



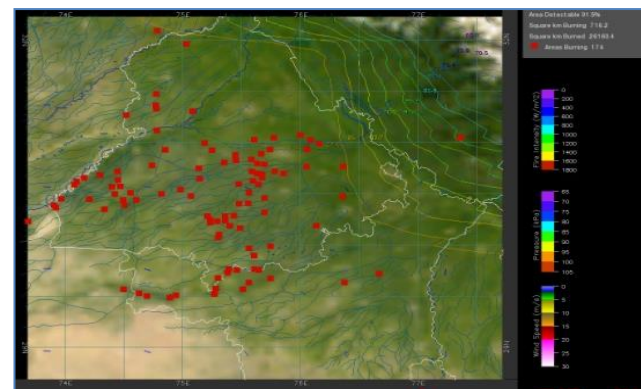
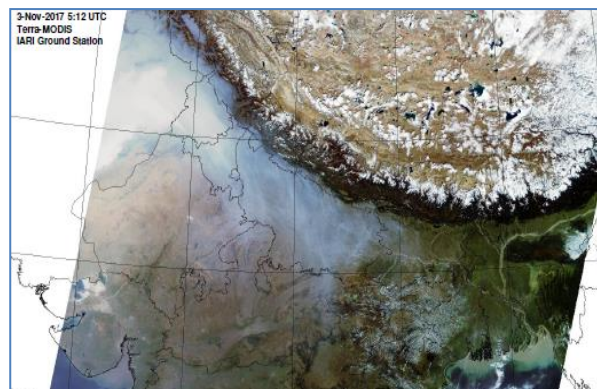
**Bulletin
No. 25**

**Events Date:
09-Oct-2022**

**Issued on:
09-Oct-2022**



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



Prepared by:

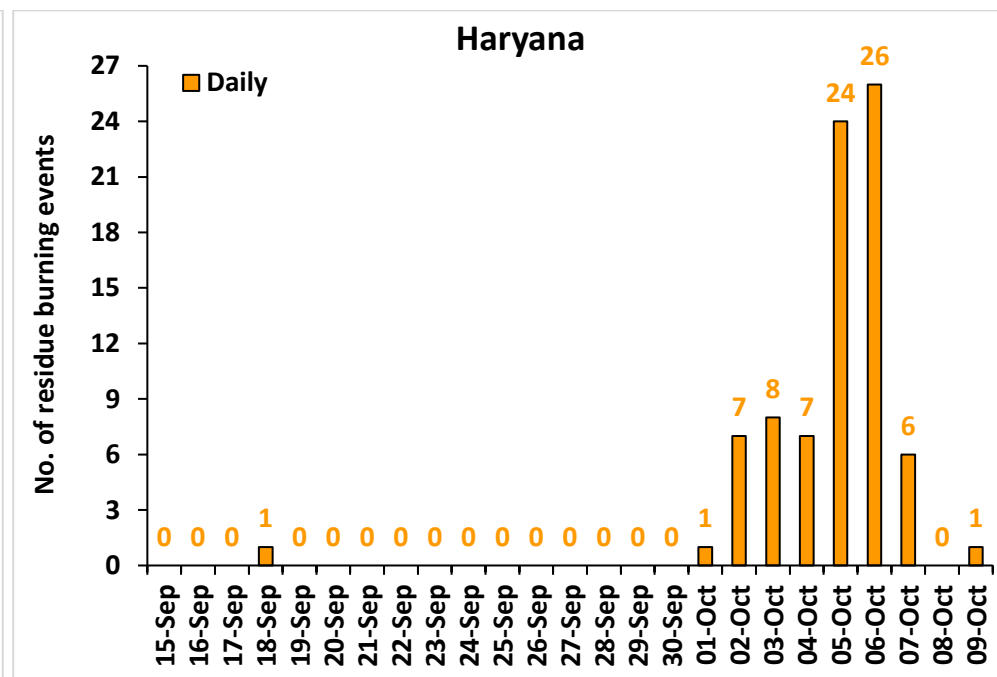
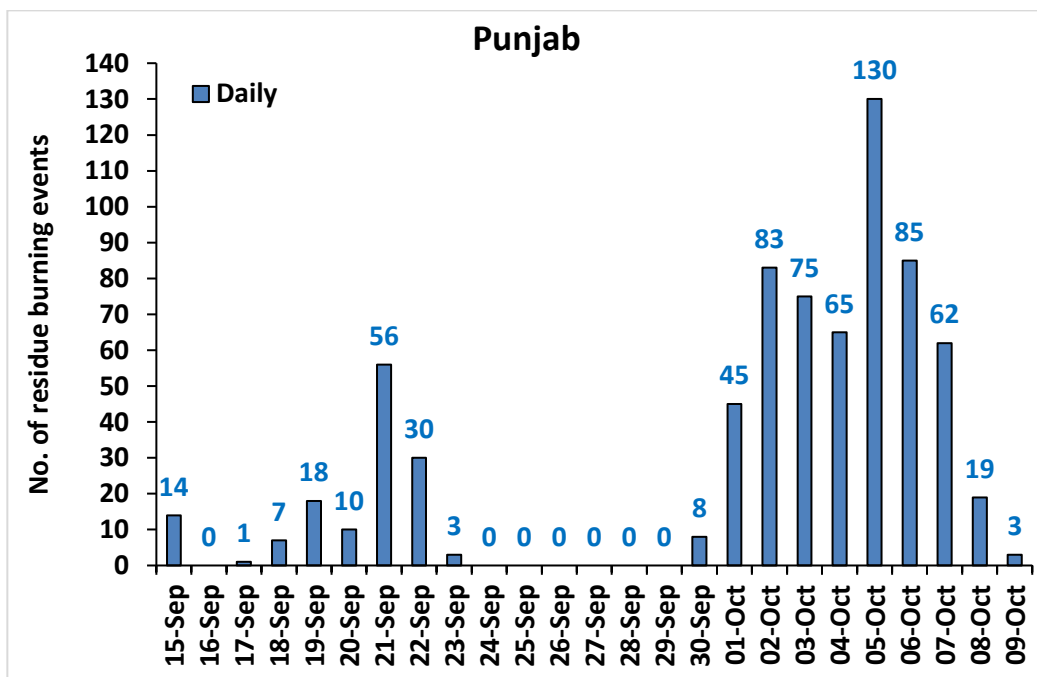
**Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012**

