

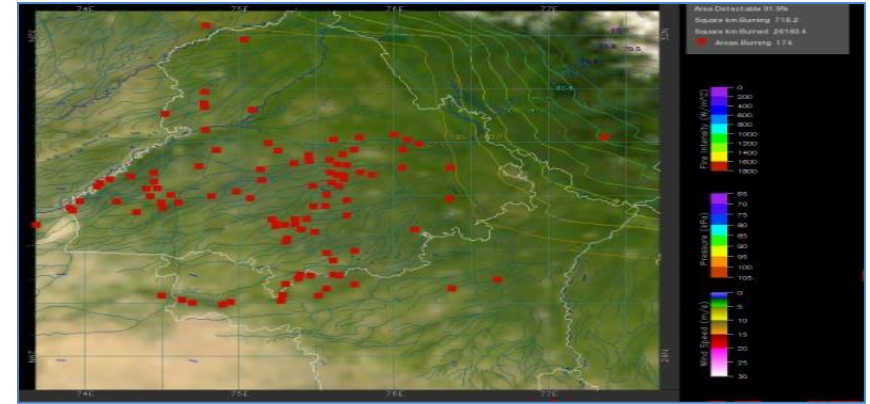
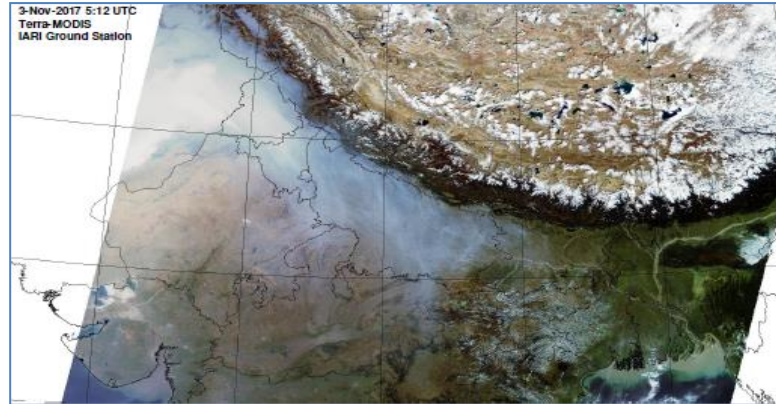


# MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2023

**Bulletin  
No. 06**

**Events Date:  
20-Sep-2023**

**Issued on:  
20-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**

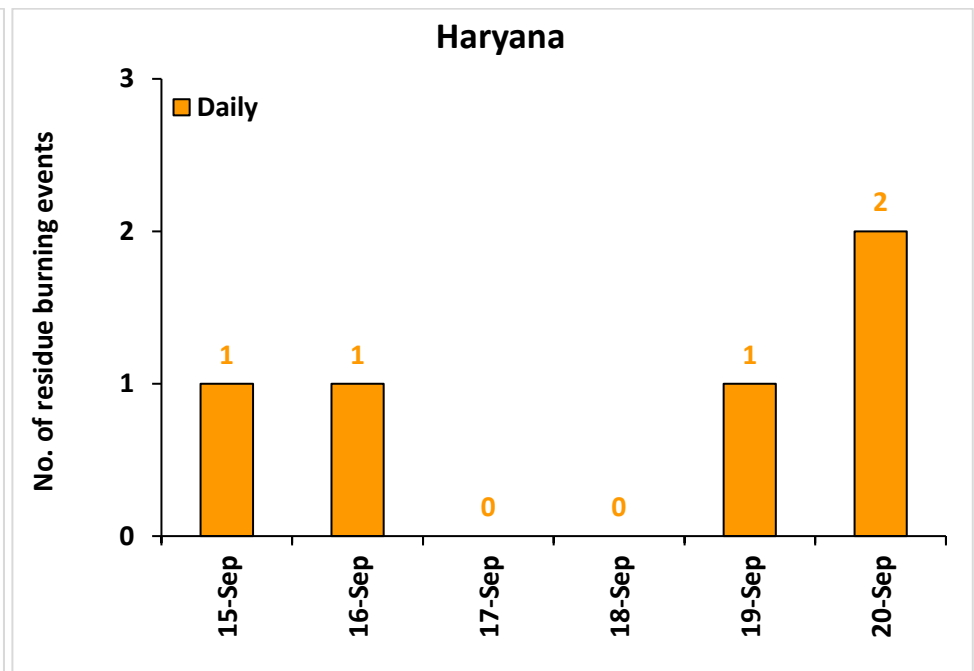
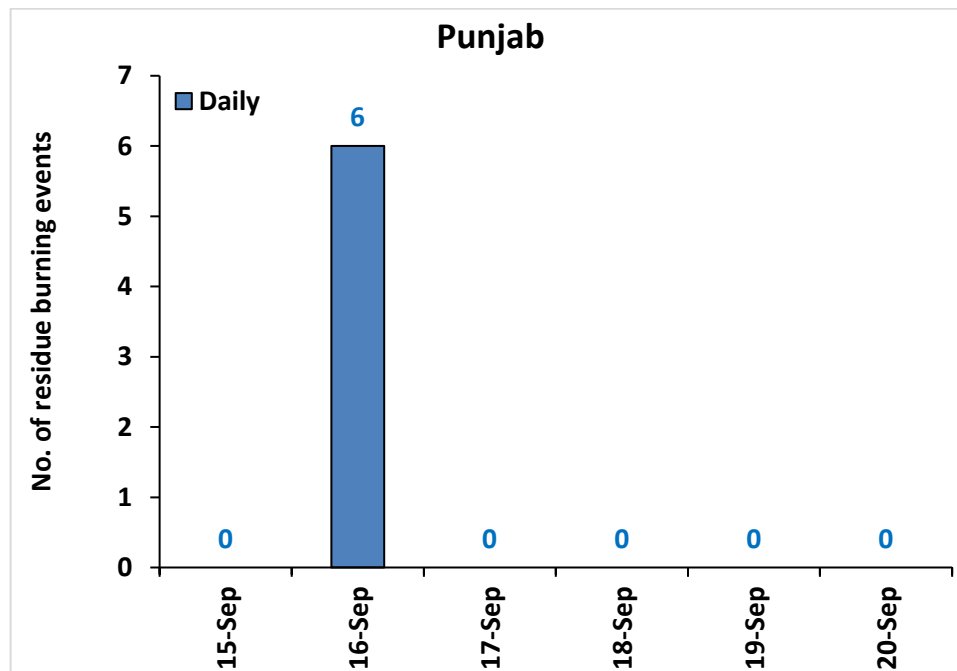
<http://creams.iari.res.in>



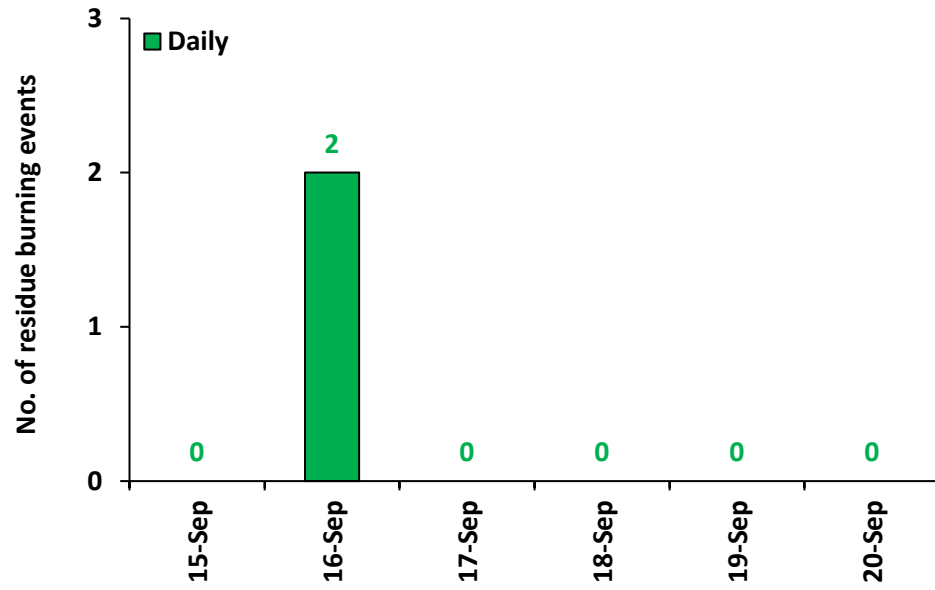
## Highlights for 20-Sep-2023

- 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 **03** residue burning events in the six study States on 20-Sep-2023.
- The state wise events detected on 20-Sep-2023 were **00** in Punjab, **02** in Haryana, **00** in UP, **00** in Delhi, **00** in Rajasthan and **01** in MP.
- Total **15** burning events were detected in the six states between 15-Sept-2023 and 20-Sep-2023, which are distributed as **06**, **05**, **02**, **00**, **00** and **02** in Punjab, Haryana, UP, Delhi, Rajasthan and MP respectively.
- Detection of residue burning events was hampered by the presence of scattered clouds over Haryana, Delhi, Rajasthan, Uttar Pradesh and Madhya Pradesh states.

