

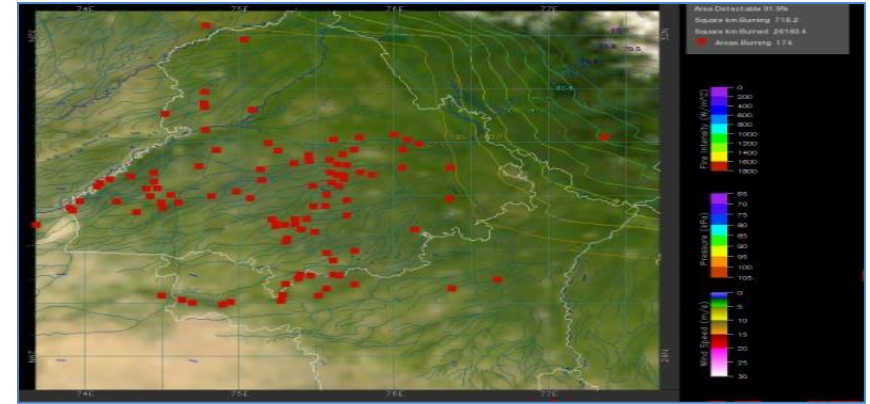
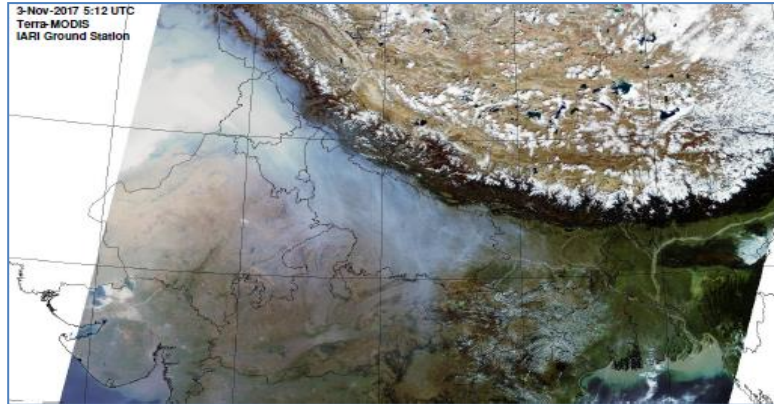


MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2023

Bulletin
No. 02

Events Date:
16-Sep-2023

Issued on:
16-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

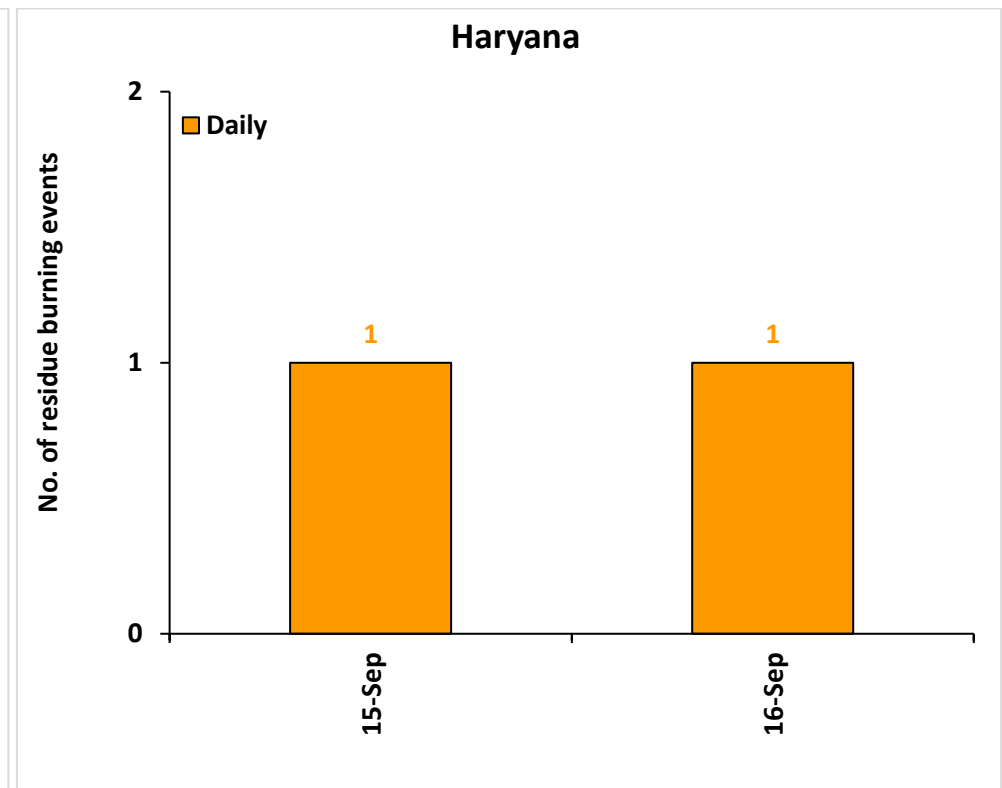
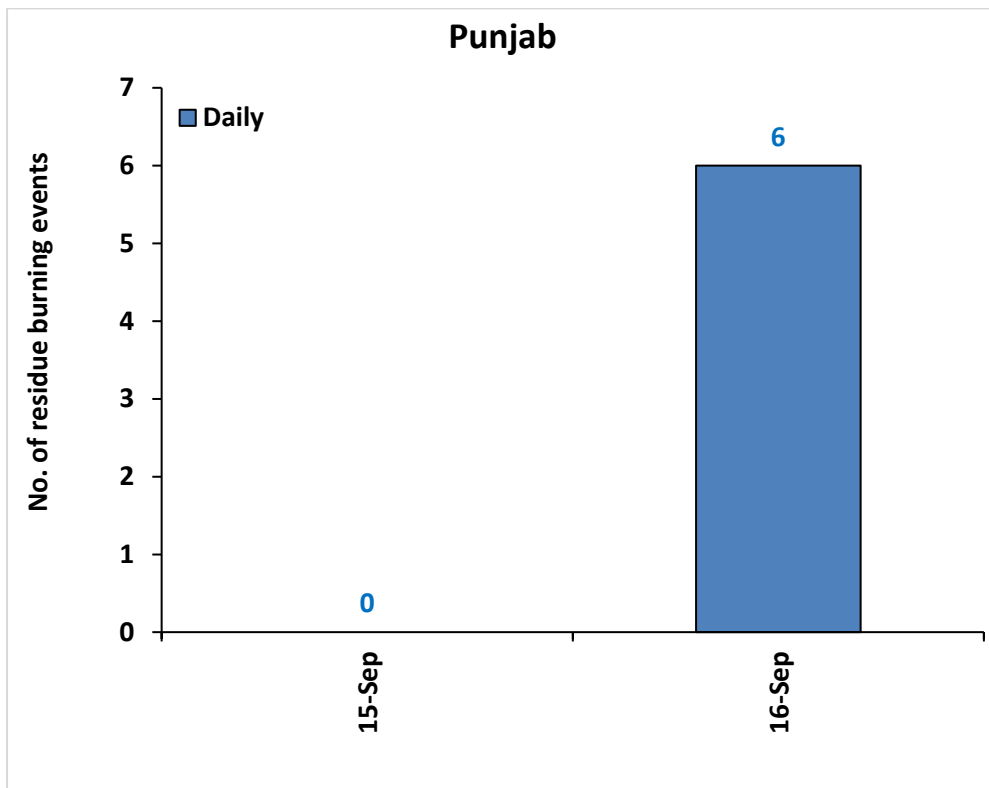
<http://creams.iari.res.in>