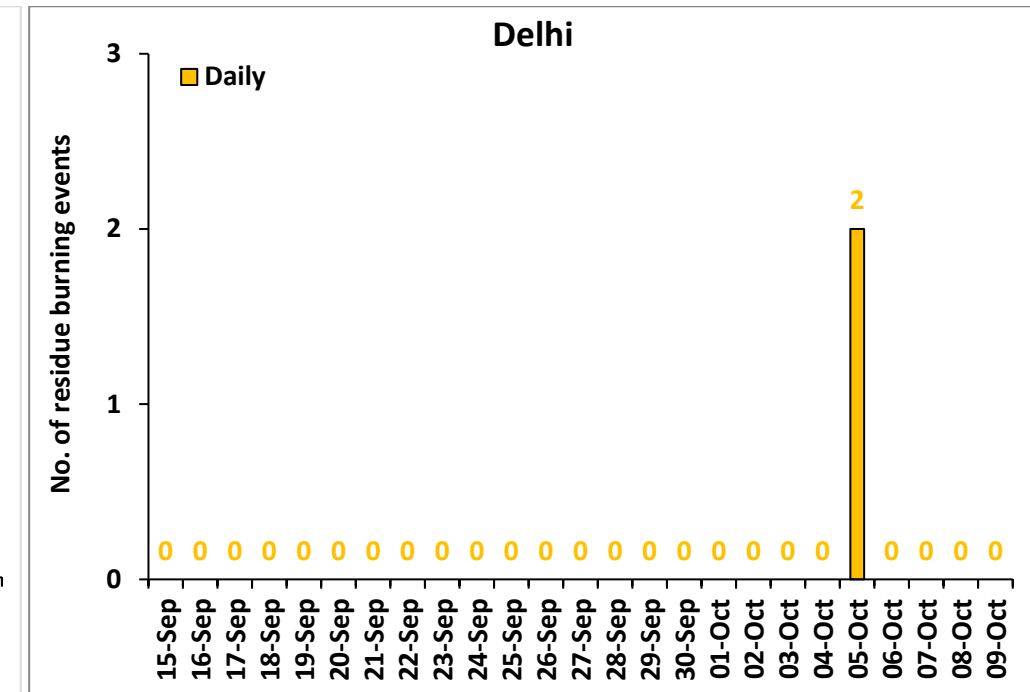
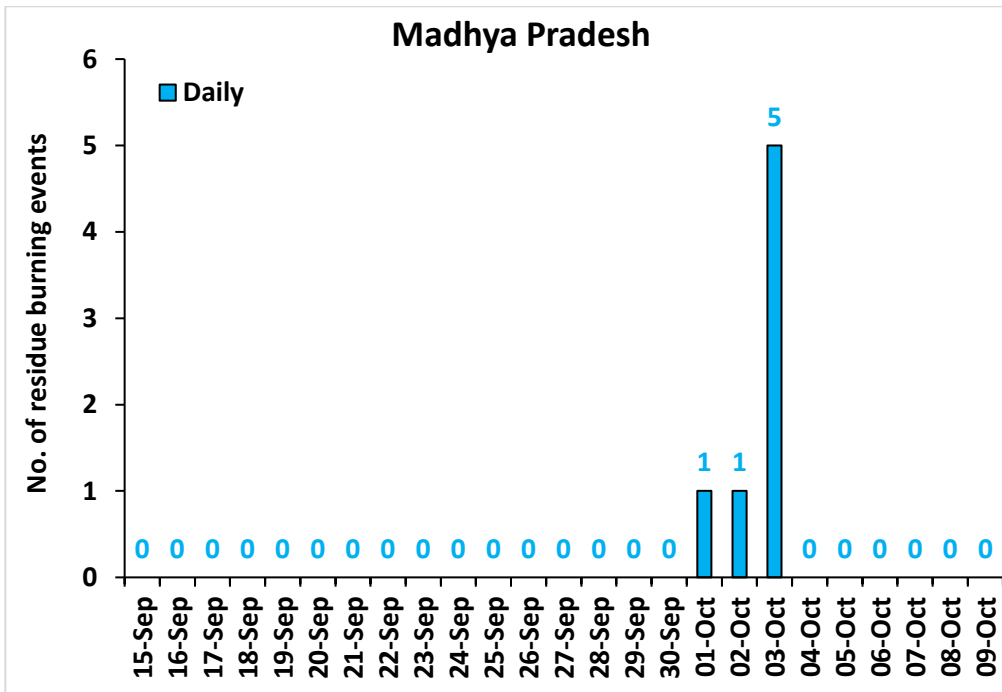
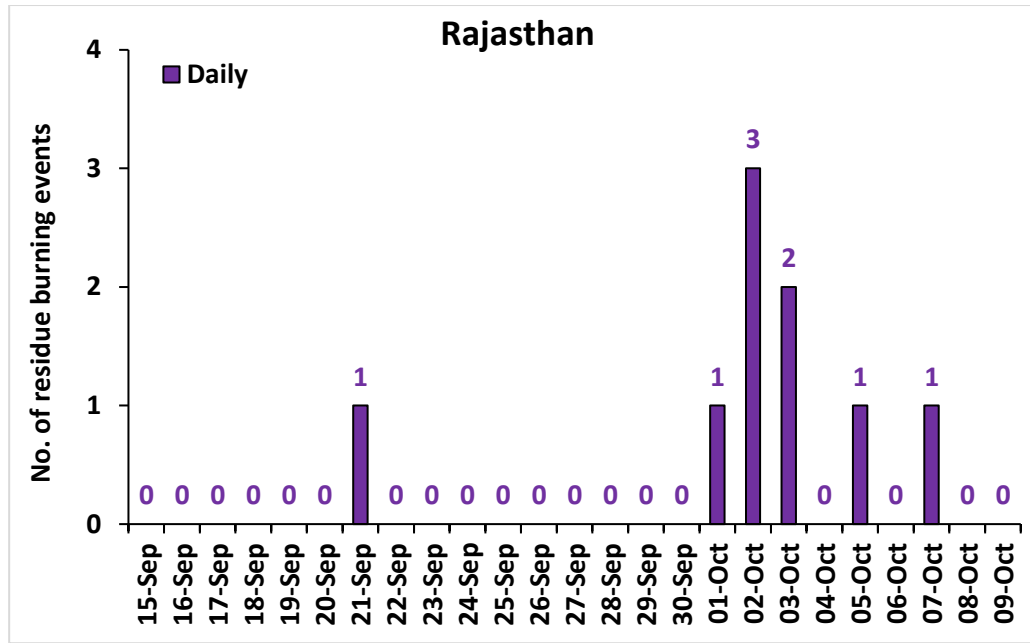
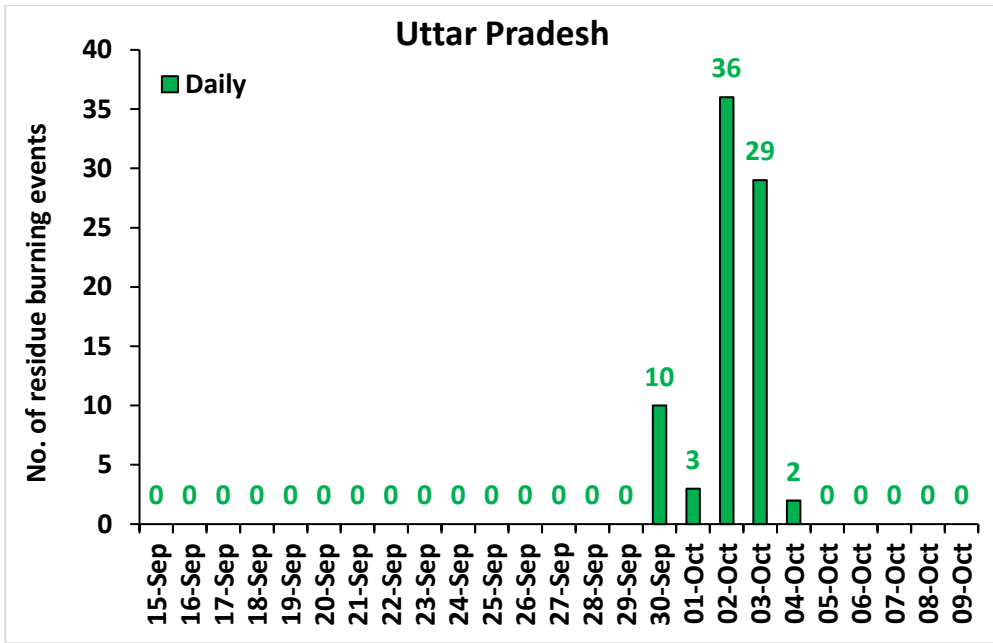
<http://creams.iari.res.in>

Highlights for 09-Oct-2022

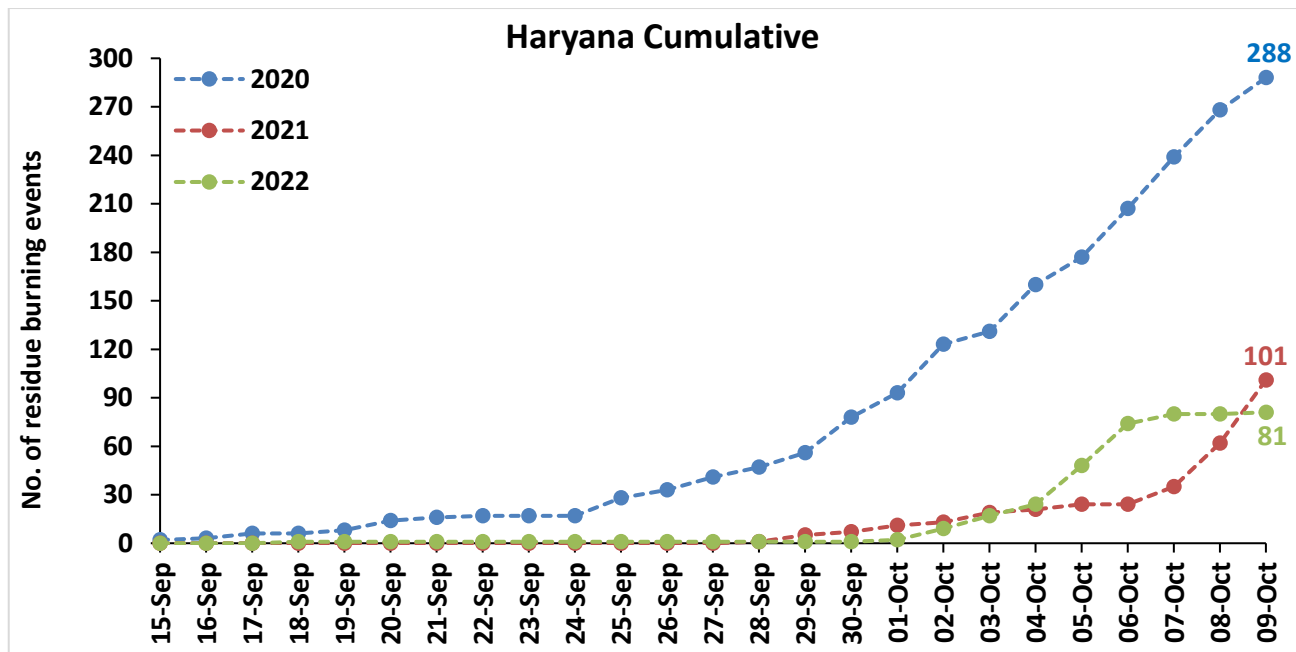
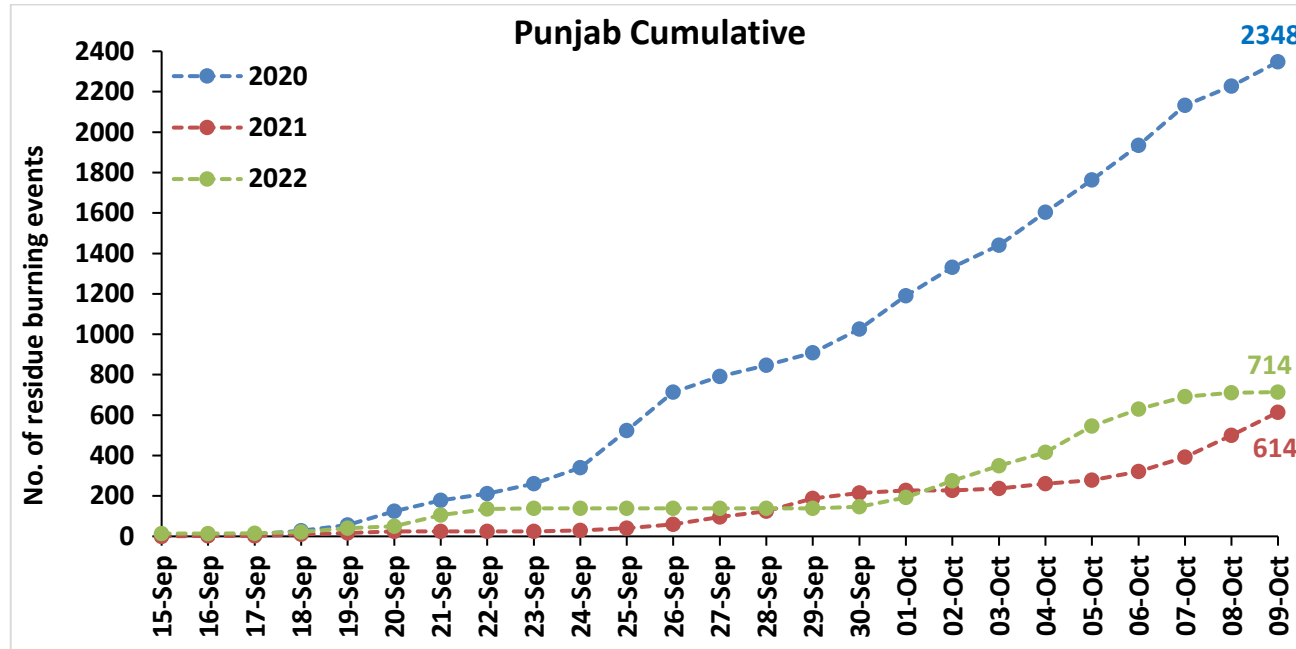
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **04** residue burning events in the six study States on 09-Oct-2022.
- The state wise events detected on 09-Oct-2022 were **3** in Punjab, **1** in Haryana, **0** in UP, **0** in Delhi, **0** in Rajasthan and **0** in MP.
- Total **893** burning events were detected in the six states between 15-Sept-2022 and 09-Oct-2022, which are distributed as **714**, **81**, **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 and Madhya Pradesh.