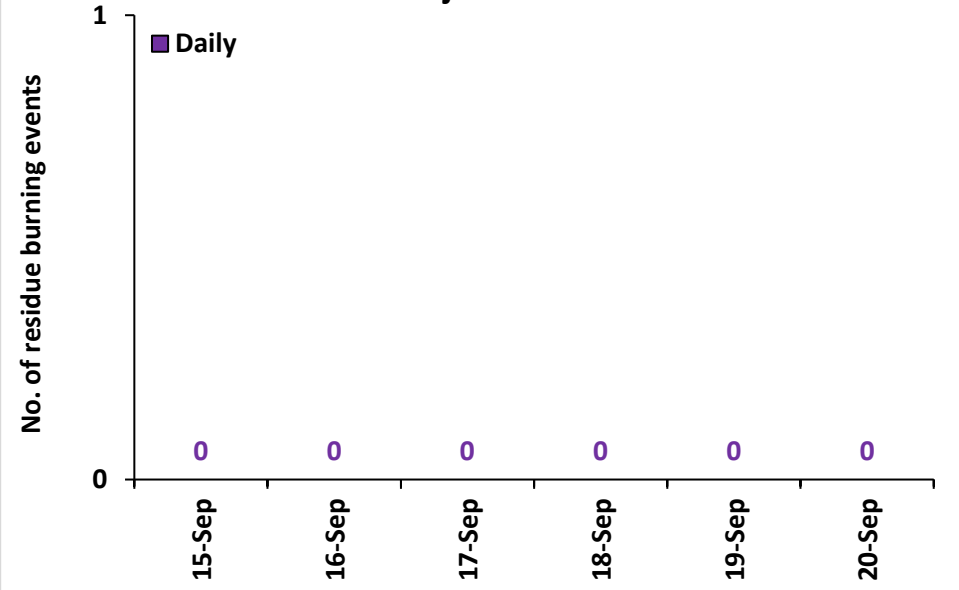
### Temporal distribution of rice residue burning events for the study States in 2023



