



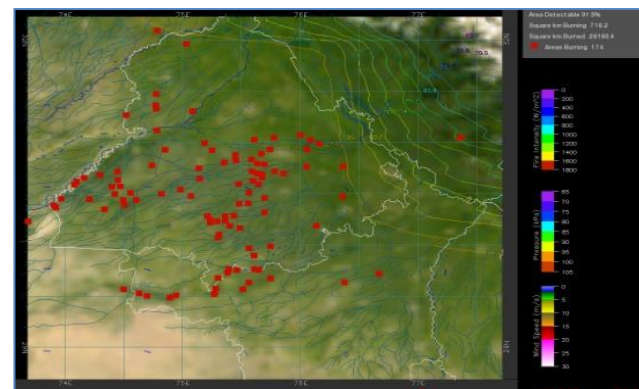
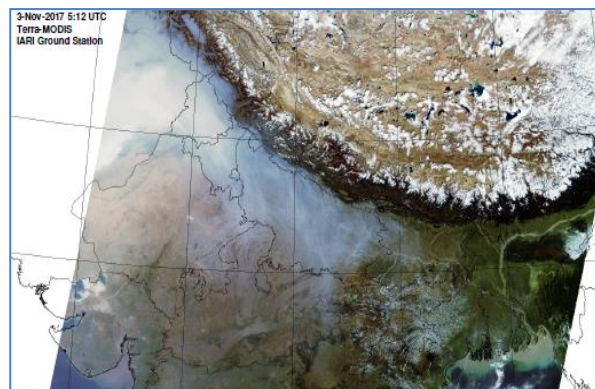
**Bulletin
No. 08**

**Events Date:
22-Sep-2022**

**Issued on:
22-Sep-2022**



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



Prepared by:

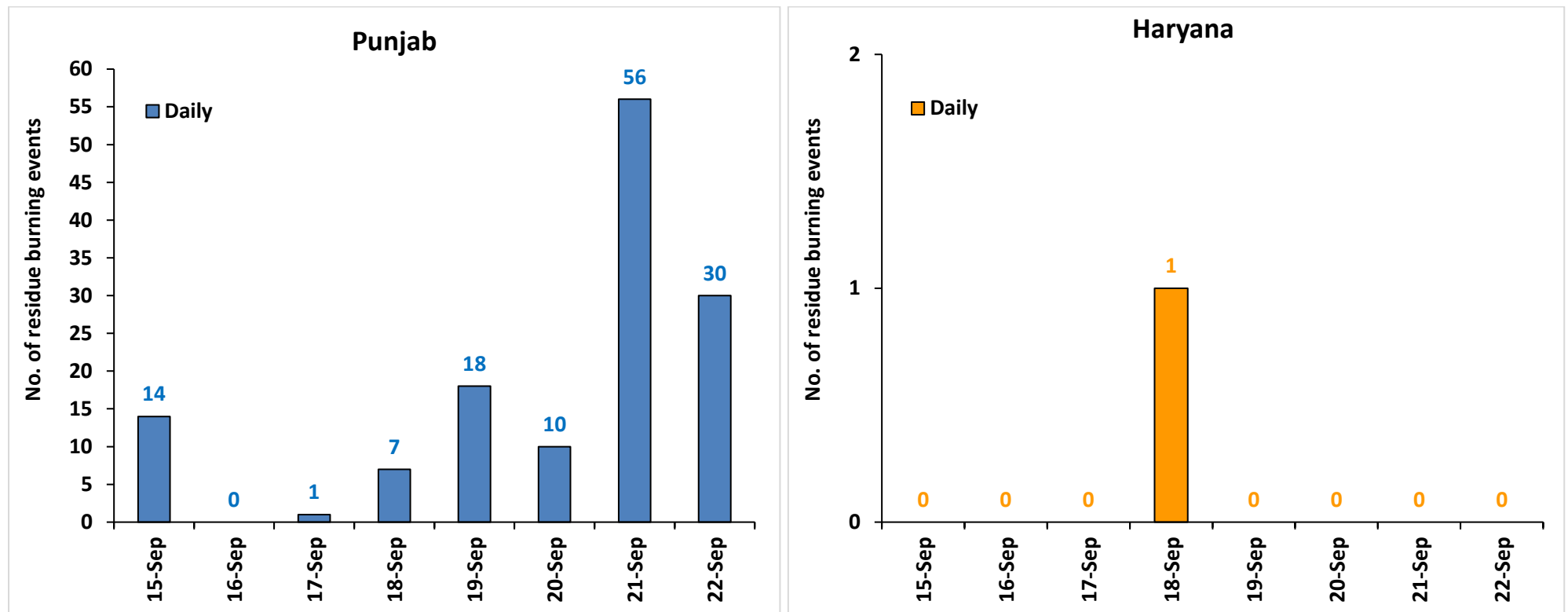
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

