

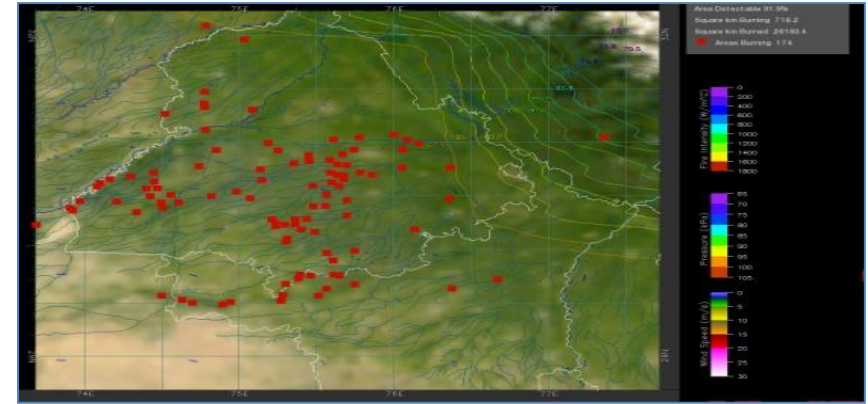
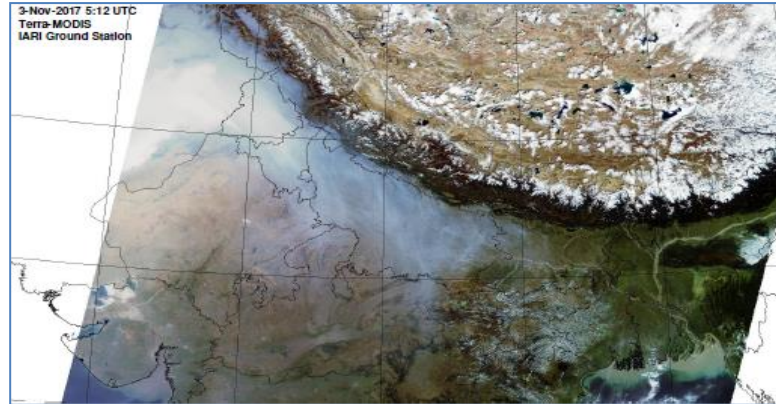


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2024

Bulletin
No. 20

Events Date:
04-Oct-2024

Issued on:
04-Oct-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

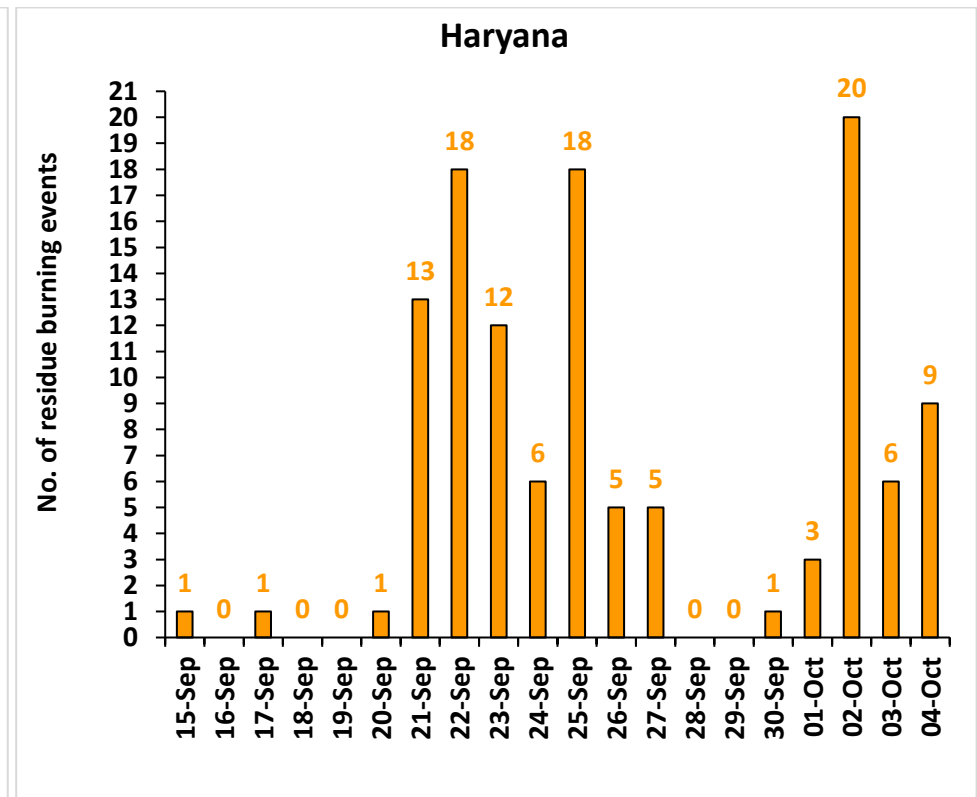
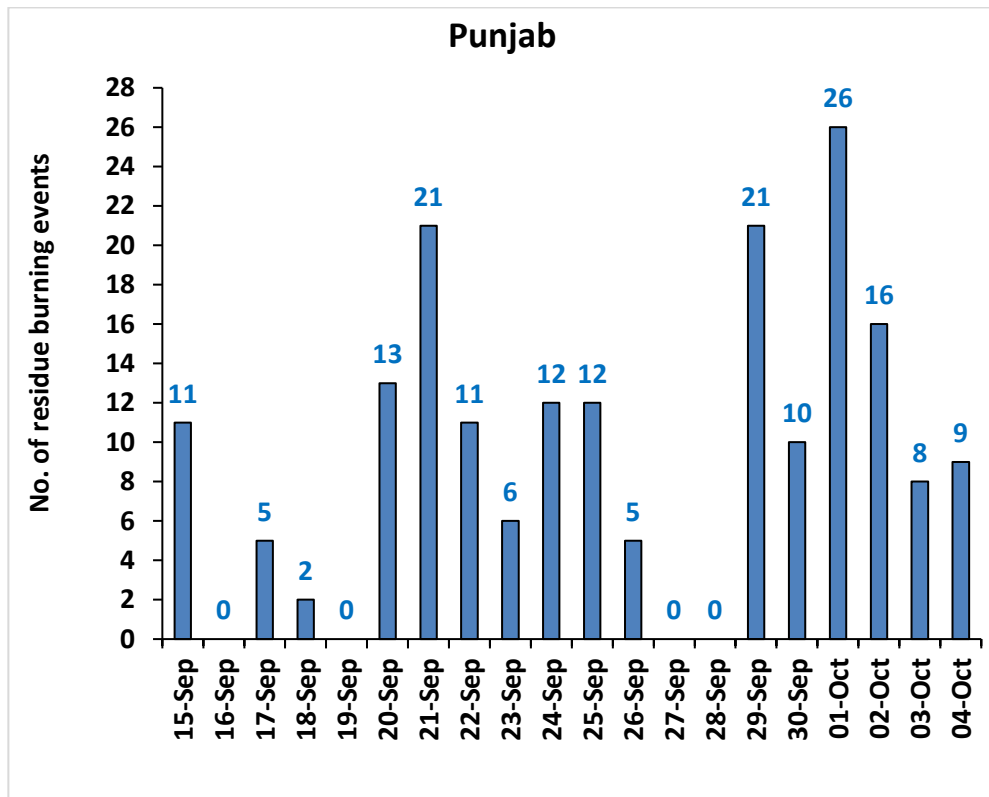
<https://creams.iari.res.in>



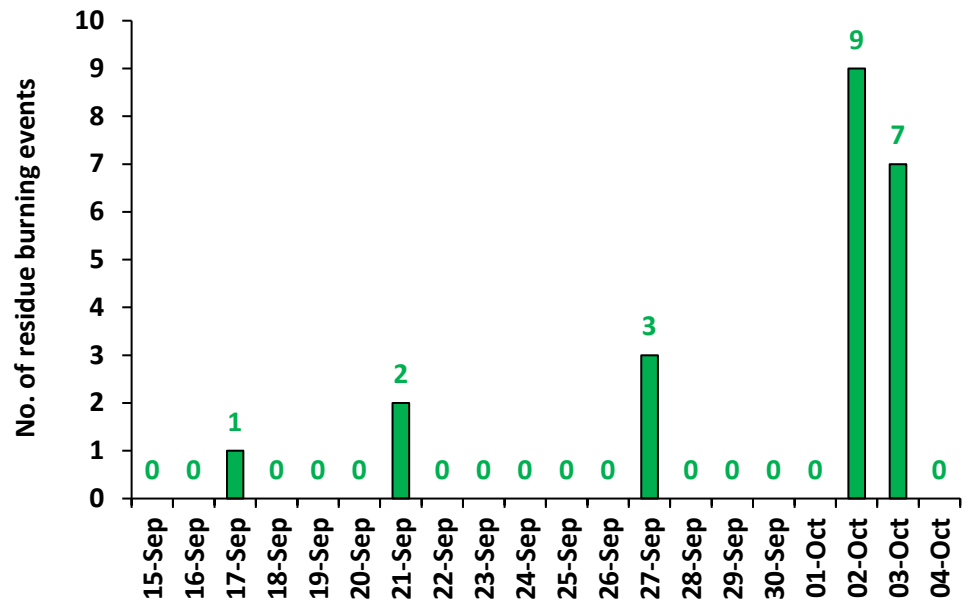
Highlights for 04-Oct-2024

- 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 **18** residue burning events in the six study States on **04-Oct-2024**.
- The state wise events detected on **04-Oct-2024** were **09** in Punjab, **09** in Haryana, **00** in UP, **00** in Delhi, **00** in Rajasthan and **00** in MP.
- Total **351** burning events were detected in the six states between **15-Sept-2024** and **04-Oct-2024**, which are distributed as **188**, **119**, **22**, **00**, **09** and **13** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.

