



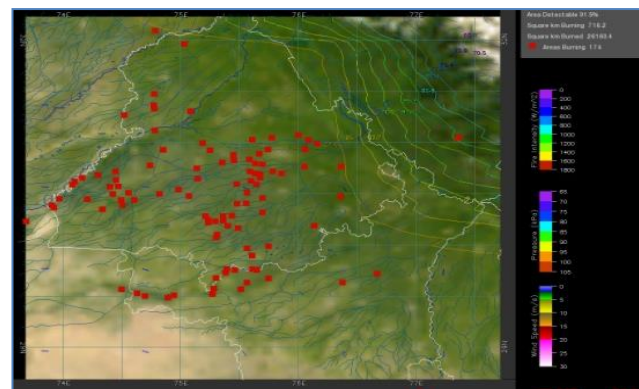
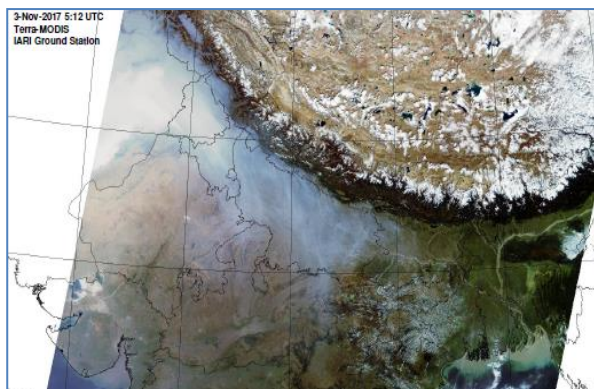
Bulletin No. 18

Events Date:
02-Oct-2021

Issued on:
02-Oct-2021



MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2021



Prepared by:

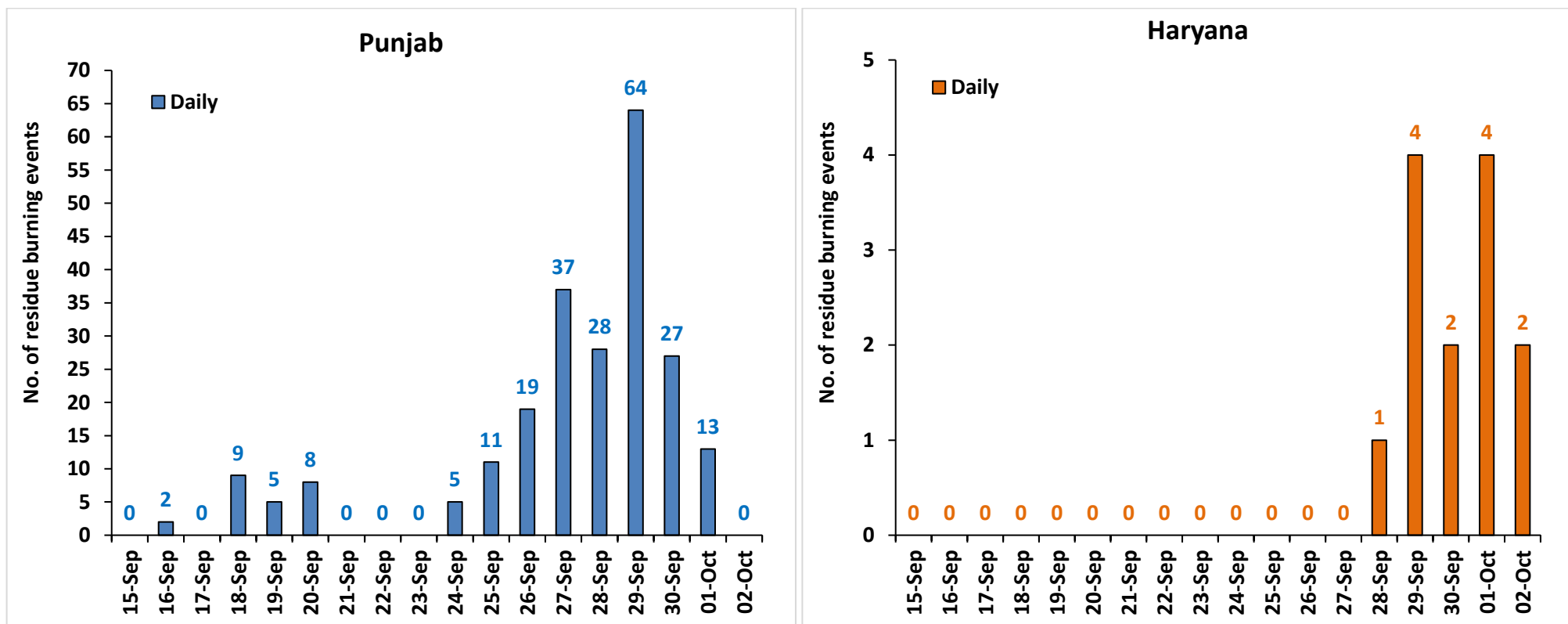
Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

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

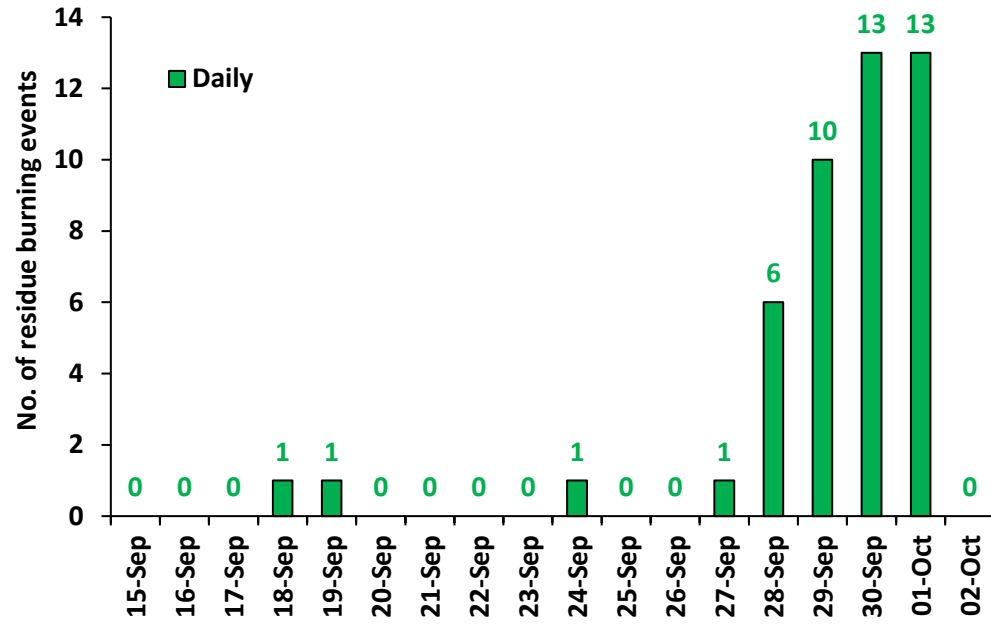
Highlights for 02-October-2021

- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the new "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **02** residue burning events in the six study States on 02-Oct-2021.
- The state wise events detected on 02-Oct-2021 were **0** in Punjab, **2** in Haryana, **0** in UP, **0** in Delhi, **0** in Rajasthan and **0** in MP.
- Detection of burning events by satellites was hampered due to cloud cover over Eastern Rajasthan and Western Uttar Pradesh.

