



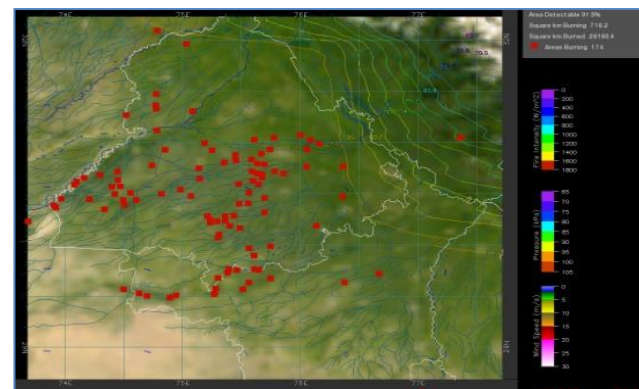
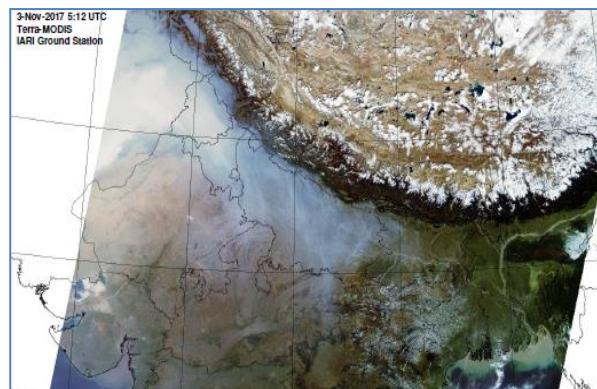
## Bulletin No. 16

Events Date:  
30-Sep-2022

Issued on:  
30-Sep-2022



# MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2022



Prepared by:

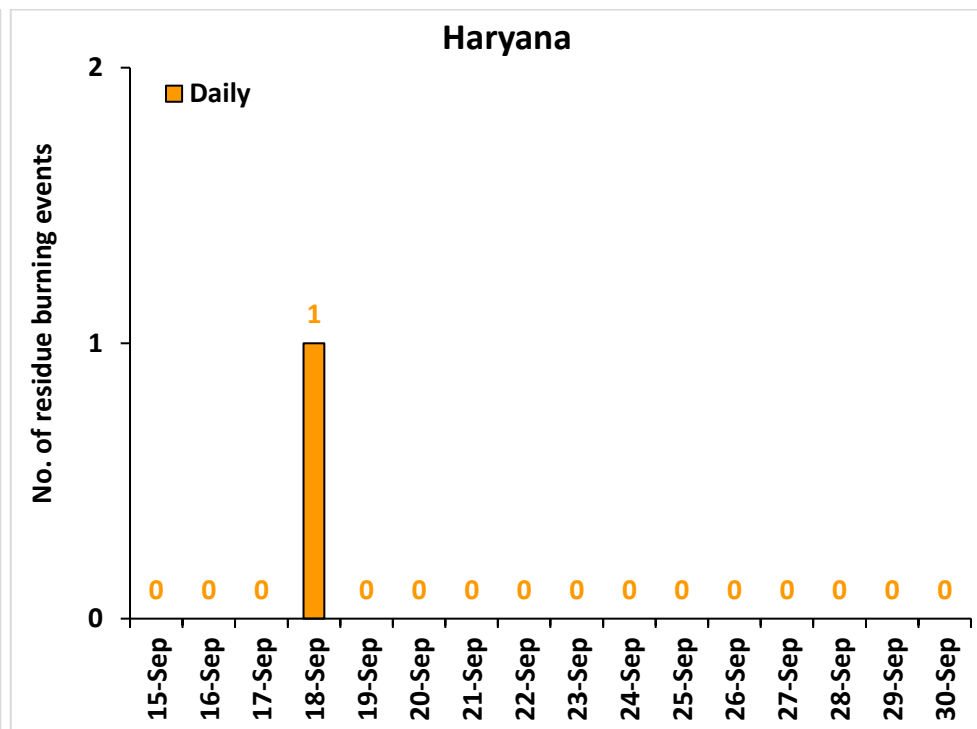
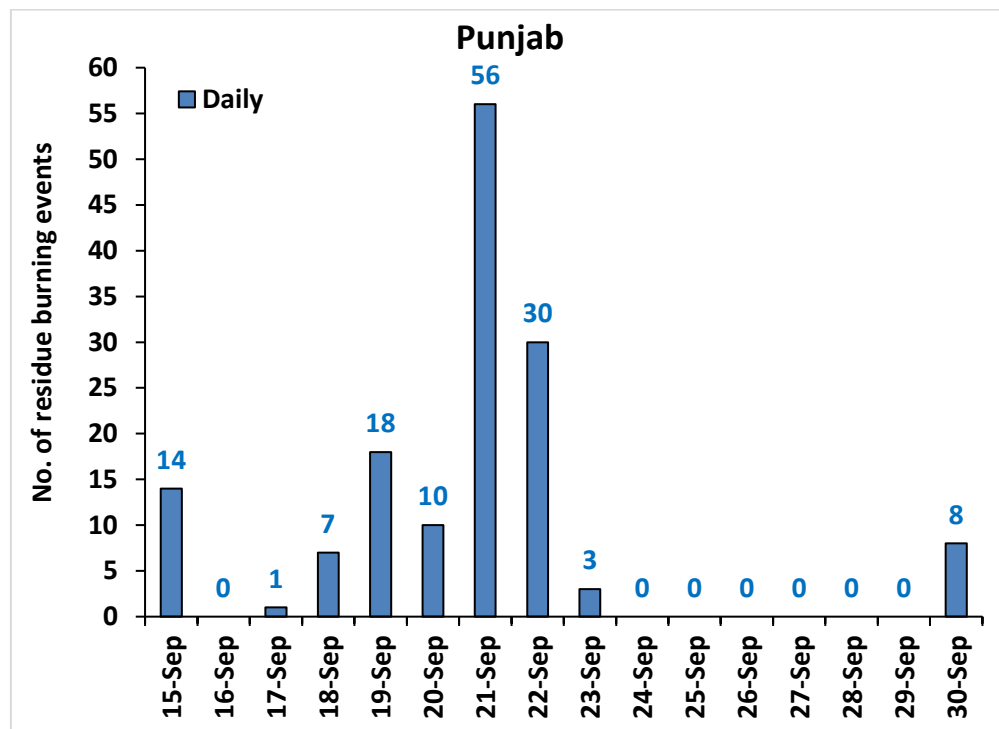
Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,  
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

