

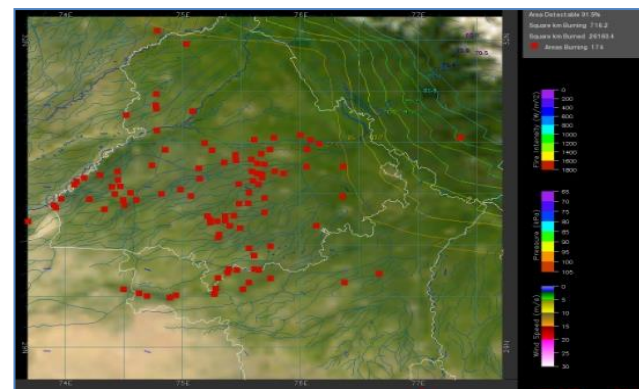
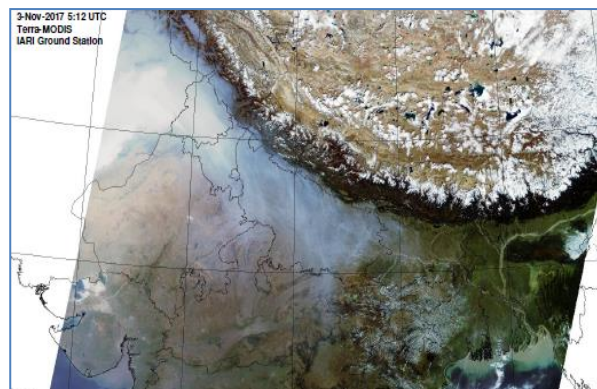


# MONITORING PADDY RESIDUE BURNING IN INDIA USING SATELLITE REMOTE SENSING DURING 2021

**Bulletin  
No. 19**

**Events Date:  
03-Oct-2021**

**Issued on:  
03-Oct-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**

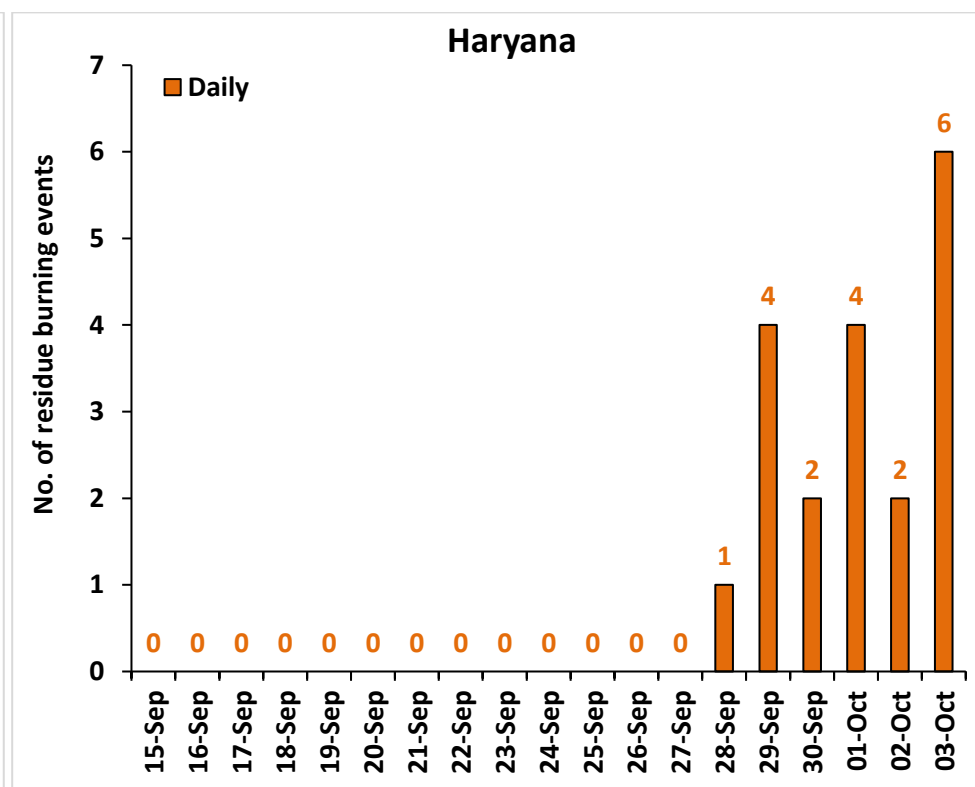
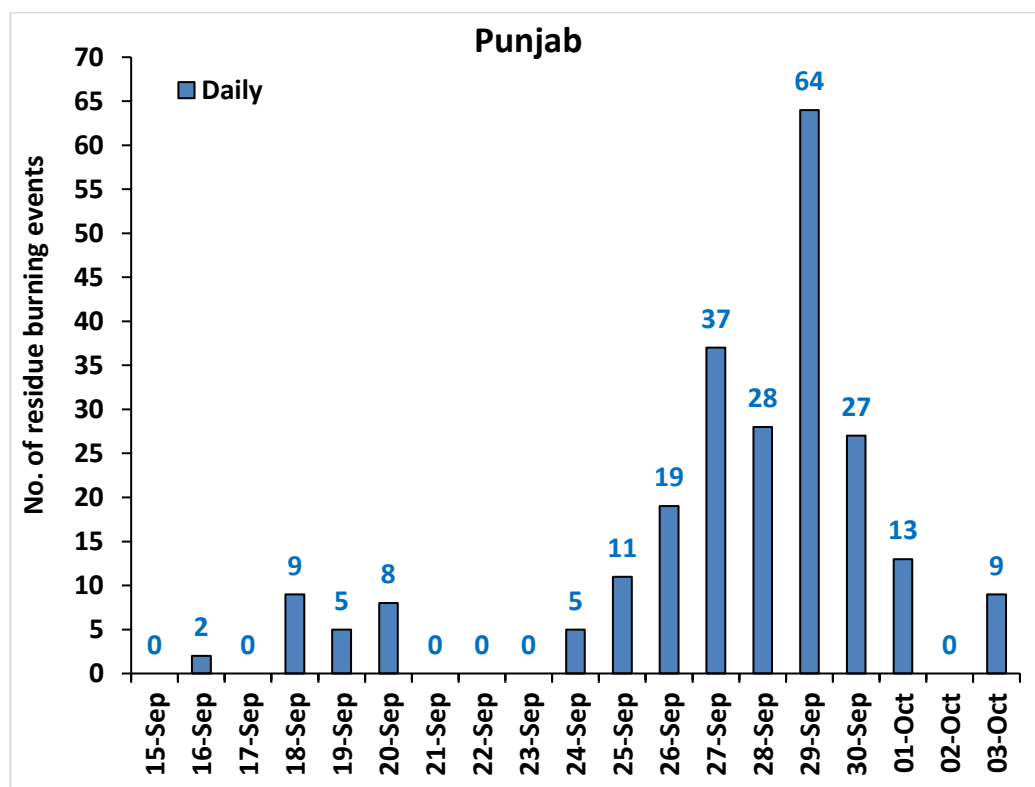
<http://creams.iari.res.in>