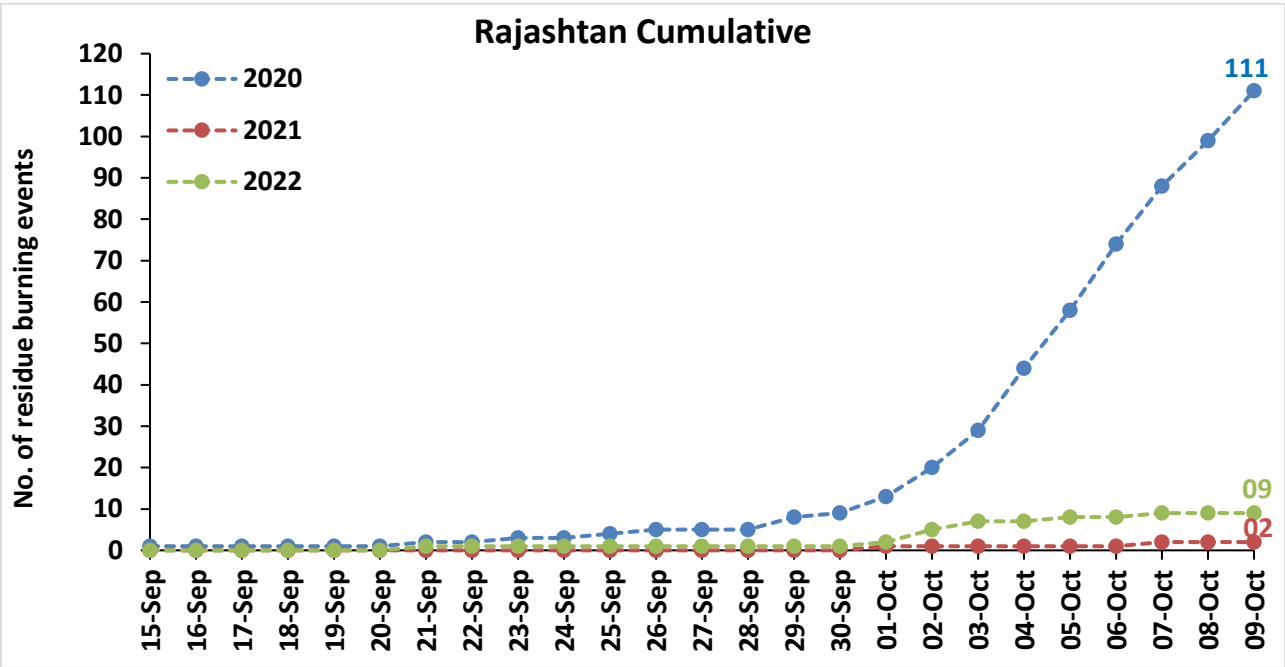
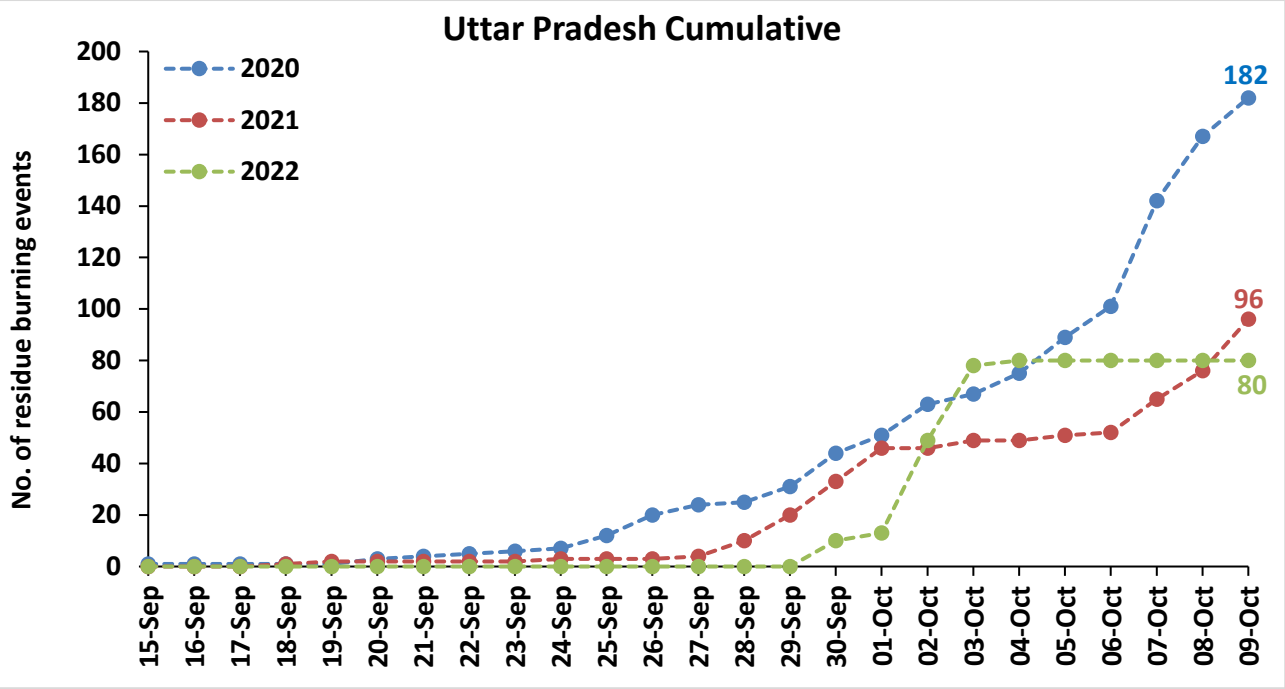
Temporal distribution of rice residue burning events for the study States in 2022

