

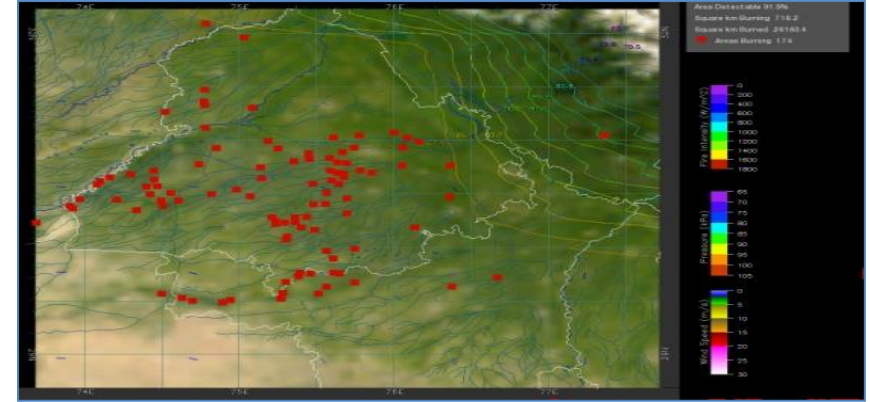
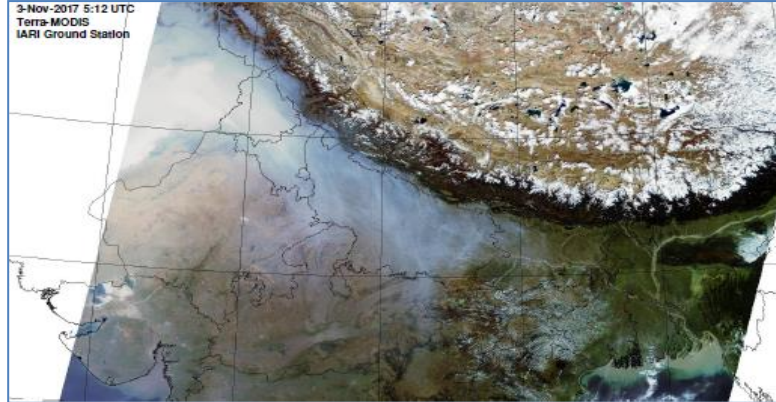


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2024

Bulletin
No. 16

Events Date:
30-Sep-2024

Issued on:
30-Sep-2024



Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS)
Laboratory,

Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

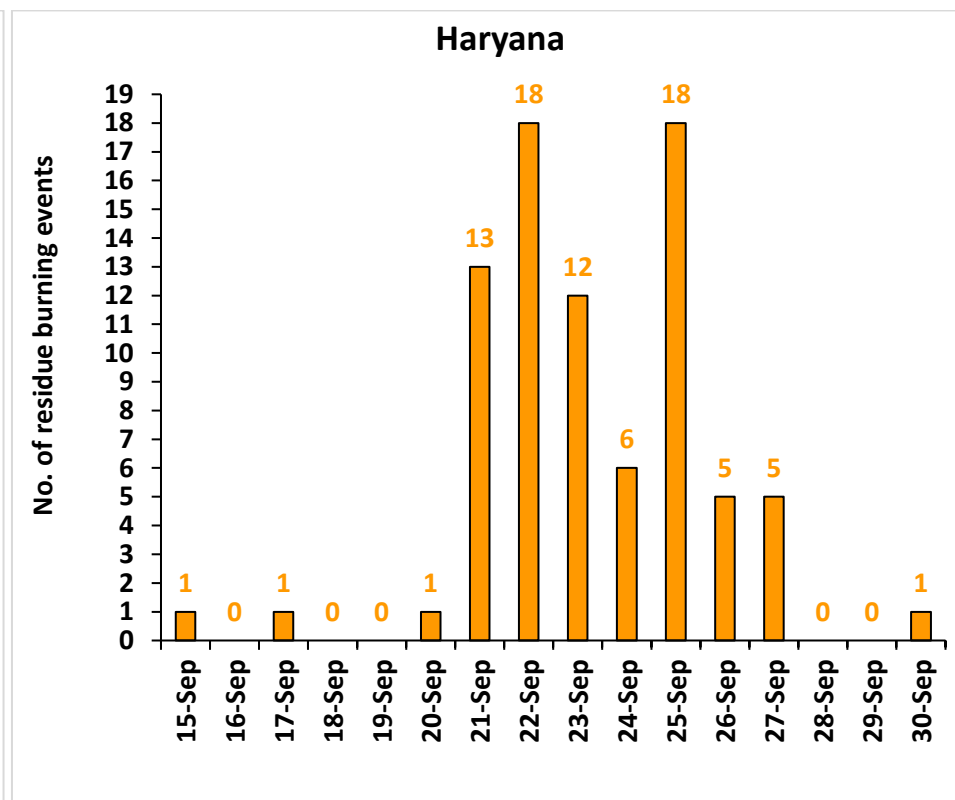
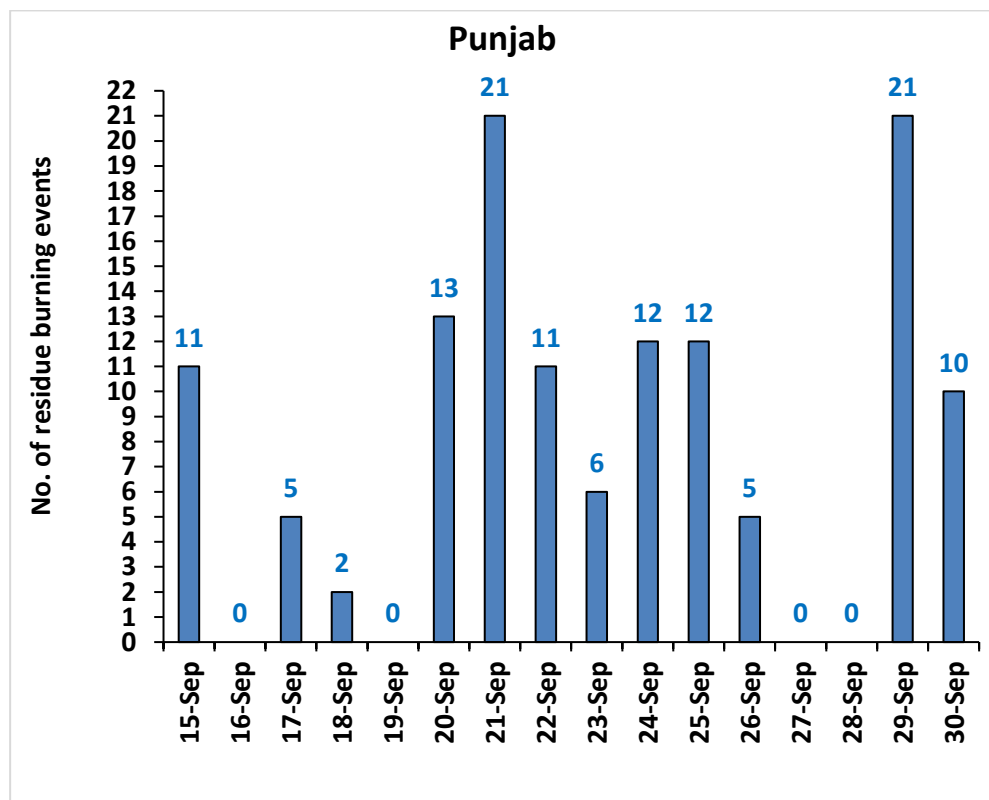
<https://creams.iari.res.in>



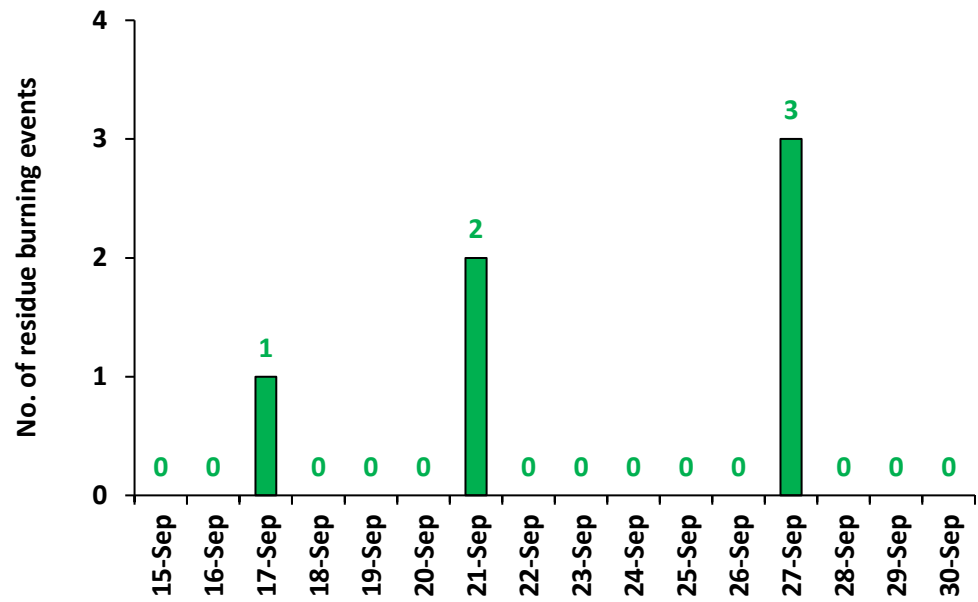
Highlights for 30-Sep-2024

- 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 **13** residue burning events in the six study States on **30-Sep-2024**.
- The state wise events detected on **30-Sep-2024** were **10** in Punjab, **01** in Haryana, **00** in UP, **00** in Delhi, **02** in Rajasthan and **00** in MP.
- Detection of residue burning events was hampered by the presence of scattered clouds over Rajasthan, Uttar Pradesh and Madhya Pradesh states.

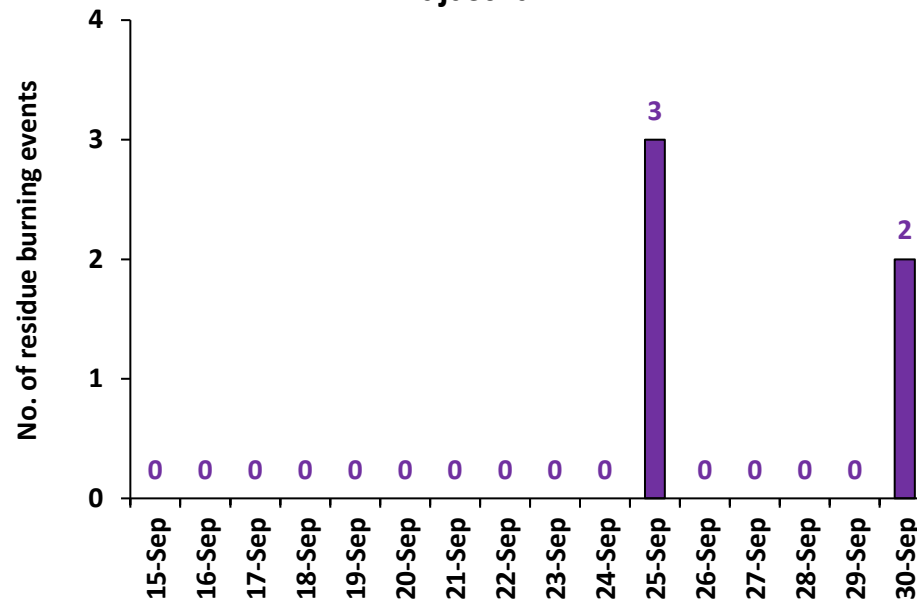
Temporal distribution of rice residue burning events for the study States in 2024