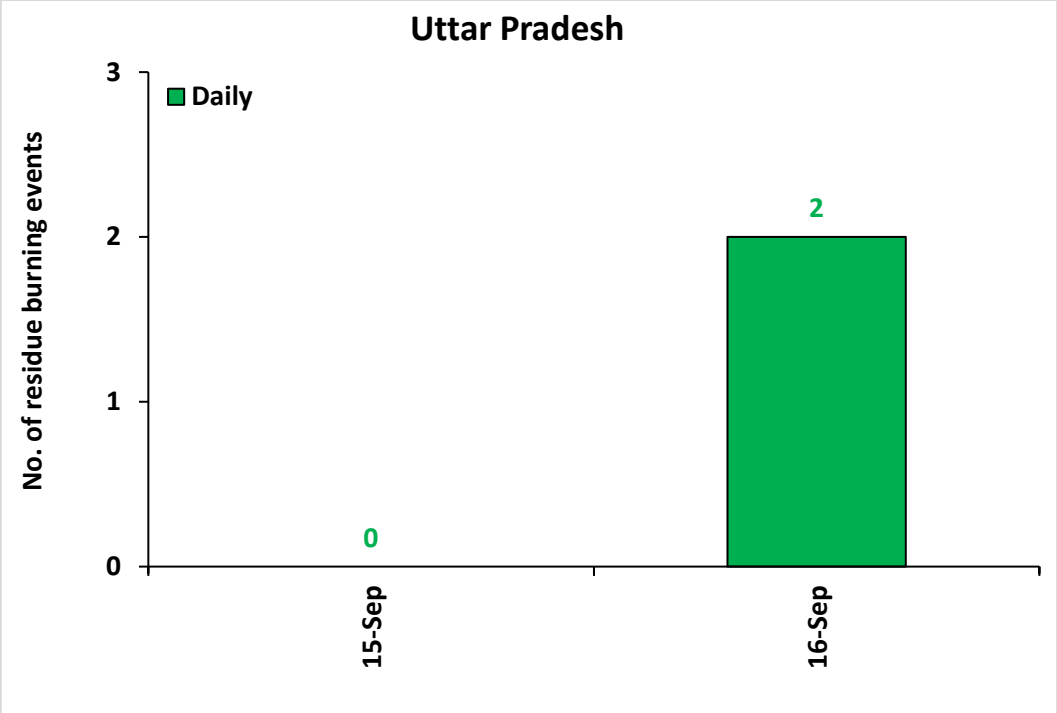


Highlights for 16-Sep-2023

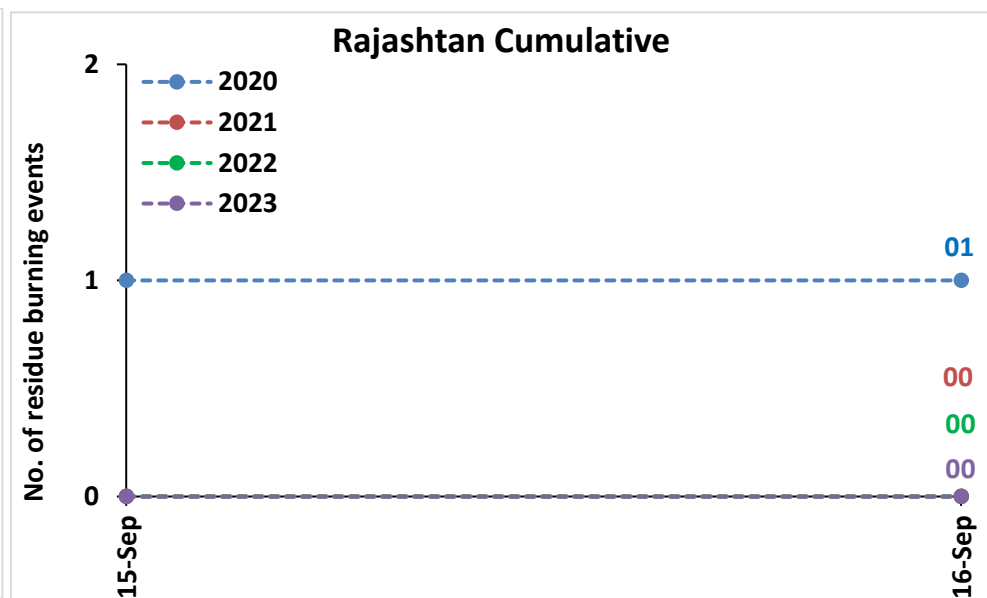
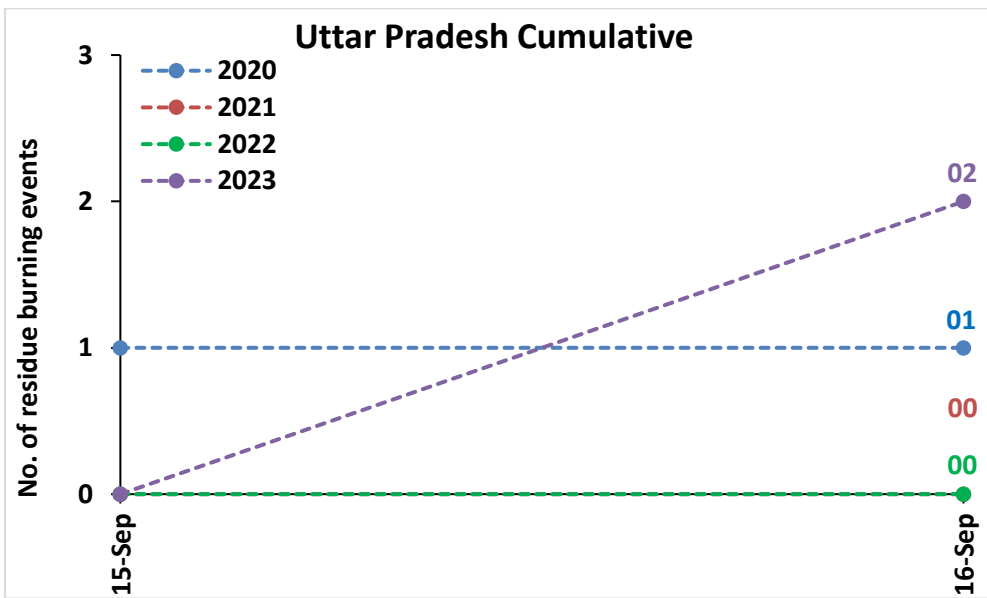
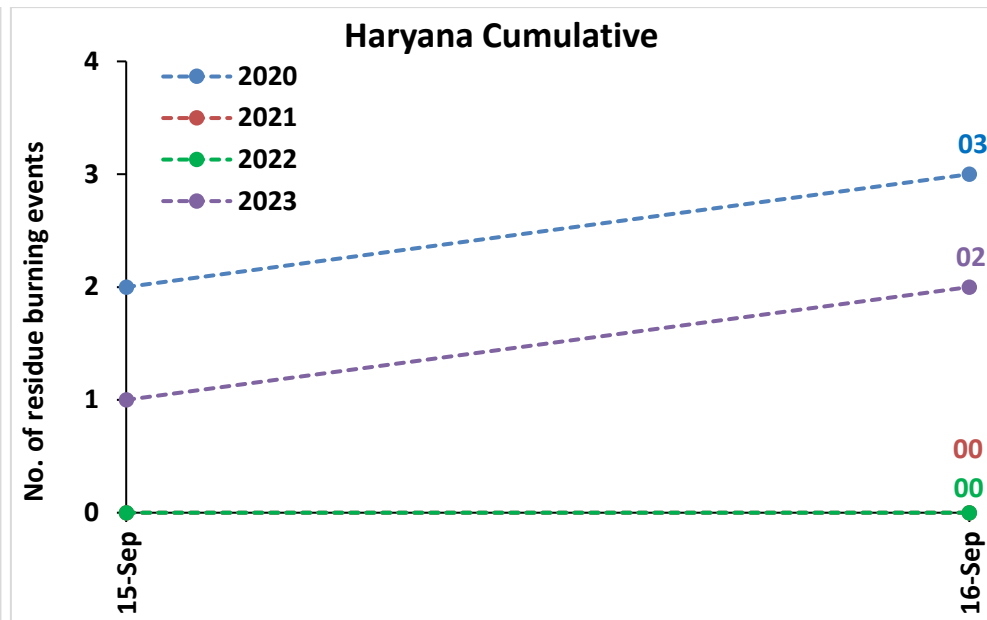
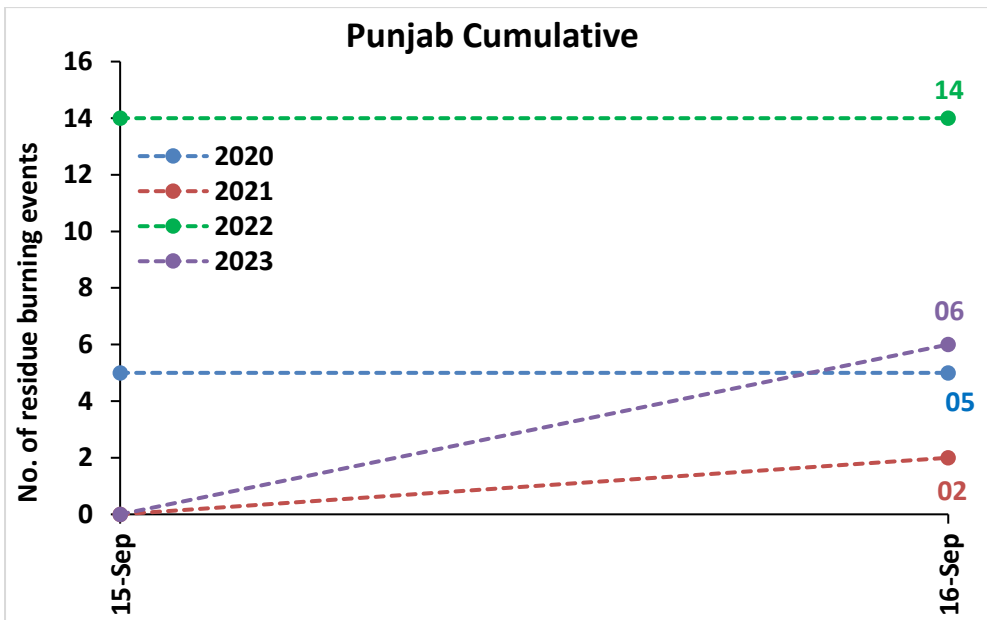
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **09** residue burning events in the six study States on 16-Sep-2023.
- The state wise events detected on 16-Sep-2023 were **06** in Punjab, **01** in Haryana, **02** in UP, **00** in Delhi, **00** in Rajasthan and **00** in MP.
- Detection of residue burning events was hampered by the presence of clouds over Punjab, Haryana, Delhi, Rajasthan, Uttar Pradesh and Madhya Pradesh states.