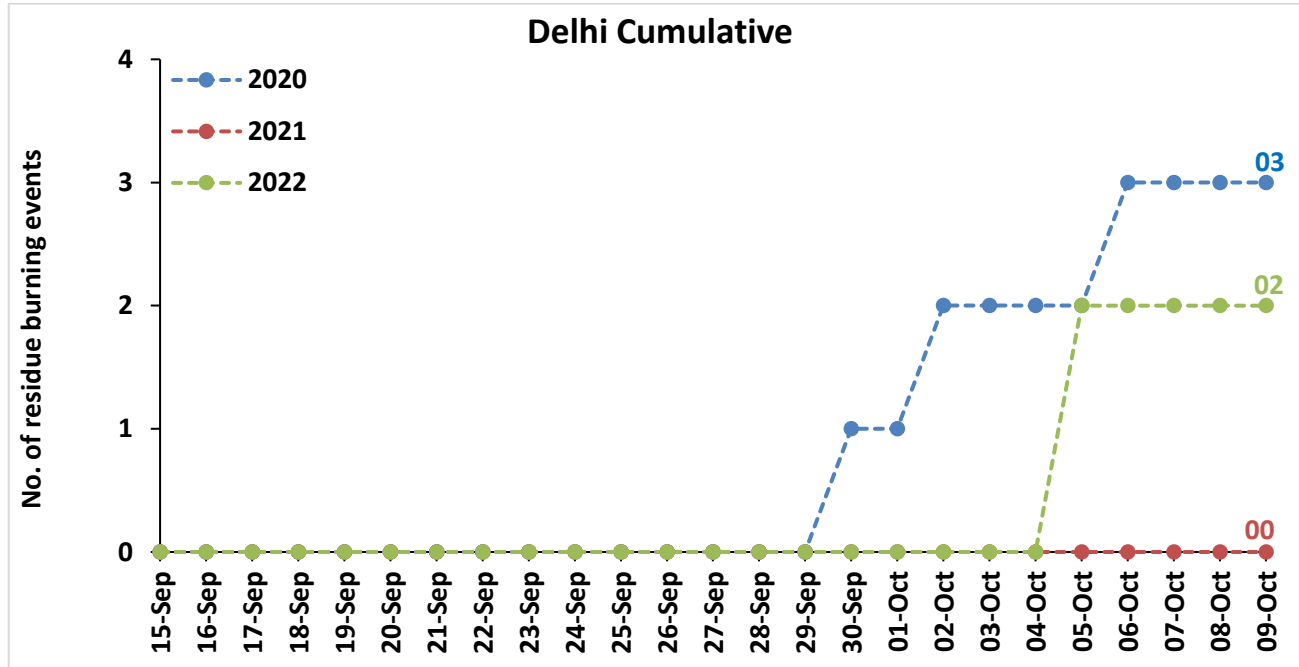
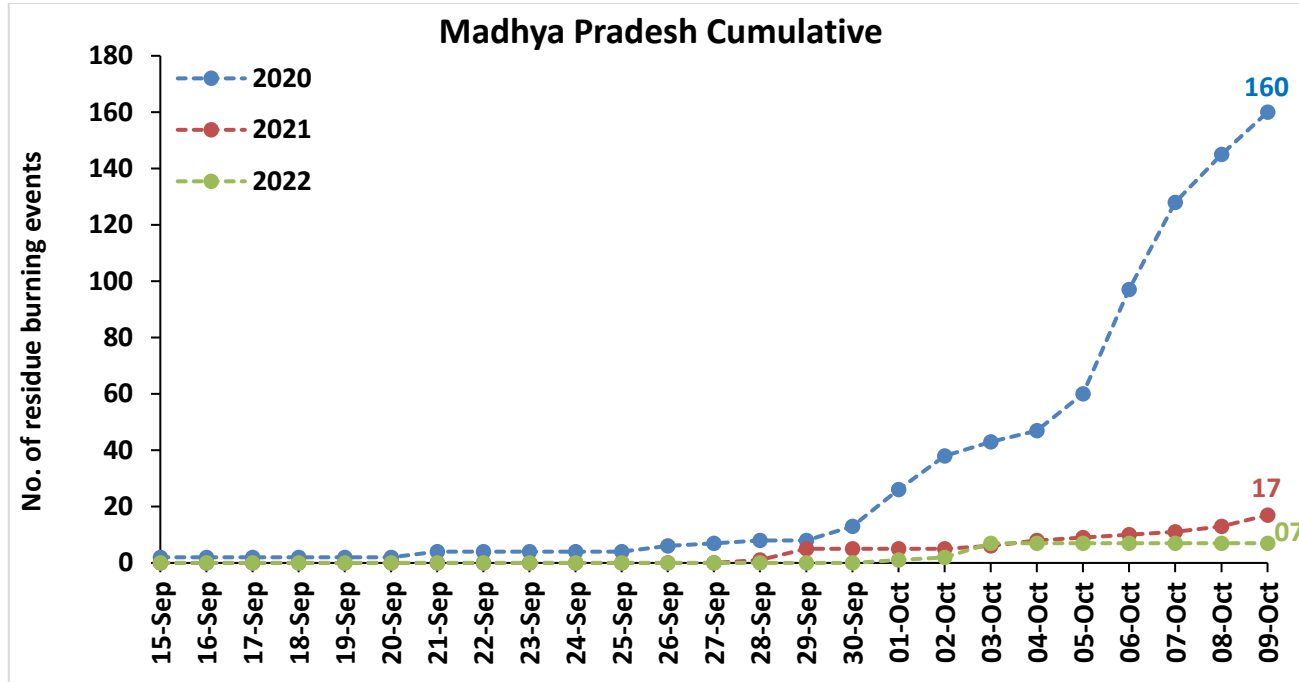




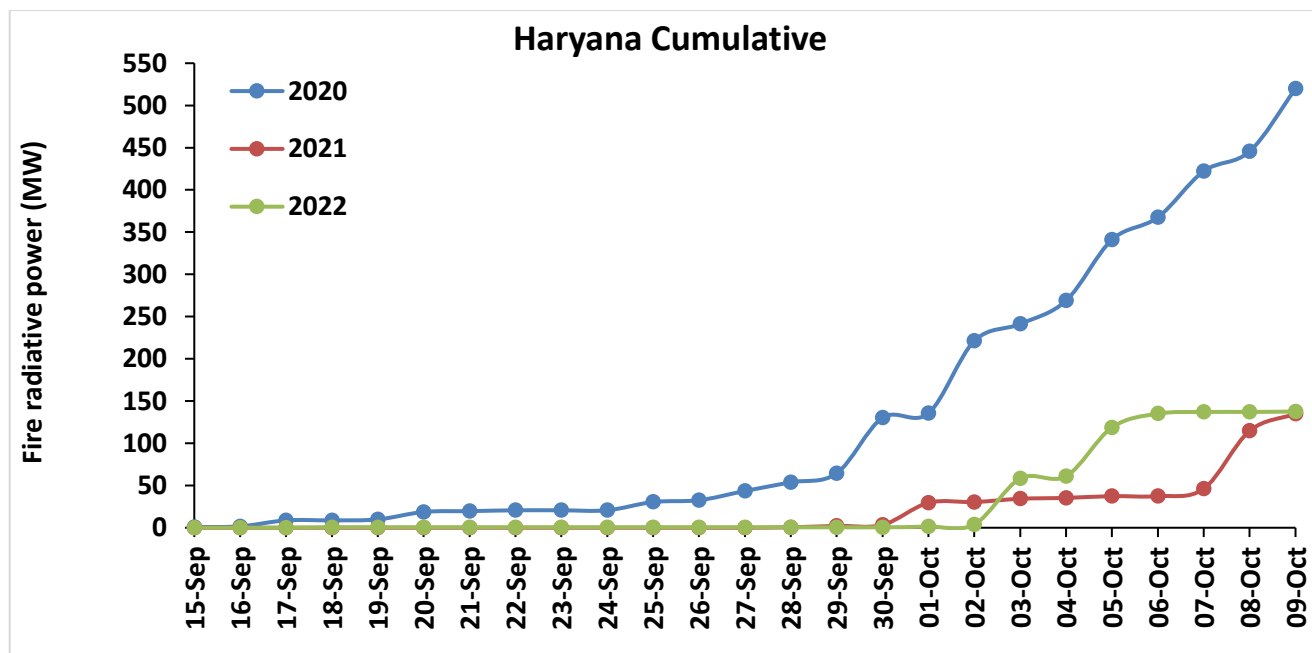
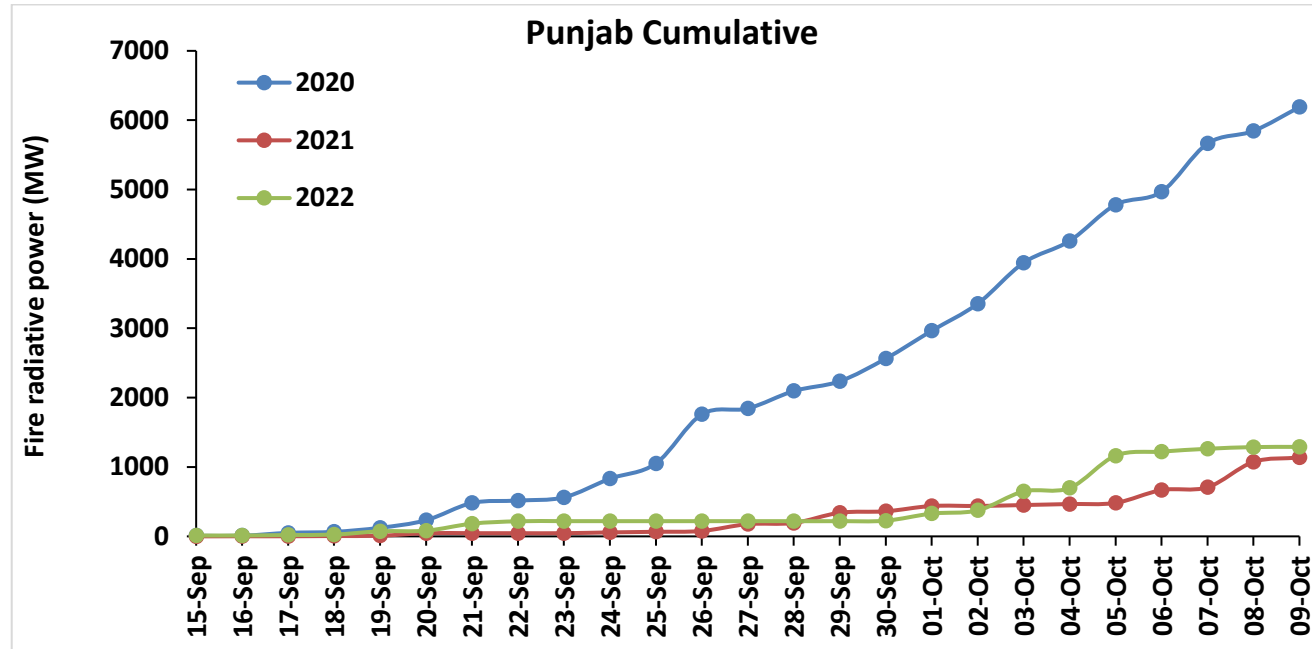
Comparison of residue burning events in current year (2022) with previous years (2020 and 2021) for the study States