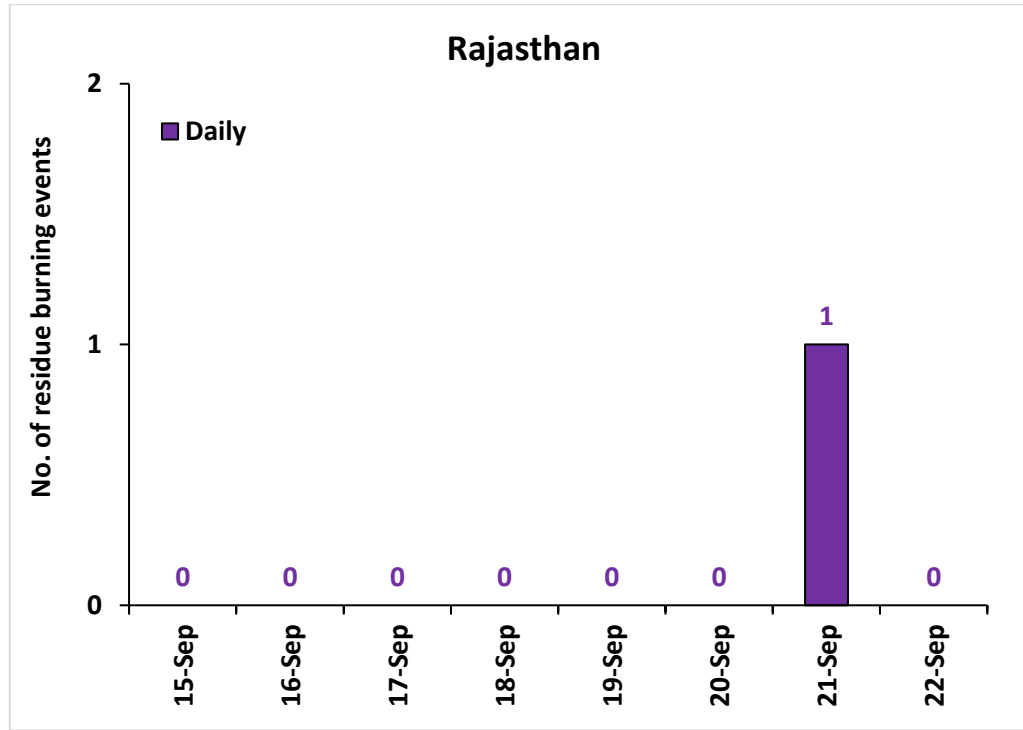
<http://creams.iari.res.in>

Highlights for 22-Sep-2022

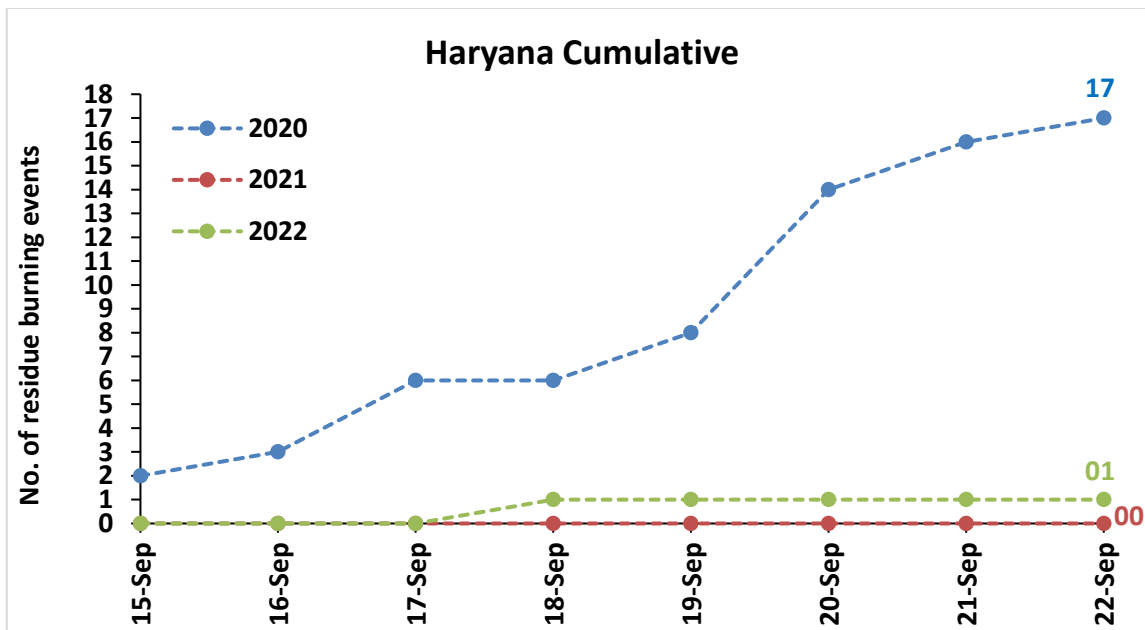
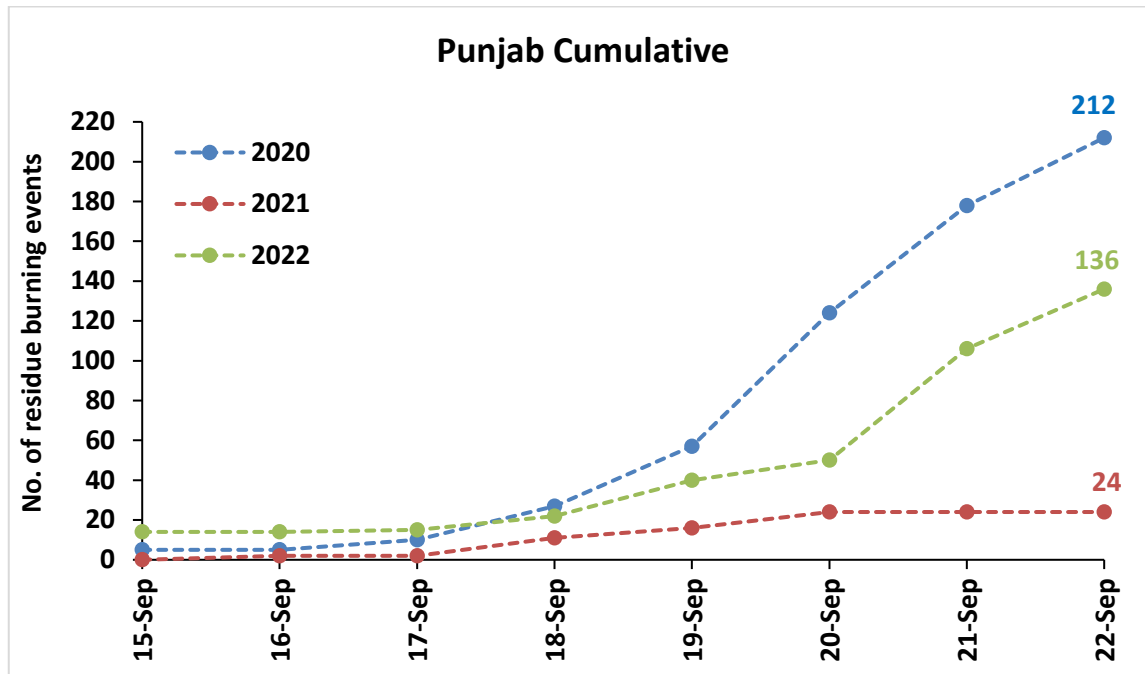
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **30** residue burning events in the six study States on 22-Sep-2022.
- The state wise events detected on 22-Sep-2022 were **30** in Punjab, **0** in Haryana, **0** in UP, **0** in Delhi, **0** in Rajasthan and **0** in MP.
- Detection of residue burning events was hampered by the presence of clouds over Eastern Punjab, Haryana, Delhi, Uttar Pradesh and Madhya Pradesh states.

