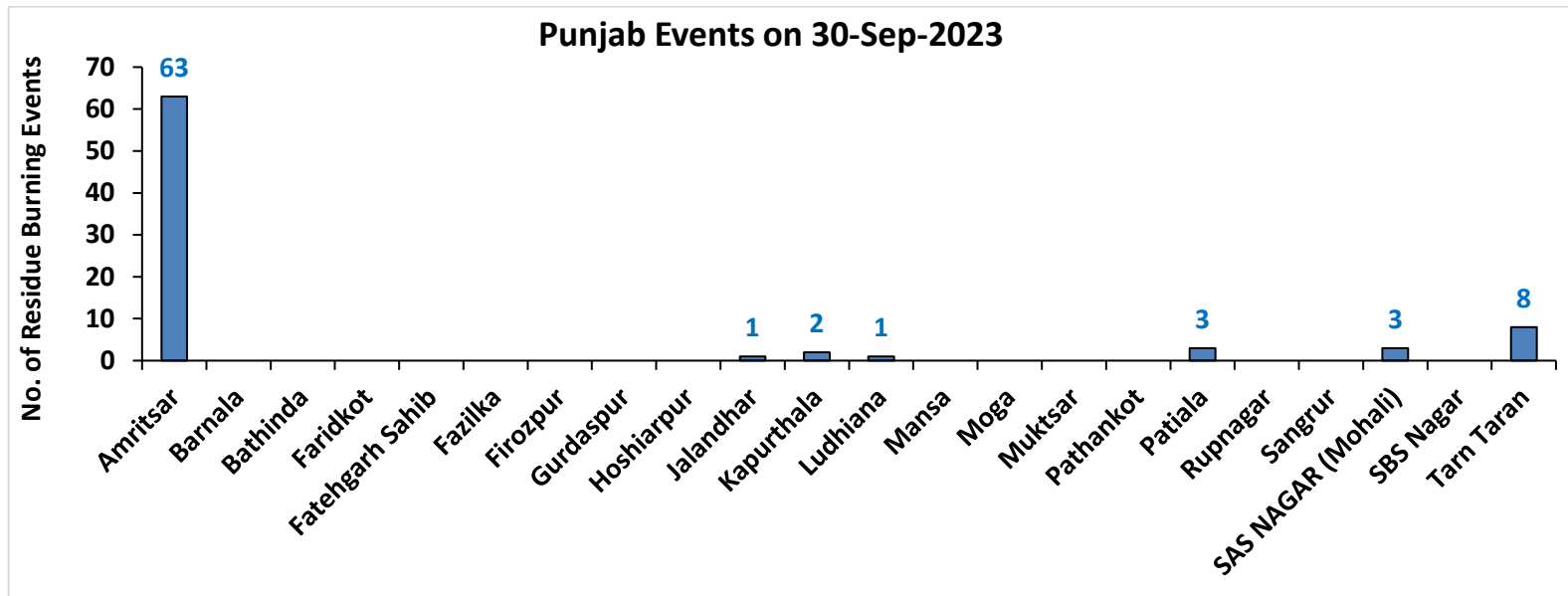
Fire Intensity (W/m²)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



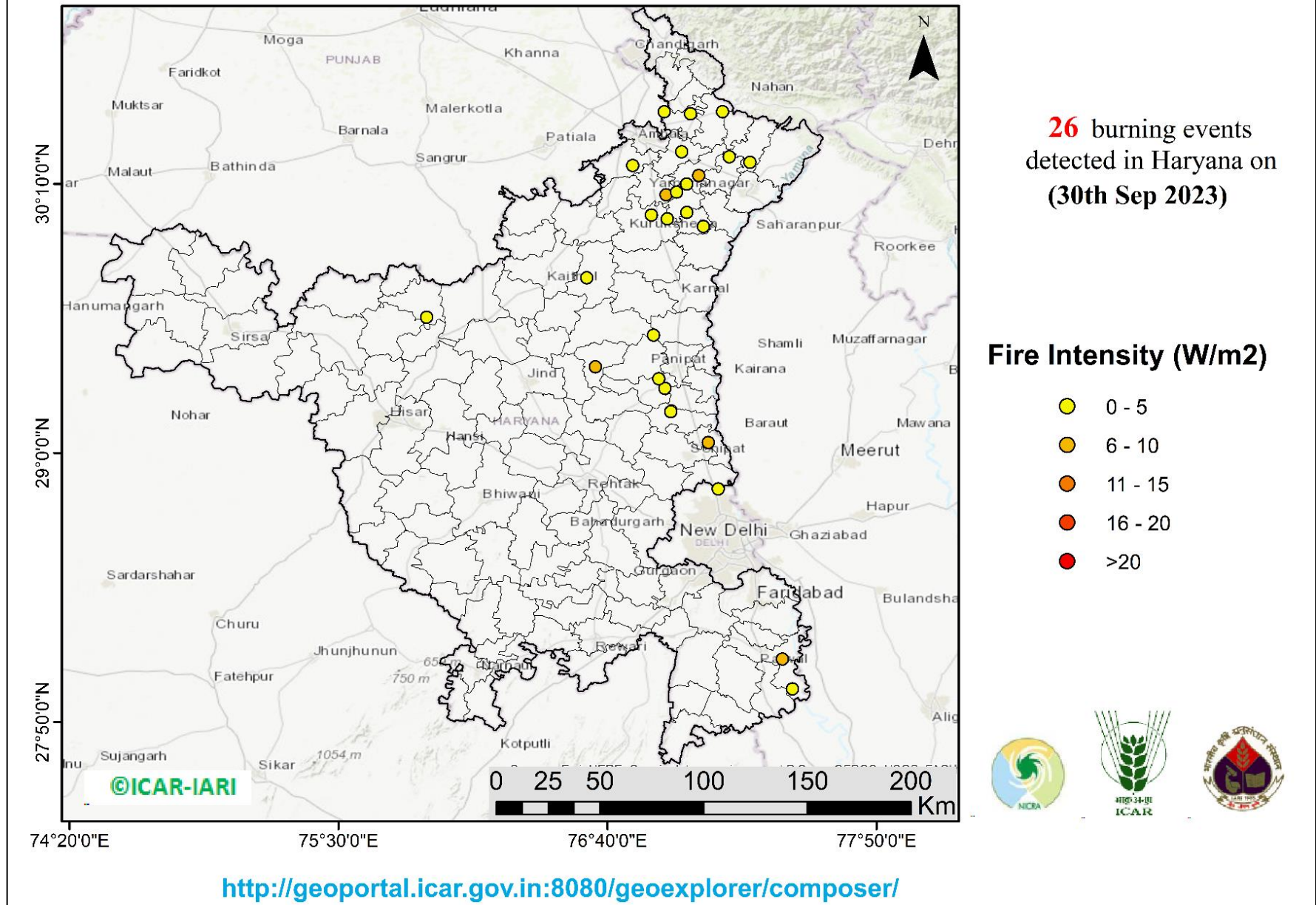
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep- 30Sep-2023)