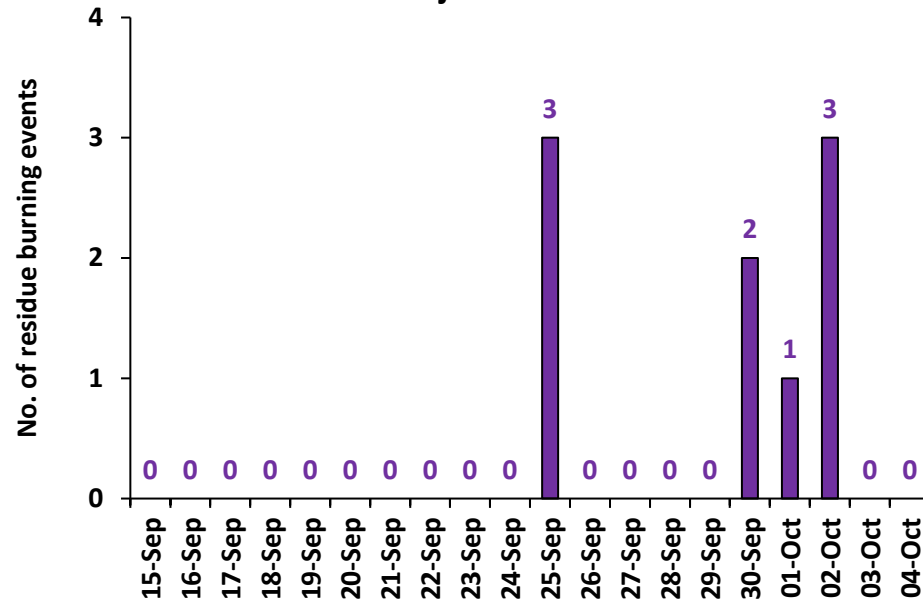
Temporal distribution of rice residue burning events for the study States in 2024



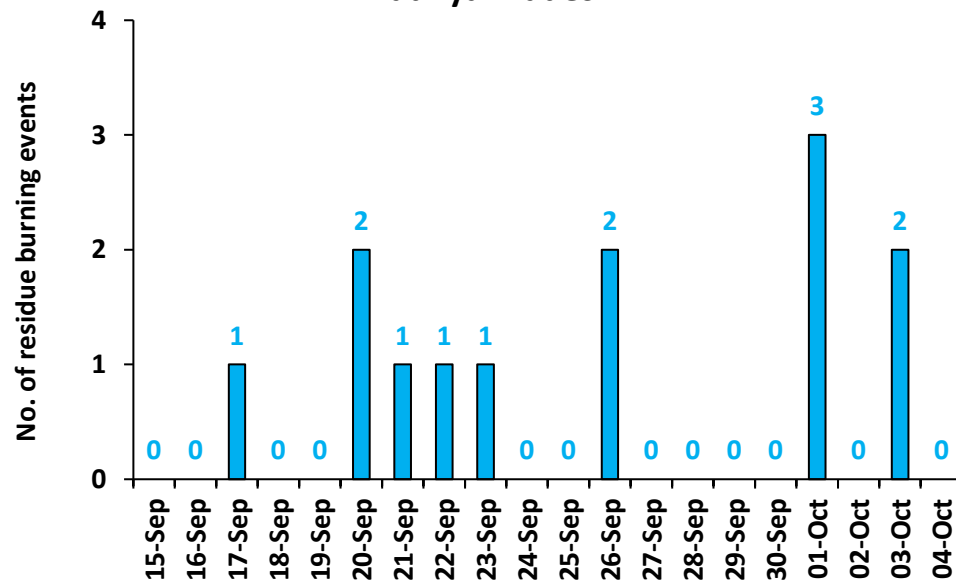
Uttar Pradesh



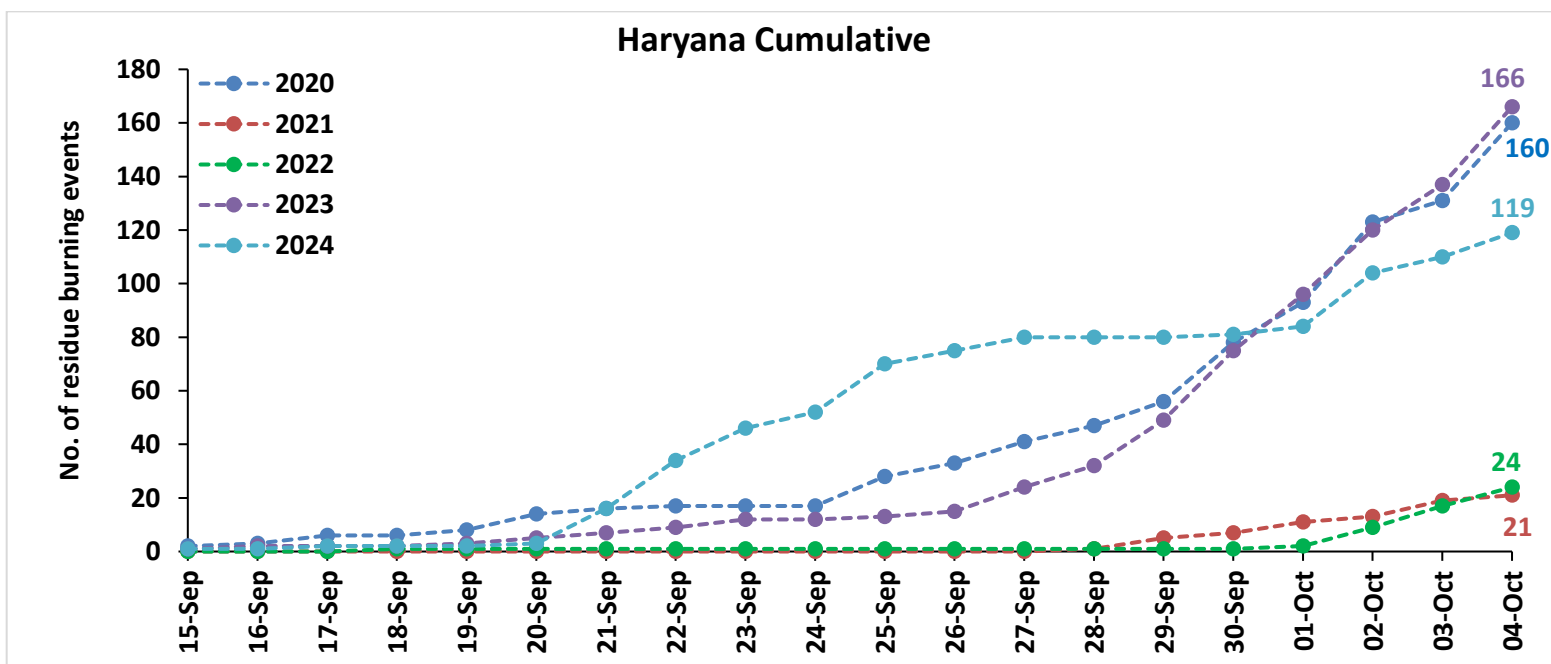
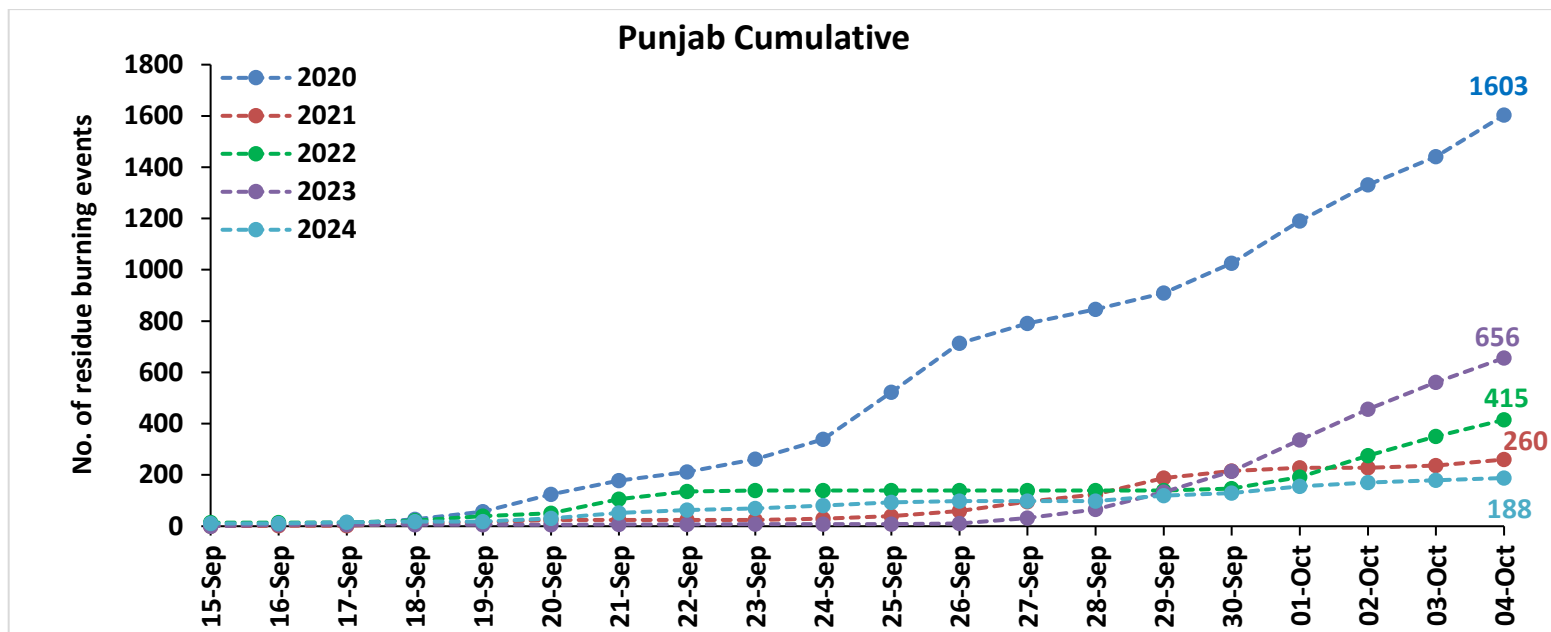
Rajasthan