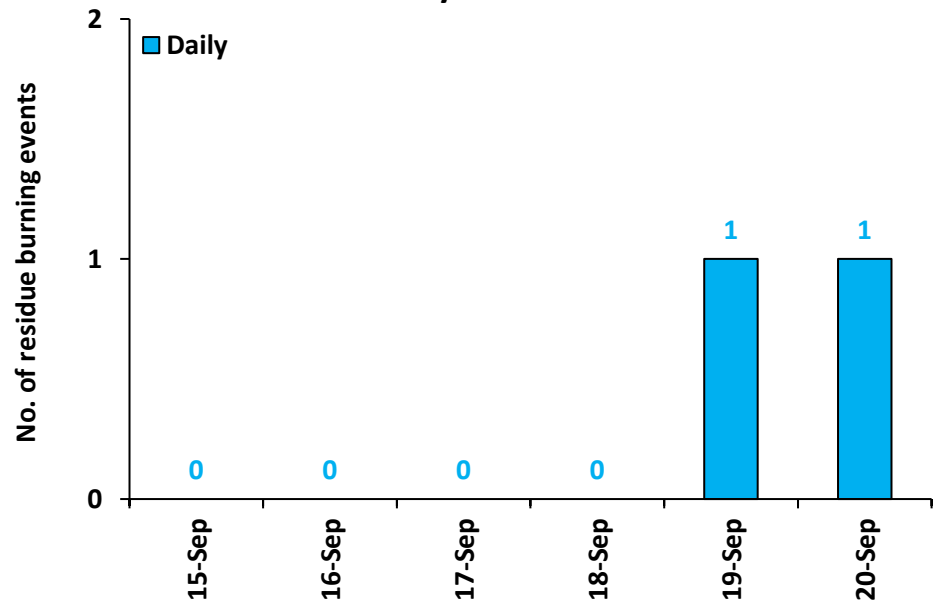
### Uttar Pradesh



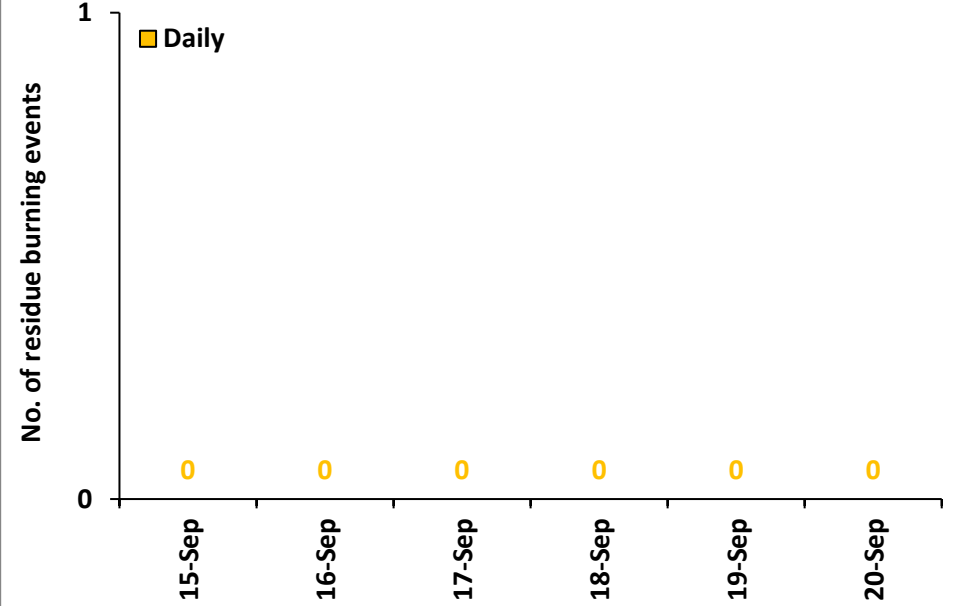
### Rajasthan



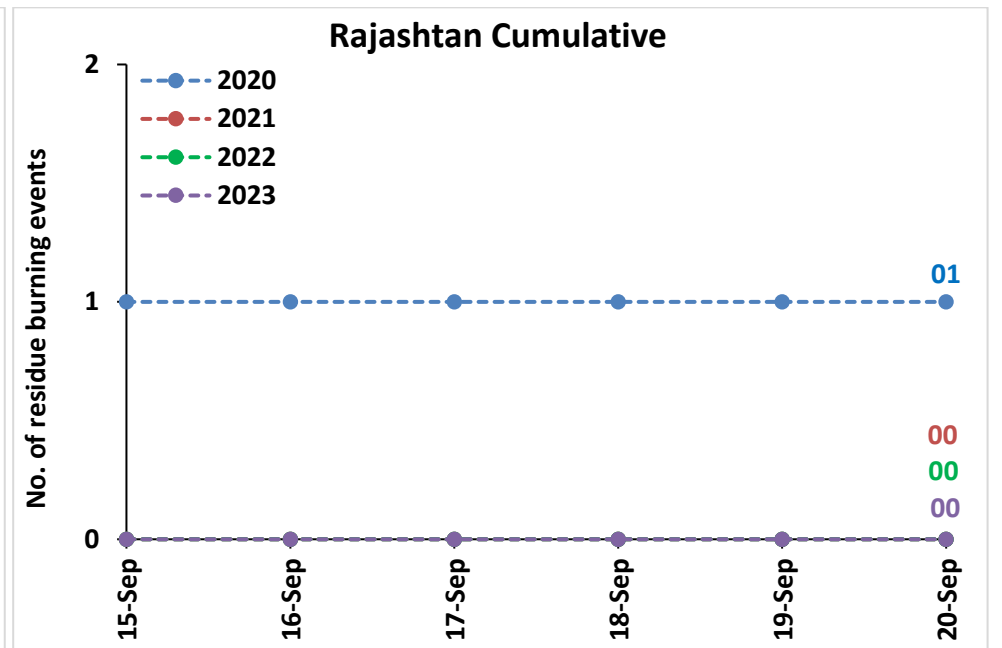
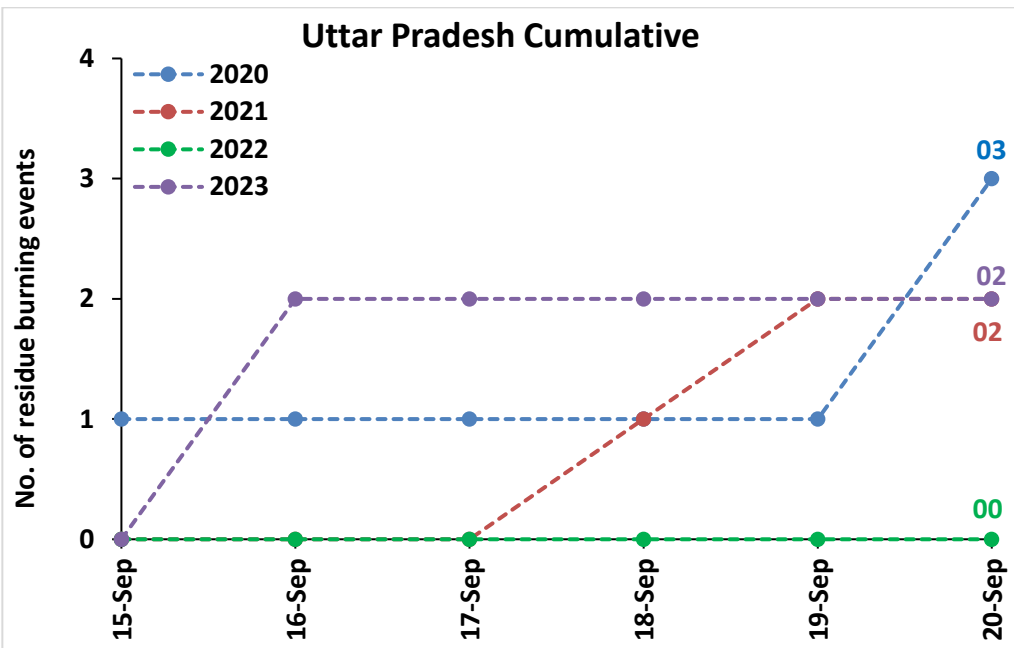
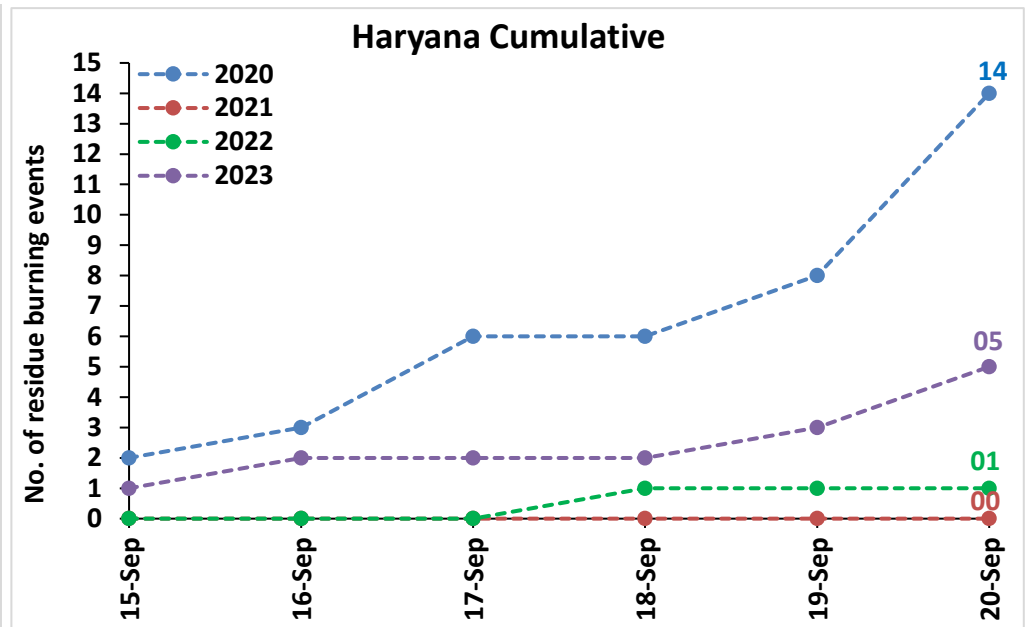
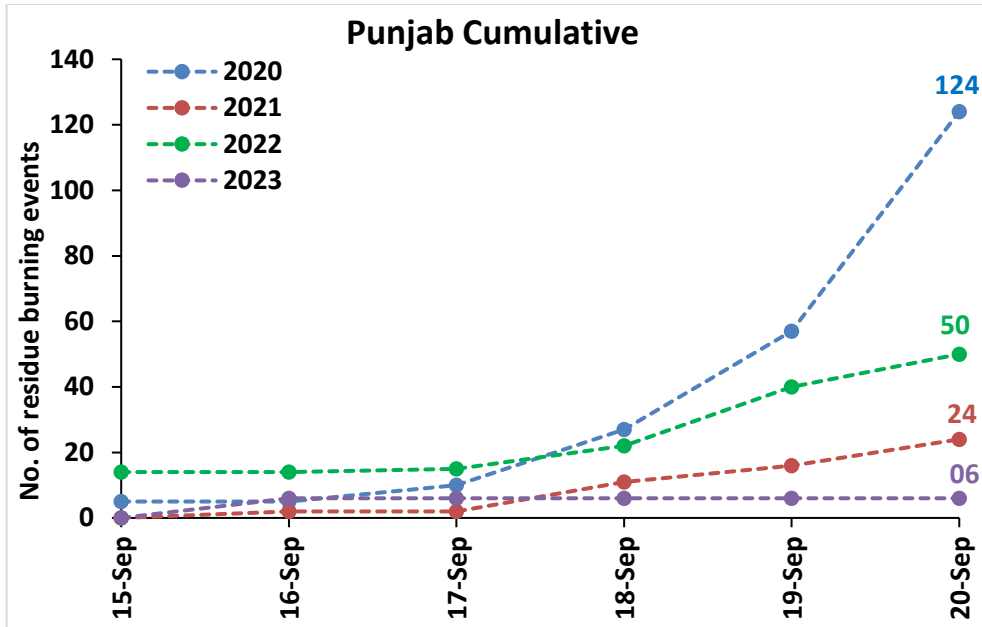
### Madhya Pradesh