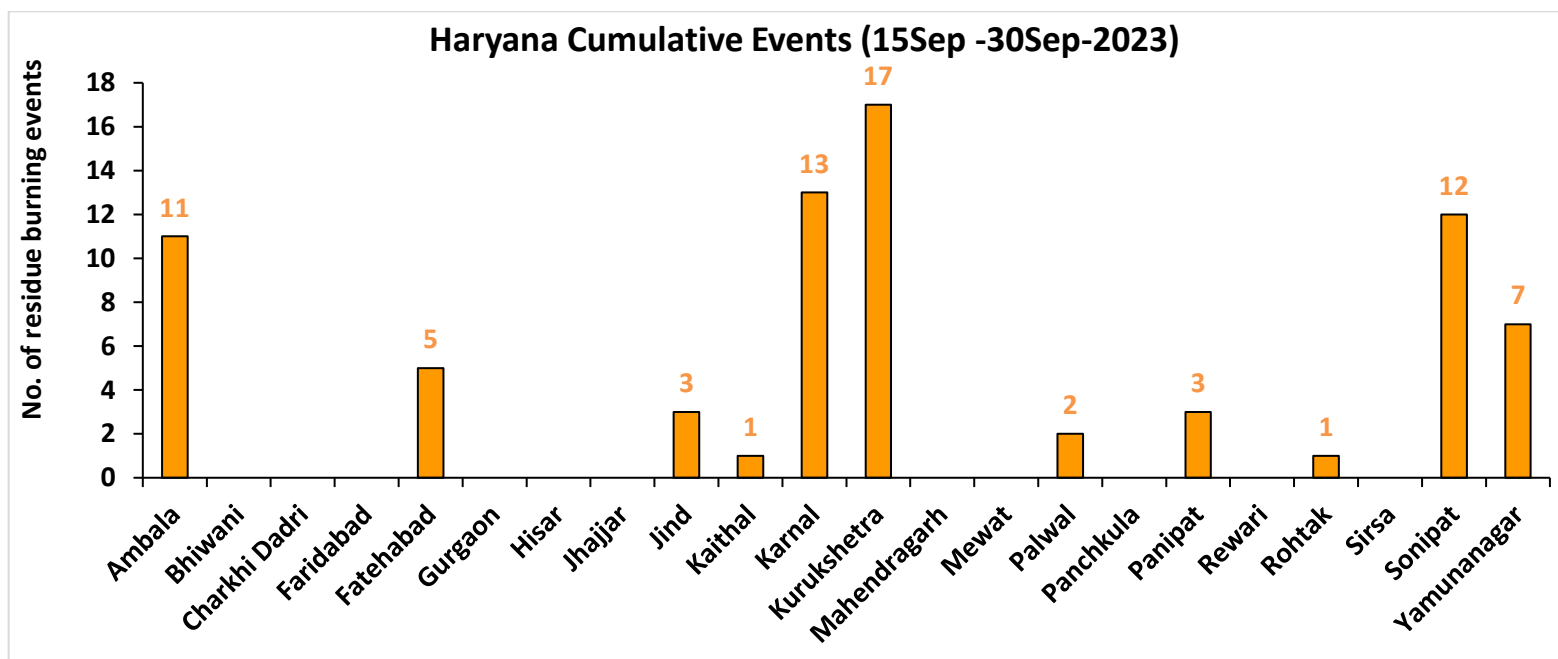
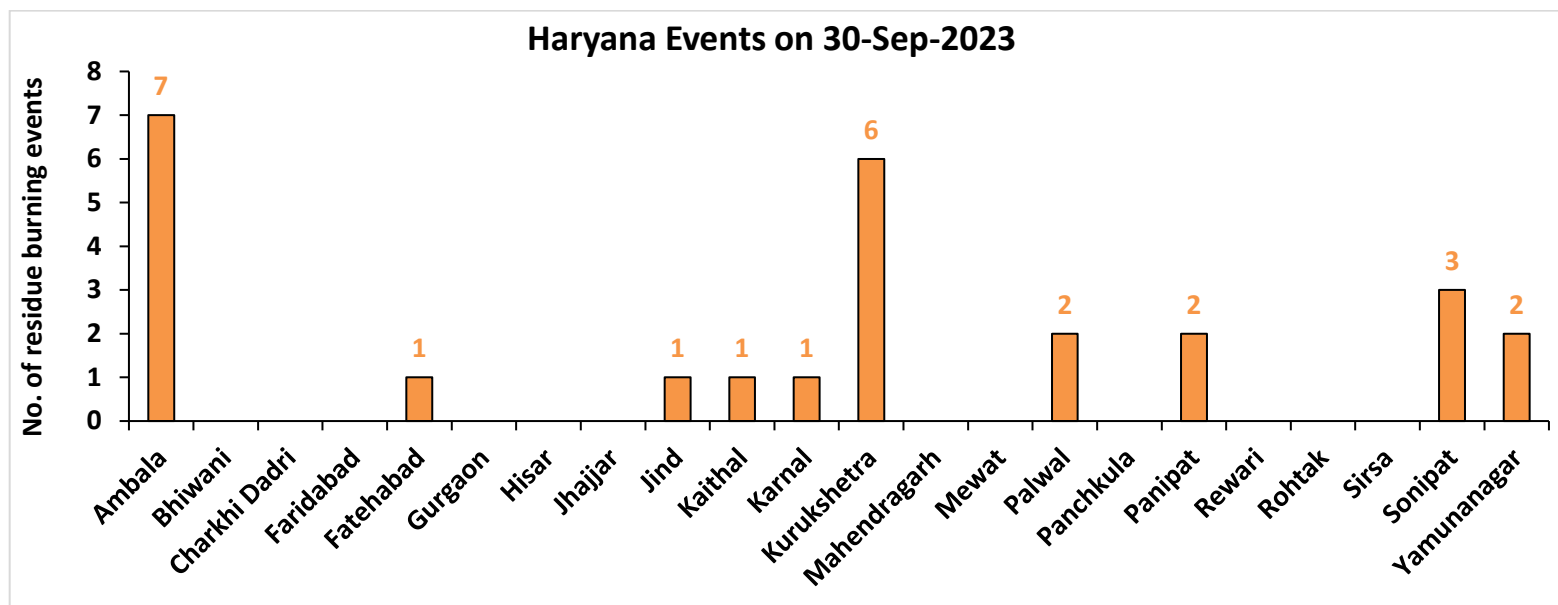


Haryana

RICE RESIDUE BURNING IN HARYANA

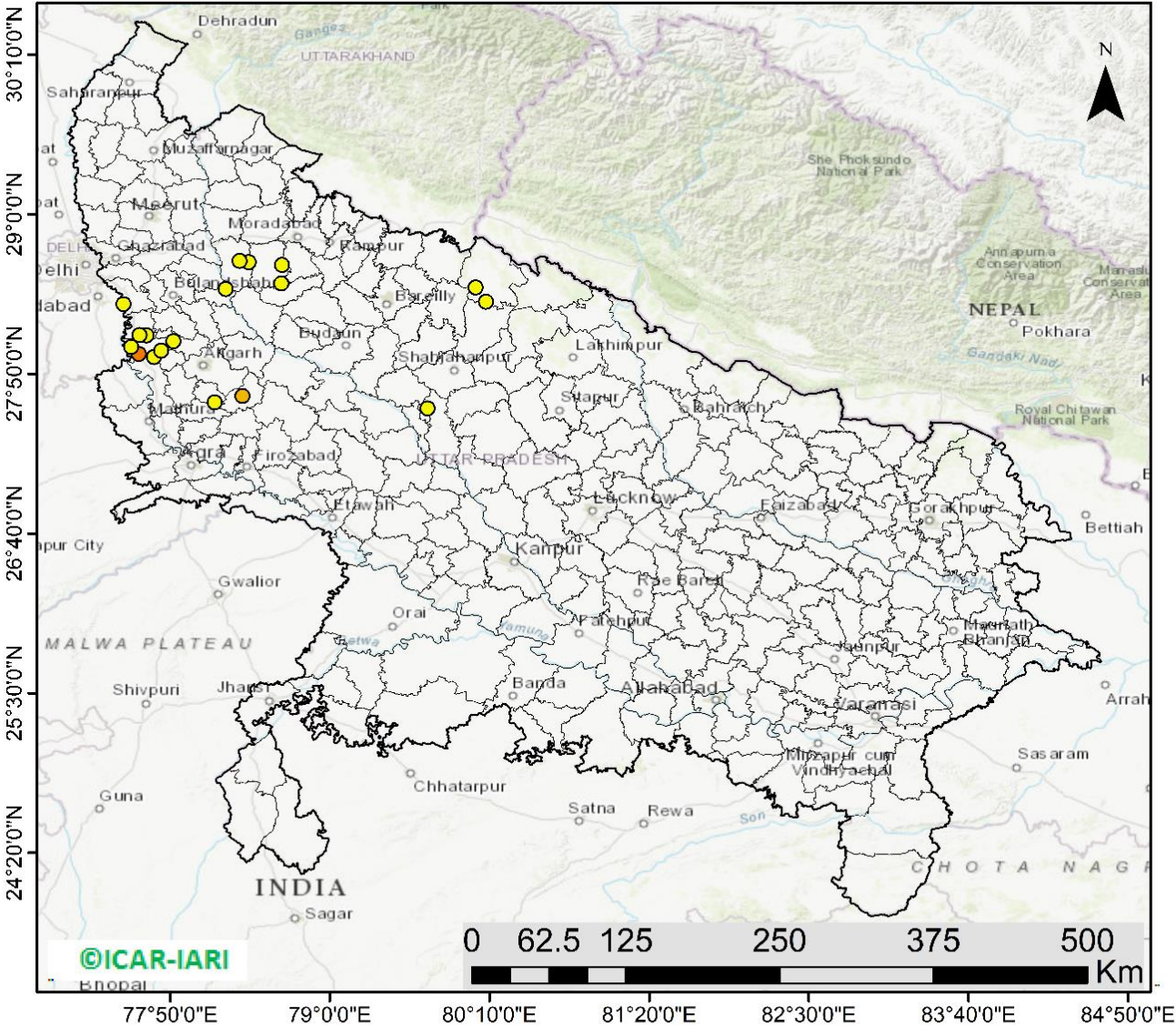


District-wise cumulative number of residues burning events in Haryana (15Sep-30Sep-2023)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