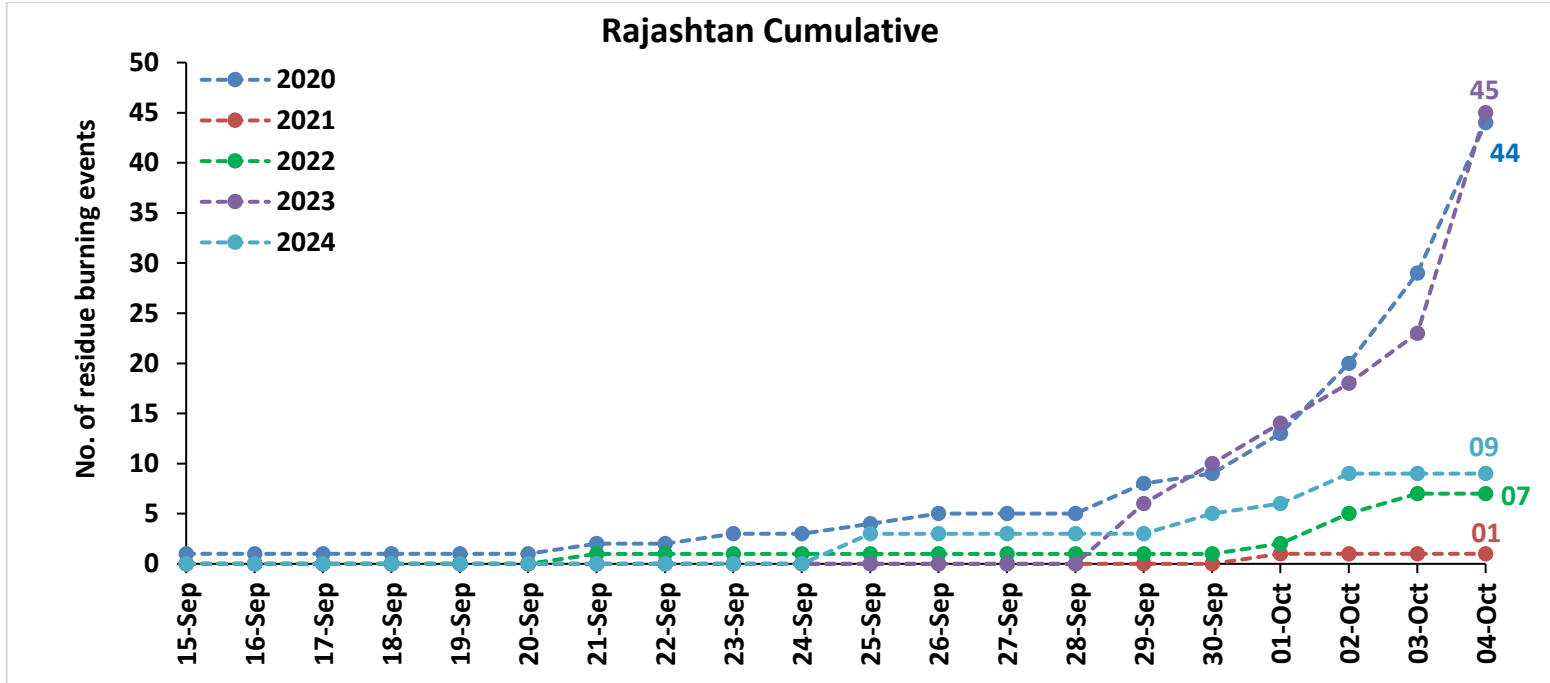
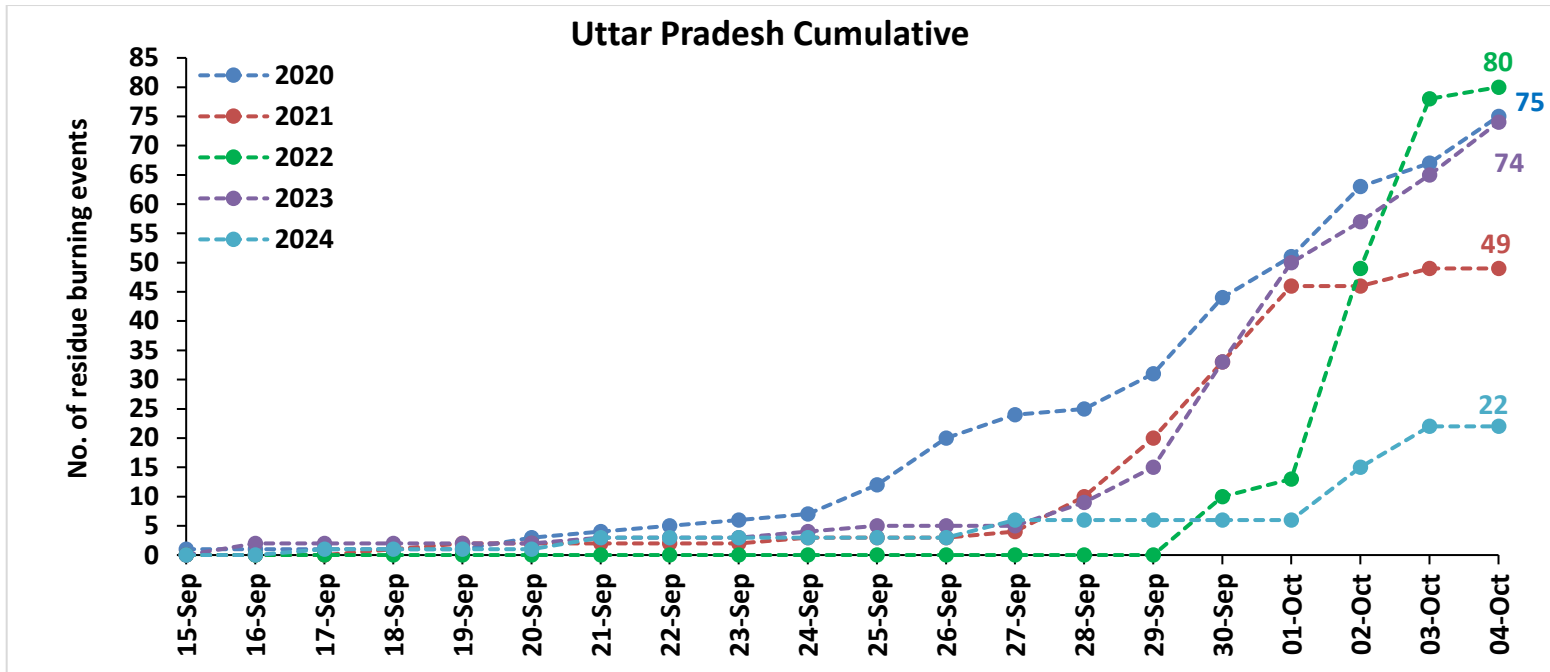


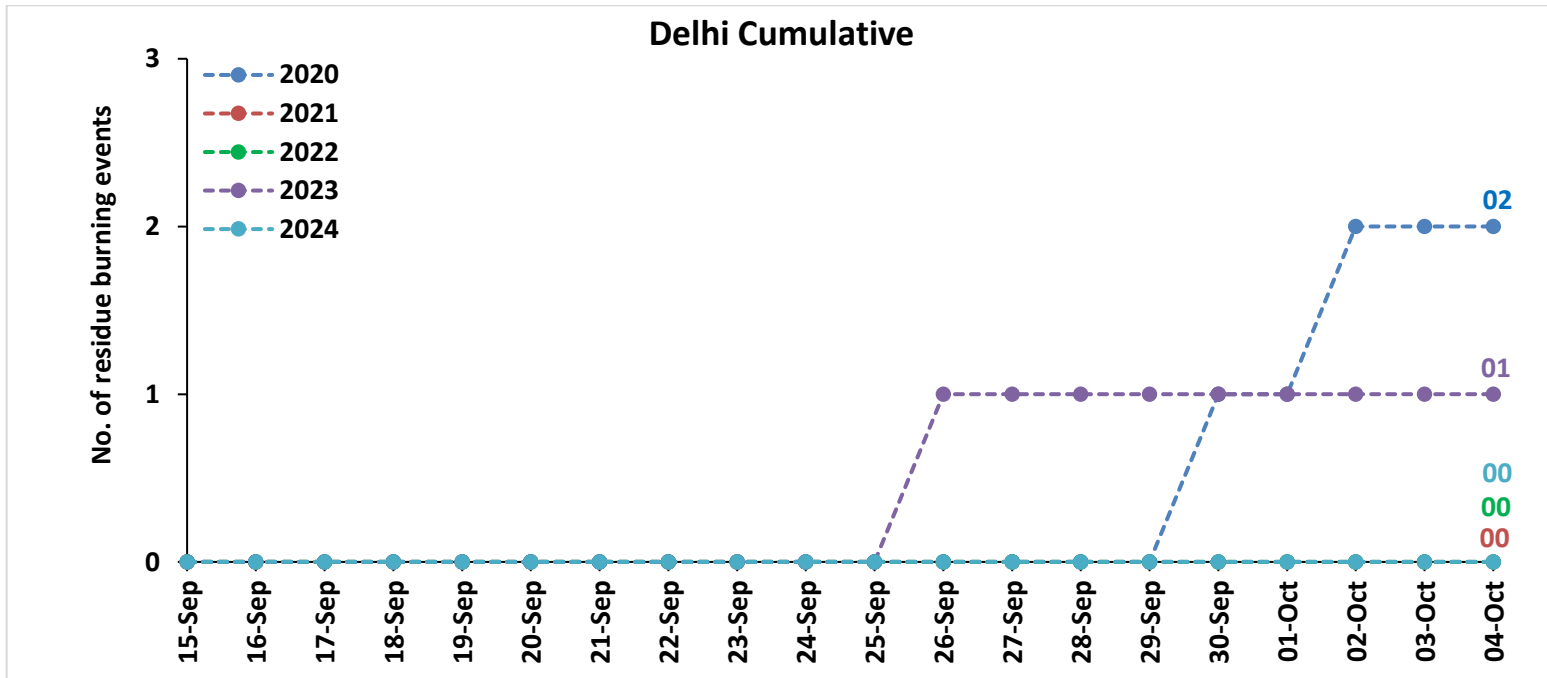
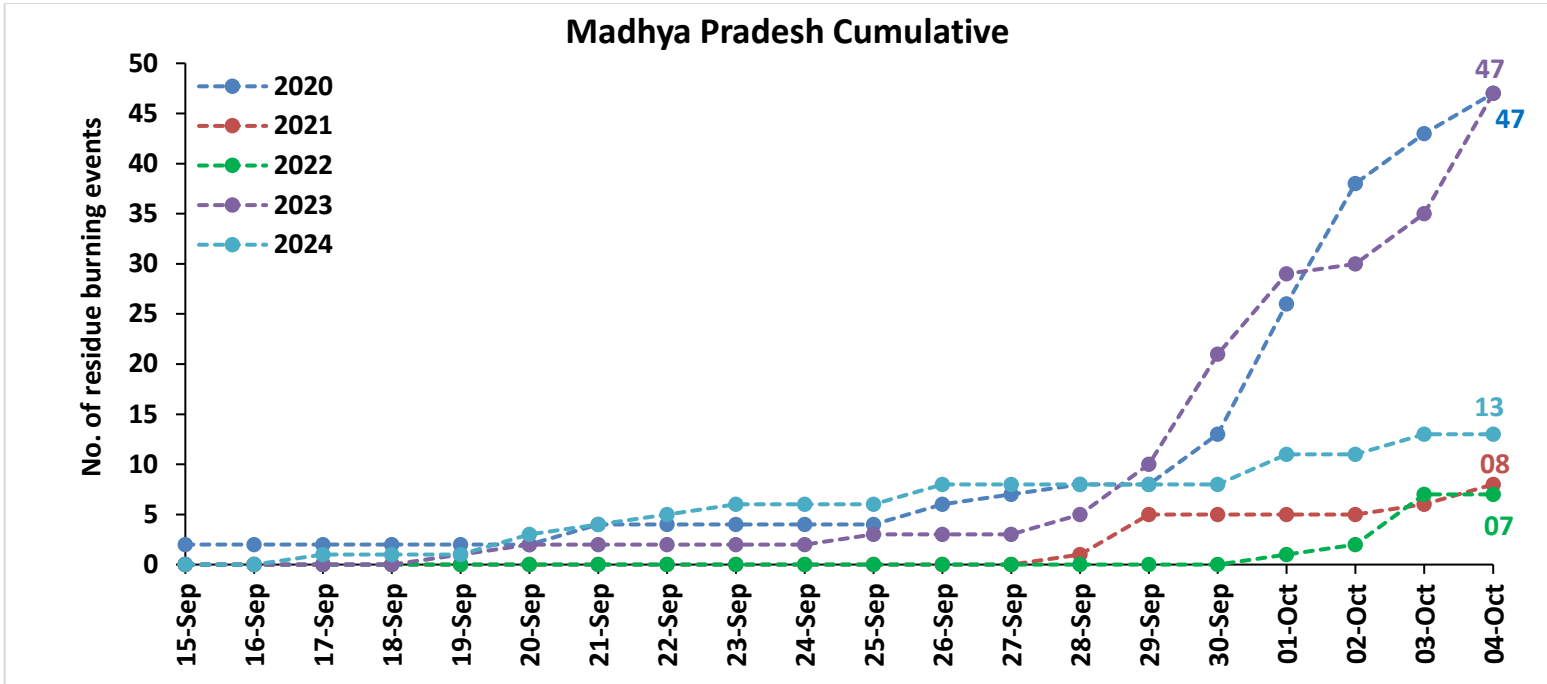
Madhya Pradesh



