



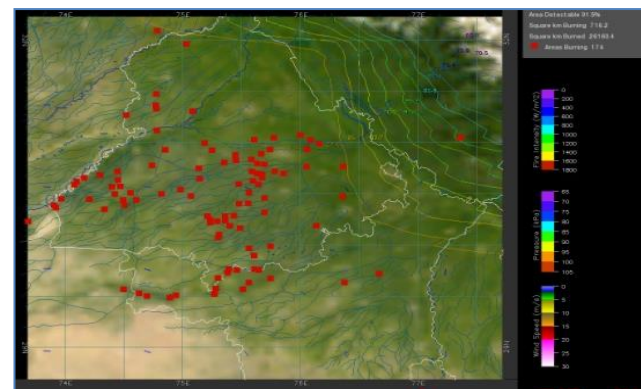
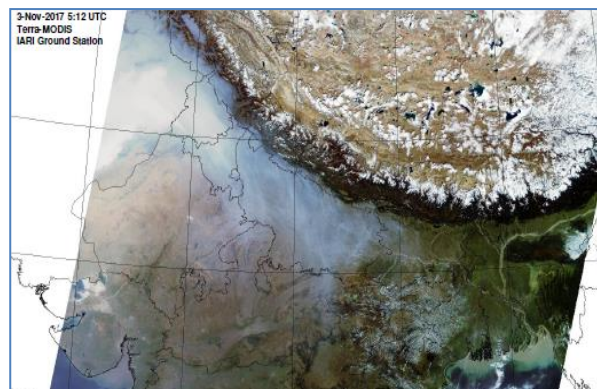
**Bulletin
No. 26**

**Events Date:
10-Oct-2022**

**Issued on:
10-Oct-2022**



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



Prepared by:

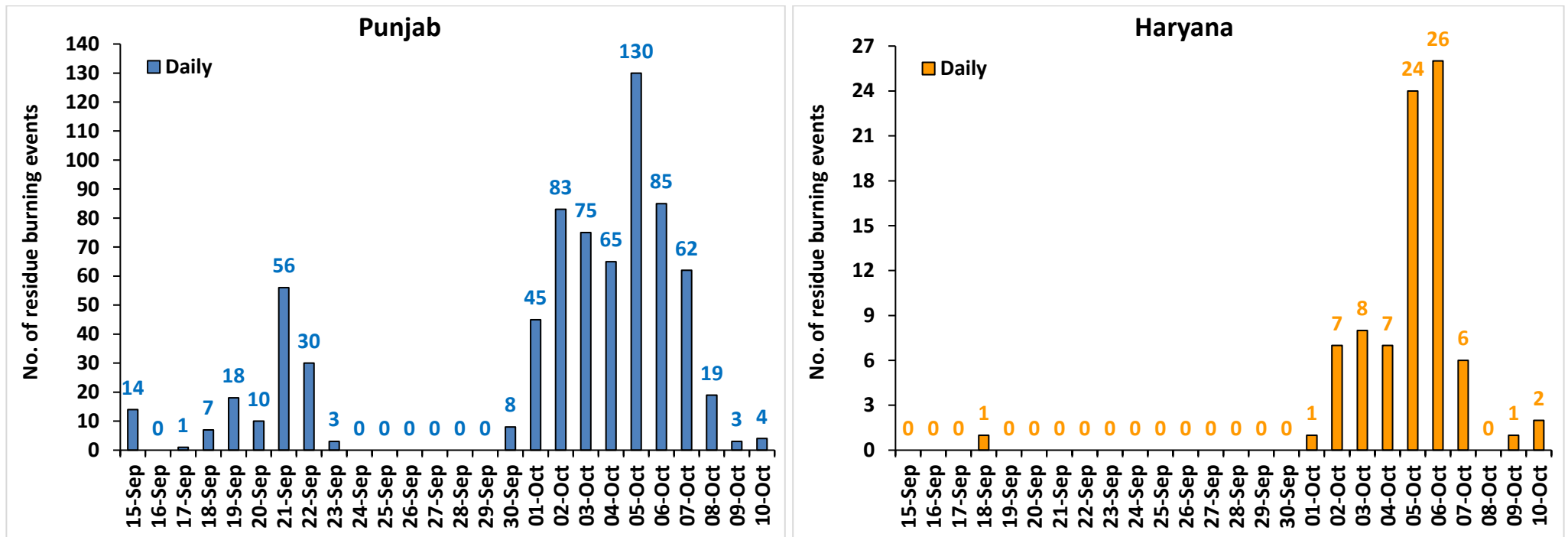
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

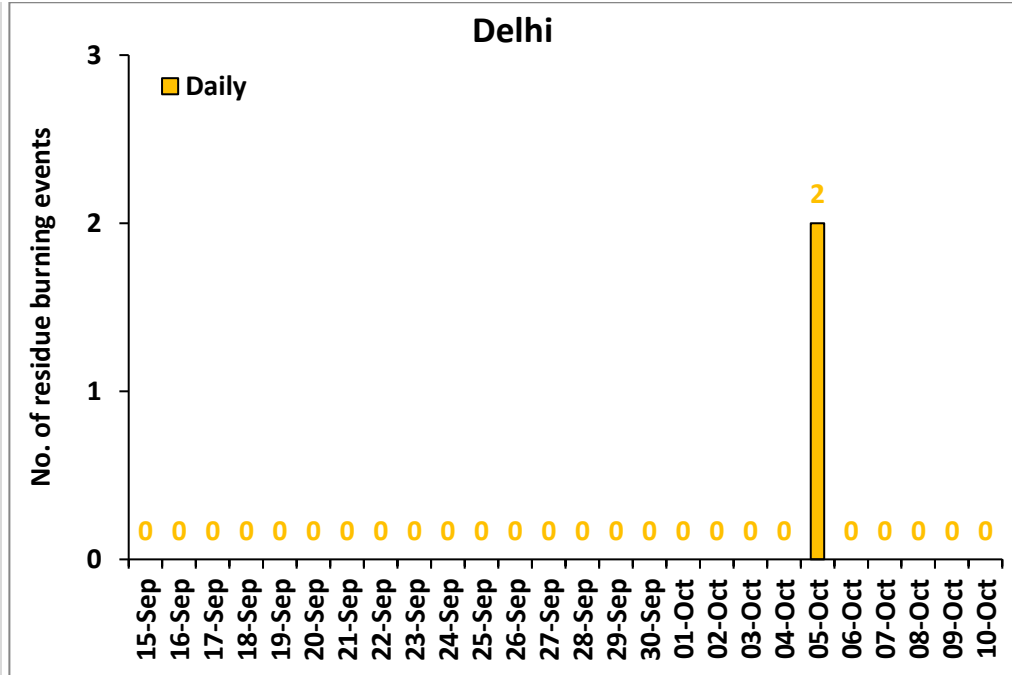
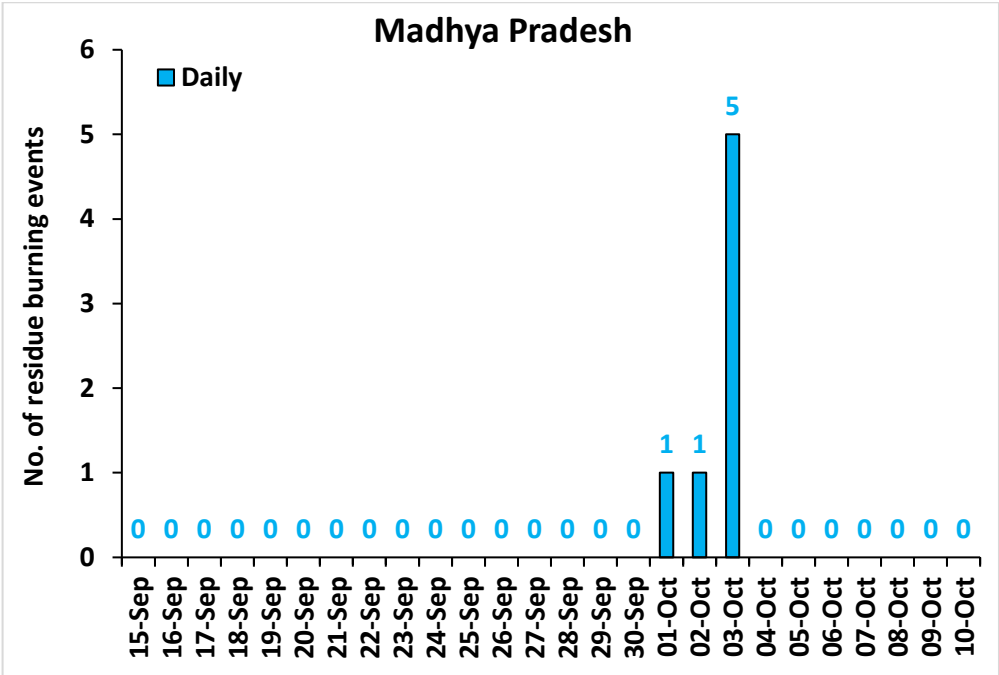
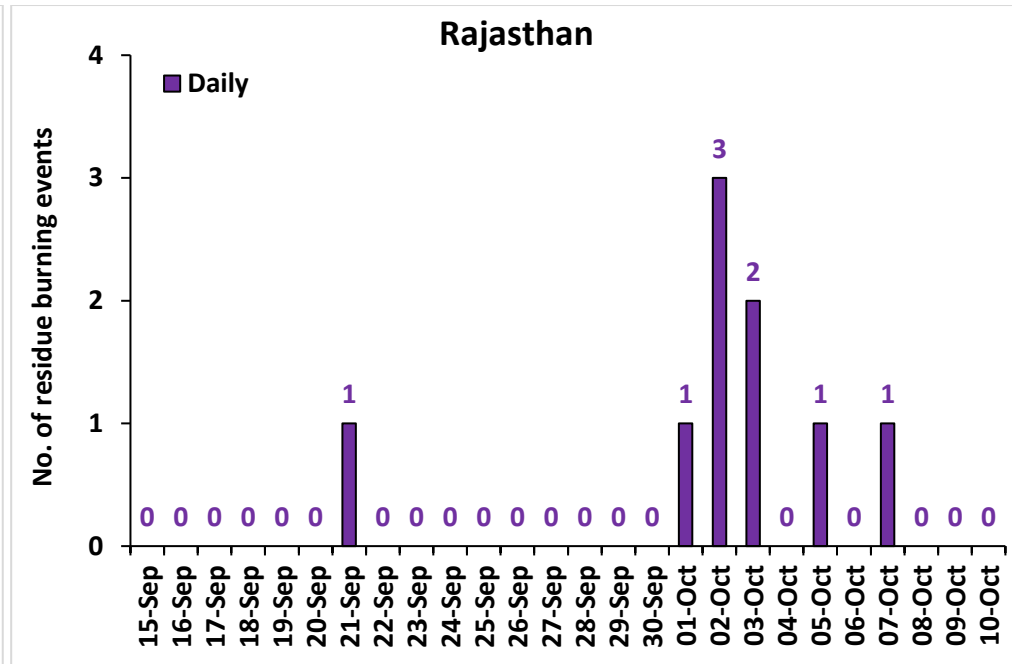
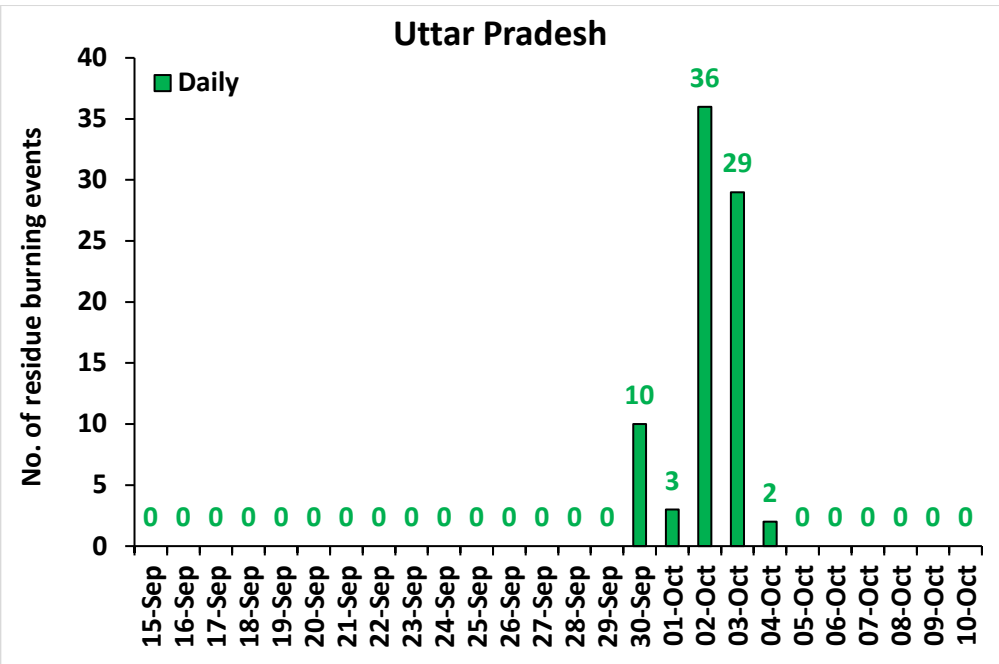
<http://creams.iari.res.in>