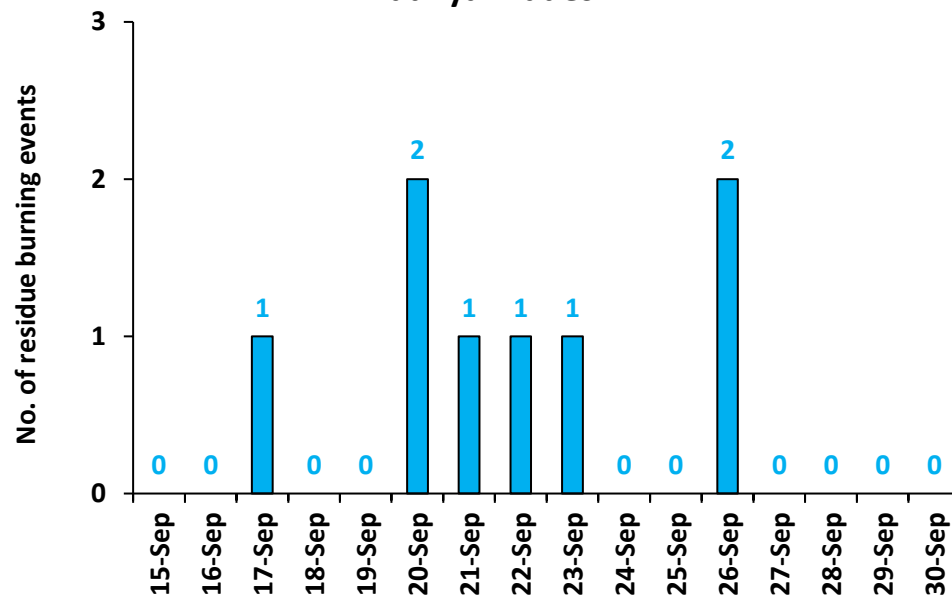
Uttar Pradesh



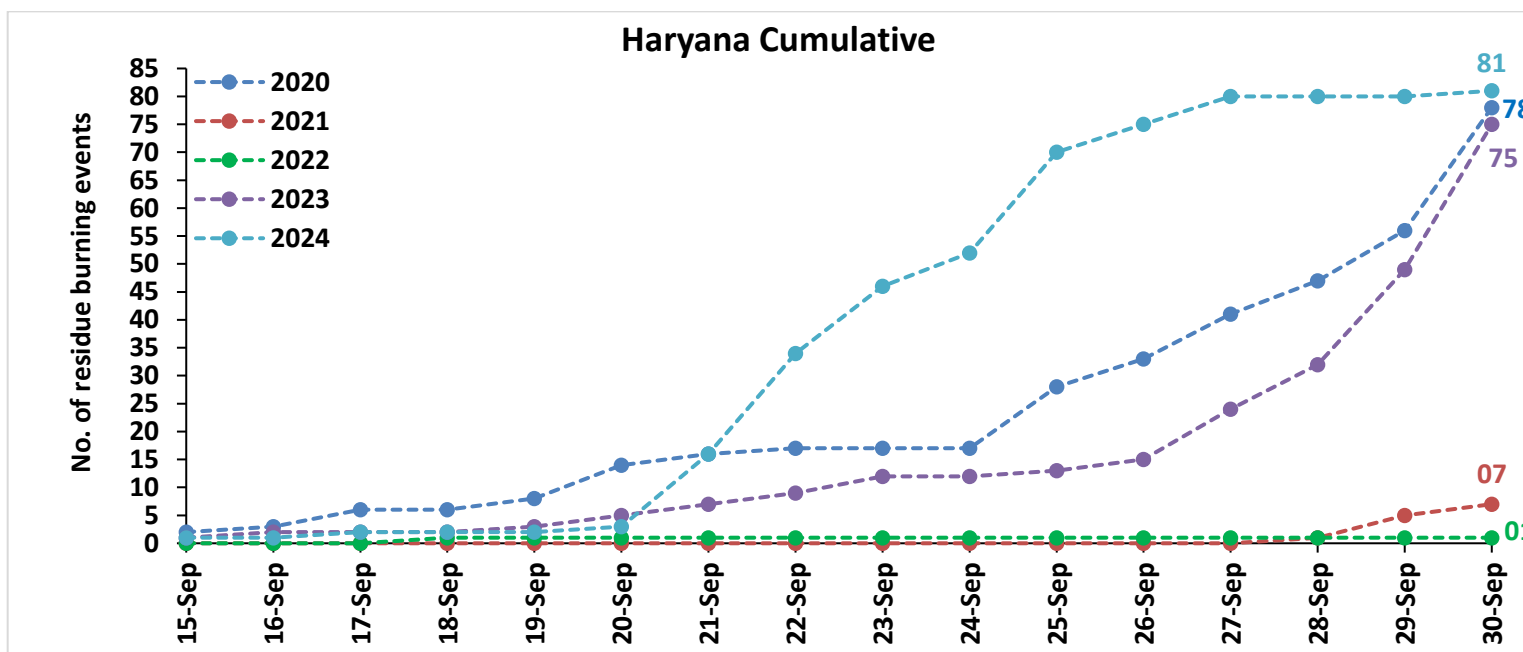
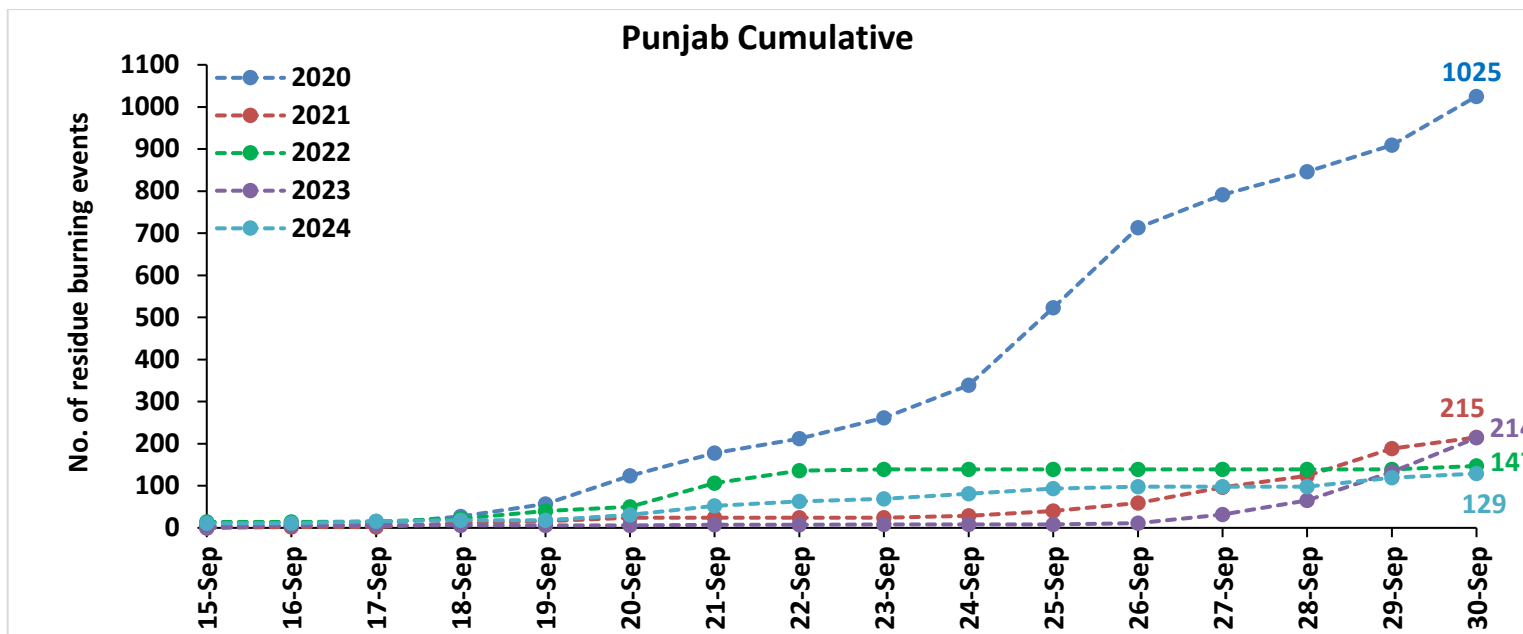
Rajasthan

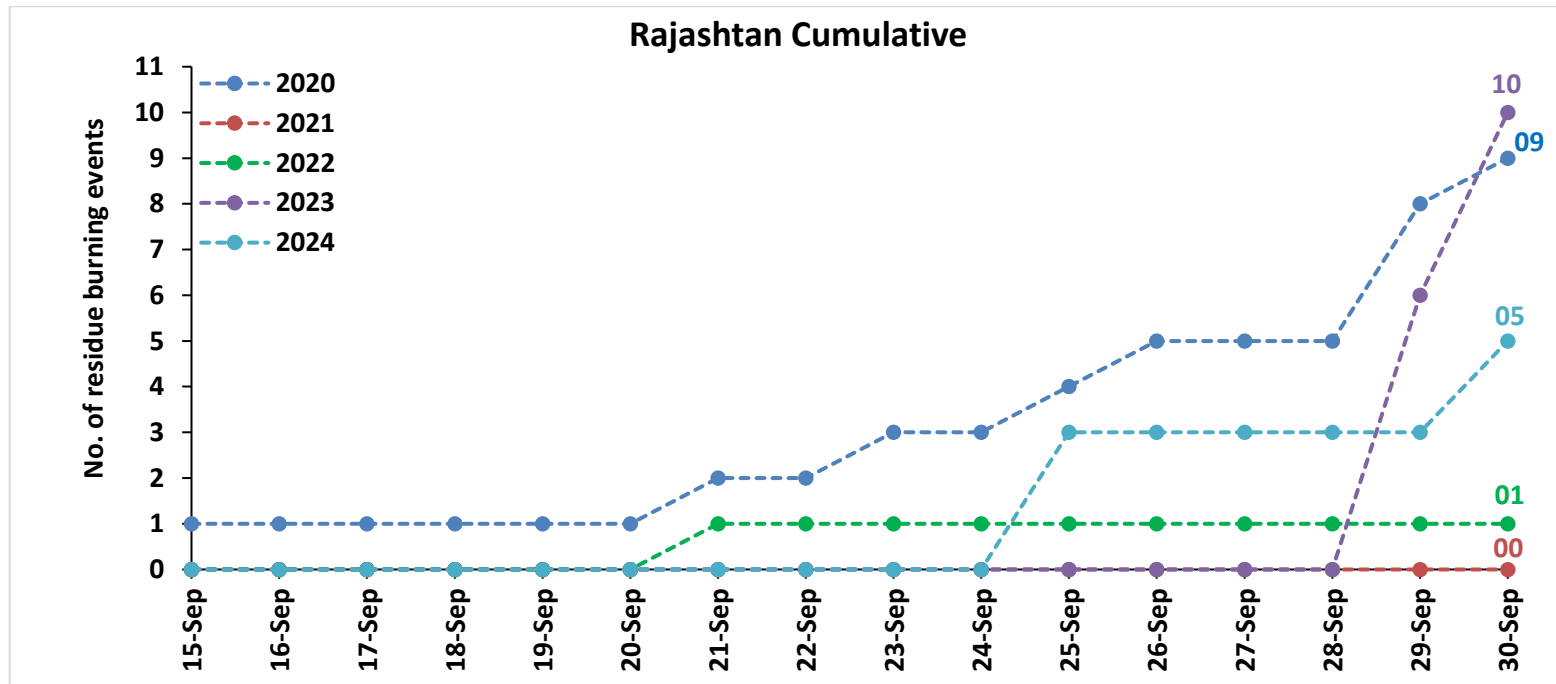
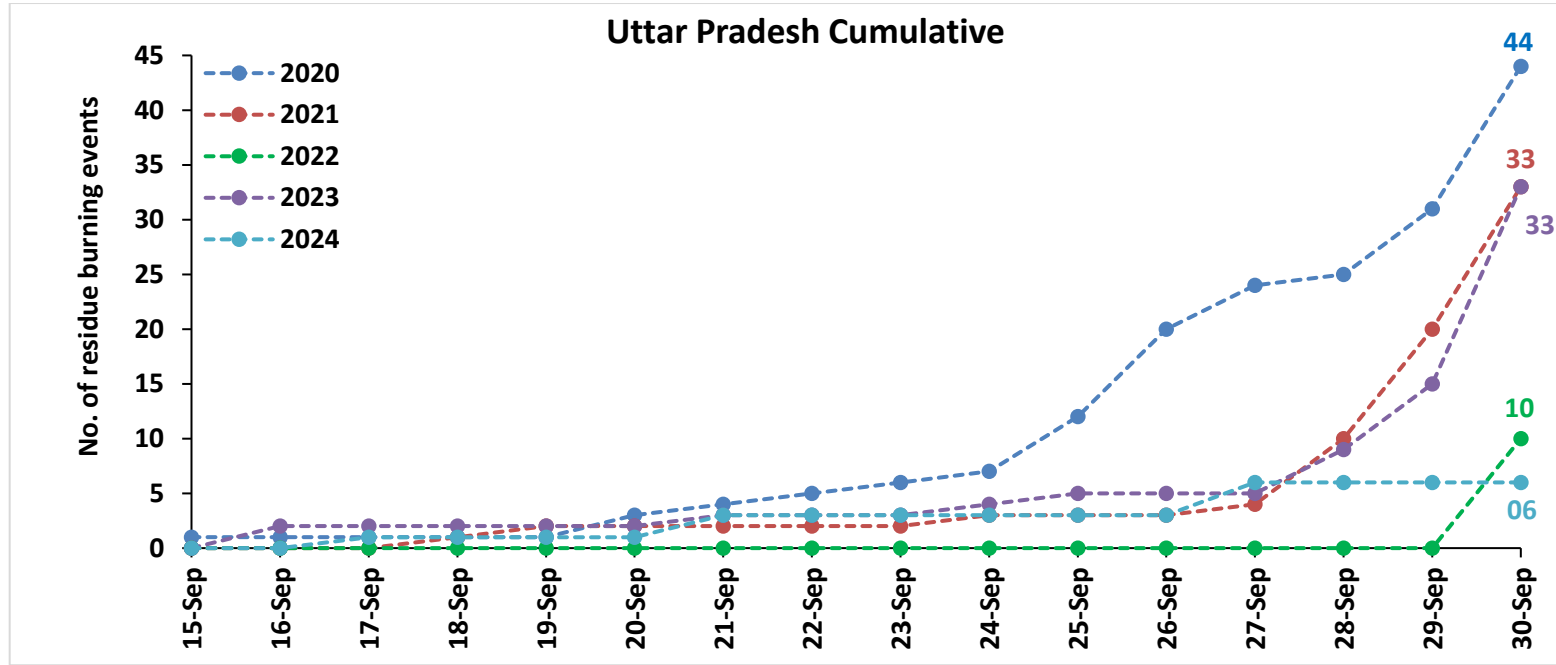