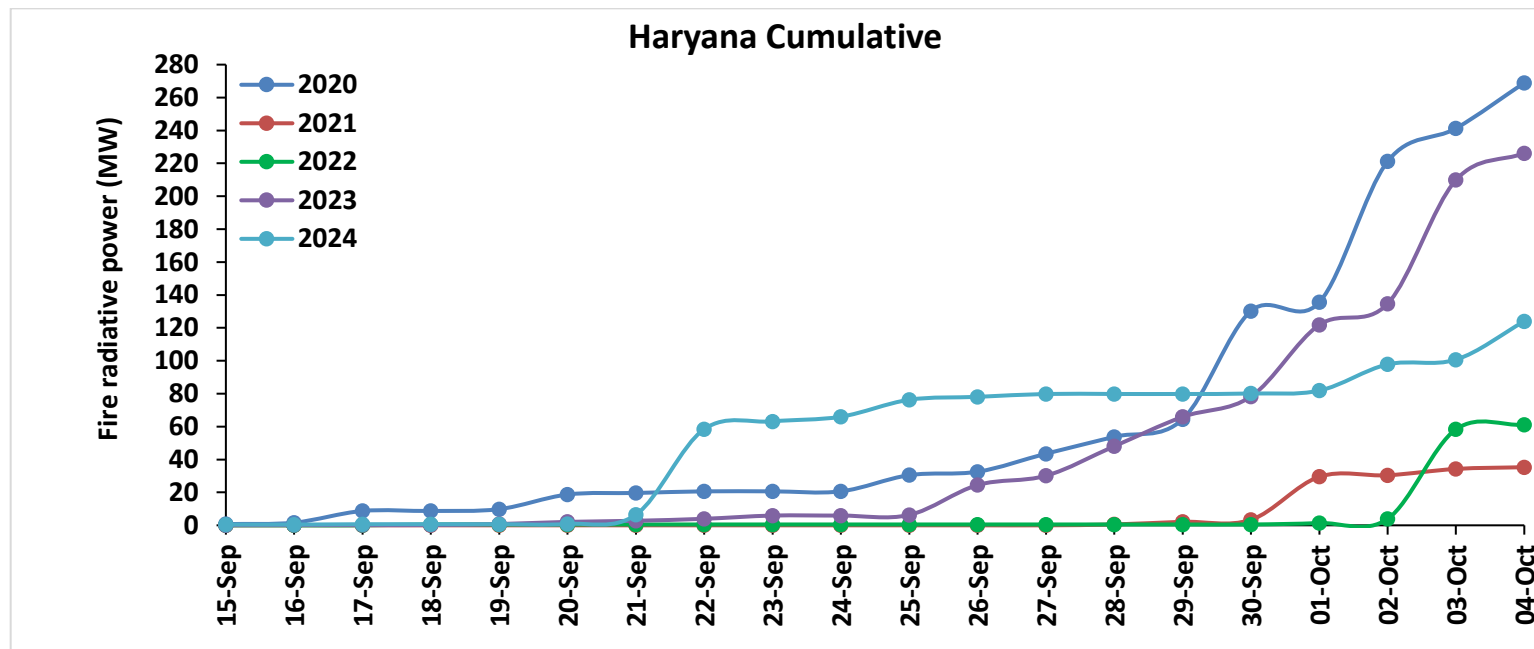
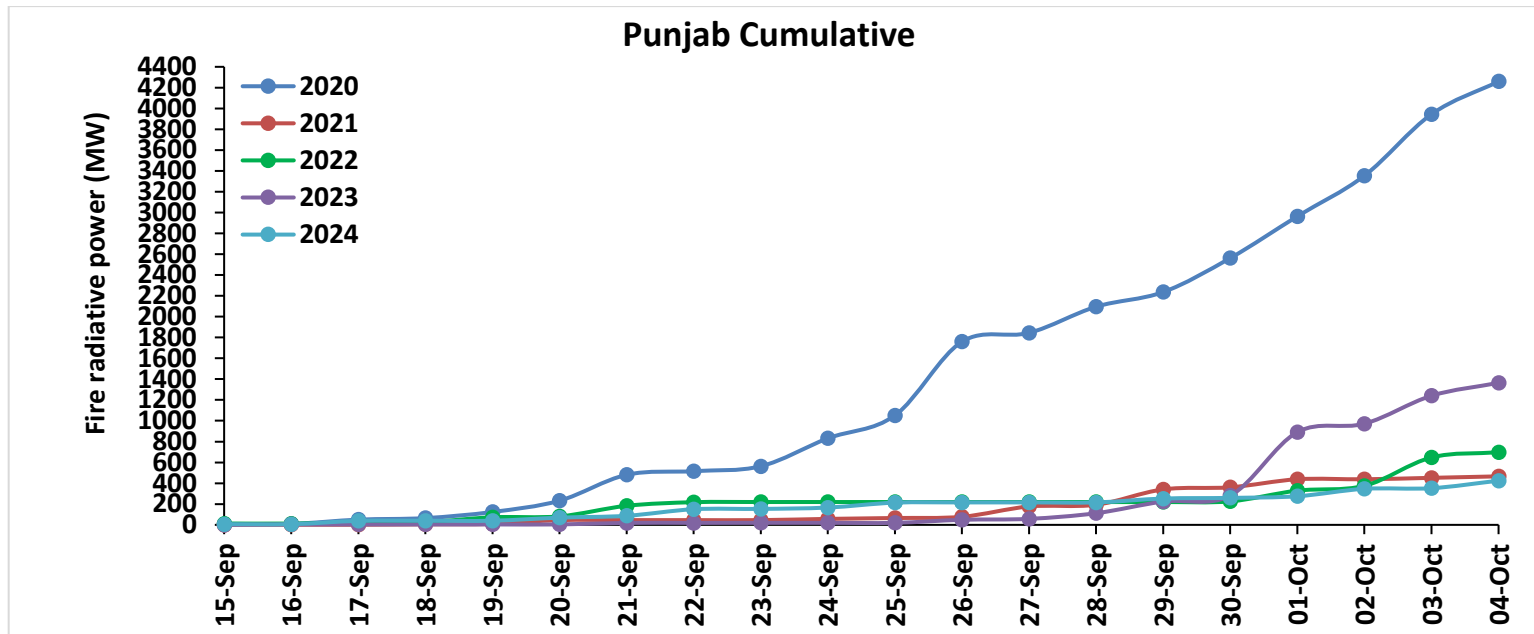
Comparison of residue burning events in current year (2024) with previous years (2020, 2021, 2022 and 2023) for the study States