Highlights for 10-Oct-2022

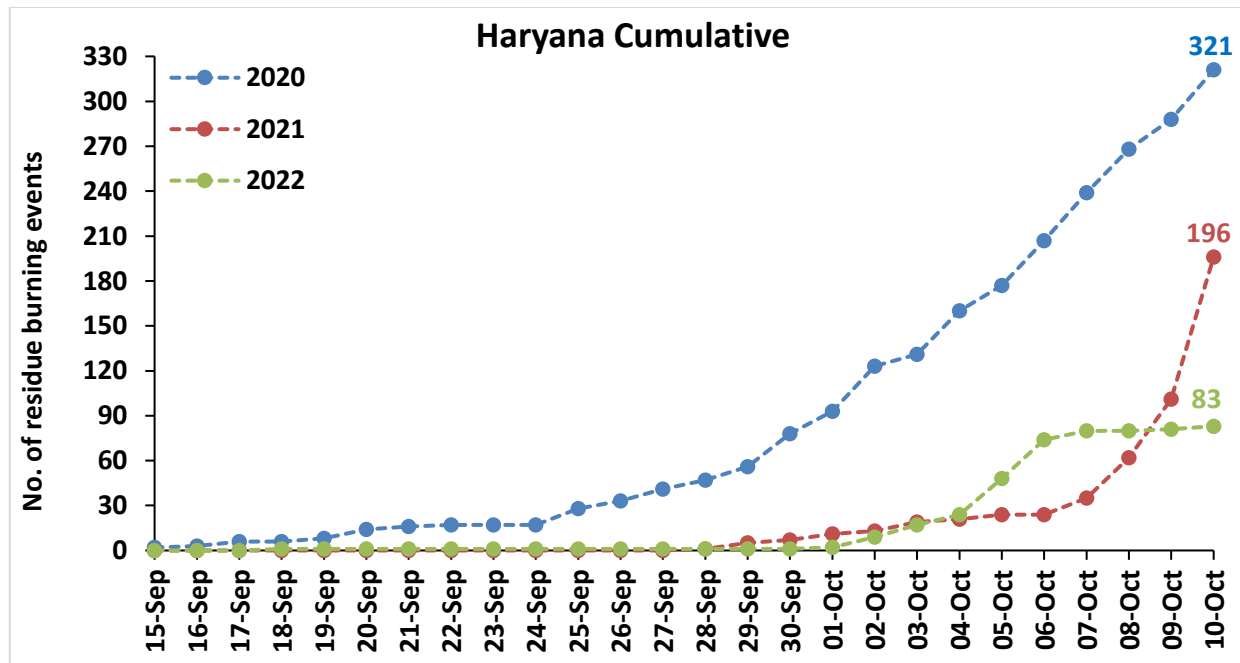
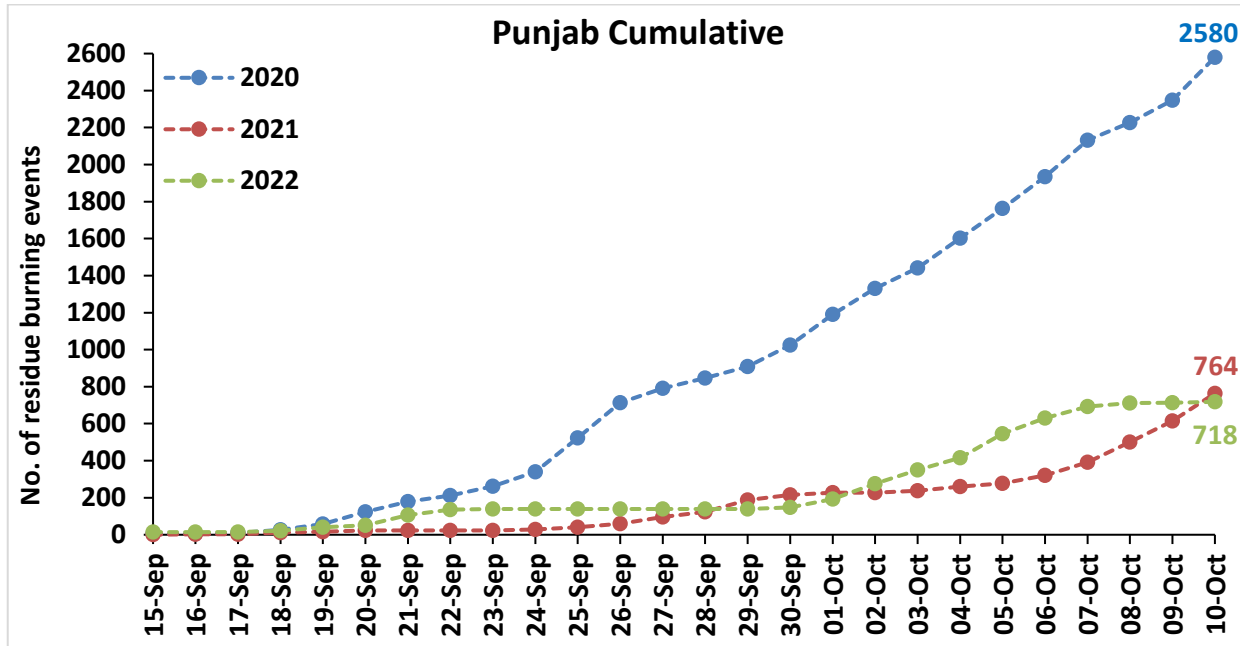
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **06** residue burning events in the six study States on 10-Oct-2022.
- The state wise events detected on 10-Oct-2022 were **4** in Punjab, **2** in Haryana, **0** in UP, **0** in Delhi, **0** in Rajasthan and **0** in MP.
- Total **899** burning events were detected in the six states between 15-Sept-2022 and 10-Oct-2022, which are distributed as **718**, **83**, **80**, **2**, **9** and **7** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.
- Detection of residue burning events was hampered by the presence of clouds over Punjab, Haryana, Delhi, Uttar Pradesh, Rajasthan and Madhya Pradesh.