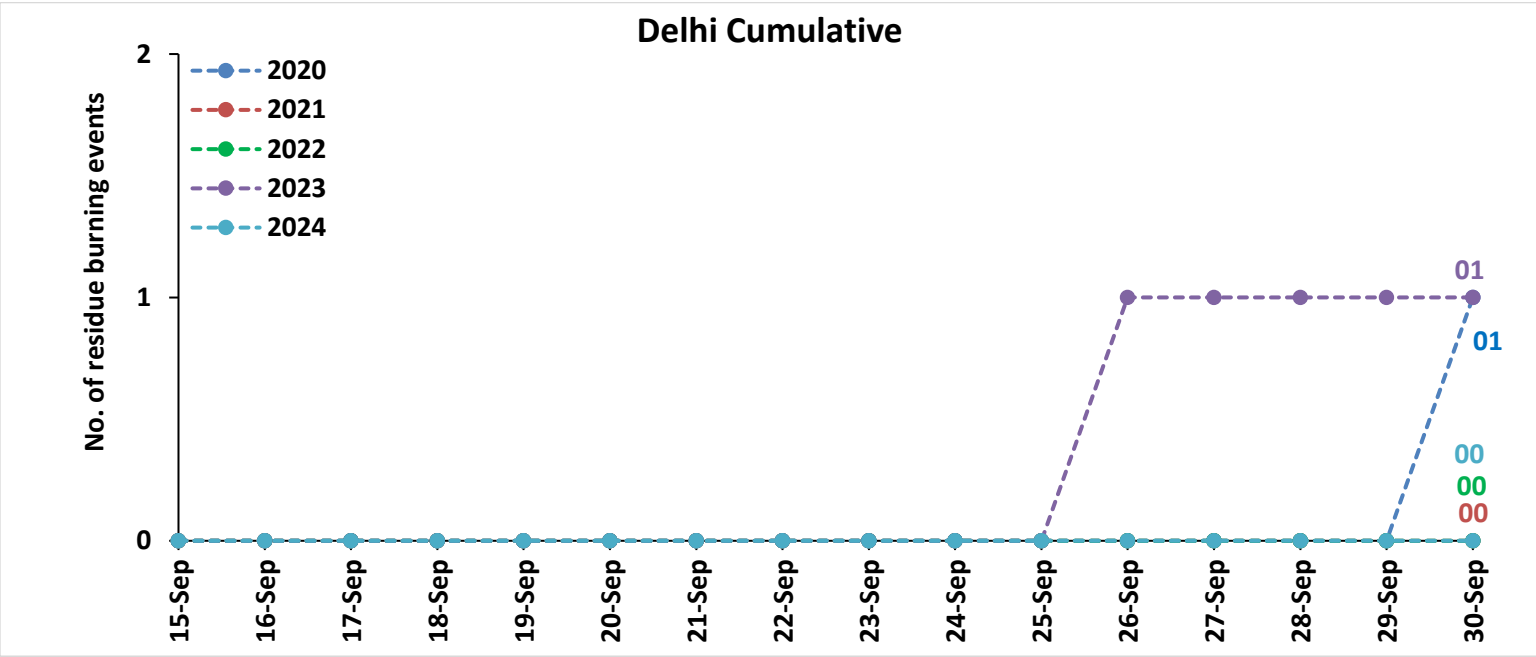
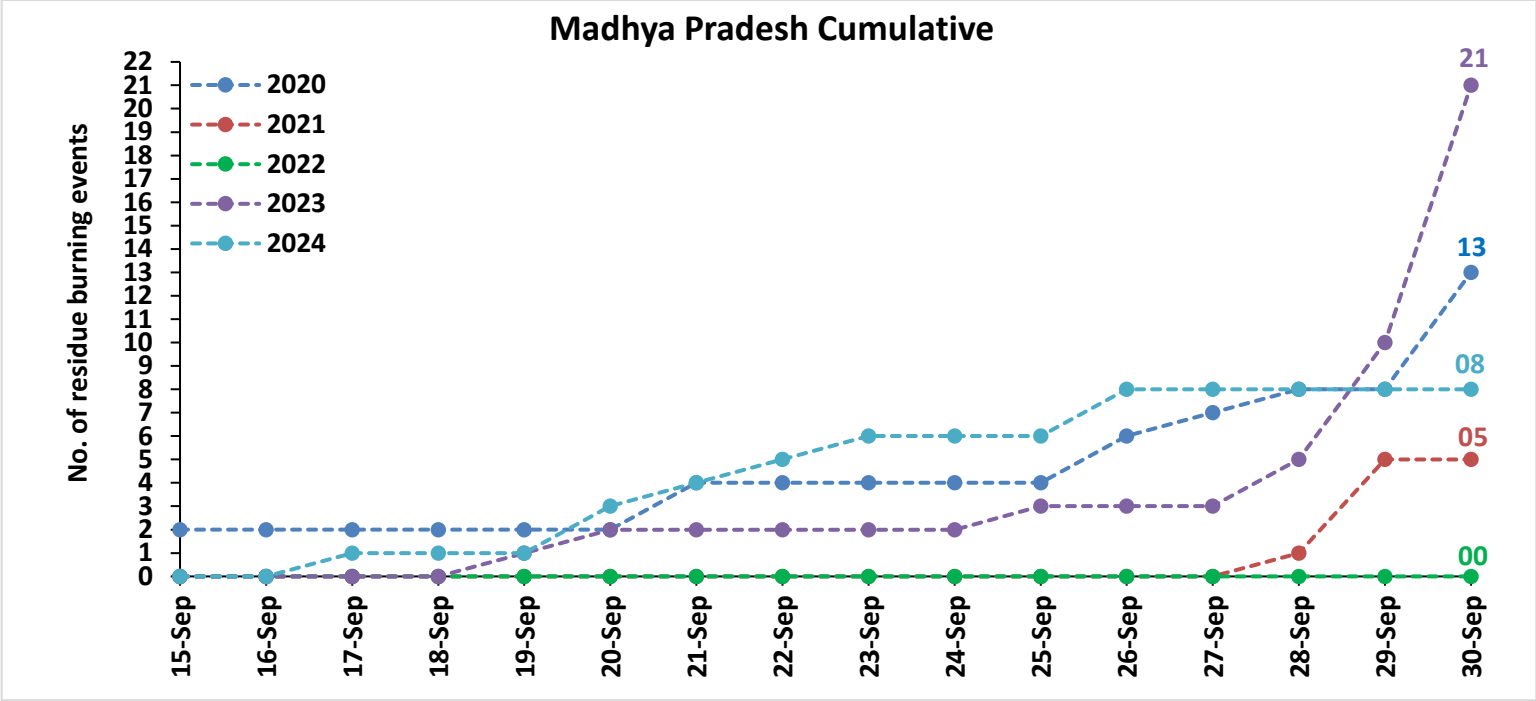
Madhya Pradesh



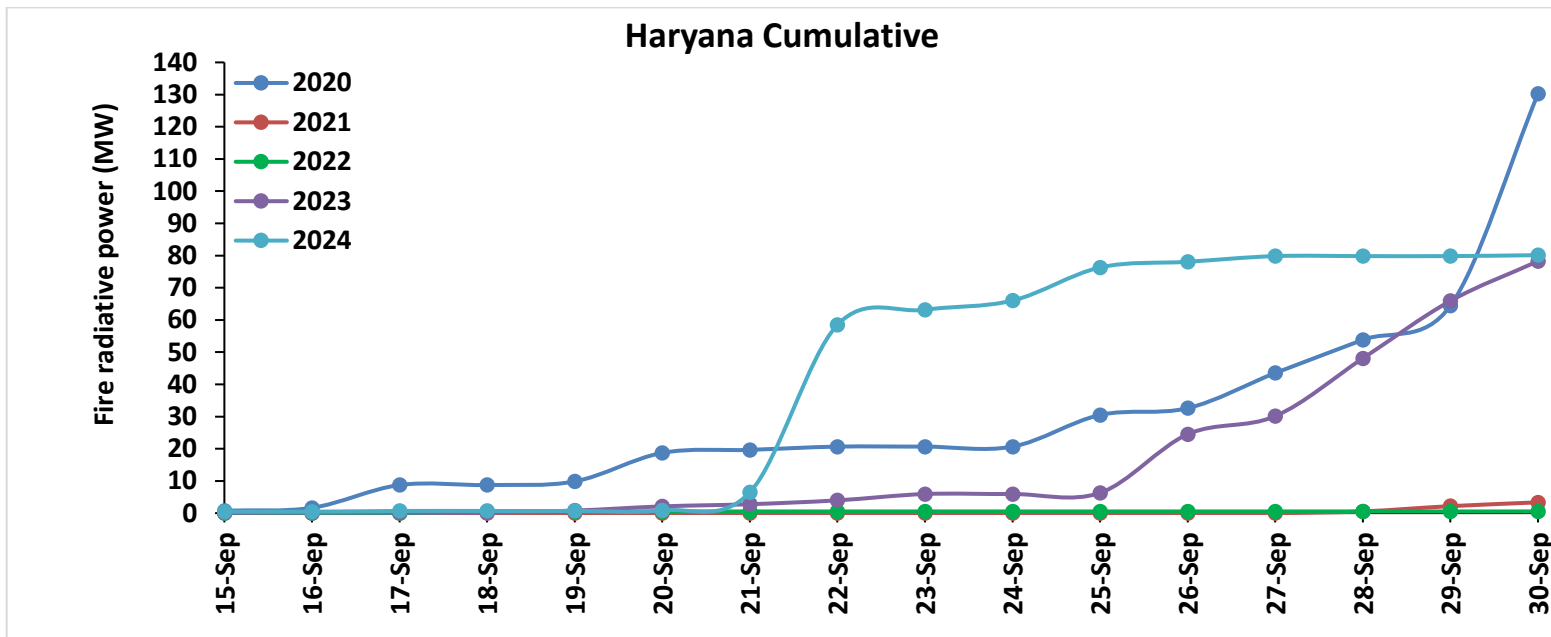
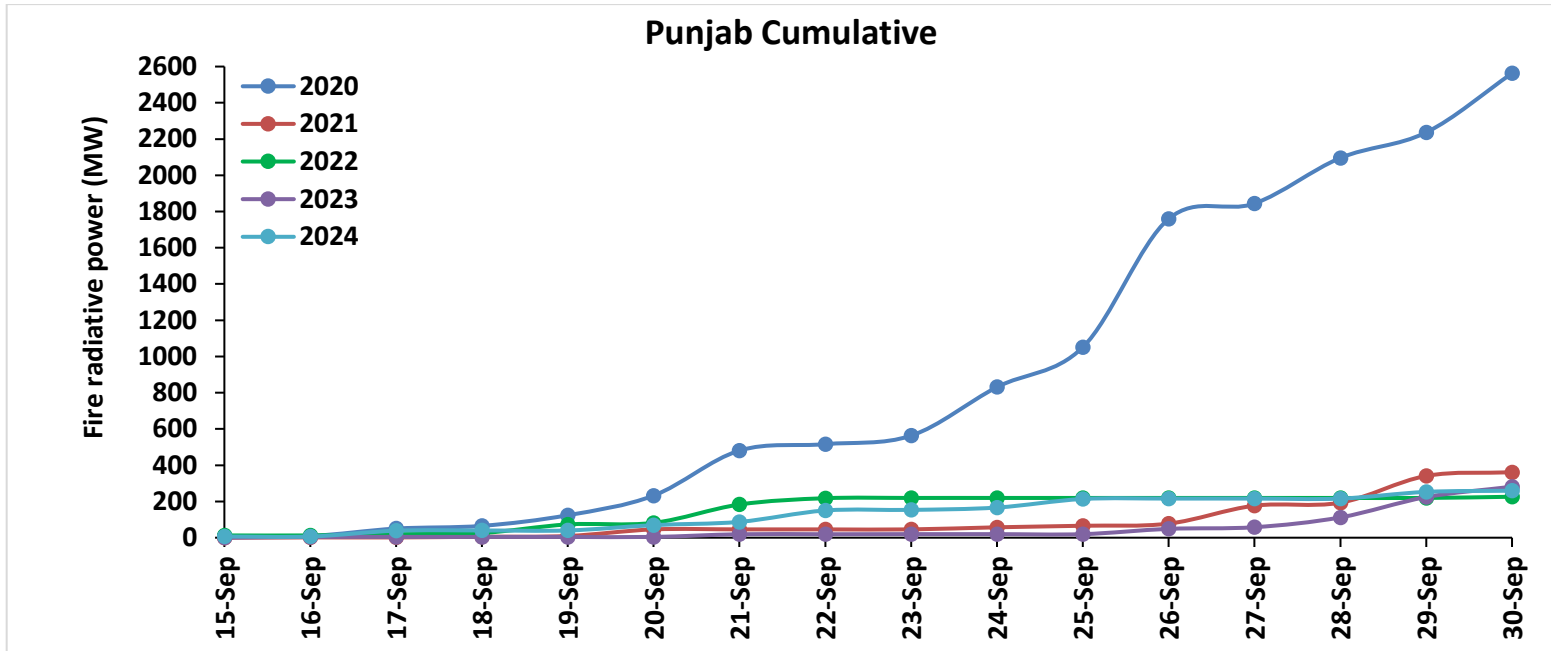
Comparison of residue burning events in current year (2024) with previous years (2020, 2021, 2022 and 2023) for the study States