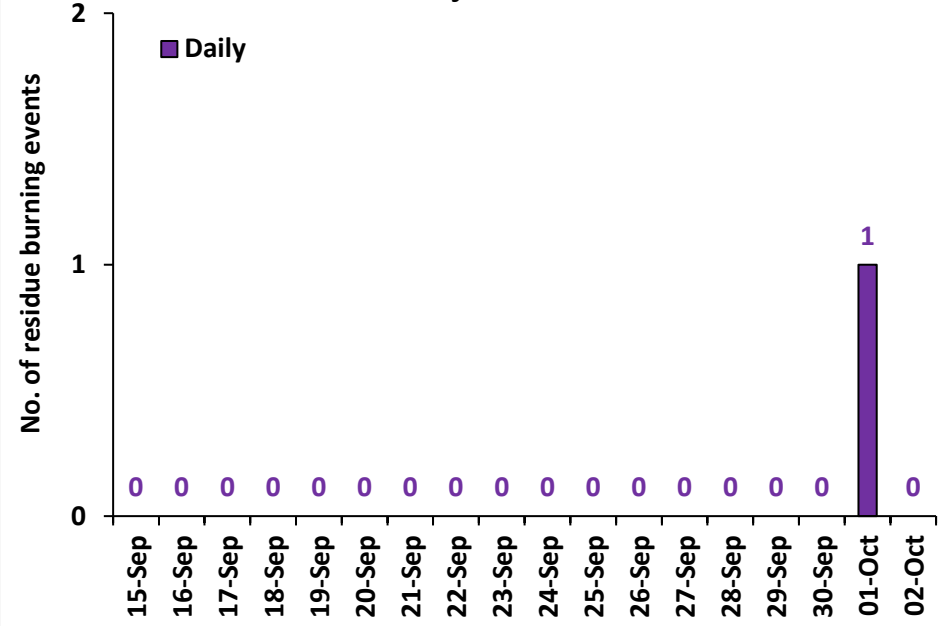
Temporal distribution of rice residue burning events for the study States in 2021



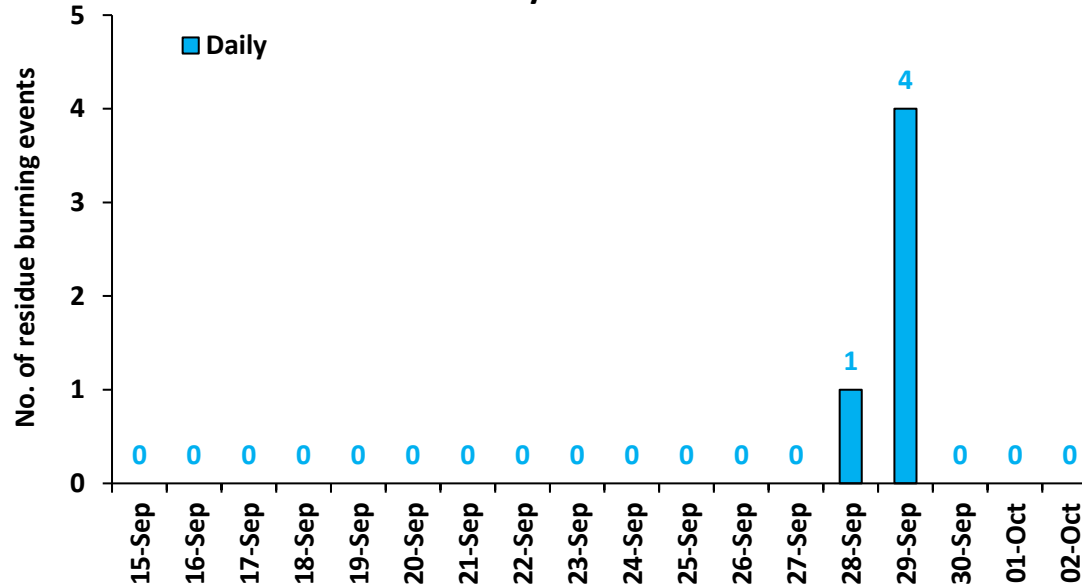
Uttar Pradesh



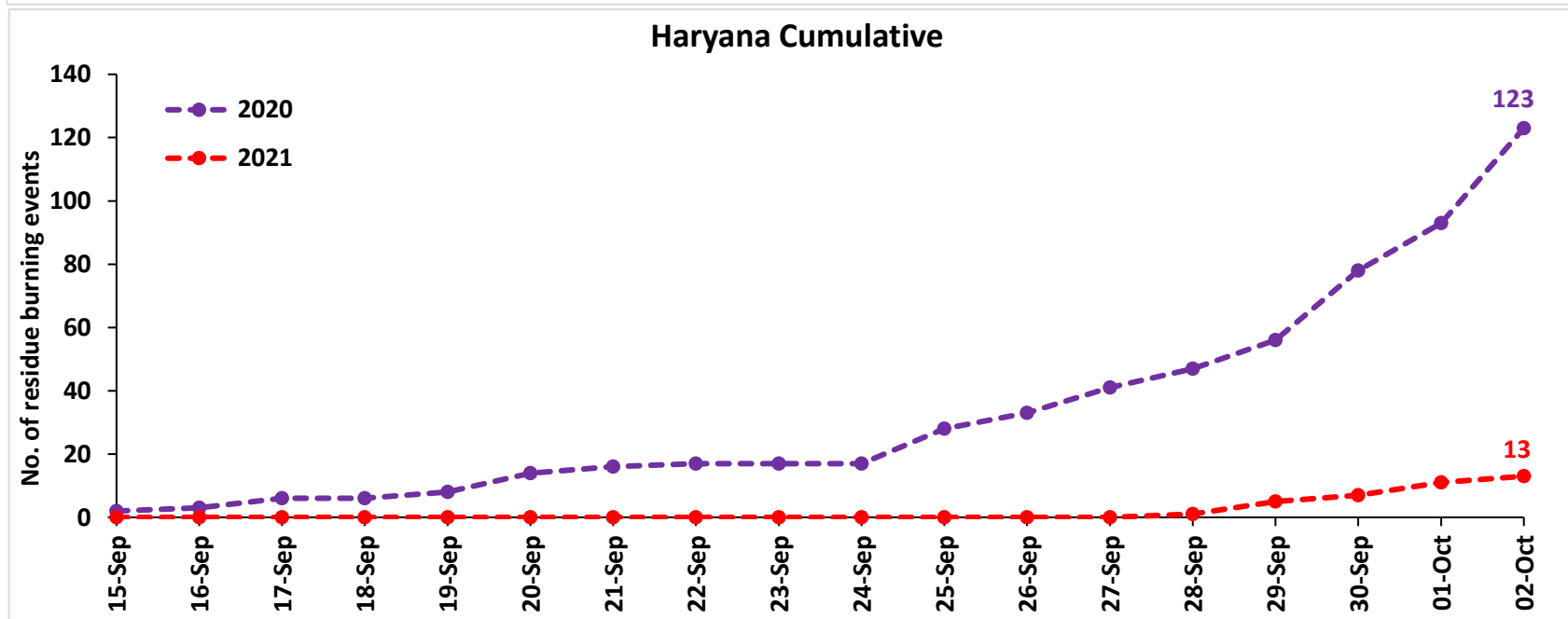
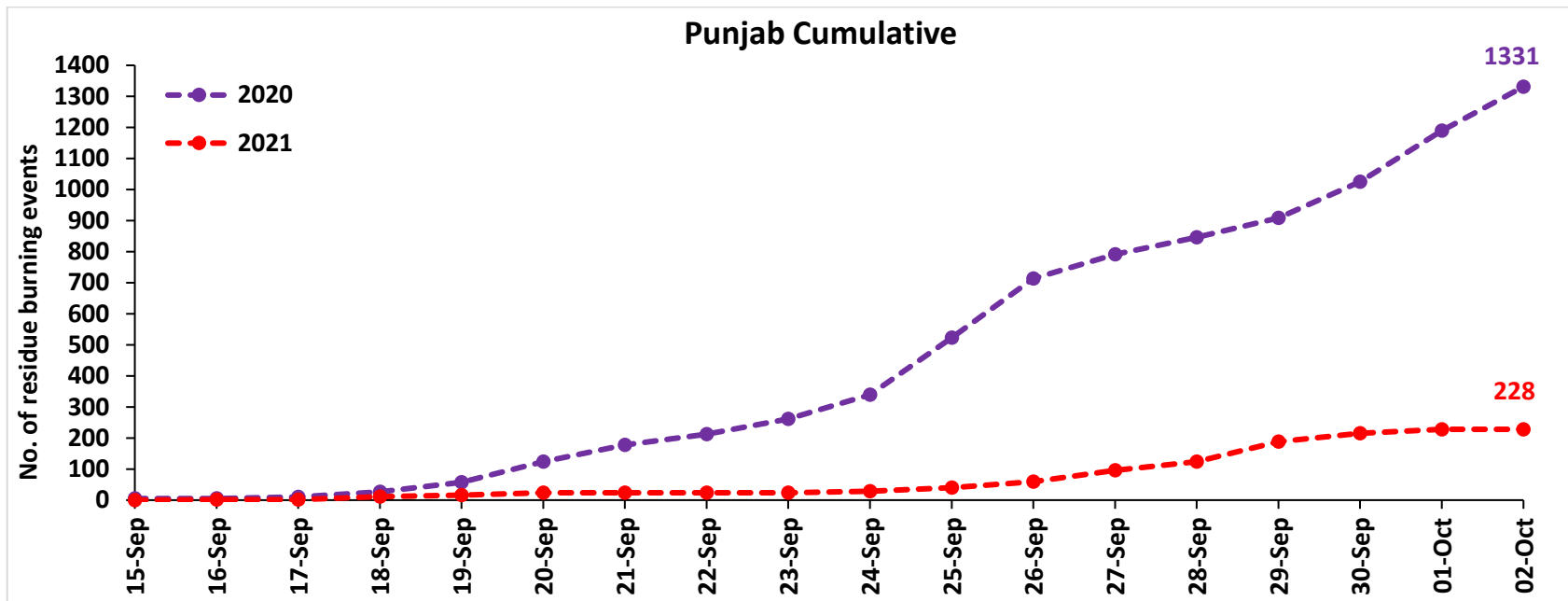
Rajasthan