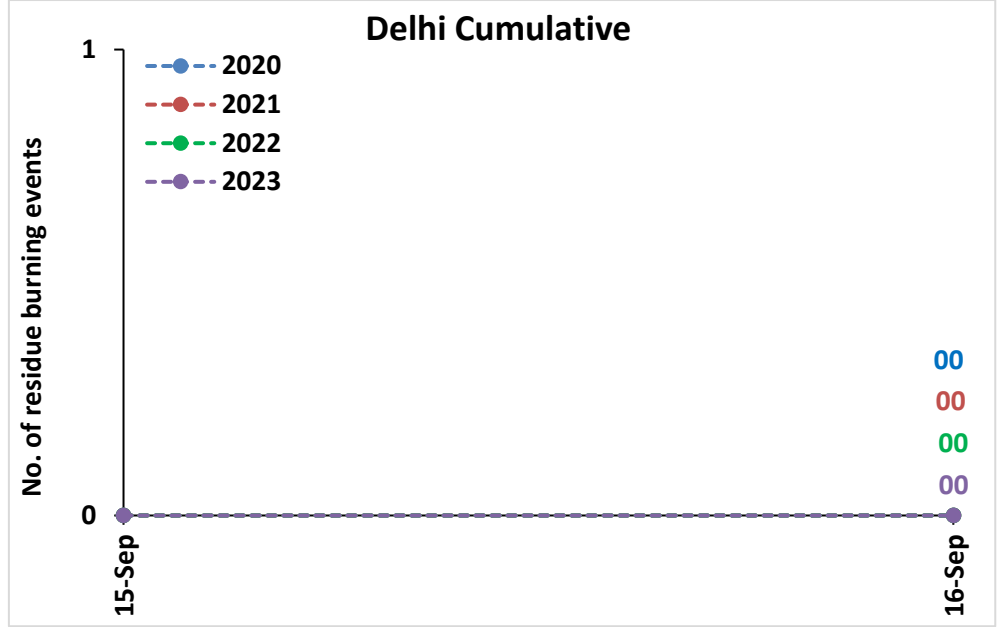
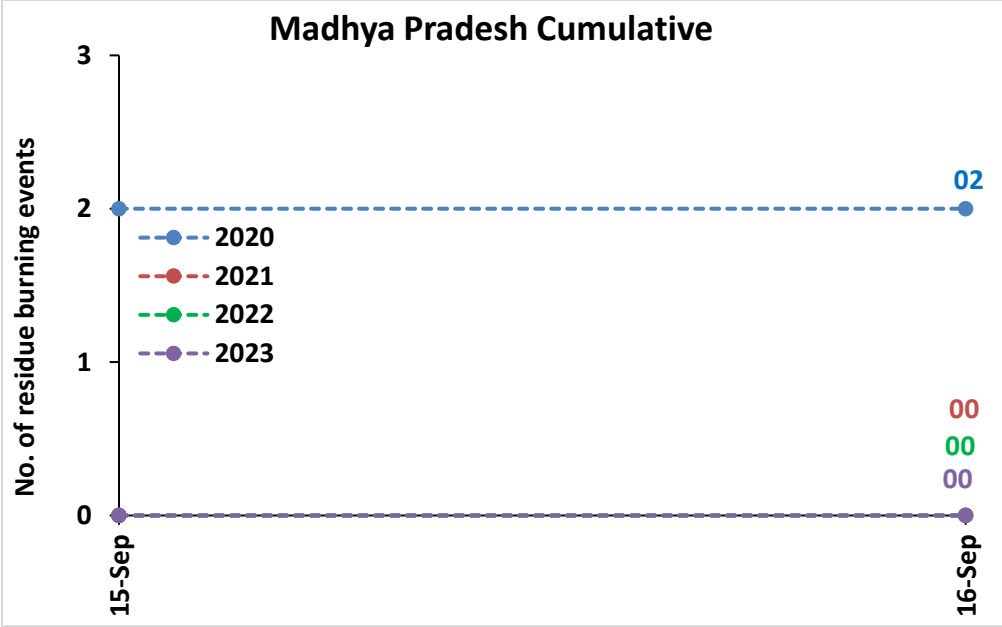
Temporal distribution of rice residue burning events for the study States in 2023



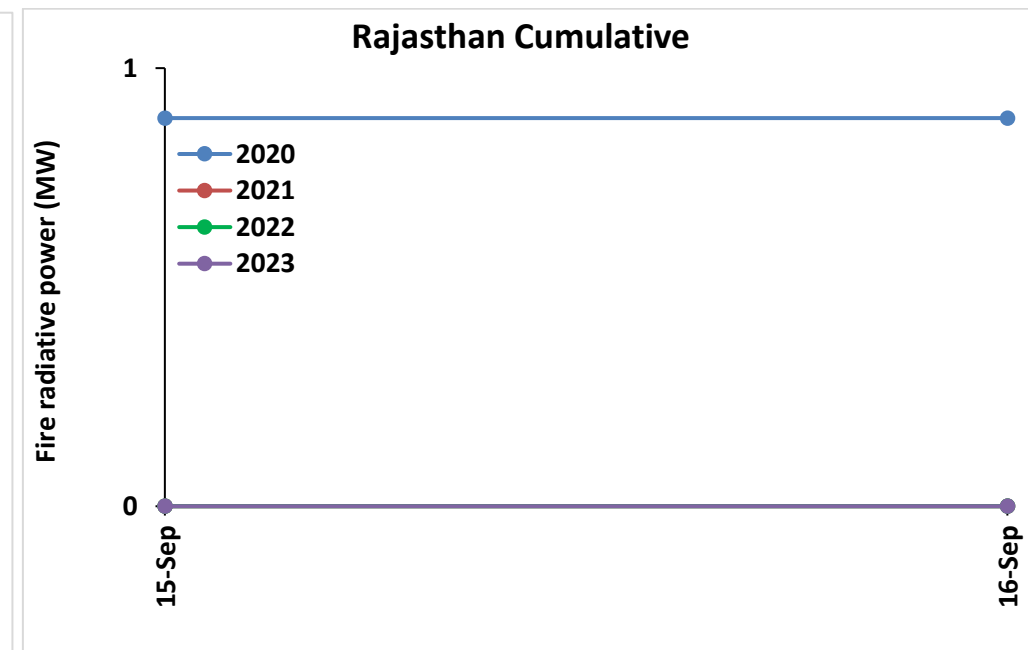
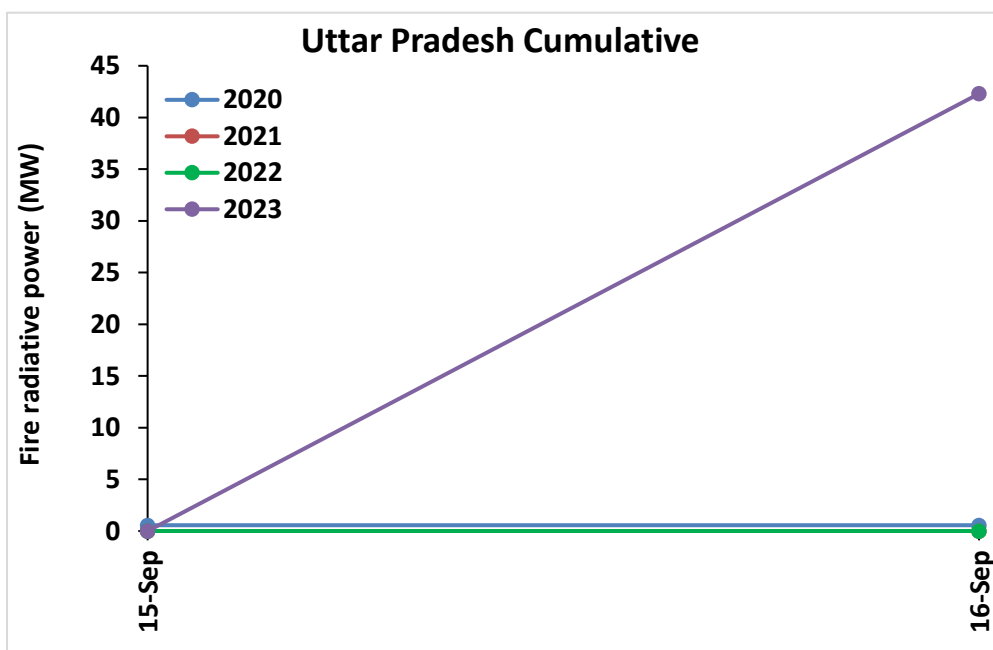
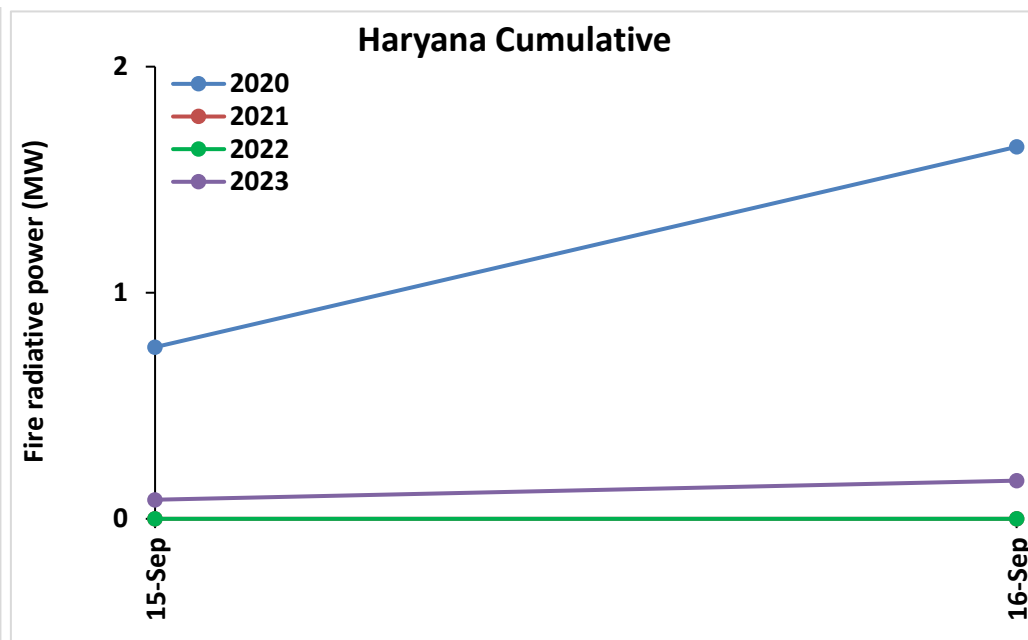
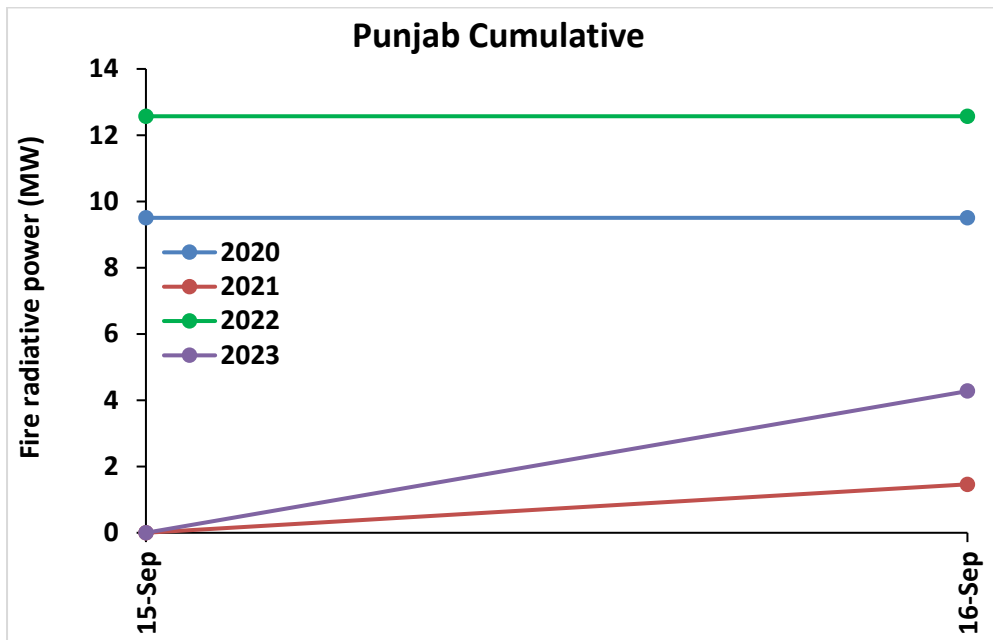