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

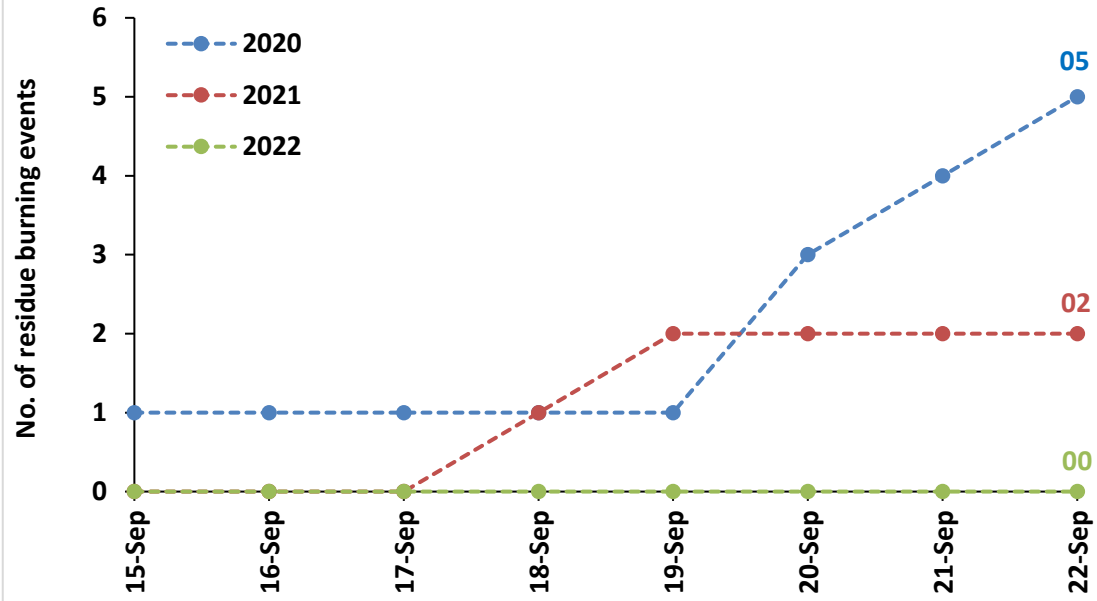




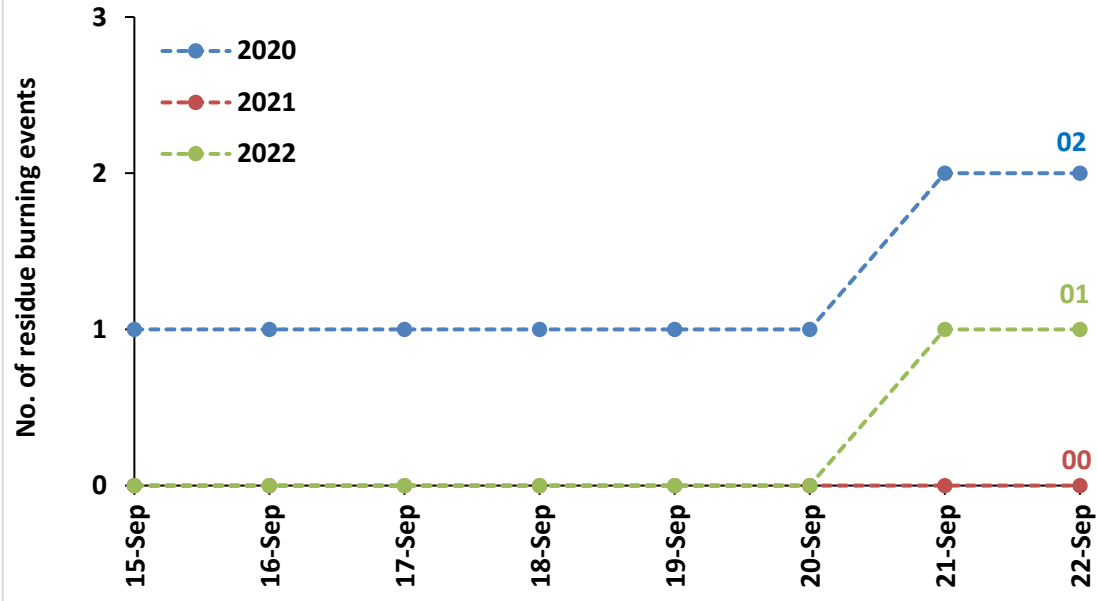
Comparison of residue burning events in current year (2022) with previous year (2020 and 2021) for the study States

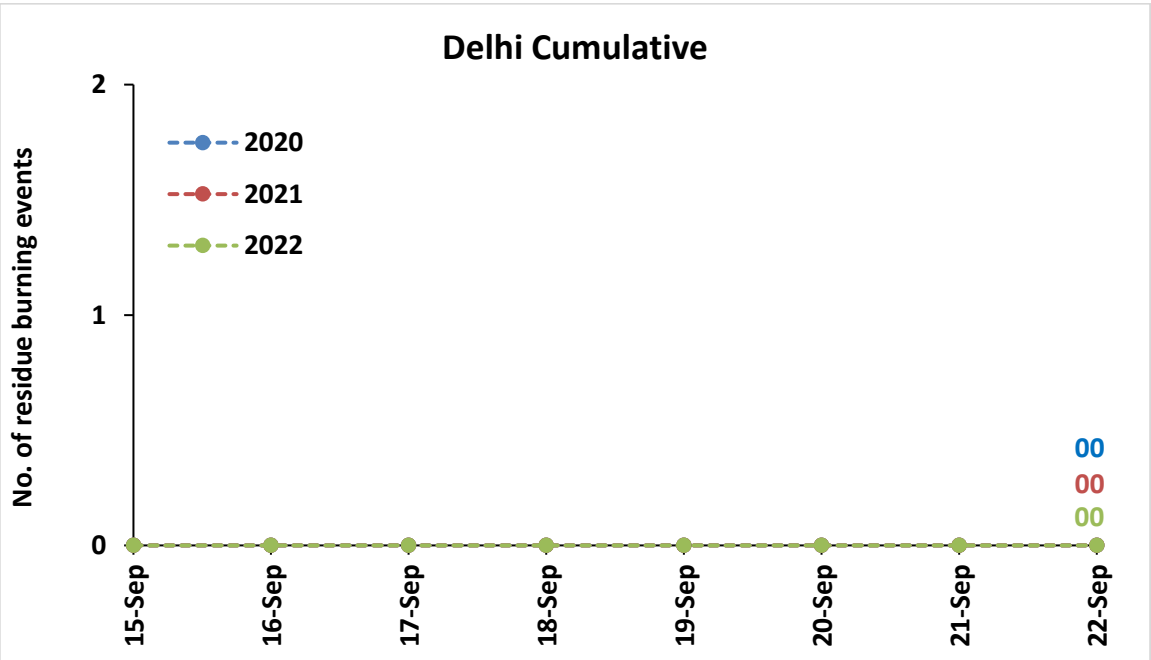
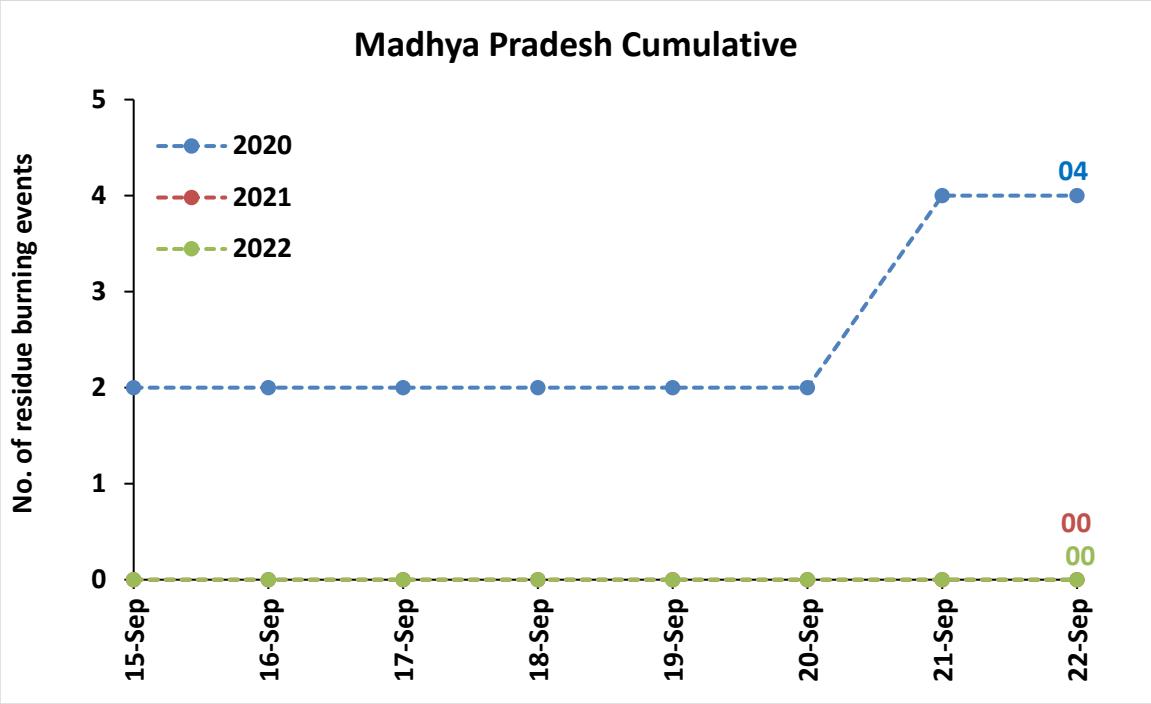