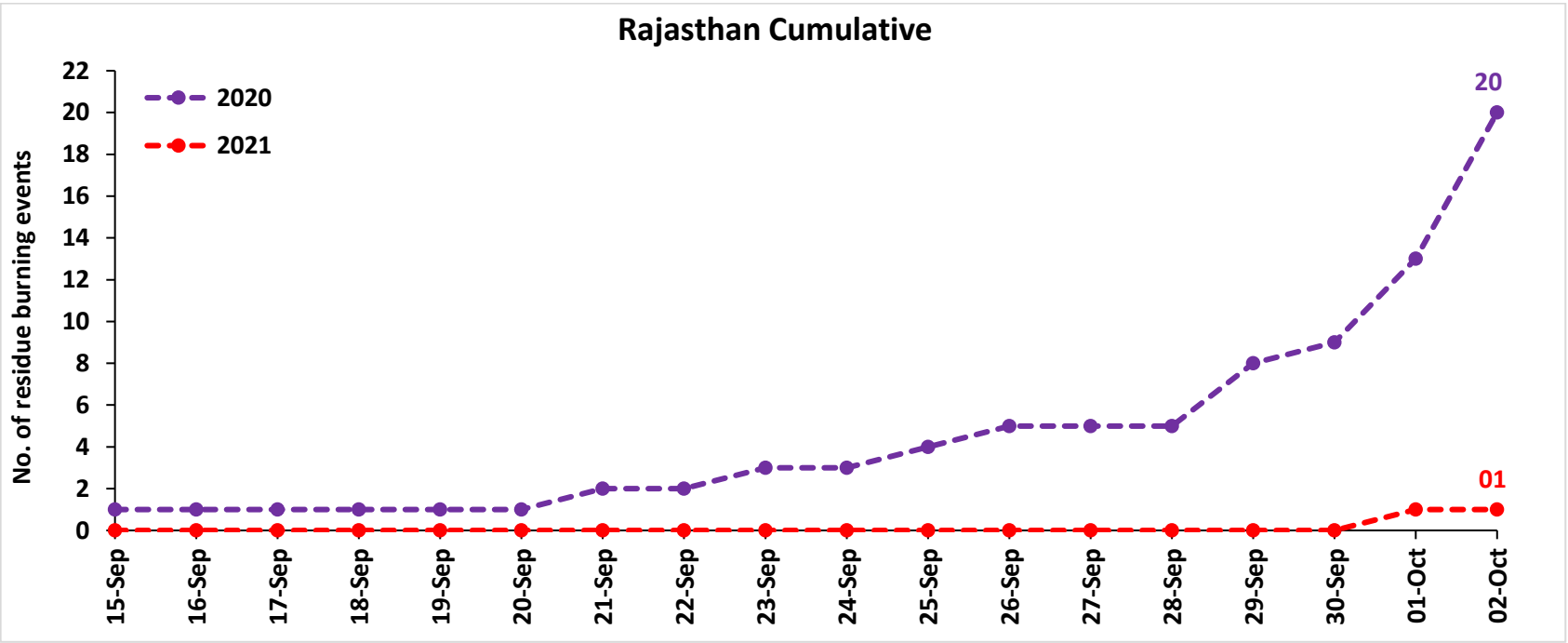
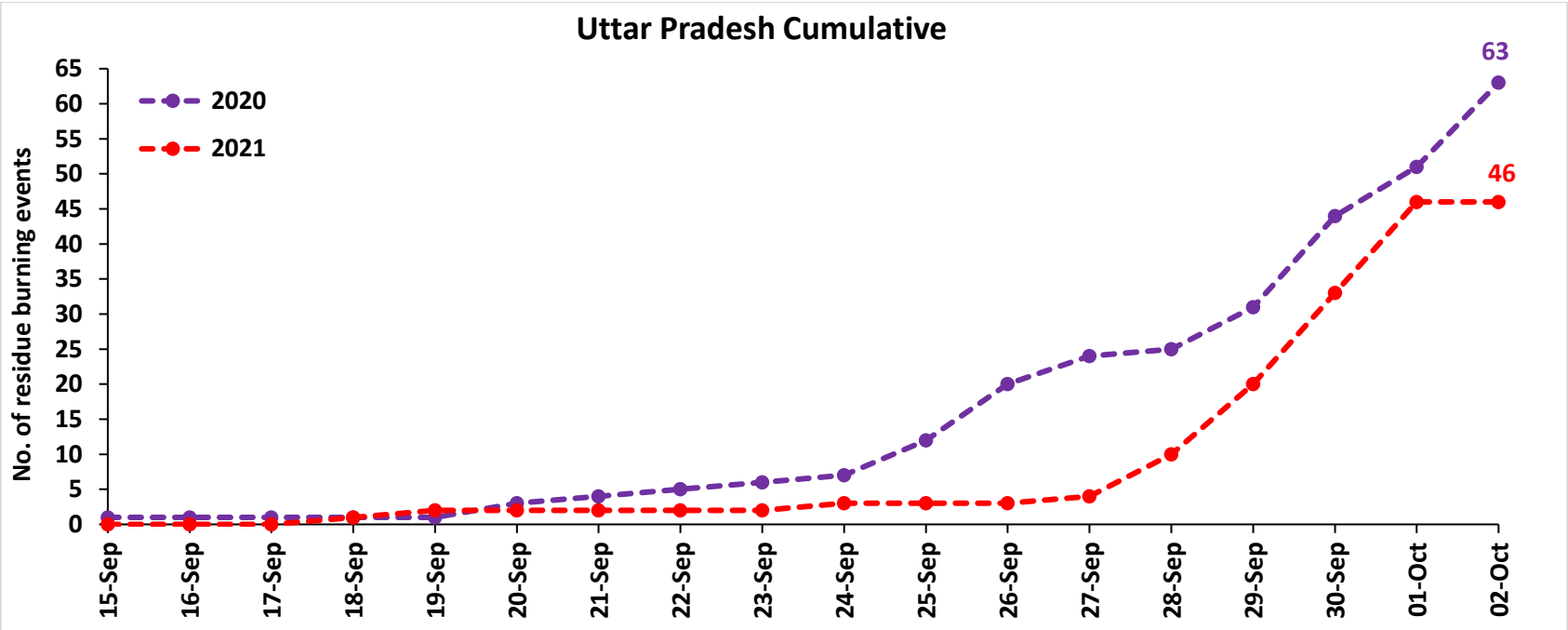


