

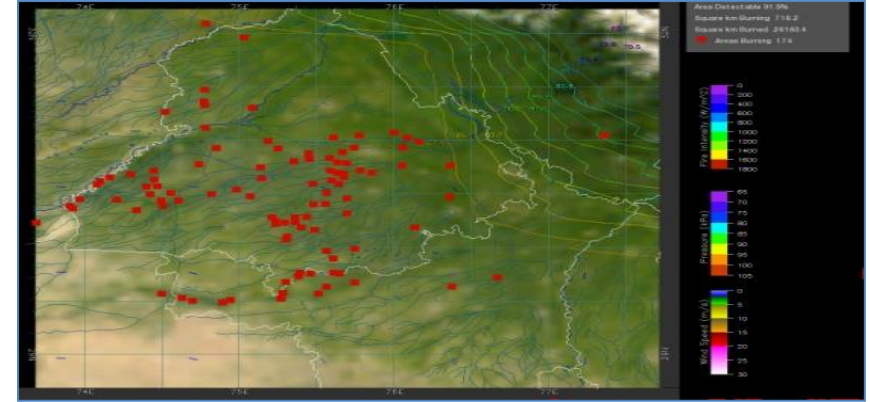
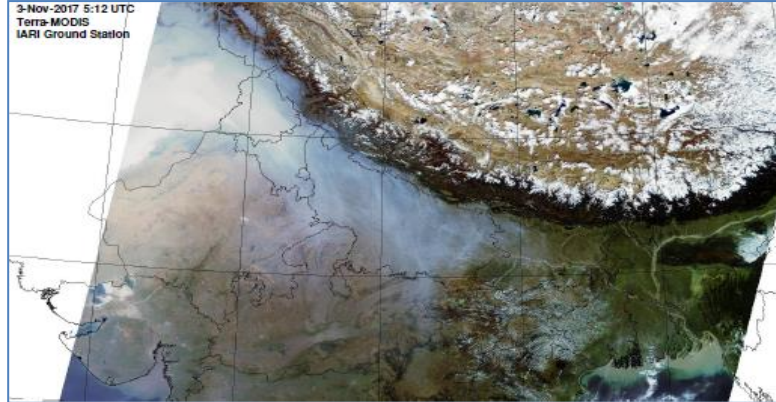


# MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2023

Bulletin  
No. 03

Events Date:  
17-Sep-2023

Issued on:  
17-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

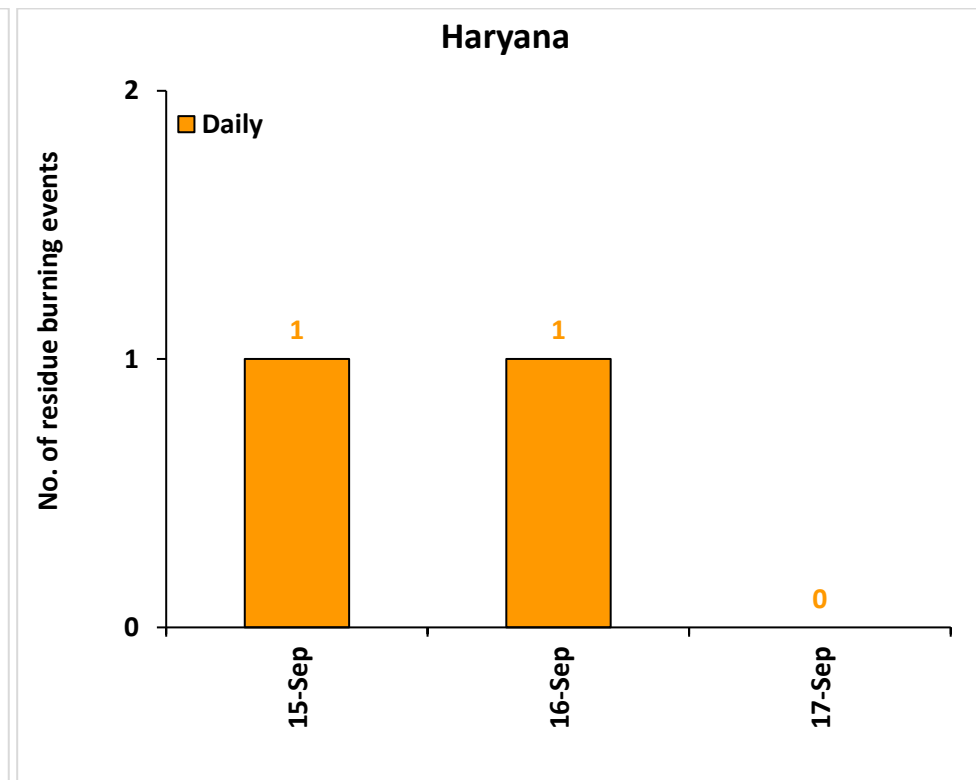
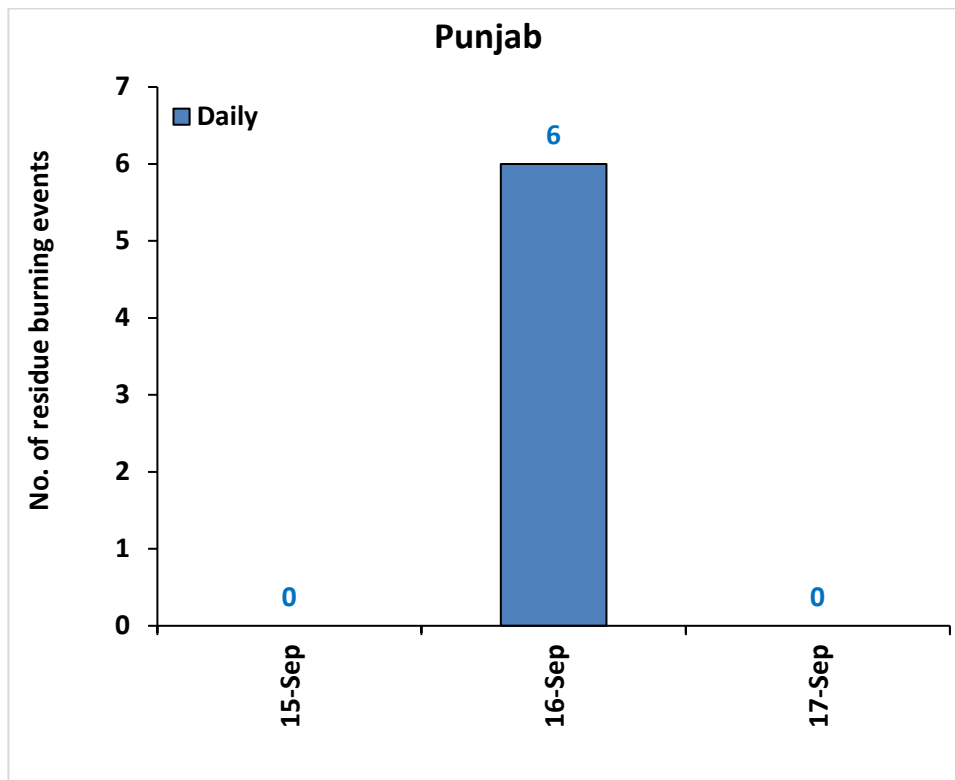
<http://creams.iari.res.in>