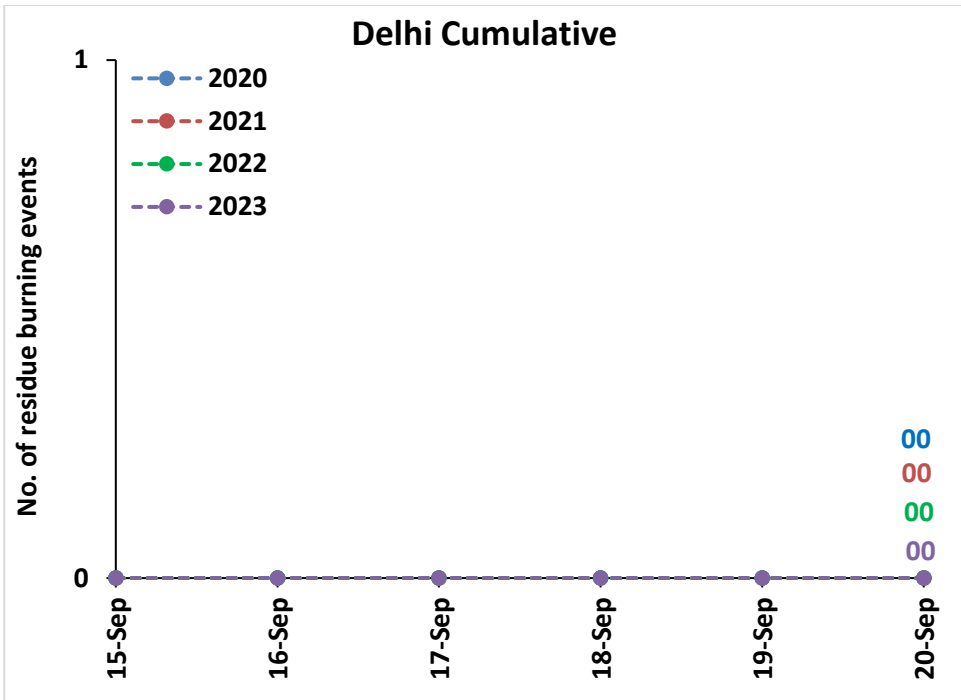
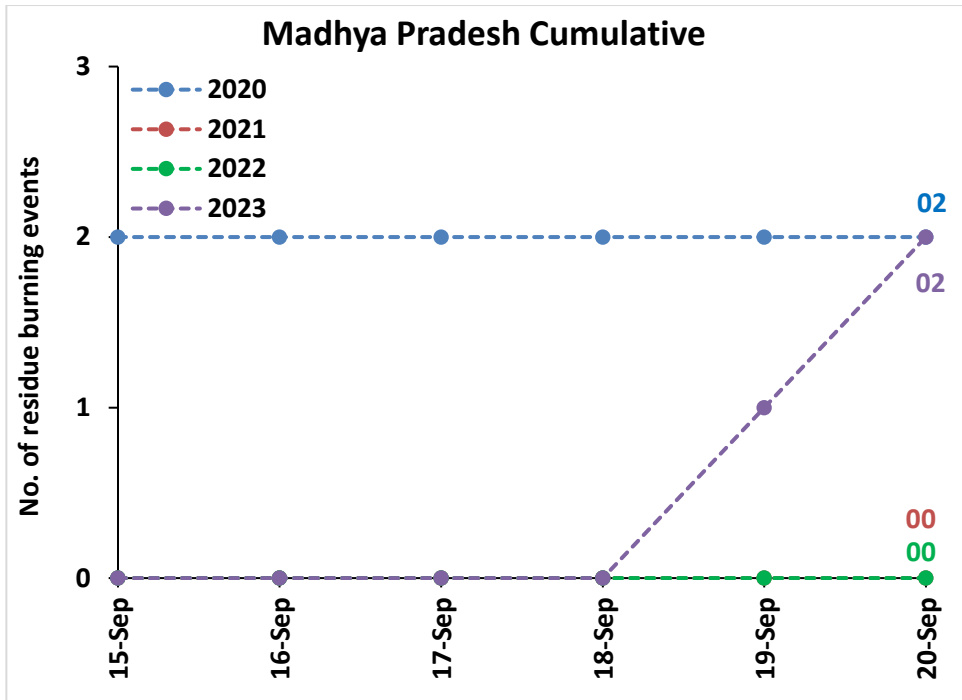


### Delhi

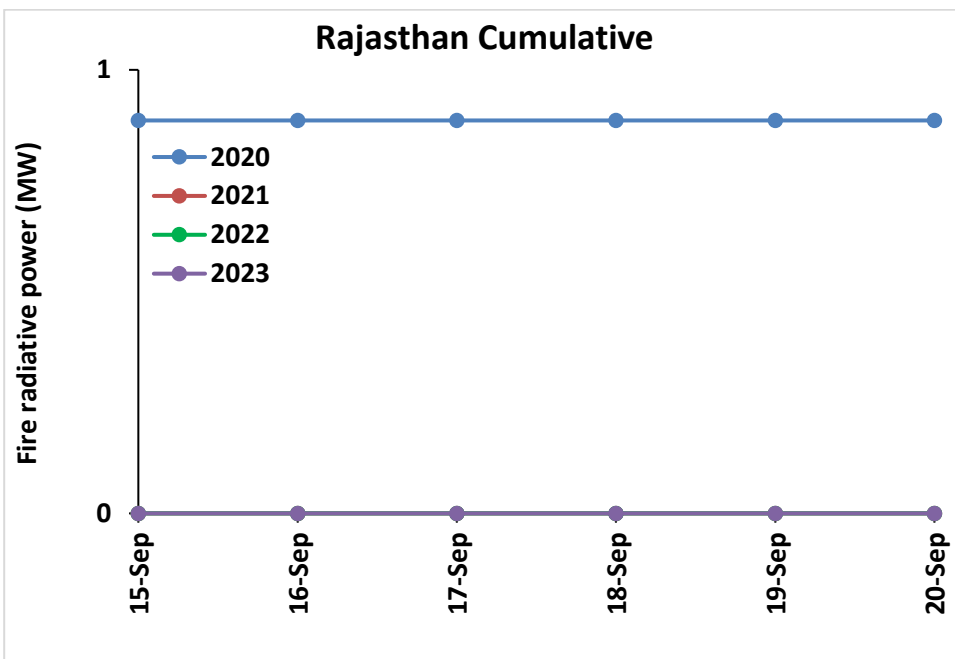
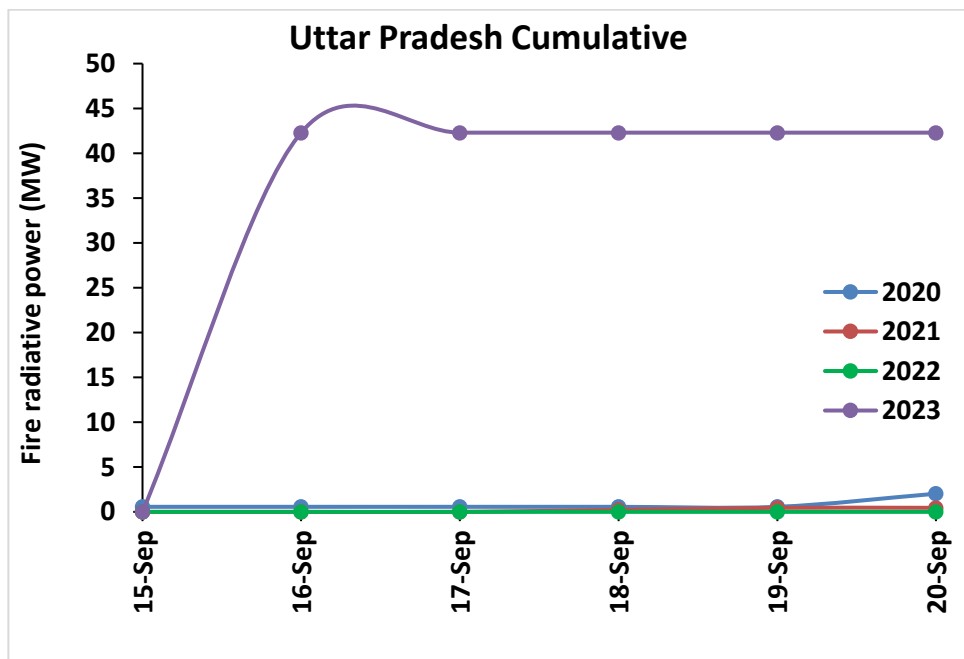
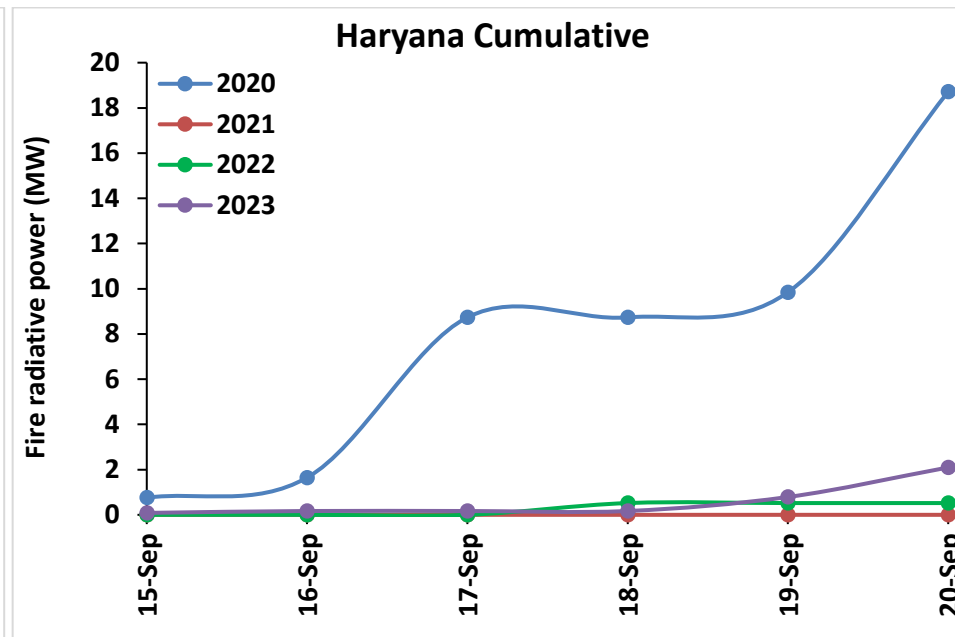
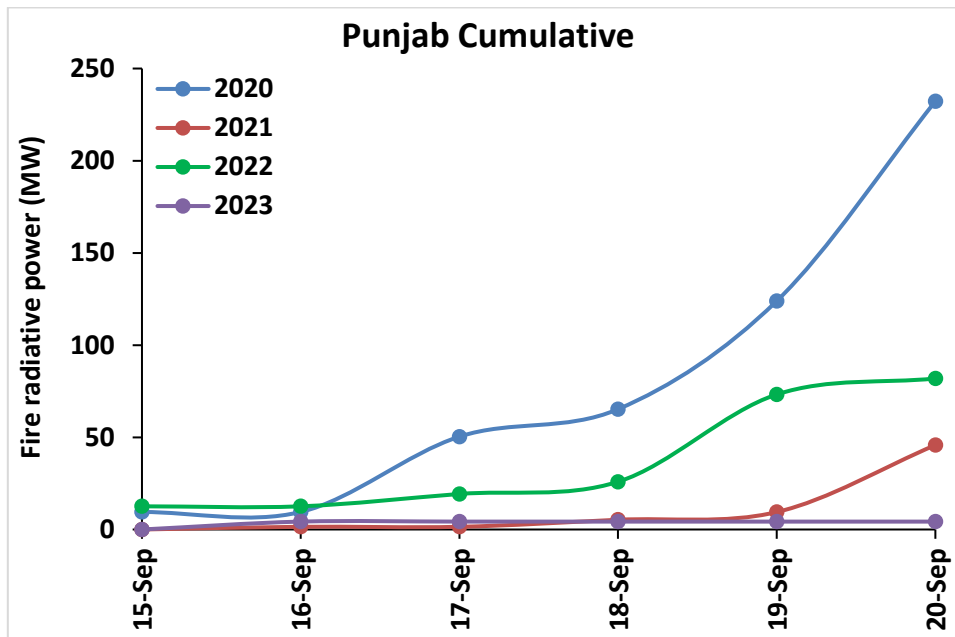