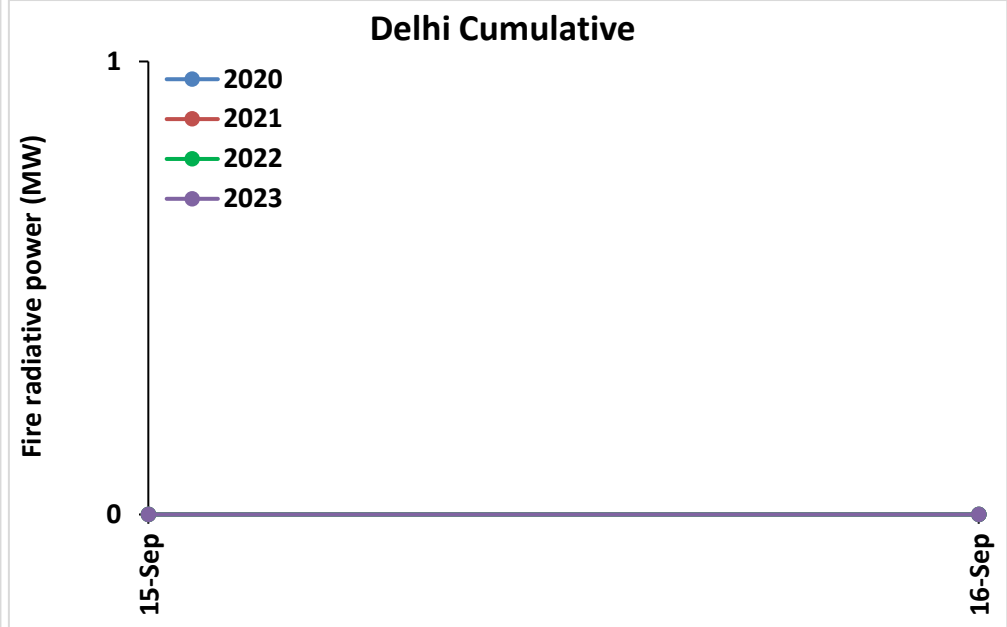
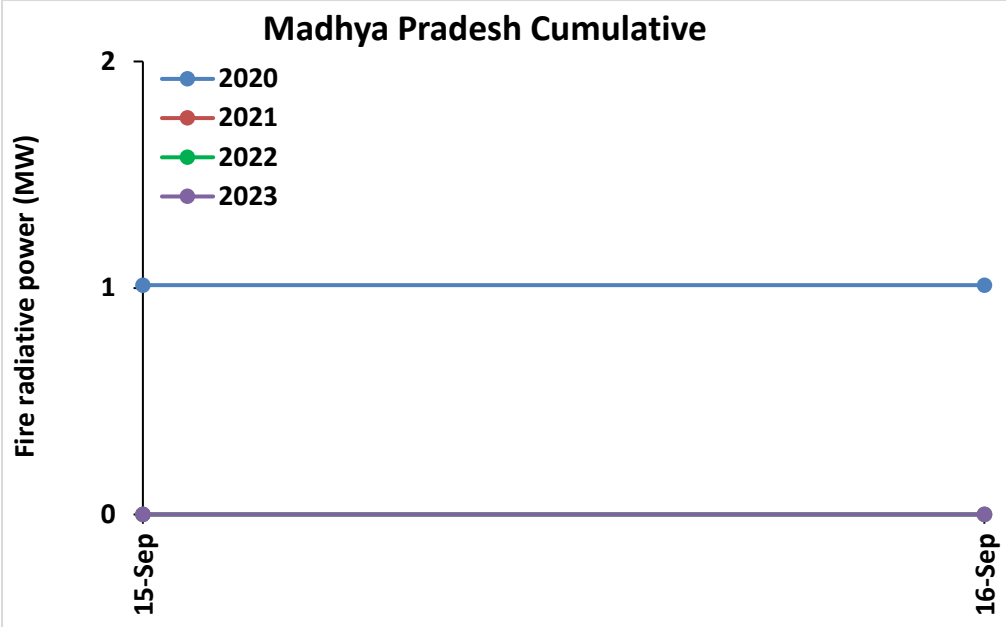
Comparison of residue burning events in current year (2023) with previous years (2020, 2021 and 2022) for the study States