Uttar Pradesh Cumulative

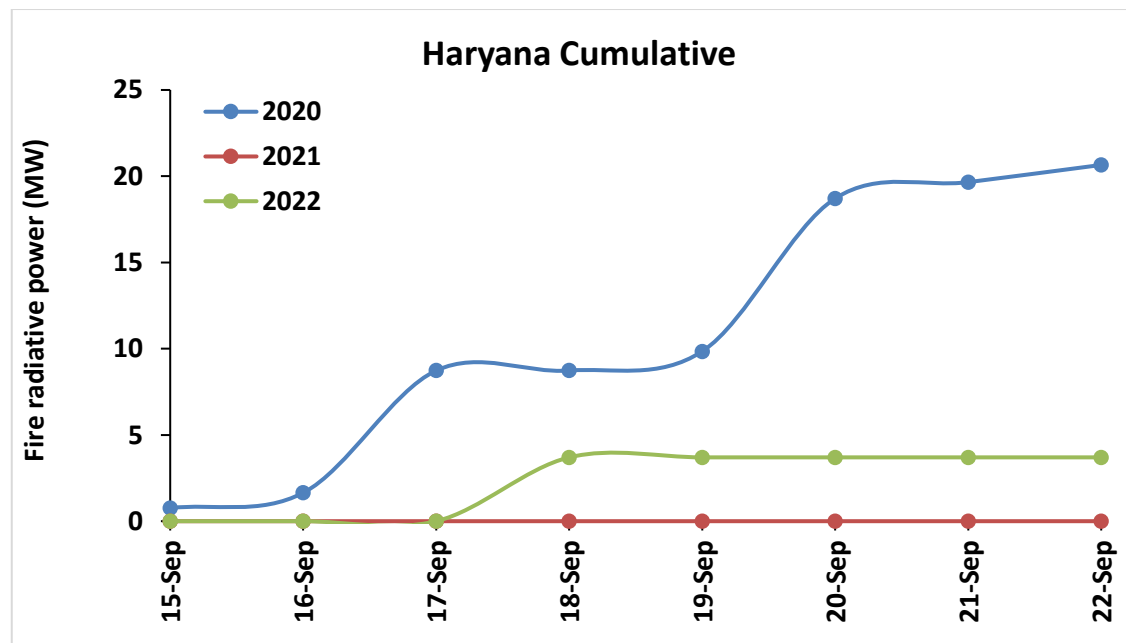
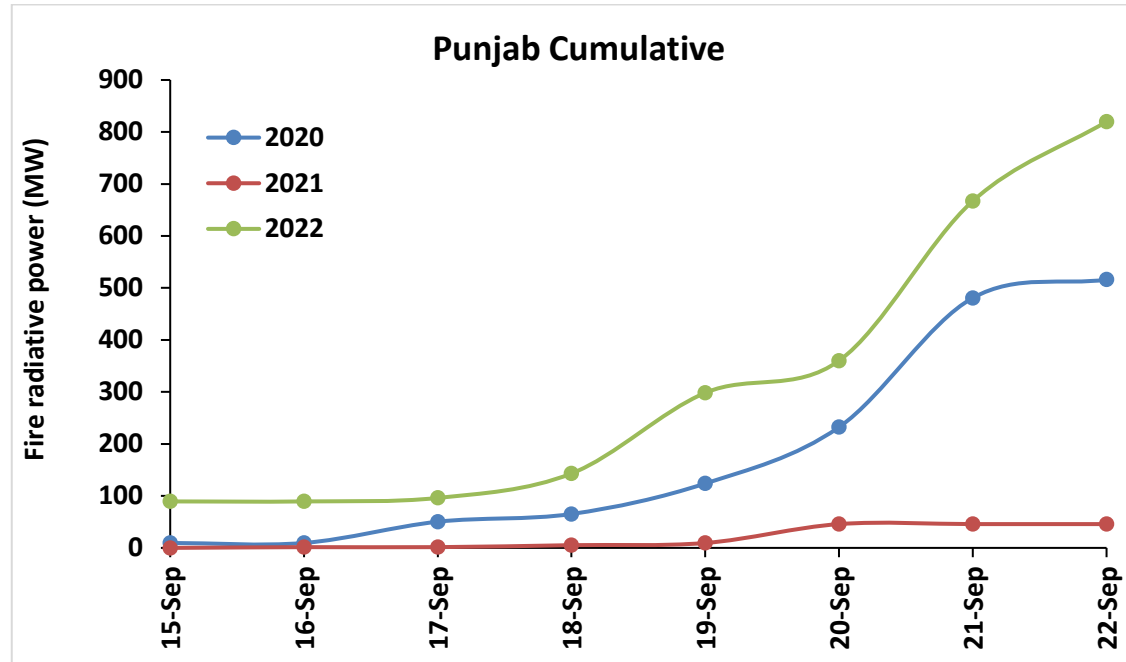