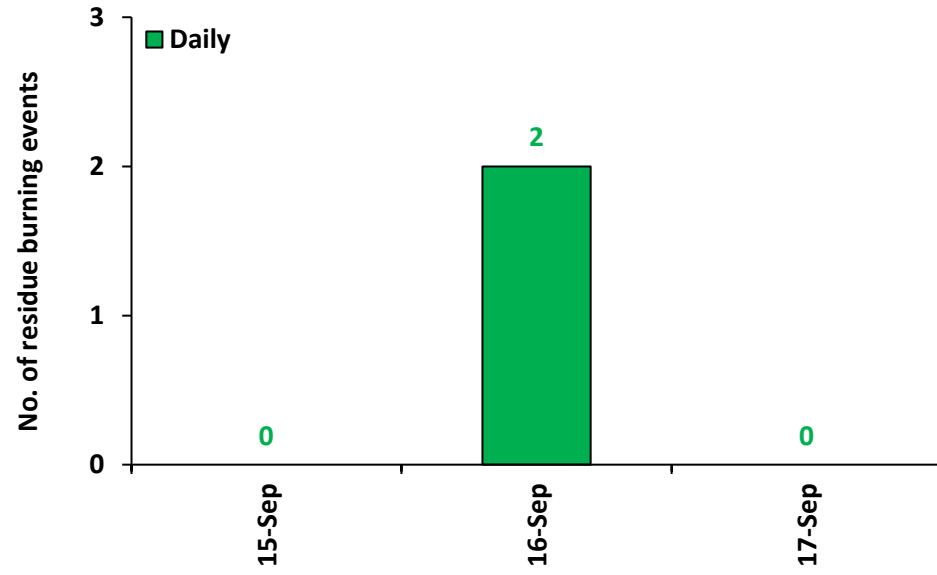
## Highlights for 17-Sep-2023

- 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 **00** residue burning events in the six study States on 17-Sep-2023.
- The state wise events detected on 17-Sep-2023 were **00** in Punjab, **00** in Haryana, **00** 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.

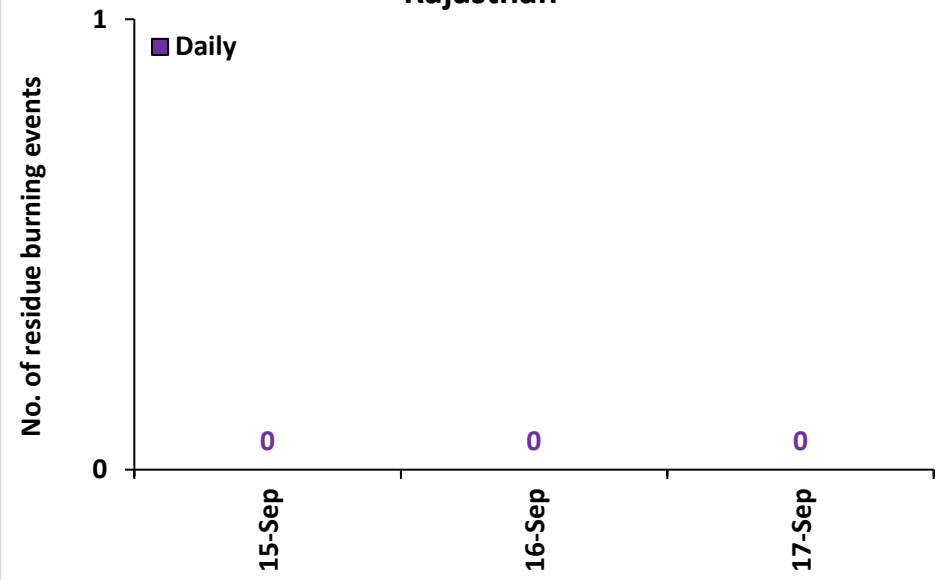
### Temporal distribution of rice residue burning events for the study States in 2023