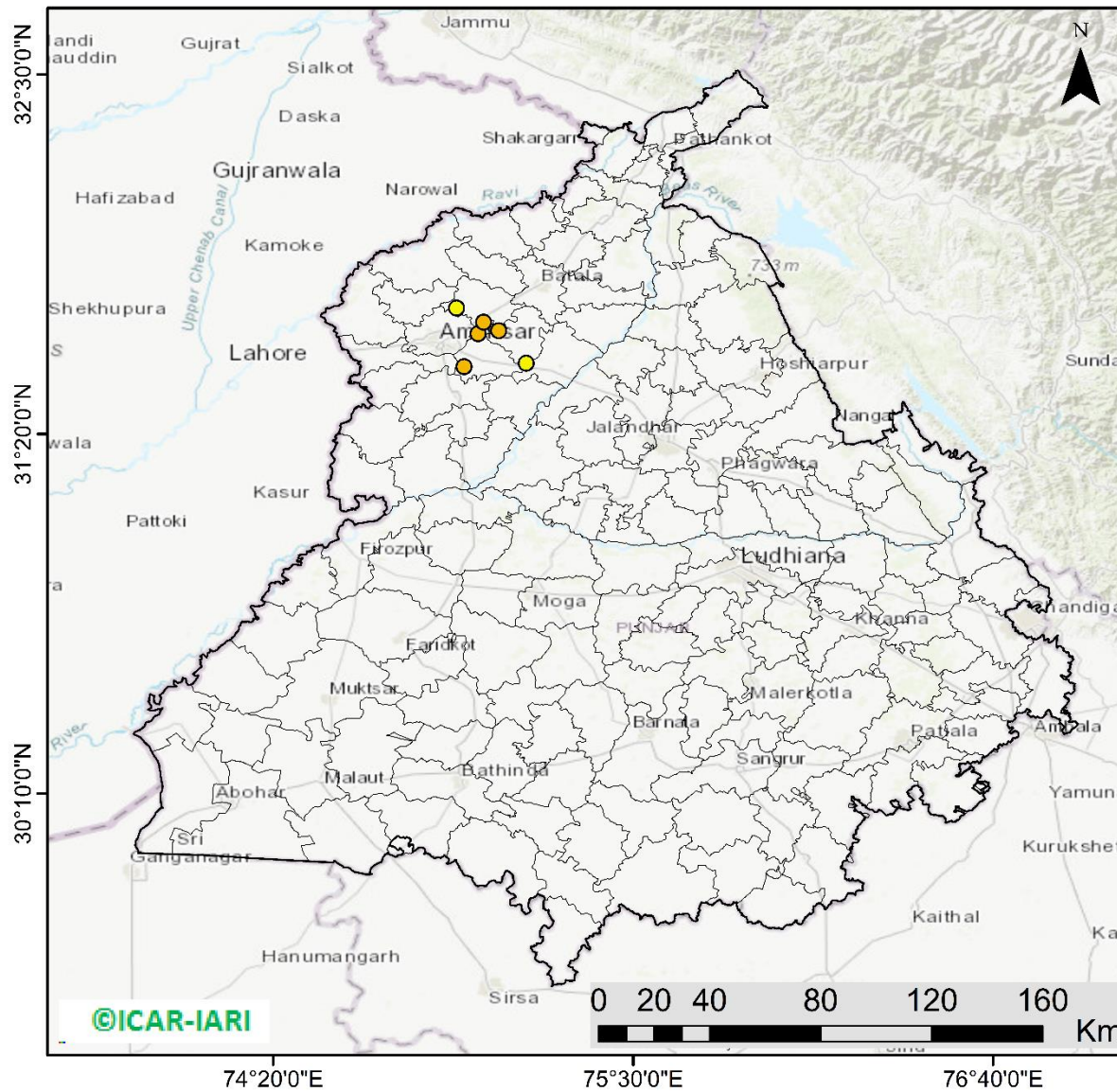
Comparison of residue burning fire power in current year (2023) with previous years (2020, 2021 and 2022) for the study States





Punjab

RICE RESIDUE BURNING IN PUNJAB



06 burning events detected in Punjab during (16th Sep 2023)

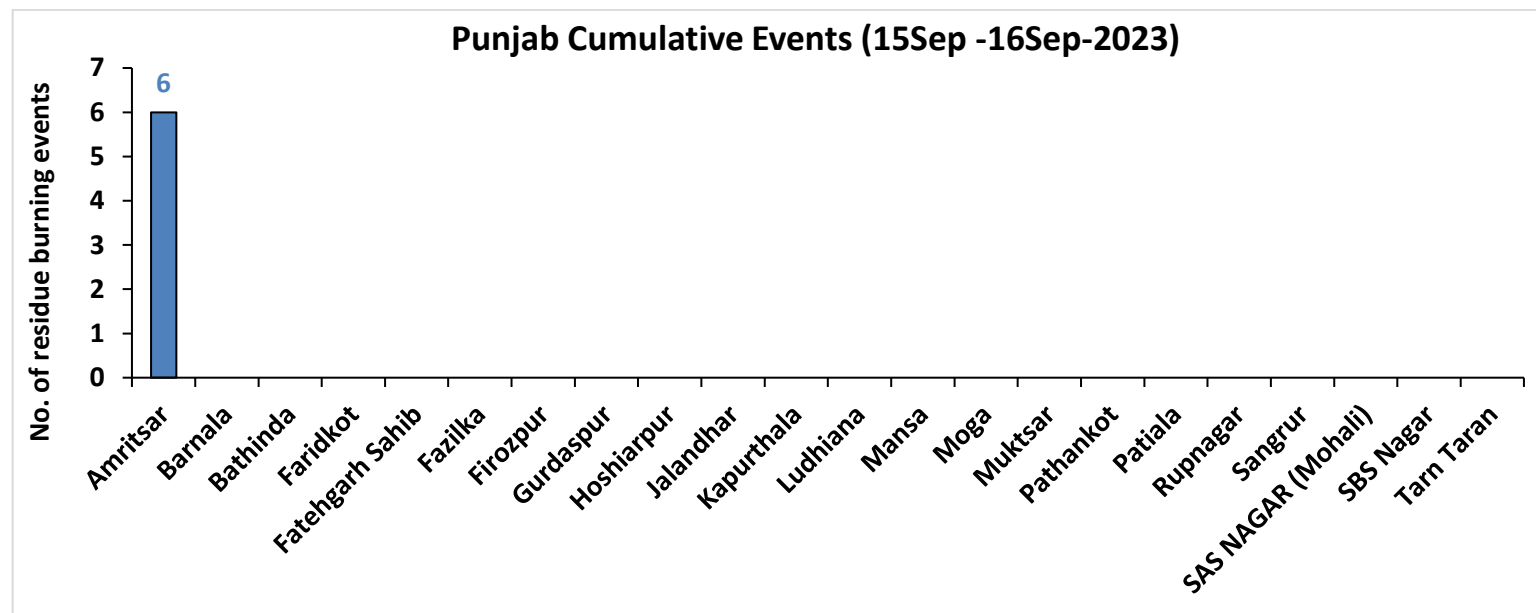
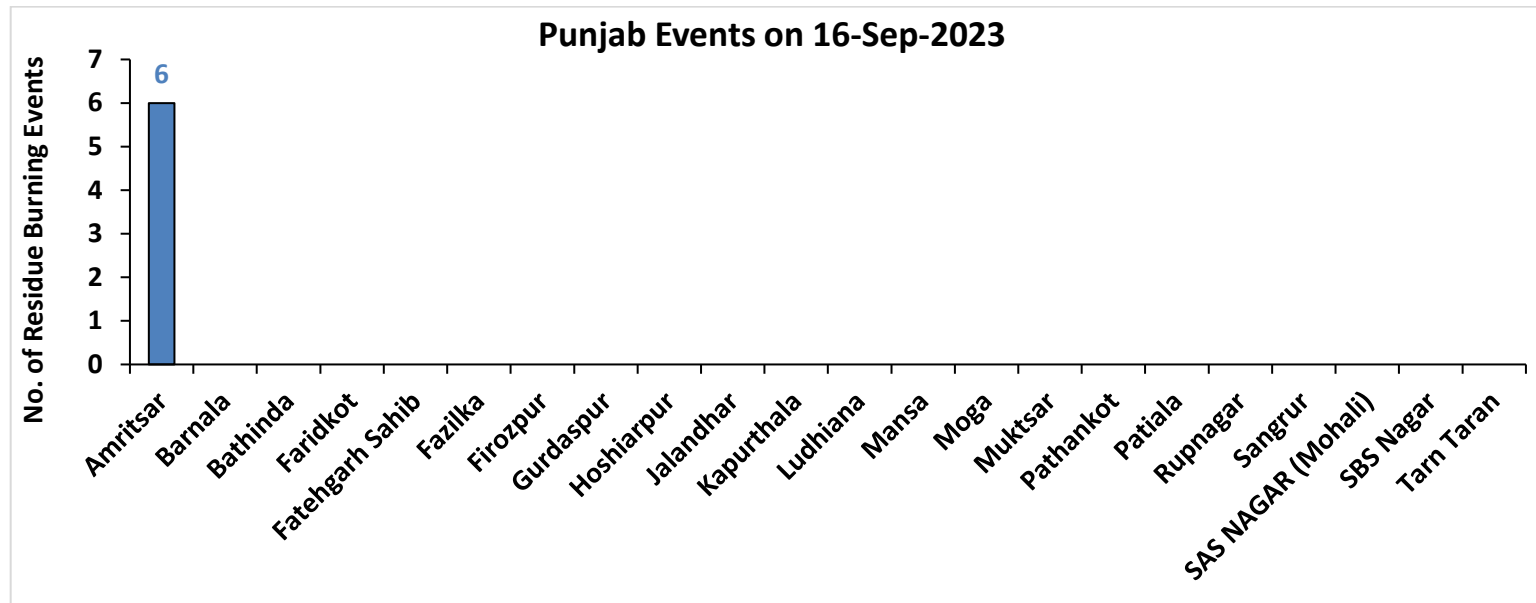
Fire Intensity (W/m²)