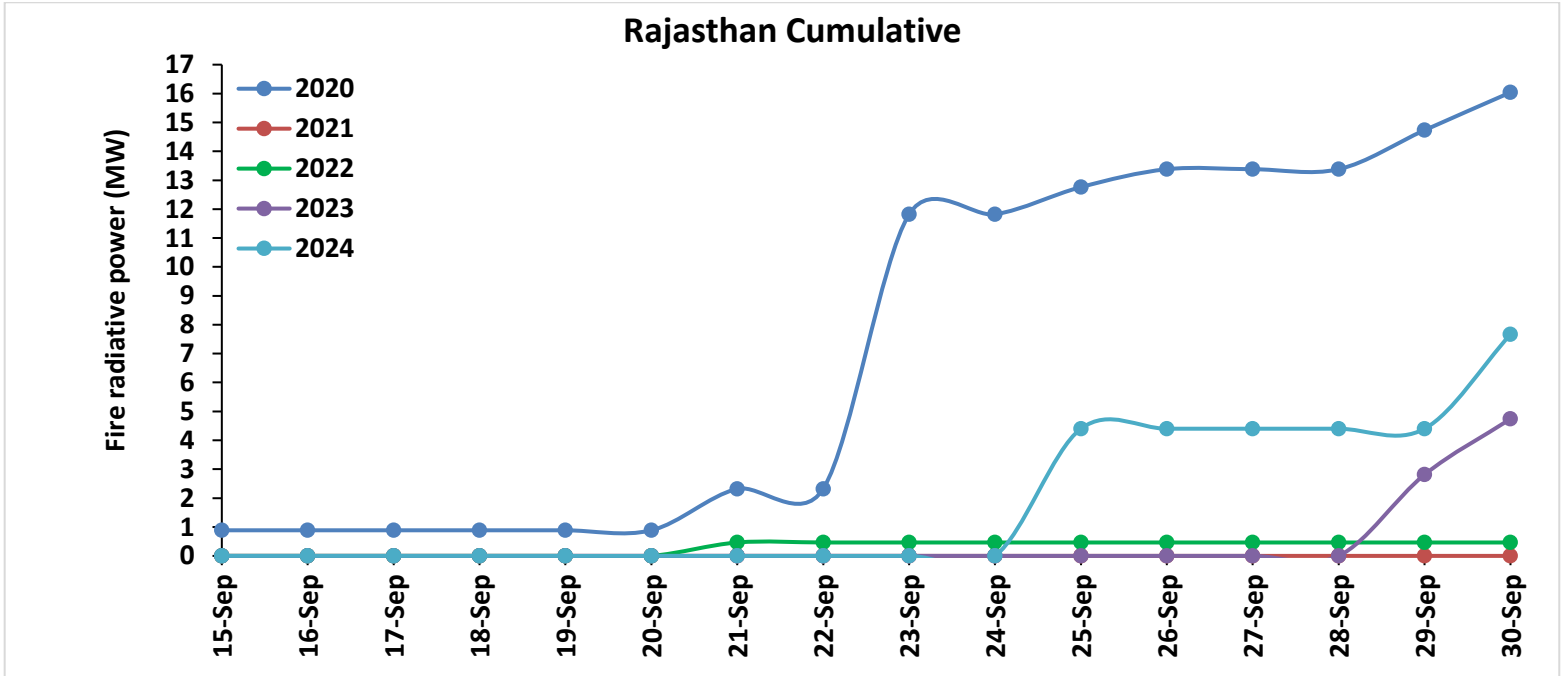
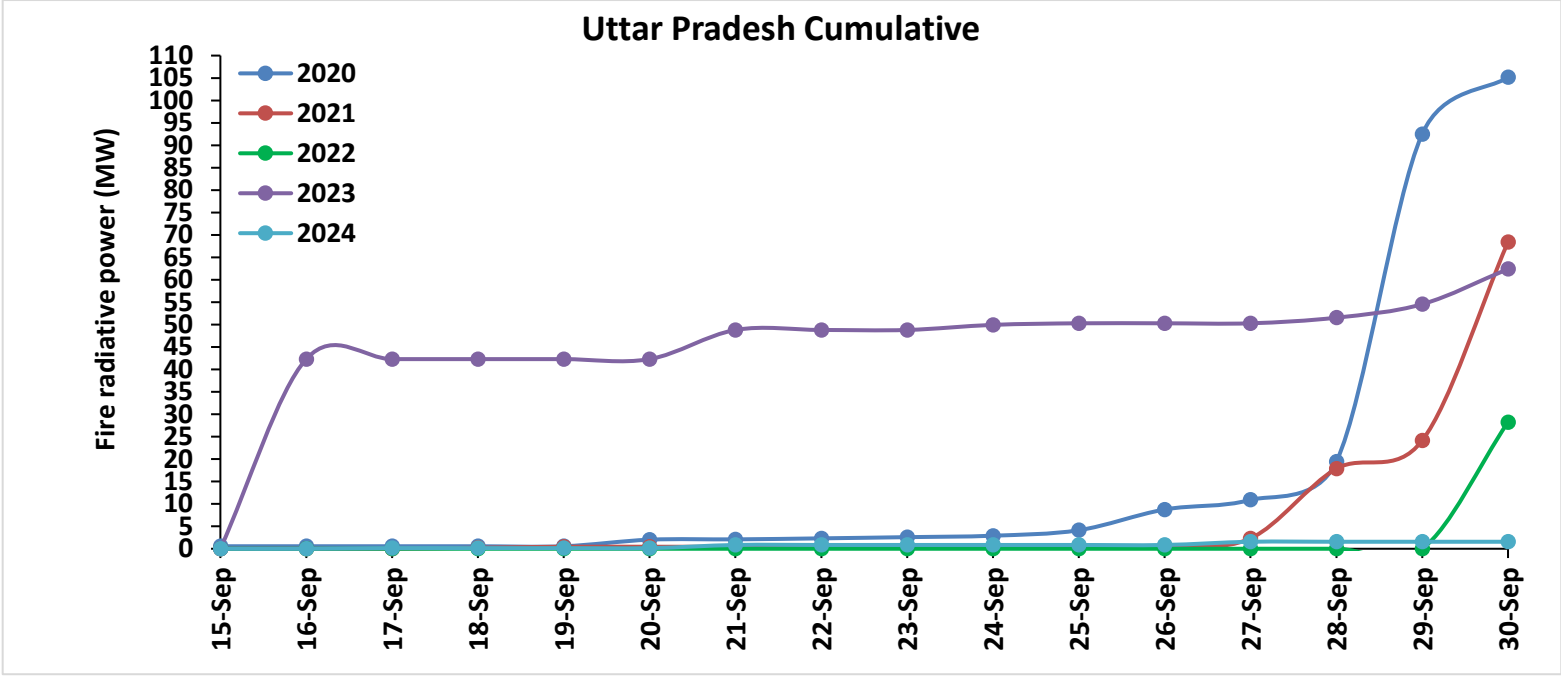