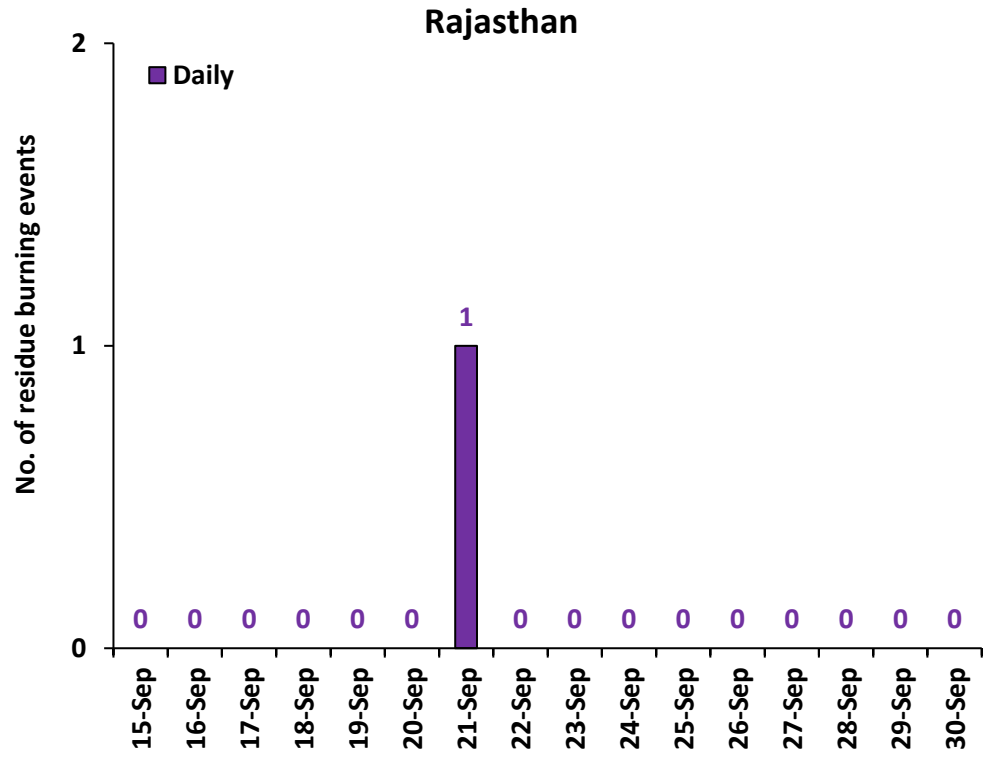
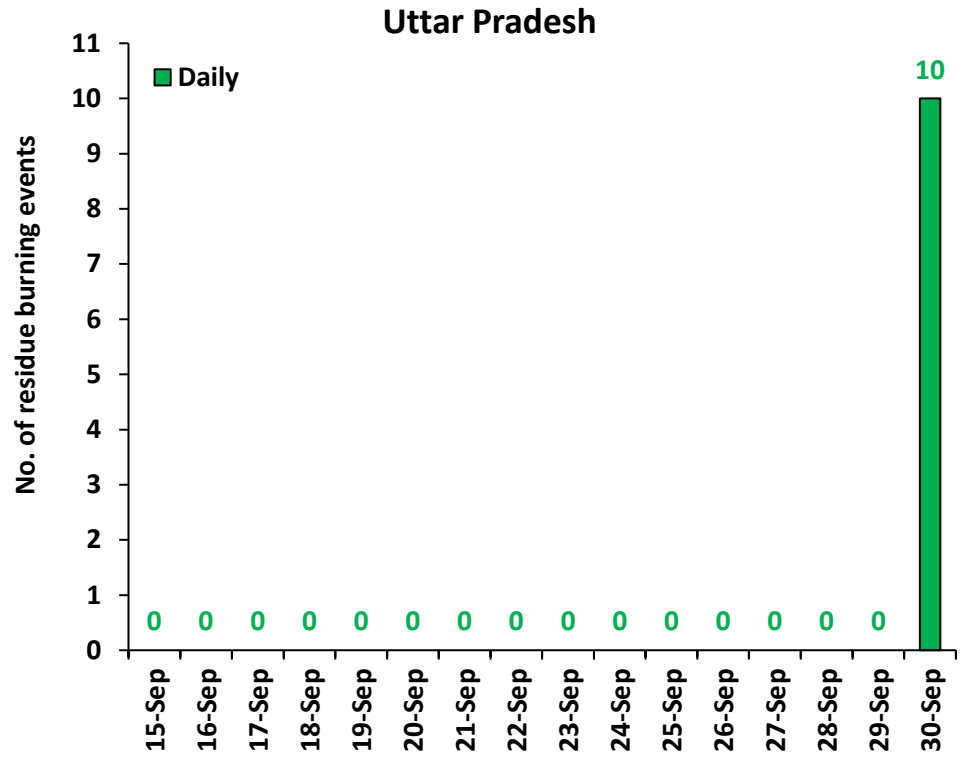
<http://creams.iari.res.in>

## Highlights for 30-Sep-2022

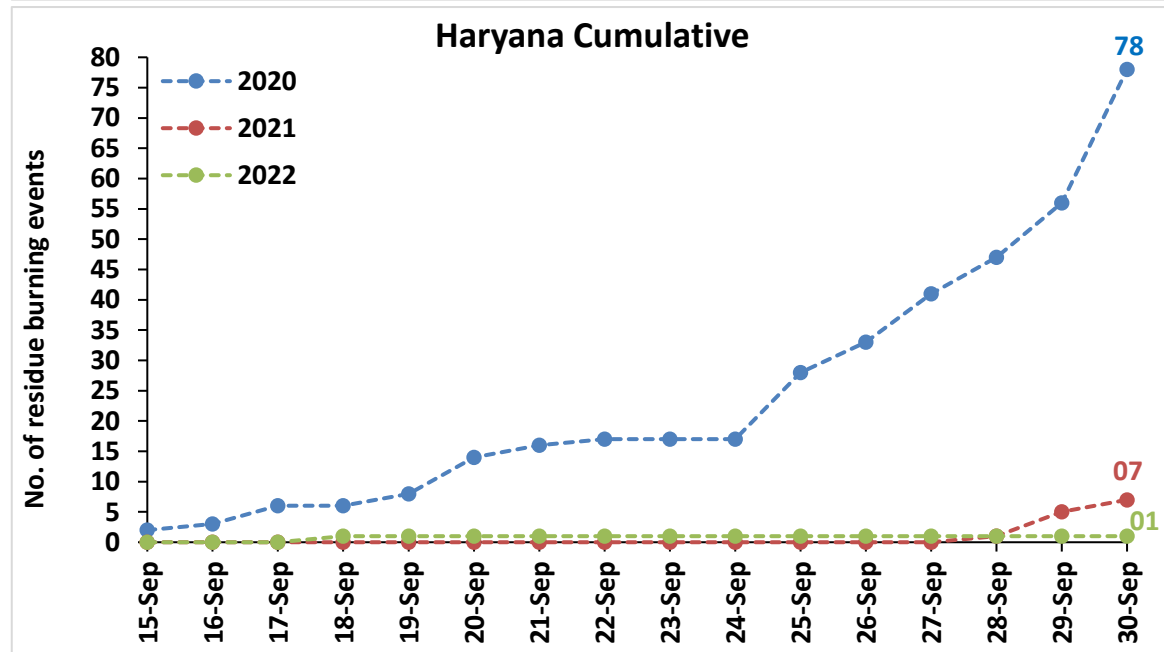
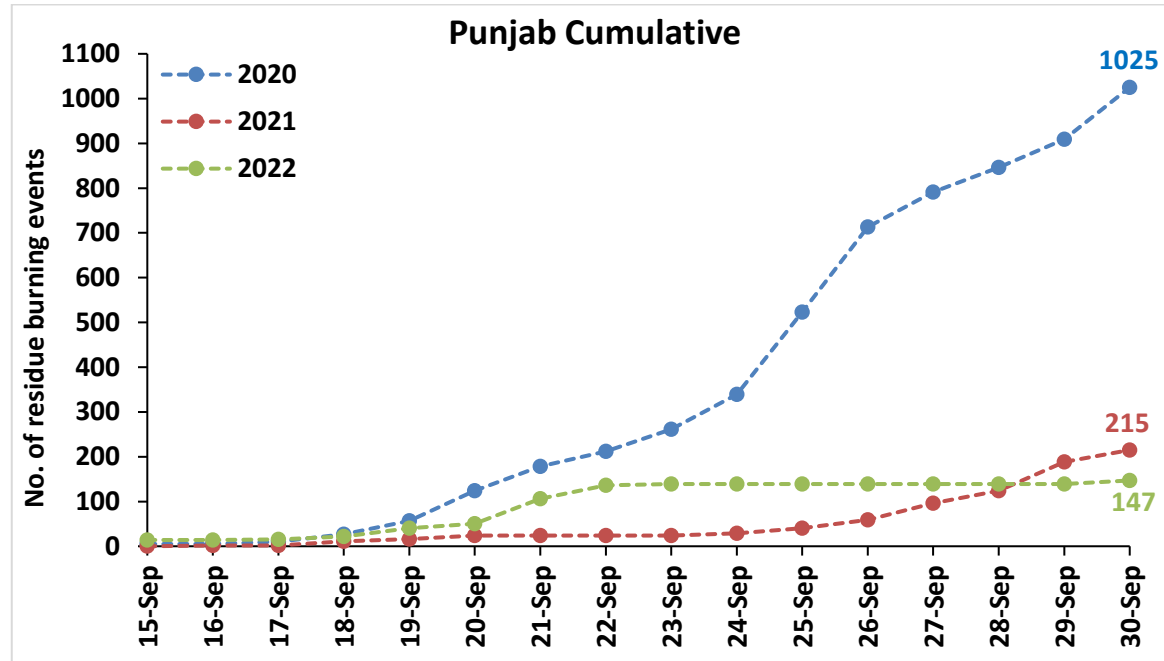
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **18** residue burning events in the six study States on 30-Sep-2022.
- The state wise events detected on 30-Sep-2022 were **8** in Punjab, **0** in Haryana, **10** in UP, **0** in Delhi, **0** in Rajasthan and **0** in MP.
- Total **159** burning events were detected in the six states between 15-Sep-2022 and 30-Sep-2022, which are distributed as **147**, **1**, **10**, **0**, **1** and **0** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.