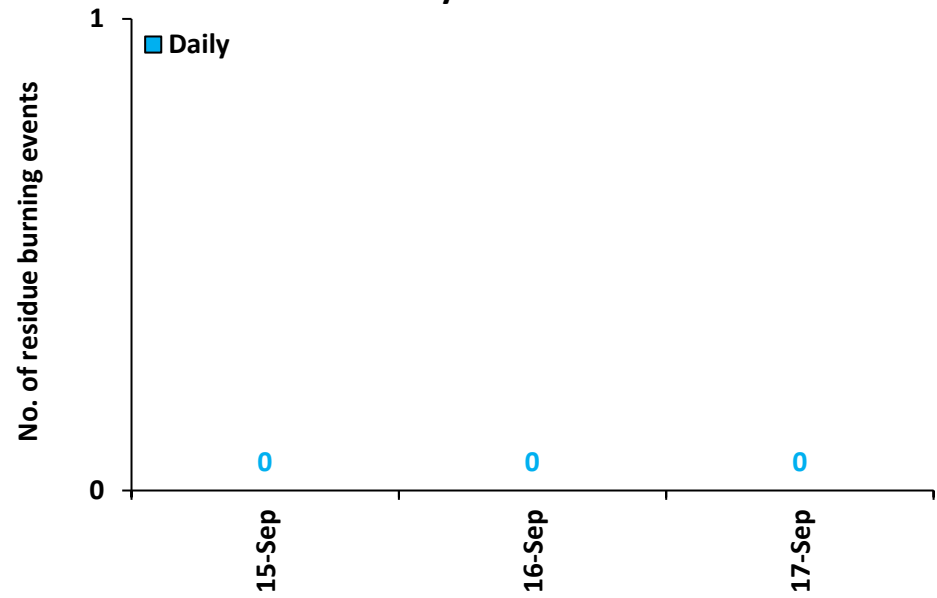
### Uttar Pradesh



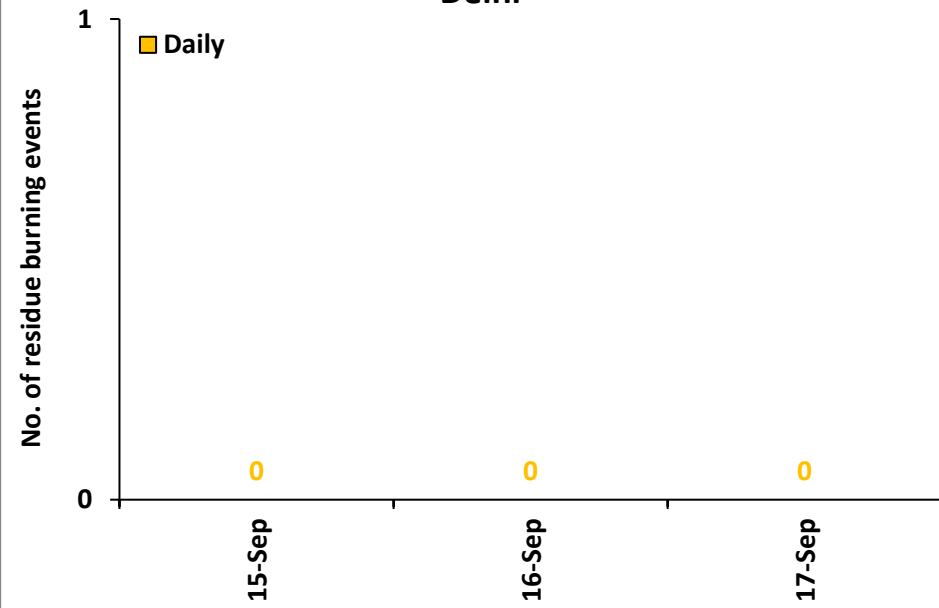
### Rajasthan



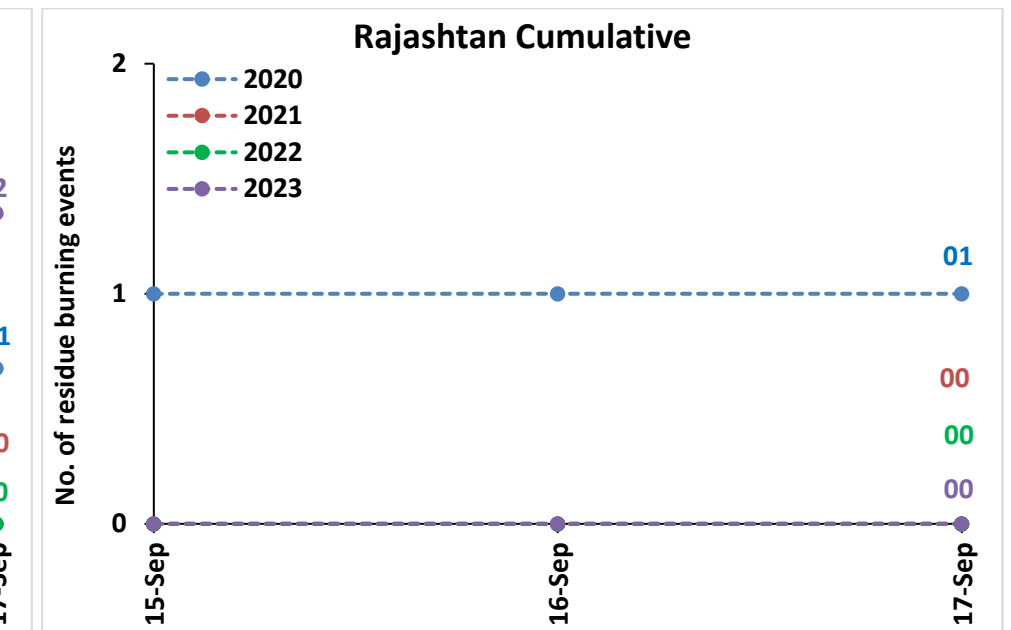