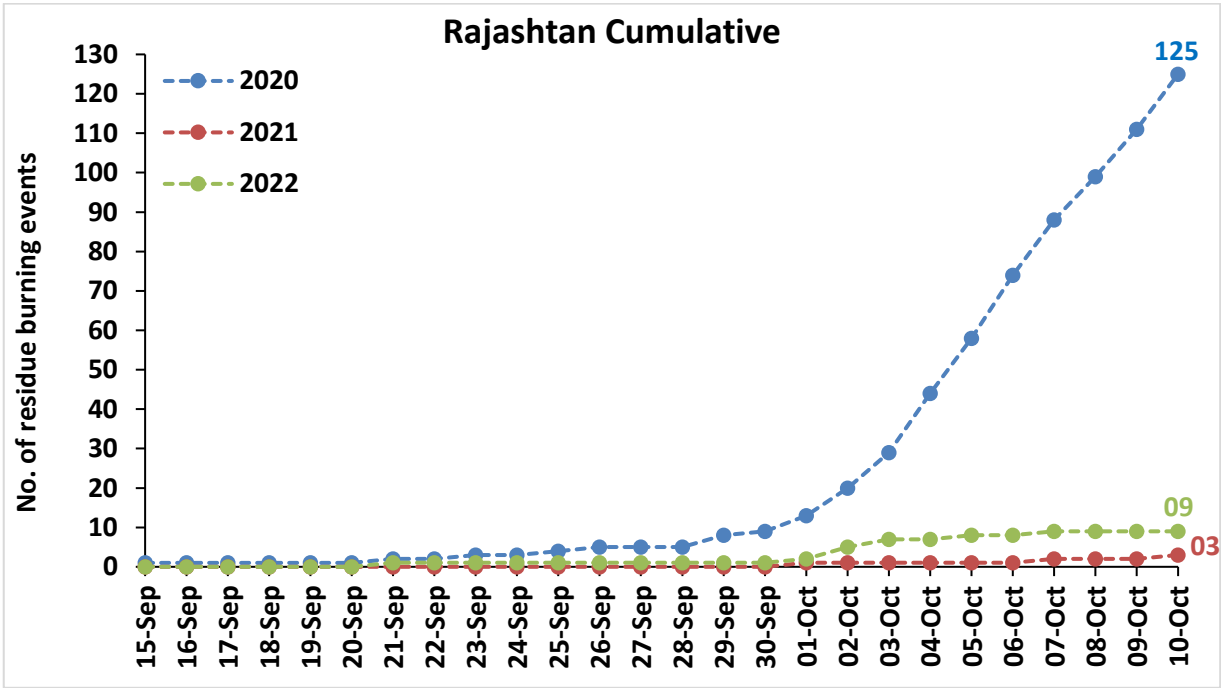
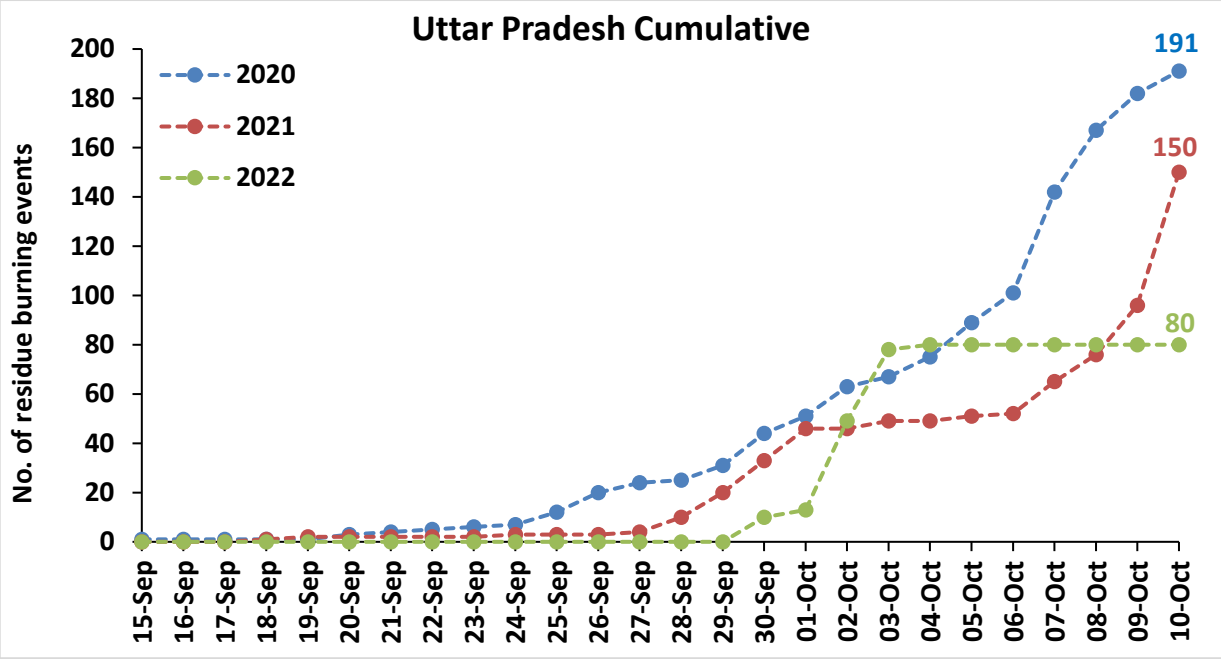
Temporal distribution of rice residue burning events for the study States in 2022

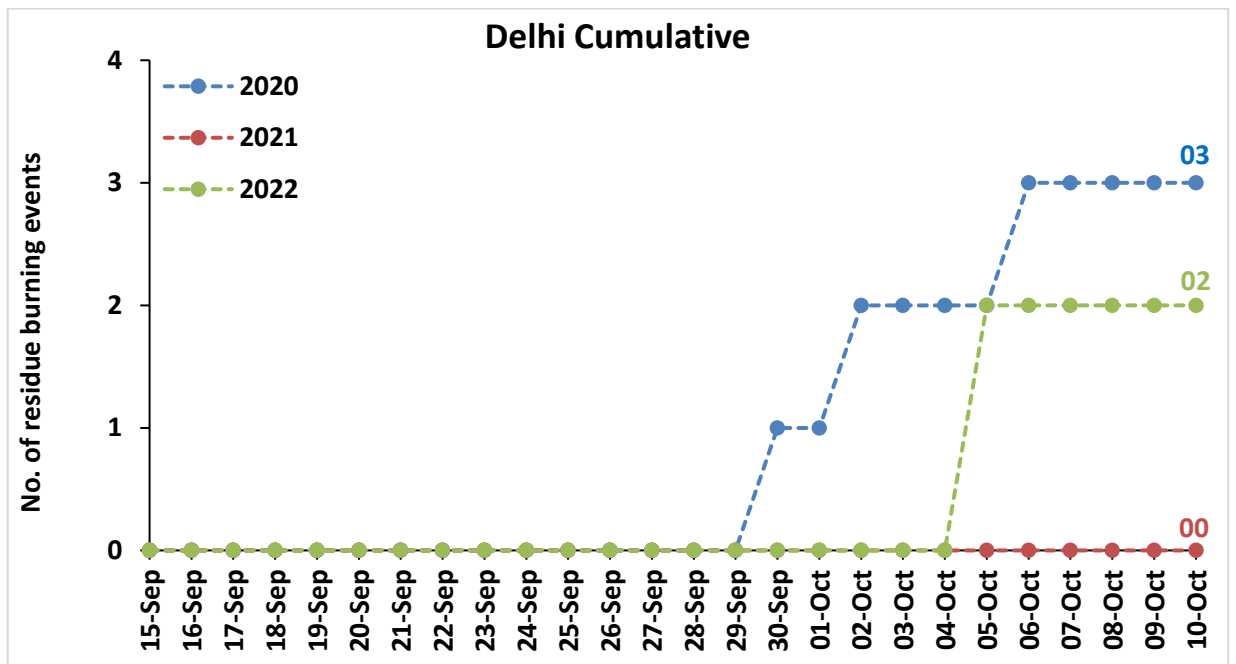
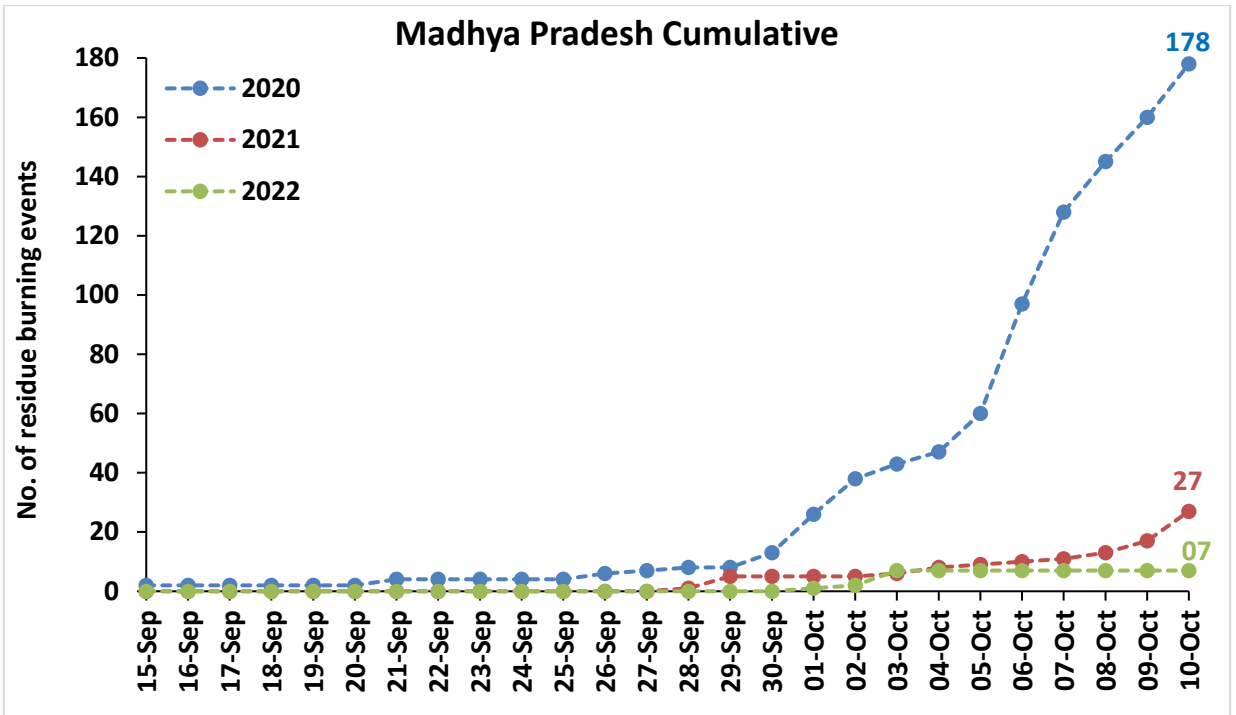