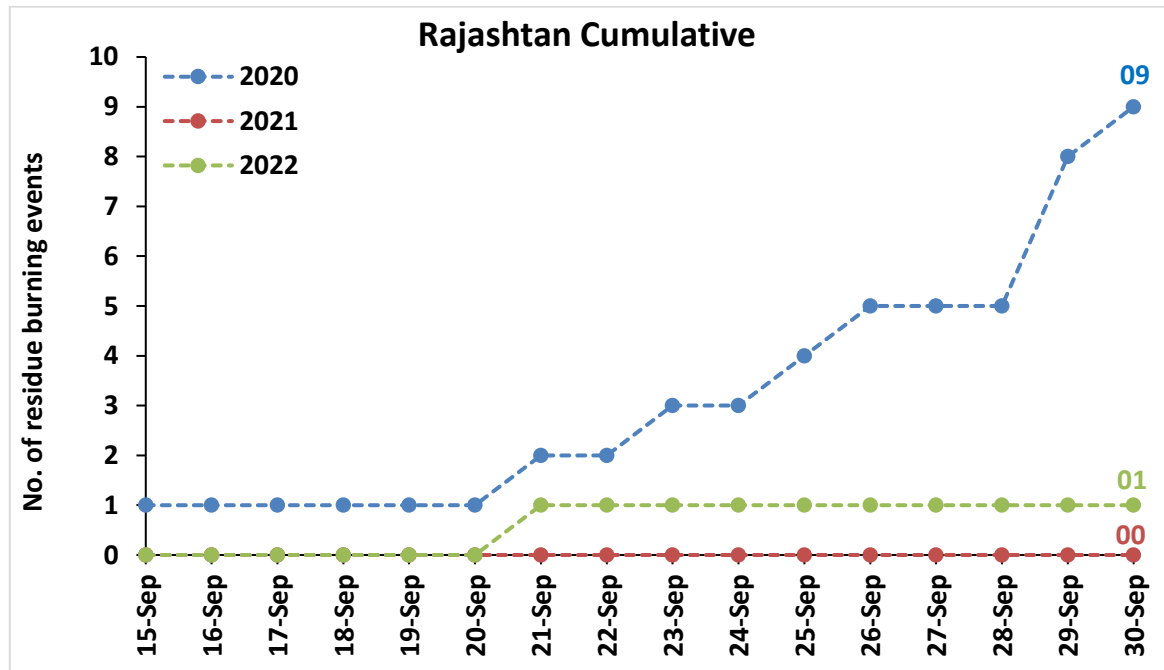
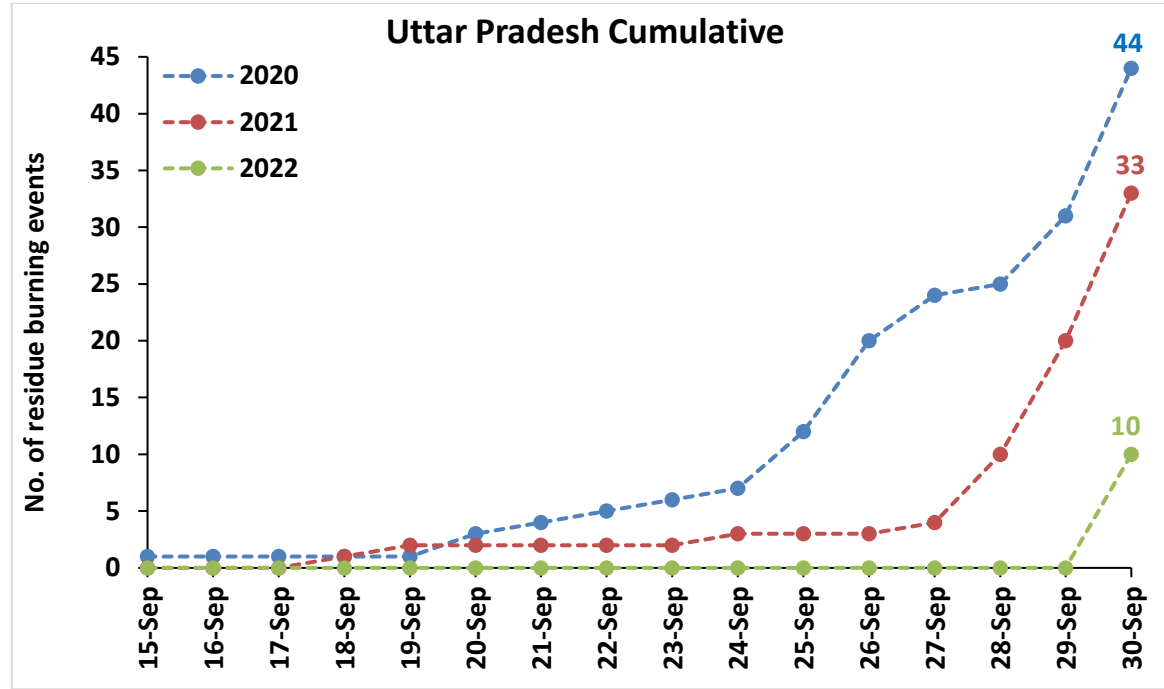
### Temporal distribution of rice residue burning events for the study States in 2022

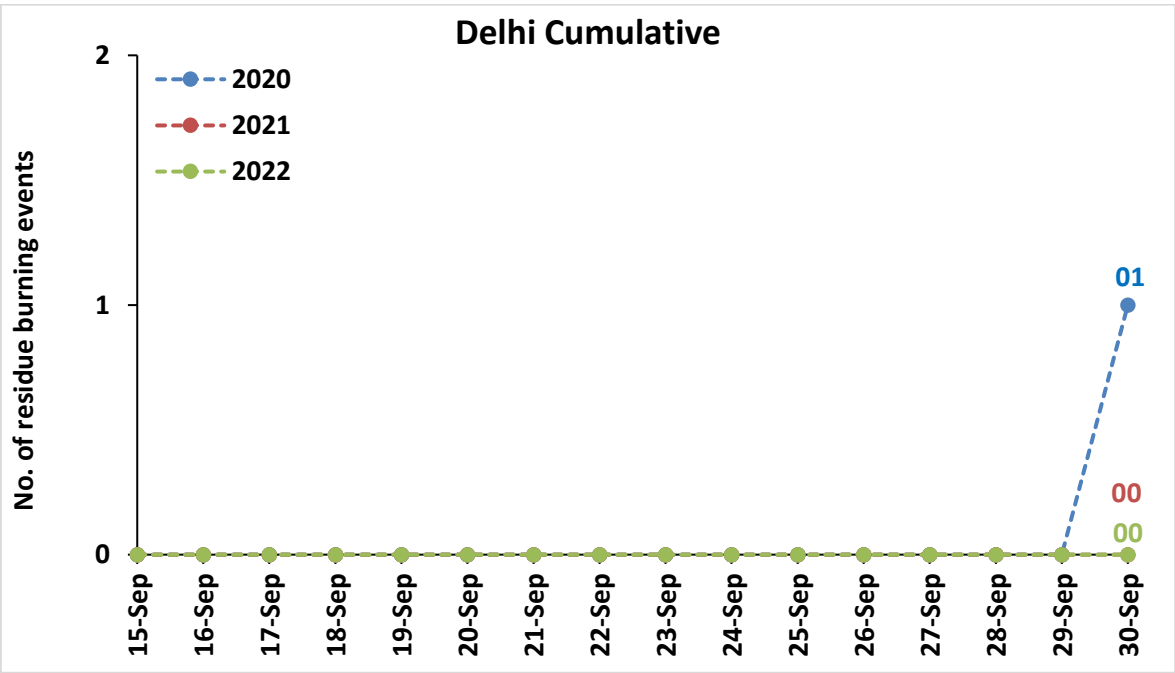
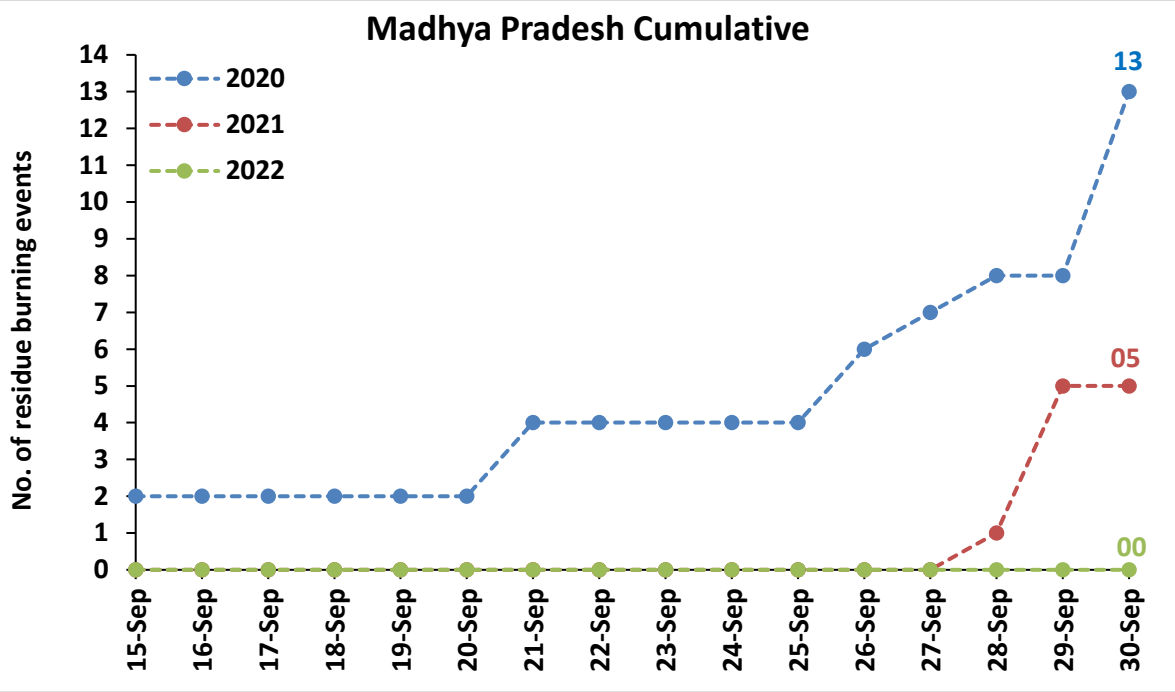