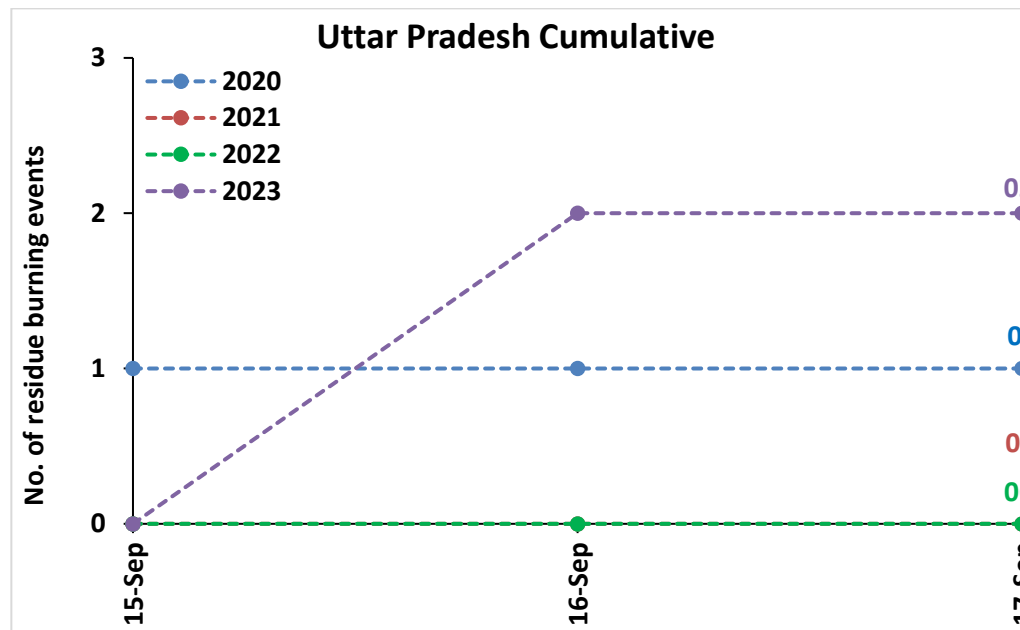
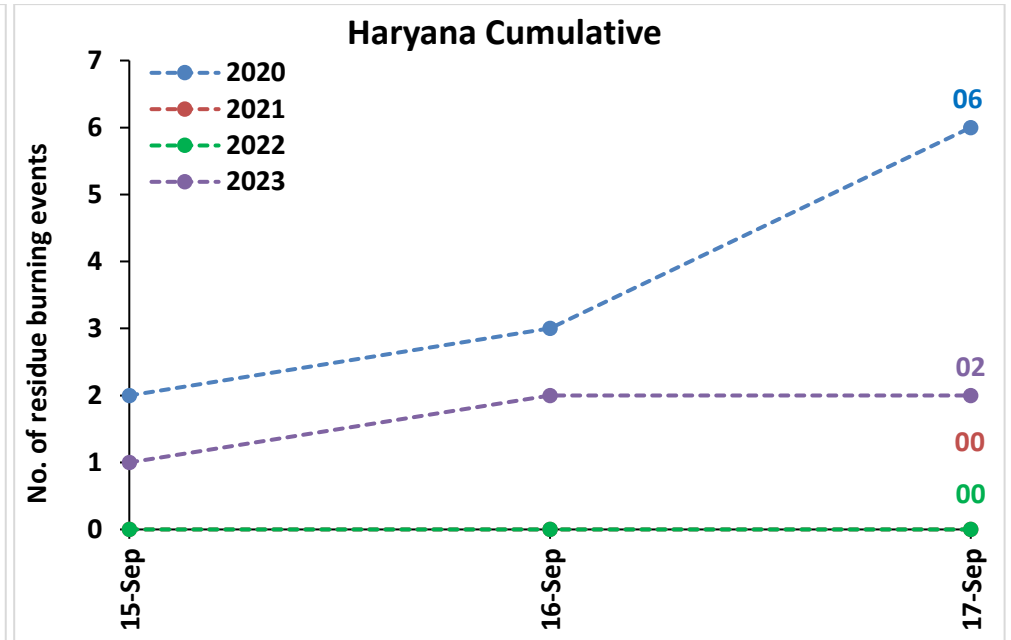
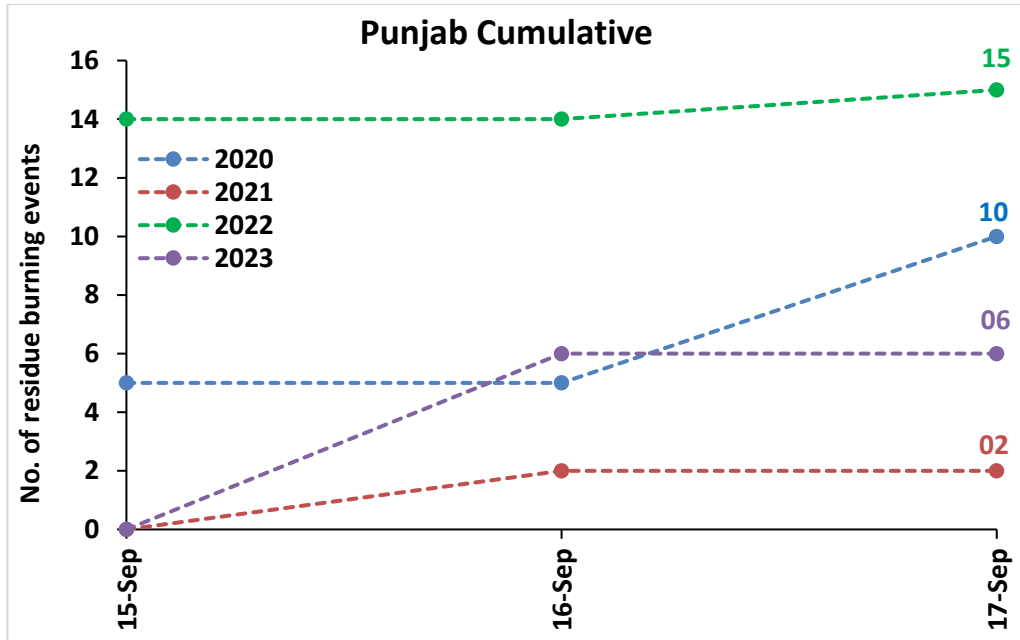
### Madhya Pradesh