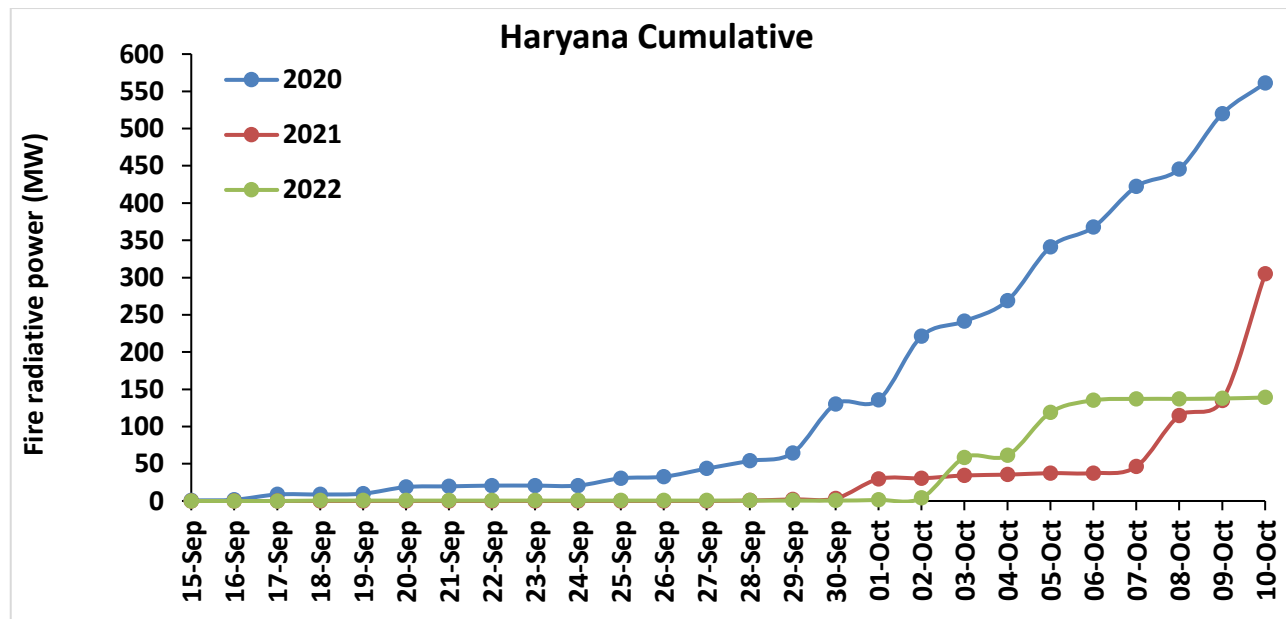
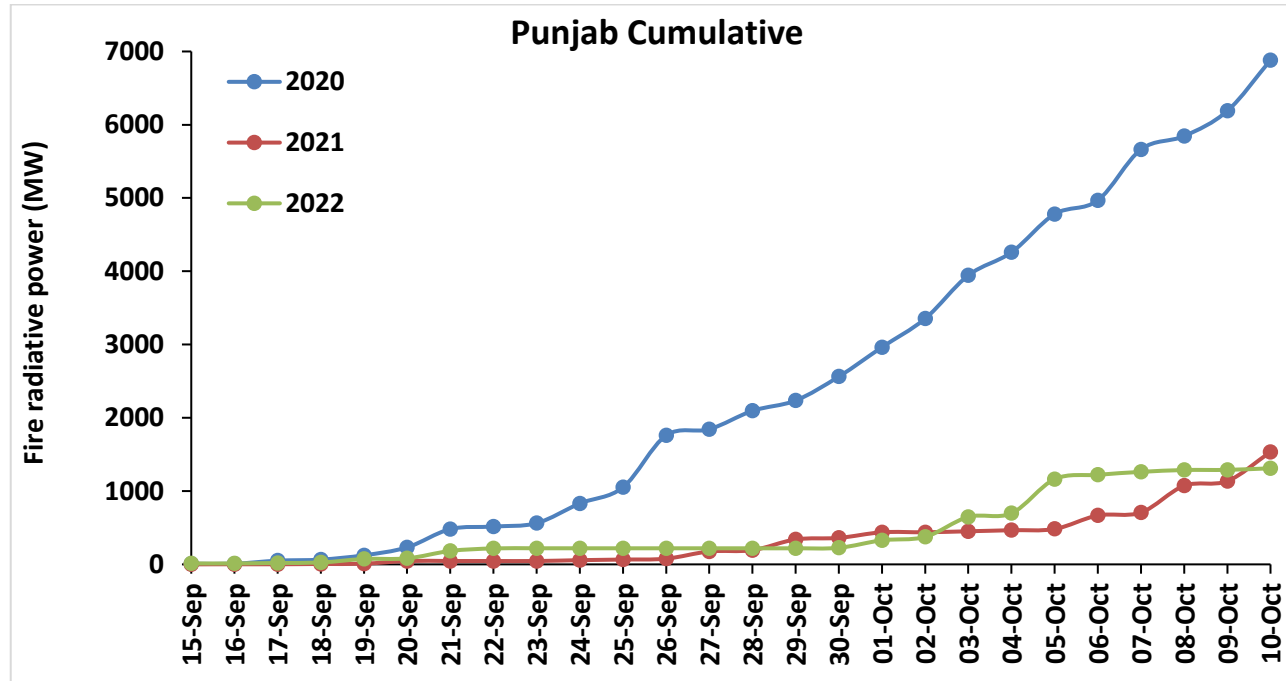
Comparison of residue burning events in current year (2022) with previous years (2020 and 2021) for the study States

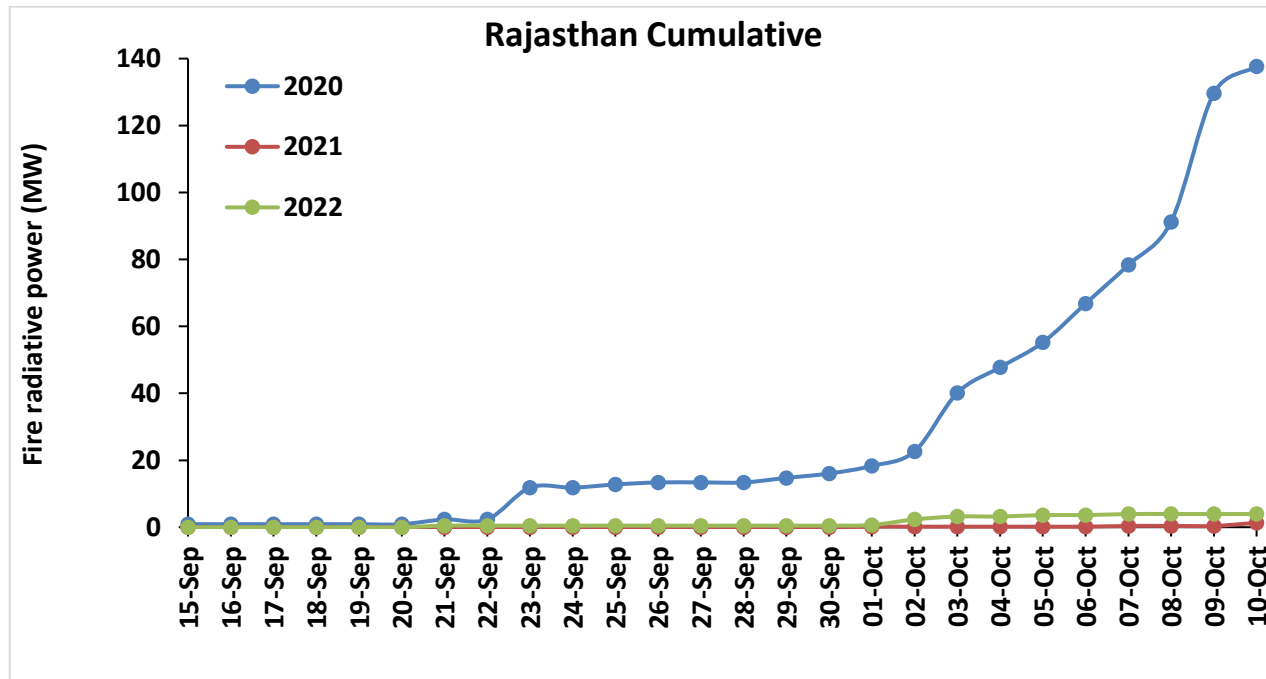
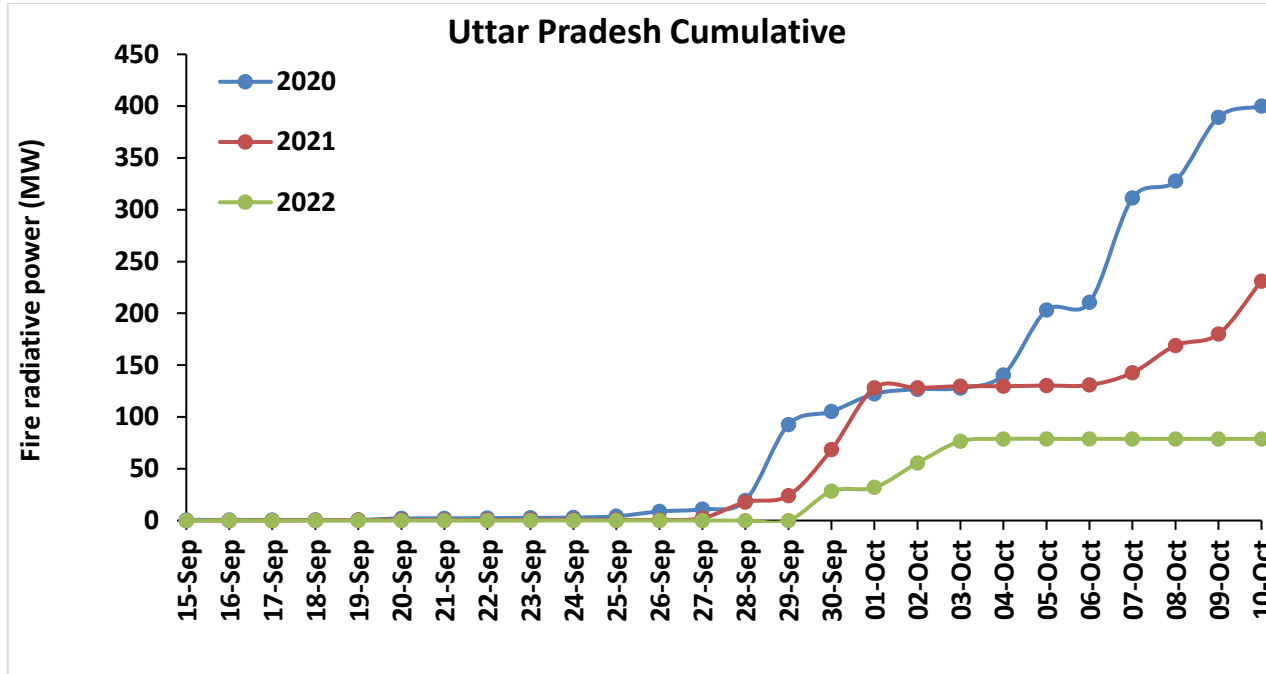