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



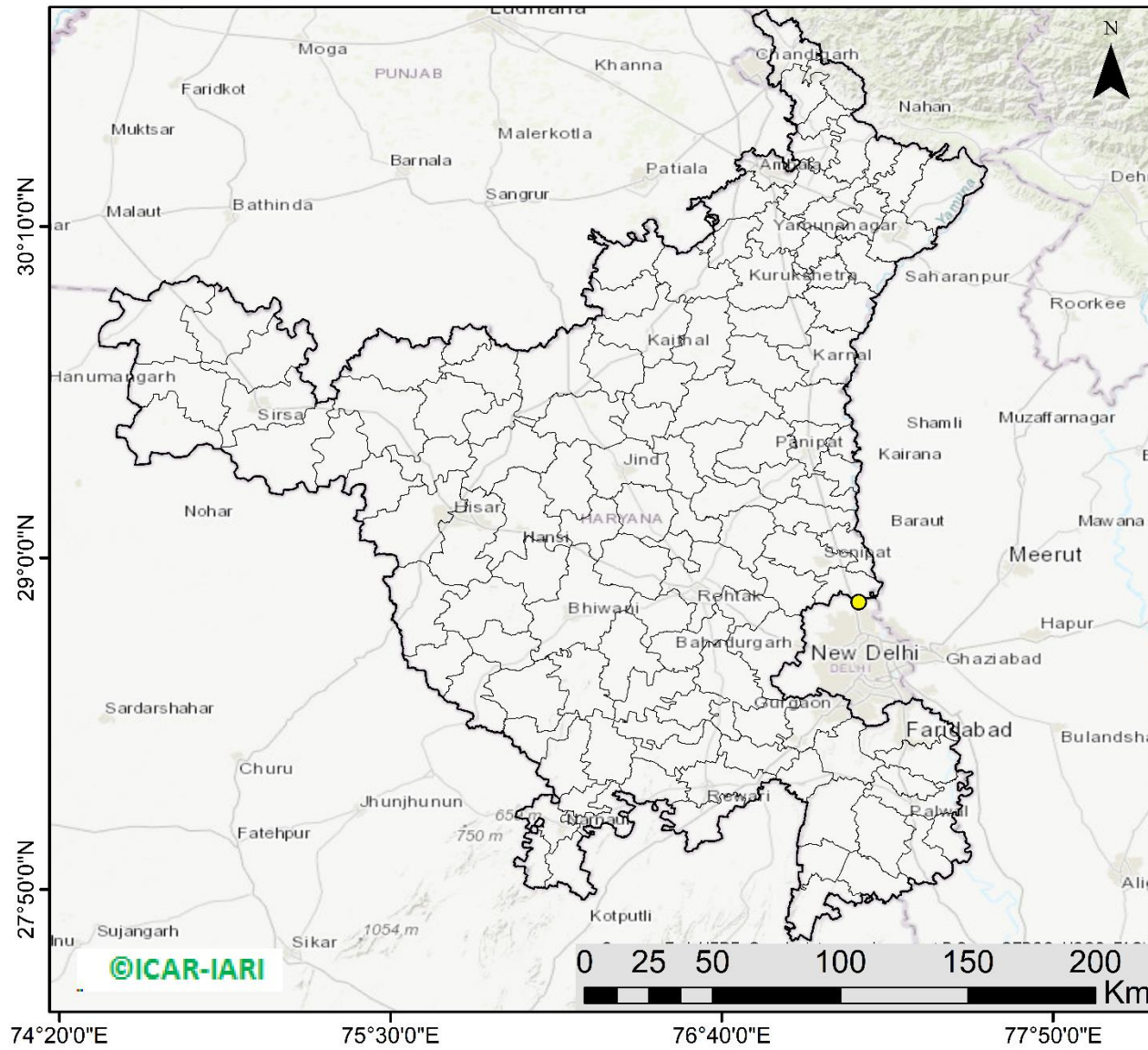
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep- 16Sep-2023)



Haryana

RICE RESIDUE BURNING IN HARYANA



01 burning events detected in Haryana on (16th Sep 2023)

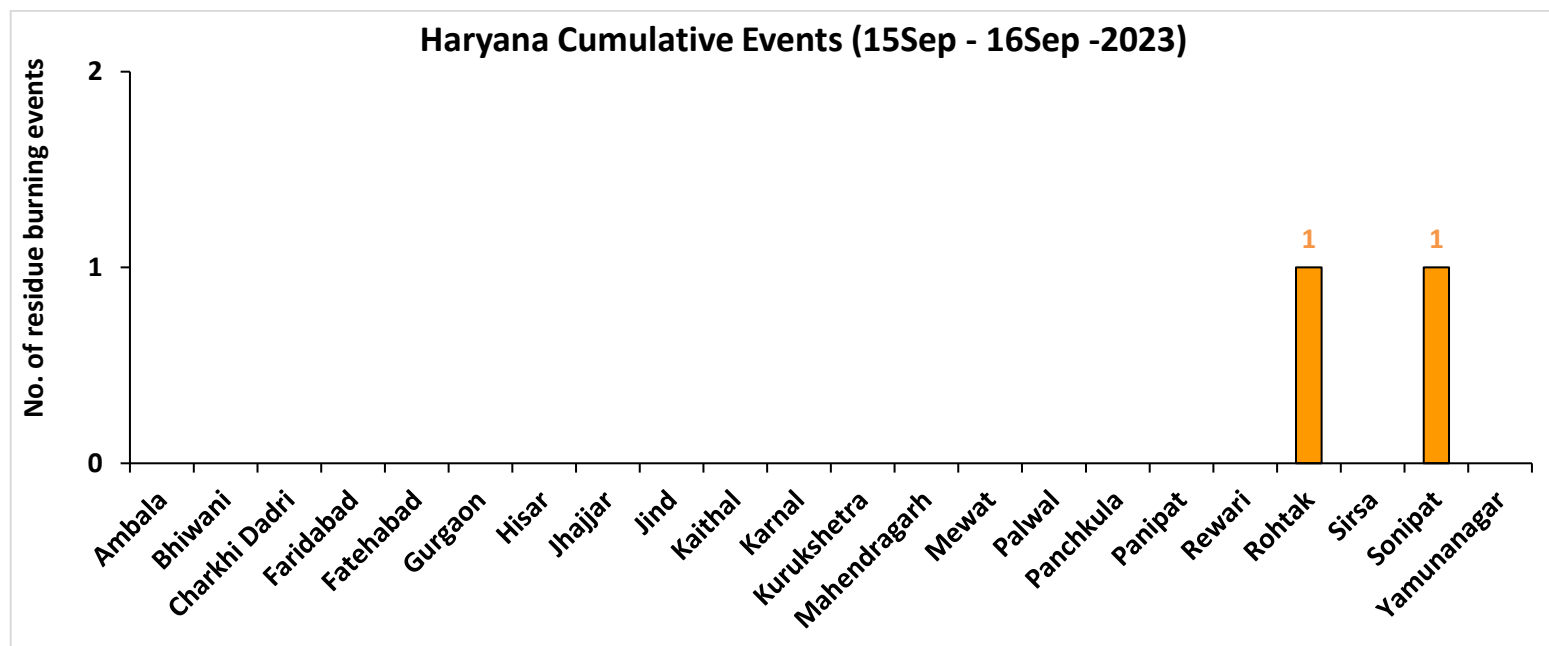
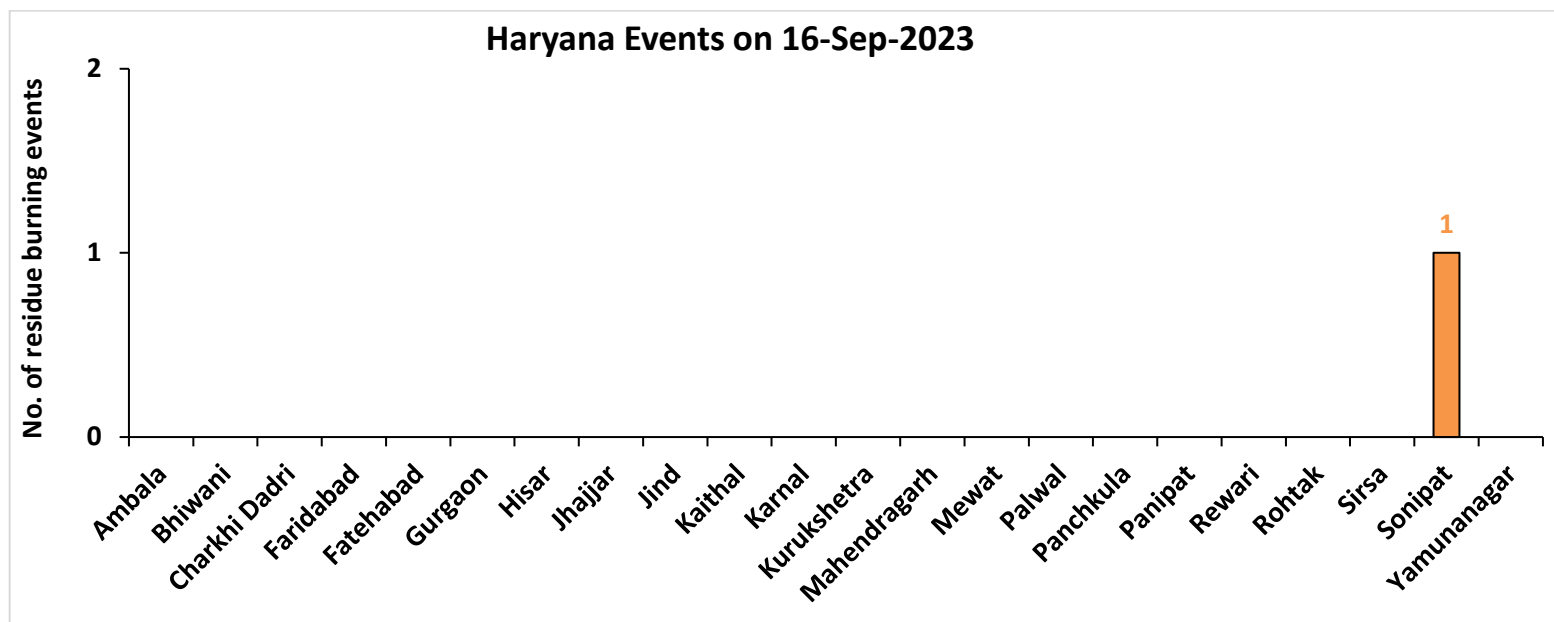
Fire Intensity (W/m²)