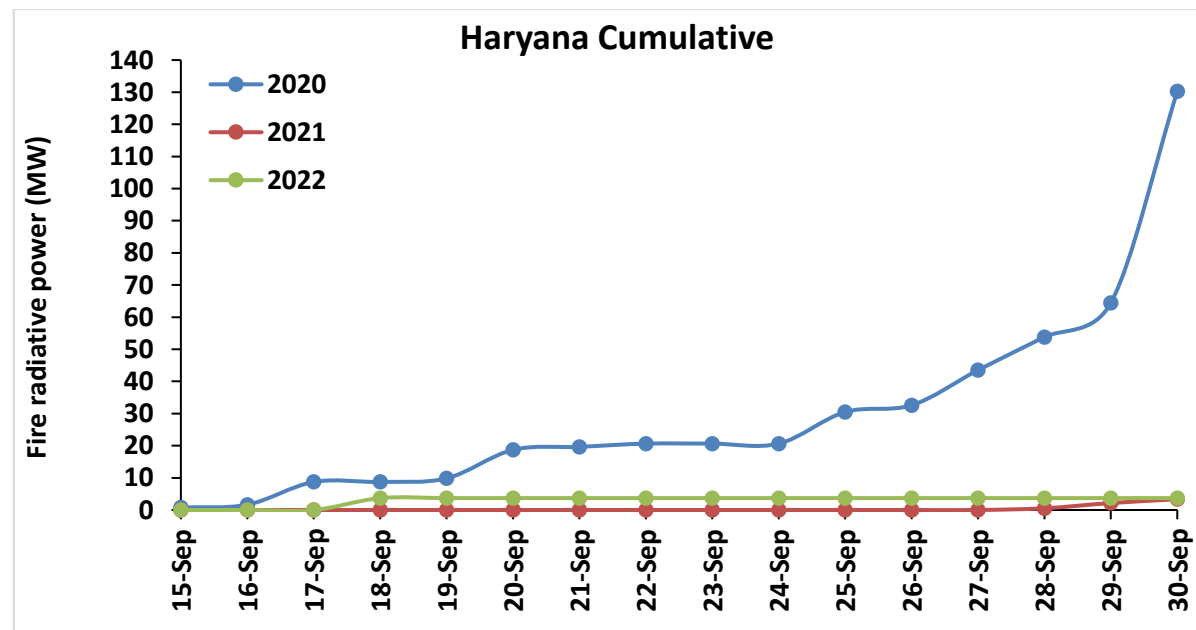
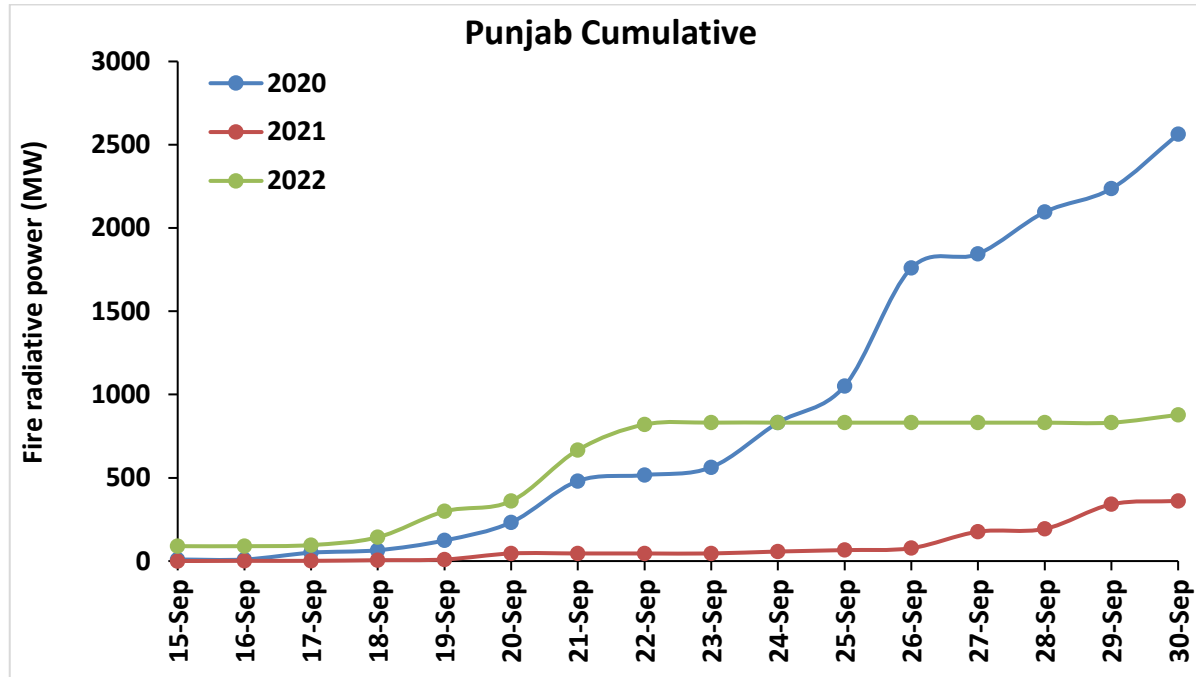
**Comparison of residue burning events in current year (2022) with previous years (2020 and 2021) for the study States**