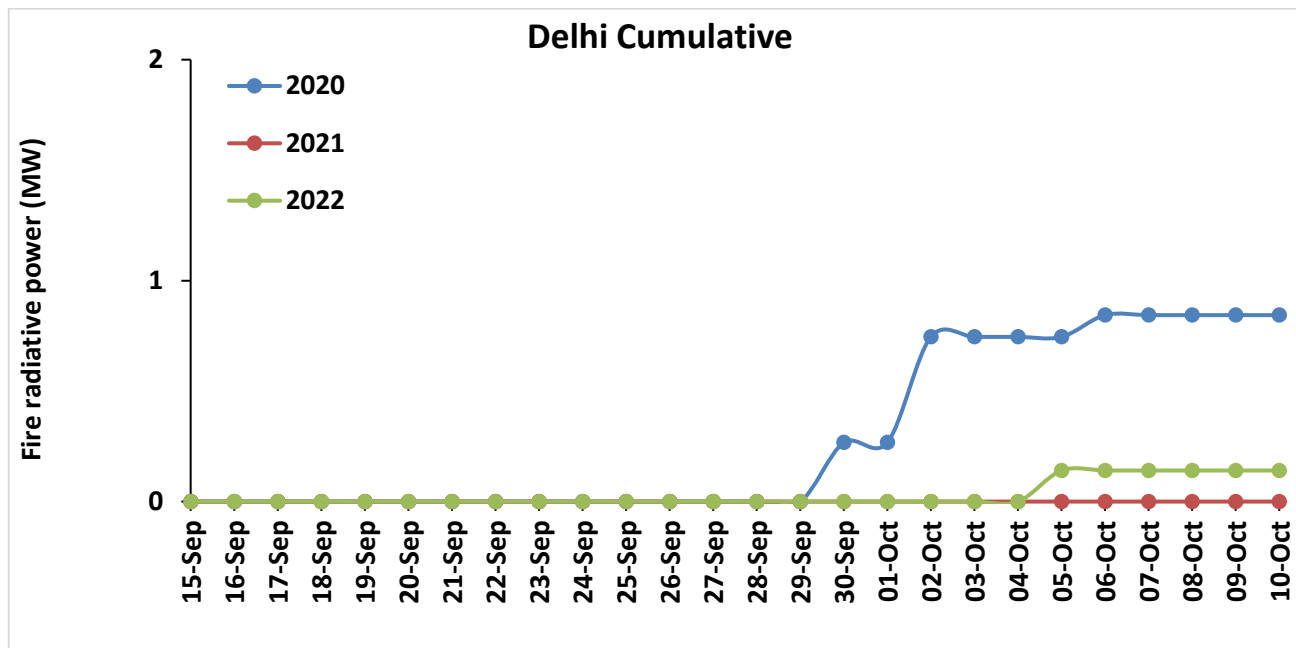
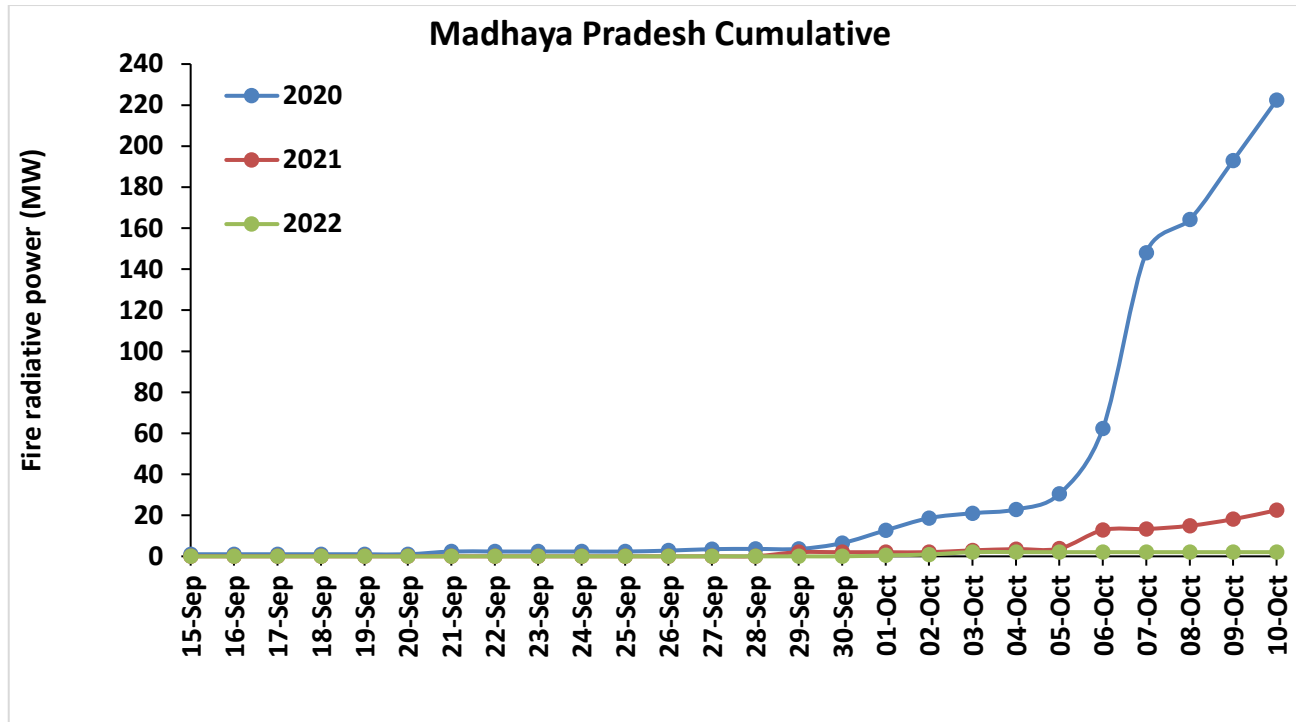




Comparison of residue burning fire power in current year (2022) with previous years (2021 and 2020) for the study States