Madhya Pradesh

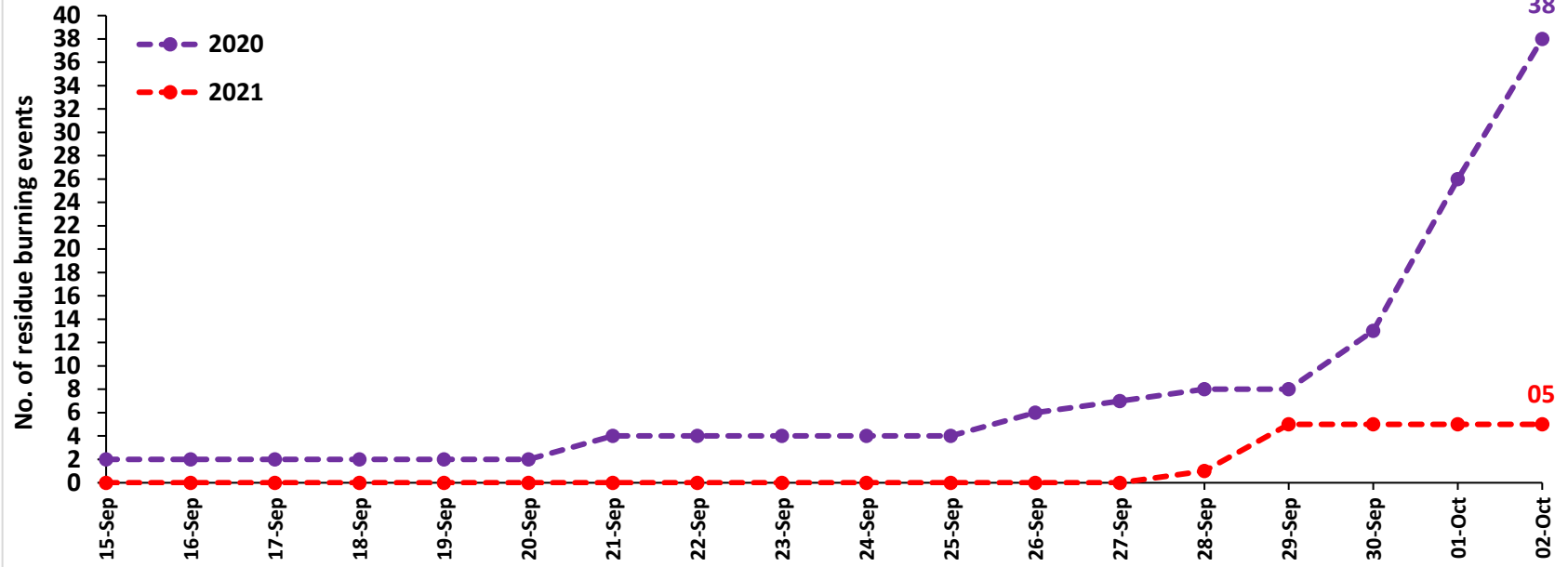


Comparison of residue burning events in current year (2021) with previous year (2020) for the study States