Rajashtan Cumulative

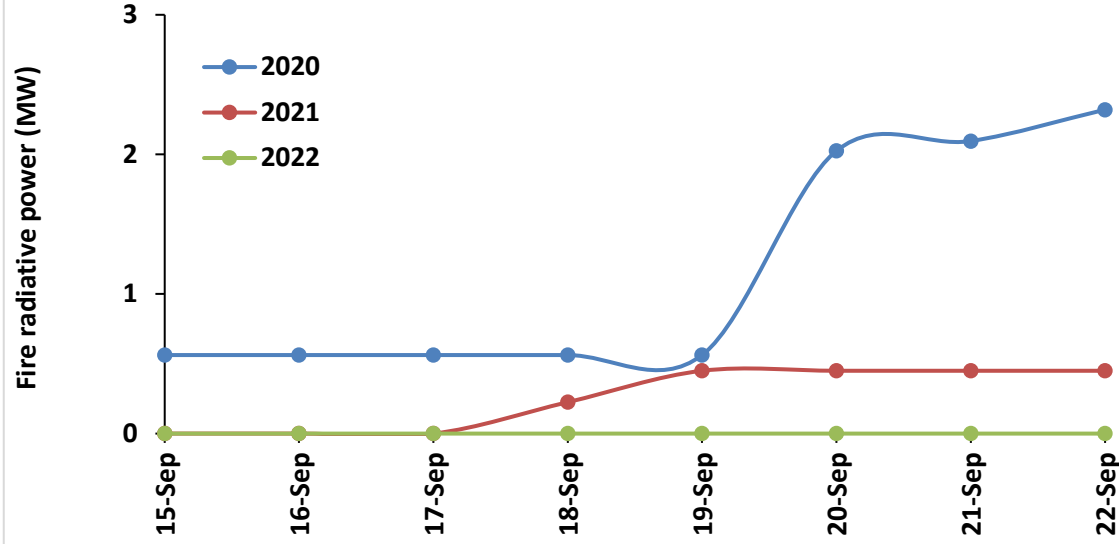




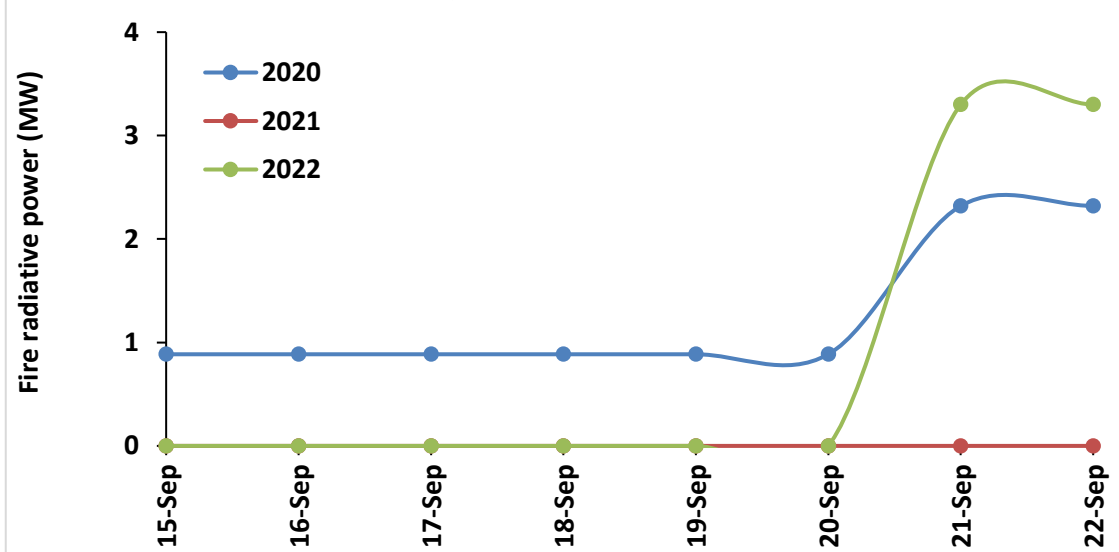
Comparison of residue burning fire power in current year (2022) with previous year (2021 and 2020) for the study States