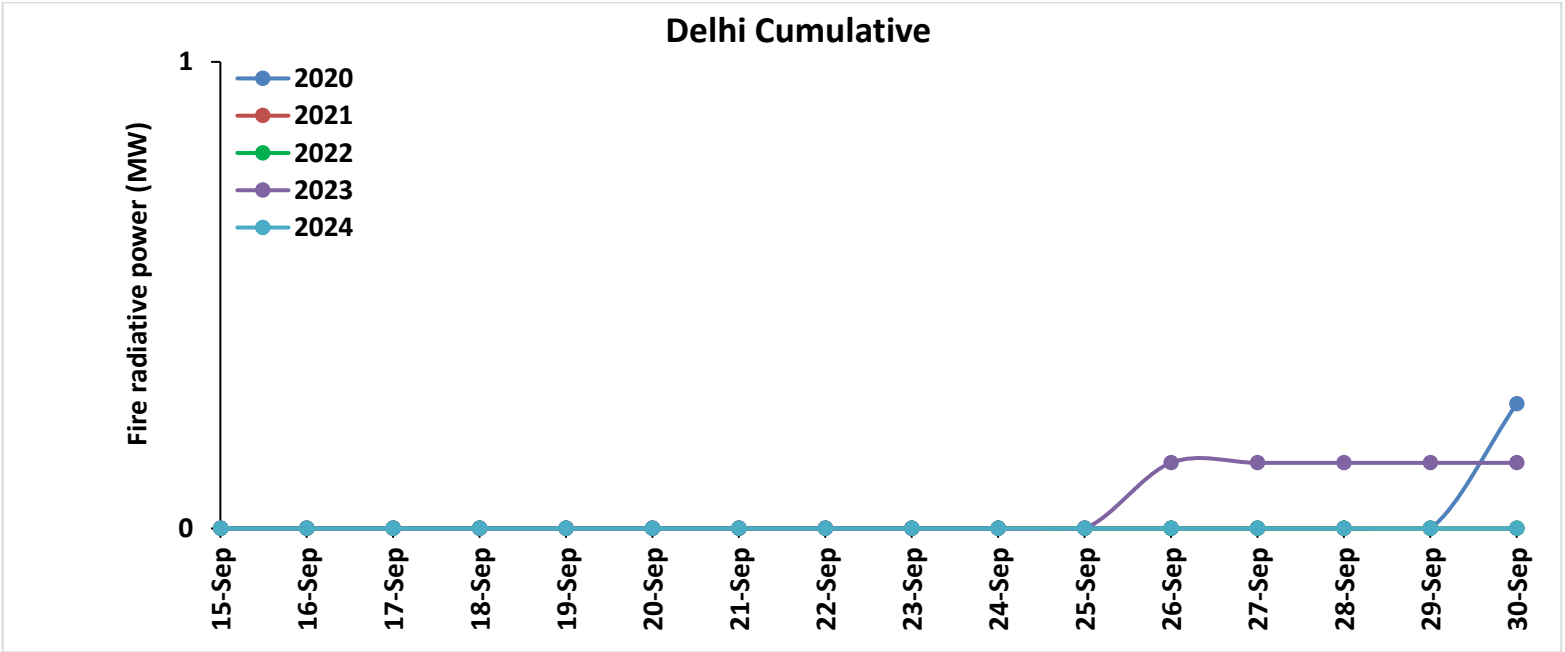
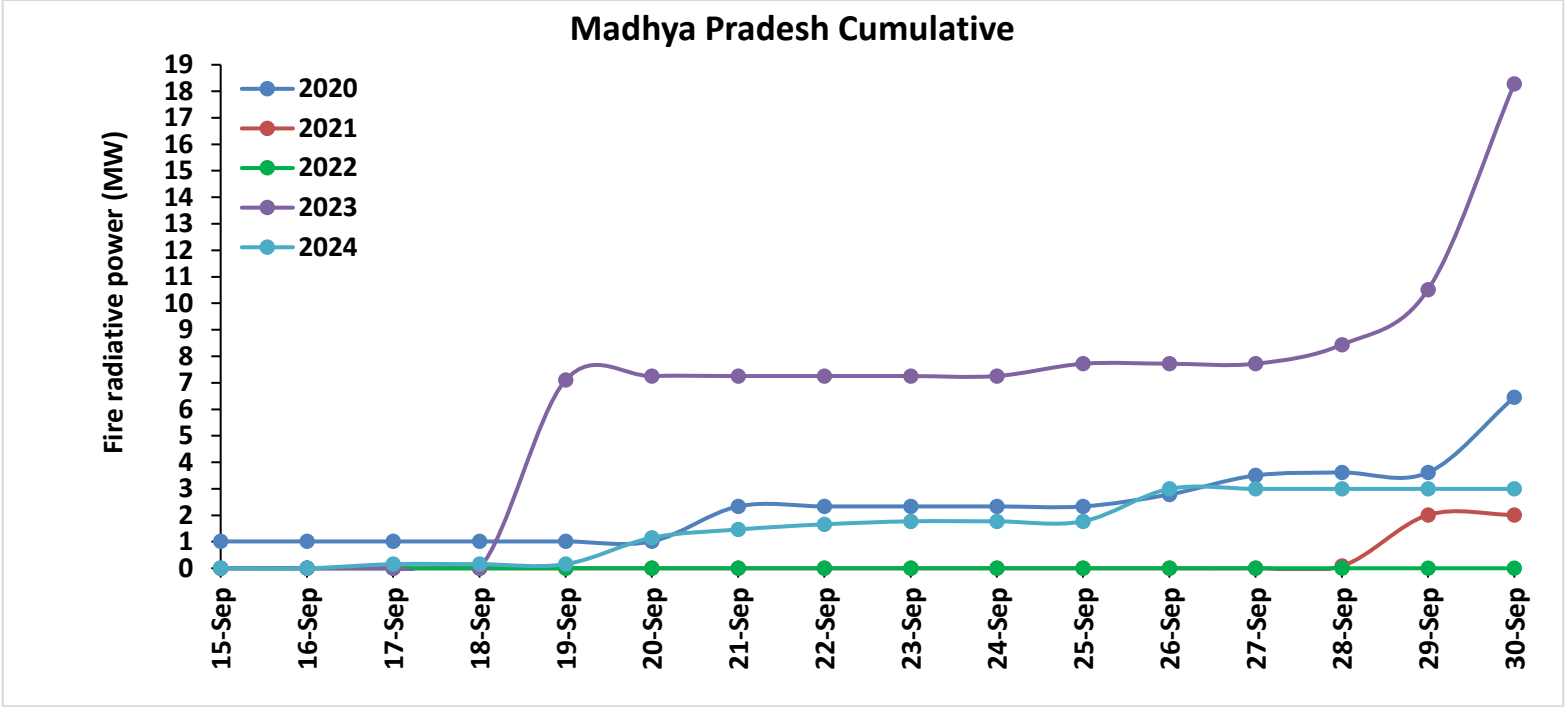




Comparison of residue burning fire power in current year (2024) with previous years (2020,2021,2022 and 2023) for the study States

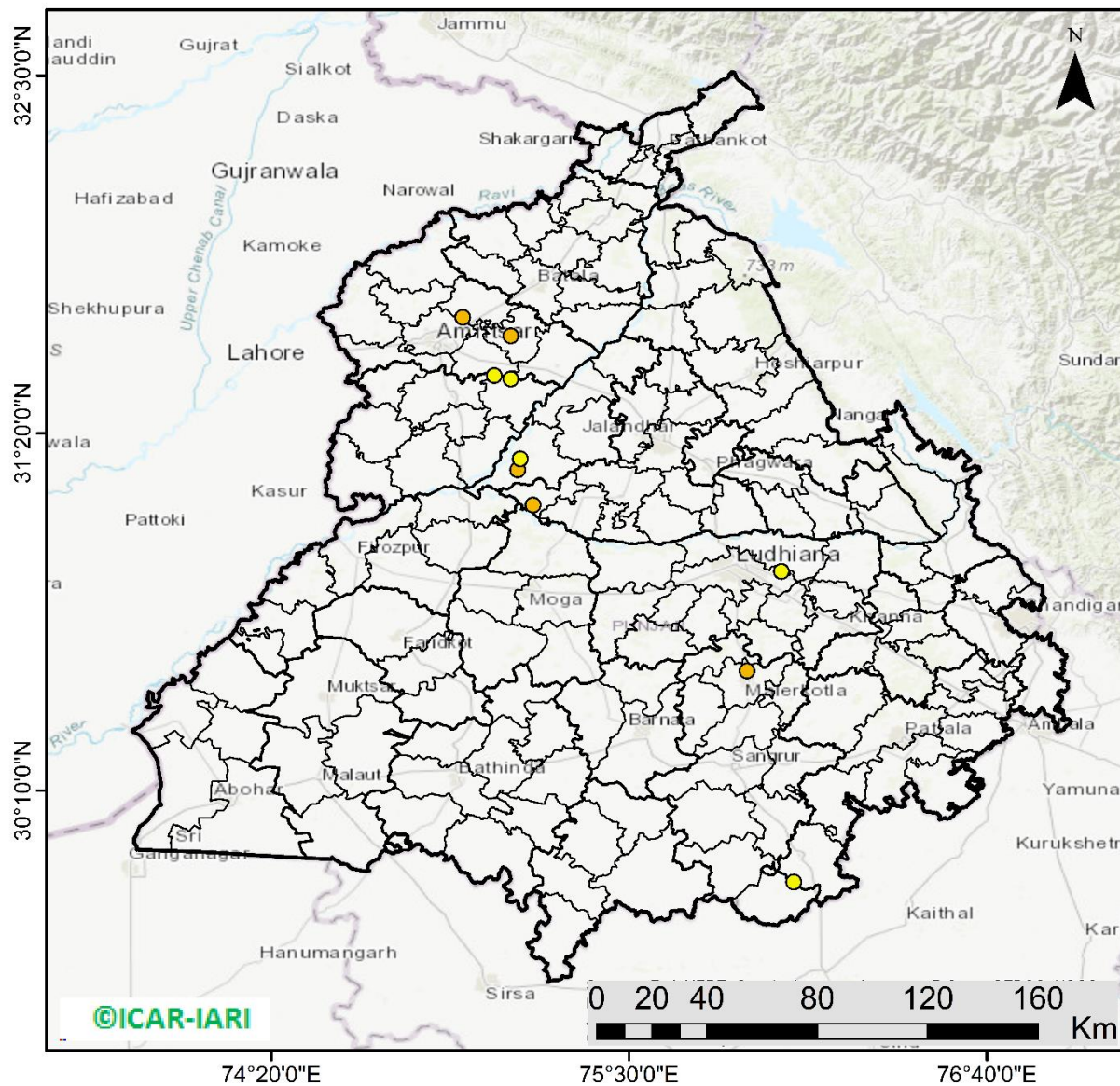






Punjab

RICE RESIDUE BURNING IN PUNJAB



10 burning events detected in Punjab during (30th Sep 2024)

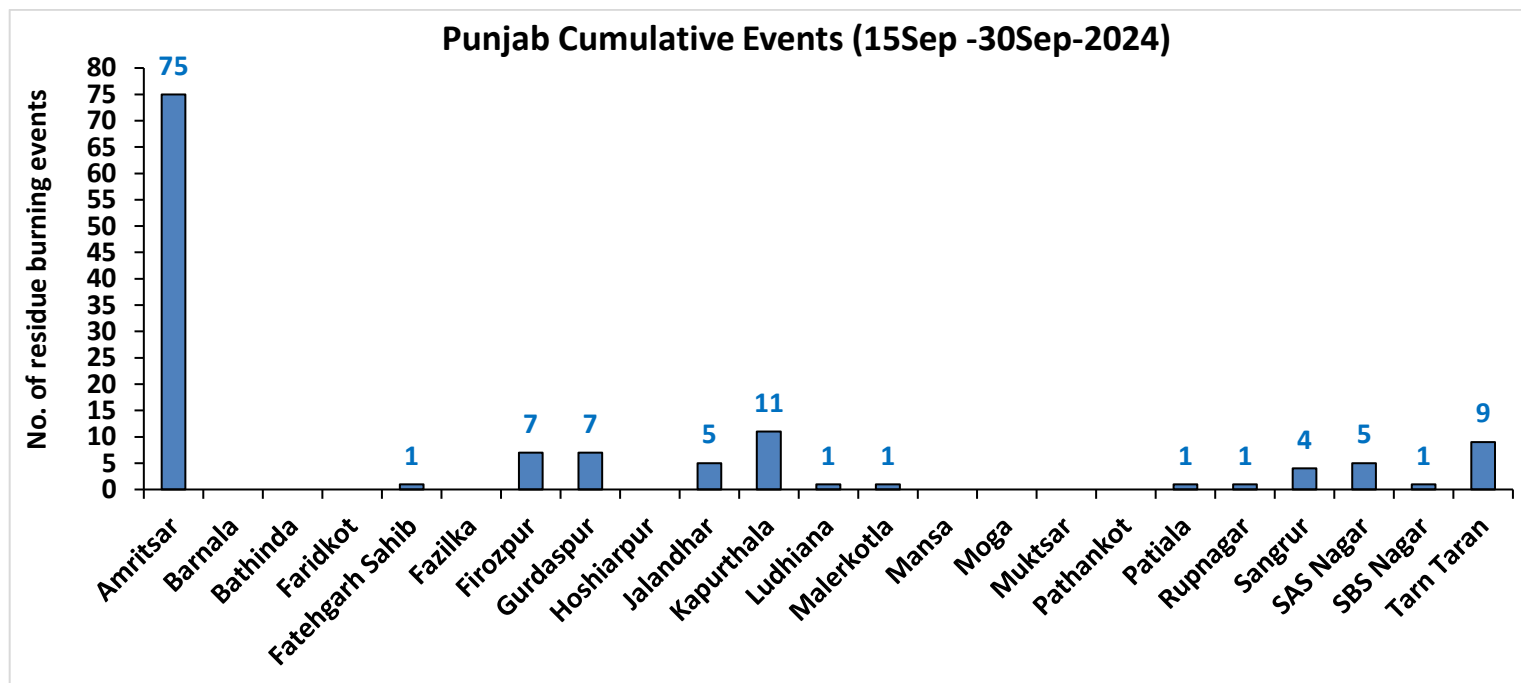
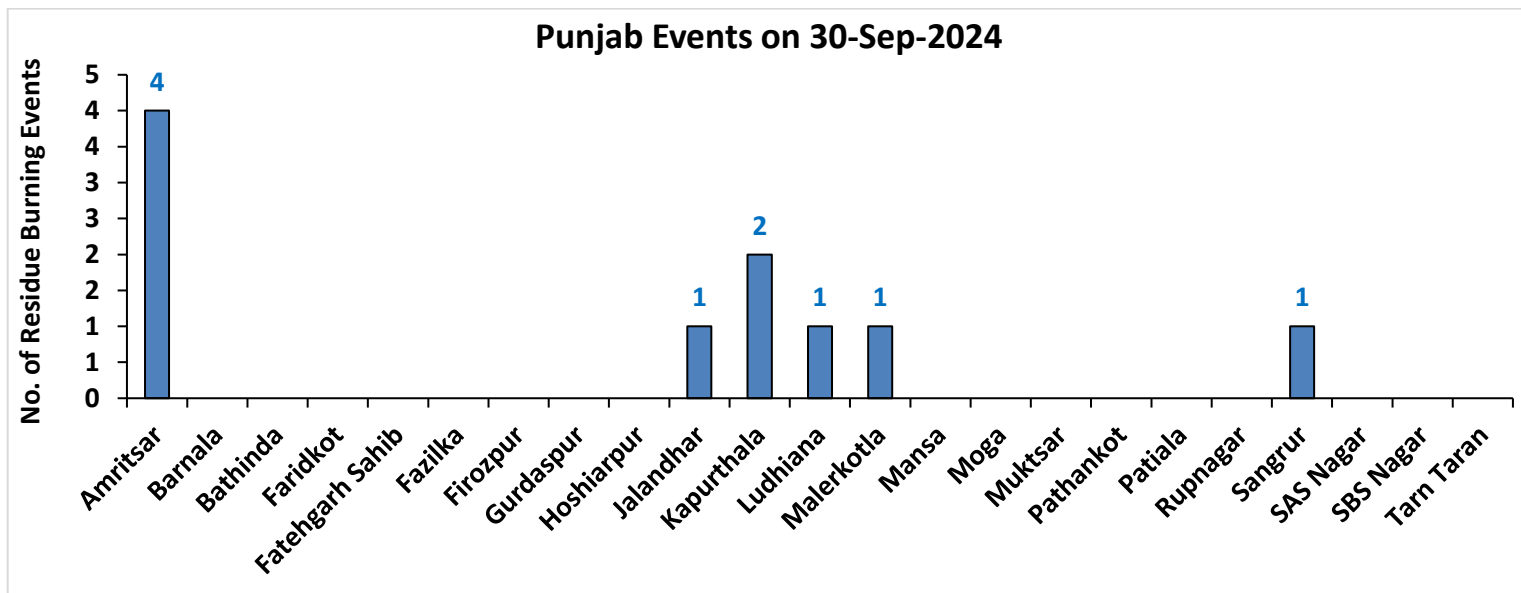
Fire Intensity (W/m²)