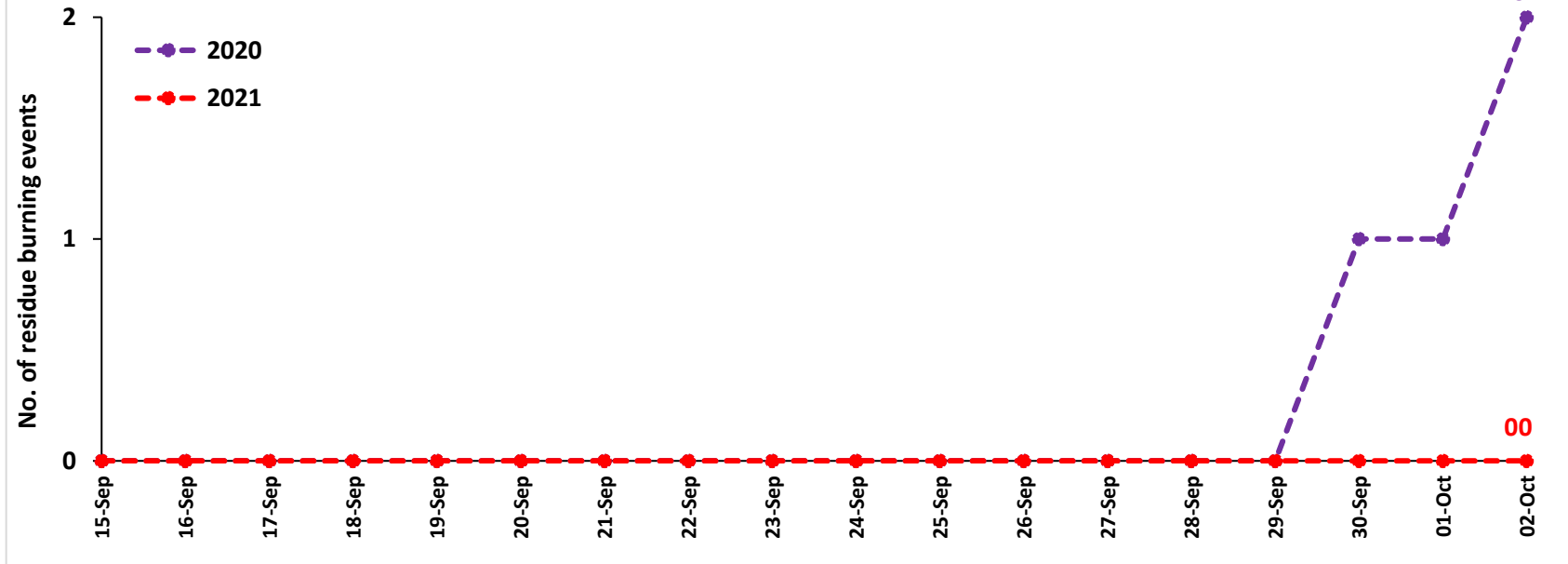




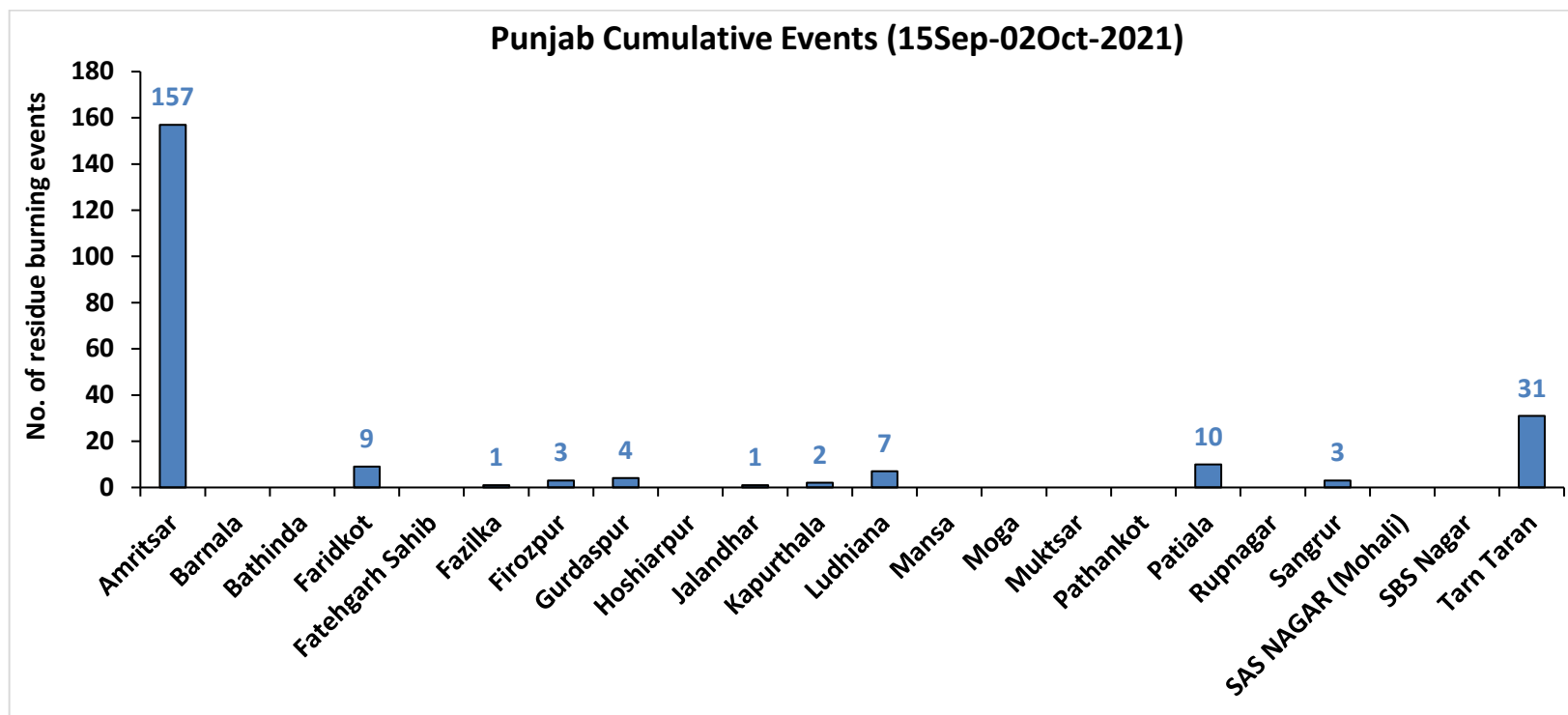
Madhya Pradesh Cumulative



Delhi Cumulative

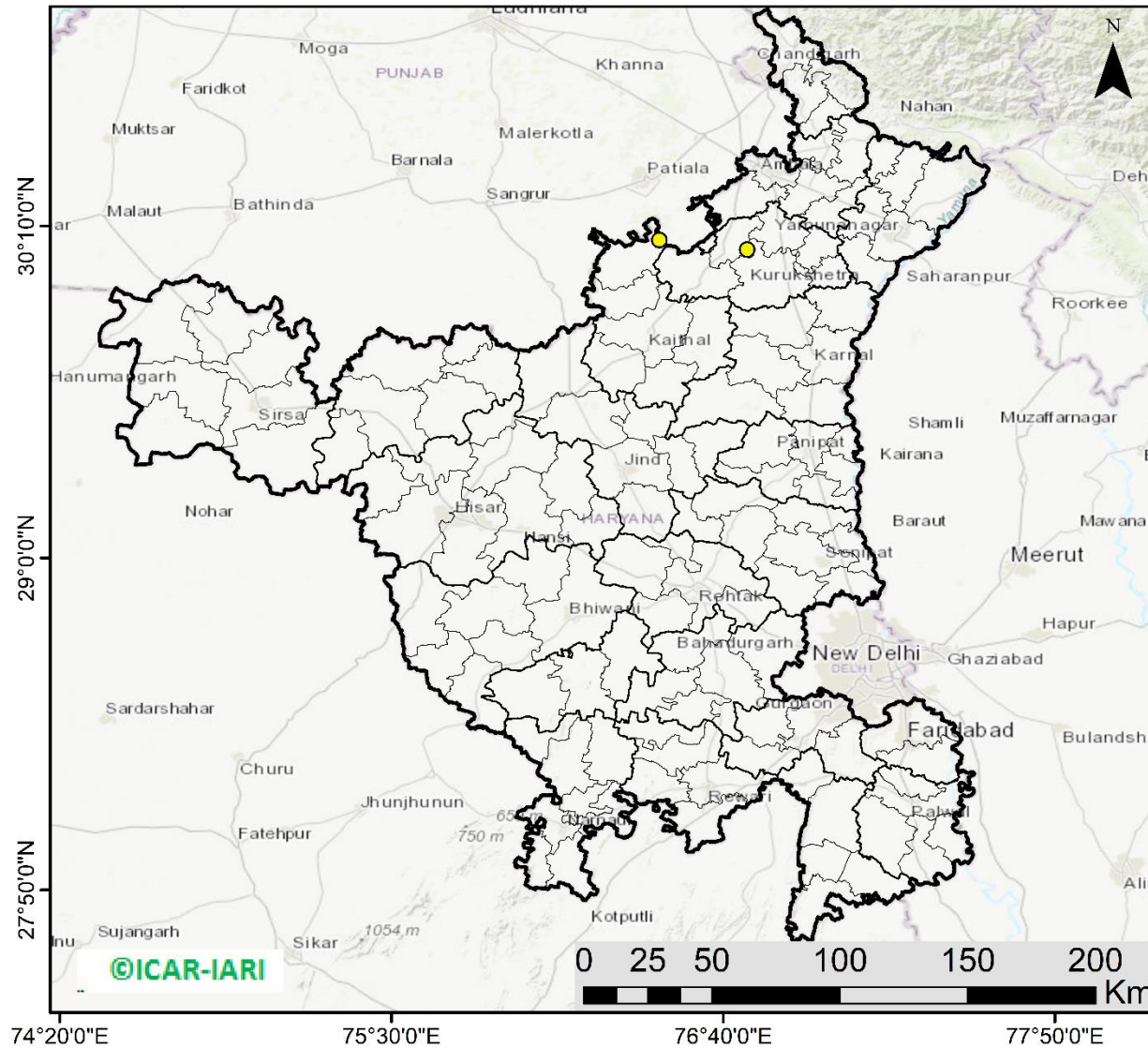


District-wise cumulative number of residues burning events in Punjab (15Sep - 02Oct-2021)