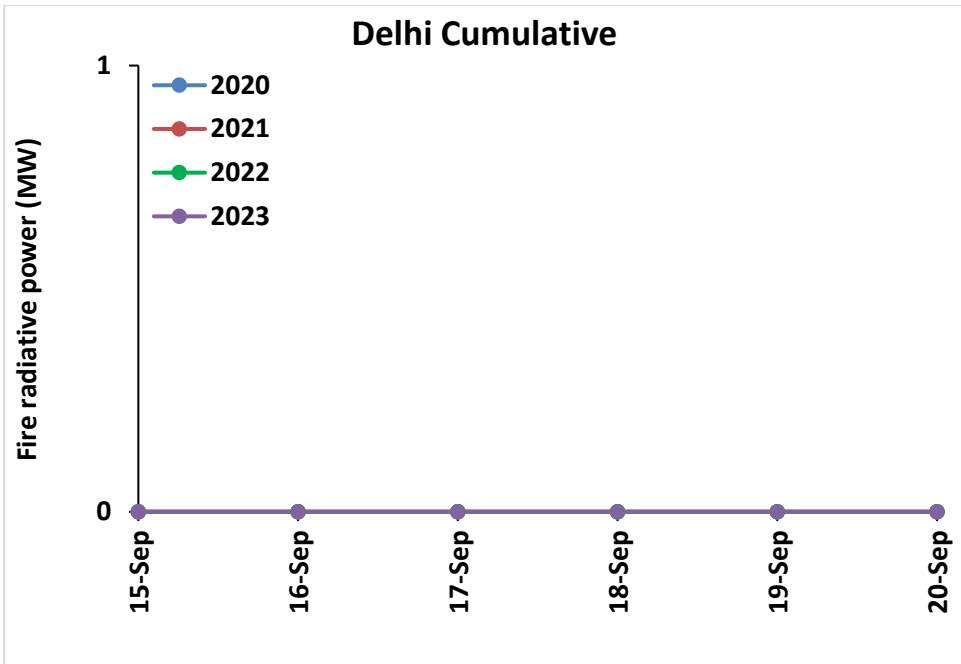
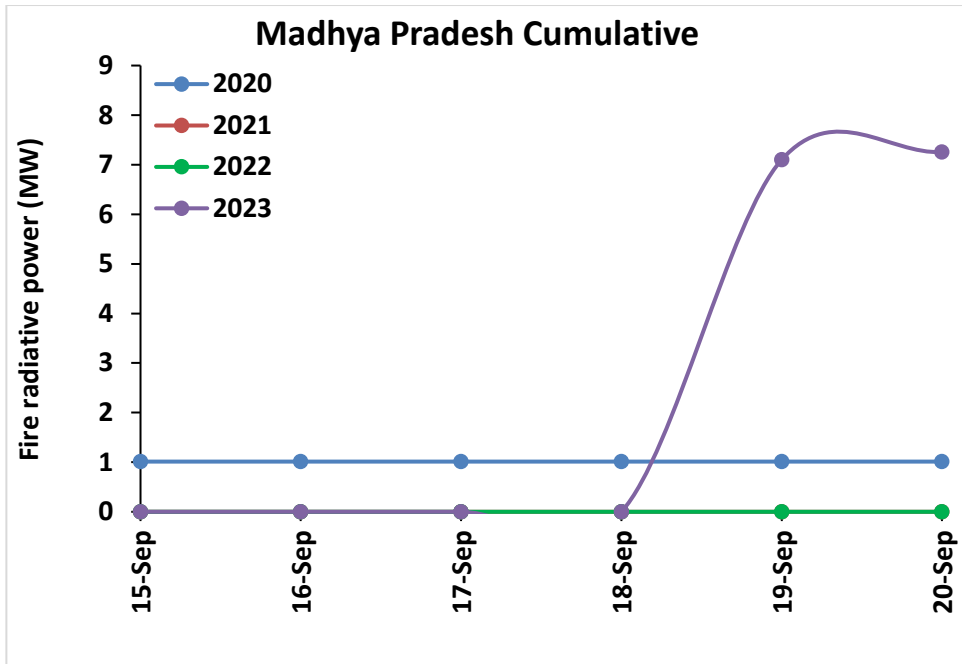
**Comparison of residue burning events in current year (2023) with previous years (2020, 2021 and 2022) for the study States**