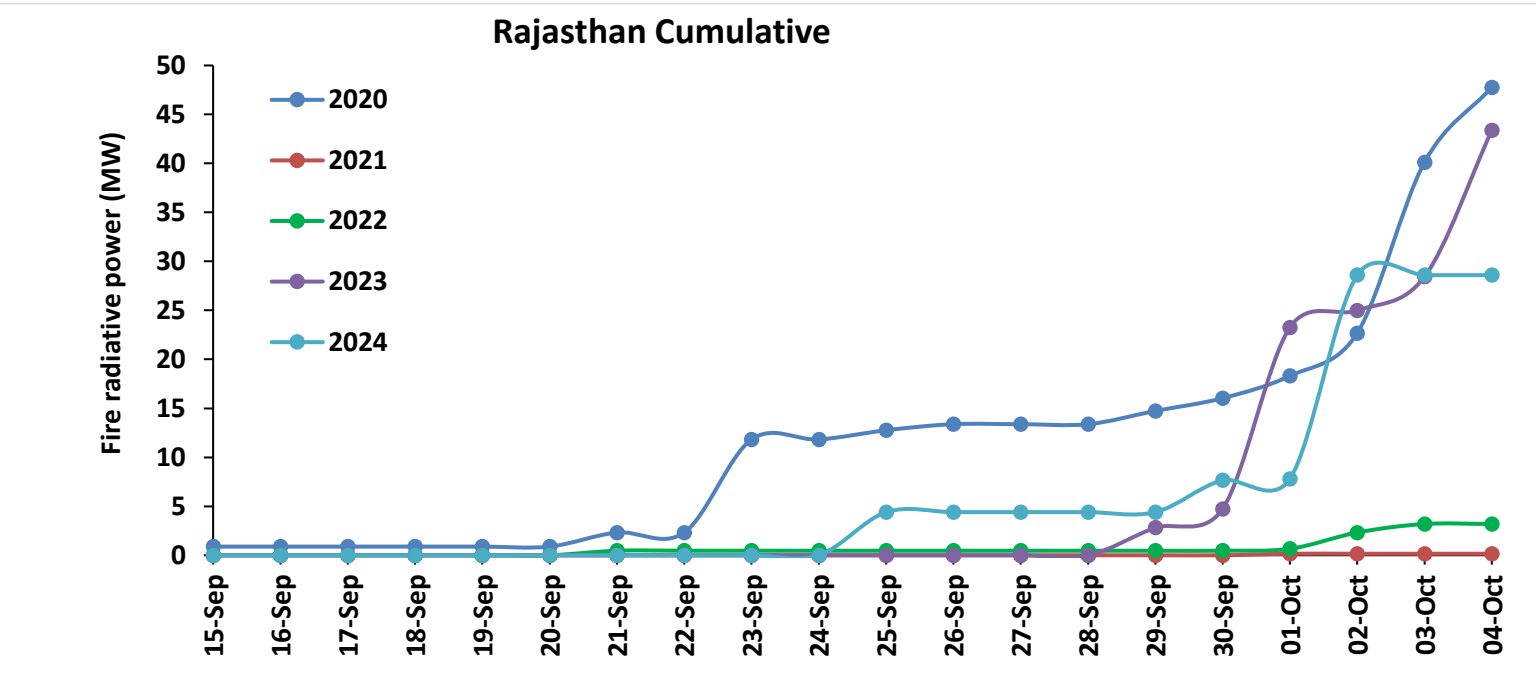
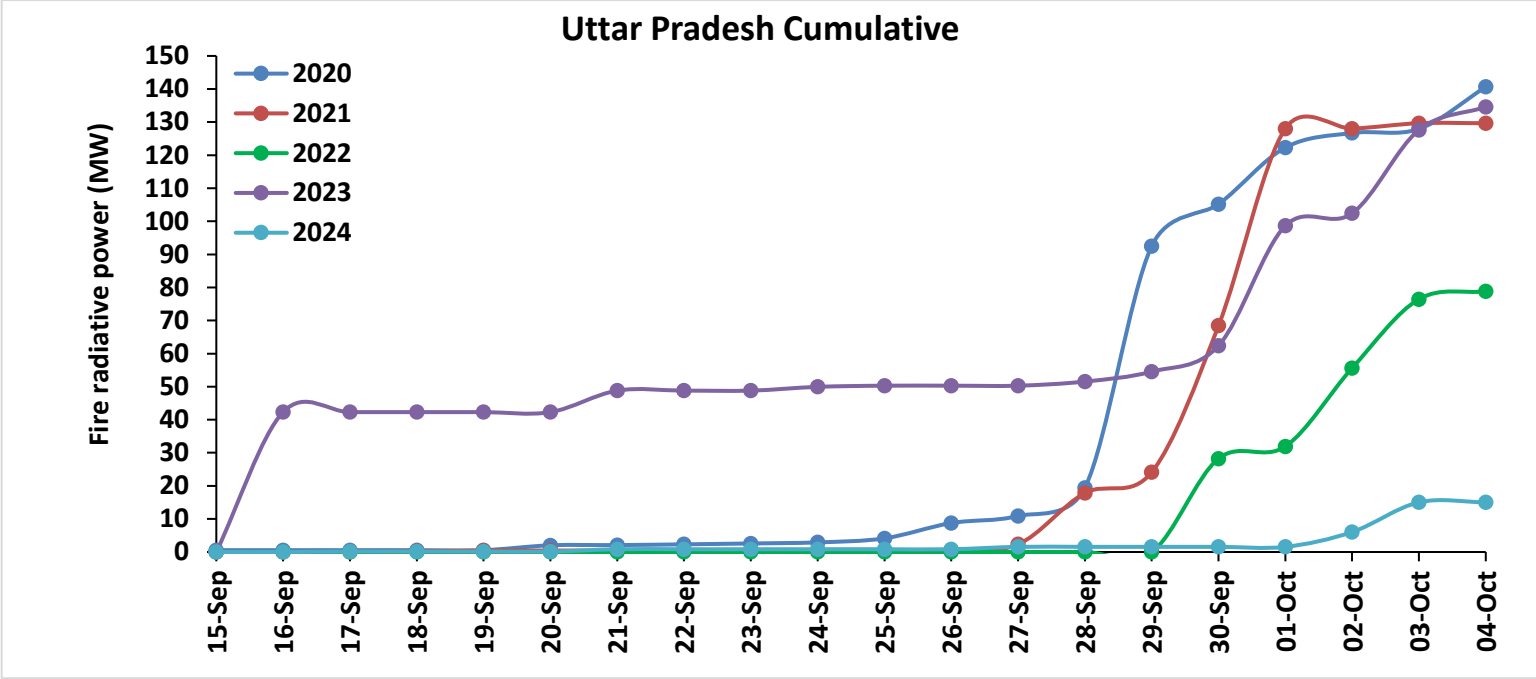


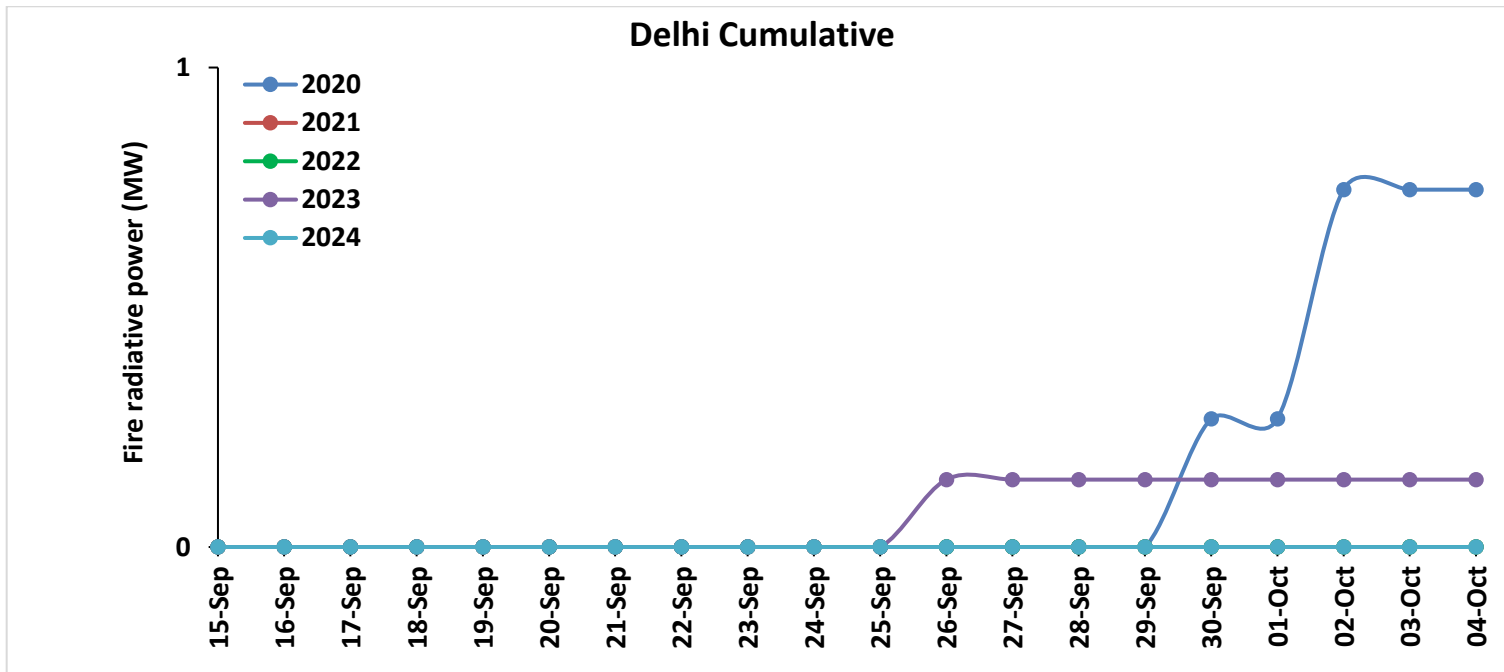
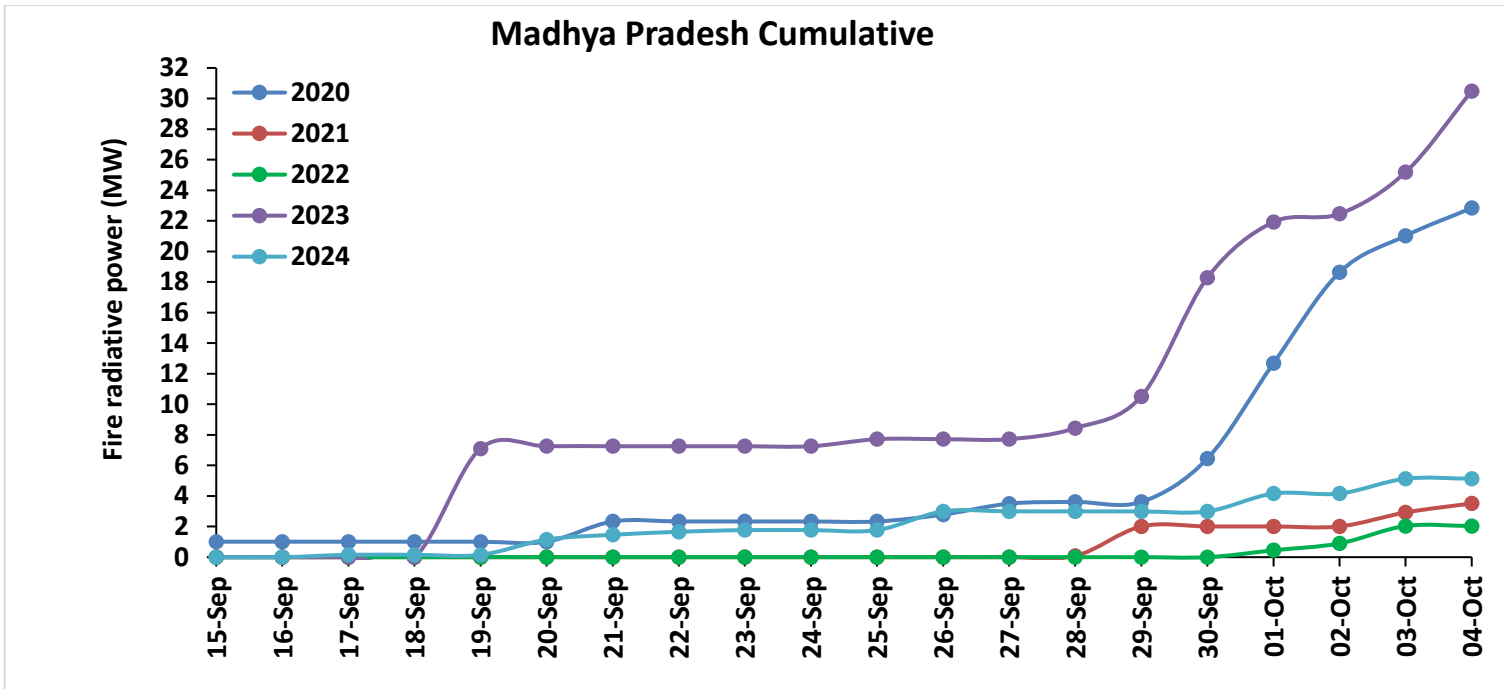