Haryana

RICE RESIDUE BURNING IN HARYANA



02 burning events detected in Haryana on **02nd October 2021**

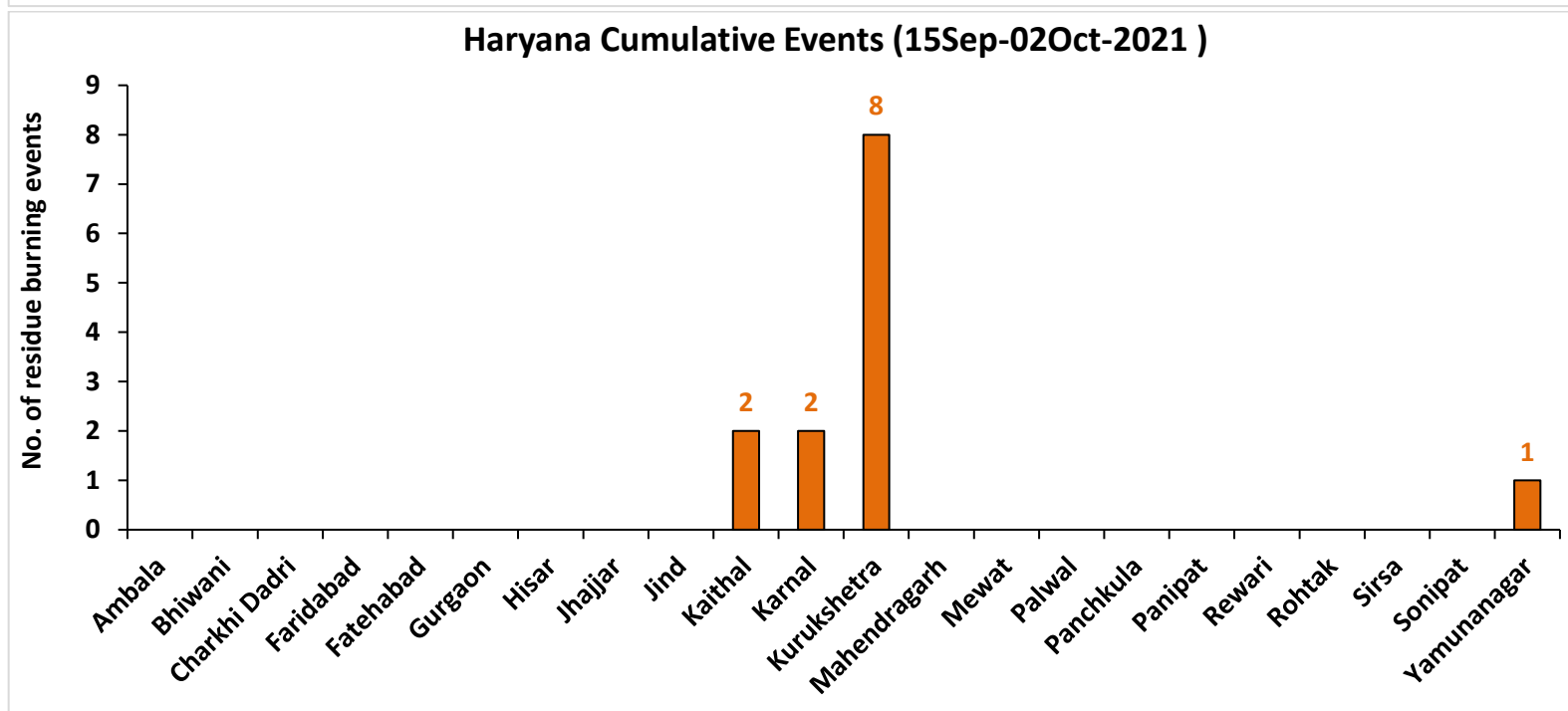
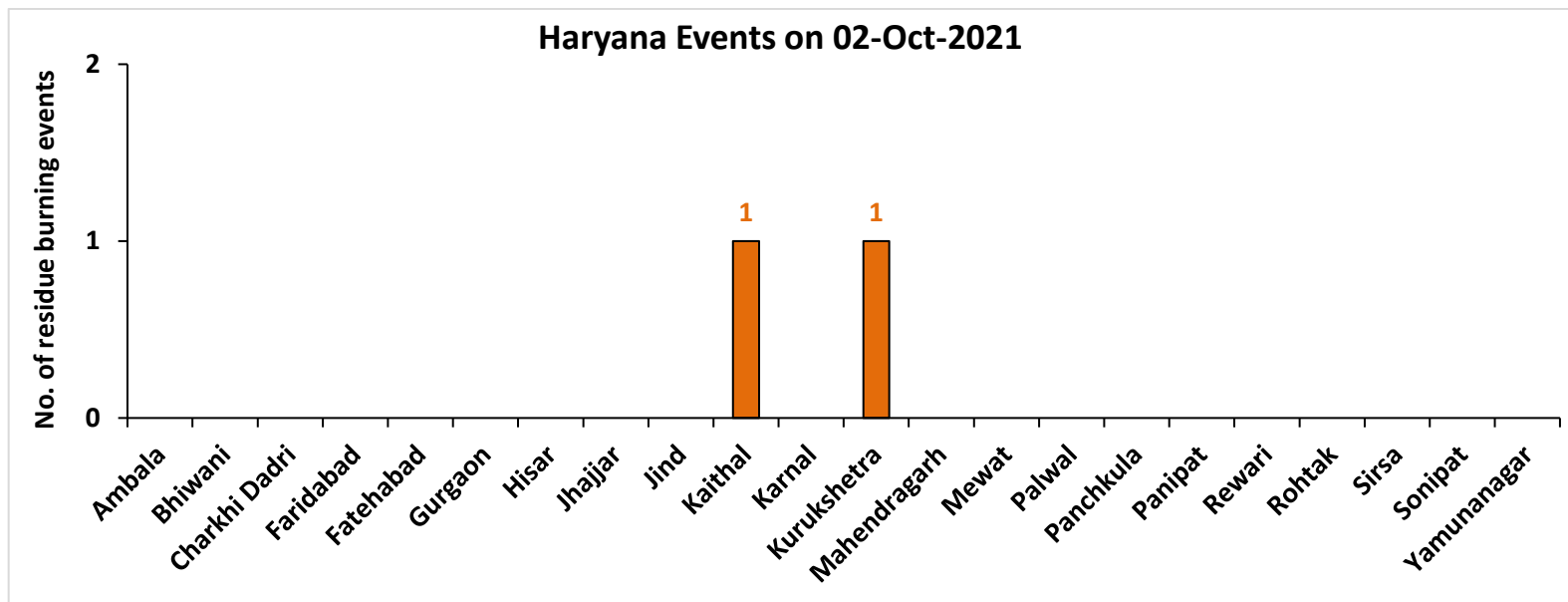
Fire Intensity (W/m²)