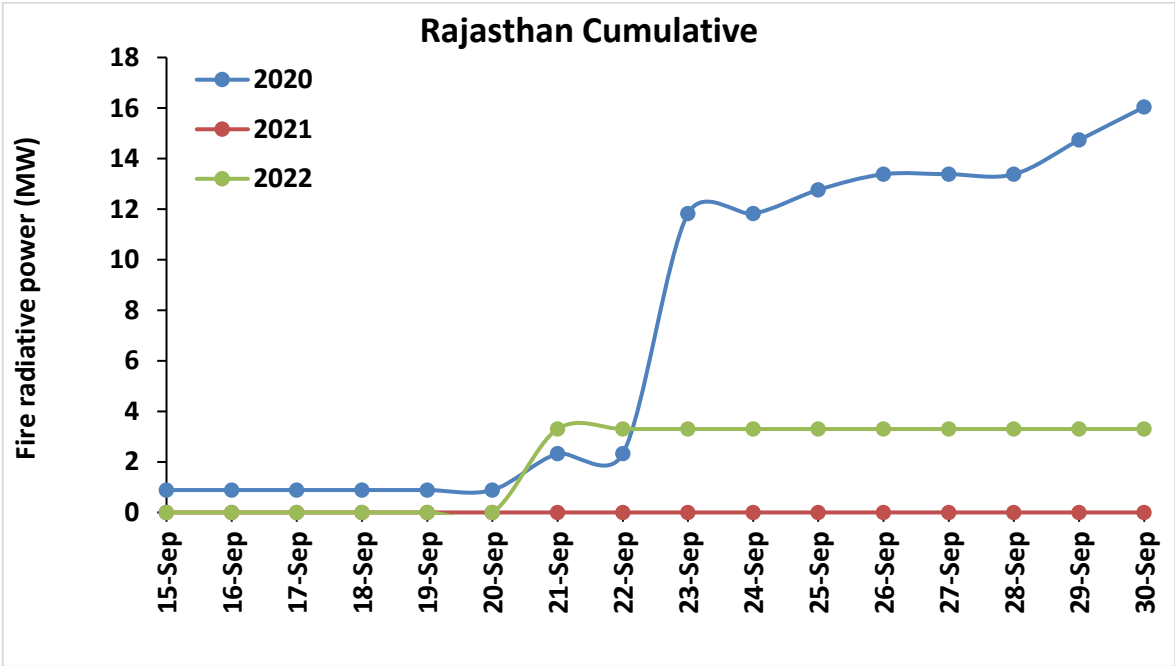
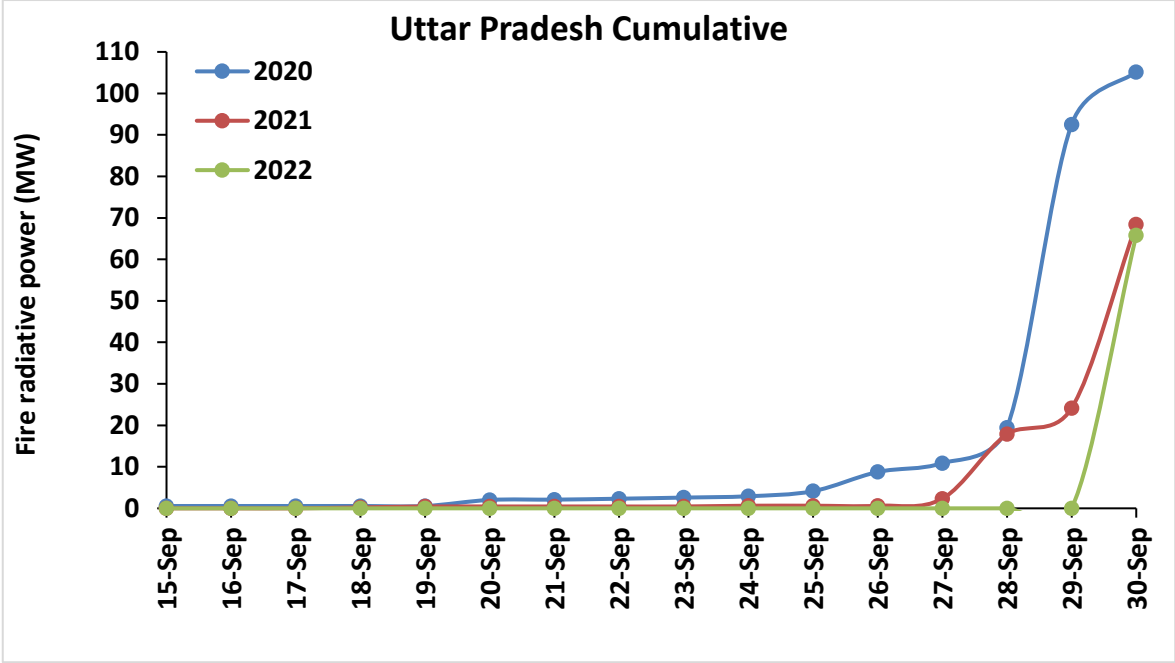




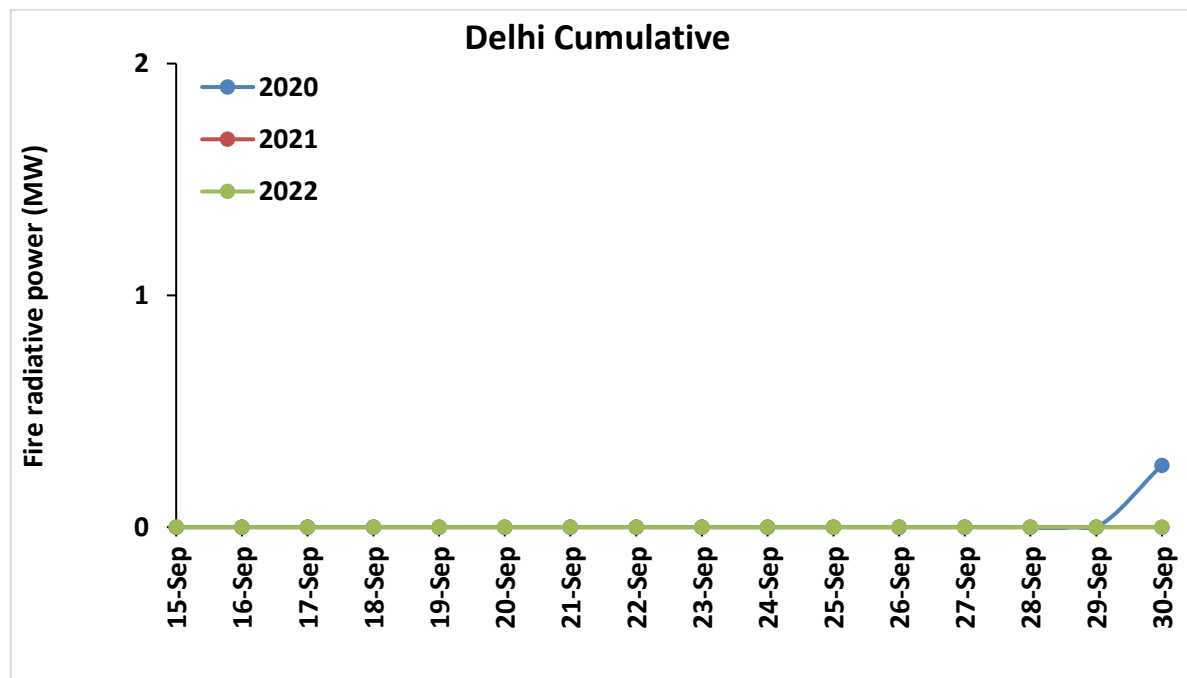
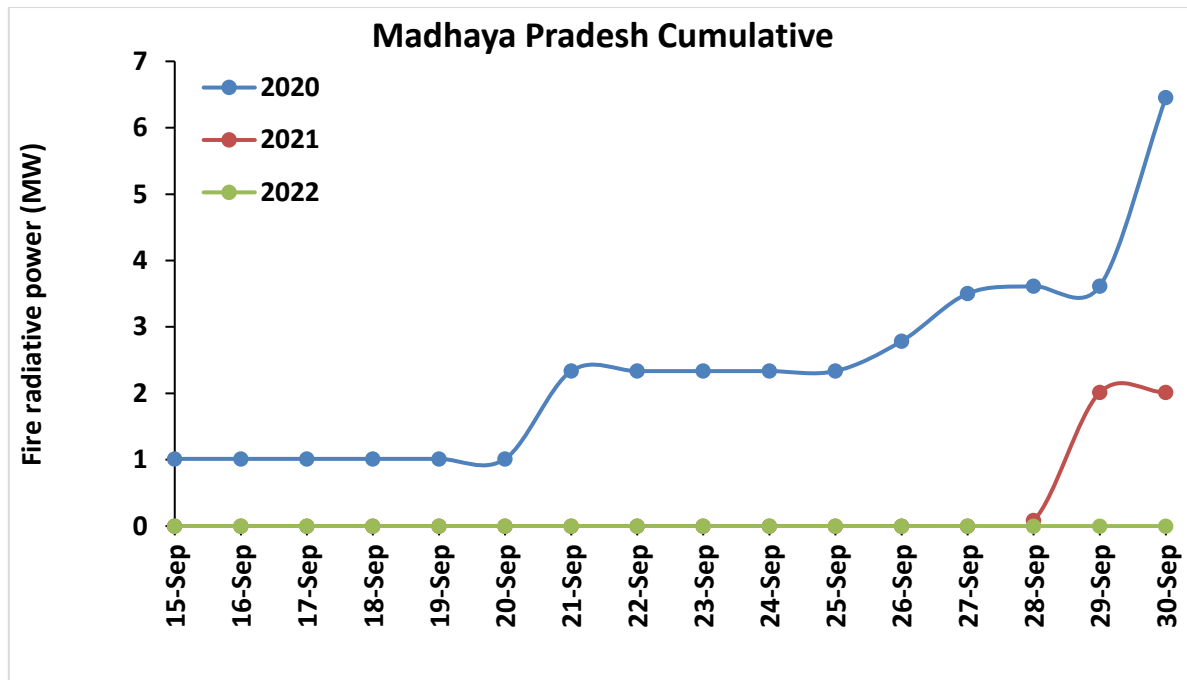


**Comparison of residue burning fire power in current year (2022) with previous years (2021 and 2020) for the study States**