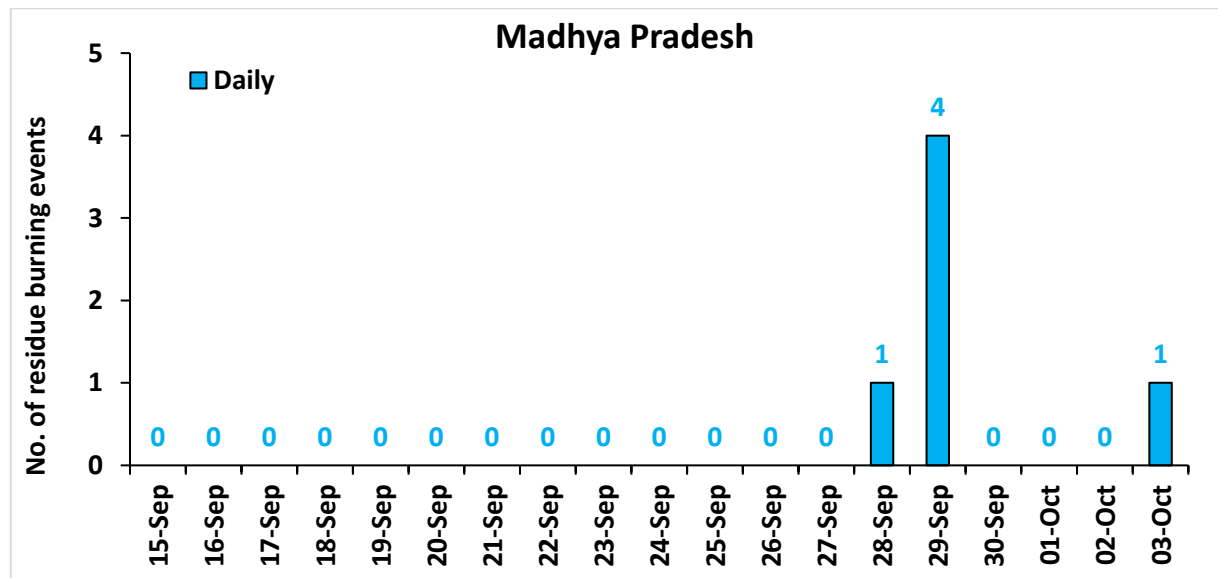
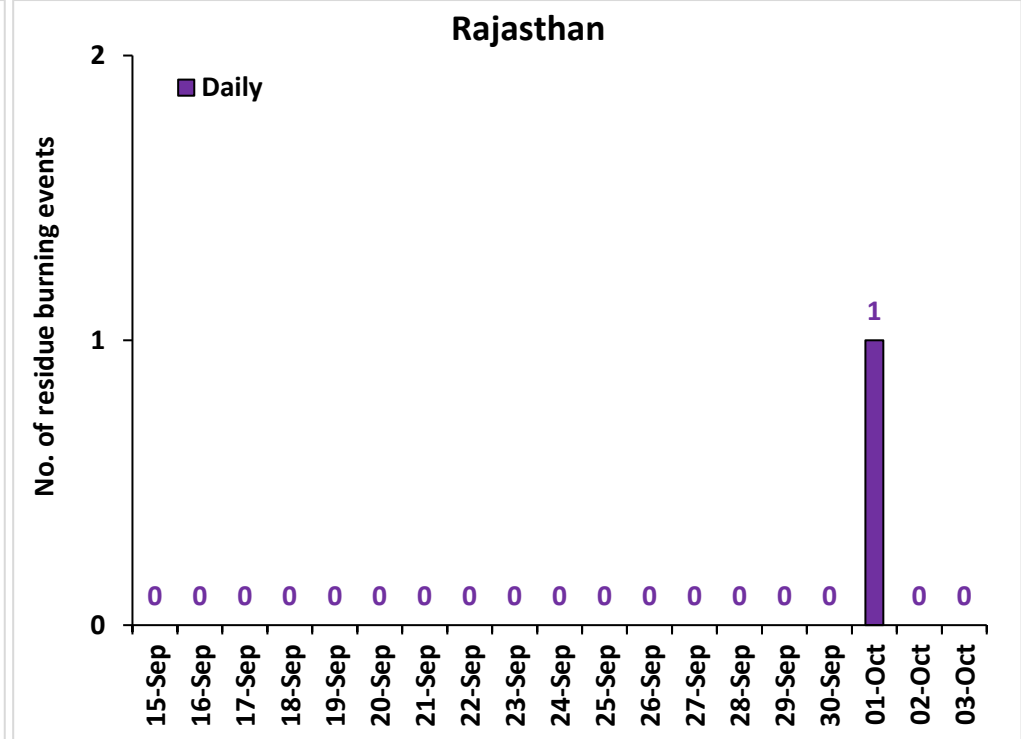
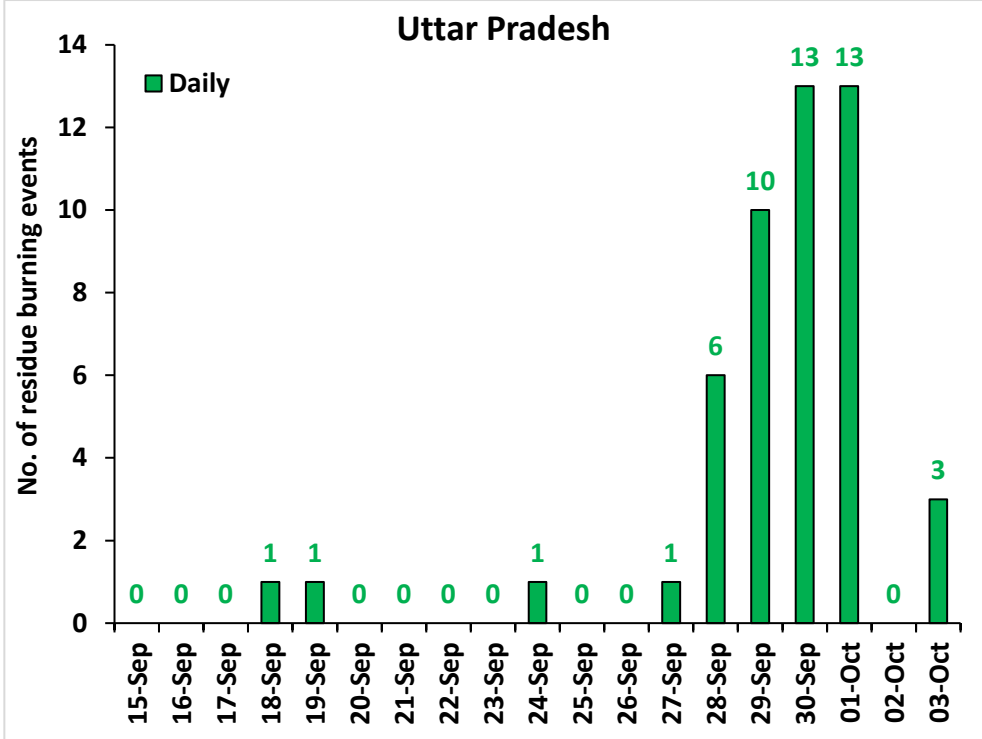


## Highlights for 03-October-2021

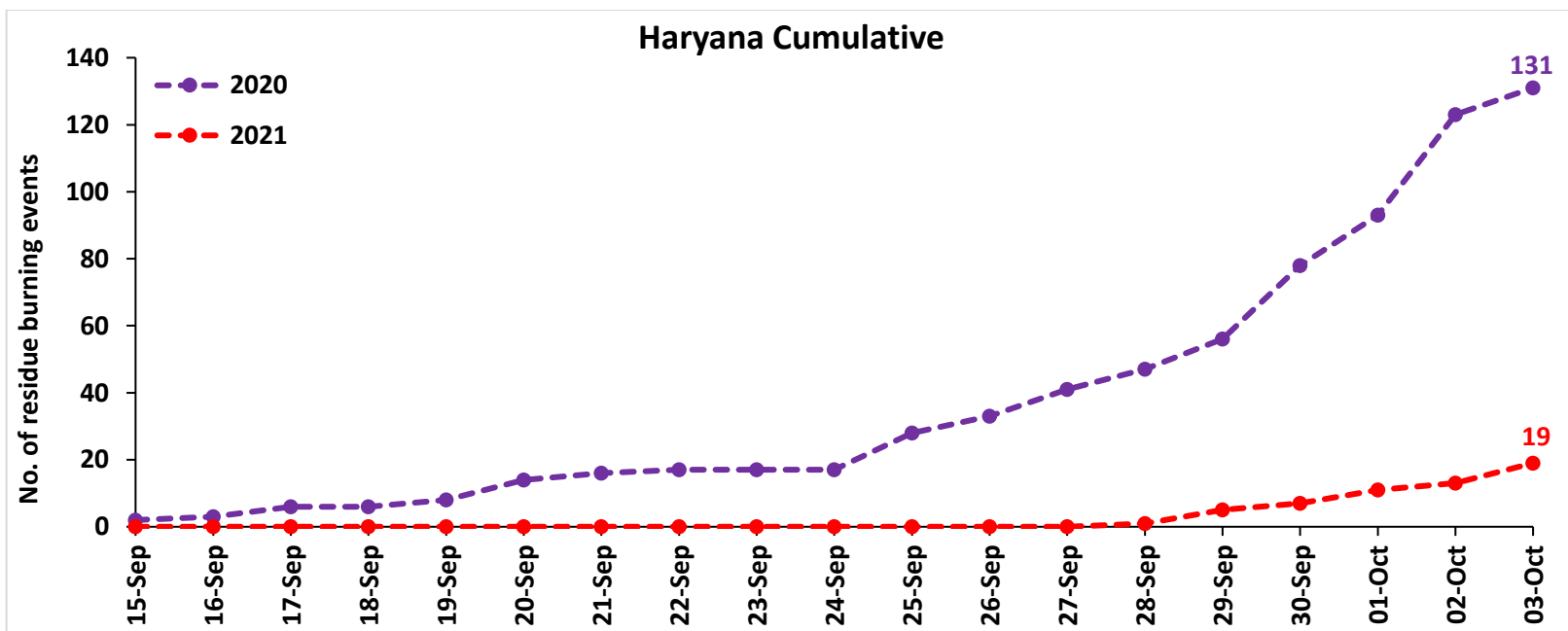
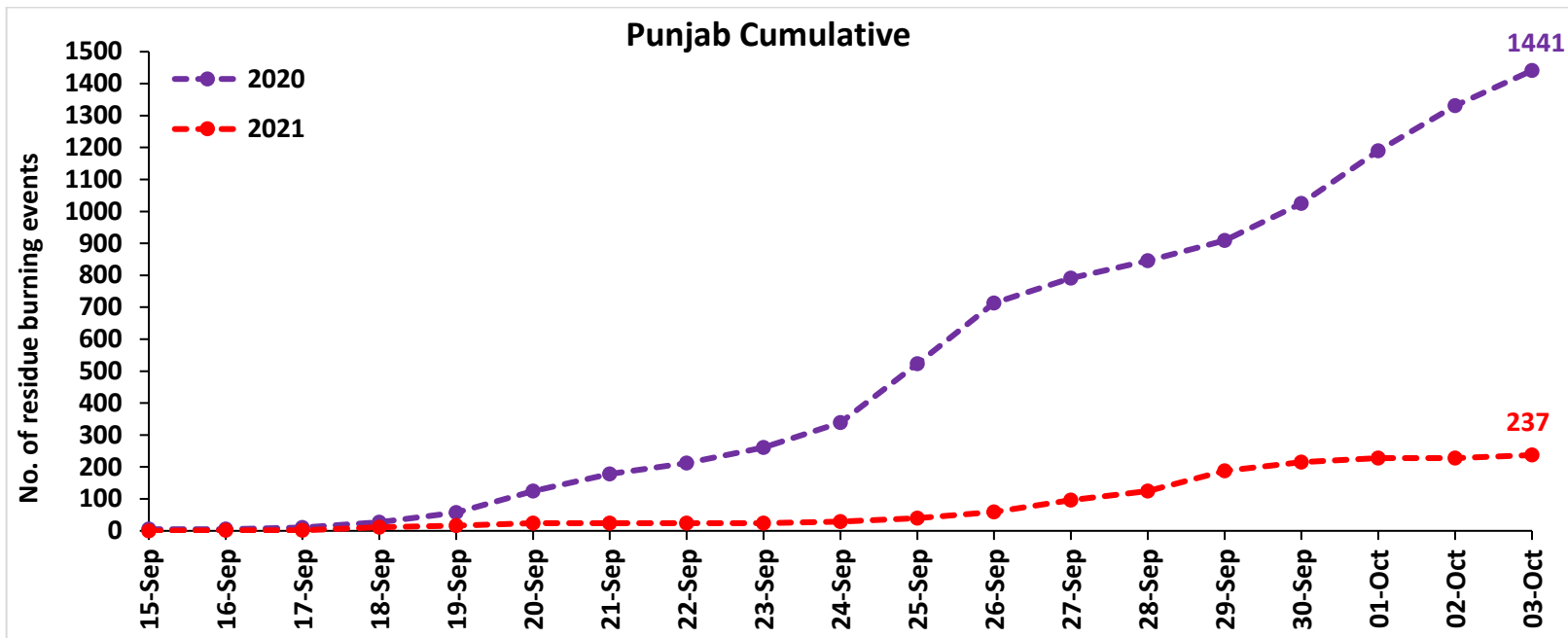
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the new "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **19** residue burning events in the six study States on 03-Oct-2021.
- The state wise events detected on 03-Oct-2021 were **9** in Punjab, **6** in Haryana, **3** in UP, **0** in Delhi, **0** in Rajasthan and **1** in MP.
- Detection of burning events by satellites was hampered due to scattered clouds over all the study states.