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



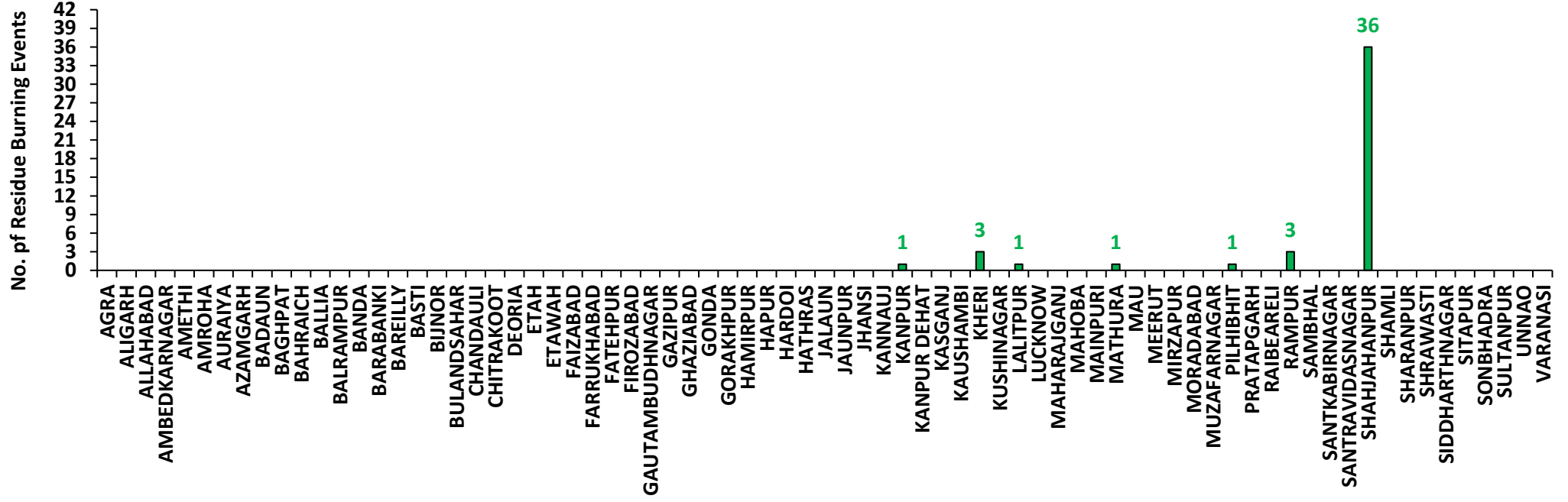
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

District-wise cumulative number of residues burning events in Haryana (15 Sep - 02 Oct-2021)

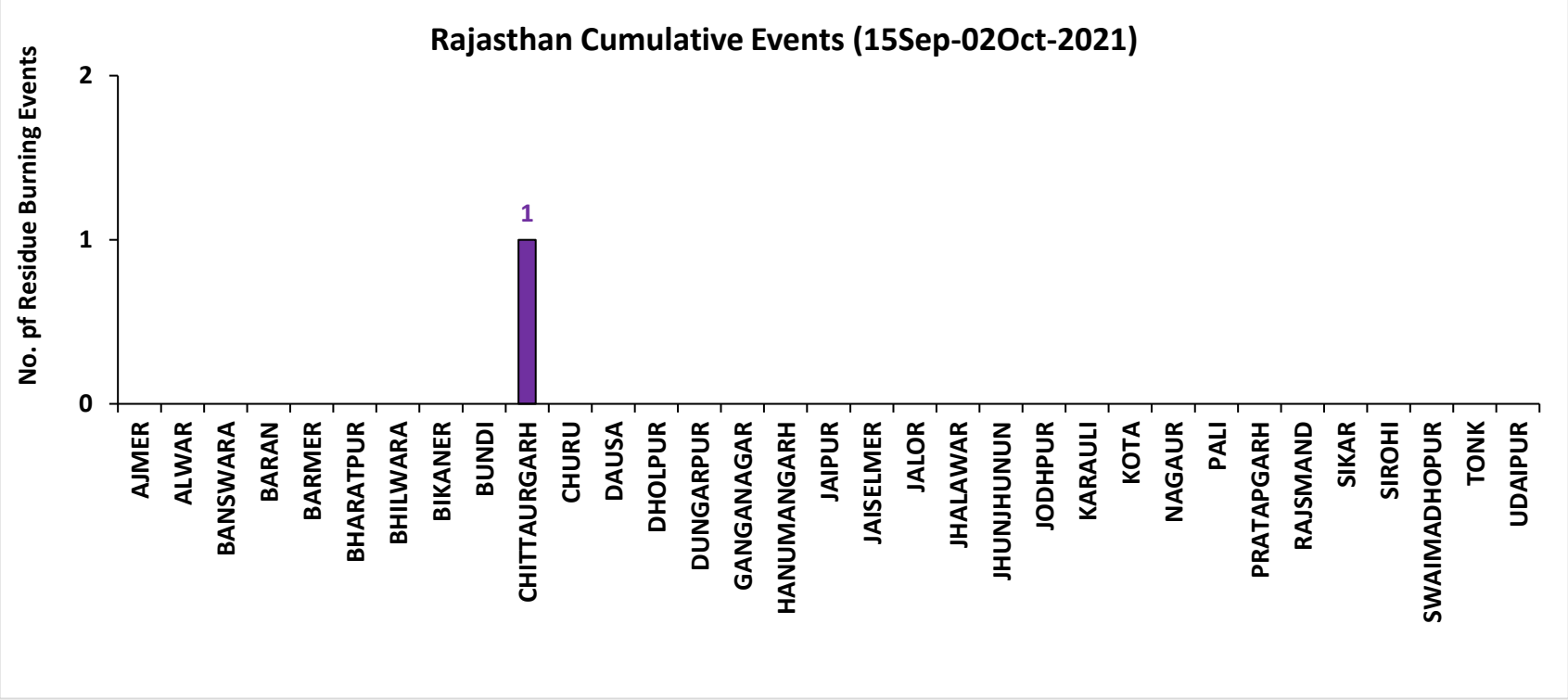


District-wise cumulative number of residues burning events in Uttar Pradesh (15 Sep - 02 Oct-2021)

Uttar Pradesh Cumulative Events (15Sep-02Oct-2021)



District-wise cumulative number of residues burning events in Rajasthan (15 Sep - 02 Oct-2021)



District-wise cumulative number of residues burning events detected in 2020 and 2021

(Period: 15 September - 02 October)

(a) Punjab

District	15 Sep – 02 Oct	
	2020	2021
AMRITSAR	891	157
BARNALA	2	0
BATHINDA	0	0
FARIDKOT	3	9
FATEHGARH SAHIB	12	0
FAZILKA	0	1
FIROZPUR	12	3
GURDASPUR	44	4
HOSHIARPUR	3	0
JALANDHAR	11	1
KAPURTHALA	11	2
LUDHIANA	30	7
MANSA	1	0
MOGA	7	0
MUKTSAR	1	0
PATHANKOT	0	0
PATIALA	46	10
RUPNAGAR	1	0
SANGRUR	14	3
SAS NAGAR (MOHALI)	7	0
SBS NAGAR	2	0
TARN TARAN	233	31
TOTAL	1331	228

(b) Haryana

District	15 Sep – 02 Oct	
	2020	2021
AMBALA	17	0
BHIWANI	0	0
CHARKHI DADRI	0	0
FARIDABAD	0	0
FATEHABAD	12	0
GURGAON	0	0
HISAR	2	0
JHAJJAR	0	0
JIND	0	0
KAITHAL	15	2
KARNAL	35	2
KURUKSHETRA	27	8
MAHENDRAGARH	0	0
MEWAT	0	0
PALWAL	1	0
PANCHKULA	0	0
PANIPAT	6	0
REWARI	0	0
ROHTAK	0	0
SIRSA	1	0
SONIPAT	1	0
YAMUNANAGAR	6	1
Total	123	13