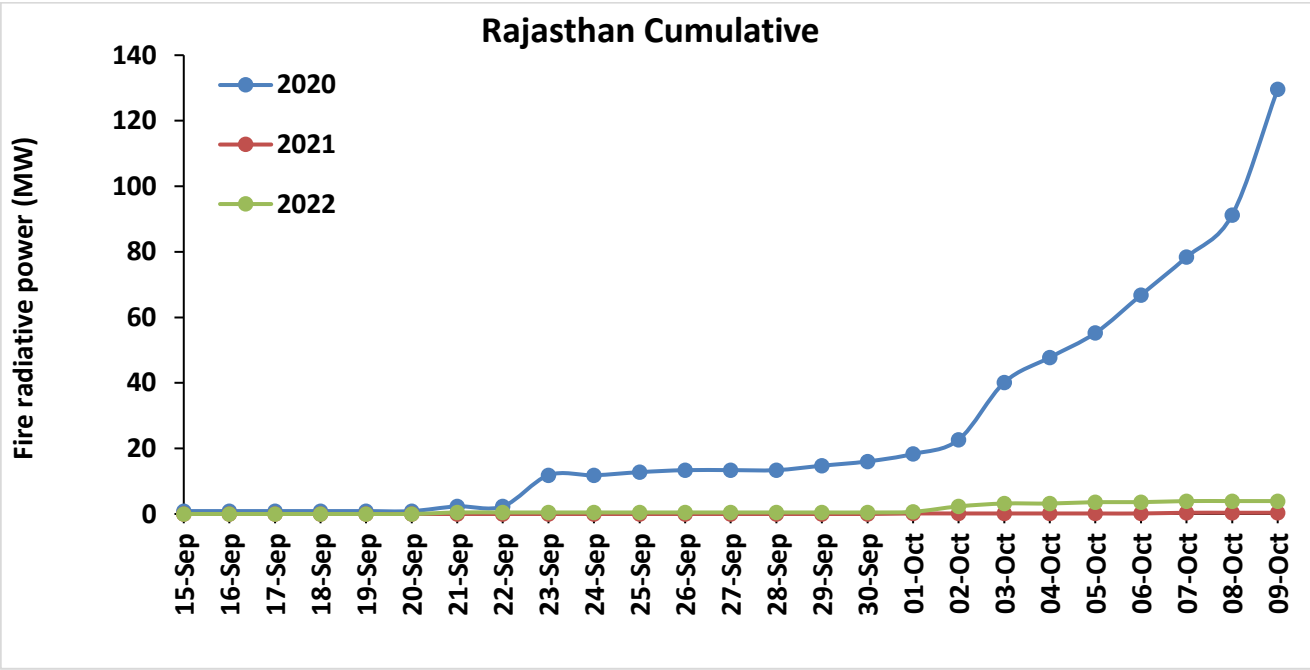
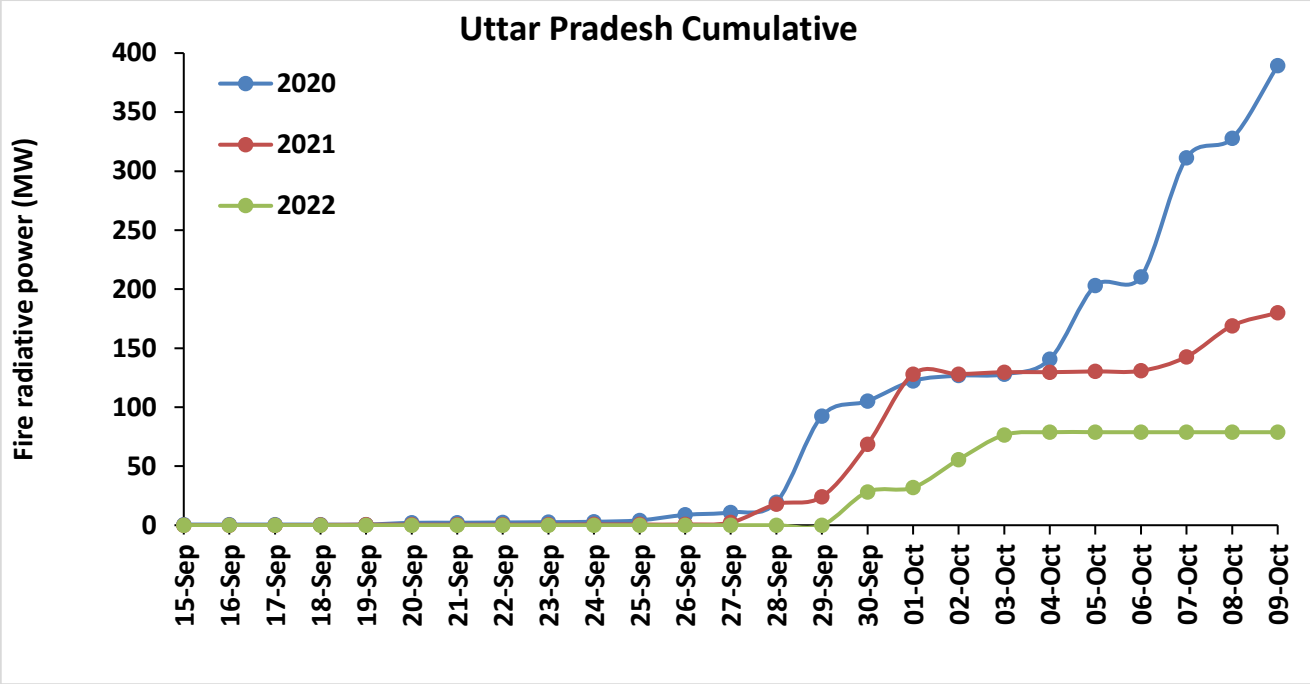


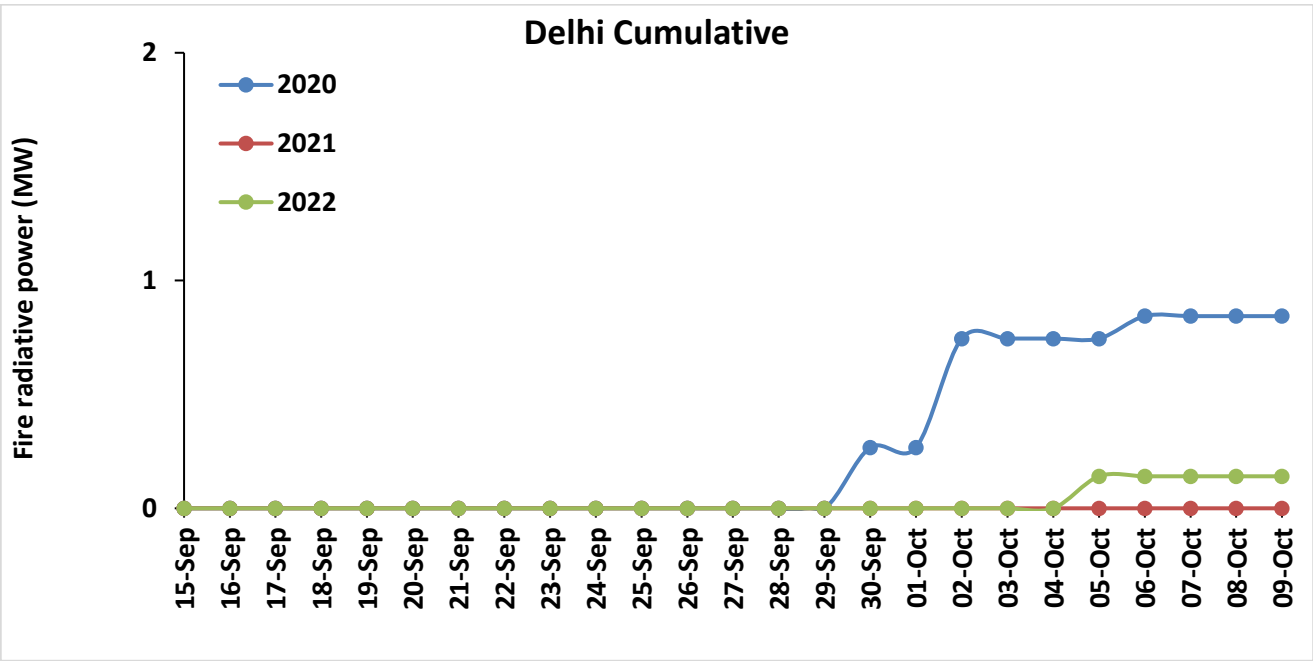
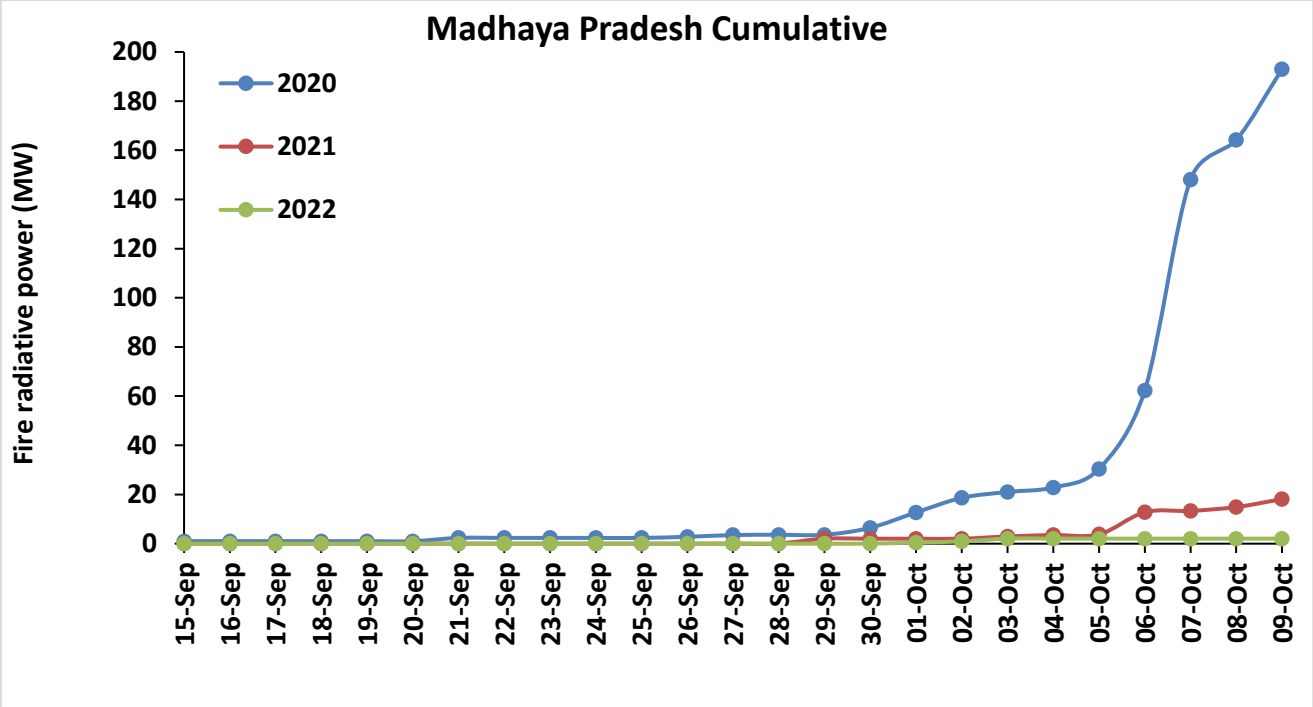