18 burning events detected in Uttar Pradesh on (30th Sep 2023)

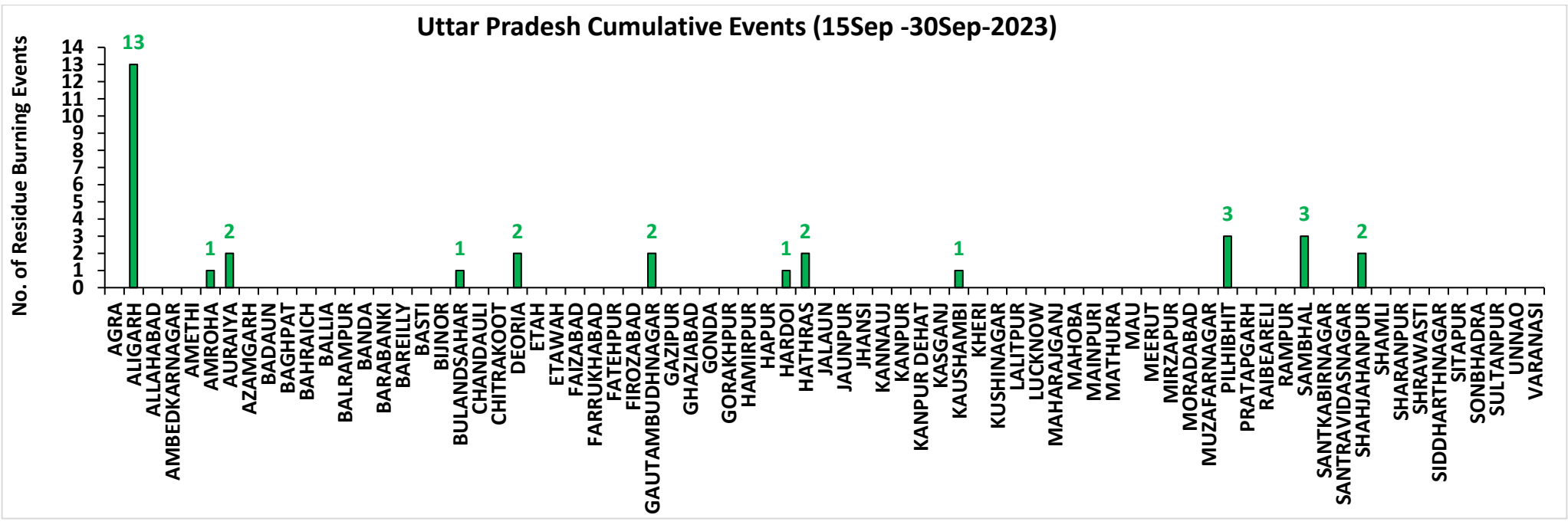
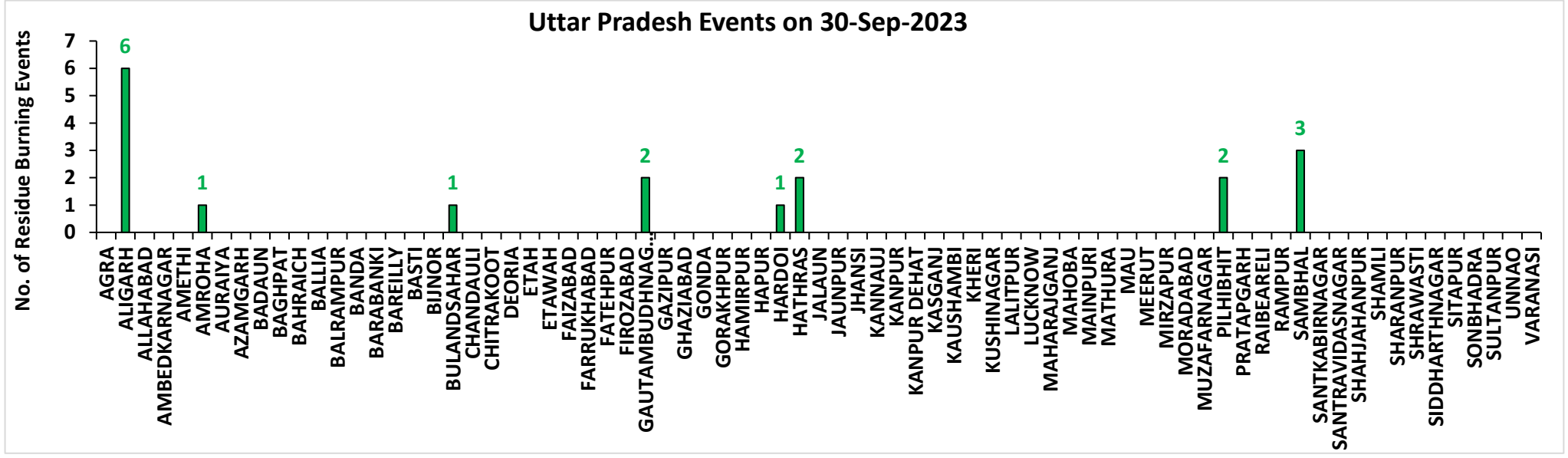
Fire Intensity (W/m2)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



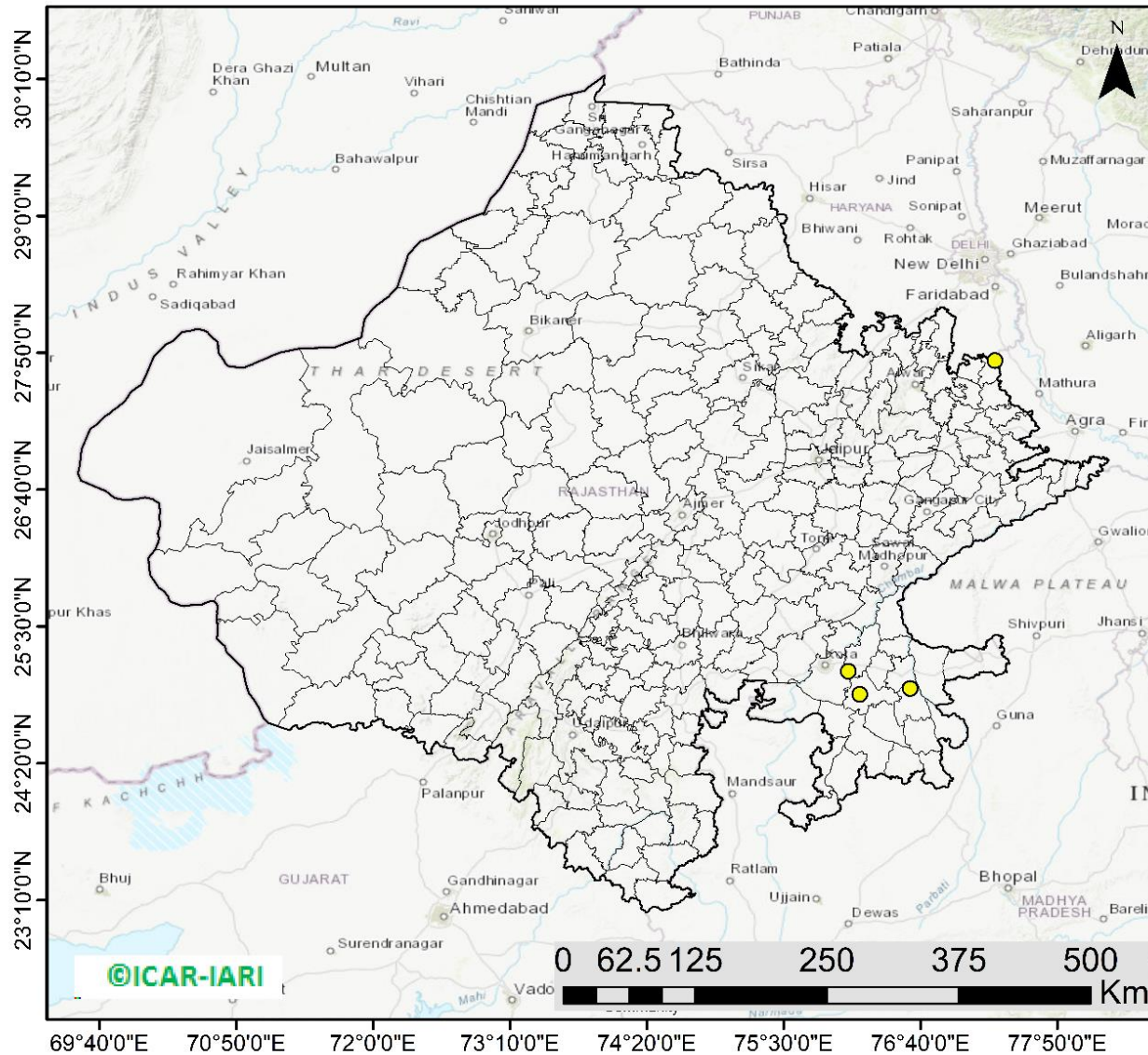
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Uttar Pradesh (15Sep-30Sep-2023)