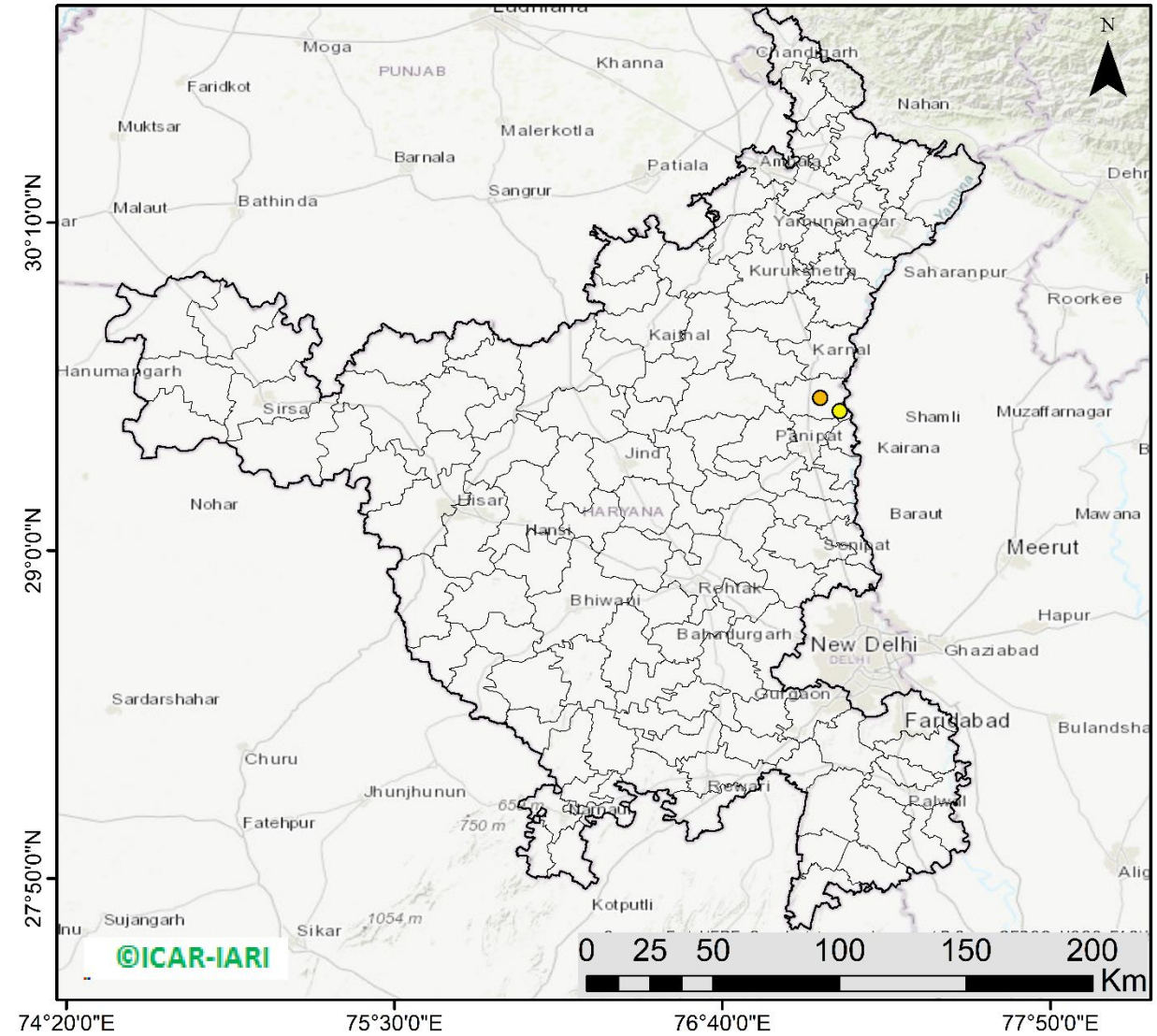
**Comparison of residue burning fire power in current year (2023) with previous years (2020, 2021 and 2022) for the study States**





# Haryana

## RICE RESIDUE BURNING IN HARYANA



**02** burning events  
detected in Haryana on  
(20th Sep 2023)

### Fire Intensity (W/m<sup>2</sup>)

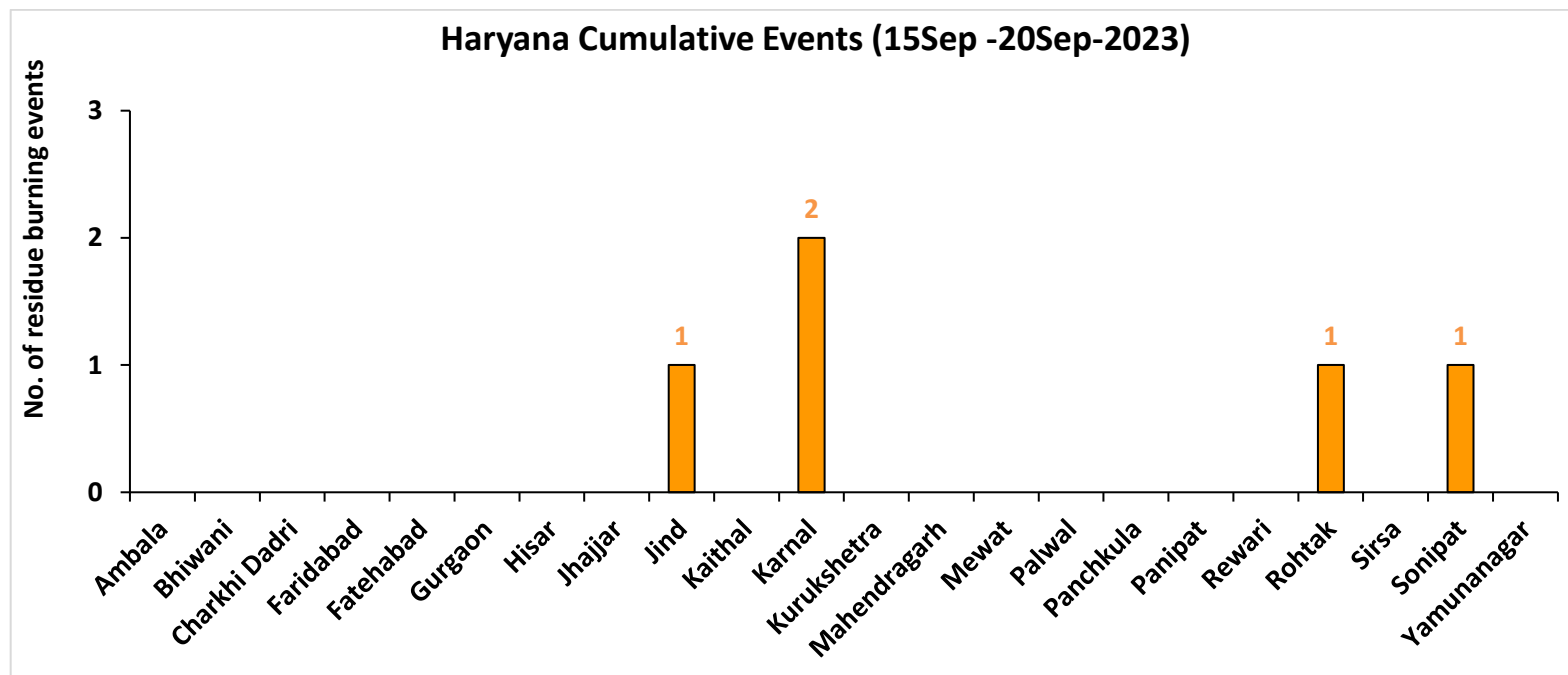
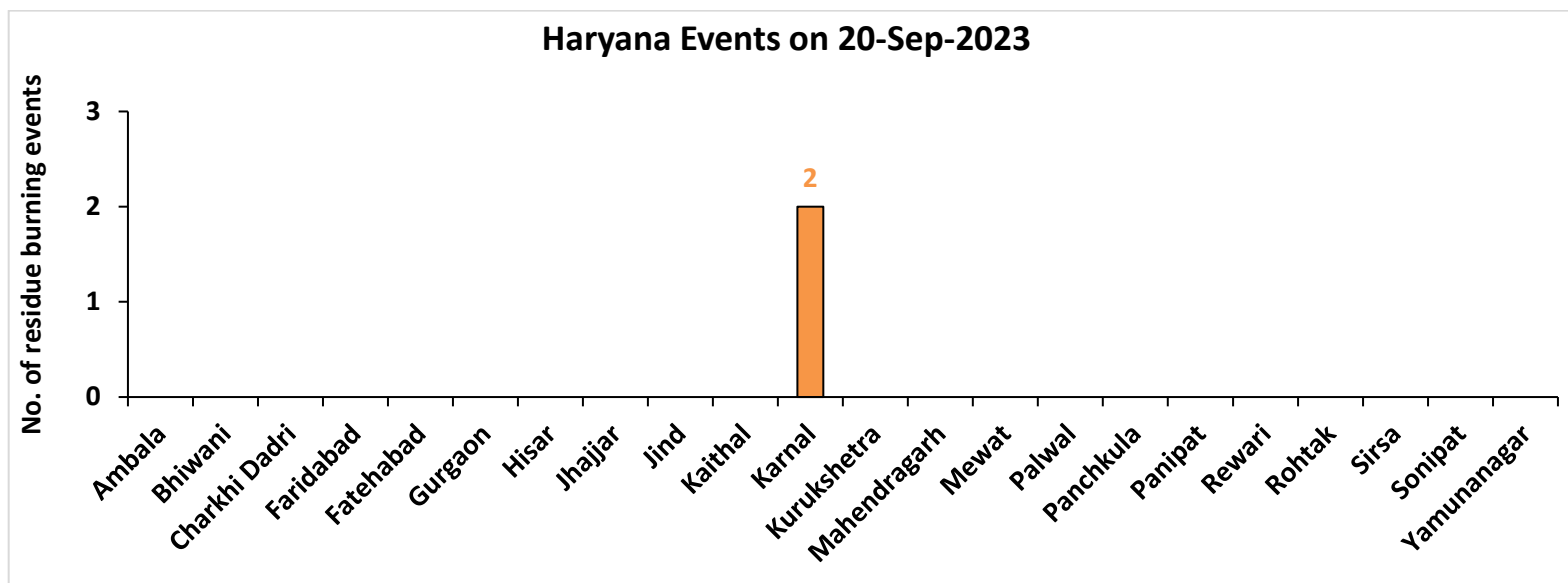
- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