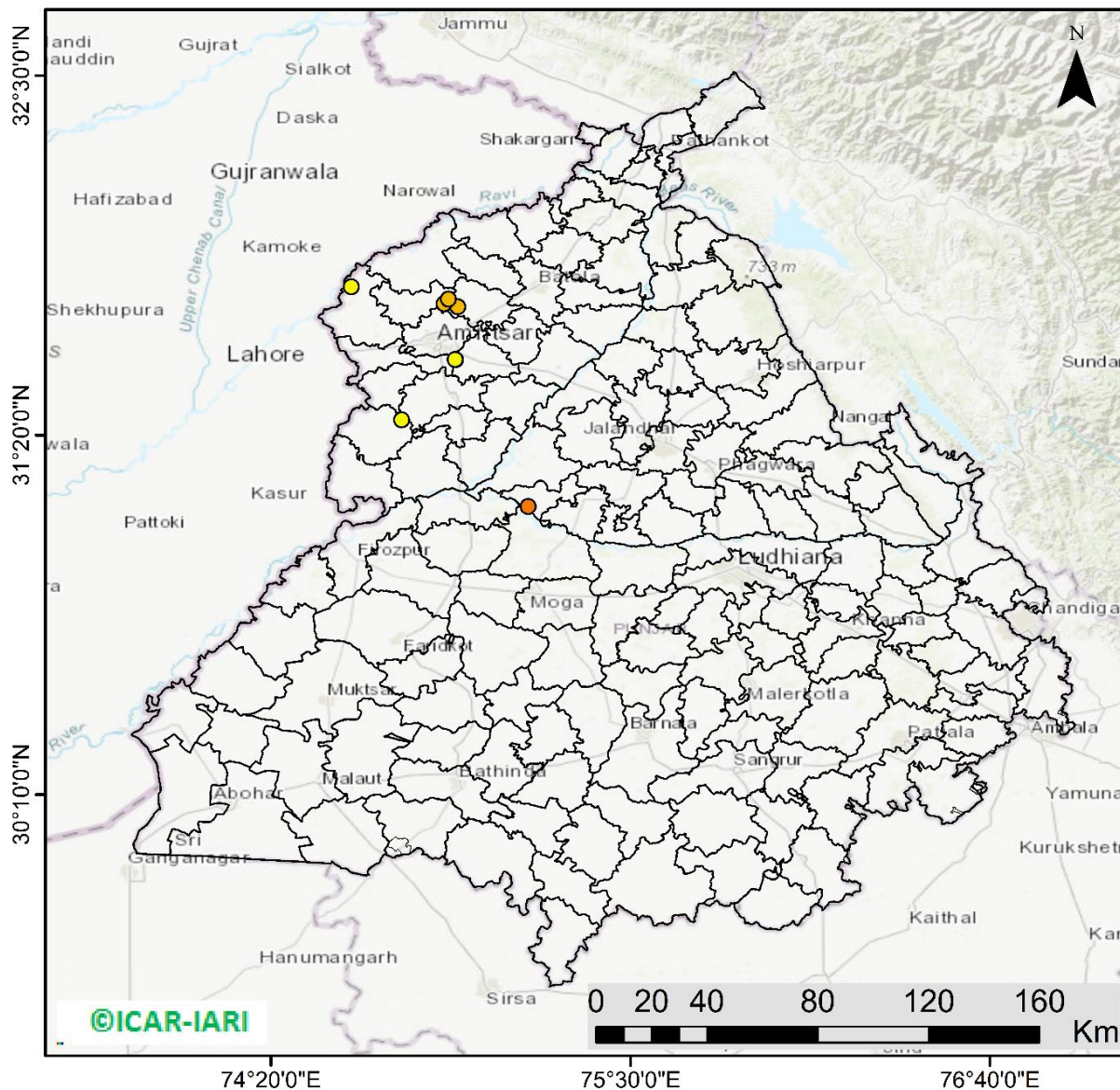






# Punjab

## RICE RESIDUE BURNING IN PUNJAB



**08** burning events detected in Punjab during (30th Sep 2022)

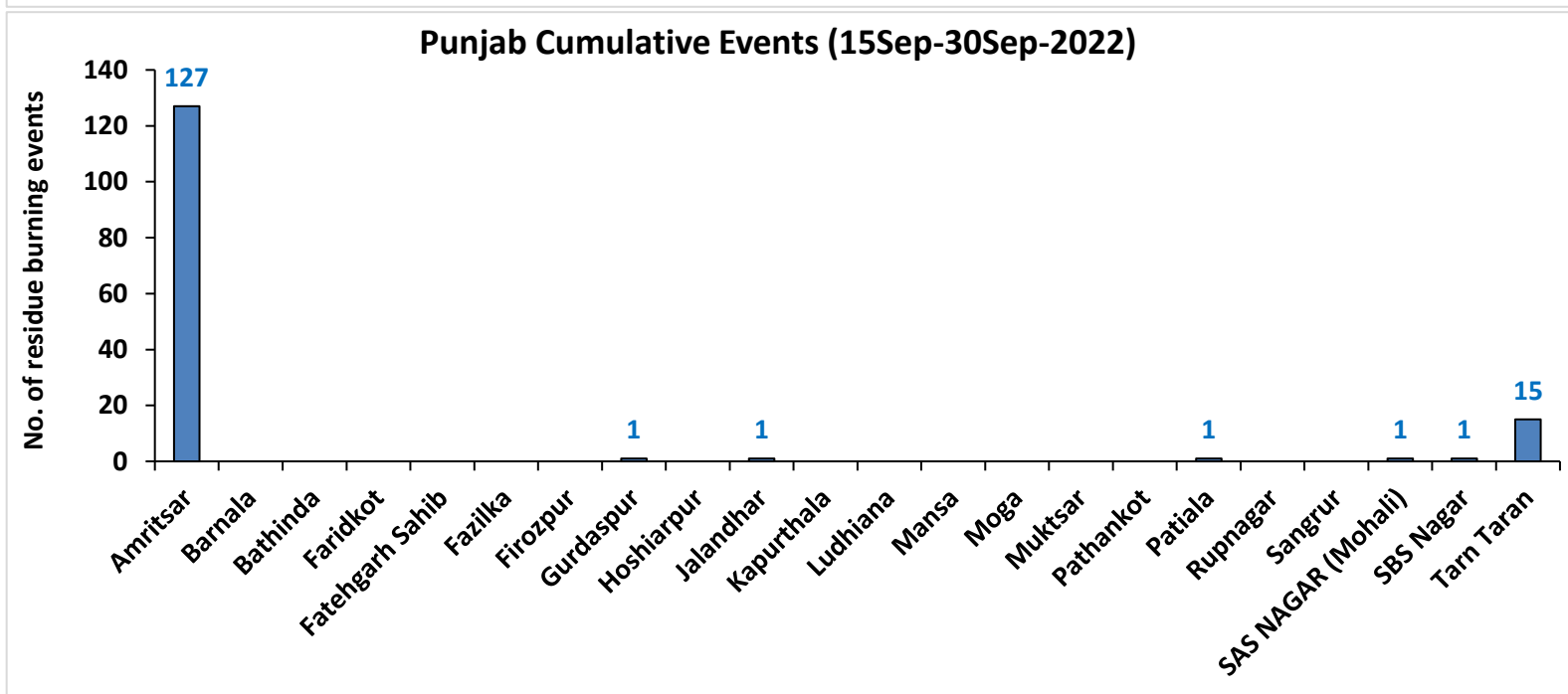
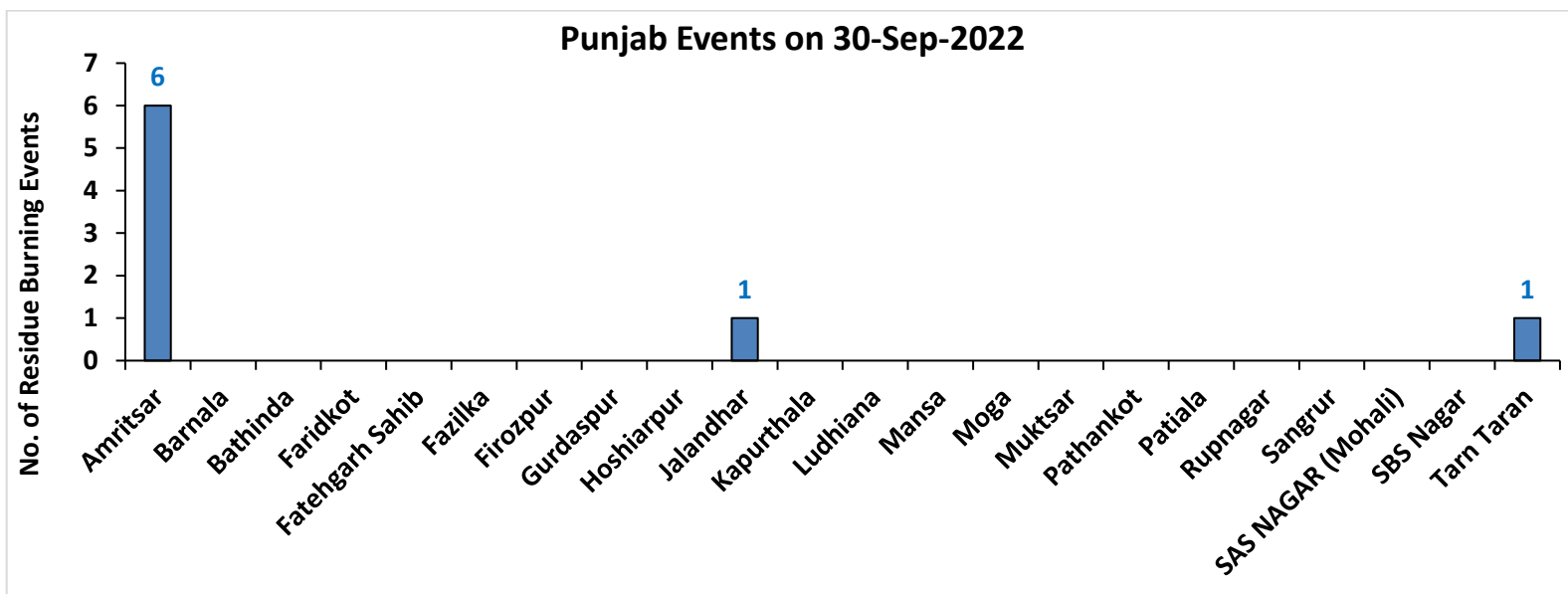
### Fire Intensity (W/m<sup>2</sup>)