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



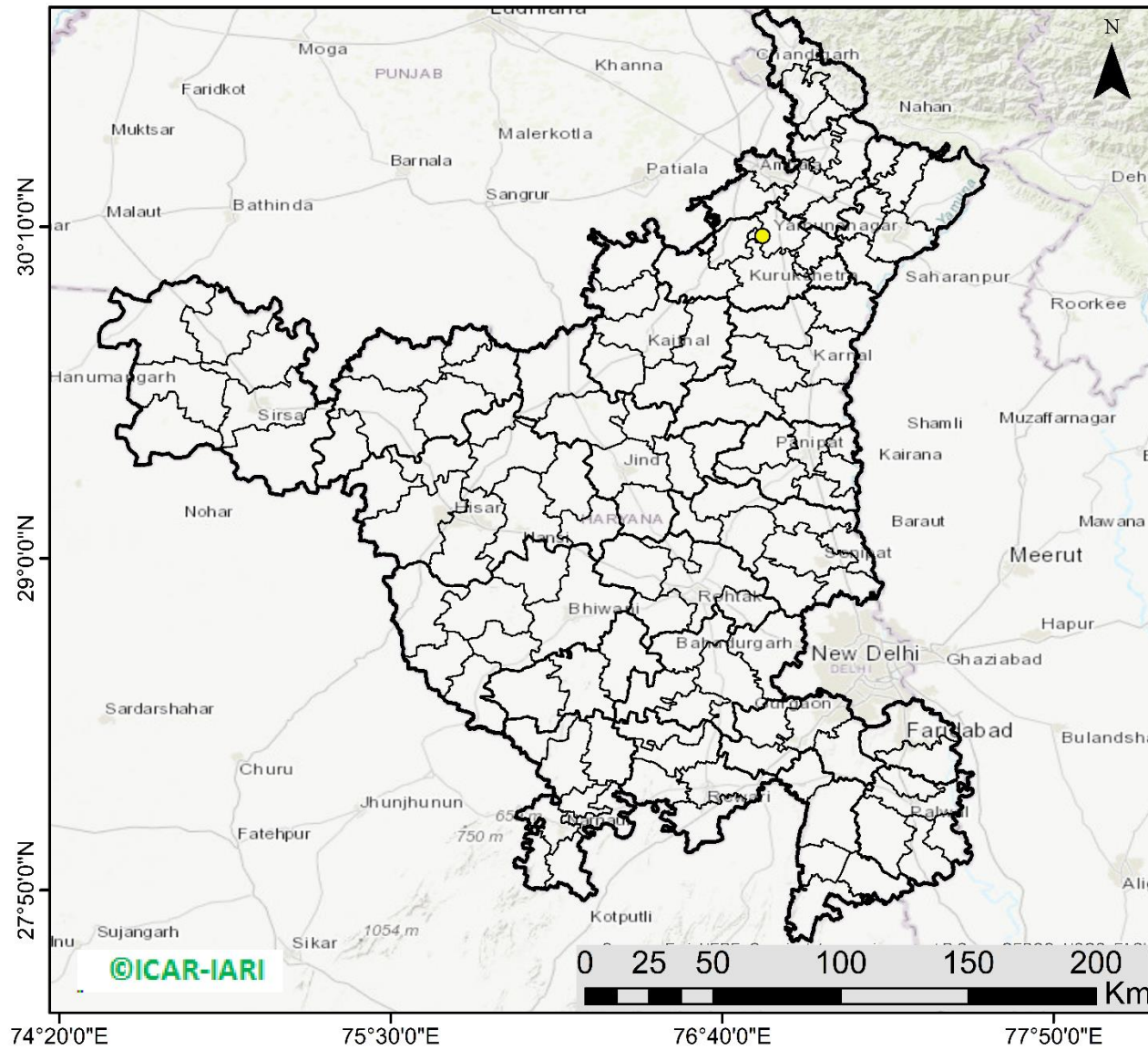
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep-30Sep-2024)



Haryana

RICE RESIDUE BURNING IN HARYANA



01 burning events detected in Haryana on (30th Sep 2024)

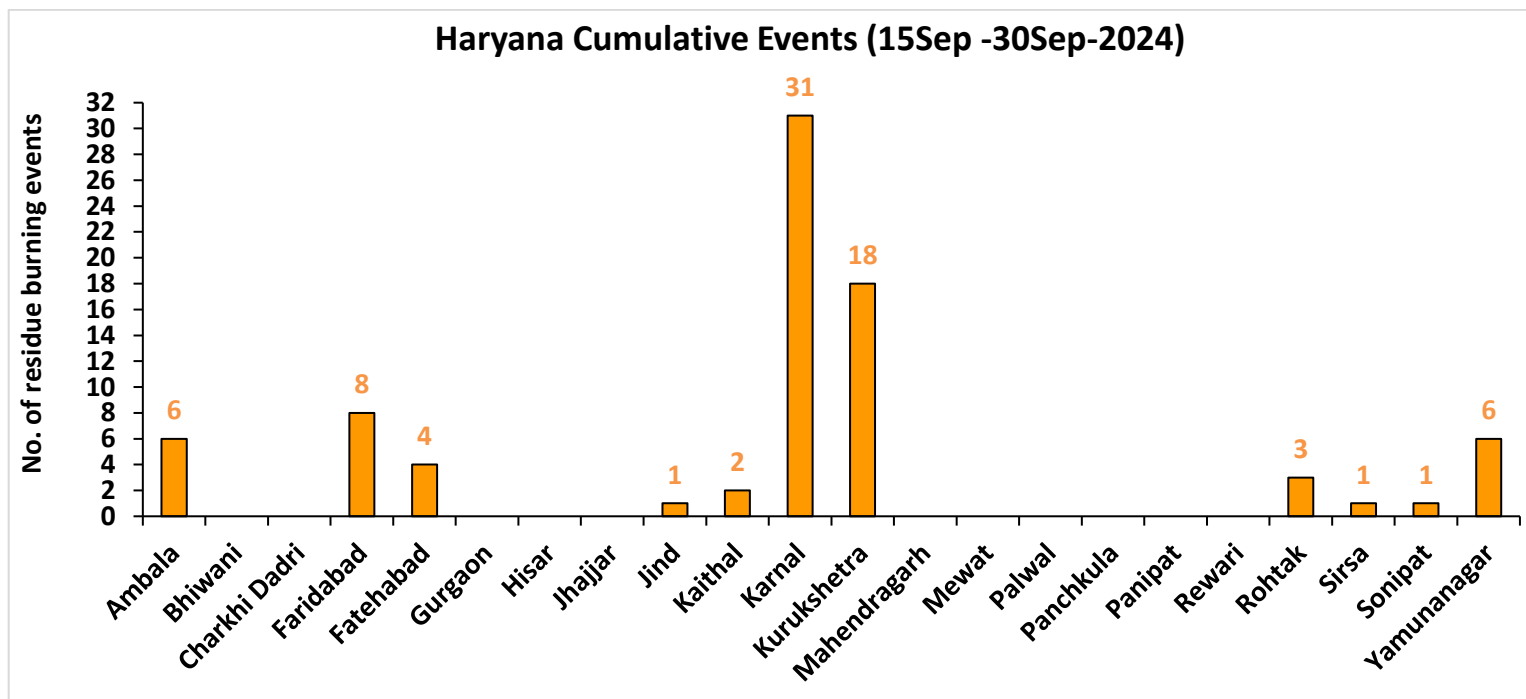
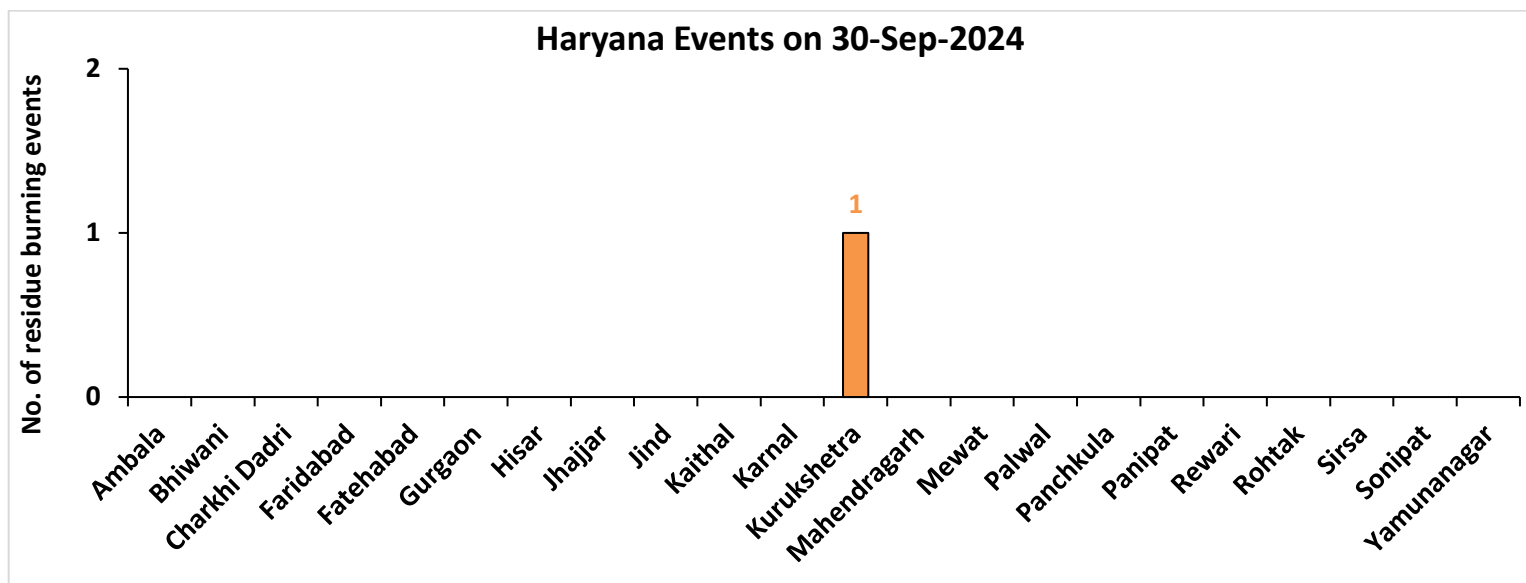
Fire Intensity (W/m²)