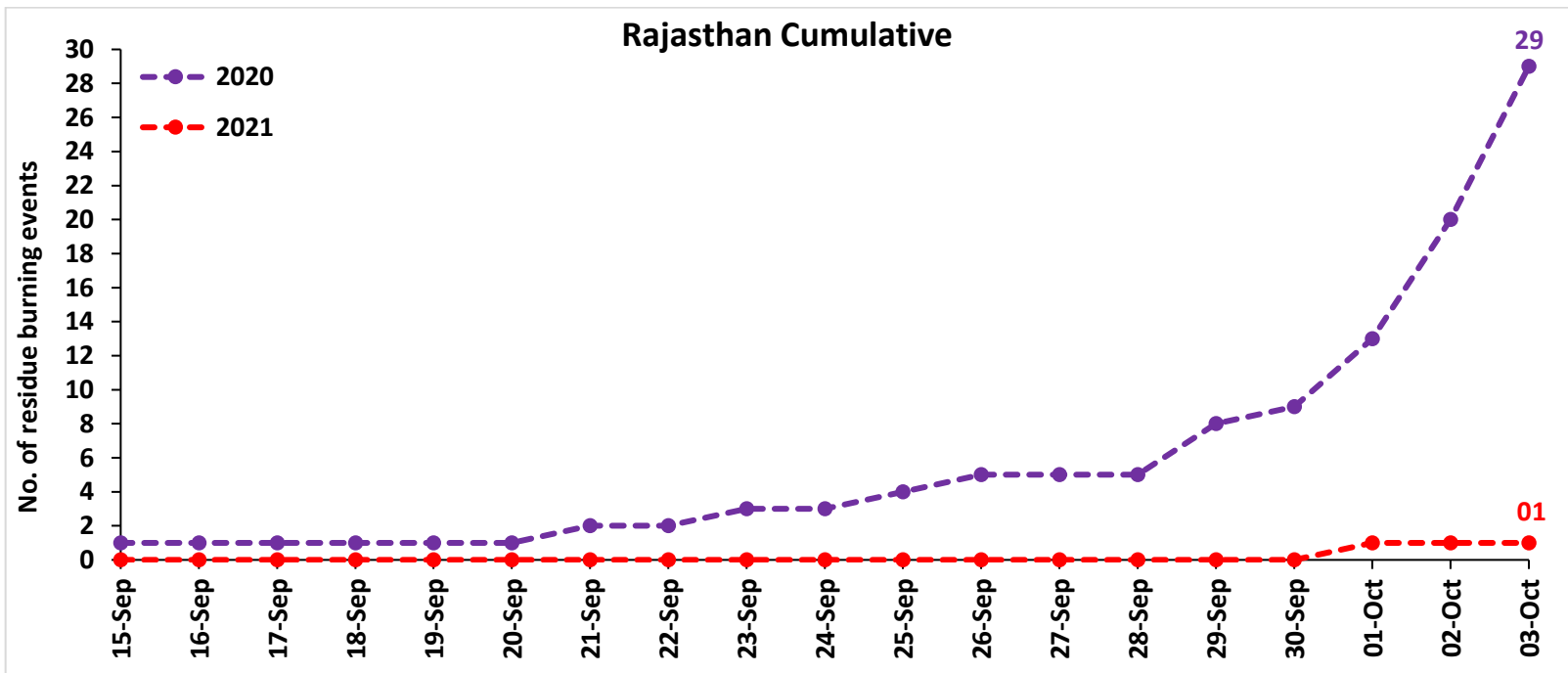
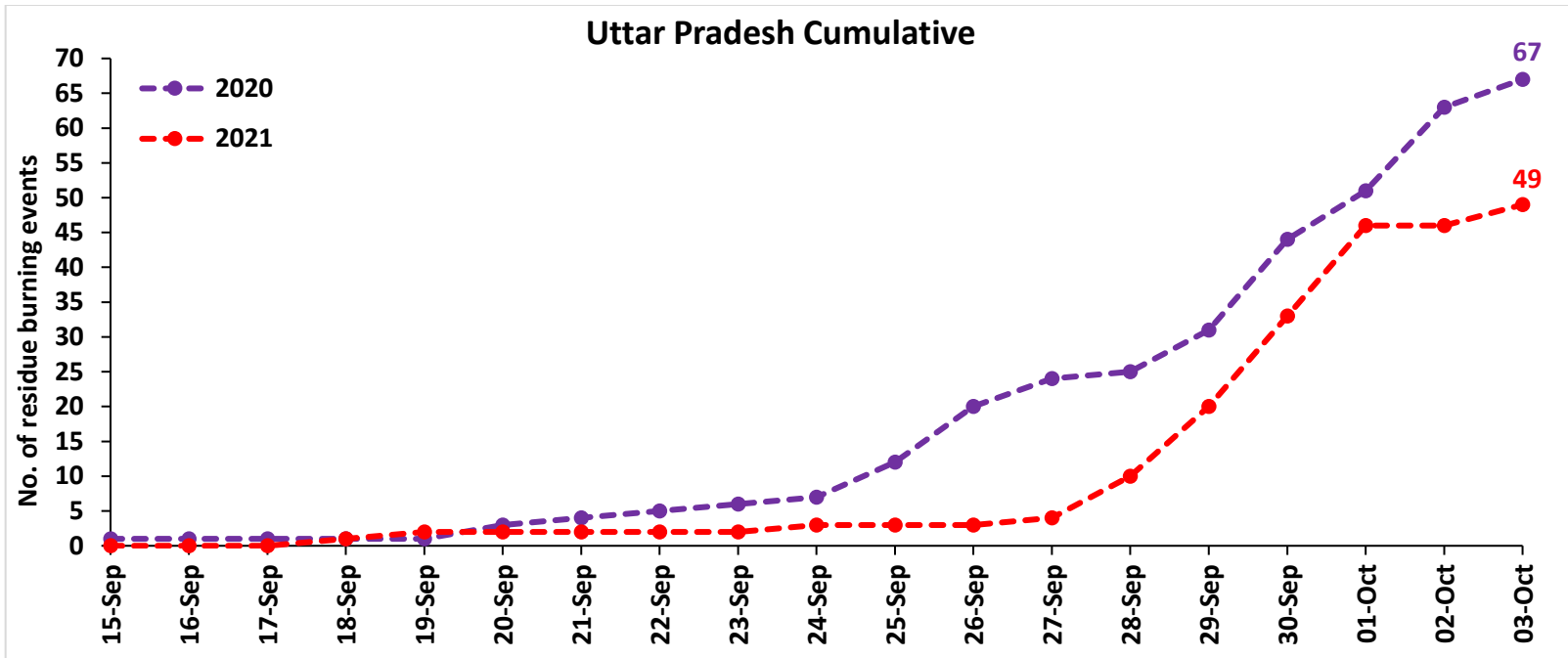
### Temporal distribution of rice residue burning events for the study States in 2021

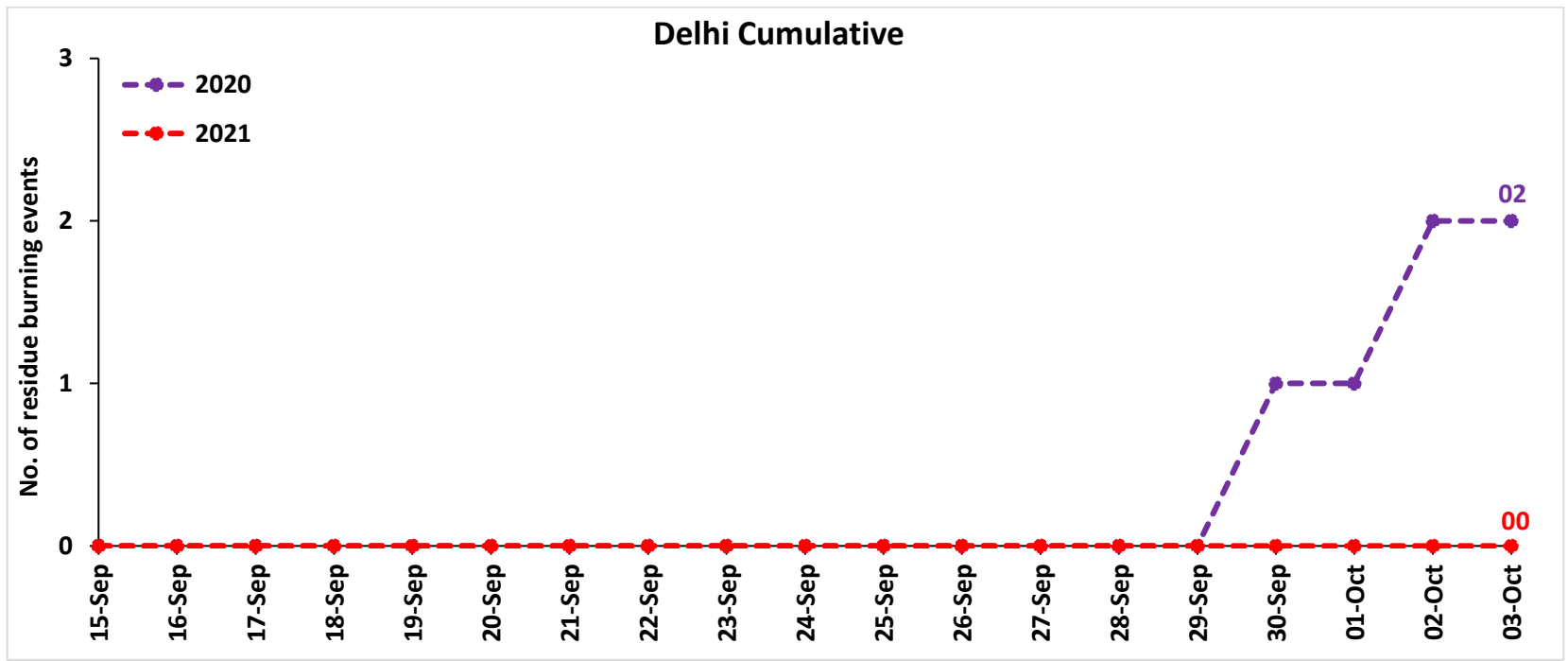
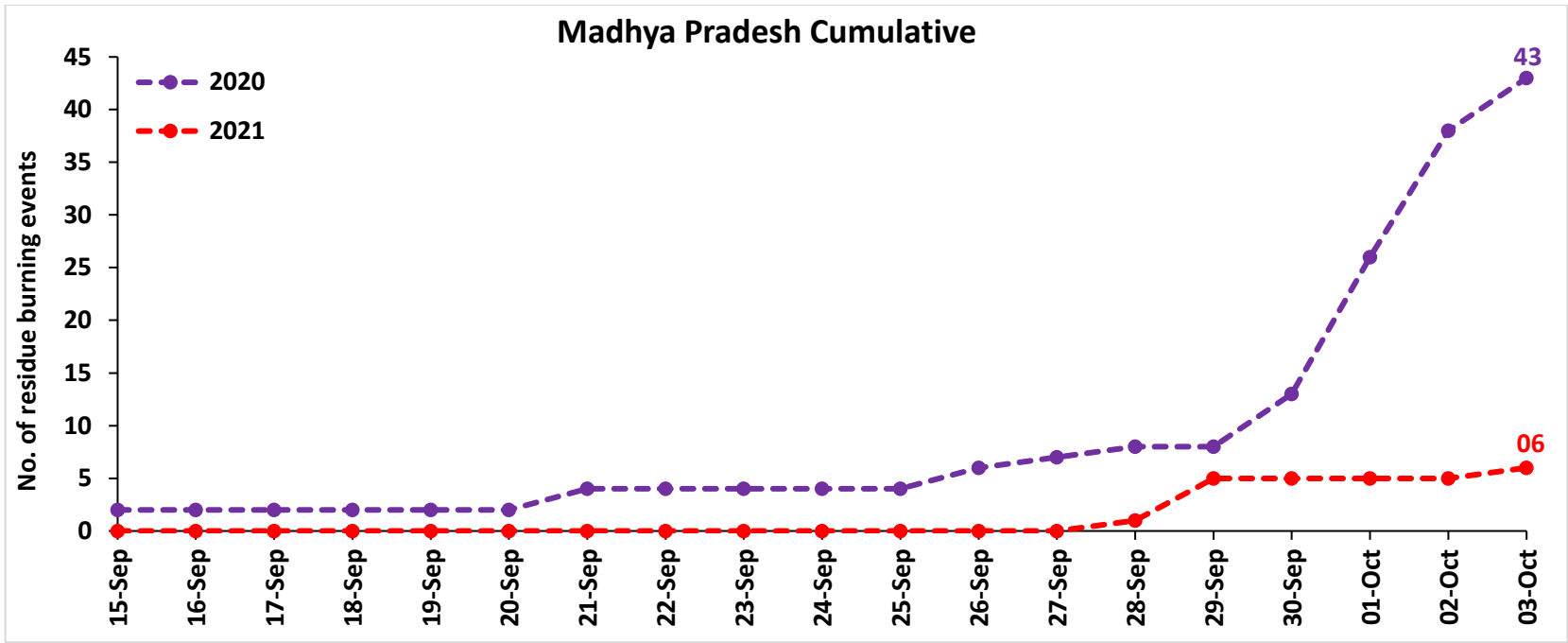