Comparison of residue burning fire power in current year (2022) with previous years (2021 and 2020) for the study States

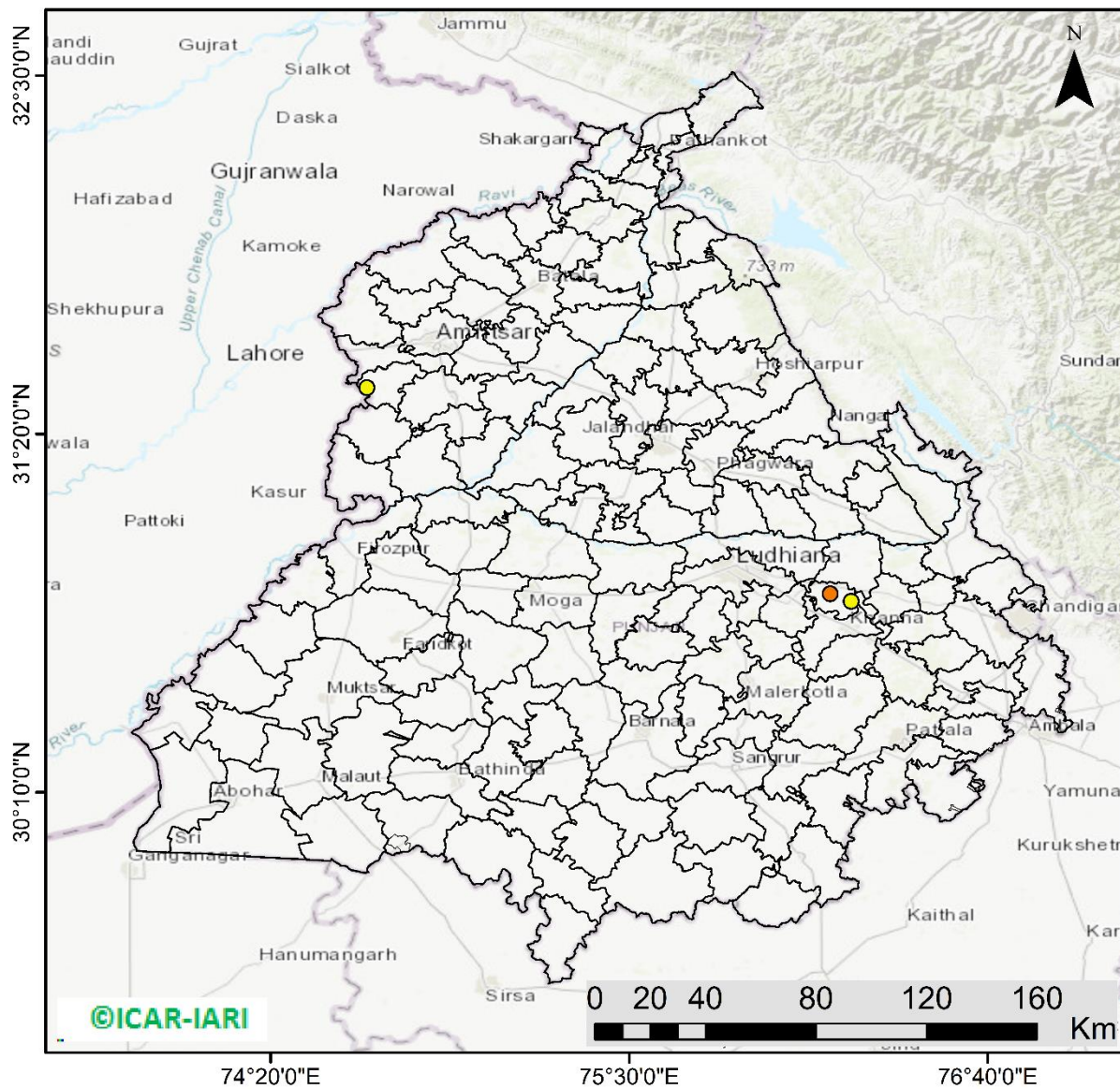






Punjab

RICE RESIDUE BURNING IN PUNJAB



03 burning events detected in Punjab during (09th Oct 2022)