Rajasthan

RICE RESIDUE BURNING IN RAJASTHAN



04 burning events
detected in Rajasthan on
(30th Sep 2023)

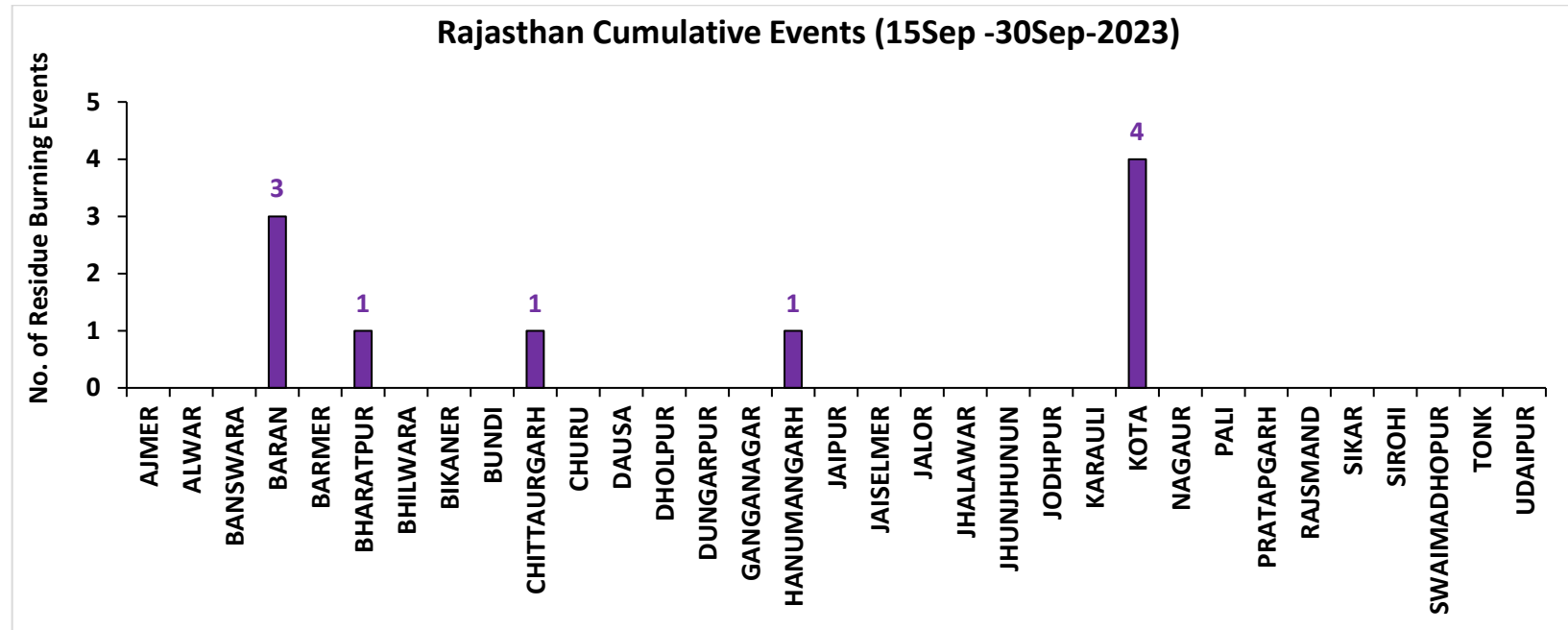
Fire Intensity (W/m²)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



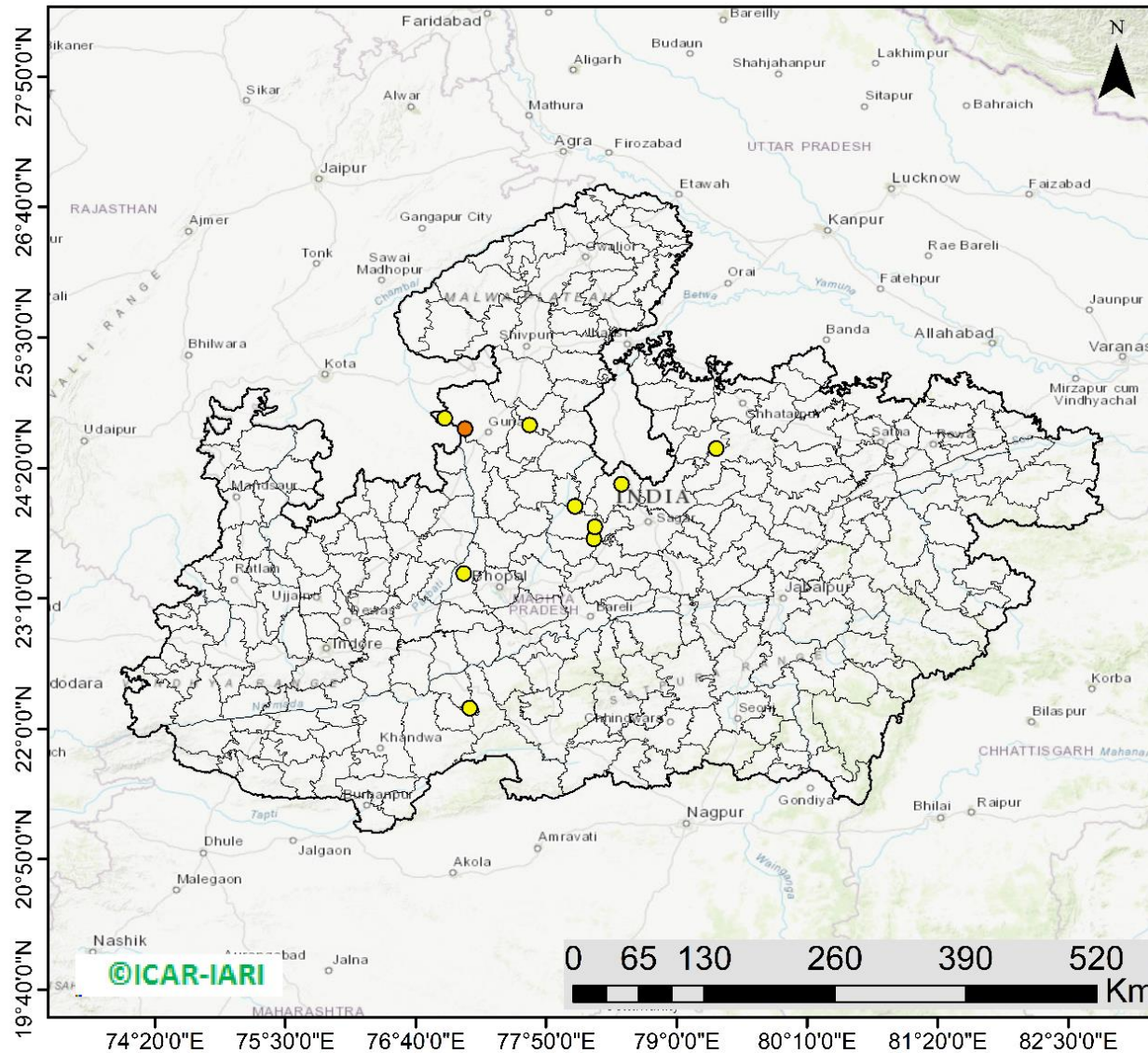
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Rajasthan (15Sep-30Sep-2023)



Madhya Pradesh

RICE RESIDUE BURNING IN MADHYA PRADESH



11 burning events detected in MP on (30th Sep 2023)