### Comparison of residue burning events in current year (2021) with previous year (2020) for the study States



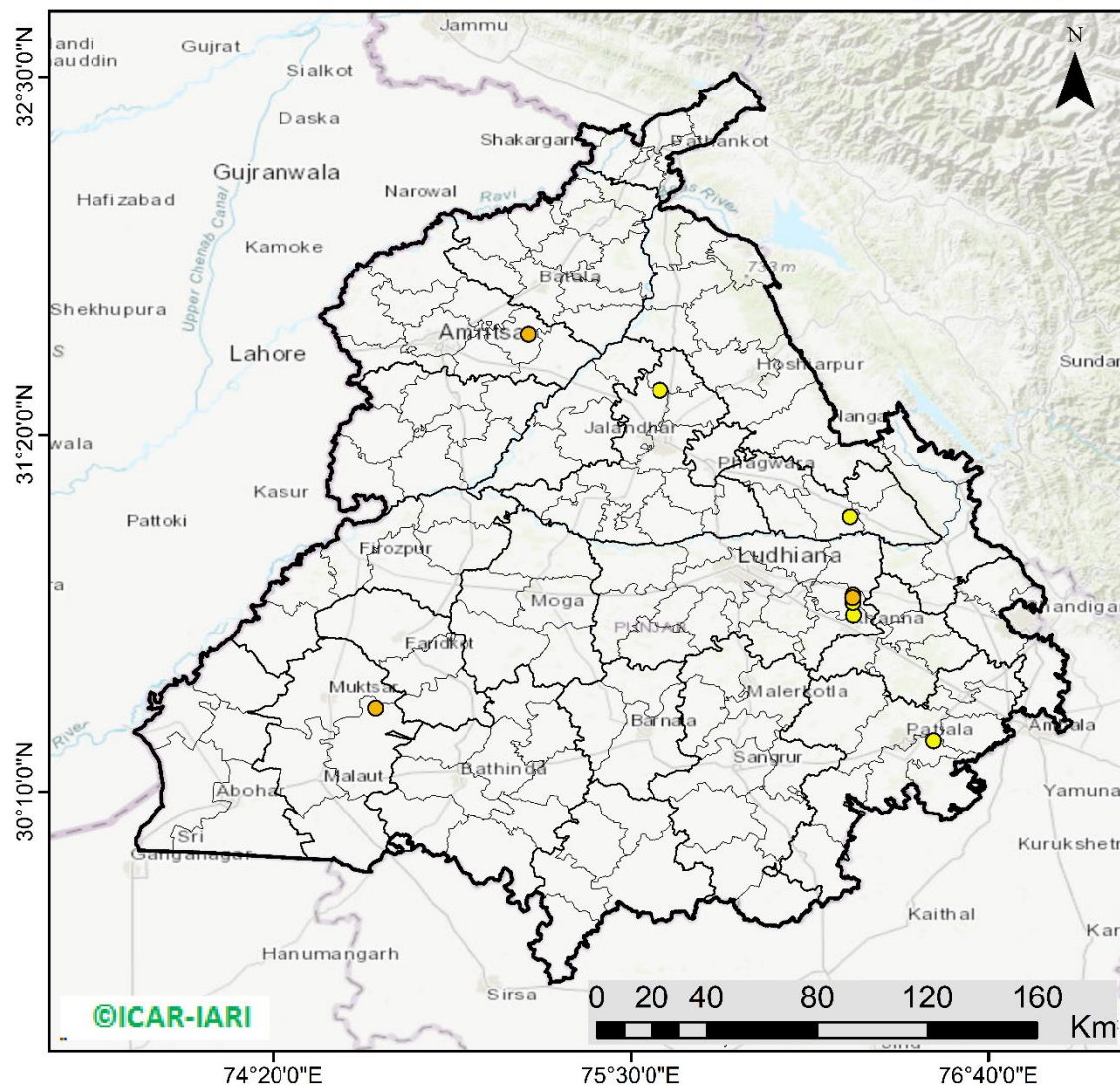






# Punjab

## RICE RESIDUE BURNING IN PUNJAB



**09** burning events detected in Punjab on 03rd October 2021

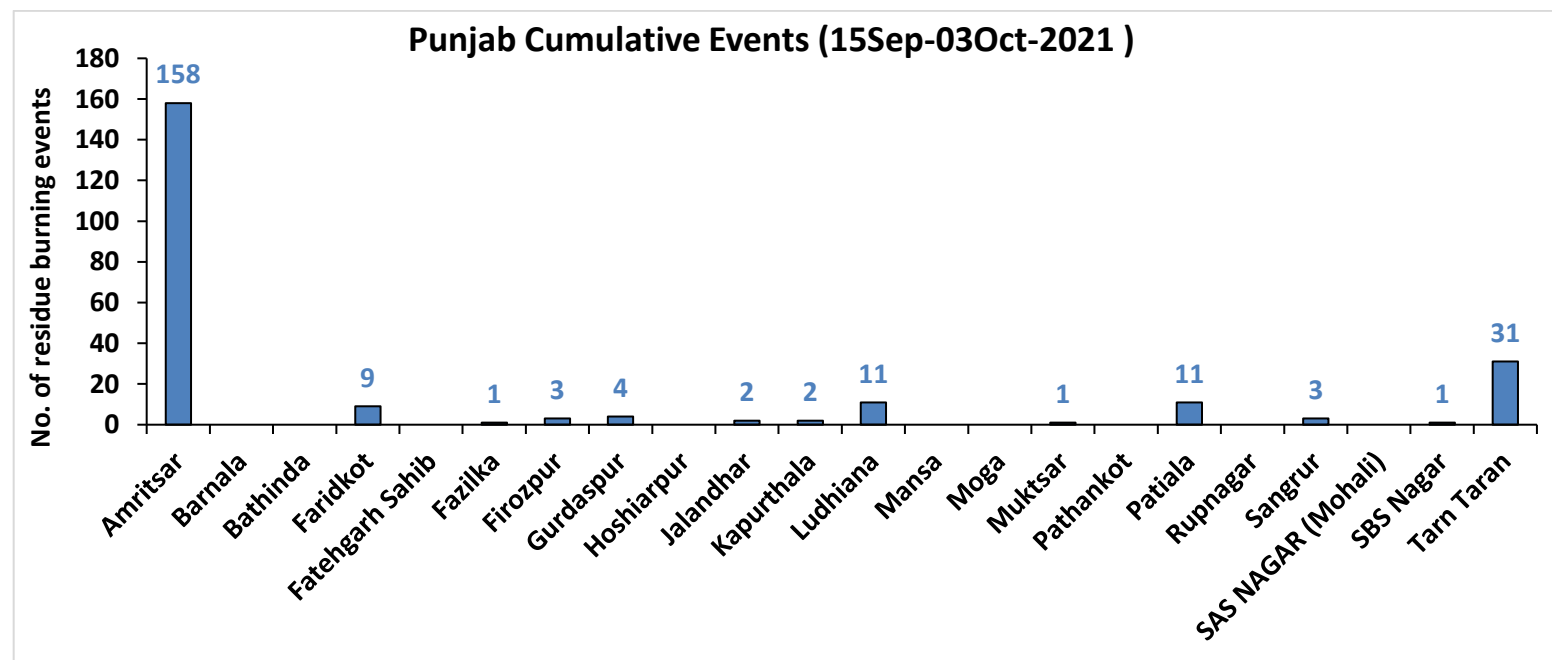