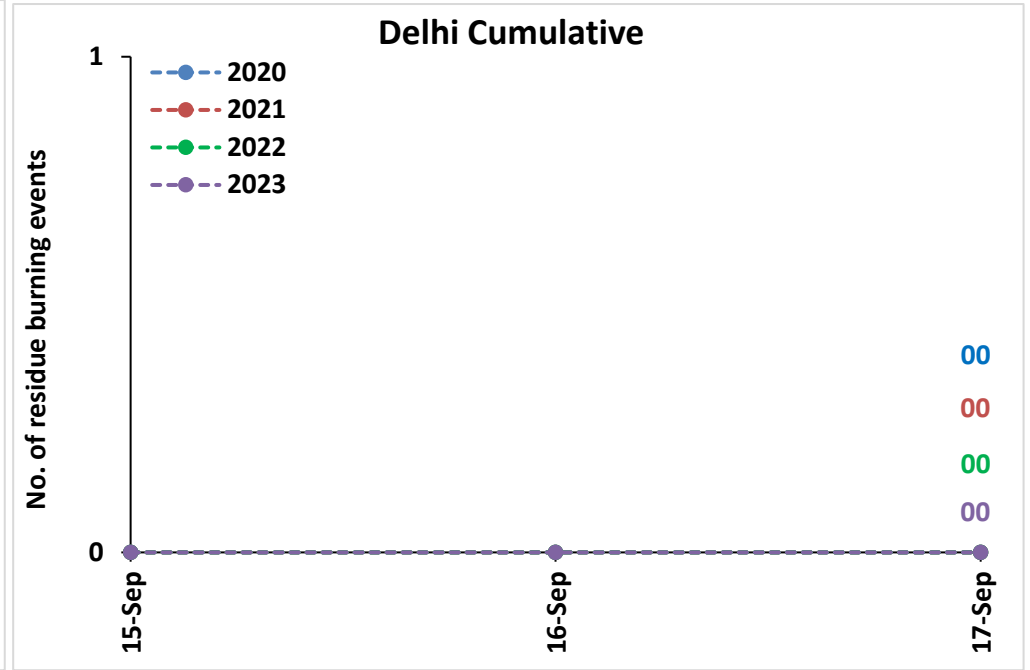
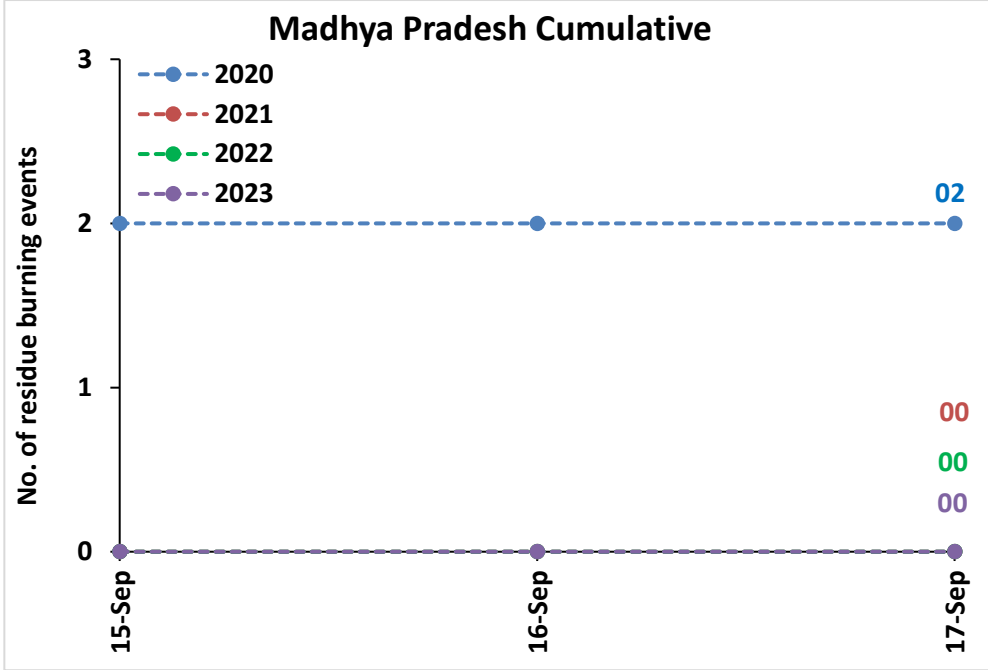