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



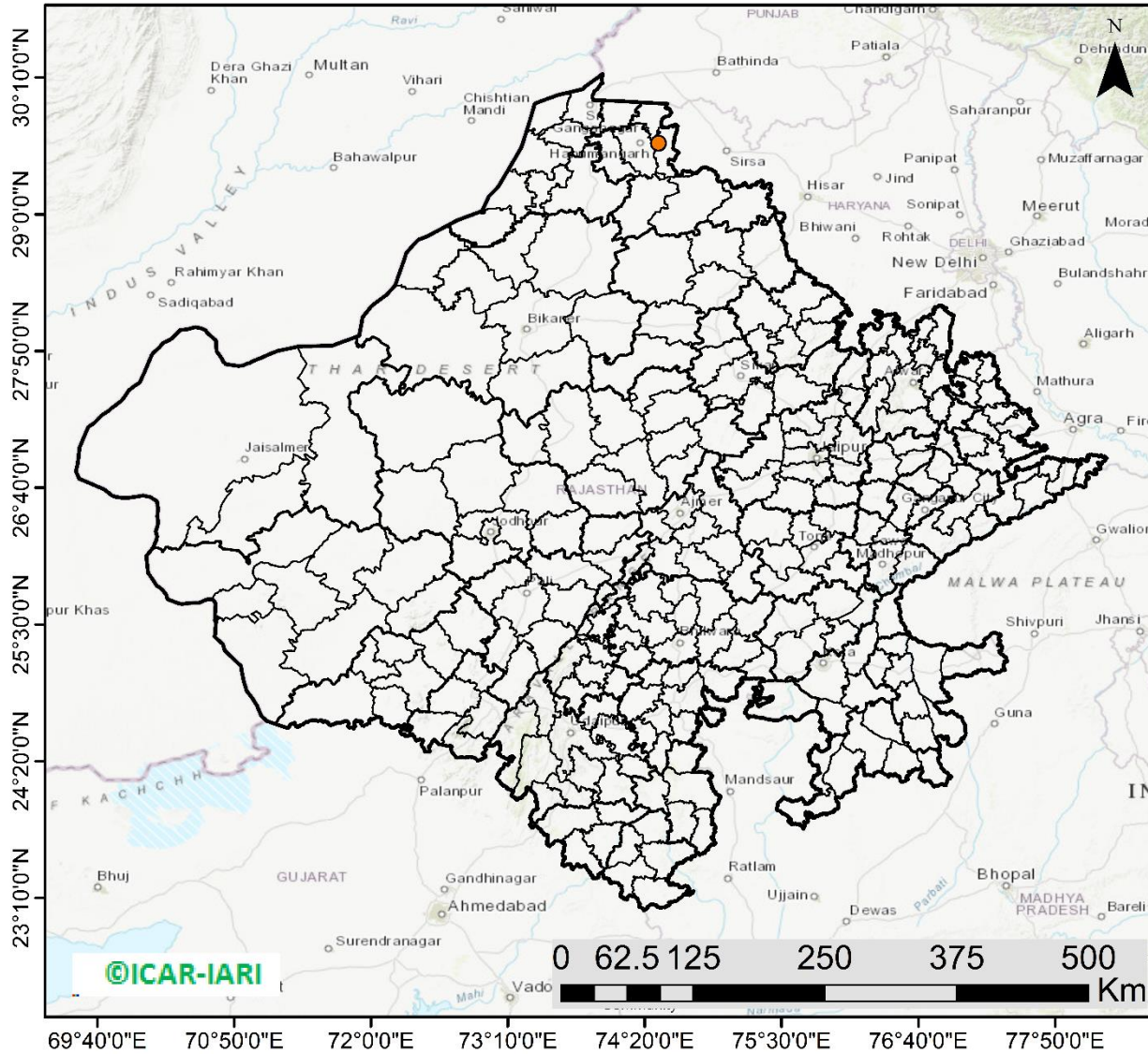
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Haryana (15Sep-30Sep-2024)



Rajasthan

RICE RESIDUE BURNING IN RAJASTHAN



02 burning events
detected in Rajasthan on
(30th Sep 2024)

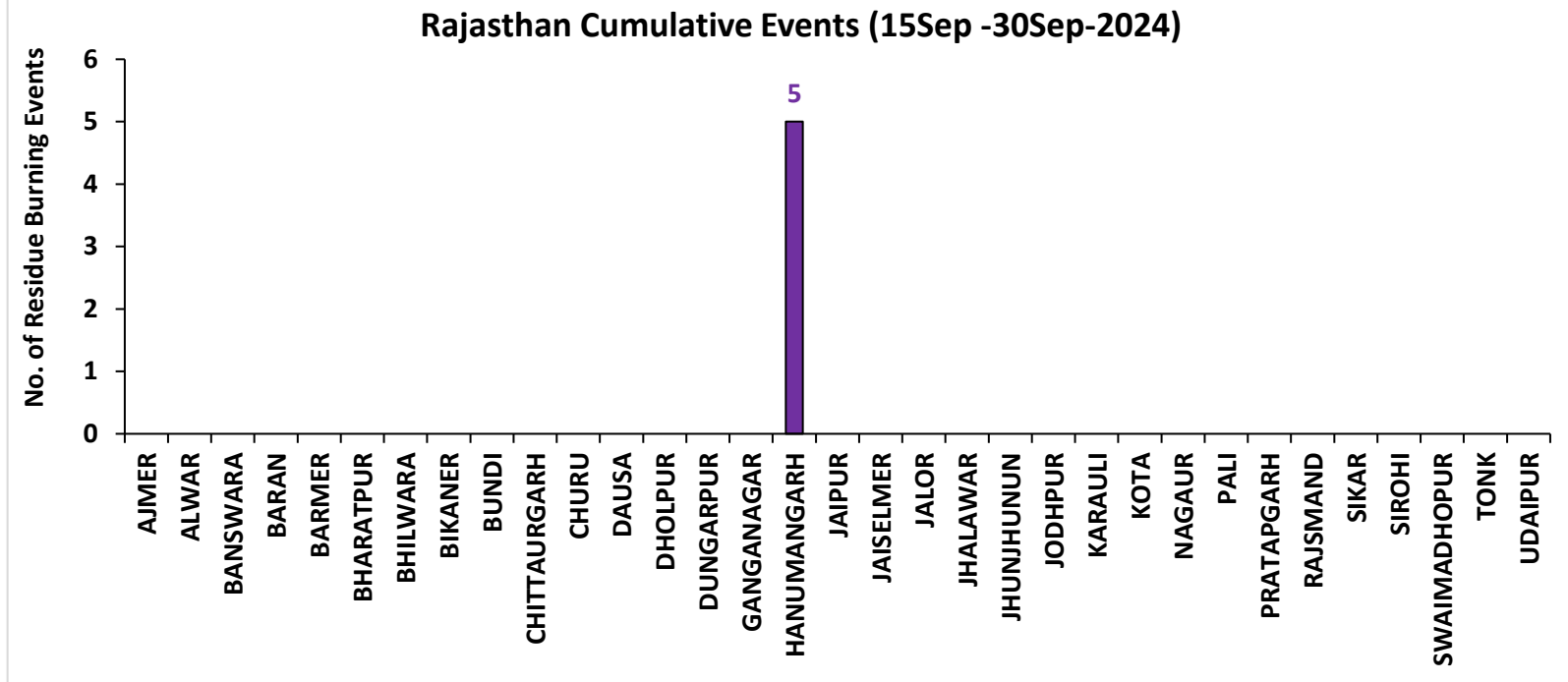
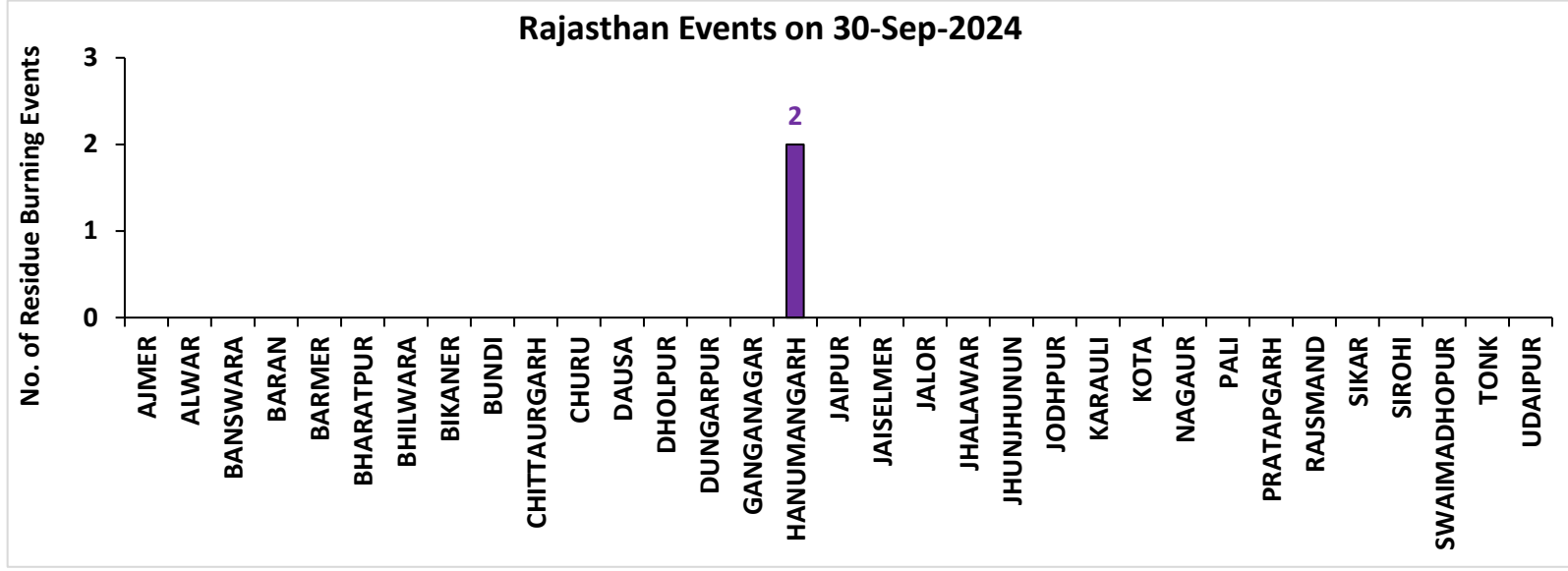
Fire Intensity (W/m²)

- 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-2024)



District-wise cumulative number of residues burning events detected in 2020, 2021, 2022, 2023 and 2024
(Period: 15 September-30 September)

(a) Punjab

District	15 Sep-30 Sep				
	2020	2021	2022	2023	2024
Amritsar	749	153	127	174	75
Barnala	2	0	0	0	0
Bathinda	0	0	0	0	0
Faridkot	1	8	0	1	0
Fatehgarh Sahib	3	0	0	0	1
Fazilka	0	1	0	0	0
Firozpur	5	2	0	3	7
Gurdaspur	27	4	1	3	7
Hoshiarpur	1	0	0	1	0
Jalandhar	4	1	1	2	5
Kapurthala	9	1	0	3	11
Ludhiana	16	7	0	2	1
Malerkotla	0	0	0	0	1
Mansa	1	0	0	0	0
Moga	5	0	0	0	0
Muktsar	1	0	0	0	0
Pathankot	0	0	0	0	0
Patiala	25	10	1	3	1
Rupnagar	1	0	0	0	1
Sangrur	6	3	0	2	4
SAS NAGAR (Mohali)	5	0	1	6	5
SBS Nagar	1	0	1	1	1
Tarn Taran	163	25	15	13	9
Total	1025	215	147	214	129

(b) Haryana

District	15 Sep-30 Sep				
	2020	2021	2022	2023	2024
AMBALA	9	0	0	11	6
BHIWANI	0	0	0	0	0
CHARKHI DADRI	0	0	0	0	0
FARIDABAD	0	0	0	0	8
FATEHABAD	8	0	0	5	4
GURGAON	0	0	0	0	0
HISAR	2	0	0	0	0
JHAJJAR	0	0	0	0	0
JIND	0	0	1	3	1
KAITHAL	10	0	0	1	2
KARNAL	24	2	0	13	31
KURUKSHETRA	14	4	0	17	18
MAHENDRAGARH	0	0	0	0	0
MEWAT	0	0	0	0	0
PALWAL	1	0	0	2	0
PANCHKULA	0	0	0	0	0
PANIPAT	3	0	0	3	0
REWARI	0	0	0	0	0
ROHTAK	0	0	0	1	3
SIRSA	1	0	0	0	1
SONIPAT	1	0	0	12	1
YAMUNANAGAR	5	1	0	7	6
Total	78	7	1	75	81