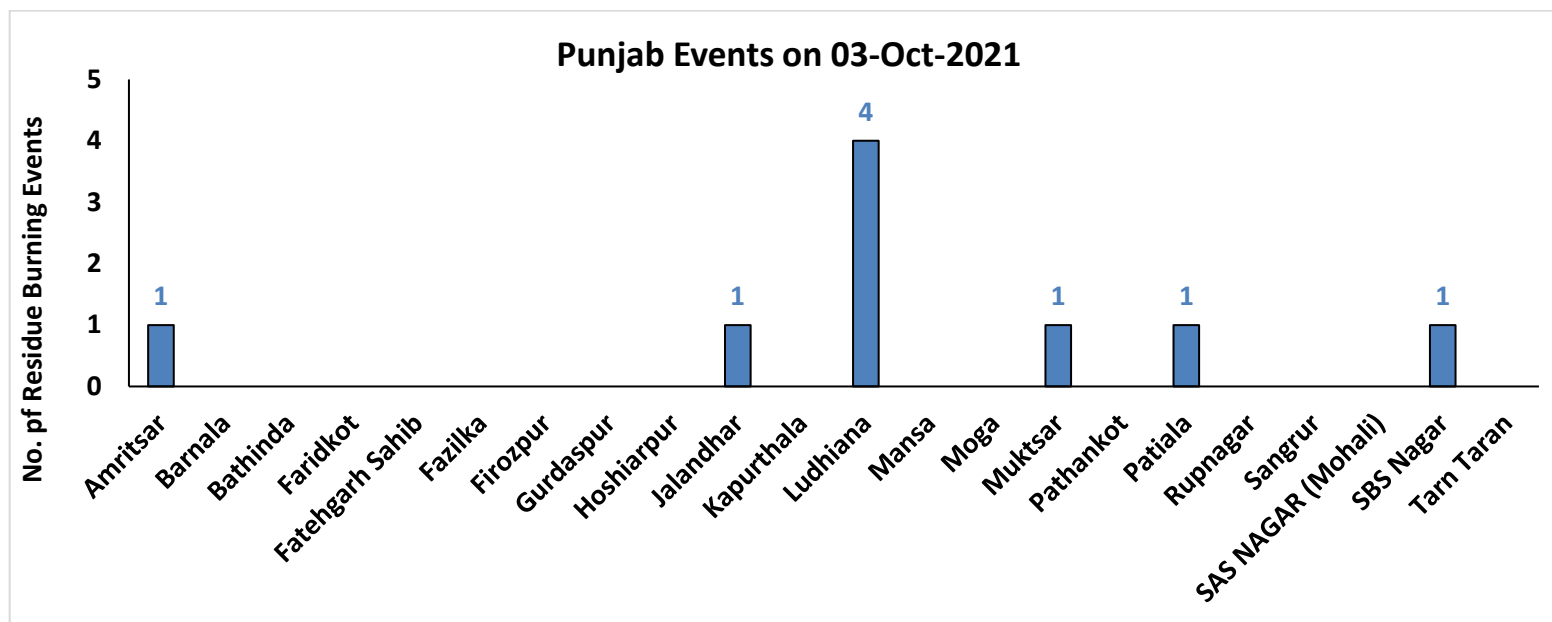
### Fire Intensity (W/m<sup>2</sup>)

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



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

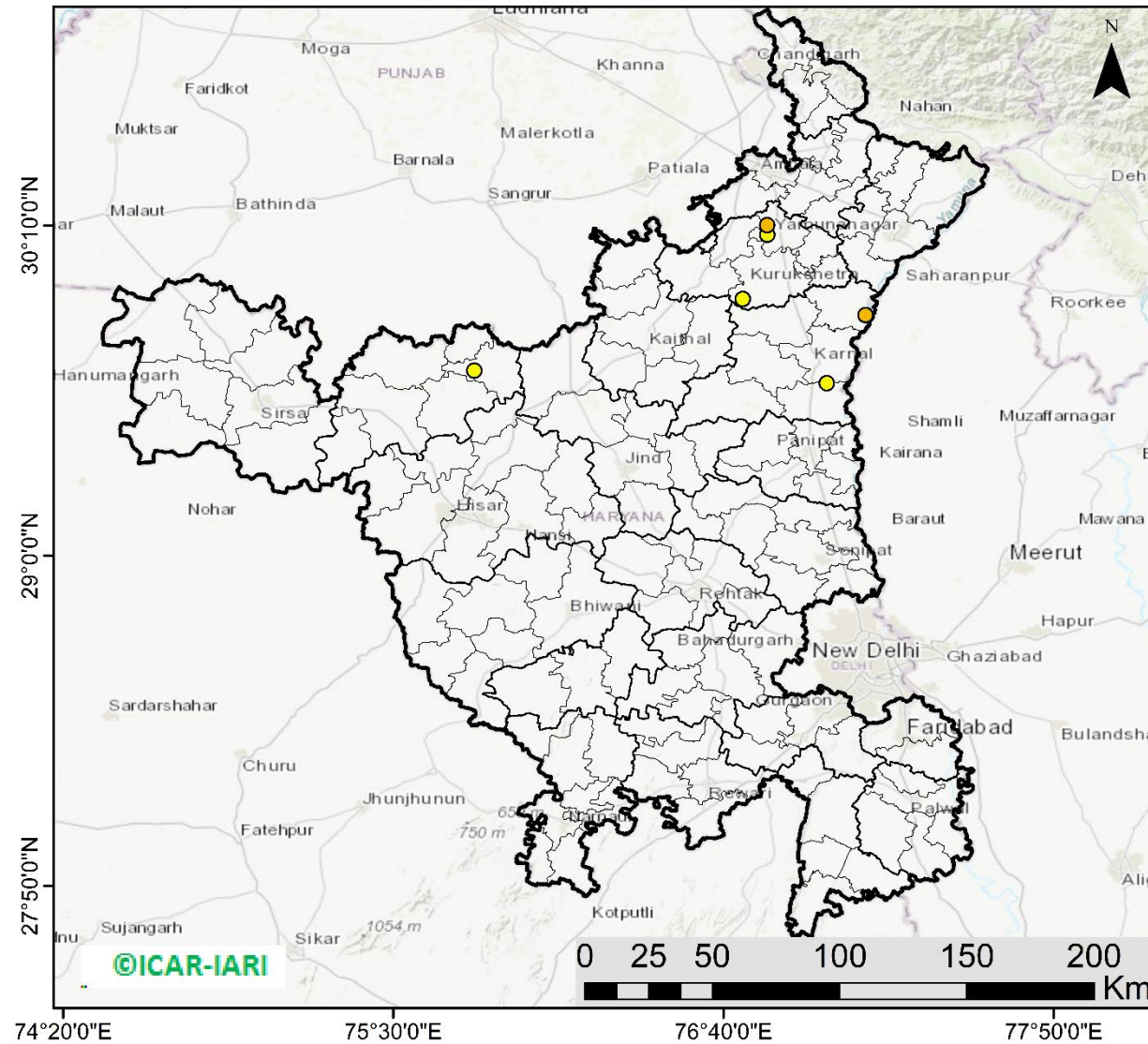
## District-wise cumulative number of residues burning events in Punjab (15Sep - 03Oct-2021)