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



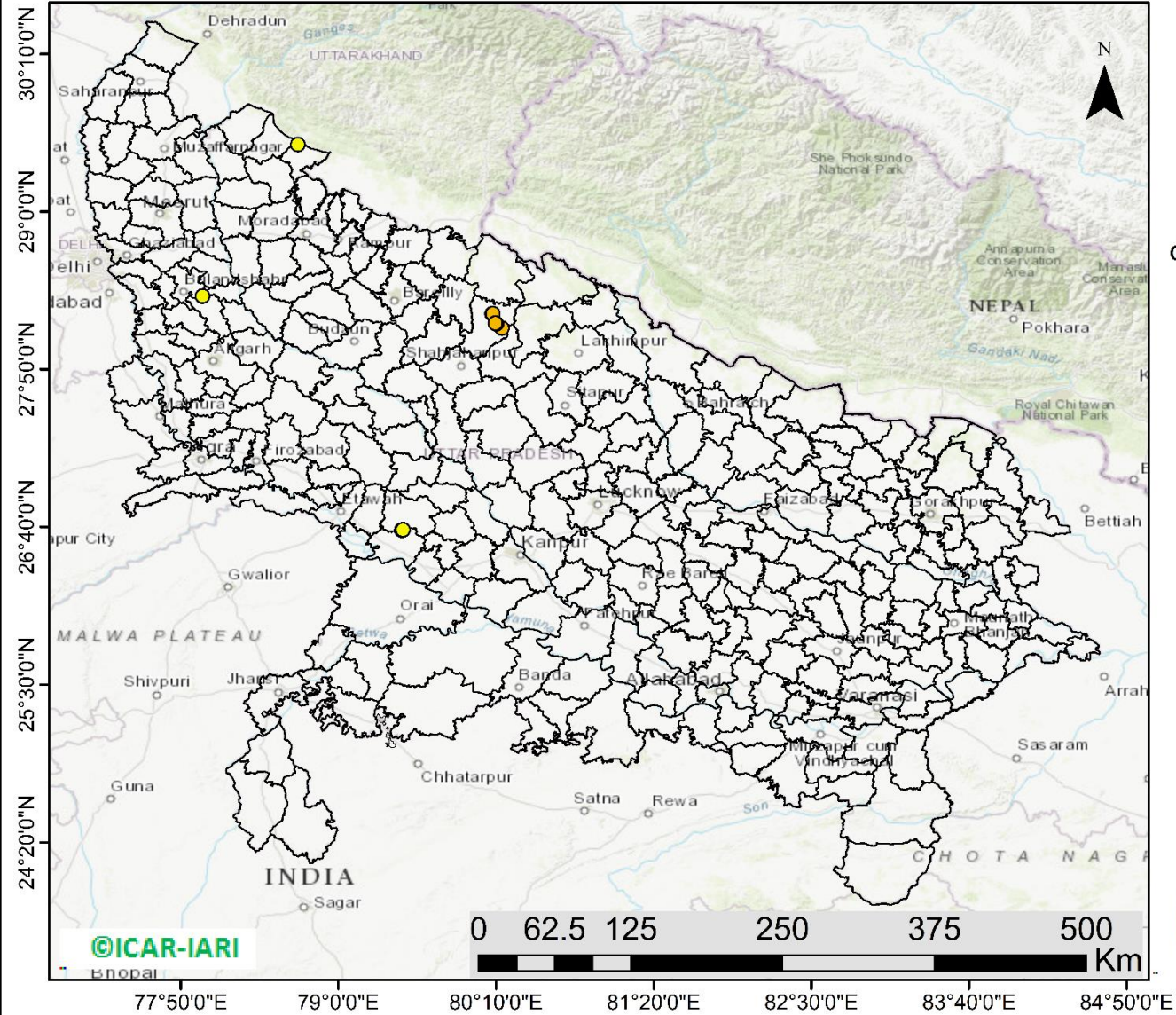
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

## District-wise cumulative number of residues burning events in Punjab (15Sep- 30Sep-2022)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



10 burning events detected in Uttar Pradesh on (30th Sep 2022)

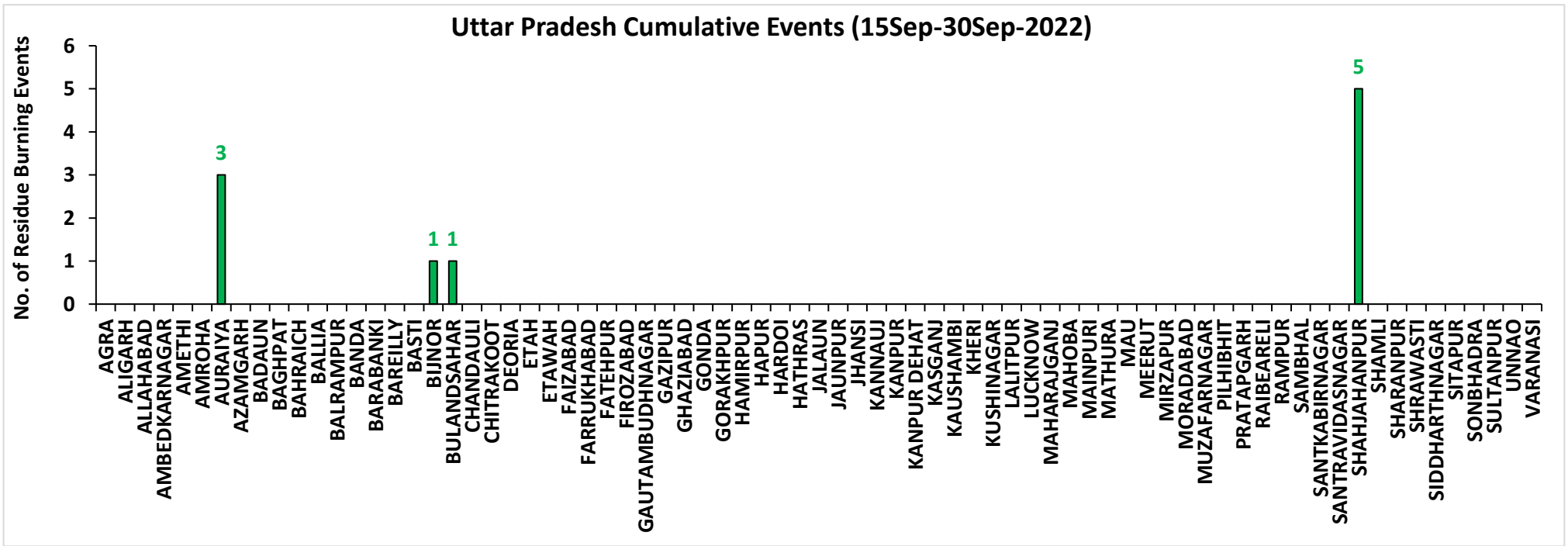
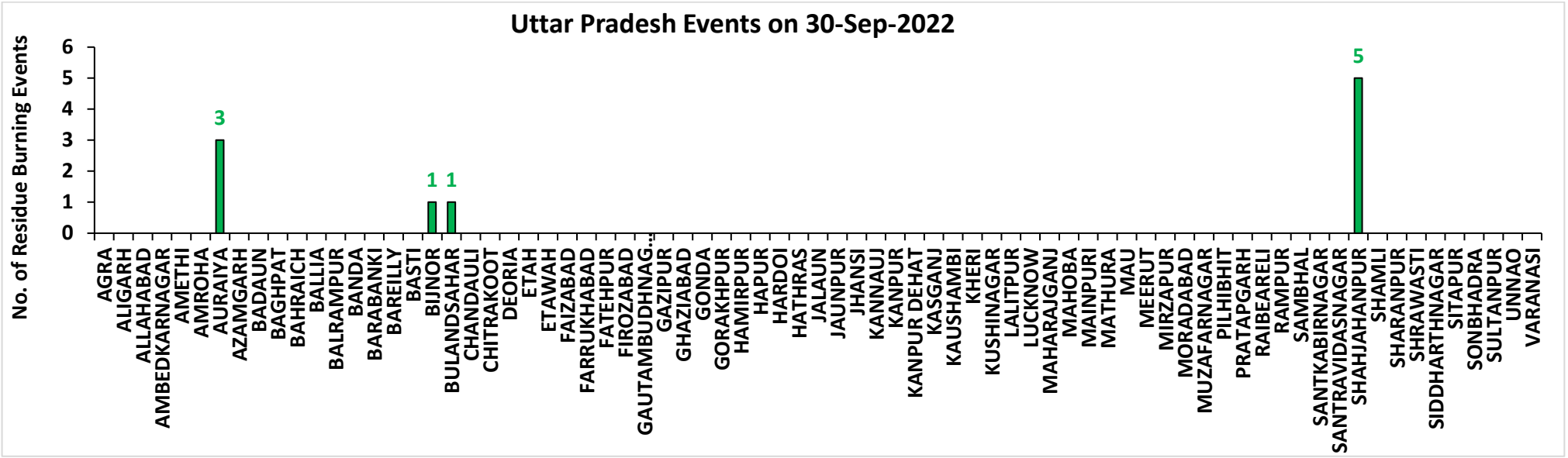
Fire Intensity (W/m2)