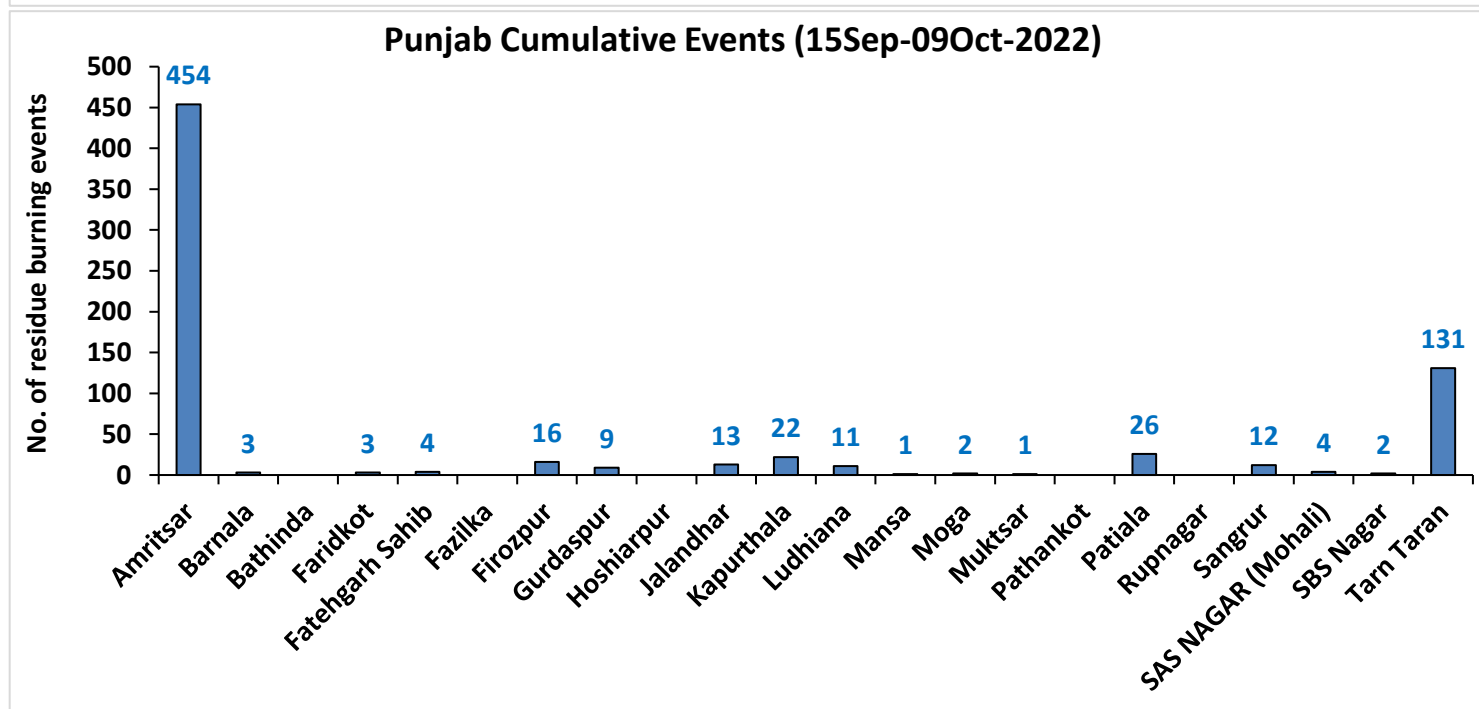
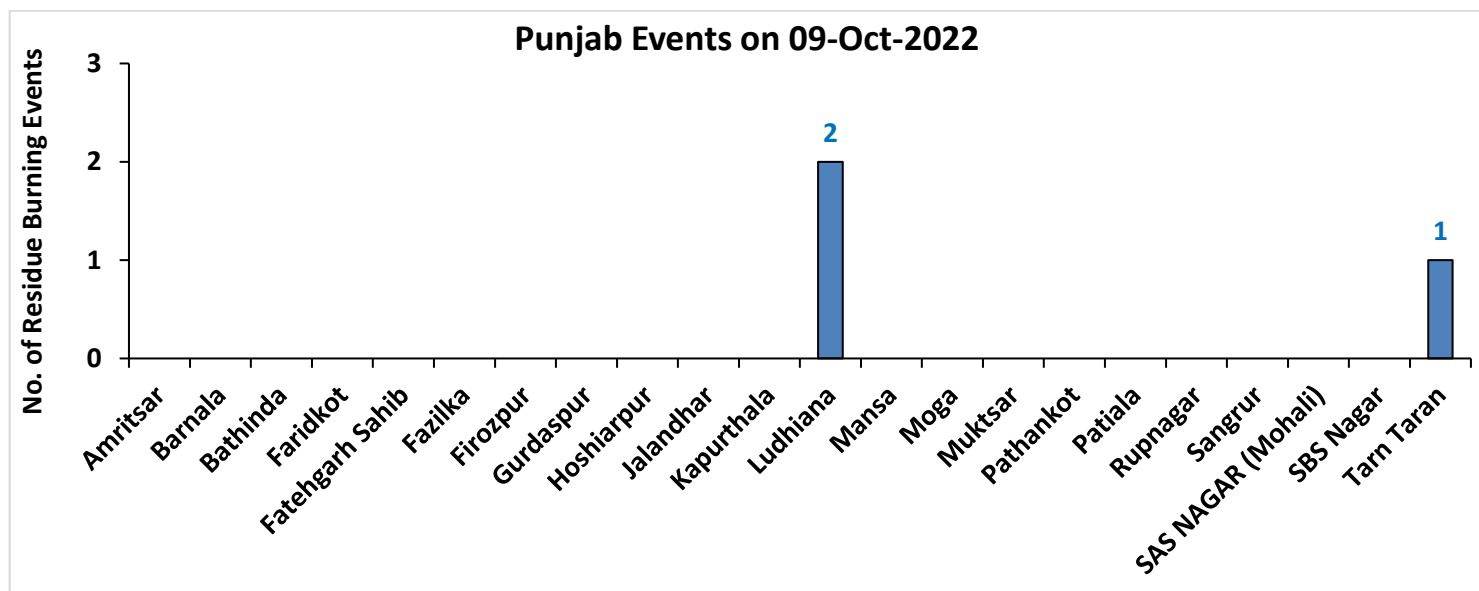
Fire Intensity (W/m²)

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



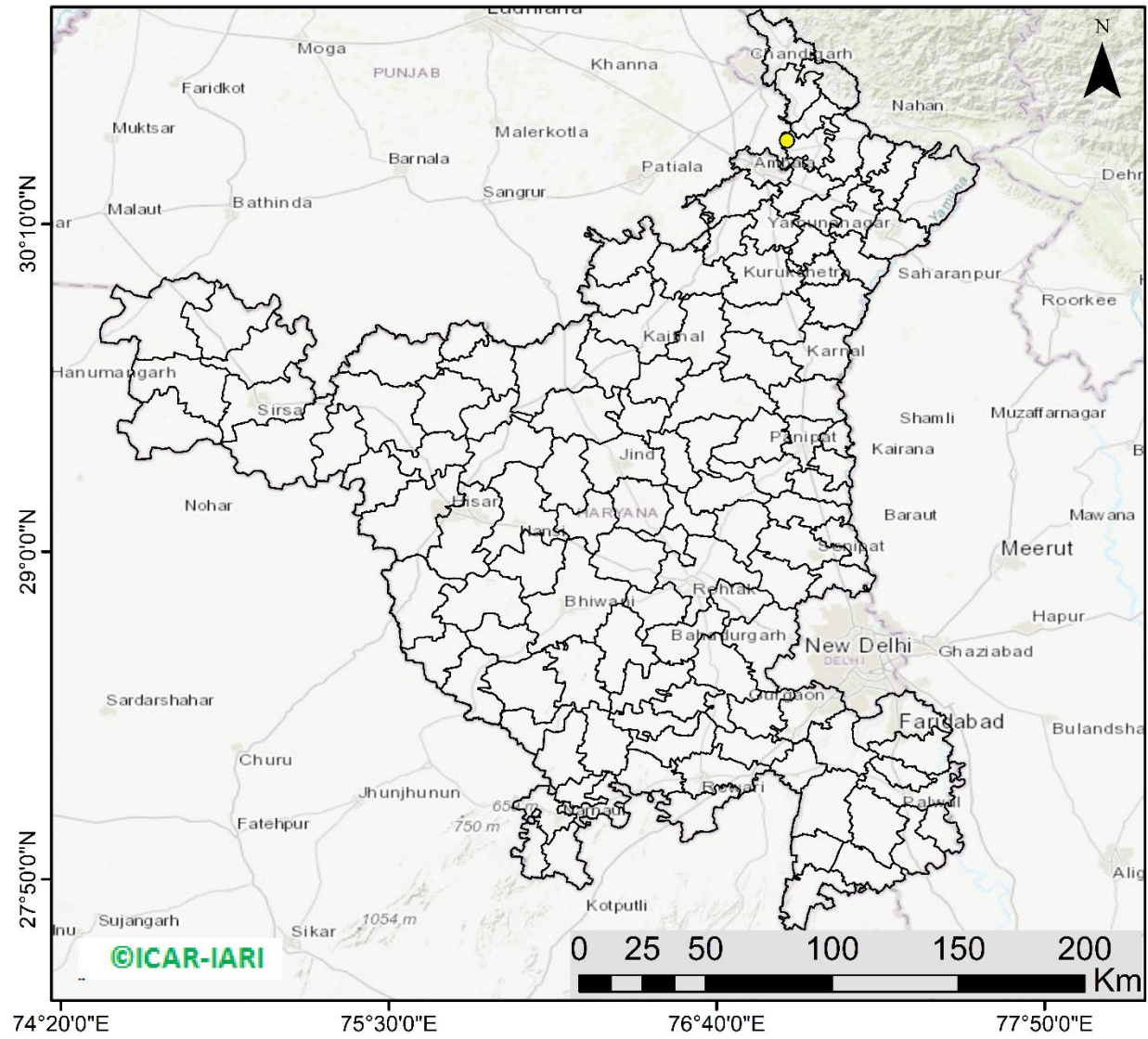
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Punjab (15Sep- 09Oct-2022)



Haryana

RICE RESIDUE BURNING IN HARYANA



01 burning events detected in Haryana on (09th Oct 2022)