# Haryana

## RICE RESIDUE BURNING IN HARYANA



**06** burning events detected in Haryana on **03rd October 2021**

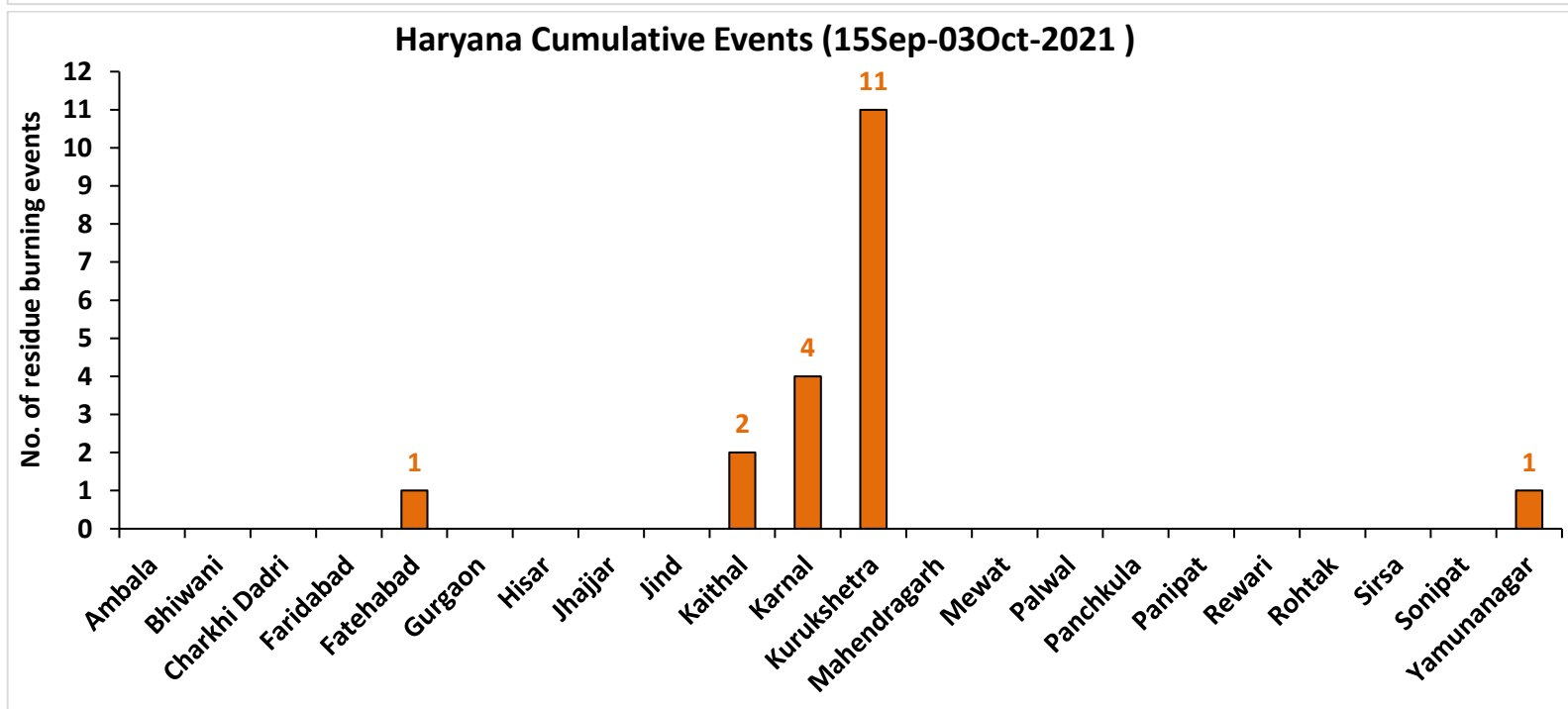
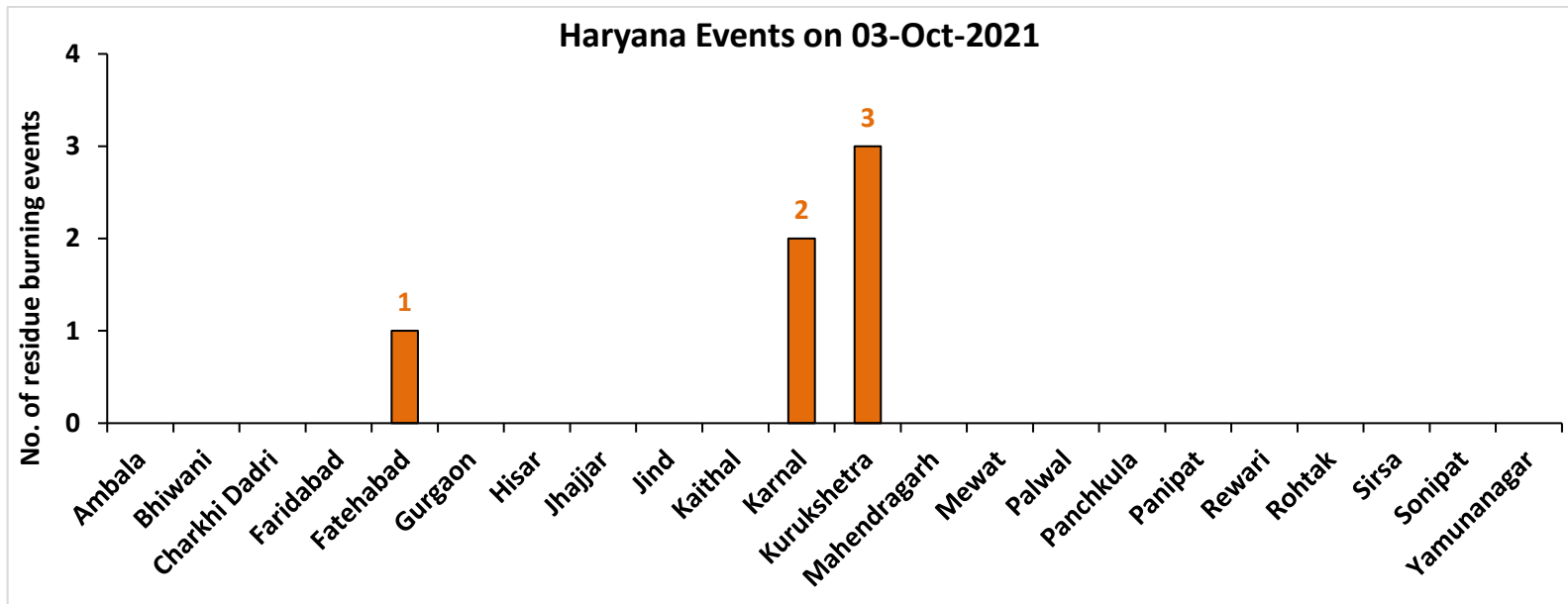
### Fire Intensity (W/m<sup>2</sup>)

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



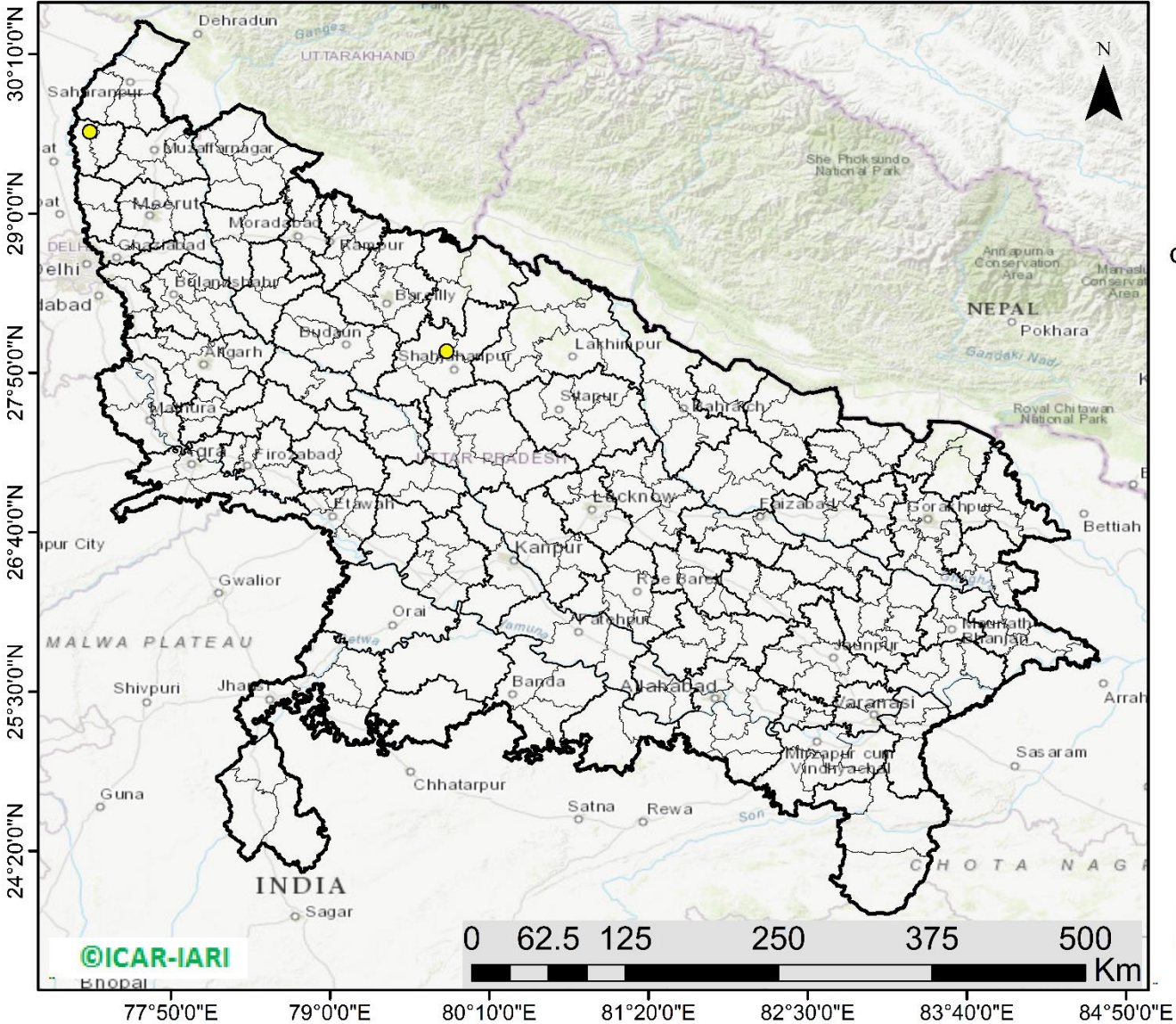
<http://geoportal.icar.gov.in:8080/geoexplorer/composer/>

## District-wise cumulative number of residues burning events in Haryana (15 Sep - 03 Oct-2021)



Uttar Pradesh

RICE RESIDUE BURNING IN UTTAR PRADESH



**03** burning events detected in Uttar Pradesh on 03rd October 2021

Fire Intensity (W/m2)