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



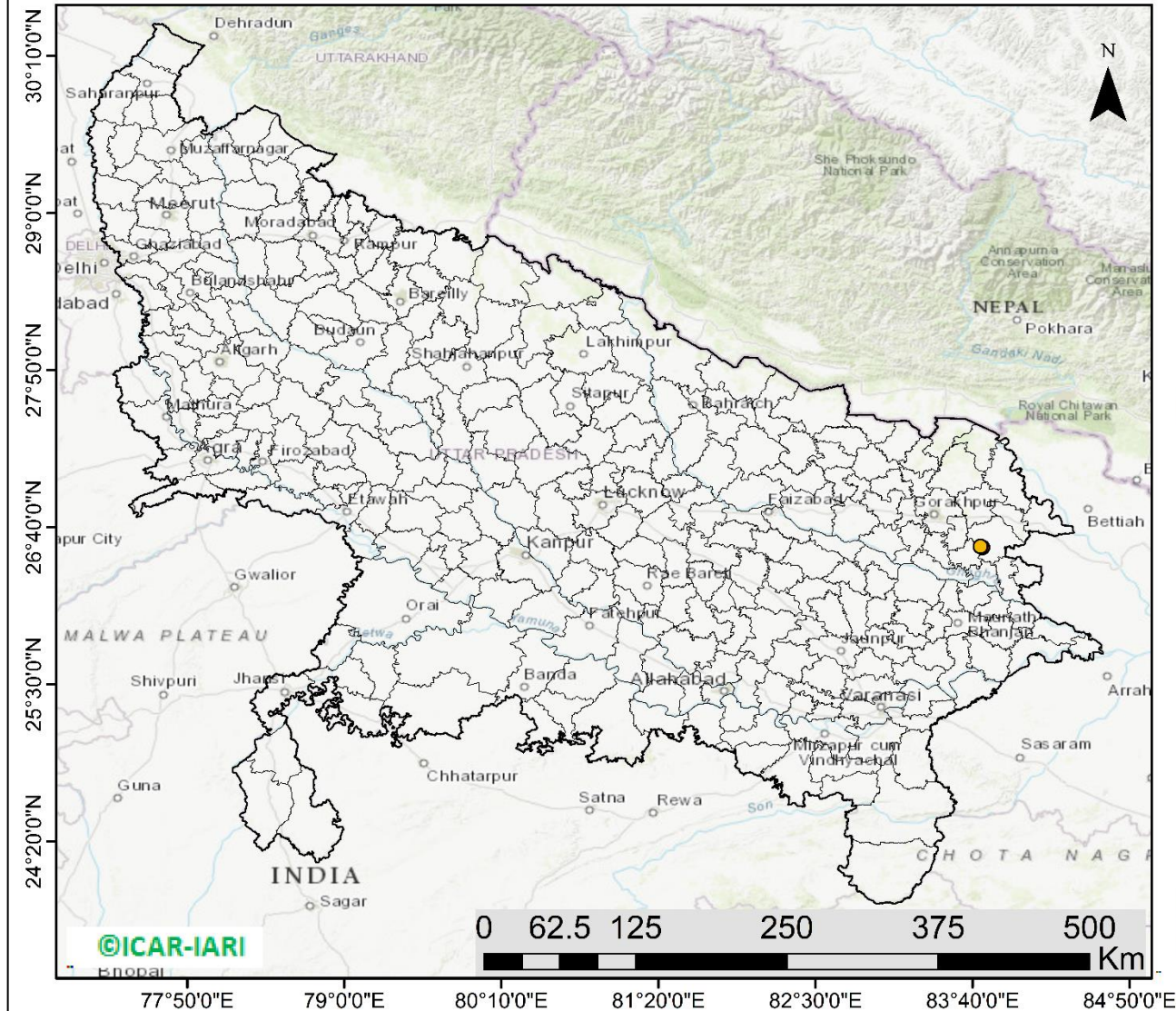
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Haryana (15Sep-16Sep-2023)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



02 burning events detected in Uttar Pradesh on (16th Sep 2023)

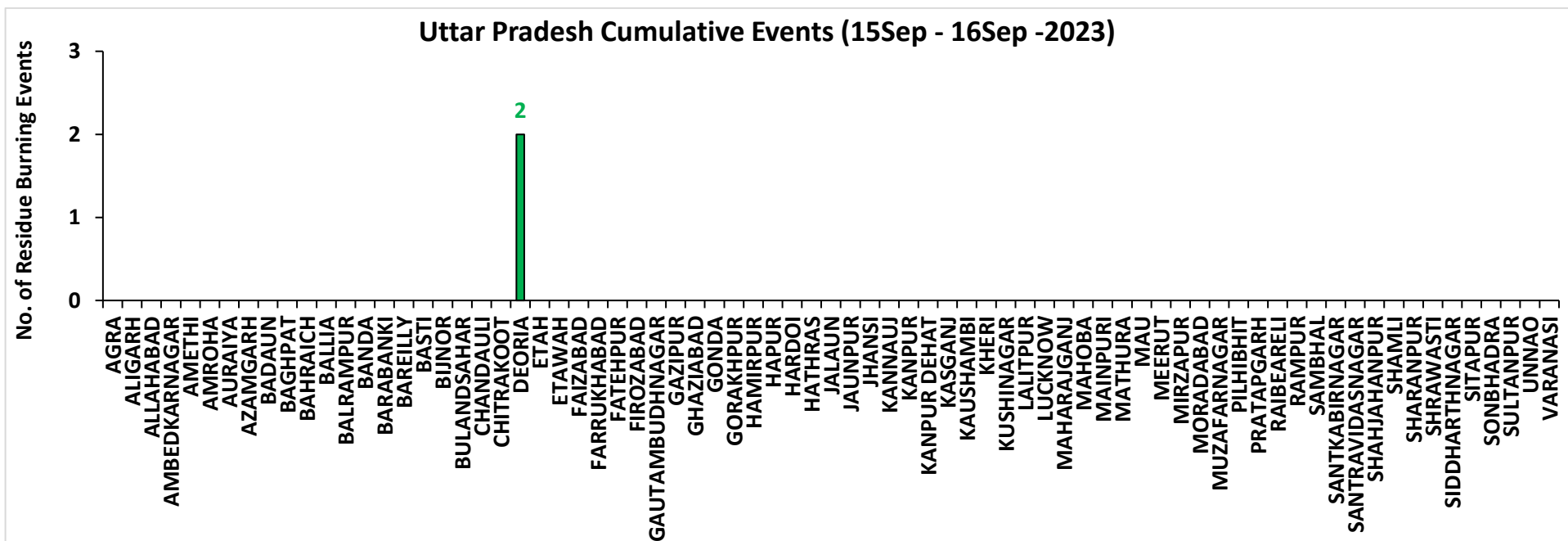
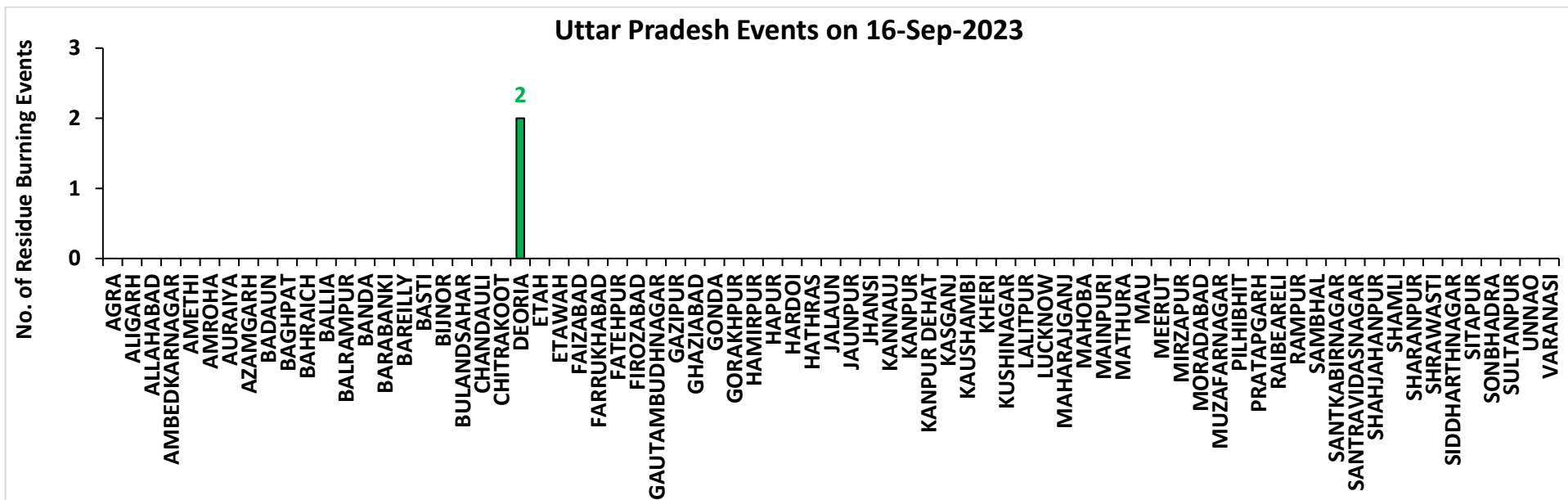
Fire Intensity (W/m²)