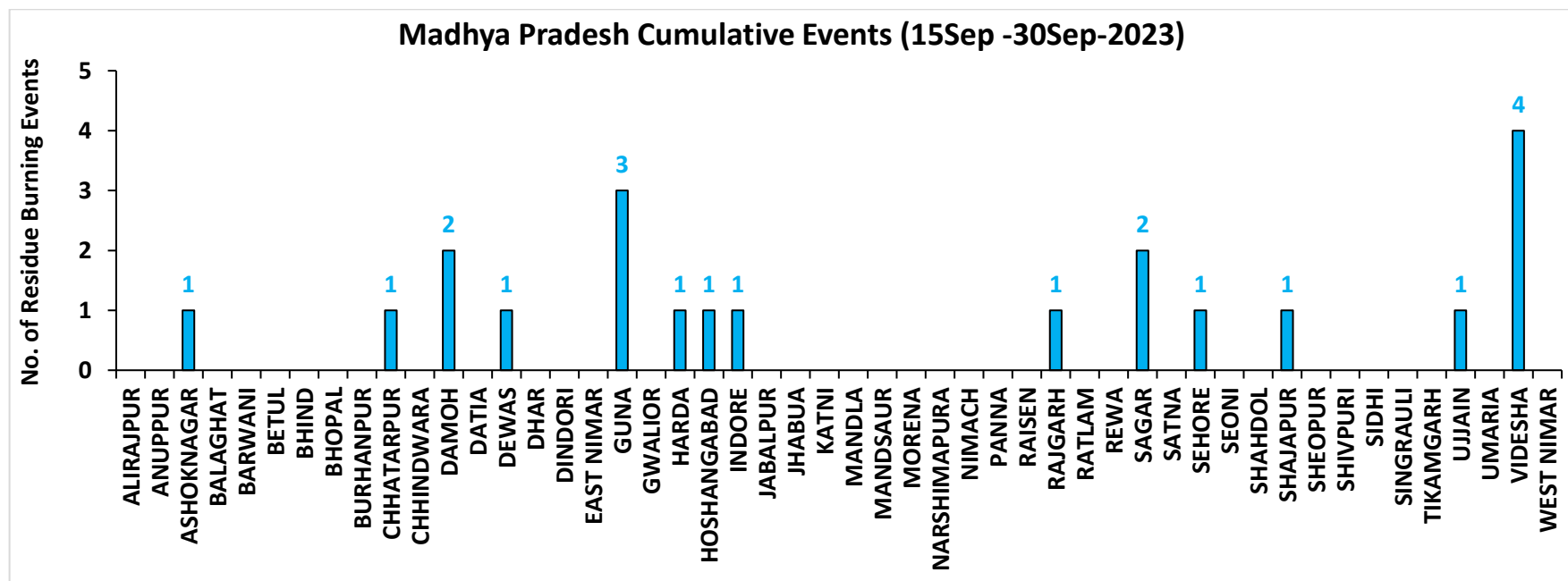
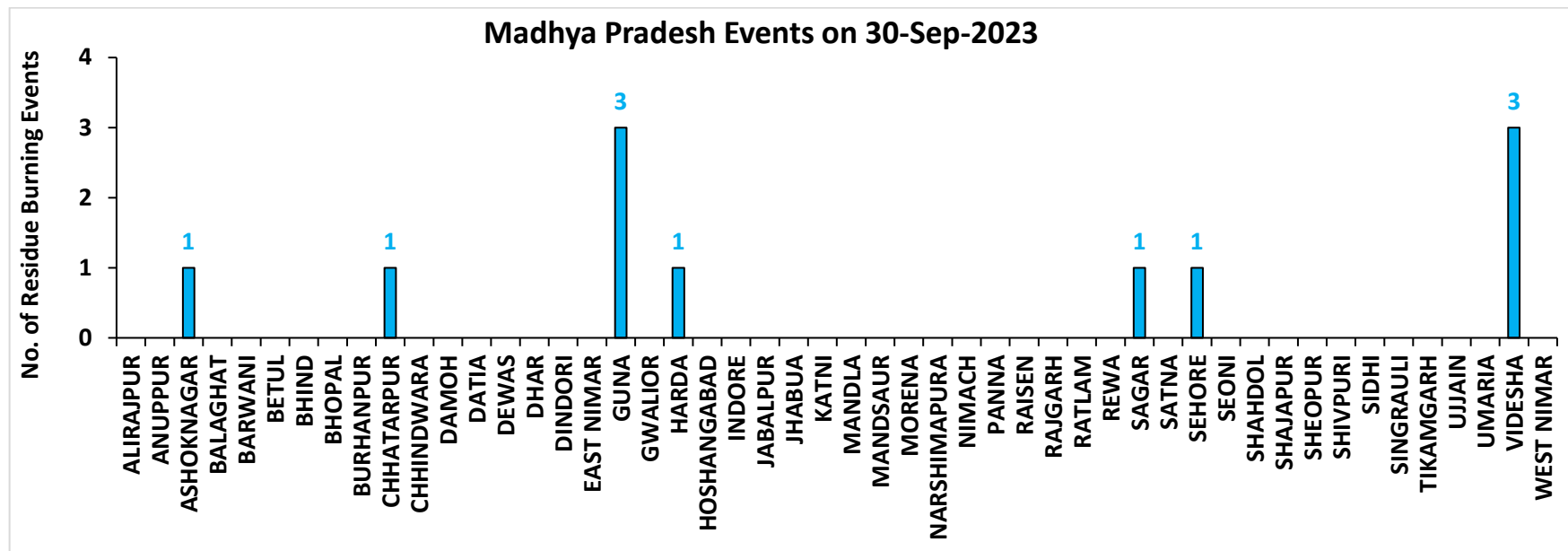
Fire Intensity (W/m²)

- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Madhya Pradesh (15Sep-30Sep-2023)



District-wise cumulative number of residues burning events detected in 2020, 2021, 2022 and 2023
(Period: 15 September-30 September)

(a) Punjab

District	15 Sep-30 Sep			
	2020	2021	2022	2023
Amritsar	749	153	127	174
Barnala	2	0	0	0
Bathinda	0	0	0	0
Faridkot	1	8	0	1
Fatehgarh Sahib	3	0	0	0
Fazilka	0	1	0	0
Firozpur	5	2	0	3
Gurdaspur	27	4	1	3
Hoshiarpur	1	0	0	1
Jalandhar	4	1	1	2
Kapurthala	9	1	0	3
Ludhiana	16	7	0	2
Mansa	1	0	0	0
Moga	5	0	0	0
Muktsar	1	0	0	0
Pathankot	0	0	0	0
Patiala	25	10	1	4
Rupnagar	1	0	0	0
Sangrur	6	3	0	2
SAS NAGAR (Mohali)	5	0	1	5
SBS Nagar	1	0	1	1
Tarn Taran	163	25	15	13
Total	1025	215	147	214

(b) Haryana

District	15 Sep-30 Sep			
	2020	2021	2022	2023
AMBALA	9	0	0	11
BHIWANI	0	0	0	0
CHARKHI DADRI	0	0	0	0
FARIDABAD	0	0	0	0
FATEHABAD	8	0	0	5
GURGAON	0	0	0	0
HISAR	2	0	0	0
JHAJJAR	0	0	0	0
JIND	0	0	1	3
KAITHAL	10	0	0	1
KARNAL	24	2	0	13
KURUKSHETRA	14	4	0	17
MAHENDRAGARH	0	0	0	0
MEWAT	0	0	0	0
PALWAL	1	0	0	2
PANCHKULA	0	0	0	0
PANIPAT	3	0	0	3
REWARI	0	0	0	0
ROHTAK	0	0	0	1
SIRSA	1	0	0	0
SONIPAT	1	0	0	12
YAMUNANAGAR	5	1	0	7
Total	78	7	1	75