(c) Uttar Pradesh

District	15 Sep – 02 Oct							
	2020	2021	GAUTAMBUDHNAGAR	1	0	MUZAFARNAGAR	0	0
AGRA	0	0	GAZIPUR	0	0	PILHIBHIT	1	1
ALIGARH	4	0	GHAZIABAD	1	0	PRATAPGARH	0	0
ALLAHABAD	0	0	GONDA	0	0	RAIBEARELI	1	0
AMBEDKARNAGAR	0	0	GORAKHPUR	0	0	RAMPUR	2	3
AMETHI	0	0	HAMIRPUR	0	0	SAMBHAL	5	0
AMROHA	0	0	HAPUR	1	0	SANTKABIRNAGAR	0	0
AURAIYA	10	0	HARDOI	0	0	SANTRAVIDASNAGAR	0	0
AZAMGARH	0	0	HATHRAS	0	0	SHAHJAHANPUR	5	36
BADAUN	0	0	JALAUN	0	0	SHAMLI	7	0
BAGHPAT	1	0	JAUNPUR	0	0	SHARANPUR	3	0
BAHRAICH	0	0	JHANSI	2	0	SHRAWASTI	0	0
BALLIA	0	0	KANNAUJ	1	0	SIDDHARTHANAGAR	0	0
BALRAMPUR	0	0	KANPUR	0	1	SITAPUR	1	0
BANDA	0	0	KANPUR DEHAT	1	0	SONBHADRA	0	0
BARABANKI	0	0	KASGANJ	0	0	SULTANPUR	0	0
BAREILLY	0	0	KAUSHAMBI	1	0	UNNAO	2	0
BASTI	0	0	KHERI	1	3	VARANASI	0	0
BIJNOR	1	0	KUSHINAGAR	0	0	Total	63	46
BULANDSAHAR	1	0	LALITPUR	0	1			
CHANDAULI	0	0	LUCKNOW	0	0			
CHITRAKOOT	0	0	MAHARAJGANJ	0	0			
DEORIA	0	0	MAHOBAB	0	0			
ETAH	1	0	MAINPURI	0	0			
ETAWAH	0	0	MATHURA	2	1			
FAIZABAD	0	0	MAU	0	0			
FARRUKHABAD	0	0	MEERUT	6	0			
FATEHPUR	1	0	MIRZAPUR	0	0			
FIROZABAD	0	0	MORADABAD	0	0			

(d) Delhi

District	15 Sep – 02 Oct	
	2020	2021
CENTRAL	0	0
EAST	0	0
NEW DELHI	0	0
NORTH	1	0
NORTH EAST	0	0
NORTH WEST DELHI	0	0
SHAHADRA	0	0
SOUTH	1	0
SOUTH EAST	0	0
SOUTH WEST DELHI	0	0
WEST DELHI	0	0
Total	2	0

(e) Rajasthan

District	15 Sep – 02 Oct	
	2020	2021
AJMER	0	0
ALWAR	1	0
BANSWARA	0	0
BARAN	7	0
BARMER	2	0
BHARATPUR	0	0
BHILWARA	1	0
BIKANER	0	0
BUNDI	1	0
CHITTAURGARH	0	1
CHURU	0	0
DAUSA	0	0
DHOLPUR	0	0
DUNGARPUR	0	0
GANGANAGAR	1	0
HANUMANGARH	4	0
JAIPUR	0	0
JAISELMER	1	0
JALOR	0	0
JHALAWAR	0	0
JHUNJHUNUN	0	0
JODHPUR	1	0
KARALI	0	0
KOTA	0	0
NAGAU	0	0
PALI	1	0
PRATAPGARH	0	0
RAJSMAND	0	0
SIKAR	0	0
SIROHI	0	0
SWAIMADHOPUR	0	0
TONK	0	0
UDAIPUR	0	0
Total	20	1

(f) Madhya Pradesh

District	15 Sep – 02 Oct				
	2020	2021			
			PANNA	0	0
ALIRAJPUR	0	0	RAISEN	0	0
ANUPPUR	0	0	RAJGARH	1	0
ASHOKNAGAR	5	0	RATLAM	0	0
BALAGHAT	0	0	REWA	0	0
BARWANI	0	0	SAGAR	2	2
BETUL	0	0	SATNA	1	0
BHIND	0	0	SEHORE	1	0
BHOPAL	1	0	SEONI	0	0
BURHANPUR	0	0	SHAHDOL	0	0
CHHATARPUR	0	0	SHAJAPUR	2	0
CHHINDWARA	0	0	SHEOPUR	0	0
DAMOH	5	0	SHIVPURI	0	0
DATIA	0	0	SIDHI	0	0
DEWAS	0	0	SINGRAULI	0	0
DHAR	2	0	TIKAMGARH	0	0
DINDORI	0	0	UJJAIN	3	0
EAST NIMAR	0	0	UMARIA	0	0
GUNA	4	1	VIDESHA	4	1
GWALIOR	3	0	WEST NIMAR	0	0
HARDA	2	1	Total	38	5
HOSHANGABAD	0	0			
INDORE	1	0			
JABALPUR	1	0			
JHABUA	0	0			
KATNI	0	0			
MANDLA	0	0			
MANDSAUR	0	0			
MORENA	0	0			
NARSHIMAPURA	0	0			
NIMACH	0	0			

State-wise and date-wise number of paddy residue burning events detected in 2020 and 2021
(Period: 15 September - 01 October)

Number of Paddy Residue Burning Events Detected												
	Punjab		Haryana		Uttar Pradesh		Delhi		Rajasthan		Madhya Pradesh	
	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
15-Sep	5	0	2	0	1	0	0	0	1	0	2	0
16-Sep	0	2	1	0	0	0	0	0	0	0	0	0
17-Sep	5	0	3	0	0	0	0	0	0	0	0	0
18-Sep	17	9	0	0	0	1	0	0	0	0	0	0
19-Sep	30	5	2	0	0	1	0	0	0	0	0	0
20-Sep	67	8	6	0	2	0	0	0	0	0	0	0
21-Sep	54	0	2	0	1	0	0	0	1	0	2	0
22-Sep	34	0	1	0	1	0	0	0	0	0	0	0
23-Sep	49	0	0	0	1	0	0	0	1	0	0	0
24-Sep	78	5	0	0	1	1	0	0	0	0	0	0
25-Sep	184	11	11	0	5	0	0	0	1	0	0	0
26-Sep	190	19	5	0	8	0	0	0	1	0	2	0
27-Sep	78	37	8	0	4	1	0	0	0	0	1	0
28-Sep	55	28	6	1	1	6	0	0	0	0	1	1
29-Sep	63	64	9	4	6	10	0	0	3	0	0	4
30-Sep	116	27	22	2	13	13	1	0	1	0	5	0
01-Oct	165	13	15	4	7	13	0	0	4	1	13	0
02-Oct	141	0	30	2	12	0	1	0	7	0	12	0
Total	1331	228	123	13	63	46	2	0	20	1	38	5

Details of residue burning events in Haryana on 02-Oct-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	KAITHAL	GUHLA	S-NPP	30.11730	76.44220	2/10/2021	14:06:27	D	3.10
2	KURUKSHETRA	ISMAILABAD	S-NPP	30.08370	76.75130	2/10/2021	14:06:27	D	3.20

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)