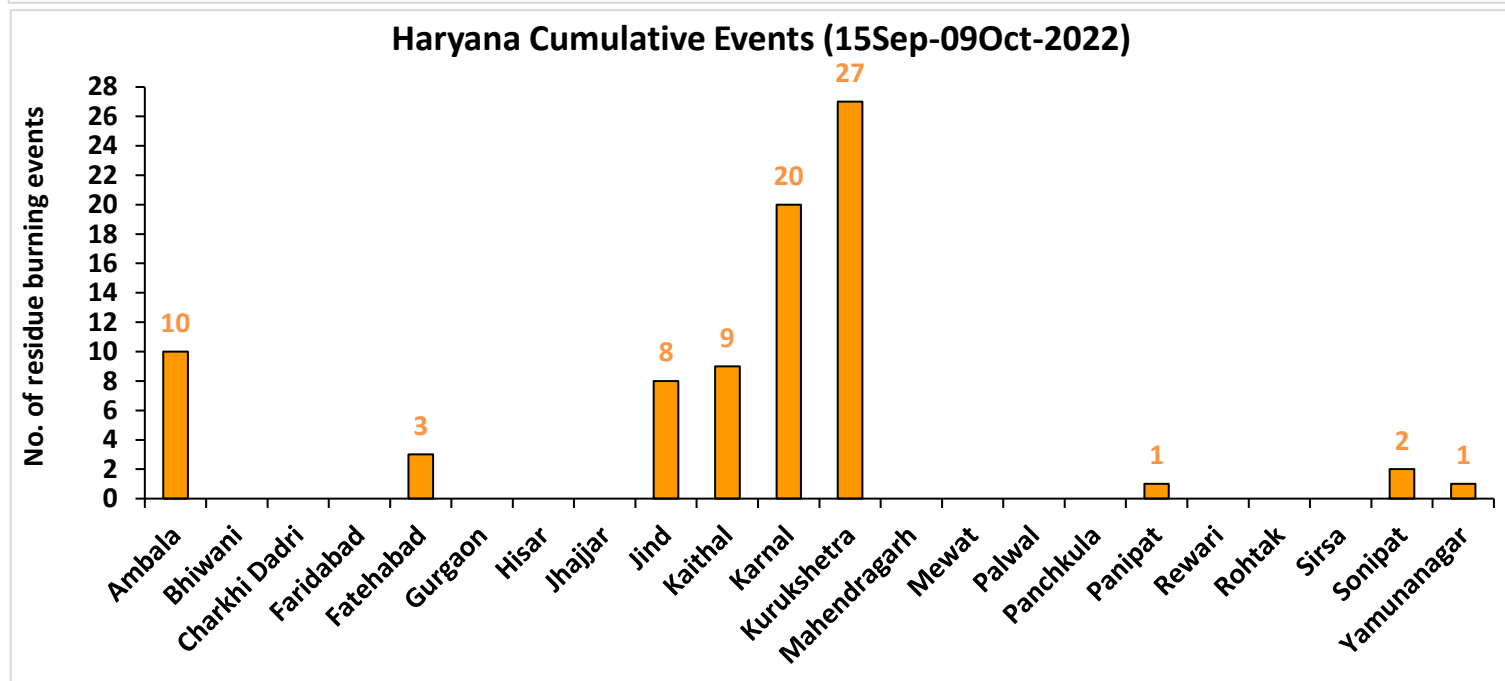
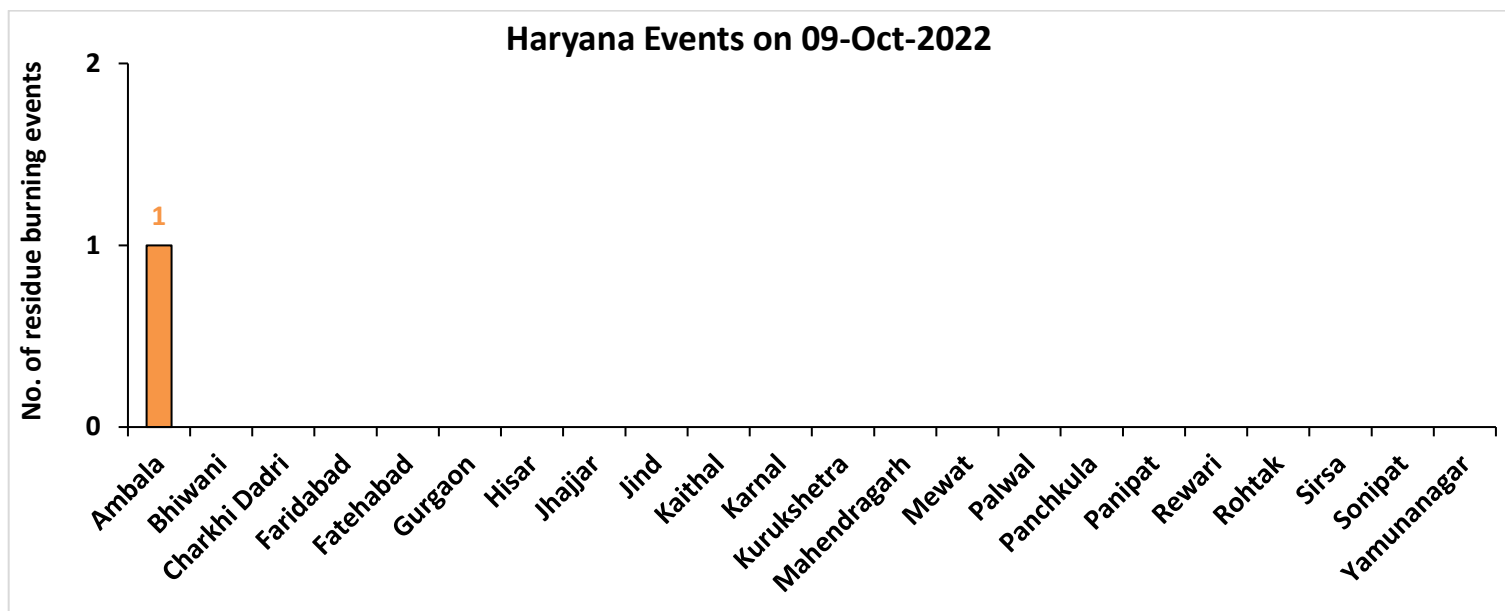
Fire Intensity (W/m²)

- 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- 09Oct-2022)



District-wise cumulative number of residues burning events detected in 2020 ,2021 and 2022
(Period: 15 September-09 October)

(a) Punjab

District	15 Sep-09 Oct 2022		
	2020	2021	2022
Amritsar	1278	279	454
Barnala	5	2	3
Bathinda	1	0	0
Faridkot	17	16	3
Fatehgarh Sahib	30	17	4
Fazilka	1	3	0
Firozpur	69	18	16
Gurdaspur	103	12	9
Hoshiarpur	5	0	0
Jalandhar	24	11	13
Kapurthala	39	17	22
Ludhiana	63	42	11
Mansa	4	1	1
Moga	15	3	2
Muktsar	1	1	1
Pathankot	0	0	0
Patiala	142	46	26
Rupnagar	7	2	0
Sangrur	52	9	12
SAS NAGAR (Mohali)	12	11	4
SBS Nagar	5	1	2
Tarn Taran	475	123	131
Total	2348	614	714

(b) Haryana

District	15 Sep-09 Oct 2022		
	2020	2021	2022
AMBALA	41	5	10
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	0	0
FATEHABAD	20	4	3
GURGAON	0	0	0
HISAR	3	0	0
JHAJJAR	1	0	0
JIND	3	2	8
KAITHAL	42	18	9
KARNAL	77	35	20
KURUKSHETRA	63	27	27
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	5	3	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	19	4	1
Total	288	101	81

(c) Uttar Pradesh

District	15 Sep-09 Oct 2022										
	2020	2021	2022	GAUTAMBUDHNAGAR	1	1	0	MUZAFARNAGAR	2	0	0
AGRA	0	0	0	GAZIPUR	0	0	0	PILHIBHIT	4	2	2
ALIGARH	15	0	1	GHAZIABAD	1	1	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	9	0
AMETHI	0	0	0	HAMIRPUR	0	0	0	SAMBHAL	6	1	4
AMROHA	1	0	0	HAPUR	2	0	0	SANTKABIRNAGAR	0	0	0
AURAIYA	12	0	4	HARDOI	0	0	0	SANTRAVIDASNAGAR	0	0	0
AZAMGARH	0	0	0	HATHRAS	0	0	0	SHAHJAHANPUR	11	66	53
BADAUN	0	0	0	JALAUN	0	0	0	SHAMLI	17	3	2
BAGHPAT	1	0	0	JAUNPUR	0	0	0	SHARANPUR	13	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	1	0	KAUSHAMBI	6	0	0	UNNAO	2	0	0
BASTI	2	0	0	KHERI	14	5	8	VARANASI	0	0	0
BIJNOR	3	0	1	KUSHINAGAR	0	0	0	Total	182	96	80
BULANDSAHAR	2	0	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	0	0	MAINPURI	0	1	0				
ETAWAH	1	0	0	MATHURA	4	3	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	0	0				

(d) Delhi

District	15 Sep-09 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-09 Oct 2022		
	2020	2021	2022
AJMER	0	0	0
ALWAR	1	0	0
BANSWARA	0	0	0
BARAN	53	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	27	1	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	15	0	1
NAGAUR	0	0	0
PALI	1	0	0
PRATAPGARH	0	0	0
RAJSMAND	0	0	0
SIKAR	0	0	0
SIROHI	0	0	0
SWAIMADHOPUR	1	0	0
TONK	1	0	0
UDAIPUR	0	0	0
Total	111	2	9

(f) Madhya Pradesh

District	15 Sep-09 Oct 2022						
	2020	2021	2022				
				PANNA	1	0	0
ALIRAJPUR	0	0	0	RAISEN	2	0	0
ANUPPUR	0	0	0	RAJGARH	6	0	2
ASHOKNAGAR	7	0	0	RATLAM	0	0	0
BALAGHAT	0	0	0	REWA	2	0	0
BARWANI	0	0	0	SAGAR	8	2	1
BETUL	0	0	0	SATNA	3	0	0
BHIND	0	0	0	SEHORE	4	0	1
BHOPAL	2	1	0	SEONI	2	0	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	0	0	SHIVPURI	3	0	0
DATIA	5	0	0	SIDHI	0	0	0
DEWAS	3	0	0	SINGRAULI	0	0	0
DHAR	13	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	28	4	1
GWALIOR	16	0	1	WEST NIMAR	1	0	0
HARDA	8	7	0	Total	160	17	7
HOSHANGABAD	3	0	0				
INDORE	2	0	0				
JABALPUR	6	0	0				
JHABUA	0	0	0				
KATNI	0	0	0				
MANDLA	0	0	0				
MANDSAUR	0	0	0				
MORENA	5	1	0				
NARSHIMAPURA	1	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 - 09 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
Total	2348	614	714	288	101	81	182	96	80	3	0	2	111	2	9	160	17	7

Details of residue burning events in Punjab on 09-Oct-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	LUDHIANA	SAMRALA	S-NPP	30.78800	76.22260	12:51:51	D	2.20
2	LUDHIANA	SAMRALA	S-NPP	30.81230	76.15420	12:51:51	D	11.10
3	TARN TARAN	GANDIWIND TATLA	S-NPP	31.48370	74.64640	12:51:51	D	3.70

Details of residue burning events in Haryana on 09-Oct-2022

S. No.	District	Tehsil / Block	Satellite	Latitude	Longitude	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMBALA	SHAHZADPUR	S-NPP	30.46370	76.91690	12:51:51	D	3.60

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

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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>)