(c) Uttar Pradesh

District	15 Sep-30 Sep																
	2020	2021	2022	2023	2024	GAUTAMBUDHNAGAR	0	0	0	2	1	MUZAFARNAGAR	0	0	0	0	0
AGRA	0	0	0	0	0	GAZIPUR	0	0	0	0	0	PILHIBHIT	1	1	0	3	0
ALIGARH	2	0	0	13	1	GHAZIABAD	1	0	0	0	2	PRATAPGARH	0	0	0	0	0
ALLAHABAD	0	0	0	0	0	GONDA	0	0	0	0	0	RAIBEARELI	1	0	0	0	0
AMBEDKARNAGAR	0	0	0	0	0	GORAKHPUR	0	0	0	0	0	RAMPUR	0	3	0	0	0
AMETHI	0	0	0	0	0	HAMIRPUR	0	0	0	0	0	SAMBHAL	4	0	0	3	0
AMROHA	0	0	0	1	0	HAPUR	1	0	0	0	0	SANTKABIRNAGAR	0	0	0	0	0
AURAIYA	10	0	3	2	0	HARDOI	0	0	0	1	0	SANTRAVIDASNAGAR	0	0	0	0	0
AZAMGARH	0	0	0	0	0	HATHRAS	0	0	0	2	0	SHAHJAHANPUR	3	25	5	2	1
BADAUN	0	0	0	0	0	JALAUN	0	0	0	0	0	SHAMLI	6	0	0	0	0
BAGHPAT	1	0	0	0	0	JAUNPUR	0	0	0	0	0	SHARANPUR	3	0	0	0	0
BAHRAICH	0	0	0	0	0	JHANSI	2	0	0	0	0	SHRAWASTI	0	0	0	0	0
BALLIA	0	0	0	0	0	KANNAUJ	1	0	0	0	0	SIDDHARTHANAGAR	0	0	0	0	0
BALRAMPUR	0	0	0	0	0	KANPUR	0	1	0	0	0	SITAPUR	0	0	0	0	0
BANDA	0	0	0	0	0	KANPUR DEHAT	0	0	0	0	0	SONBHADRA	0	0	0	0	0
BARABANKI	0	0	0	0	0	KASGANJ	0	0	0	0	0	SULTANPUR	0	0	0	0	0
BAREILLY	0	0	0	0	0	KAUSHAMBI	1	0	0	1	0	UNNAO	2	0	0	0	0
BASTI	0	0	0	0	0	KHERI	0	1	0	0	0	VARANASI	0	0	0	0	0
BIJNOR	1	0	1	0	1	KUSHINAGAR	0	0	0	0	0	Total	44	33	10	33	6
BULANDSAHAR	0	0	1	1	0	LALITPUR	0	1	0	0	0						
CHANDAULI	0	0	0	0	0	LUCKNOW	0	0	0	0	0						
CHITRAKOOT	0	0	0	0	0	MAHARAJGANJ	0	0	0	0	0						
DEORIA	0	0	0	2	0	MAHOBA	0	0	0	0	0						
ETAH	1	0	0	0	0	MAINPURI	0	0	0	0	0						
ETAWAH	0	0	0	0	0	MATHURA	0	1	0	0	0						
FAIZABAD	0	0	0	0	0	MAU	0	0	0	0	0						
FARRUKHABAD	0	0	0	0	0	MEERUT	3	0	0	0	0						
FATEHPUR	0	0	0	0	0	MIRZAPUR	0	0	0	0	0						
FIROZABAD	0	0	0	0	0	MORADABAD	0	0	0	0	0						

(d) Delhi

District	15 Sep-30 Sep				
	2020	2021	2022	2023	2024
CENTRAL	0	0	0	0	0
EAST	0	0	0	0	0
NEW DELHI	0	0	0	0	0
NORTH	0	0	0	1	0
NORTH EAST	0	0	0	0	0
NORTH WEST DELHI	0	0	0	0	0
SHAHADRA	0	0	0	0	0
SOUTH	1	0	0	0	0
SOUTH EAST	0	0	0	0	0
SOUTH WEST DELHI	0	0	0	0	0
WEST DELHI	0	0	0	0	0
Total	1	0	0	1	0

(e) Rajasthan

District	15 Sep-30 Sep				
	2020	2021	2022	2023	2024
AJMER	0	0	0	0	0
ALWAR	1	0	0	0	0
BANSWARA	0	0	0	0	0
BARAN	2	0	0	3	0
BARMER	2	0	0	0	0
BHARATPUR	0	0	0	1	0
BHILWARA	1	0	0	0	0
BIKANER	0	0	0	0	0
BUNDI	0	0	1	0	0
CHITTAURGARH	0	0	0	1	0
CHURU	0	0	0	0	0
DAUSA	0	0	0	0	0
DHOLPUR	0	0	0	0	0
DUNGARPUR	0	0	0	0	0
GANGANAGAR	1	0	0	0	0
HANUMANGARH	0	0	0	1	5
JAIPUR	0	0	0	0	0
JAISELMER	1	0	0	0	0
JALOR	0	0	0	0	0
JHALAWAR	0	0	0	0	0
JHUNJHUNUN	0	0	0	0	0
JODHPUR	1	0	0	0	0
KARALI	0	0	0	0	0
KOTA	0	0	0	4	0
NAGOUR	0	0	0	0	0
PALI	0	0	0	0	0
PRATAPGARH	0	0	0	0	0
RAJSMAND	0	0	0	0	0
SIKAR	0	0	0	0	0
SIROHI	0	0	0	0	0
SWAIMADHOPUR	0	0	0	0	0
TONK	0	0	0	0	0
UDAIPUR	0	0	0	0	0
Total	9	0	1	10	5

(f) Madhya Pradesh

District	15 Sep-30 Sep										
	2020	2021	2022	2023	2024	PANNA	0	0	0	0	0
ALIRAJPUR	0	0	0	0	0	RAISEN	0	0	0	0	0
ANUPPUR	0	0	0	0	0	RAJGARH	0	0	0	1	0
ASHOKNAGAR	3	0	0	1	0	RATLAM	0	0	0	0	0
BALAGHAT	0	0	0	0	0	REWA	0	0	0	0	0
BARWANI	0	0	0	0	0	SAGAR	2	2	0	2	0
BETUL	0	0	0	0	0	SATNA	0	0	0	0	0
BHIND	0	0	0	0	0	SEHORE	0	0	0	1	0
BHOPAL	0	0	0	0	0	SEONI	0	0	0	0	0
BURHANPUR	0	0	0	0	0	SHAHDOL	0	0	0	0	0
CHHATARPUR	0	0	0	1	0	SHAJAPUR	0	0	0	1	0
CHHINDWARA	0	0	0	0	0	SHEOPUR	0	0	0	0	0
DAMOH	0	0	0	2	0	SHIVPURI	0	0	0	0	0
DATIA	0	0	0	0	0	SIDHI	0	0	0	0	0
DEWAS	0	0	0	1	0	SINGRAULI	0	0	0	0	2
DHAR	0	0	0	0	1	TIKAMGARH	0	0	0	0	0
DINDORI	0	0	0	0	0	UJJAIN	2	0	0	1	0
EAST NIMAR	0	0	0	0	0	UMARIA	0	0	0	0	0
GUNA	2	1	0	3	0	VIDESHA	0	1	0	4	2
GWALIOR	2	0	0	0	0	WEST NIMAR	0	0	0	0	0
HARDA	2	1	0	1	0	Total	13	5	0	21	8
HOSHANGABAD	0	0	0	1	0						
INDORE	0	0	0	1	3						
JABALPUR	0	0	0	0	0						
JHABUA	0	0	0	0	0						
KATNI	0	0	0	0	0						
MANDLA	0	0	0	0	0						
MANDSAUR	0	0	0	0	0						
MORENA	0	0	0	0	0						
NARSHIMAPURA	0	0	0	0	0						
NIMACH	0	0	0	0	0						

State-wise and date-wise number of paddy residue burning events detected in 2020 ,2021 ,2022, 2023 and 2024
(Period: 15 September-30 September)

Number of Paddy Residue Burning Events Detected

Date	Punjab					Haryana					Uttar Pradesh				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
15-Sep	5	0	14	0	11	2	0	0	1	1	1	0	0	0	0
16-Sep	0	2	0	6	0	1	0	0	1	0	0	0	0	2	0
17-Sep	5	0	1	0	5	3	0	0	0	1	0	0	0	0	1
18-Sep	17	9	7	0	2	0	0	1	0	0	0	1	0	0	0
19-Sep	30	5	18	0	0	2	0	0	1	0	0	1	0	0	0
20-Sep	67	8	10	0	13	6	0	0	2	1	2	0	0	0	0
21-Sep	54	0	56	1	21	2	0	0	2	13	1	0	0	1	2
22-Sep	34	0	30	0	11	1	0	0	2	18	1	0	0	0	0
23-Sep	49	0	3	1	6	0	0	0	3	12	1	0	0	0	0
24-Sep	78	5	0	0	12	0	0	0	0	6	1	1	0	1	0
25-Sep	184	11	0	0	12	11	0	0	1	18	5	0	0	1	0
26-Sep	190	19	0	3	5	5	0	0	2	5	8	0	0	0	0
27-Sep	78	37	0	21	0	8	0	0	9	5	4	1	0	0	3
28-Sep	55	28	0	33	0	6	1	0	8	0	1	6	0	4	0
29-Sep	63	64	0	68	21	9	4	0	17	0	6	10	0	6	0
30-Sep	116	27	8	81	10	22	2	0	26	1	13	13	10	18	0
Total	1025	215	147	214	129	78	7	1	75	81	44	33	10	33	6

Number of Paddy Residue Burning Events Detected

Date	Delhi					Rajasthan					Madhya Pradesh				
	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024	2020	2021	2022	2023	2024
15-Sep	0	0	0	0	0	1	0	0	0	0	2	0	0	0	0
16-Sep	0	0	0	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	0	0	1
18-Sep	0	0	0	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	0	0	1	0
20-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	1	2
21-Sep	0	0	0	0	0	1	0	1	0	0	2	0	0	0	1
22-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
23-Sep	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
24-Sep	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
25-Sep	0	0	0	0	0	1	0	0	0	3	0	0	0	1	0
26-Sep	0	0	0	1	0	1	0	0	0	0	2	0	0	0	2
27-Sep	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
28-Sep	0	0	0	0	0	0	0	0	0	0	1	1	0	2	0
29-Sep	0	0	0	0	0	3	0	0	6	0	0	4	0	5	0
30-Sep	1	0	0	0	0	1	0	0	4	2	5	0	0	11	0
Total	1	0	0	1	0	9	0	1	10	5	13	5	0	21	8

Details of residue burning events in Punjab on 30-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	JANDIALA GURU	S-NPP	31.52078	75.06066	13:53:22	D	3.00
2	AMRITSAR	RAYYA	S-NPP	31.50972	75.11478	13:53:22	D	4.90
3	AMRITSAR	TARSIKKA	S-NPP	31.65027	75.11475	13:53:22	D	6.00
4	AMRITSAR	VERKA	S-NPP	31.71087	74.95802	13:53:22	D	5.40
5	JALANDHAR	LOHIAN	S-NPP	31.09870	75.18709	13:53:22	D	8.00
6	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.21298	75.13721	13:53:22	D	5.60
7	KAPURTHALA	SULTANPUR LODHI	S-NPP	31.24925	75.14561	13:53:22	D	1.70
8	LUDHIANA	LUDHIANA 1	S-NPP	30.88152	75.99693	02:43:22	N	0.60
9	MALERKOTLA	MALERKOTLA	S-NPP	30.55740	75.88467	13:53:22	D	6.50
10	SANGRUR	ANDANA	S-NPP	29.86834	76.03729	13:53:22	D	4.20

Details of residue burning events in Haryana on 30-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	KURUKSHETRA	SHAHBAD	S-NPP	30.13374	76.80829	13:53:22	D	2.10

Details of residue burning events in Rajasthan on 30-Sep-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	HANUMANGARH	TIBI	S-NPP	29.60347	74.45123	13:53:22	D	11.60
2	HANUMANGARH	TIBI	S-NPP	29.60736	74.45065	13:53:22	D	11.60

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**

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)

The DASHBOARD for paddy residue burning events is available at weblink: [CREAMS Fire Dashboard](#)