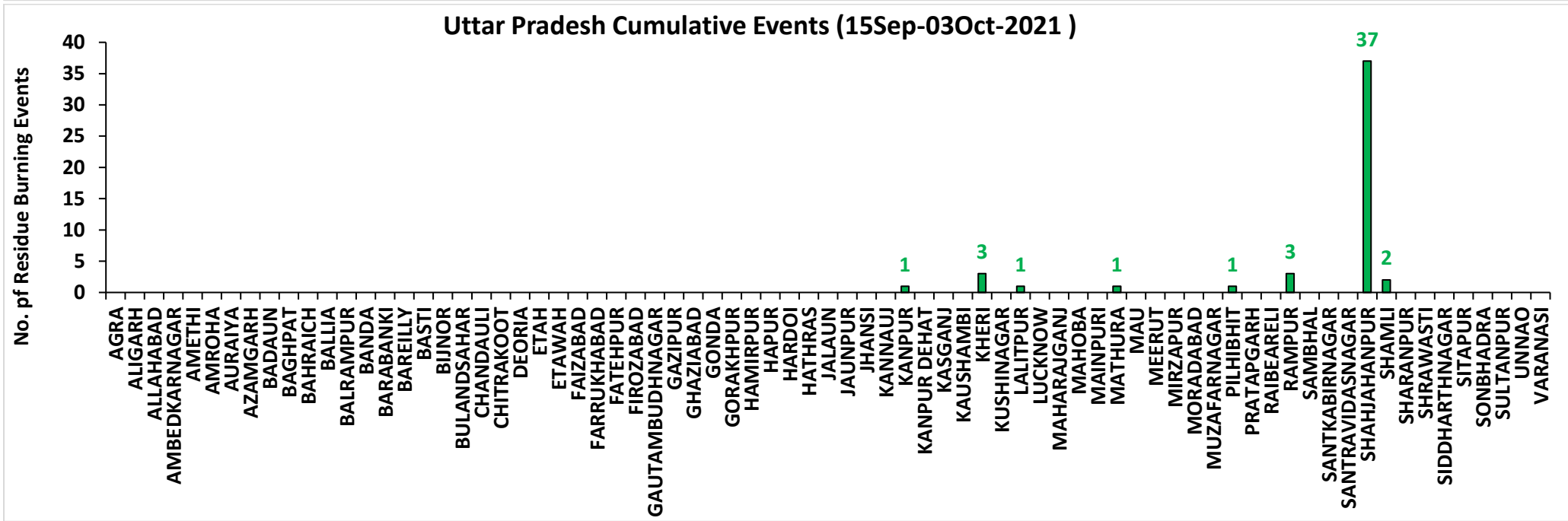
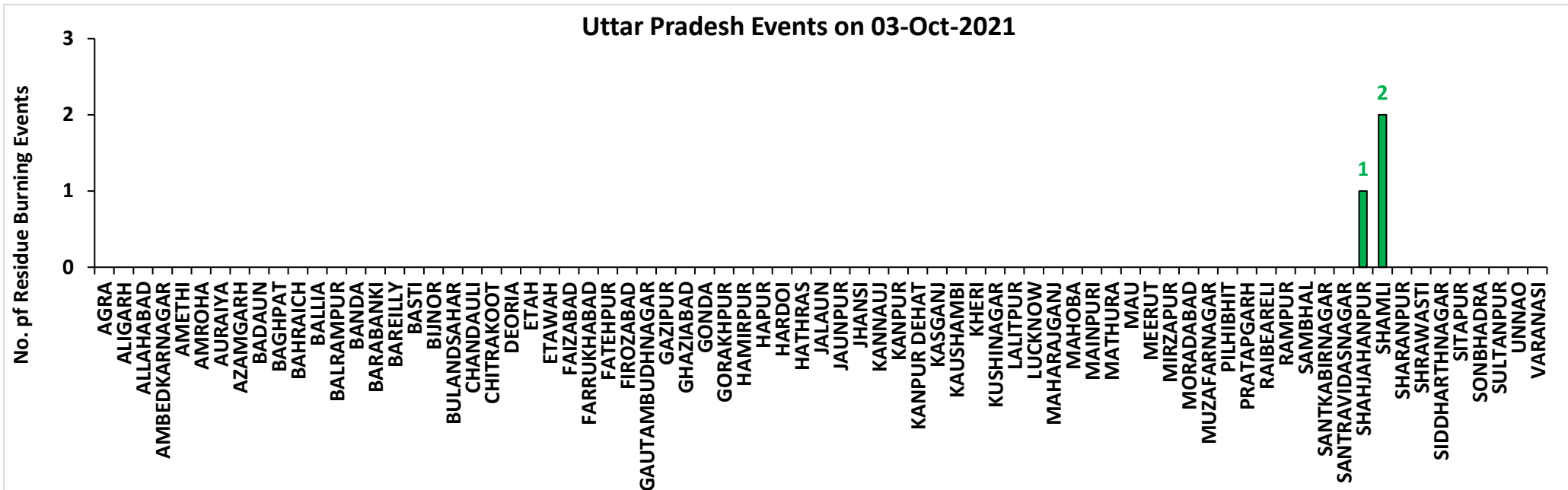
- 0 - 5
- 6 - 10
- 11 - 15
- 16 - 20
- >20



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

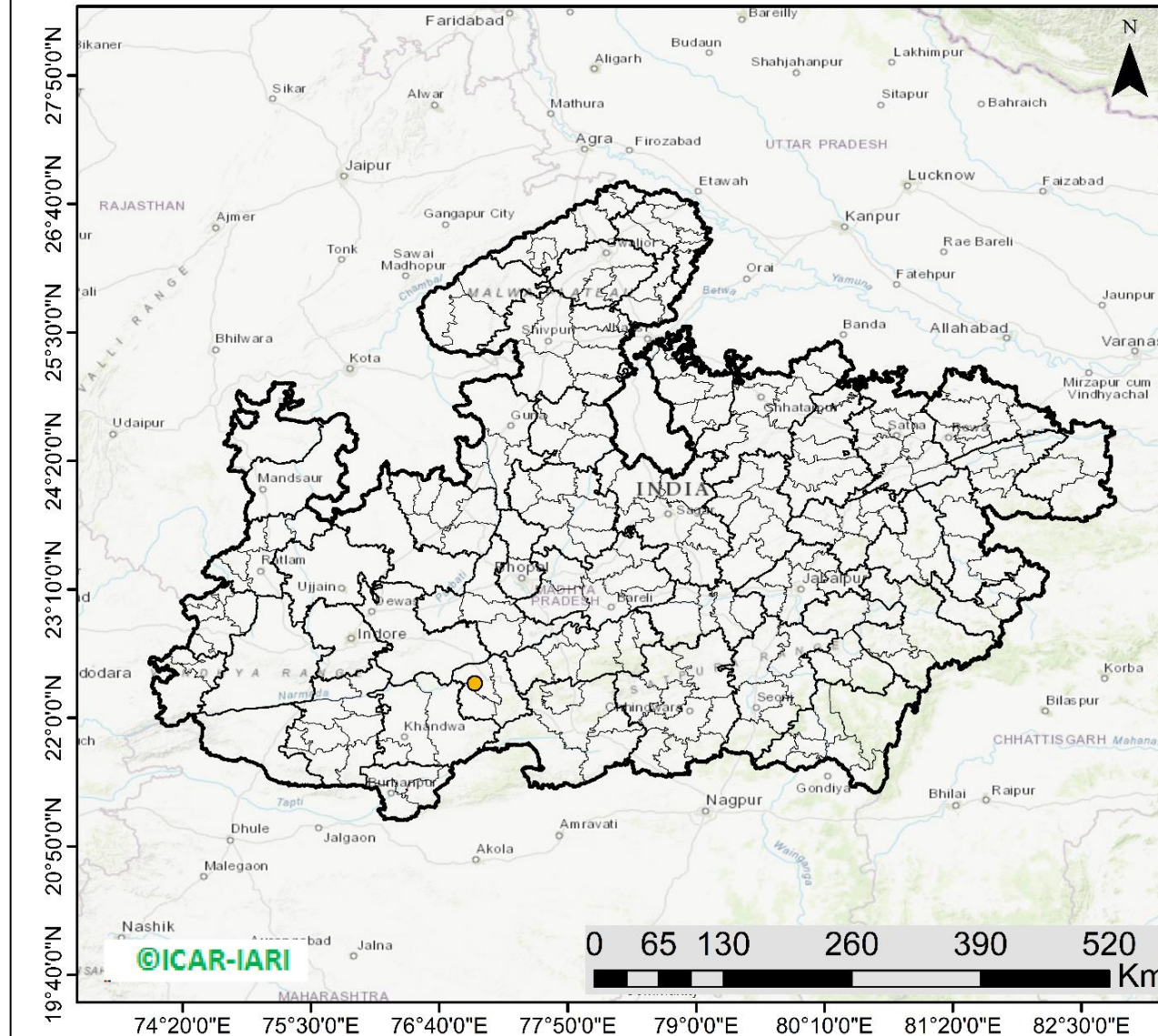


## District-wise cumulative number of residues burning events in Uttar Pradesh (15 Sep - 03 Oct-2021)



# Madhya Pradesh

## RICE RESIDUE BURNING IN MADHYA PRADESH



**01** burning events detected in MP on **03rd October 2021**

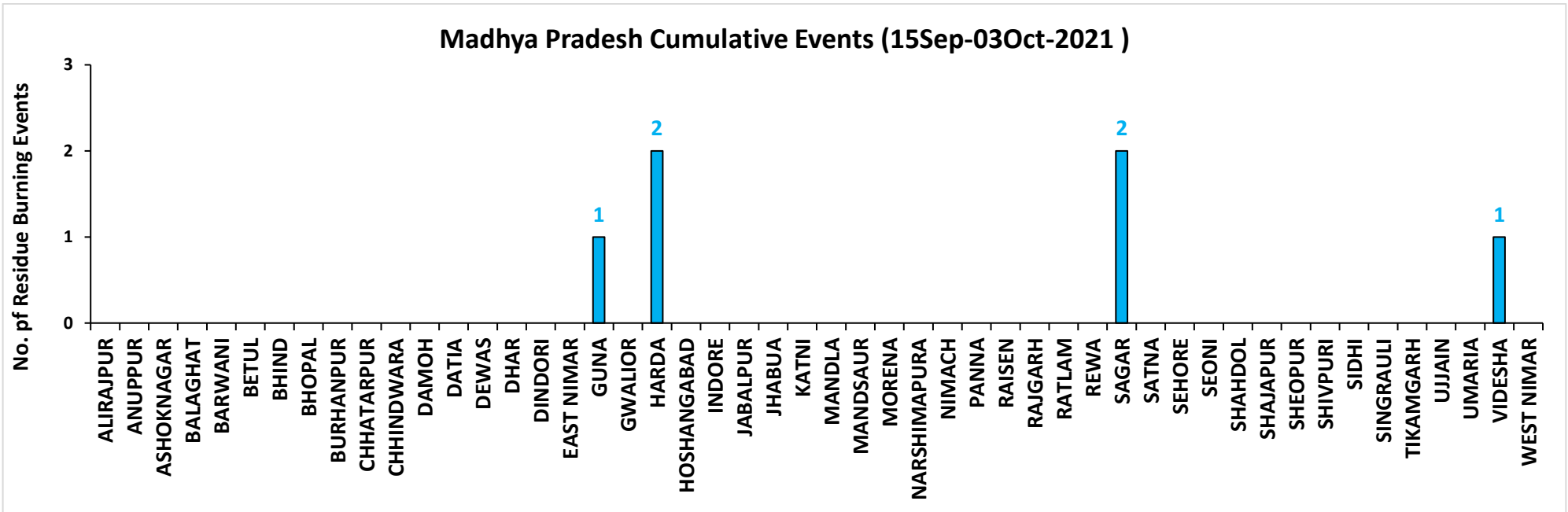
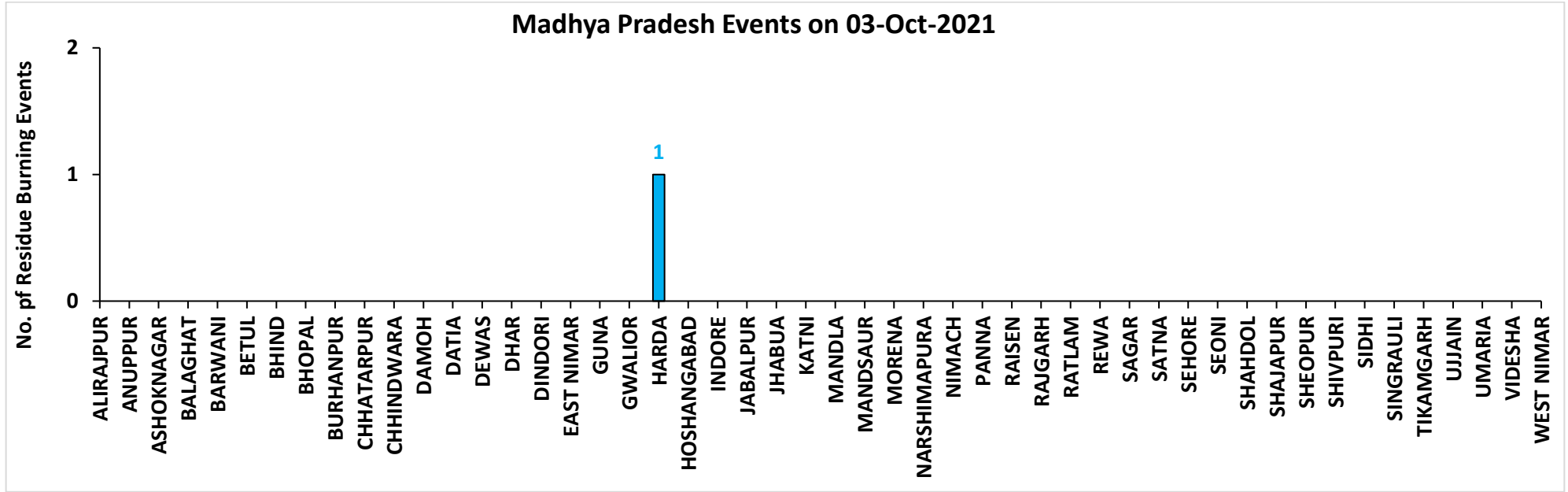
### Fire Intensity (W/m<sup>2</sup>)