Comparison of residue burning fire power in current year (2024) with previous years (2020,2021,2022 and 2023) for the study States

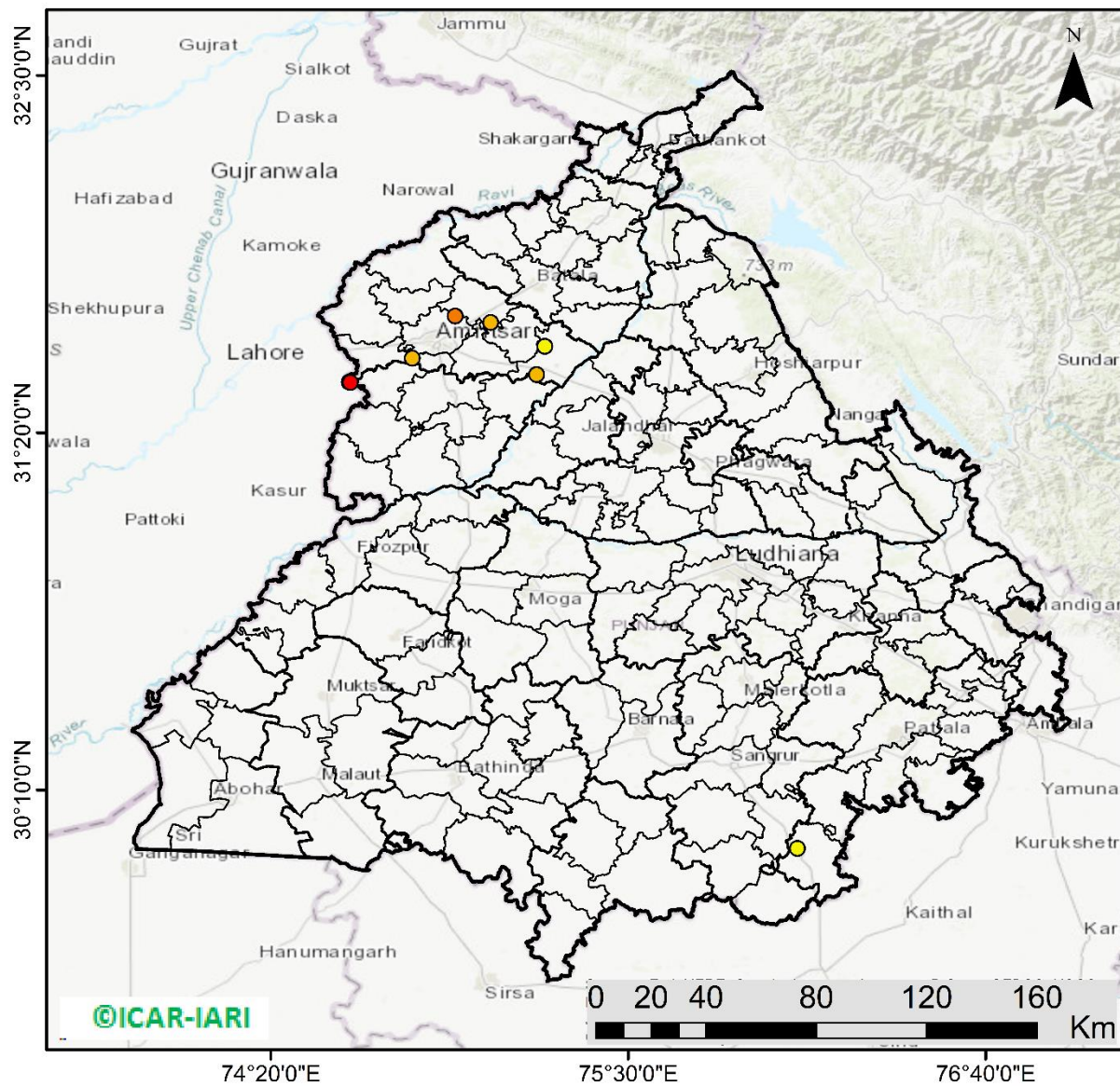






Punjab

RICE RESIDUE BURNING IN PUNJAB



09 burning events detected in Punjab during (04th Oct 2024)

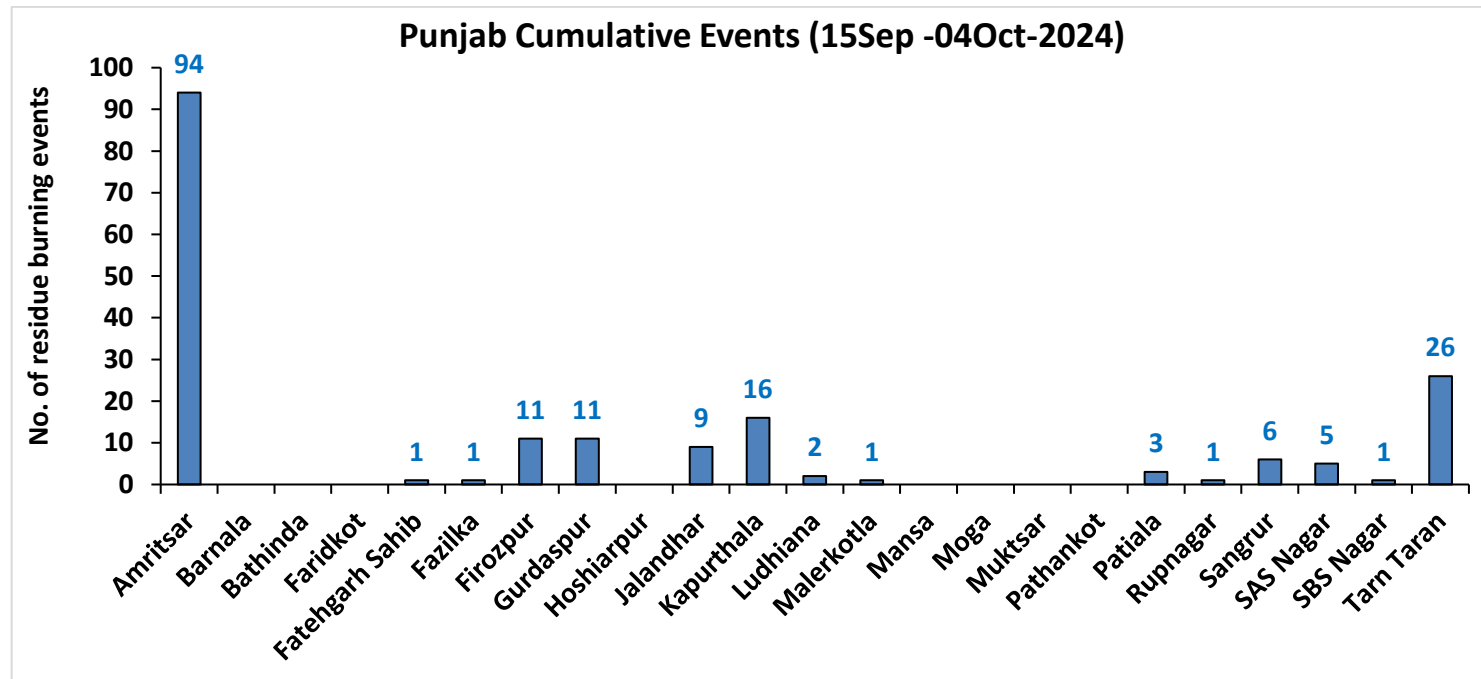
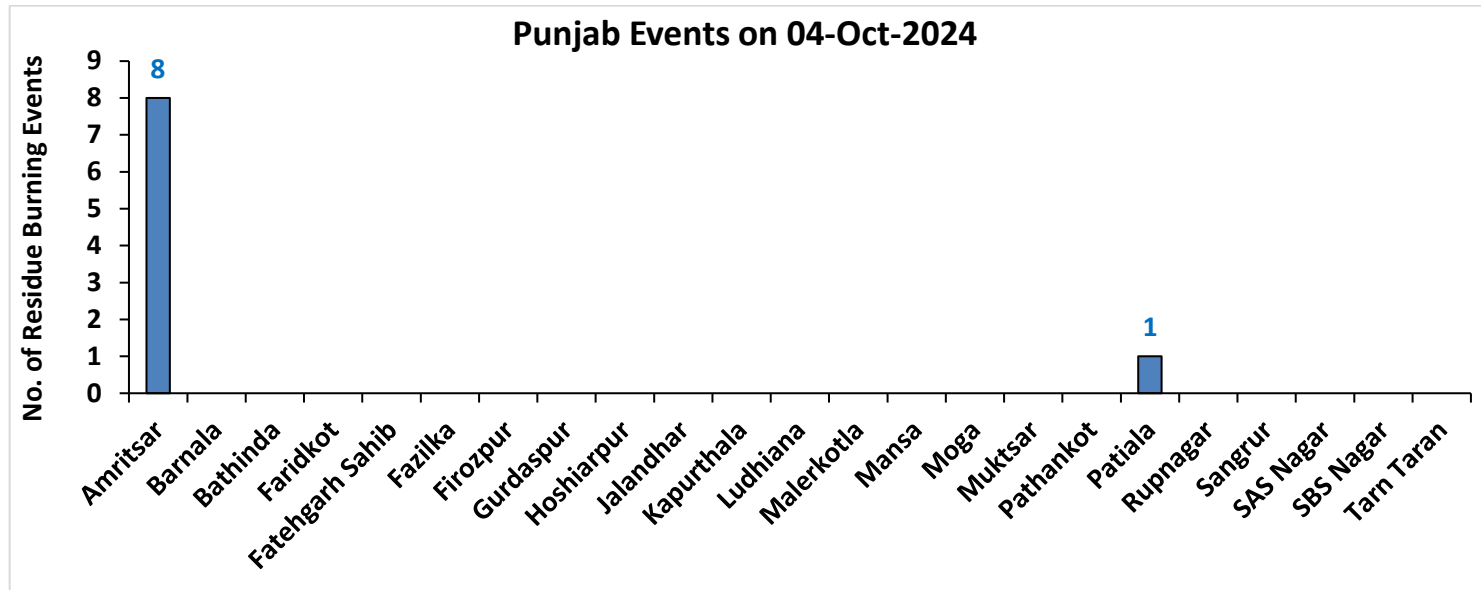
Fire Intensity (W/m²)