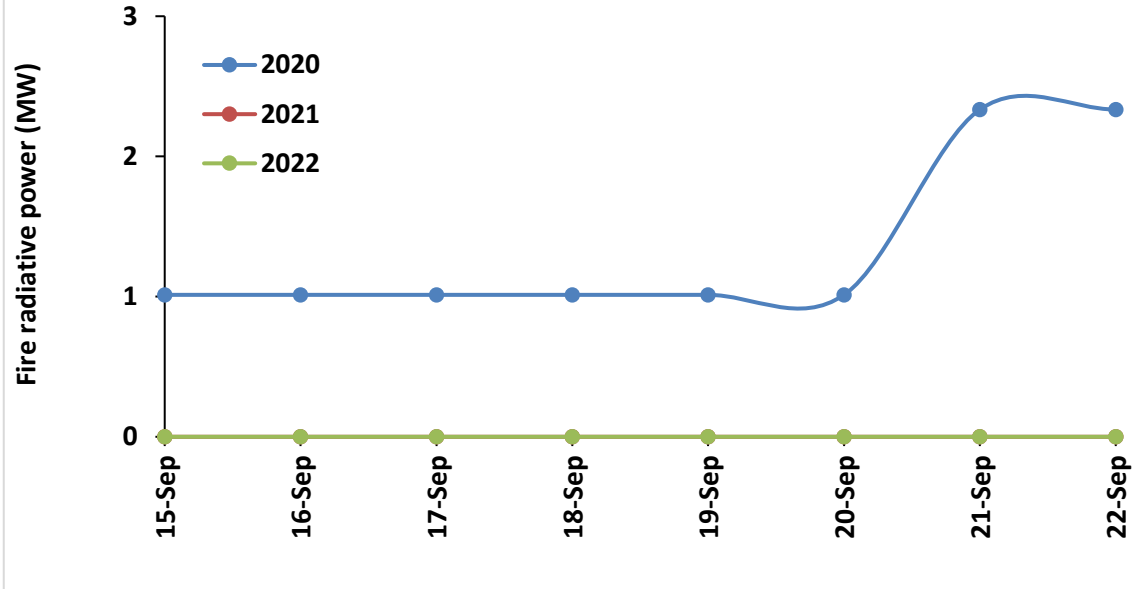
Uttar Pradesh Cumulative



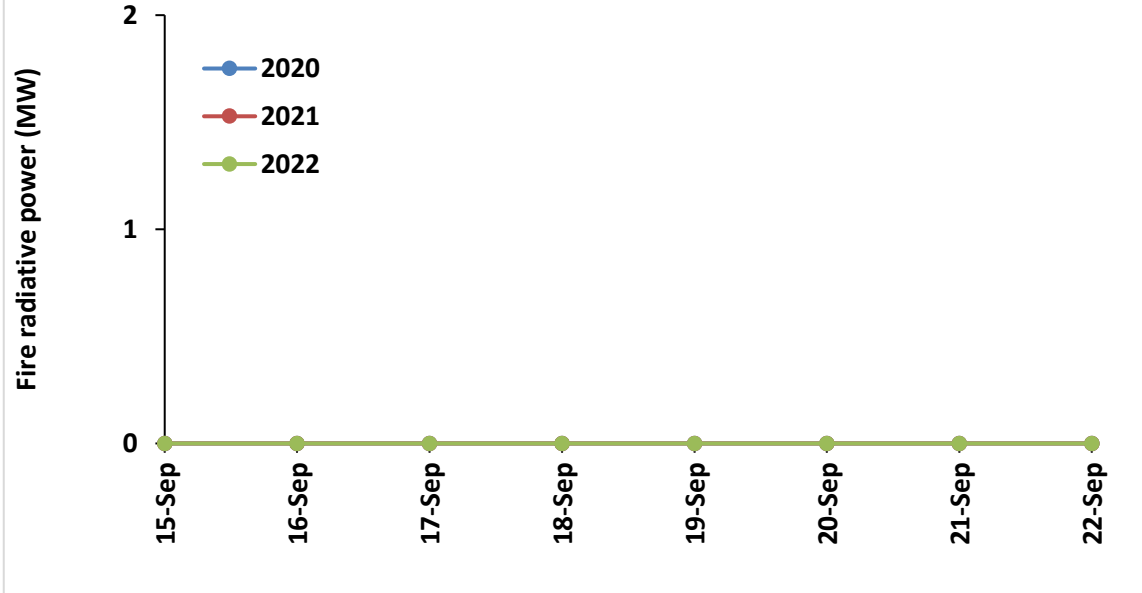
Rajasthan Cumulative



Madhaya Pradesh Cumulative

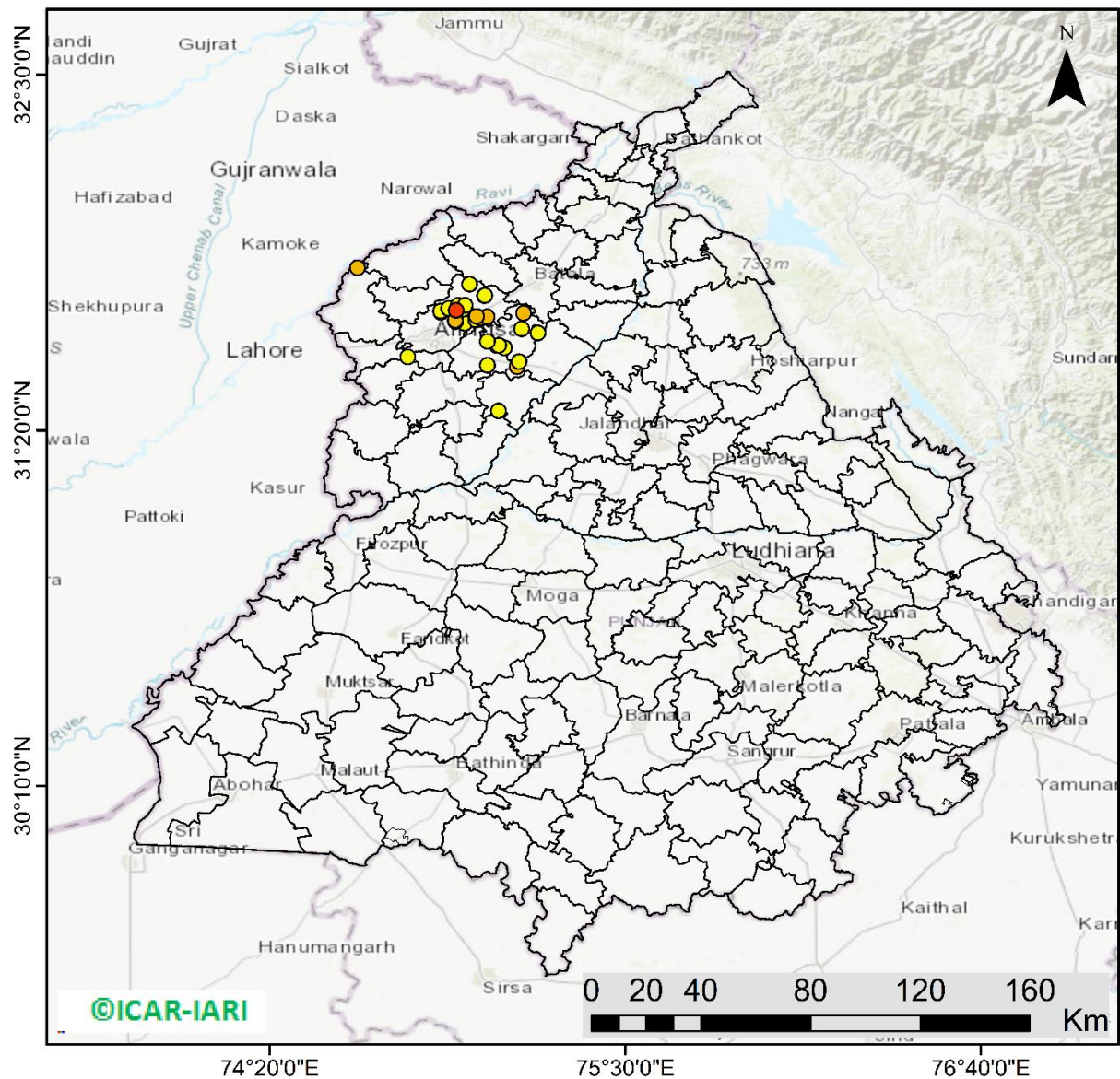


Delhi Cumulative



Punjab

RICE RESIDUE BURNING IN PUNJAB



30 burning events detected in Punjab during (22nd Sep 2022)

Fire Intensity (W/m²)