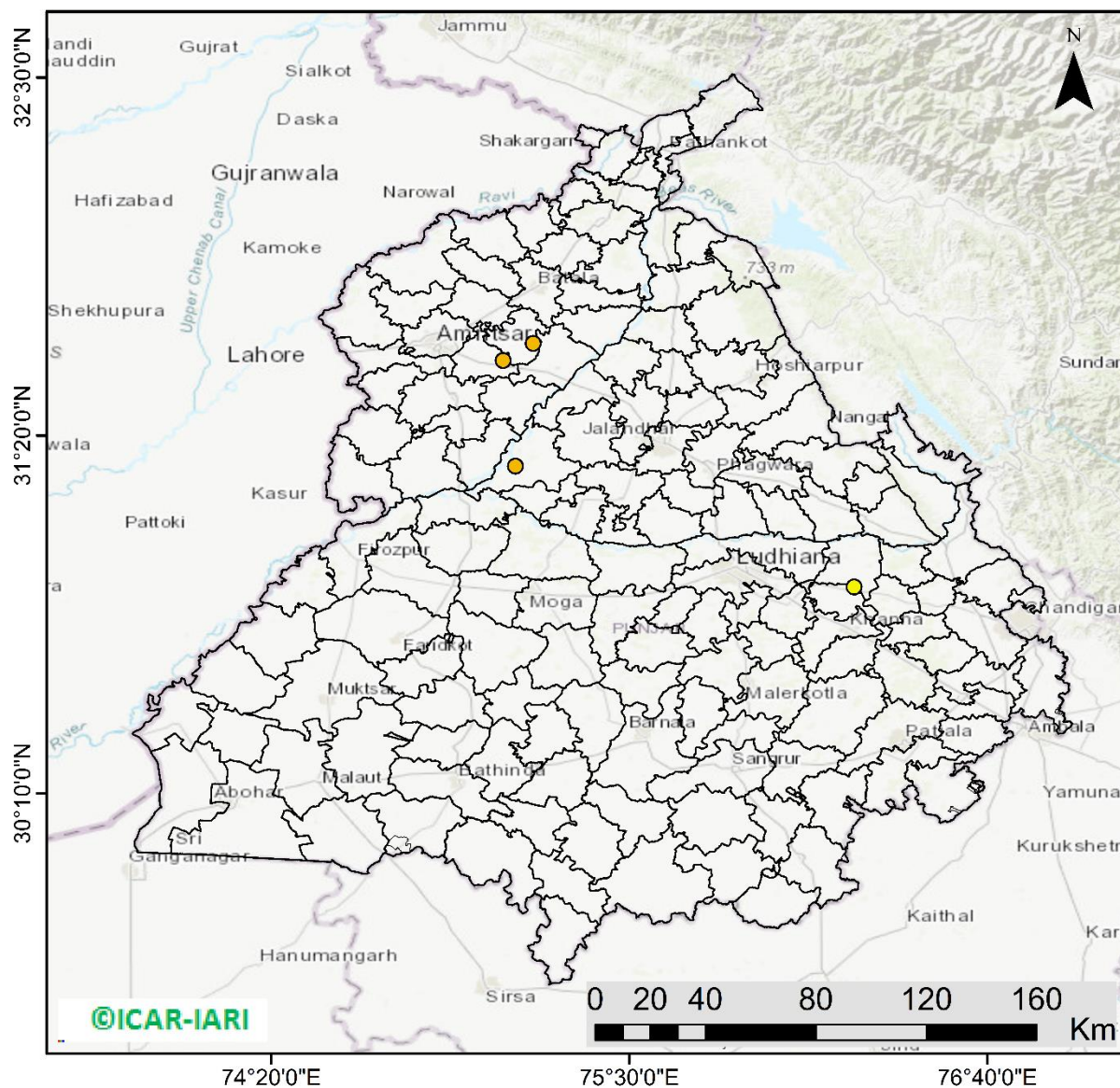






Punjab

RICE RESIDUE BURNING IN PUNJAB



04 burning events
detected in Punjab during
(10th Oct 2022)

Fire Intensity (W/m²)

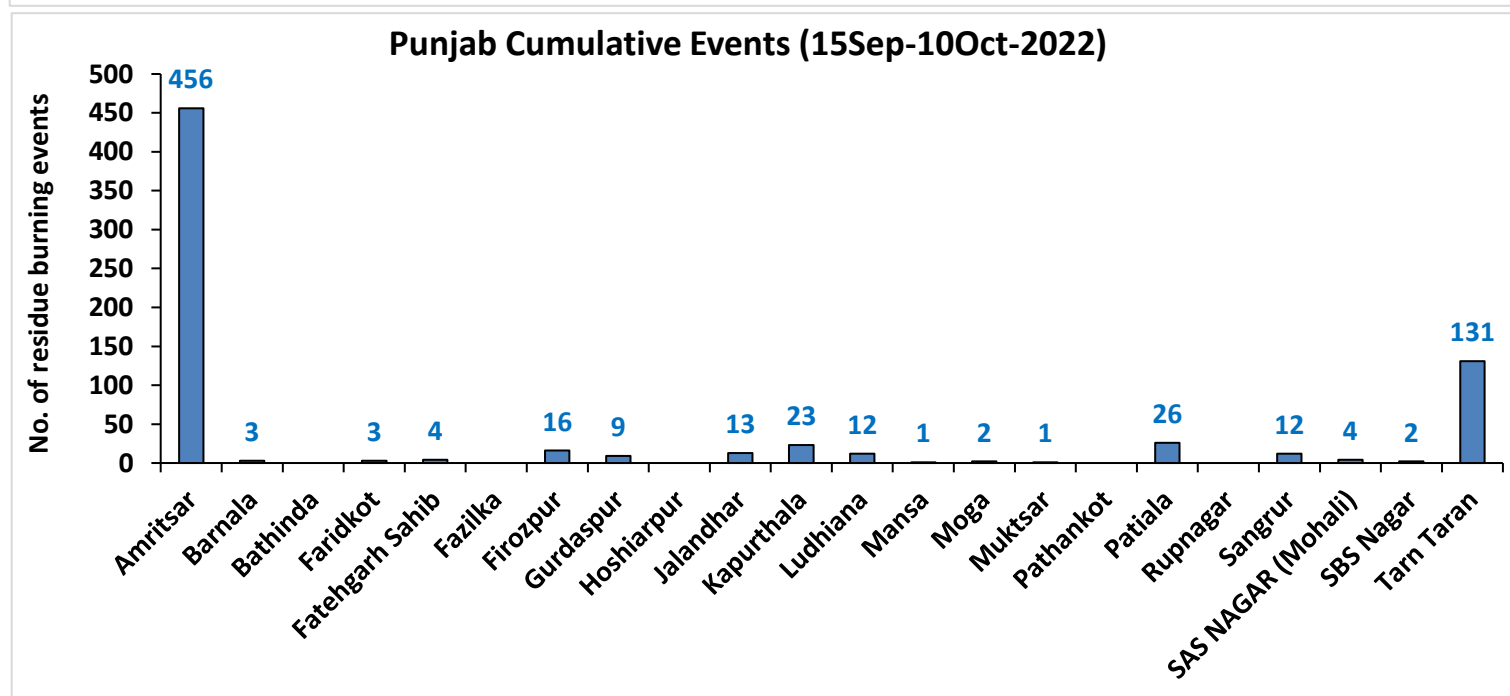
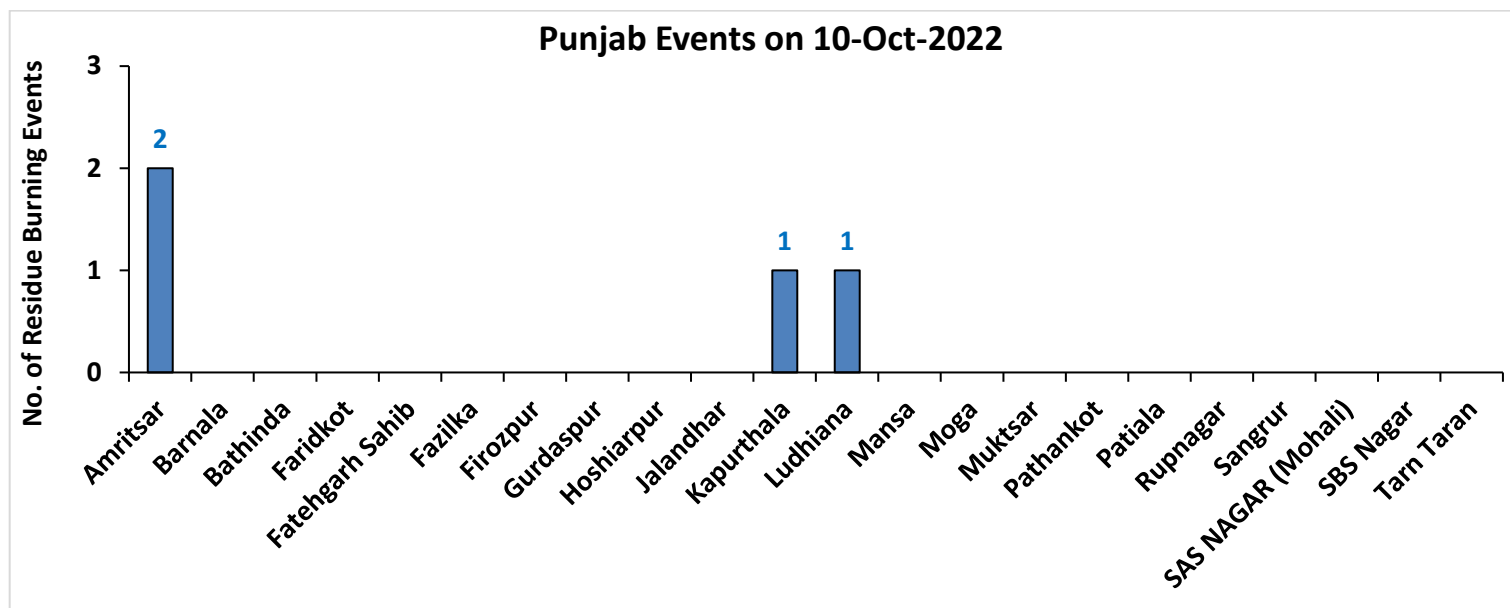
- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