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



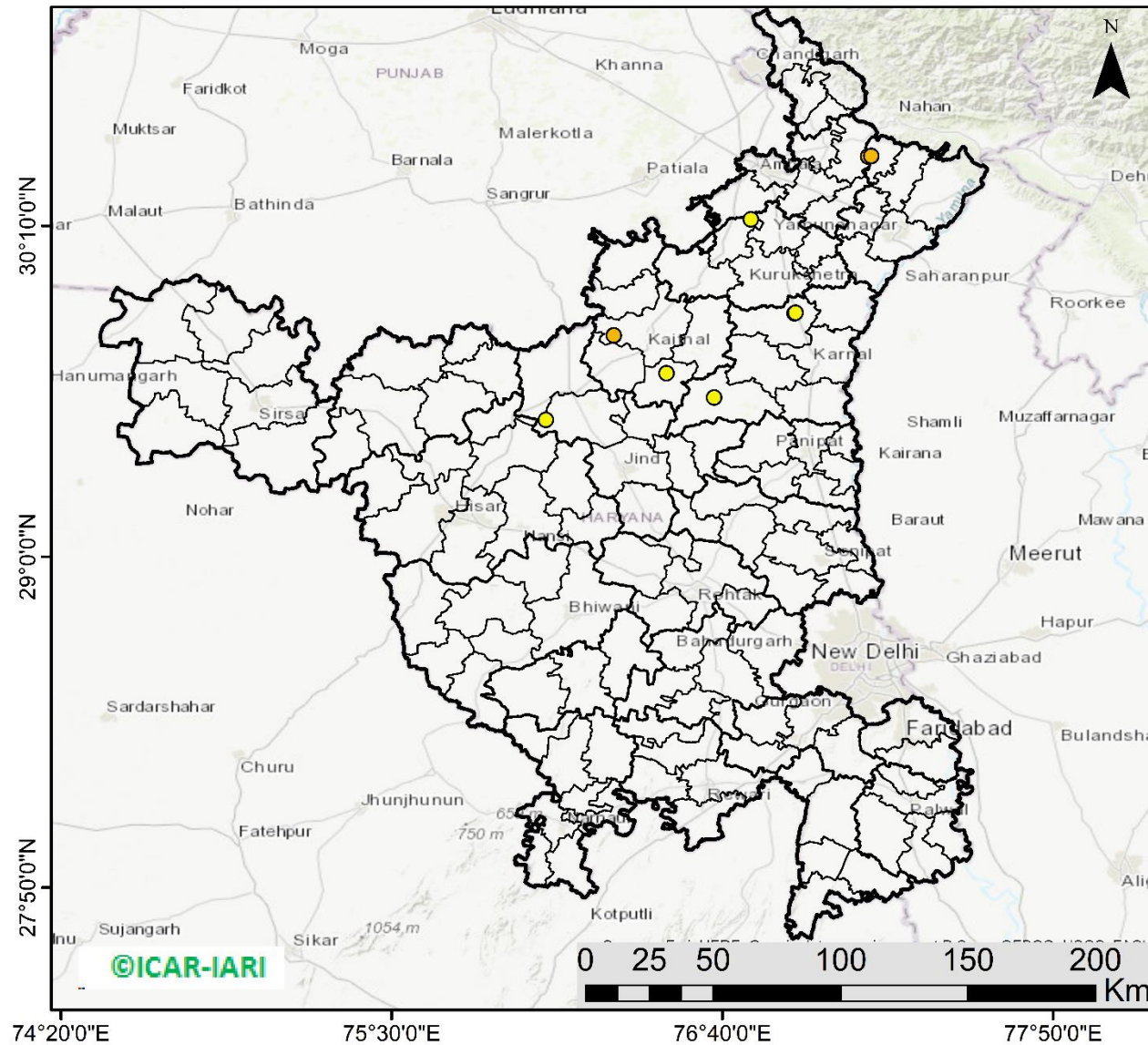
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep-04Oct-2024)



Haryana

RICE RESIDUE BURNING IN HARYANA



09 burning events
detected in Haryana on
(04th Oct 2024)

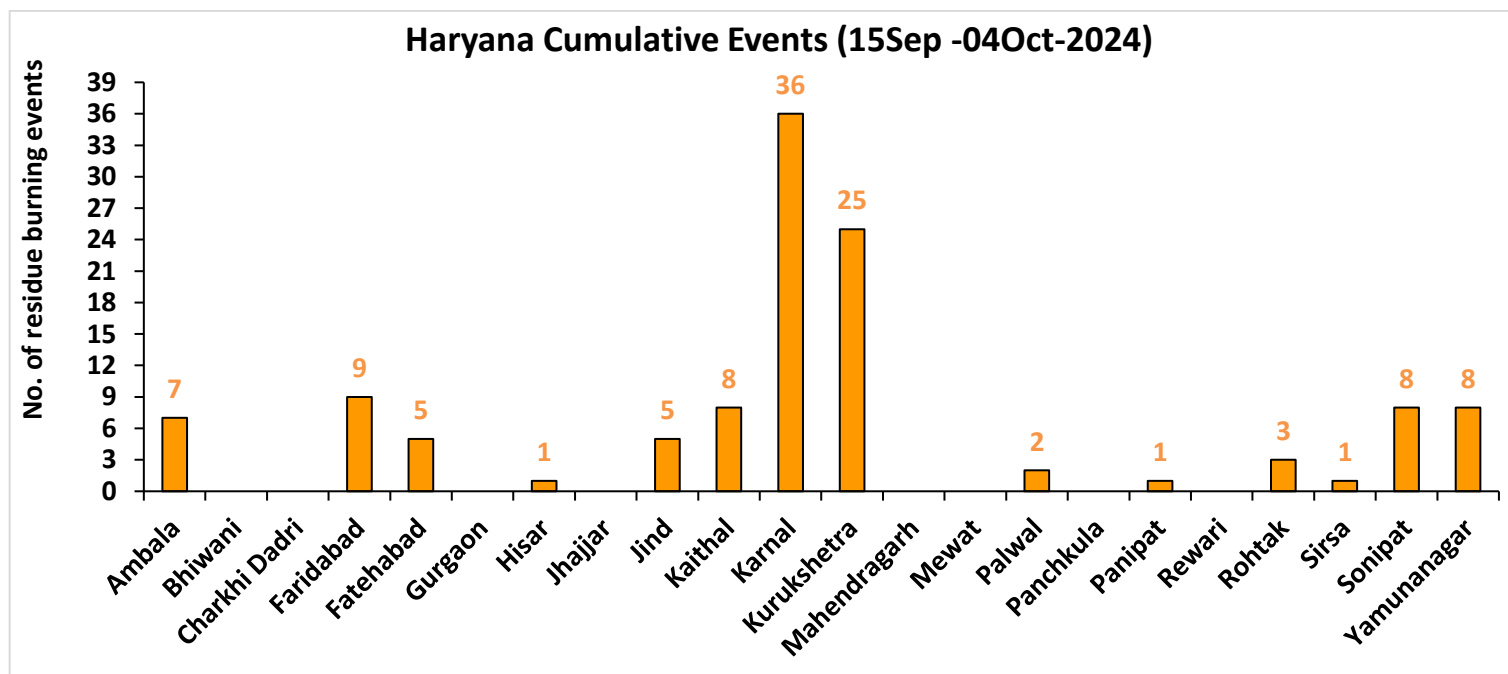
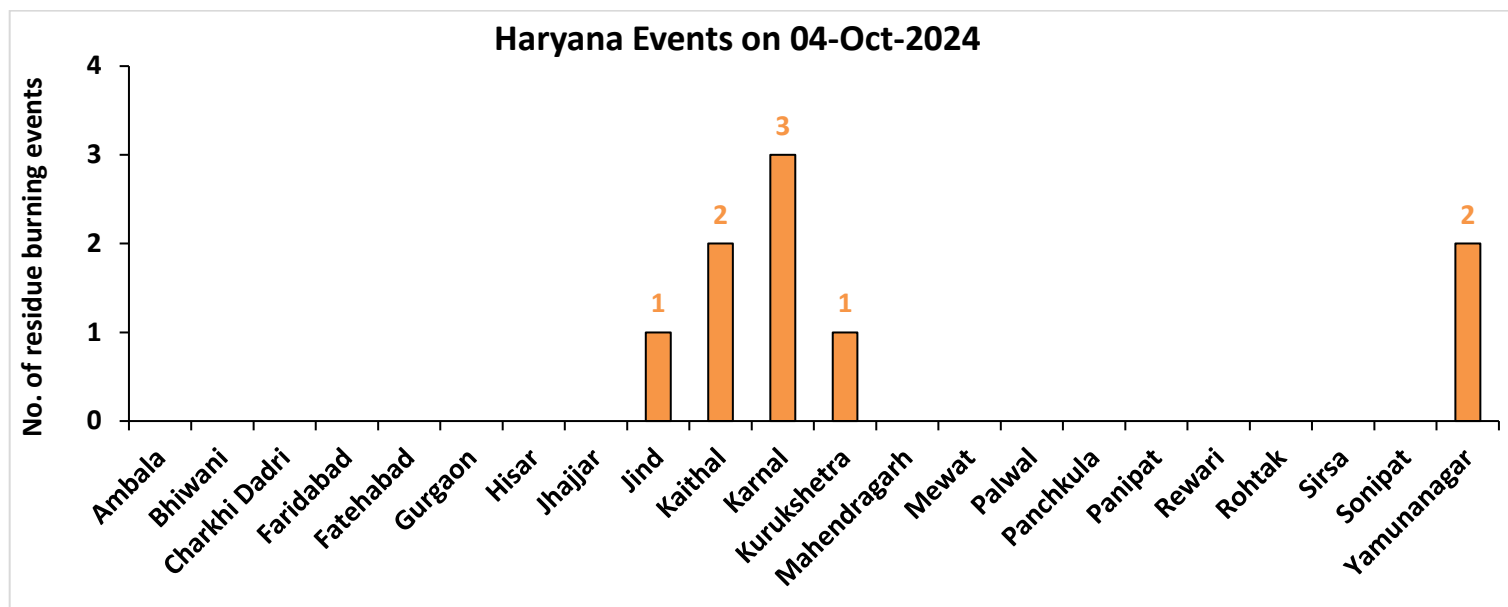
Fire Intensity (W/m²)