### Delhi

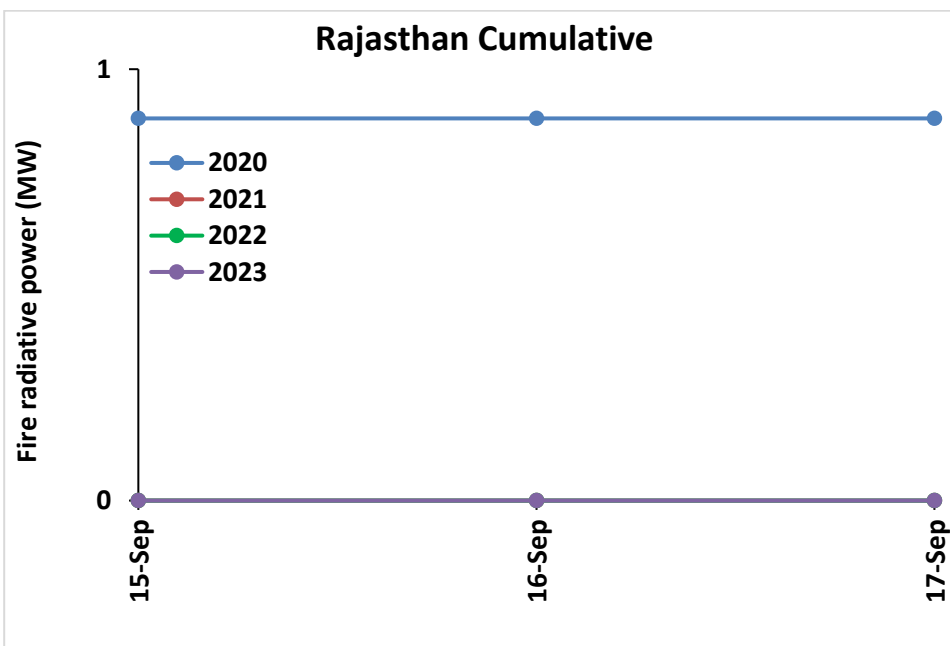
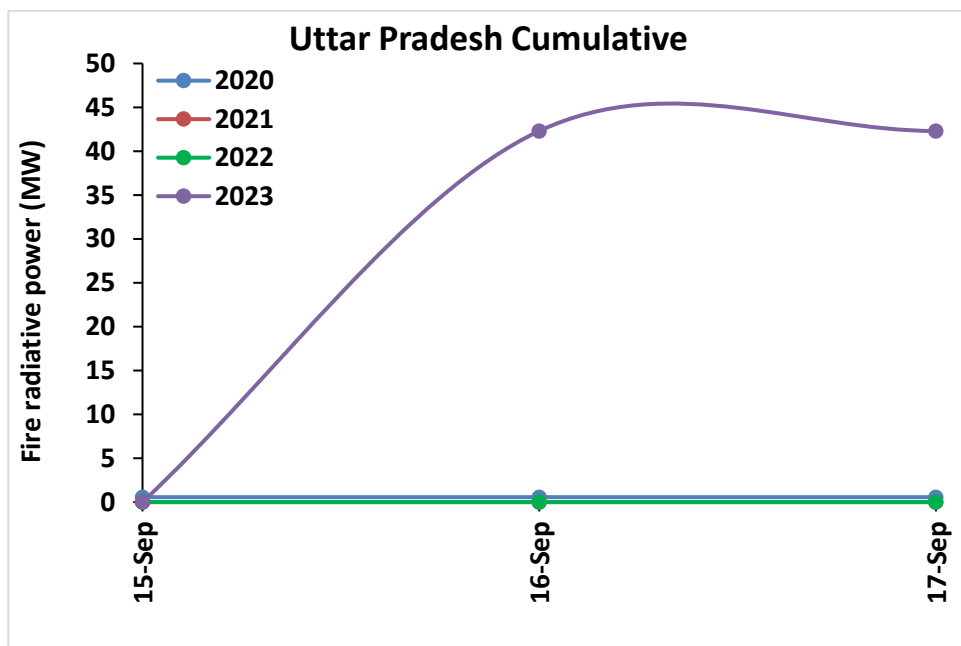
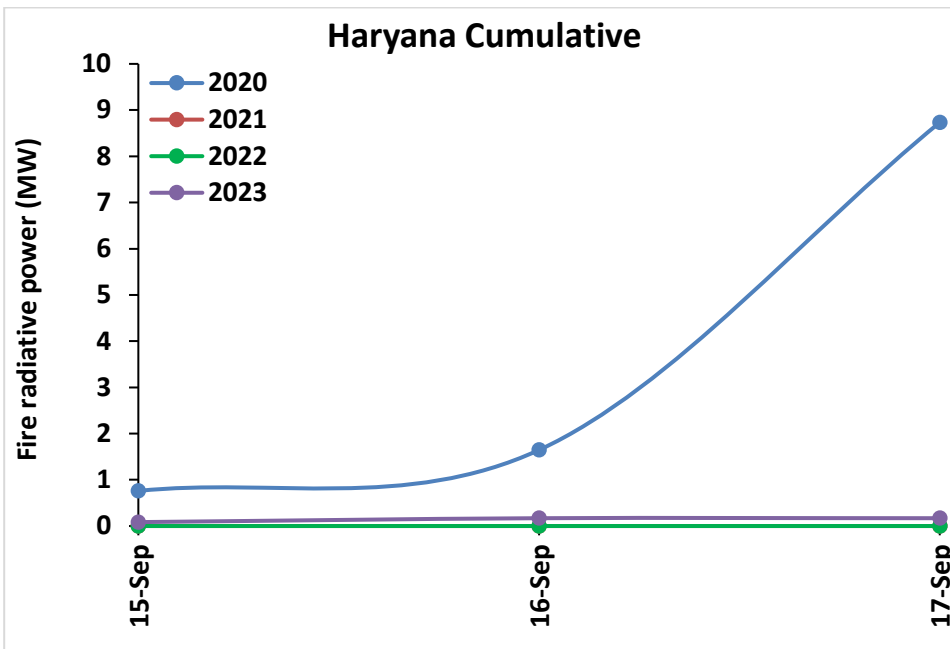
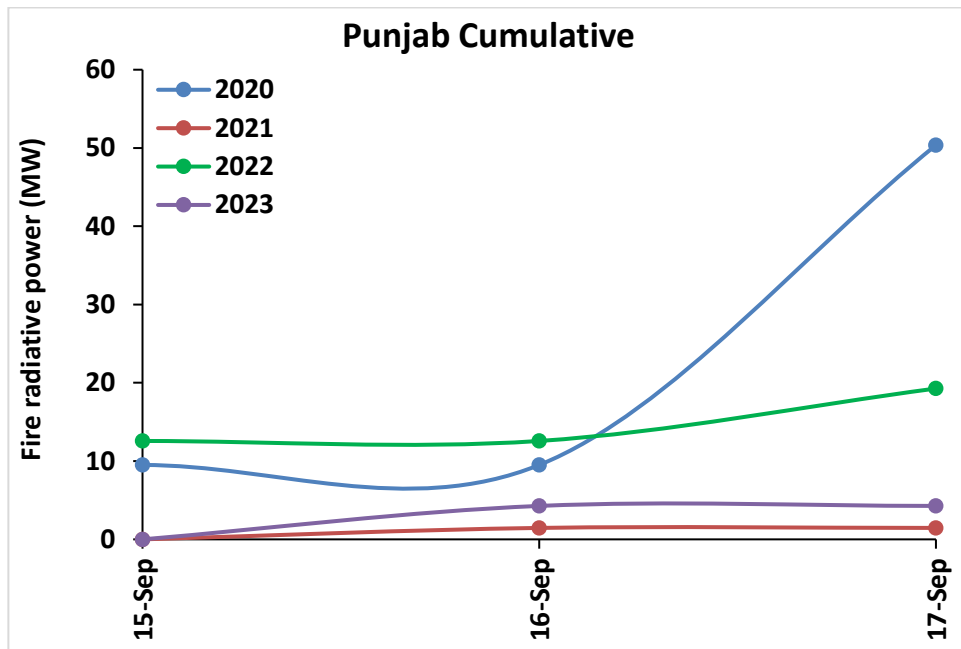