- 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- 30Sep-2022)



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

**(a) Punjab**

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

**(b) Haryana**

District	15 Sep-30 Sep 2022		
	2020	2021	2022
AMBALA	9	0	0
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	0	0
FATEHABAD	8	0	0
GURGAON	0	0	0
HISAR	2	0	0
JHAJJAR	0	0	0
JIND	0	0	1
KAITHAL	10	0	0
KARNAL	24	2	0
KURUKSHETRA	14	4	0
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	1	0	0
PANCHKULA	0	0	0
PANIPAT	3	0	0
REWARI	0	0	0
ROHTAK	0	0	0
SIRSA	1	0	0
SONIPAT	1	0	0
YAMUNANAGAR	5	1	0
<b>Total</b>	<b>78</b>	<b>7</b>	<b>1</b>

(c) Uttar Pradesh

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

**(d) Delhi**

District	15 Sep-30 Sep 2022		
	2020	2021	2022
CENTRAL	0	0	0
EAST	0	0	0
NEW DELHI	0	0	0
NORTH	0	0	0
NORTH EAST	0	0	0
NORTH WEST DELHI	0	0	0
SHAHADRA	0	0	0
SOUTH	1	0	0
SOUTH EAST	0	0	0
SOUTH WEST DELHI	0	0	0
WEST DELHI	0	0	0
<b>Total</b>	<b>1</b>	<b>0</b>	<b>0</b>

**(e) Rajasthan**

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



(f) Madhya Pradesh

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

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

**Number of Paddy Residue Burning Events Detected**

	Punjab			Haryana			Uttar Pradesh			Delhi			Rajasthan			Madhya Pradesh		
	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022	2020	2021	2022
15-Sep	5	0	14	2	0	0	1	0	0	0	0	0	1	0	0	2	0	0
16-Sep	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17-Sep	5	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18-Sep	17	9	7	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
19-Sep	30	5	18	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0
20-Sep	67	8	10	6	0	0	2	0	0	0	0	0	0	0	0	0	0	0
21-Sep	54	0	56	2	0	0	1	0	0	0	0	0	1	0	1	2	0	0
22-Sep	34	0	30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
23-Sep	49	0	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
24-Sep	78	5	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
25-Sep	184	11	0	11	0	0	5	0	0	0	0	0	1	0	0	0	0	0
26-Sep	190	19	0	5	0	0	8	0	0	0	0	0	1	0	0	2	0	0
27-Sep	78	37	0	8	0	0	4	1	0	0	0	0	0	0	0	1	0	0
28-Sep	55	28	0	6	1	0	1	6	0	0	0	0	0	0	0	1	1	0
29-Sep	63	64	0	9	4	0	6	10	0	0	0	0	3	0	0	0	4	0
30-Sep	116	27	8	22	2	0	13	13	10	1	0	0	1	0	0	5	0	0
<b>Total</b>	<b>1025</b>	<b>215</b>	<b>147</b>	<b>78</b>	<b>7</b>	<b>1</b>	<b>44</b>	<b>33</b>	<b>10</b>	<b>1</b>	<b>0</b>	<b>0</b>	<b>9</b>	<b>0</b>	<b>1</b>	<b>13</b>	<b>5</b>	<b>0</b>

### Details of residue burning events in Punjab on 30-Sep-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	CHOGAWAN	S-NPP	31.81460	74.59380	14:01:09	D	3.70
2	AMRITSAR	HARSHA CHHINA	S-NPP	31.77450	74.90950	14:01:09	D	9.60
3	AMRITSAR	JANDIALA GURU	S-NPP	31.57790	74.93230	14:01:09	D	1.90
4	AMRITSAR	JANDIALA GURU	S-NPP	31.57860	74.93120	14:01:09	D	3.90
5	AMRITSAR	MAJITHA	S-NPP	31.74970	74.93970	14:01:09	D	7.70
6	AMRITSAR	MAJITHA	S-NPP	31.75930	74.89510	14:01:09	D	5.10
7	JALANDHAR	LOHIAN	S-NPP	31.10140	75.16820	14:01:09	D	11.40
8	TARN TARAN	TARN TARAN	S-NPP	31.38230	74.75750	14:01:09	D	3.30

### Details of residue burning events in Uttar Pradesh on 30-Sep-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AURAIYA	BIDHUNA	S-NPP	26.64270	79.47010	12:21:34	D	11.80
2	AURAIYA	BIDHUNA	S-NPP	26.64440	79.47650	12:21:34	D	11.80
3	AURAIYA	BIDHUNA	S-NPP	26.64480	79.47890	14:01:09	D	4.30
4	BIJNOR	NAGINA	S-NPP	29.49580	78.70120	14:01:09	D	2.60
5	BULANDSAHAR	BULANDSHAHR	S-NPP	28.37370	77.99550	01:10:52	N	1.60
6	SHAHJAHANPUR	PUWANYA	S-NPP	28.24300	80.13840	14:01:09	D	4.50
7	SHAHJAHANPUR	PUWANYA	S-NPP	28.24340	80.14340	14:01:09	D	7.10
8	SHAHJAHANPUR	PUWANYA	AQUA	28.13700	80.21100	13:20:02	D	7.70
9	SHAHJAHANPUR	PUWANYA	AQUA	28.16900	80.17000	13:20:02	D	6.30
10	SHAHJAHANPUR	PUWANYA	AQUA	28.17400	80.16200	13:20:02	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**

**Study Team**

ICAR - IARI	<b>Dr V.K. Sehgal</b>	Principal & Nodal Scientist	<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 Rajbir Singh	Director ATARI (Zone-I) Ludhiana	<a href="mailto:rajbirsingh.zpd@gmail.com">rajbirsingh.zpd@gmail.com</a>
	Dr S.K. Singh	Director ATARI (Zone-II) Jodhpur	<a href="mailto:sushilsinghiipr@yahoo.co.in">sushilsinghiipr@yahoo.co.in</a>
	Dr Atar Singh	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)

and on IARI CREAMS website (<http://creams.iari.res.in/cms2/index.php>)

\*\*\*