- 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-16Sep-2023)



District-wise cumulative number of residues burning events detected in 2020 ,2021 ,2022 and 2023
(Period: 15 eptember-16 September)

(a) Punjab

District	15 Sep-16 Sep			
	2020	2021	2022	2023
Amritsar	5	2	11	6
Barnala	0	0	0	0
Bathinda	0	0	0	0
Faridkot	0	0	0	0
Fatehgarh Sahib	0	0	0	0
Fazilka	0	0	0	0
Firozpur	0	0	0	0
Gurdaspur	0	0	0	0
Hoshiarpur	0	0	0	0
Jalandhar	0	0	0	0
Kapurthala	0	0	0	0
Ludhiana	0	0	0	0
Mansa	0	0	0	0
Moga	0	0	0	0
Muktsar	0	0	0	0
Pathankot	0	0	0	0
Patiala	0	0	0	0
Rupnagar	0	0	0	0
Sangrur	0	0	0	0
SAS NAGAR (Mohali)	0	0	0	0
SBS Nagar	0	0	0	0
Tarn Taran	0	0	3	0
Total	5	2	14	6

(b) Haryana

District	15 Sep-16 Sep			
	2020	2021	2022	2023
AMBALA	0	0	0	0
BHIWANI	0	0	0	0
CHARKHI DADRI	0	0	0	0
FARIDABAD	0	0	0	0
FATEHABAD	0	0	0	0
GURGAON	0	0	0	0
HISAR	0	0	0	0
JHAJJAR	0	0	0	0
JIND	0	0	0	0
KAITHAL	0	0	0	0
KARNAL	2	0	0	0
KURUKSHETRA	0	0	0	0
MAHENDRAGARH	0	0	0	0
MEWAT	0	0	0	0
PALWAL	0	0	0	0
PANCHKULA	0	0	0	0
PANIPAT	0	0	0	0
REWARI	0	0	0	0
ROHTAK	0	0	0	1
SIRSA	1	0	0	0
SONIPAT	0	0	0	1
YAMUNANAGAR	0	0	0	0
Total	3	0	0	2

(c) Uttar Pradesh

District	15 Sep-16 Sep													
	2020	2021	2022	2023	GAUTAMBUDHNAGAR	0	0	0	0	MUZAFARNAGAR	0	0	0	0
AGRA	0	0	0	0	GAZIPUR	0	0	0	0	PILHIBHIT	0	0	0	0
ALIGARH	0	0	0	0	GHAZIABAD	0	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	0	0	0
AMETHI	0	0	0	0	HAMIRPUR	0	0	0	0	SAMBHAL	0	0	0	0
AMROHA	0	0	0	0	HAPUR	0	0	0	0	SANTKABIRNAGAR	0	0	0	0
AURAIYA	0	0	0	0	HARDOI	0	0	0	0	SANTRAVIDASNAGAR	0	0	0	0
AZAMGARH	0	0	0	0	HATHRAS	0	0	0	0	SHAHJAHANPUR	0	0	0	0
BADAUN	0	0	0	0	JALAUN	0	0	0	0	SHAMLI	0	0	0	0
BAGHPAT	0	0	0	0	JAUNPUR	0	0	0	0	SHARANPUR	0	0	0	0
BAHRAICH	0	0	0	0	JHANSI	0	0	0	0	SHRAWASTI	0	0	0	0
BALLIA	0	0	0	0	KANNAUJ	0	0	0	0	SIDDHARTHANAGAR	0	0	0	0
BALRAMPUR	0	0	0	0	KANPUR	0	0	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	0	0	0	0	UNNAO	0	0	0	0
BASTI	0	0	0	0	KHERI	0	0	0	0	VARANASI	0	0	0	0
BIJNOR	0	0	0	0	KUSHINAGAR	0	0	0	0	Total	1	0	0	2
BULANDSAHAR	0	0	0	0	LALITPUR	0	0	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	0	0	0	0	MAINPURI	0	0	0	0					
ETAWAH	0	0	0	0	MATHURA	0	0	0	0					
FAIZABAD	0	0	0	0	MAU	0	0	0	0					
FARRUKHABAD	0	0	0	0	MEERUT	0	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-16 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	0
NORTH EAST	0	0	0	0
NORTH WEST DELHI	0	0	0	0
SHAHADRA	0	0	0	0
SOUTH	0	0	0	0
SOUTH EAST	0	0	0	0
SOUTH WEST DELHI	0	0	0	0
WEST DELHI	0	0	0	0
Total	0	0	0	0

(e) Rajasthan

District	15 Sep-16 Sep			
	2020	2021	2022	2023
AJMER	0	0	0	0
ALWAR	0	0	0	0
BANSWARA	0	0	0	0
BARAN	0	0	0	0
BARMER	0	0	0	0
BHARATPUR	0	0	0	0
BHILWARA	1	0	0	0
BIKANER	0	0	0	0
BUNDI	0	0	0	0
CHITTAURGARH	0	0	0	0
CHURU	0	0	0	0
DAUSA	0	0	0	0
DHOLPUR	0	0	0	0
DUNGARPUR	0	0	0	0
GANGANAGAR	0	0	0	0
HANUMANGARH	0	0	0	0
JAIPUR	0	0	0	0
JAISELMER	0	0	0	0
JALOR	0	0	0	0
JHALAWAR	0	0	0	0
JHUNJHUNUN	0	0	0	0
JODHPUR	0	0	0	0
KARAULI	0	0	0	0
KOTA	0	0	0	0
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	1	0	0	0

(f) Madhya Pradesh

District	15 Sep-16 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	0
ASHOKNAGAR	0	0	0	0	RATLAM	0	0	0	0
BALAGHAT	0	0	0	0	REWA	0	0	0	0
BARWANI	0	0	0	0	SAGAR	0	0	0	0
BETUL	0	0	0	0	SATNA	0	0	0	0
BHIND	0	0	0	0	SEHORE	0	0	0	0
BHOPAL	0	0	0	0	SEONI	0	0	0	0
BURHANPUR	0	0	0	0	SHAHDOL	0	0	0	0
CHHATARPUR	0	0	0	0	SHAJAPUR	0	0	0	0
CHHINDWARA	0	0	0	0	SHEOPUR	0	0	0	0
DAMOH	0	0	0	0	SHIVPURI	0	0	0	0
DATIA	0	0	0	0	SIDHI	0	0	0	0
DEWAS	0	0	0	0	SINGRAULI	0	0	0	0
DHAR	0	0	0	0	TIKAMGARH	0	0	0	0
DINDORI	0	0	0	0	UJJAIN	0	0	0	0
EAST NIMAR	0	0	0	0	UMARIA	0	0	0	0
GUNA	0	0	0	0	VIDESHA	0	0	0	0
GWALIOR	0	0	0	0	WEST NIMAR	0	0	0	0
HARDA	2	0	0	0	Total	2	0	0	0
HOSHANGABAD	0	0	0	0					
INDORE	0	0	0	0					
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-16 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
Total	5	2	14	6	3	0	0	2	1	0	0	2

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
Total	0	0	0	0	1	0	0	0	2	0	0	0

Details of residue burning events in Punjab on 16-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	AMRITSAR	JANDIALA GURU	S-NPP	31.55132	74.95206	14:19:30	D	5.60
2	AMRITSAR	JANDIALA GURU	S-NPP	31.65829	74.99740	14:19:30	D	5.30
3	AMRITSAR	JANDIALA GURU	S-NPP	31.69553	75.01547	14:19:30	D	5.30
4	AMRITSAR	MAJITHA	S-NPP	31.74133	74.92747	14:19:30	D	3.20
5	AMRITSAR	RAYYA	S-NPP	31.56246	75.15346	14:19:30	D	3.80
6	AMRITSAR	TARSIKKA	S-NPP	31.66803	75.06416	14:19:30	D	7.20

Details of residue burning events in Haryana on 16-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	SONIPAT	RAI	S-NPP	28.84420	77.14883	01:29:55	N	0.60

Details of residue burning events in Uttar Pradesh on 16-Sep-2023

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	DEORIA	DEORIA	AQUA	26.51500	83.74000	13:19:38	D	34.20
2	DEORIA	DEORIA	AQUA	26.52300	83.72600	13:19:38	D	8.10

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)