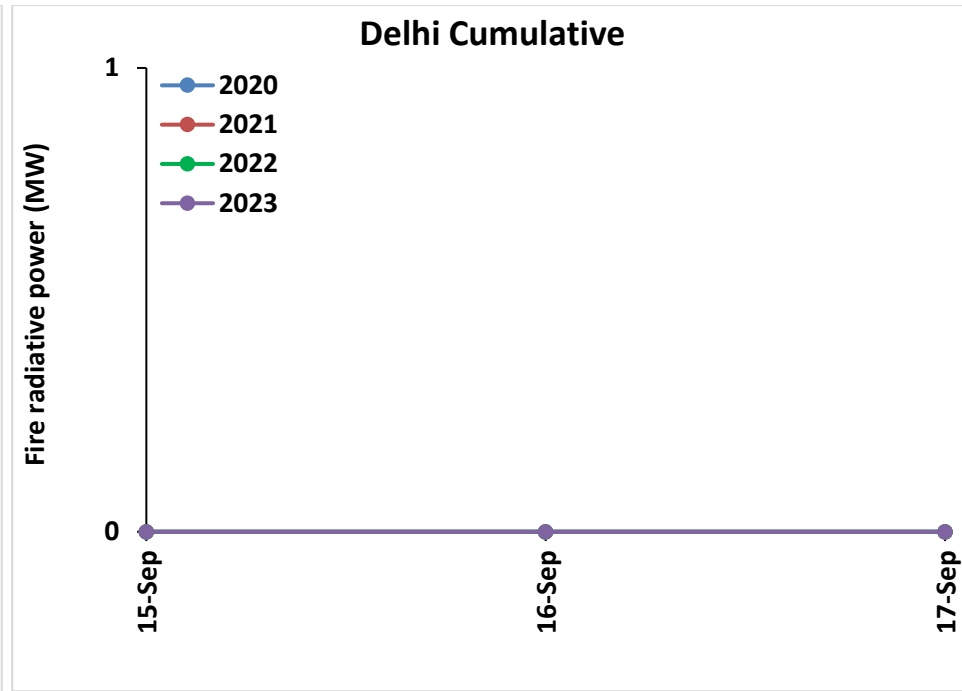
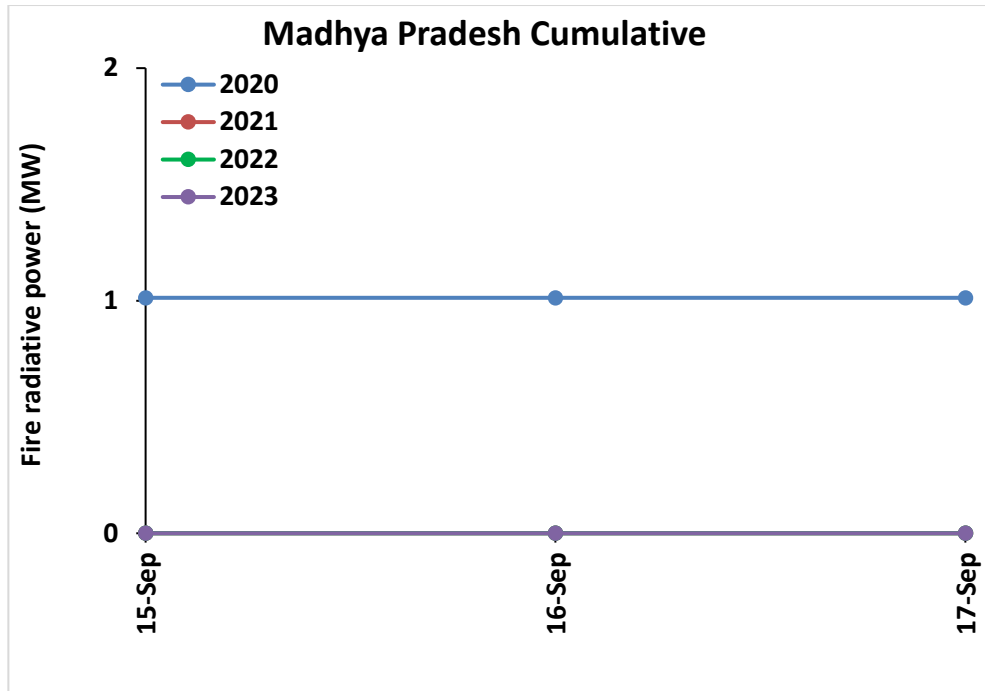
**Comparison of residue burning events in current year (2023) with previous years (2020, 2021 and 2022) for the study States**