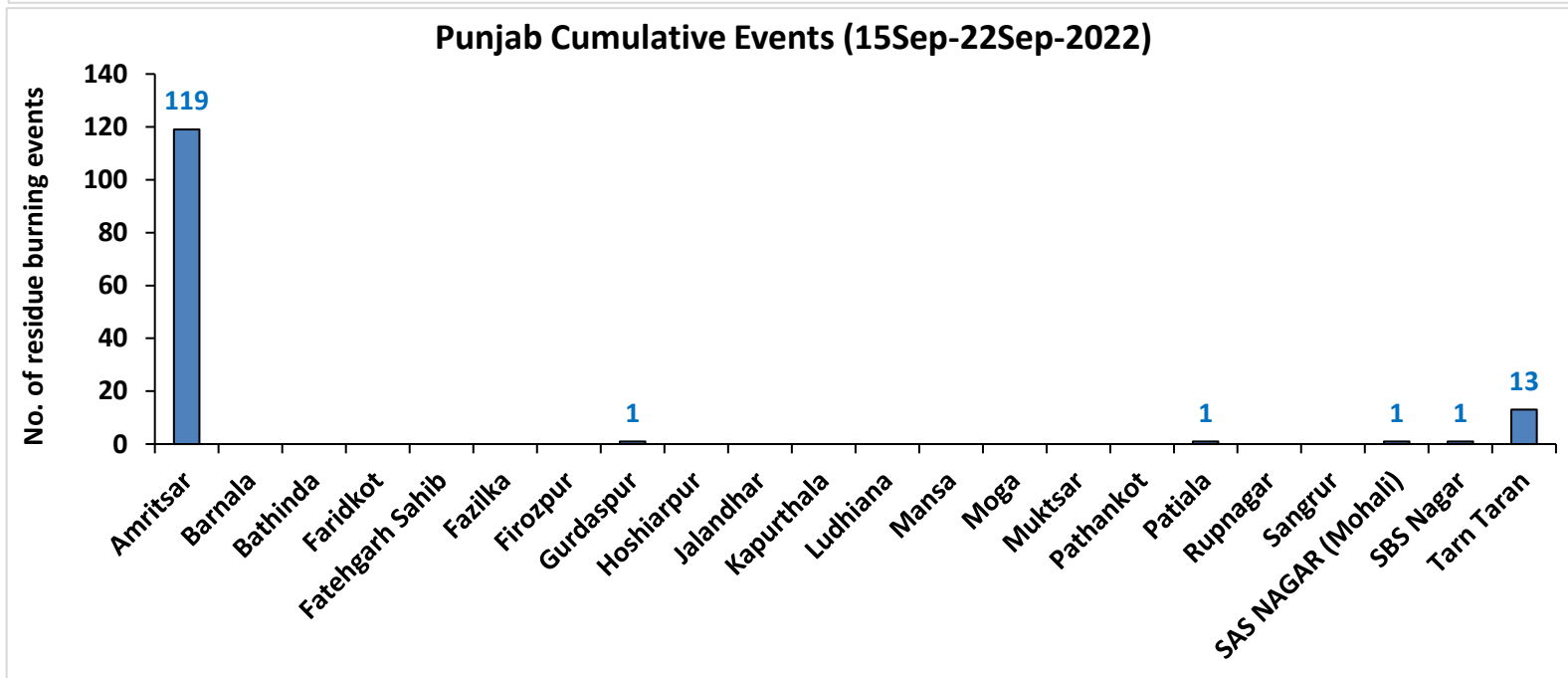
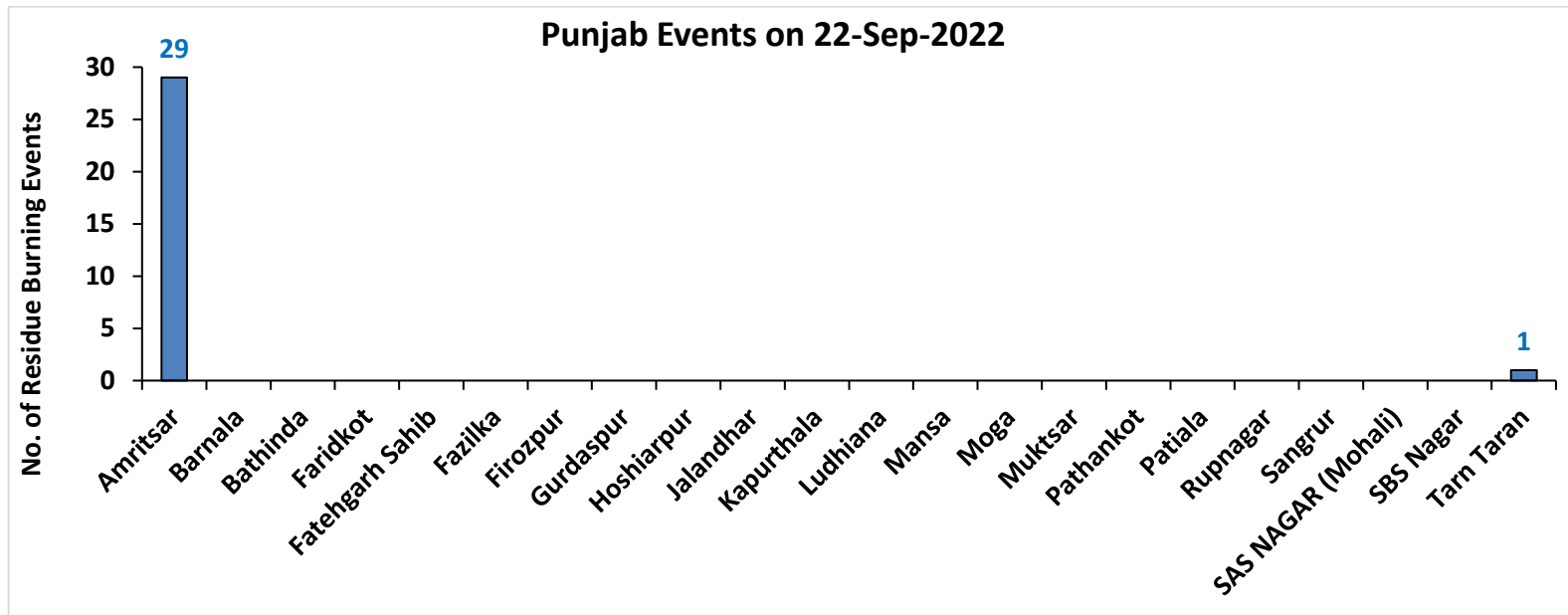
- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20

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

District-wise cumulative number of residues burning events in Punjab (15Sep- 22Sep-2022)



District-wise cumulative number of residues burning events detected in 2020 ,2021 and 2022
(Period: 15 September-22 September)

(a) Punjab

District	15 Sep-22 Sep 2022		
	2020	2021	2022
Amritsar	192	19	119
Barnala	0	0	0
Bathinda	0	0	0
Faridkot	0	1	0
Fatehgarh Sahib	0	0	0
Fazilka	0	0	0
Firozpur	0	0	0
Gurdaspur	1	0	1
Hoshiarpur	0	0	0
Jalandhar	0	0	0
Kapurthala	2	0	0
Ludhiana	3	0	0
Mansa	1	0	0
Moga	0	0	0
Muktsar	1	0	0
Pathankot	0	0	0
Patiala	0	3	1
Rupnagar	0	0	0
Sangrur	0	0	0
SAS NAGAR (Mohali)	3	0	1
SBS Nagar	0	0	1
Tarn Taran	9	1	13
Total	212	24	136