(c) Uttar Pradesh

District	15 Sep-30 Sep													
	2020	2021	2022	2023	GAUTAMBUDHNAGAR	0	0	0	2	MUZAFARNAGAR	0	0	0	0
AGRA	0	0	0	0	GAZIPUR	0	0	0	0	PILHIBHIT	1	1	0	3
ALIGARH	2	0	0	13	GHAZIABAD	1	0	0	0	PRATAPGARH	0	0	0	0
ALLAHABAD	0	0	0	0	GONDA	0	0	0	0	RAIBEARELI	1	0	0	0
AMBEDKARNAGAR	0	0	0	0	GORAKHPUR	0	0	0	0	RAMPUR	0	3	0	0
AMETHI	0	0	0	0	HAMIRPUR	0	0	0	0	SAMBHAL	4	0	0	3
AMROHA	0	0	0	1	HAPUR	1	0	0	0	SANTKABIRNAGAR	0	0	0	0
AURAIYA	10	0	3	2	HARDOI	0	0	0	1	SANTRAVIDASNAGAR	0	0	0	0
AZAMGARH	0	0	0	0	HATHRAS	0	0	0	2	SHAHJAHANPUR	3	25	5	2
BADAUN	0	0	0	0	JALAUN	0	0	0	0	SHAMLI	6	0	0	0
BAGHPAT	1	0	0	0	JAUNPUR	0	0	0	0	SHARANPUR	3	0	0	0
BAHRAICH	0	0	0	0	JHANSI	2	0	0	0	SHRAWASTI	0	0	0	0
BALLIA	0	0	0	0	KANNAUJ	1	0	0	0	SIDDHARTHANAGAR	0	0	0	0
BALRAMPUR	0	0	0	0	KANPUR	0	1	0	0	SITAPUR	0	0	0	0
BANDA	0	0	0	0	KANPUR DEHAT	0	0	0	0	SONBHADRA	0	0	0	0
BARABANKI	0	0	0	0	KASGANJ	0	0	0	0	SULTANPUR	0	0	0	0
BAREILLY	0	0	0	0	KAUSHAMBI	1	0	0	1	UNNAO	2	0	0	0
BASTI	0	0	0	0	KHERI	0	1	0	0	VARANASI	0	0	0	0
BIJNOR	1	0	1	0	KUSHINAGAR	0	0	0	0	Total	44	33	10	33
BULANDSAHAR	0	0	1	1	LALITPUR	0	1	0	0					
CHANDAULI	0	0	0	0	LUCKNOW	0	0	0	0					
CHITRAKOOT	0	0	0	0	MAHARAJGANJ	0	0	0	0					
DEORIA	0	0	0	2	MAHOBA	0	0	0	0					
ETAH	1	0	0	0	MAINPURI	0	0	0	0					
ETAWAH	0	0	0	0	MATHURA	0	1	0	0					
FAIZABAD	0	0	0	0	MAU	0	0	0	0					
FARRUKHABAD	0	0	0	0	MEERUT	3	0	0	0					
FATEHPUR	0	0	0	0	MIRZAPUR	0	0	0	0					
FIROZABAD	0	0	0	0	MORADABAD	0	0	0	0					

(d) Delhi

District	15 Sep-30 Sep			
	2020	2021	2022	2023
CENTRAL	0	0	0	0
EAST	0	0	0	0
NEW DELHI	0	0	0	0
NORTH	0	0	0	1
NORTH EAST	0	0	0	0
NORTH WEST DELHI	0	0	0	0
SHAHADRA	0	0	0	0
SOUTH	1	0	0	0
SOUTH EAST	0	0	0	0
SOUTH WEST DELHI	0	0	0	0
WEST DELHI	0	0	0	0
Total	1	0	0	1

(e) Rajasthan

District	15 Sep-30 Sep			
	2020	2021	2022	2023
AJMER	0	0	0	0
ALWAR	1	0	0	0
BANSWARA	0	0	0	0
BARAN	2	0	0	3
BARMER	2	0	0	0
BHARATPUR	0	0	0	1
BHILWARA	1	0	0	0
BIKANER	0	0	0	0
BUNDI	0	0	1	0
CHITTAURGARH	0	0	0	1
CHURU	0	0	0	0
DAUSA	0	0	0	0
DHOLPUR	0	0	0	0
DUNGARPUR	0	0	0	0
GANGANAGAR	1	0	0	0
HANUMANGARH	0	0	0	1
JAIPUR	0	0	0	0
JAISELMER	1	0	0	0
JALOR	0	0	0	0
JHALAWAR	0	0	0	0
JHUNJHUNUN	0	0	0	0
JODHPUR	1	0	0	0
KARAULI	0	0	0	0
KOTA	0	0	0	4
NAGAU	0	0	0	0
PALI	0	0	0	0
PRATAPGARH	0	0	0	0
RAJSMAND	0	0	0	0
SIKAR	0	0	0	0
SIROHI	0	0	0	0
SWAIMADHOPUR	0	0	0	0
TONK	0	0	0	0
UDAIPUR	0	0	0	0
Total	9	0	1	10

(f) Madhya Pradesh

District	15 Sep-30 Sep								
	2020	2021	2022	2023					
					PANNA	0	0	0	0
ALIRAJPUR	0	0	0	0	RAISEN	0	0	0	0
ANUPPUR	0	0	0	0	RAJGARH	0	0	0	1
ASHOKNAGAR	3	0	0	1	RATLAM	0	0	0	0
BALAGHAT	0	0	0	0	REWA	0	0	0	0
BARWANI	0	0	0	0	SAGAR	2	2	0	2
BETUL	0	0	0	0	SATNA	0	0	0	0
BHIND	0	0	0	0	SEHORE	0	0	0	1
BHOPAL	0	0	0	0	SEONI	0	0	0	0
BURHANPUR	0	0	0	0	SHAHDOL	0	0	0	0
CHHATARPUR	0	0	0	1	SHAJAPUR	0	0	0	1
CHHINDWARA	0	0	0	0	SHEOPUR	0	0	0	0
DAMOH	0	0	0	2	SHIVPURI	0	0	0	0
DATIA	0	0	0	0	SIDHI	0	0	0	0
DEWAS	0	0	0	1	SINGRAULI	0	0	0	0
DHAR	0	0	0	0	TIKAMGARH	0	0	0	0
DINDORI	0	0	0	0	UJJAIN	2	0	0	1
EAST NIMAR	0	0	0	0	UMARIA	0	0	0	0
GUNA	2	1	0	3	VIDESHA	0	1	0	4
GWALIOR	2	0	0	0	WEST NIMAR	0	0	0	0
HARDA	2	1	0	1	Total	13	5	0	21
HOSHANGABAD	0	0	0	1					
INDORE	0	0	0	1					
JABALPUR	0	0	0	0					
JHABUA	0	0	0	0					
KATNI	0	0	0	0					
MANDLA	0	0	0	0					
MANDSAUR	0	0	0	0					
MORENA	0	0	0	0					
NARSHIMAPURA	0	0	0	0					
NIMACH	0	0	0	0					

State-wise and date-wise number of paddy residue burning events detected in 2020, 2021, 2022 and 2023
(Period: 15 September-30 September)

Number of Paddy Residue Burning Events Detected

Date	Punjab				Haryana				Uttar Pradesh			
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
15-Sep	5	0	14	0	2	0	0	1	1	0	0	0
16-Sep	0	2	0	6	1	0	0	1	0	0	0	2
17-Sep	5	0	1	0	3	0	0	0	0	0	0	0
18-Sep	17	9	7	0	0	0	1	0	0	1	0	0
19-Sep	30	5	18	0	2	0	0	1	0	1	0	0
20-Sep	67	8	10	0	6	0	0	2	2	0	0	0
21-Sep	54	0	56	1	2	0	0	2	1	0	0	1
22-Sep	34	0	30	0	1	0	0	2	1	0	0	0
23-Sep	49	0	3	1	0	0	0	3	1	0	0	0
24-Sep	78	5	0	0	0	0	0	0	1	1	0	1
25-Sep	184	11	0	0	11	0	0	1	5	0	0	1
26-Sep	190	19	0	3	5	0	0	2	8	0	0	0
27-Sep	78	37	0	21	8	0	0	9	4	1	0	0
28-Sep	55	28	0	33	6	1	0	8	1	6	0	4
29-Sep	63	64	0	68	9	4	0	17	6	10	0	6
30-Sep	116	27	8	81	22	2	0	26	13	13	10	18
Total	1025	215	147	214	78	7	1	75	44	33	10	33

Number of Paddy Residue Burning Events Detected

Date	Delhi				Rajasthan				Madhya Pradesh			
	2020	2021	2022	2023	2020	2021	2022	2023	2020	2021	2022	2023
15-Sep	0	0	0	0	1	0	0	0	2	0	0	0
16-Sep	0	0	0	0	0	0	0	0	0	0	0	0
17-Sep	0	0	0	0	0	0	0	0	0	0	0	0
18-Sep	0	0	0	0	0	0	0	0	0	0	0	0
19-Sep	0	0	0	0	0	0	0	0	0	0	0	1
20-Sep	0	0	0	0	0	0	0	0	0	0	0	1
21-Sep	0	0	0	0	1	0	1	0	2	0	0	0
22-Sep	0	0	0	0	0	0	0	0	0	0	0	0
23-Sep	0	0	0	0	1	0	0	0	0	0	0	0
24-Sep	0	0	0	0	0	0	0	0	0	0	0	0
25-Sep	0	0	0	0	1	0	0	0	0	0	0	1
26-Sep	0	0	0	1	1	0	0	0	2	0	0	0
27-Sep	0	0	0	0	0	0	0	0	1	0	0	0
28-Sep	0	0	0	0	0	0	0	0	1	1	0	2
29-Sep	0	0	0	0	3	0	0	6	0	4	0	5
30-Sep	1	0	0	0	1	0	0	4	5	0	0	11
Total	1	0	0	1	9	0	1	10	13	5	0	21