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

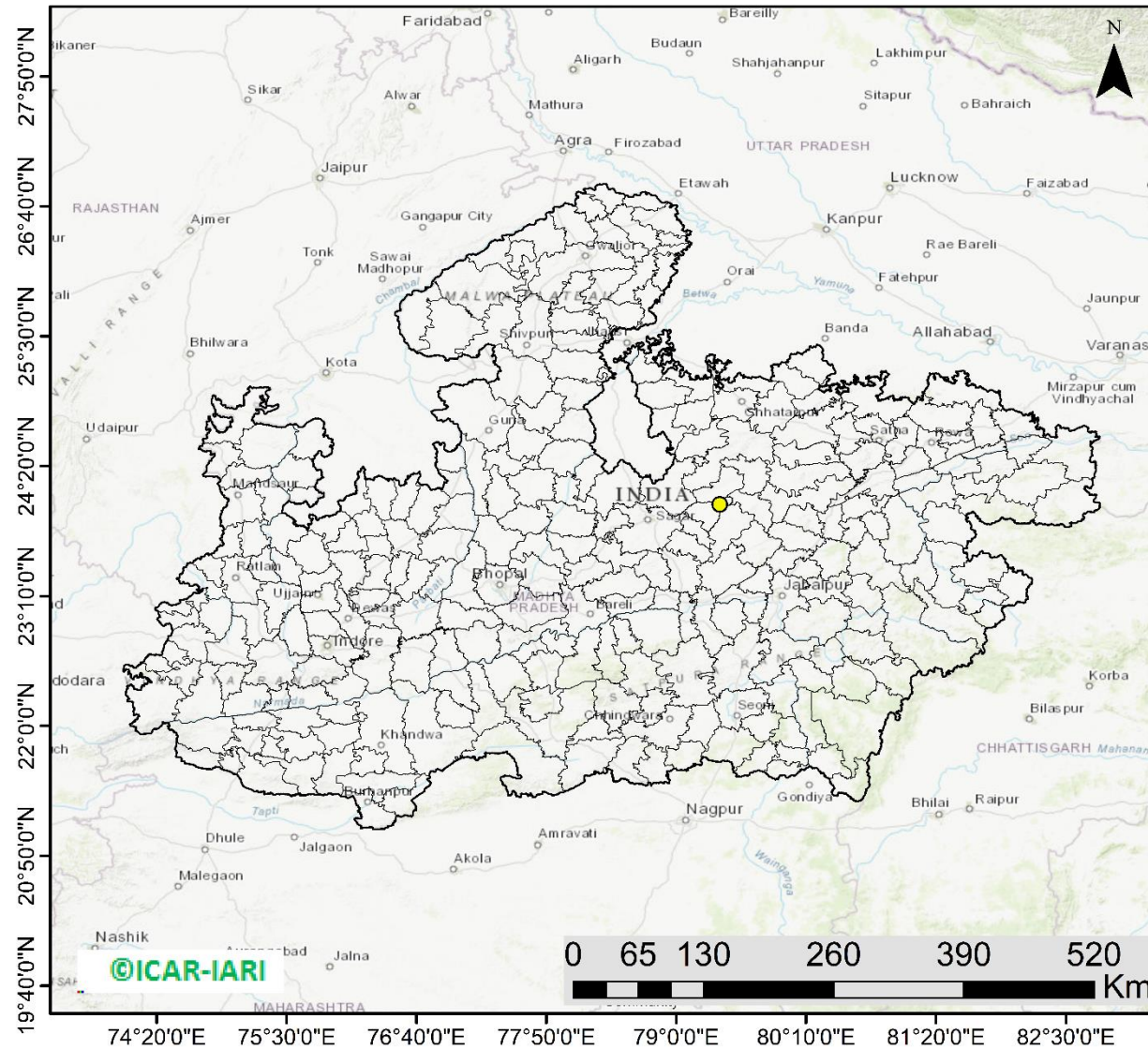


## District-wise cumulative number of residues burning events in Haryana (15Sep-20Sep-2023)



# Madhya Pradesh

## RICE RESIDUE BURNING IN MADHYA PRADESH



**01** burning events detected in MP on (20th Sep 2023)

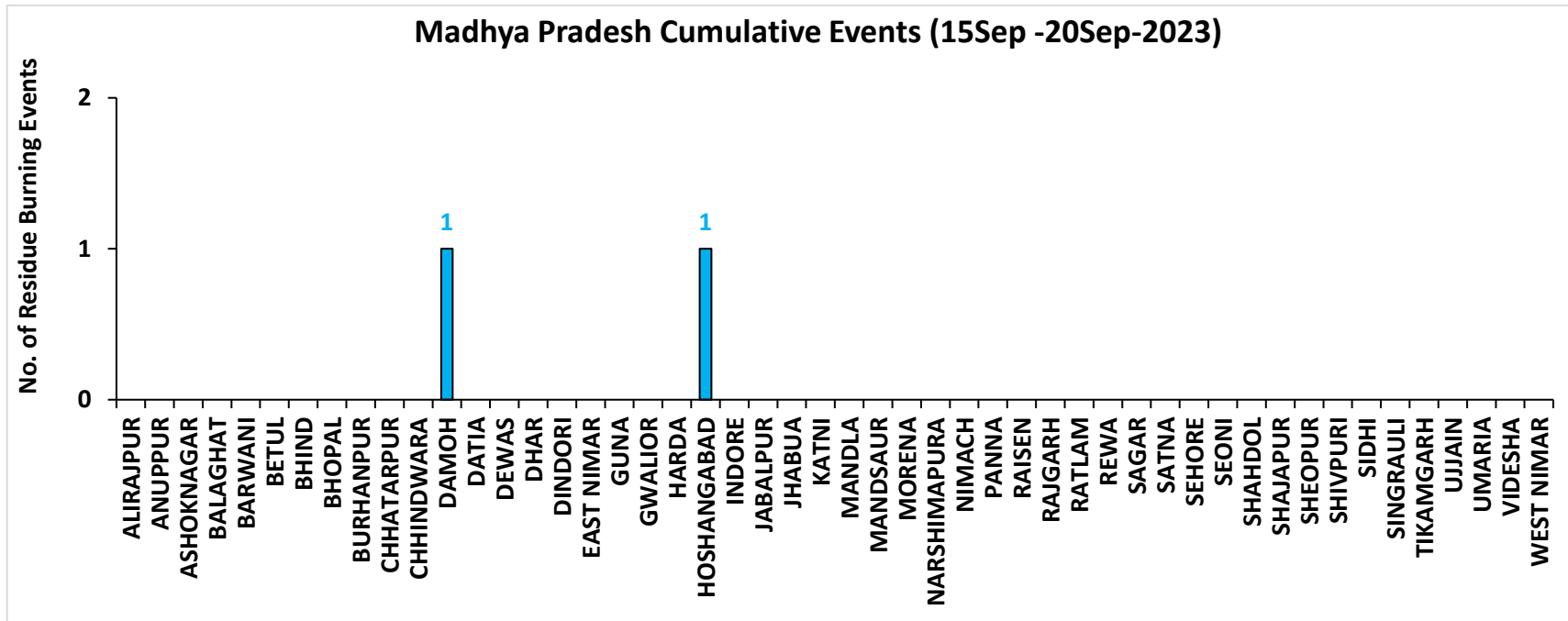
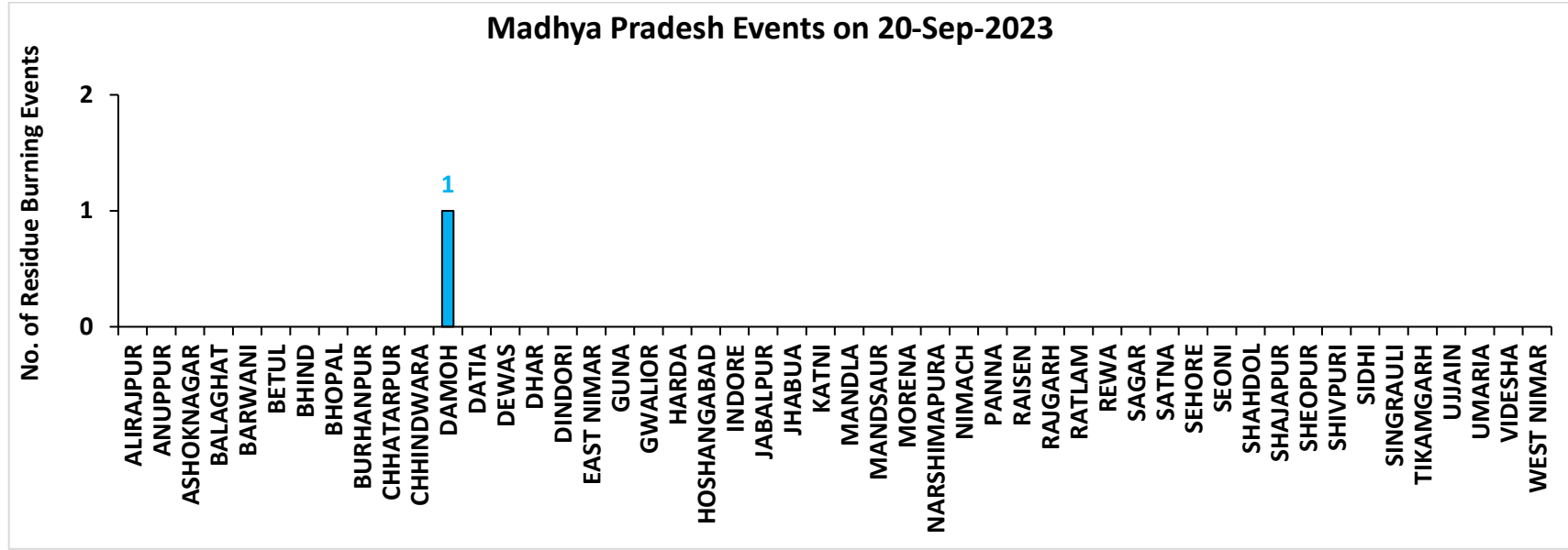
### Fire Intensity (W/m<sup>2</sup>)

- 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-20Sep-2023)**



**District-wise cumulative number of residues burning events detected in 2020, 2021, 2022 and 2023**  
**(Period: 15 September-20 September)**

**(a) Punjab**

District	15 Sep-20 Sep			
	2020	2021	2022	2023
Amritsar	116	19	41	6
Barnala	0	0	0	0
Bathinda	0	0	0	0
Faridkot	0	1	0	0
Fatehgarh Sahib	0	0	0	0
Fazilka	0	0	0	0
Firozpur	0	0	0	0
Gurdaspur	1	0	0	0
Hoshiarpur	0	0	0	0
Jalandhar	0	0	0	0
Kapurthala	0	0	0	0
Ludhiana	2	0	0	0
Mansa	1	0	0	0
Moga	0	0	0	0
Muktsar	1	0	0	0
Pathankot	0	0	0	0
Patiala	0	3	0	0
Rupnagar	0	0	0	0
Sangrur	0	0	0	0
SAS NAGAR (Mohali)	1	0	1	0
SBS Nagar	0	0	1	0
Tarn Taran	2	1	7	0
<b>Total</b>	<b>124</b>	<b>24</b>	<b>50</b>	<b>6</b>

**(b) Haryana**

District	15 Sep-20 Sep			
	2020	2021	2022	2023
AMBALA	2	0	0	0
BHIWANI	0	0	0	0
CHARKHI DADRI	0	0	0	0
FARIDABAD	0	0	0	0
FATEHABAD	1	0	0	0
GURGAON	0	0	0	0
HISAR	0	0	0	0
JHAJJAR	0	0	0	0
JIND	0	0	1	1
KAITHAL	0	0	0	0
KARNAL	8	0	0	2
KURUKSHETRA	2	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
<b>Total</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>5</b>

(c) Uttar Pradesh

District	15 Sep-20 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	1	0	0
AMETHI	0	0	0	0	HAMIRPUR	0	0	0	0	SAMBHAL	0	0	0	0
AMROHA	0	0	0	0	HAPUR	1	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	1	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	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	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	<b>Total</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>2</b>
BULANSAHAR	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-20 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
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

**(e) Rajasthan**

District	15 Sep-20 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
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>

(f) Madhya Pradesh

District	15 Sep-20 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	1	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	2
HOSHANGABAD	0	0	0	1					
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-20 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
<b>Total</b>	<b>124</b>	<b>24</b>	<b>50</b>	<b>6</b>	<b>14</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>3</b>	<b>2</b>	<b>0</b>	<b>2</b>

**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
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>



**Details of residue burning events in Haryana on 20-Sep-2023**

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	KARNAL	GHARAUNDA	S-NPP	29.49567	77.08434	13:04:31	D	4.00
2	KARNAL	GHARAUNDA	S-NPP	29.54264	77.01490	13:04:31	D	5.30

**Details of residue burning events in Madhya Pradesh on 20-Sep-2023**

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	DAMOH	PATHARIA	S-NPP	23.98786	79.39165	01:54:31	N	1.10

**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)

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