- 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-04Oct-2024)



District-wise cumulative number of residues burning events detected in 2020, 2021, 2022, 2023 and 2024
(Period: 15 September-04 October)

(a) Punjab

District	15 Sep-04 Oct				
	2020	2021	2022	2023	2024
Amritsar	1015	161	320	429	94
Barnala	2	0	0	5	0
Bathinda	0	0	0	0	0
Faridkot	3	9	2	3	0
Fatehgarh Sahib	15	1	1	4	1
Fazilka	0	1	0	1	1
Firozpur	22	5	6	9	11
Gurdaspur	54	4	6	6	11
Hoshiarpur	3	0	0	2	0
Jalandhar	13	6	7	9	9
Kapurthala	22	2	6	39	16
Ludhiana	34	19	1	6	2
Malerkotla	0	0	0	0	1
Mansa	2	0	0	1	0
Moga	9	0	0	0	0
Muktsar	1	1	1	0	0
Pathankot	0	0	0	0	0
Patiala	63	11	8	29	3
Rupnagar	1	1	0	0	1
Sangrur	17	4	0	6	6
SAS NAGAR (Mohali)	8	0	2	17	5
SBS Nagar	2	1	1	2	1
Tarn Taran	317	34	54	88	26
Total	1603	260	415	656	188

(b) Haryana

District	15 Sep-04 Oct				
	2020	2021	2022	2023	2024
AMBALA	22	0	5	34	7
BHIWANI	0	0	0	0	0
CHARKHI DADRI	0	0	0	0	0
FARIDABAD	0	0	0	0	9
FATEHABAD	15	1	1	10	5
GURGAON	0	0	0	0	0
HISAR	3	0	0	3	1
JHAJJAR	0	0	0	1	0
JIND	2	0	1	9	5
KAITHAL	21	2	1	7	8
KARNAL	46	4	7	14	36
KURUKSHETRA	31	12	8	36	25
MAHENDRAGARH	0	0	0	0	0
MEWAT	0	0	0	0	0
PALWAL	1	0	0	5	2
PANCHKULA	0	0	0	0	0
PANIPAT	6	0	0	4	1
REWARI	0	0	0	0	0
ROHTAK	0	0	0	1	3
SIRSA	1	0	0	0	1
SONIPAT	2	1	0	20	8
YAMUNANAGAR	10	1	1	22	8
Total	160	21	24	166	119

(c) Uttar Pradesh

District	15 Sep-04 Oct																
	2020	2021	2022	2023	2024	GAUTAMBUDHNAGAR	1	0	0	2	3	MUZAFARNAGAR	2	0	0	0	0
AGRA	0	0	0	0	0	GAZIPUR	0	0	0	0	0	PILHIBHIT	3	1	2	5	0
ALIGARH	4	0	1	26	4	GHAZIABAD	1	0	1	4	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	2	3	0	0	0
AMETHI	0	0	0	0	0	HAMIRPUR	0	0	0	0	0	SAMBHAL	5	0	4	3	1
AMROHA	0	0	0	2	0	HAPUR	2	0	0	0	0	SANTKABIRNAGAR	0	0	0	0	0
AURAIYA	11	0	4	2	1	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	5	37	53	10	2
BADAUN	0	0	0	0	0	JALAUN	0	0	0	0	0	SHAMLI	7	2	2	1	1
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	1	0	0	0	0
BANDA	0	0	0	0	0	KANPUR DEHAT	1	0	0	0	0	SONBHADRA	0	0	0	0	0
BARABANKI	1	0	0	0	0	KASGANJ	0	0	0	0	0	SULTANPUR	0	0	0	0	0
BAREILLY	2	0	0	0	0	KAUSHAMBI	1	0	0	1	0	UNNAO	2	0	0	0	0
BASTI	0	0	0	0	0	KHERI	2	3	8	0	0	VARANASI	0	0	0	0	0
BIJNOR	1	0	1	0	1	KUSHINAGAR	0	0	0	0	0	Total	75	49	80	74	22
BULANDSAHAR	1	0	2	1	3	LALITPUR	0	1	2	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	2	0	0	0	0	MAINPURI	0	0	0	1	0						
ETAWAH	0	0	0	0	0	MATHURA	2	1	0	9	0						
FAIZABAD	0	0	0	0	4	MAU	0	0	0	0	0						
FARRUKHABAD	0	0	0	0	0	MEERUT	6	0	0	2	0						
FATEHPUR	1	0	0	0	0	MIRZAPUR	0	0	0	0	0						
FIROZABAD	0	0	0	0	0	MORADABAD	1	0	0	0	0						

(d) Delhi

District	15 Sep-04 Oct				
	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	1	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	2	0	0	1	0

(e) Rajasthan

District	15 Sep-04 Oct				
	2020	2021	2022	2023	2024
AJMER	0	0	0	0	0
ALWAR	1	0	0	0	0
BANSWARA	0	0	0	0	0
BARAN	20	0	3	14	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	1	0	2	2	0
CHITTAURGARH	0	1	0	1	1
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	4	0
HANUMANGARH	8	0	1	5	8
JAIPUR	0	0	0	0	0
JAISELMER	1	0	0	0	0
JALOR	0	0	0	0	0
JHALAWAR	0	0	0	3	0
JHUNJHUNUN	1	0	0	0	0
JODHPUR	1	0	0	0	0
KARALI	1	0	0	0	0
KOTA	4	0	1	15	0
NAGAU	0	0	0	0	0
PALI	1	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	1	0	0	0	0
UDAIPUR	0	0	0	0	0
Total	44	1	7	45	9

(f) Madhya Pradesh

District	15 Sep-04 Oct										
	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	1	0	2	1	0
ASHOKNAGAR	5	0	0	1	1	RATLAM	0	0	0	1	0
BALAGHAT	0	0	0	0	0	REWA	0	0	0	0	0
BARWANI	0	0	0	0	0	SAGAR	2	2	1	2	1
BETUL	0	0	0	0	0	SATNA	1	0	0	0	0
BHIND	0	0	0	0	0	SEHORE	1	0	1	1	0
BHOPAL	1	0	0	2	0	SEONI	0	0	0	0	0
BURHANPUR	0	0	0	0	0	SHAHDOL	0	0	0	0	0
CHHATARPUR	1	0	0	1	0	SHAJAPUR	2	0	0	1	0
CHHINDWARA	0	0	0	0	0	SHEOPUR	0	0	0	1	0
DAMOH	5	0	0	3	0	SHIVPURI	0	0	0	0	0
DATIA	1	0	0	2	0	SIDHI	0	0	0	0	0
DEWAS	0	0	0	1	1	SINGRAULI	0	0	0	0	2
DHAR	4	0	0	4	1	TIKAMGARH	0	0	0	0	0
DINDORI	0	0	0	0	0	UJJAIN	3	0	0	3	0
EAST NIMAR	0	0	0	0	0	UMARIA	0	0	0	0	0
GUNA	5	1	1	6	0	VIDESHA	5	1	1	6	3
GWALIOR	3	0	1	2	0	WEST NIMAR	0	0	0	0	0
HARDA	5	4	0	2	0	Total	47	8	7	47	13
HOSHANGABAD	0	0	0	1	0						
INDORE	1	0	0	2	3						
JABALPUR	1	0	0	0	1						
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	4	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-04 October)

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
01-Oct	165	13	45	123	26	15	4	1	21	3	7	13	3	17	0
02-Oct	141	0	83	119	16	30	2	7	24	20	12	0	36	7	9
03-Oct	110	9	75	105	8	8	6	8	17	6	4	3	29	8	7
04-Oct	162	23	65	95	9	29	2	7	29	9	8	0	2	9	0
Total	1603	260	415	656	188	160	21	24	166	119	75	49	80	74	22

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
01-Oct	0	0	0	0	0	4	1	1	4	1	13	0	1	8	3
02-Oct	1	0	0	0	0	7	0	3	4	3	12	0	1	1	0
03-Oct	0	0	0	0	0	9	0	2	5	0	5	1	5	5	2
04-Oct	0	0	0	0	0	15	0	0	22	0	4	2	0	12	0
Total	2	0	0	1	0	44	1	7	45	9	47	8	7	47	13

Details of residue burning events in Punjab on 04-Oct-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	ATTARI	S-NPP	31.49788	74.59116	14:17:58	D	15.50
2	AMRITSAR	ATTARI	S-NPP	31.49831	74.58959	14:17:58	D	10.00
3	AMRITSAR	ATTARI	S-NPP	31.57656	74.79516	12:37:41	D	6.30
4	AMRITSAR	ATTARI	AQUA	31.49700	74.59300	14:09:02	D	38.20
5	AMRITSAR	MAJITHA	AQUA	31.69300	75.05100	14:09:02	D	7.10
6	AMRITSAR	RAYYA	S-NPP	31.61527	75.22795	12:37:41	D	3.30
7	AMRITSAR	RAYYA	AQUA	31.52300	75.20100	14:09:02	D	9.50
8	AMRITSAR	VERKA	AQUA	31.71400	74.93500	14:09:02	D	11.70
9	PATIALA	PATRAN	S-NPP	29.97584	76.05222	14:17:58	D	4.40

Details of residue burning events in Haryana on 04-Oct-2024

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	JIND	UCHANA	S-NPP	29.48207	76.04395	12:37:41	D	2.70
2	KAITHAL	KAITHAL	AQUA	29.78000	76.28400	14:09:02	D	7.20
3	KAITHAL	RAJOUND	S-NPP	29.64664	76.46992	12:37:41	D	2.80
4	KARNAL	ASSANDH	S-NPP	29.56090	76.63766	12:37:41	D	2.20
5	KARNAL	NILOKHERI	S-NPP	29.85817	76.92174	14:17:58	D	4.80
6	KARNAL	NILOKHERI	S-NPP	29.85999	76.92479	14:17:58	D	4.20
7	KURUKSHETRA	ISMAILABAD	S-NPP	30.18900	76.76728	14:17:58	D	3.10
8	YAMUNANAGAR	SADHAURA	AQUA	30.41100	77.18100	14:09:02	D	5.70
9	YAMUNANAGAR	SADHAURA	AQUA	30.41300	77.19200	14:09:02	D	7.60

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](#)