Details of residue burning events in Punjab on 30-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	AJNALA	S-NPP	31.85330	74.66161	13:16:35	D	2.10
2	AMRITSAR	AJNALA	S-NPP	31.89034	74.71488	13:16:35	D	2.30
3	AMRITSAR	AJNALA	S-NPP	31.90995	74.69997	13:16:35	D	7.80
4	AMRITSAR	AJNALA	S-NPP	31.91514	74.74870	13:16:35	D	2.40
5	AMRITSAR	ATTARI	S-NPP	31.57343	74.83951	13:16:35	D	3.80
6	AMRITSAR	ATTARI	S-NPP	31.57428	74.84428	13:16:35	D	3.80
7	AMRITSAR	ATTARI	S-NPP	31.57767	74.77625	13:16:35	D	3.80
8	AMRITSAR	ATTARI	S-NPP	31.57850	74.80107	13:16:35	D	2.60
9	AMRITSAR	ATTARI	S-NPP	31.58907	74.83837	13:16:35	D	2.80
10	AMRITSAR	JANDIALA GURU	S-NPP	31.54567	75.11689	13:16:35	D	3.40
11	AMRITSAR	JANDIALA GURU	S-NPP	31.56680	75.11175	13:16:35	D	6.70
12	AMRITSAR	JANDIALA GURU	S-NPP	31.59258	74.98816	13:16:35	D	3.50
13	AMRITSAR	JANDIALA GURU	S-NPP	31.61569	75.05598	13:16:35	D	2.20
14	AMRITSAR	JANDIALA GURU	S-NPP	31.62634	75.00212	13:16:35	D	2.50
15	AMRITSAR	JANDIALA GURU	S-NPP	31.65798	75.01398	13:16:35	D	4.10
16	AMRITSAR	JANDIALA GURU	S-NPP	31.69681	75.00446	13:16:35	D	3.80
17	AMRITSAR	MAJITHA	S-NPP	31.68670	75.05090	13:16:35	D	4.20
18	AMRITSAR	MAJITHA	S-NPP	31.70452	75.02702	13:16:35	D	4.10
19	AMRITSAR	MAJITHA	S-NPP	31.72281	74.93124	13:16:35	D	5.80
20	AMRITSAR	MAJITHA	S-NPP	31.72366	74.93596	13:16:35	D	8.80
21	AMRITSAR	MAJITHA	S-NPP	31.72988	74.92950	13:16:35	D	4.70
22	AMRITSAR	MAJITHA	S-NPP	31.73318	74.96803	13:16:35	D	11.60
23	AMRITSAR	MAJITHA	S-NPP	31.73462	75.01665	13:16:35	D	3.30
24	AMRITSAR	MAJITHA	S-NPP	31.73534	75.04090	13:16:35	D	5.80
25	AMRITSAR	MAJITHA	S-NPP	31.73756	74.97186	13:16:35	D	8.70
26	AMRITSAR	MAJITHA	S-NPP	31.74293	74.96072	13:16:35	D	2.90
27	AMRITSAR	MAJITHA	S-NPP	31.75463	75.04593	13:16:35	D	2.40
28	AMRITSAR	MAJITHA	S-NPP	31.75499	75.10901	13:16:35	D	4.70
29	AMRITSAR	MAJITHA	S-NPP	31.76681	74.94994	13:16:35	D	4.00
30	AMRITSAR	MAJITHA	S-NPP	31.77576	75.04076	13:16:35	D	11.10

31	AMRITSAR	MAJITHA	S-NPP	31.81322	74.98268	13:16:35	D	8.20
32	AMRITSAR	RAYYA	S-NPP	31.52495	75.13949	13:16:35	D	4.60
33	AMRITSAR	RAYYA	S-NPP	31.53997	75.16676	13:16:35	D	2.40
34	AMRITSAR	RAYYA	S-NPP	31.57306	75.18772	13:16:35	D	2.10
35	AMRITSAR	RAYYA	S-NPP	31.61646	75.28777	13:16:35	D	2.40
36	AMRITSAR	RAYYA	S-NPP	31.61742	75.21072	13:16:35	D	2.40
37	AMRITSAR	RAYYA	S-NPP	31.61996	75.28693	13:16:35	D	2.40
38	AMRITSAR	RAYYA	S-NPP	31.63125	75.28899	13:16:35	D	4.80
39	AMRITSAR	RAYYA	S-NPP	31.64008	75.21484	13:16:35	D	5.40
40	AMRITSAR	TARSIKKA	S-NPP	31.57326	75.16835	13:16:35	D	2.40
41	AMRITSAR	TARSIKKA	S-NPP	31.58525	75.19441	13:16:35	D	14.40
42	AMRITSAR	TARSIKKA	S-NPP	31.58752	75.14553	13:16:35	D	2.00
43	AMRITSAR	TARSIKKA	S-NPP	31.61647	75.14333	13:16:35	D	2.80
44	AMRITSAR	TARSIKKA	S-NPP	31.61999	75.14247	13:16:35	D	5.00
45	AMRITSAR	TARSIKKA	S-NPP	31.62373	75.12215	13:16:35	D	8.00
46	AMRITSAR	TARSIKKA	S-NPP	31.62409	75.16566	13:16:35	D	3.70
47	AMRITSAR	TARSIKKA	S-NPP	31.62455	75.12680	13:16:35	D	8.00
48	AMRITSAR	TARSIKKA	S-NPP	31.63553	75.07317	13:16:35	D	6.90
49	AMRITSAR	TARSIKKA	S-NPP	31.63790	75.10663	13:16:35	D	7.40
50	AMRITSAR	TARSIKKA	S-NPP	31.63989	75.07697	13:16:35	D	6.90
51	AMRITSAR	TARSIKKA	S-NPP	31.65935	75.06248	13:16:35	D	24.60
52	AMRITSAR	TARSIKKA	S-NPP	31.66807	75.07010	13:16:35	D	16.40
53	AMRITSAR	TARSIKKA	S-NPP	31.66985	75.16182	13:16:35	D	4.20
54	AMRITSAR	TARSIKKA	S-NPP	31.67093	75.04502	13:16:35	D	1.40
55	AMRITSAR	TARSIKKA	S-NPP	31.67419	75.16560	13:16:35	D	10.40
56	AMRITSAR	TARSIKKA	S-NPP	31.67428	75.06371	13:16:35	D	4.90
57	AMRITSAR	TARSIKKA	S-NPP	31.67667	75.17947	13:16:35	D	3.90
58	AMRITSAR	TARSIKKA	S-NPP	31.73466	75.15569	13:16:35	D	5.60
59	AMRITSAR	VERKA	S-NPP	31.67258	74.95148	13:16:35	D	3.80
60	AMRITSAR	VERKA	S-NPP	31.68320	74.94887	13:16:35	D	2.20
61	AMRITSAR	VERKA	S-NPP	31.70005	74.93978	13:16:35	D	4.10
62	AMRITSAR	VERKA	S-NPP	31.71234	74.94662	13:16:35	D	6.20
63	AMRITSAR	VERKA	S-NPP	31.71391	74.94328	13:16:35	D	2.60