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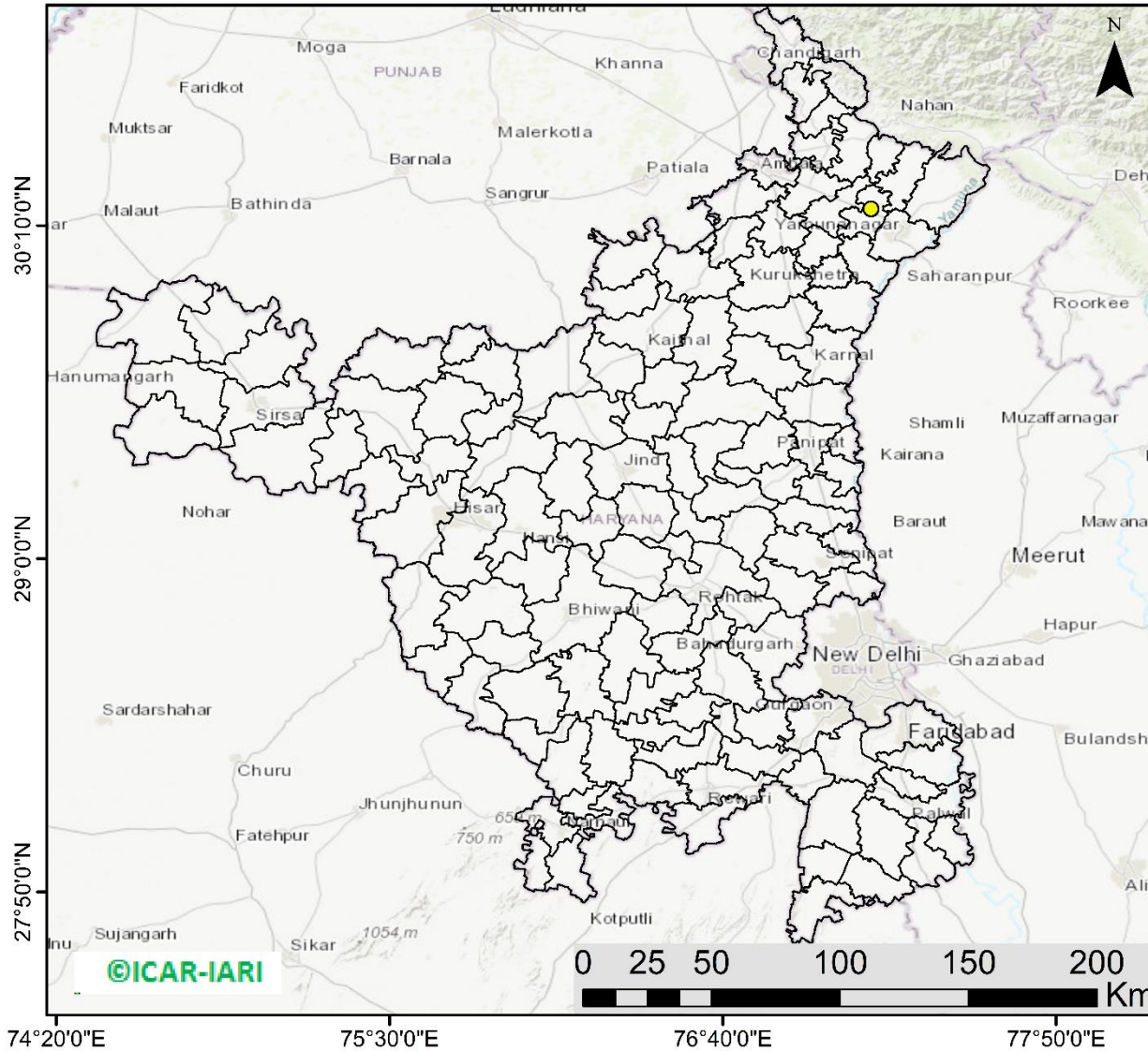
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep- 10Oct-2022)



Haryana

RICE RESIDUE BURNING IN HARYANA



02 burning events
detected in Haryana on
(10th Oct 2022)

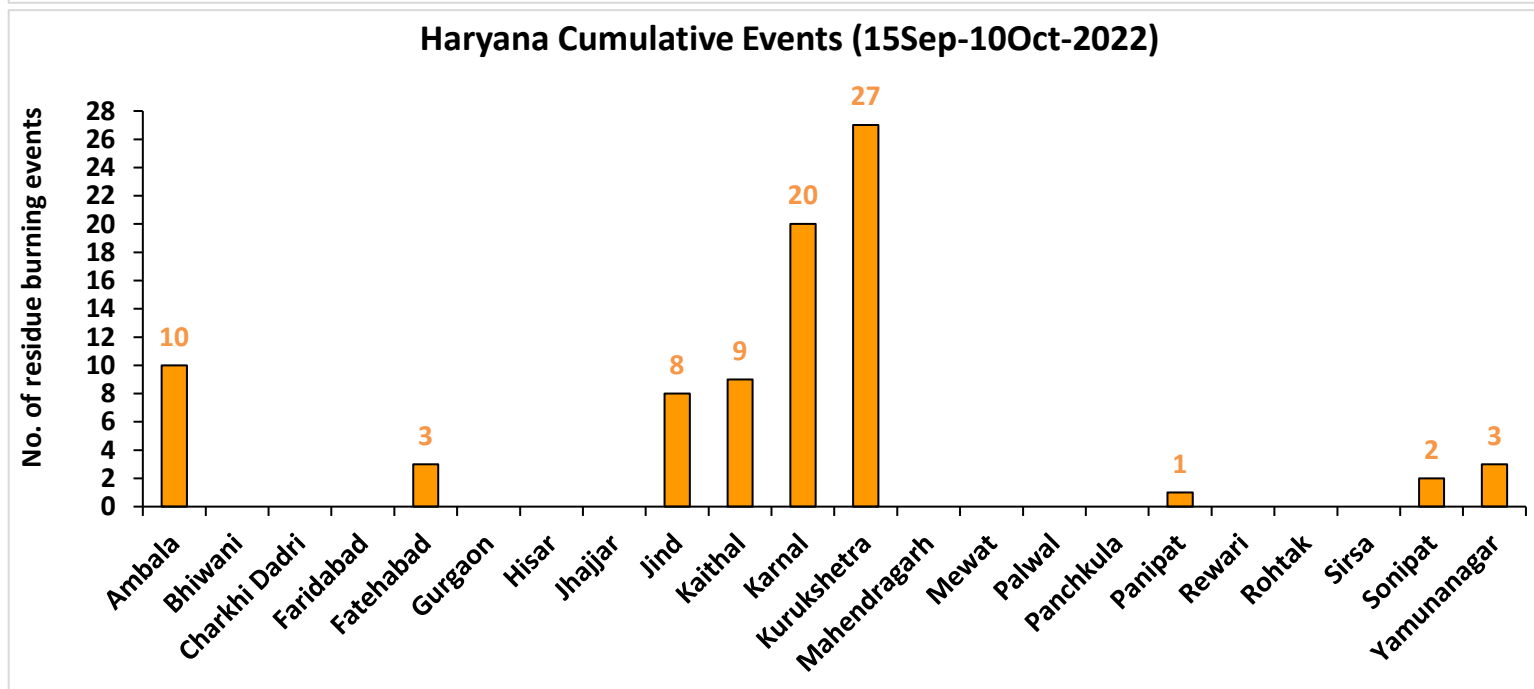
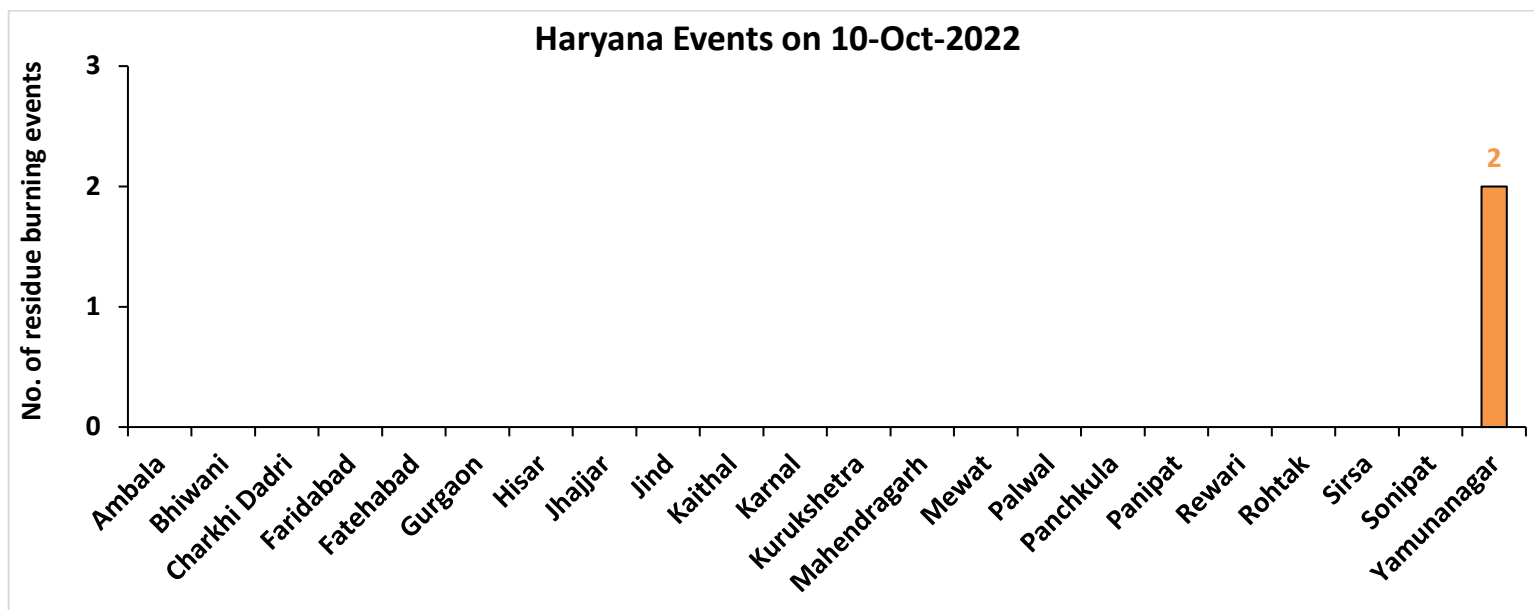
Fire Intensity (W/m²)