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





**District-wise cumulative number of residues burning events detected in 2020 ,2021 ,2022 and 2023**  
**(Period: 15 September-17 September)**

**(a) Punjab**

District	15 Sep-17 Sep			
	2020	2021	2022	2023
Amritsar	10	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	1	0
SBS Nagar	0	0	0	0
Tarn Taran	0	0	3	0
<b>Total</b>	<b>10</b>	<b>2</b>	<b>15</b>	<b>6</b>

**(b) Haryana**

District	15 Sep-17 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	5	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
<b>Total</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>2</b>



(c) Uttar Pradesh

District	15 Sep-17 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	<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>2</b>
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-17 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-17 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-17 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-17 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
<b>Total</b>	<b>10</b>	<b>2</b>	<b>15</b>	<b>6</b>	<b>6</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>1</b>	<b>0</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
<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>0</b>

**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**

ICAR - IARI	<b>Dr V.K. Sehgal</b>	Pr. Scientist & Nodal Officer	<a href="mailto:iaricreams@gmail.com">iaricreams@gmail.com</a>
	Dr Rajkumar Dhakar	Scientist	<a href="mailto:rajdhakar.iari@gmail.com">rajdhakar.iari@gmail.com</a>
	Mr Mohd Jahangir	Lab Assistant (KRISHI)	<a href="mailto:mjahangir198@gmail.com">mjahangir198@gmail.com</a>
ICAR - ATARI	Dr Parvender Sheoran	Director ATARI (Zone-I) Ludhiana	<a href="mailto:zcu1ldh@gmail.com">zcu1ldh@gmail.com</a>
	Dr. J.P. Mishra	Director ATARI (Zone-II) Jodhpur	<a href="mailto:jp.mishra67@gov.in">jp.mishra67@gov.in</a>
	Dr S.K. Dubey	Director ATARI (Zone-III) Kanpur	<a href="mailto:zpdicarkanpur@gmail.com">zpdicarkanpur@gmail.com</a>
ICAR - IASRI	Dr Rajender Parsad	Director	<a href="mailto:rajender.parsad@icar.gov.in">rajender.parsad@icar.gov.in</a>

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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