64	JALANDHAR	JALANDHAR EAST	S-NPP	31.35603	75.75011	13:16:35	D	4.10
65	KAPURTHALA	DHILWAN	S-NPP	31.46057	75.41266	13:16:35	D	4.90
66	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.25686	75.14755	13:16:35	D	4.10
67	LUDHIANA	MACHHIWARA	S-NPP	30.93812	76.23798	13:16:35	D	3.40
68	PATIALA	NABHA	S-NPP	30.34239	76.21021	13:16:35	D	5.60
69	PATIALA	RAJPURA	S-NPP	30.53349	76.64970	13:16:35	D	2.80
70	PATIALA	RAJPURA	S-NPP	30.53666	76.71030	13:16:35	D	4.70
71	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.42891	76.88503	13:16:35	D	7.20
72	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.43228	76.88428	13:16:35	D	3.10
73	SAS NAGAR (MOHALI)	DERABASSI	S-NPP	30.46481	76.91170	13:16:35	D	1.40
74	TARN TARAN	CHOHLA SAHIB	S-NPP	31.36400	75.09418	13:16:35	D	3.60
75	TARN TARAN	GANDIWIND TATLA	S-NPP	31.51100	74.63854	13:16:35	D	4.40
76	TARN TARAN	GANDIWIND TATLA	S-NPP	31.51459	74.63765	13:16:35	D	7.10
77	TARN TARAN	GANDIWIND TATLA	S-NPP	31.52457	74.83661	13:16:35	D	2.40
78	TARN TARAN	KHADUR SAHIB	S-NPP	31.41489	75.11108	13:16:35	D	1.70
79	TARN TARAN	KHADUR SAHIB	S-NPP	31.41627	75.10756	13:16:35	D	3.30
80	TARN TARAN	KHADUR SAHIB	S-NPP	31.50073	75.10649	13:16:35	D	2.70
81	TARN TARAN	NAUSHERA PANNUAN	S-NPP	31.36285	75.02586	13:16:35	D	8.50

Details of residue burning events in Haryana on 30-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMBALA	AMBALA-II	S-NPP	30.24570	76.77649	13:16:35	D	3.80
2	AMBALA	BARARA	S-NPP	30.16568	77.01035	13:16:35	D	2.90
3	AMBALA	BARARA	S-NPP	30.20221	77.06252	13:16:35	D	6.90
4	AMBALA	NARAINGARH	S-NPP	30.47916	77.16621	13:16:35	D	3.90
5	AMBALA	SAHA	S-NPP	30.30547	76.98872	13:16:35	D	1.60
6	AMBALA	SHAHZADPUR	S-NPP	30.47001	77.02695	13:16:35	D	2.20
7	AMBALA	SHAHZADPUR	S-NPP	30.47897	76.91288	13:16:35	D	2.20
8	FATEHABAD	TOHANA	S-NPP	29.58788	75.88226	13:16:35	D	1.40
9	JIND	SAFIDON	S-NPP	29.37325	76.61443	13:16:35	D	6.00
10	KAITHAL	PUNDRI	S-NPP	29.75936	76.57713	13:16:35	D	2.30
11	KARNAL	ASSANDH	S-NPP	29.51054	76.86679	13:16:35	D	2.80
12	KURUKSHETRA	BABAIN	S-NPP	30.13041	76.96633	13:16:35	D	4.70
13	KURUKSHETRA	LADWA	S-NPP	29.98131	77.08292	13:16:35	D	2.00
14	KURUKSHETRA	LADWA	S-NPP	30.01466	76.92616	13:16:35	D	4.90
15	KURUKSHETRA	LADWA	S-NPP	30.04278	77.01070	13:16:35	D	3.00
16	KURUKSHETRA	SHAHBAD	S-NPP	30.11935	76.92121	13:16:35	D	5.10
17	KURUKSHETRA	THANESAR	S-NPP	30.03118	76.85742	13:16:35	D	3.10
18	PALWAL	HASSANPUR	S-NPP	27.97642	77.46936	13:16:35	D	1.50
19	PALWAL	PALWAL	S-NPP	28.10610	77.42561	13:16:35	D	6.70
20	PANIPAT	ISRANA	S-NPP	29.28015	76.91580	13:16:35	D	3.50
21	PANIPAT	ISRANA	S-NPP	29.32153	76.88927	13:16:35	D	2.60
22	SONIPAT	GANAUR	S-NPP	29.17898	76.94144	13:16:35	D	2.60
23	SONIPAT	MURTHAL	S-NPP	29.04509	77.10432	13:16:35	D	5.90
24	SONIPAT	RAI	S-NPP	28.84406	77.14734	02:07:17	N	0.90
25	YAMUNANAGAR	BILASPUR	S-NPP	30.25946	77.28490	13:16:35	D	3.60
26	YAMUNANAGAR	MUSTAFABAD	S-NPP	30.28381	77.19493	13:16:35	D	1.70

Details of residue burning events in Uttar Pradesh on 30-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	ALIGARH	GABHANA	S-NPP	28.07002	77.85750	02:07:17	N	0.50
2	ALIGARH	KHAIR	S-NPP	27.95421	77.71477	13:16:35	D	1.50
3	ALIGARH	KHAIR	S-NPP	27.97783	77.60465	13:16:35	D	12.50
4	ALIGARH	KHAIR	S-NPP	28.00122	77.76782	13:16:35	D	4.60
5	ALIGARH	KHAIR	S-NPP	28.02845	77.54813	13:16:35	D	2.70
6	ALIGARH	KHAIR	S-NPP	28.11343	77.66108	13:16:35	D	1.20
7	AMROHA	HASANPUR	S-NPP	28.65749	78.34050	13:16:35	D	2.30
8	BULANDSAHAR	ANUP SHAHR	S-NPP	28.45167	78.23905	13:16:35	D	2.00
9	GAUTAMBUDHNAGAR	GAUTAMBUDHNAGAR	S-NPP	28.34183	77.49265	13:16:35	D	1.70
10	GAUTAMBUDHNAGAR	JEVAR	S-NPP	28.11551	77.61013	13:16:35	D	2.10
11	HARDOI	SIWAIJPUR	S-NPP	27.57895	79.71514	13:16:35	D	2.80
12	HATHRAS	HATHRAS	S-NPP	27.62350	78.15865	13:16:35	D	1.50
13	HATHRAS	SIKANDRA RAO	S-NPP	27.67002	78.36207	13:16:35	D	7.90
14	PILHIBHIT	PURANPUR	S-NPP	28.35839	80.14111	13:16:35	D	2.70
15	PILHIBHIT	PURANPUR	S-NPP	28.46252	80.06525	13:16:35	D	2.20
16	SAMBHAL	CHANDAUSI	S-NPP	28.49186	78.64603	13:16:35	D	2.50
17	SAMBHAL	SAMBHAL	S-NPP	28.62822	78.65112	13:16:35	D	2.40
18	SAMBHAL	SAMBHAL	S-NPP	28.64759	78.40775	13:16:35	D	2.70

Details of residue burning events in Rajasthan on 30-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	BARAN	ATRU	S-NPP	24.97123	76.58083	13:16:35	D	2.80
2	BHARATPUR	KAMAN	S-NPP	27.76636	77.30362	13:16:35	D	4.70
3	KOTA	LADPURA	S-NPP	25.11769	76.05266	13:16:35	D	2.70
4	KOTA	SANGOD	S-NPP	24.92120	76.15073	13:16:35	D	3.50

Details of residue burning events in Madhya Pradesh on 30-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	ASHOKNAGAR	ISAGARH	S-NPP	24.71645	77.68367	13:16:35	D	2.30
2	CHHATARPUR	BARAMALEHRA	S-NPP	24.50615	79.35353	13:16:35	D	2.40
3	GUNA	GUNA	S-NPP	24.68247	77.10899	13:16:35	D	13.70
4	GUNA	GUNA	S-NPP	24.68334	77.10749	13:16:35	D	10.40
5	GUNA	GUNA	S-NPP	24.77707	76.92539	13:16:35	D	2.50
6	HARDA	HARDA	S-NPP	22.18435	77.14964	13:16:35	D	4.60
7	SAGAR	KHURAI	S-NPP	24.18821	78.50656	13:16:35	D	2.70
8	SEHORE	SEHORE	S-NPP	23.38905	77.09606	13:16:35	D	3.60
9	VIDESHA	BASODA	S-NPP	23.80523	78.26856	13:16:35	D	4.70
10	VIDESHA	GYARASPUR	S-NPP	23.69844	78.25961	13:16:35	D	3.30
11	VIDESHA	KORWAI	S-NPP	23.98895	78.09054	13:16:35	D	5.00

The study used data received from following Satellites at NRSC Ground Station

S. No.	Satellite Name	Sensor	Resolution (meter)	Day / Night Passes
1.	Suomi NPP	VIIRS	375 / 750	Both
2.	Terra	MODIS	1000	Both
3.	Aqua	MODIS	1000	Both

**The rice mask for the Punjab and Haryana were provided by MNCFC, MoA&FW, Govt of India
The kharif crop mask for Delhi, Uttar Pradesh, Rajasthan and Madhya Pradesh were provided by NRSC (ISRO)**

Study Team

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GIS Maps of fire events can be visualized online on ICAR KRISHI Geoportal website: <http://geoportal.icar.gov.in:8080/geoexplorer/composer/>
(Part of KRISHI Portal: <https://krishi.icar.gov.in> initiative)