- 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 Haryana (15Sep- 10Oct-2022)



District-wise cumulative number of residues burning events detected in 2020 ,2021 and 2022
(Period: 15 September-10 October)

(a) Punjab

District	15 Sep-10 Oct 2022		
	2020	2021	2022
Amritsar	1338	318	456
Barnala	5	4	3
Bathinda	7	0	0
Faridkot	22	20	3
Fatehgarh Sahib	35	28	4
Fazilka	2	3	0
Firozpur	76	25	16
Gurdaspur	118	20	9
Hoshiarpur	5	0	0
Jalandhar	30	16	13
Kapurthala	44	26	23
Ludhiana	67	57	12
Mansa	6	1	1
Moga	19	7	2
Muktsar	2	2	1
Pathankot	0	0	0
Patiala	175	62	26
Rupnagar	10	2	0
Sangrur	58	9	12
SAS NAGAR (Mohali)	14	11	4
SBS Nagar	6	2	2
Tarn Taran	541	151	131
Total	2580	764	718

(b) Haryana

District	15 Sep-10 Oct 2022		
	2020	2021	2022
AMBALA	48	13	10
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	1	0
FATEHABAD	22	5	3
GURGAON	0	0	0
HISAR	4	0	0
JHAJJAR	1	0	0
JIND	3	6	8
KAITHAL	45	43	9
KARNAL	83	69	20
KURUKSHETRA	71	42	27
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	5	5	0
PANCHKULA	0	0	0
PANIPAT	6	2	1
REWARI	0	0	0
ROHTAK	0	0	0
SIRSA	2	0	0
SONIPAT	6	1	2
YAMUNANAGAR	25	9	3
Total	321	196	83

(c) Uttar Pradesh

District	15 Sep-10 Oct 2022										
	2020	2021	2022	GAUTAMBUDHNAGAR	1	1	0	MUZAFARNAGAR	2	0	0
AGRA	0	0	0	GAZIPUR	0	0	0	PILHIBHIT	4	4	2
ALIGARH	16	2	1	GHAZIABAD	1	2	1	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	5	14	0
AMETHI	0	0	0	HAMIRPUR	0	0	0	SAMBHAL	6	1	4
AMROHA	1	0	0	HAPUR	3	0	0	SANTKABIRNAGAR	0	0	0
AURAIYA	12	0	4	HARDOI	2	3	0	SANTRAVIDASNAGAR	0	0	0
AZAMGARH	0	0	0	HATHRAS	0	0	0	SHAHJAHANPUR	12	83	53
BADAUN	0	0	0	JALAUN	0	0	0	SHAMLI	17	5	2
BAGHPAT	1	0	0	JAUNPUR	0	0	0	SHARANPUR	14	0	0
BAHRAICH	2	0	0	JHANSI	5	0	0	SHRAWASTI	0	0	0
BALLIA	0	0	0	KANNAUJ	2	0	0	SIDDHARTHANAGAR	0	0	0
BALRAMPUR	0	0	0	KANPUR	0	1	0	SITAPUR	4	1	0
BANDA	0	0	0	KANPUR DEHAT	1	0	0	SONBHADRA	0	0	0
BARABANKI	7	0	0	KASGANJ	1	0	0	SULTANPUR	0	0	0
BAREILLY	5	4	0	KAUSHAMBI	6	1	0	UNNAO	2	0	0
BASTI	2	0	0	KHERI	15	14	8	VARANASI	0	0	0
BIJNOR	3	1	1	KUSHINAGAR	0	0	0	Total	191	150	80
BULANDSAHAR	3	1	2	LALITPUR	0	1	2				
CHANDAULI	0	0	0	LUCKNOW	2	0	0				
CHITRAKOOT	0	0	0	MAHARAJGANJ	0	0	0				
DEORIA	0	0	0	MAHOBA	0	0	0				
ETAH	4	1	0	MAINPURI	0	2	0				
ETAWAH	2	3	0	MATHURA	4	4	0				
FAIZABAD	0	0	0	MAU	0	0	0				
FARRUKHABAD	0	0	0	MEERUT	9	0	0				
FATEHPUR	7	0	0	MIRZAPUR	5	0	0				
FIROZABAD	1	0	0	MORADABAD	1	1	0				

(d) Delhi

District	15 Sep-10 Oct 2022		
	2020	2021	2022
CENTRAL	0	0	0
EAST	0	0	0
NEW DELHI	0	0	0
NORTH	2	0	2
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
Total	3	0	2

(e) Rajasthan

District	15 Sep-10 Oct 2022		
	2020	2021	2022
AJMER	0	0	0
ALWAR	1	0	0
BANSWARA	0	0	0
BARAN	59	0	3
BARMER	2	0	0
BHARATPUR	0	0	0
BHILWARA	2	0	0
BIKANER	0	0	0
BUNDI	1	0	3
CHITTAURGARH	0	1	0
CHURU	0	0	0
DAUSA	0	0	0
DHOLPUR	0	0	0
DUNGARPUR	0	0	0
GANGANAGAR	2	0	0
HANUMANGARH	32	2	2
JAIPUR	0	0	0
JAISELMER	2	0	0
JALOR	0	0	0
JHALAWAR	0	0	0
JHUNJHUNUN	1	0	0
JODHPUR	1	0	0
KARAULI	1	0	0
KOTA	17	0	1
NAGAUR	0	0	0
PALI	1	0	0
PRATAPGARH	0	0	0
RAJSMAND	0	0	0
SIKAR	0	0	0
SIROHI	1	0	0
SWAIMADHOPUR	1	0	0
TONK	1	0	0
UDAIPUR	0	0	0
Total	125	3	9

(f) Madhya Pradesh

District	15 Sep-10 Oct 2022						
	2020	2021	2022				
				PANNA	1	0	0
ALIRAJPUR	0	0	0	RAISEN	2	0	0
ANUPPUR	0	0	0	RAJGARH	6	1	2
ASHOKNAGAR	7	0	0	RATLAM	0	0	0
BALAGHAT	0	0	0	REWA	2	0	0
BARWANI	0	0	0	SAGAR	9	2	1
BETUL	0	0	0	SATNA	3	0	0
BHIND	0	0	0	SEHORE	4	0	1
BHOPAL	2	2	0	SEONI	2	1	0
BURHANPUR	0	0	0	SHAHDOL	0	0	0
CHHATARPUR	2	0	0	SHAJAPUR	4	0	0
CHHINDWARA	0	0	0	SHEOPUR	3	0	0
DAMOH	6	1	0	SHIVPURI	3	0	0
DATIA	8	2	0	SIDHI	0	0	0
DEWAS	3	0	0	SINGRAULI	0	0	0
DHAR	15	0	0	TIKAMGARH	1	0	0
DINDORI	0	0	0	UJJAIN	5	0	0
EAST NIMAR	0	1	0	UMARIA	0	0	0
GUNA	8	1	1	VIDESHA	37	5	1
GWALIOR	17	0	1	WEST NIMAR	1	0	0
HARDA	8	7	0	Total	178	27	7
HOSHANGABAD	5	0	0				
INDORE	2	0	0				
JABALPUR	6	1	0				
JHABUA	0	0	0				
KATNI	0	0	0				
MANDLA	0	0	0				
MANDSAUR	0	0	0				
MORENA	5	2	0				
NARSHIMAPURA	1	1	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 - 10 October 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
01-Oct	165	13	45	15	4	1	7	13	3	0	0	0	4	1	1	13	0	1
02-Oct	141	0	83	30	2	7	12	0	36	1	0	0	7	0	3	12	0	1
03-Oct	110	9	75	8	6	8	4	3	29	0	0	0	9	0	2	5	1	5
04-Oct	162	23	65	29	2	7	8	0	2	0	0	0	15	0	0	4	2	0
05-Oct	161	18	130	17	3	24	14	2	0	0	0	2	14	0	1	13	1	0
06-Oct	171	42	85	30	0	26	12	1	0	1	0	0	16	0	0	37	1	0
07-Oct	197	72	62	32	11	6	41	13	0	0	0	0	14	1	1	31	1	0
08-Oct	95	108	19	29	27	0	25	11	0	0	0	0	11	0	0	17	2	0

09-Oct	121	114	3	20	39	1	15	20	0	0	0	0	12	0	0	15	4	0
10-Oct	232	150	4	33	95	2	9	54	0	0	0	0	14	1	0	18	10	0
Total	2580	764	718	321	196	83	191	150	80	3	0	2	125	3	9	178	27	7

Details of residue burning events in Punjab on 10-Oct-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	JANDIALA GURU	AQUA	31.57700	75.08900	13:53:36	D	6.50
2	AMRITSAR	TARSIKKA	AQUA	31.63300	75.18700	13:53:36	D	6.20
3	KAPURTHALA	SULTANPUR LODHI	AQUA	31.23300	75.12900	13:53:36	D	8.20
4	LUDHIANA	MACHHIWARA	S-NPP	30.83920	76.23250	14:13:55	D	3.80

Details of residue burning events in Haryana on 10-Oct-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	YAMUNANAGAR	MUSTAFABAD	S-NPP	30.22400	77.18580	14:13:55	D	6.10
2	YAMUNANAGAR	MUSTAFABAD	S-NPP	30.22480	77.18550	14:13:55	D	3.40

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)

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