(b) Haryana

District	15 Sep-22 Sep 2022		
	2020	2021	2022
AMBALA	3	0	0
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	0	0
FATEHABAD	1	0	0
GURGAON	0	0	0
HISAR	0	0	0
JHAJJAR	0	0	0
JIND	0	0	1
KAITHAL	0	0	0
KARNAL	9	0	0
KURUKSHETRA	2	0	0
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	0	0	0
PANCHKULA	0	0	0
PANIPAT	1	0	0
REWARI	0	0	0
ROHTAK	0	0	0
SIRSA	1	0	0
SONIPAT	0	0	0
YAMUNANAGAR	0	0	0
Total	17	0	1

(c) Uttar Pradesh

District	15 Sep-22 Sep 2022										
	2020	2021	2022	GAUTAMBUDHNAGAR	0	0	0	MUZAFARNAGAR	0	0	0
AGRA	0	0	0	GAZIPUR	0	0	0	PILHIBHIT	0	0	0
ALIGARH	0	0	0	GHAZIABAD	0	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	1	0
AMETHI	0	0	0	HAMIRPUR	0	0	0	SAMBHAL	1	0	0
AMROHA	0	0	0	HAPUR	1	0	0	SANTKABIRNAGAR	0	0	0
AURAIYA	1	0	0	HARDOI	0	0	0	SANTRAVIDASNAGAR	0	0	0
AZAMGARH	0	0	0	HATHRAS	0	0	0	SHAHJAHANPUR	0	0	0
BADAUN	0	0	0	JALAUN	0	0	0	SHAMLI	1	0	0
BAGHPAT	0	0	0	JAUNPUR	0	0	0	SHARANPUR	0	0	0
BAHRAICH	0	0	0	JHANSI	0	0	0	SHRAWASTI	0	0	0
BALLIA	0	0	0	KANNAUJ	0	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	0	0	0	UNNAO	0	0	0
BASTI	0	0	0	KHERI	0	0	0	VARANASI	0	0	0
BIJNOR	0	0	0	KUSHINAGAR	0	0	0	Total	5	2	0
BULANDSAHAR	0	0	0	LALITPUR	0	0	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	0	0	0	MAINPURI	0	0	0				
ETAWAH	0	0	0	MATHURA	0	0	0				
FAIZABAD	0	0	0	MAU	0	0	0				
FARRUKHABAD	0	0	0	MEERUT	0	0	0				
FATEHPUR	0	0	0	MIRZAPUR	0	0	0				
FIROZABAD	0	0	0	MORADABAD	0	0	0				

(d) Delhi

District	15 Sep-22 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	0	0	0
SOUTH EAST	0	0	0
SOUTH WEST DELHI	0	0	0
WEST DELHI	0	0	0
Total	0	0	0

(e) Rajasthan

District	15 Sep-22 Sep 2022		
	2020	2021	2022
AJMER	0	0	0
ALWAR	0	0	0
BANSWARA	0	0	0
BARAN	0	0	0
BARMER	0	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	0	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	0	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
Total	2	0	1

(f) Madhya Pradesh

District	15 Sep-22 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	0	0	0	RATLAM	0	0	0
BALAGHAT	0	0	0	REWA	0	0	0
BARWANI	0	0	0	SAGAR	2	0	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	0	0	0
EAST NIMAR	0	0	0	UMARIA	0	0	0
GUNA	0	0	0	VIDESHA	0	0	0
GWALIOR	0	0	0	WEST NIMAR	0	0	0
HARDA	2	0	0	Total	4	0	0
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- 22 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
Total	212	24	136	17	0	1	5	2	0	0	0	0	2	0	1	4	0	0

Details of residue burning events in Punjab on 22-Sep-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m ²)
1	AMRITSAR	ATTARI	S-NPP	31.57420	74.78630	13:10:32	D	3.80
2	AMRITSAR	CHOGAWAN	S-NPP	31.86630	74.62100	13:10:32	D	7.60
3	AMRITSAR	JANDIALA GURU	S-NPP	31.54650	75.04790	13:10:32	D	4.00
4	AMRITSAR	JANDIALA GURU	S-NPP	31.61100	75.07940	13:10:32	D	3.80
5	AMRITSAR	JANDIALA GURU	S-NPP	31.62460	75.04770	13:10:32	D	4.40
6	AMRITSAR	JANDIALA GURU	S-NPP	31.69500	75.00980	13:10:32	D	4.90
7	AMRITSAR	MAJITHA	S-NPP	31.70180	75.02500	13:10:32	D	10.60
8	AMRITSAR	MAJITHA	S-NPP	31.70600	75.04640	13:10:32	D	5.10
9	AMRITSAR	MAJITHA	S-NPP	31.70730	75.01230	13:10:32	D	6.20
10	AMRITSAR	MAJITHA	S-NPP	31.73010	74.96670	13:10:32	D	4.10
11	AMRITSAR	MAJITHA	S-NPP	31.73310	74.92040	13:10:32	D	3.10
12	AMRITSAR	MAJITHA	S-NPP	31.74310	74.95190	13:10:32	D	4.20
13	AMRITSAR	MAJITHA	S-NPP	31.74340	74.97450	13:10:32	D	4.50
14	AMRITSAR	MAJITHA	S-NPP	31.77480	75.03810	13:10:32	D	4.70
15	AMRITSAR	MAJITHA	S-NPP	31.77540	75.03950	13:10:32	D	2.70
16	AMRITSAR	MAJITHA	S-NPP	31.81250	74.98890	13:10:32	D	4.90
17	AMRITSAR	MAJITHA	AQUA	31.72700	74.94500	14:11:01	D	15.50
18	AMRITSAR	RAYYA	S-NPP	31.54130	75.14480	13:10:32	D	8.70
19	AMRITSAR	RAYYA	S-NPP	31.55830	75.15150	13:10:32	D	2.70
20	AMRITSAR	RAYYA	S-NPP	31.65230	75.21350	13:10:32	D	4.40
21	AMRITSAR	TARSIKKA	S-NPP	31.60380	75.10370	13:10:32	D	3.70
22	AMRITSAR	TARSIKKA	S-NPP	31.61200	75.08470	13:10:32	D	3.80
23	AMRITSAR	TARSIKKA	S-NPP	31.66560	75.16020	13:10:32	D	3.30
24	AMRITSAR	TARSIKKA	S-NPP	31.71730	75.16630	13:10:32	D	5.60
25	AMRITSAR	VERKA	S-NPP	31.68390	74.97310	13:10:32	D	4.00
26	AMRITSAR	VERKA	S-NPP	31.69000	74.94310	13:10:32	D	4.00
27	AMRITSAR	VERKA	S-NPP	31.69370	74.94210	13:10:32	D	6.20
28	AMRITSAR	VERKA	S-NPP	31.72040	74.89520	13:10:32	D	4.70
29	AMRITSAR	VERKA	S-NPP	31.72410	74.89420	13:10:32	D	3.60
30	TARN TARAN	KHADUR SAHIB	S-NPP	31.39690	75.08380	13:10:32	D	3.90

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**

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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)