- 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 Madhya Pradesh (15 Sep - 03 Oct-2021)



**District-wise cumulative number of residues burning events detected in 2020 and 2021**  
**(Period: 15 September - 03 October)**

**(a) Punjab**

District	15 Sep – 03 Oct	
	2020	2021
AMRITSAR	946	158
BARNALA	2	0
BATHINDA	0	0
FARIDKOT	3	9
FATEHGARH SAHIB	14	0
FAZILKA	0	1
FIROZPUR	16	3
GURDASPUR	48	4
HOSHIARPUR	3	0
JALANDHAR	12	2
KAPURTHALA	12	2
LUDHIANA	32	11
MANSA	1	0
MOGA	9	0
MUKTSAR	1	1
PATHANKOT	0	0
PATIALA	49	11
RUPNAGAR	1	0
SANGRUR	15	3
SAS NAGAR (MOHALI)	7	0
SBS NAGAR	2	1
TARN TARAN	268	31
<b>Total</b>	<b>1441</b>	<b>237</b>

**(b) Haryana**

District	15 Sep – 03 Oct	
	2020	2021
AMBALA	17	0
BHIWANI	0	0
CHARKHI DADRI	0	0
FARIDABAD	0	0
FATEHABAD	13	1
GURGAON	0	0
HISAR	3	0
JHAJJAR	0	0
JIND	0	0
KAITHAL	17	2
KARNAL	36	4
KURUKSHETRA	28	11
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	2	0
YAMUNANAGAR	7	1
<b>Total</b>	<b>131</b>	<b>19</b>



(c) Uttar Pradesh

District	15 Sep – 03 Oct							
	2020	2021	GAUTAMBUDHNAGAR	1	0	MUZAFARNAGAR	0	0
AGRA	0	0	GAZIPUR	0	0	PILHIBHIT	2	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	2	0	SANTKABIRNAGAR	0	0
AURAIYA	10	0	HARDOI	0	0	SANTRAVIDASNAGAR	0	0
AZAMGARH	0	0	HATHRAS	0	0	SHAHJAHANPUR	5	37
BADAUN	0	0	JALAUN	0	0	SHAMLI	7	2
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	1	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	<b>Total</b>	<b>67</b>	<b>49</b>
BULANDSAHAR	1	0	LALITPUR	0	1			
CHANDAULI	0	0	LUCKNOW	0	0			
CHITRAKOOT	0	0	MAHARAJGANJ	0	0			
DEORIA	0	0	MAHOPA	0	0			
ETAH	2	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 – 03 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
<b>Total</b>	<b>2</b>	<b>0</b>

**(e) Rajasthan**

District	15 Sep – 03 Oct	
	2020	2021
AJMER	0	0
ALWAR	1	0
BANSWARA	0	0
BARAN	11	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	6	0
JAIPUR	0	0
JAISELMER	1	0
JALOR	0	0
JHALAWAR	0	0
JHUNJHUNUN	0	0
JODHPUR	1	0
KARALI	1	0
KOTA	1	0
NAGAU	0	0
PALI	1	0
PRATAPGARH	0	0
RAJSMAND	0	0
SIKAR	0	0
SIROHI	0	0
SWAIMADHOPUR	0	0
TONK	1	0
UDAIPUR	0	0
<b>Total</b>	<b>29</b>	<b>1</b>

(f) Madhya Pradesh

District	15 Sep – 03 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	1	0	SHAJAPUR	2	0
CHHINDWARA	0	0	SHEOPUR	0	0
DAMOH	5	0	SHIVPURI	0	0
DATIA	1	0	SIDHI	0	0
DEWAS	0	0	SINGRAULI	0	0
DHAR	3	0	TIKAMGARH	0	0
DINDORI	0	0	UJJAIN	3	0
EAST NIMAR	0	0	UMARIA	0	0
GUNA	5	1	VIDESHA	5	1
GWALIOR	3	0	WEST NIMAR	0	0
HARDA	2	2	<b>Total</b>	<b>43</b>	<b>6</b>
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 - 03 October)**

<b>Number of Paddy Residue Burning Events Detected</b>												
	<b>Punjab</b>		<b>Haryana</b>		<b>Uttar Pradesh</b>		<b>Delhi</b>		<b>Rajasthan</b>		<b>Madhya Pradesh</b>	
	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>
<b>15-Sep</b>	5	0	2	0	1	0	0	0	1	0	2	0
<b>16-Sep</b>	0	2	1	0	0	0	0	0	0	0	0	0
<b>17-Sep</b>	5	0	3	0	0	0	0	0	0	0	0	0
<b>18-Sep</b>	17	9	0	0	0	1	0	0	0	0	0	0
<b>19-Sep</b>	30	5	2	0	0	1	0	0	0	0	0	0
<b>20-Sep</b>	67	8	6	0	2	0	0	0	0	0	0	0
<b>21-Sep</b>	54	0	2	0	1	0	0	0	1	0	2	0
<b>22-Sep</b>	34	0	1	0	1	0	0	0	0	0	0	0
<b>23-Sep</b>	49	0	0	0	1	0	0	0	1	0	0	0
<b>24-Sep</b>	78	5	0	0	1	1	0	0	0	0	0	0
<b>25-Sep</b>	184	11	11	0	5	0	0	0	1	0	0	0
<b>26-Sep</b>	190	19	5	0	8	0	0	0	1	0	2	0
<b>27-Sep</b>	78	37	8	0	4	1	0	0	0	0	1	0
<b>28-Sep</b>	55	28	6	1	1	6	0	0	0	0	1	1
<b>29-Sep</b>	63	64	9	4	6	10	0	0	3	0	0	4
<b>30-Sep</b>	116	27	22	2	13	13	1	0	1	0	5	0
<b>01-Oct</b>	165	13	15	4	7	13	0	0	4	1	13	0
<b>02-Oct</b>	141	0	30	2	12	0	1	0	7	0	12	0
<b>03-Oct</b>	110	9	8	6	4	3	0	0	9	0	5	1
<b>Total</b>	<b>1441</b>	<b>237</b>	<b>131</b>	<b>19</b>	<b>67</b>	<b>49</b>	<b>2</b>	<b>0</b>	<b>29</b>	<b>1</b>	<b>43</b>	<b>6</b>

### Details of residue burning events in Punjab on 03-Oct-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	AMRITSAR	TARSIKKA	S-NPP	31.65890	75.16740	10/3/2021	13:48:15	D	8.70
2	JALANDHAR	BHOGPUR	S-NPP	31.47730	75.59650	10/3/2021	13:48:15	D	4.10
3	LUDHIANA	KHANNA	S-NPP	30.74380	76.22860	10/3/2021	13:48:15	D	3.90
4	LUDHIANA	SAMRALA	S-NPP	30.78500	76.22680	10/3/2021	13:48:15	D	1.90
5	LUDHIANA	SAMRALA	S-NPP	30.80950	76.22740	10/3/2021	13:48:15	D	6.60
6	LUDHIANA	SAMRALA	AQUA	30.80100	76.22600	10/3/2021	13:20:04	D	8.50
7	MUKTSAR	KOT BHAI AT GIDDERBAHA	S-NPP	30.43880	74.66850	10/3/2021	13:48:15	D	5.10
8	PATIALA	SANAUR	S-NPP	30.33260	76.48850	10/3/2021	13:48:15	D	2.80
9	SBS NAGAR	NAWAN SHAHR	S-NPP	31.06330	76.21740	10/3/2021	13:48:15	D	4.40

### Details of residue burning events in Haryana on 03-Oct-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m <sup>2</sup> )
1	FATEHABAD	TOHANA	S-NPP	29.65390	75.78620	10/3/2021	13:48:15	D	3.90
2	KARNAL	GHARAUNDA	S-NPP	29.60940	77.03150	10/3/2021	13:48:15	D	2.50
3	KARNAL	INDRI	S-NPP	29.85000	77.16900	10/3/2021	13:48:15	D	7.00
4	KURUKSHETRA	SHAHBAD	S-NPP	30.13400	76.82150	10/3/2021	13:48:15	D	4.90
5	KURUKSHETRA	SHAHBAD	S-NPP	30.16750	76.82120	10/3/2021	13:48:15	D	7.10
6	KURUKSHETRA	THANESAR	S-NPP	29.90680	76.73520	10/3/2021	13:48:15	D	2.10

**Details of residue burning events in Uttar Pradesh on 03-Oct-2021**

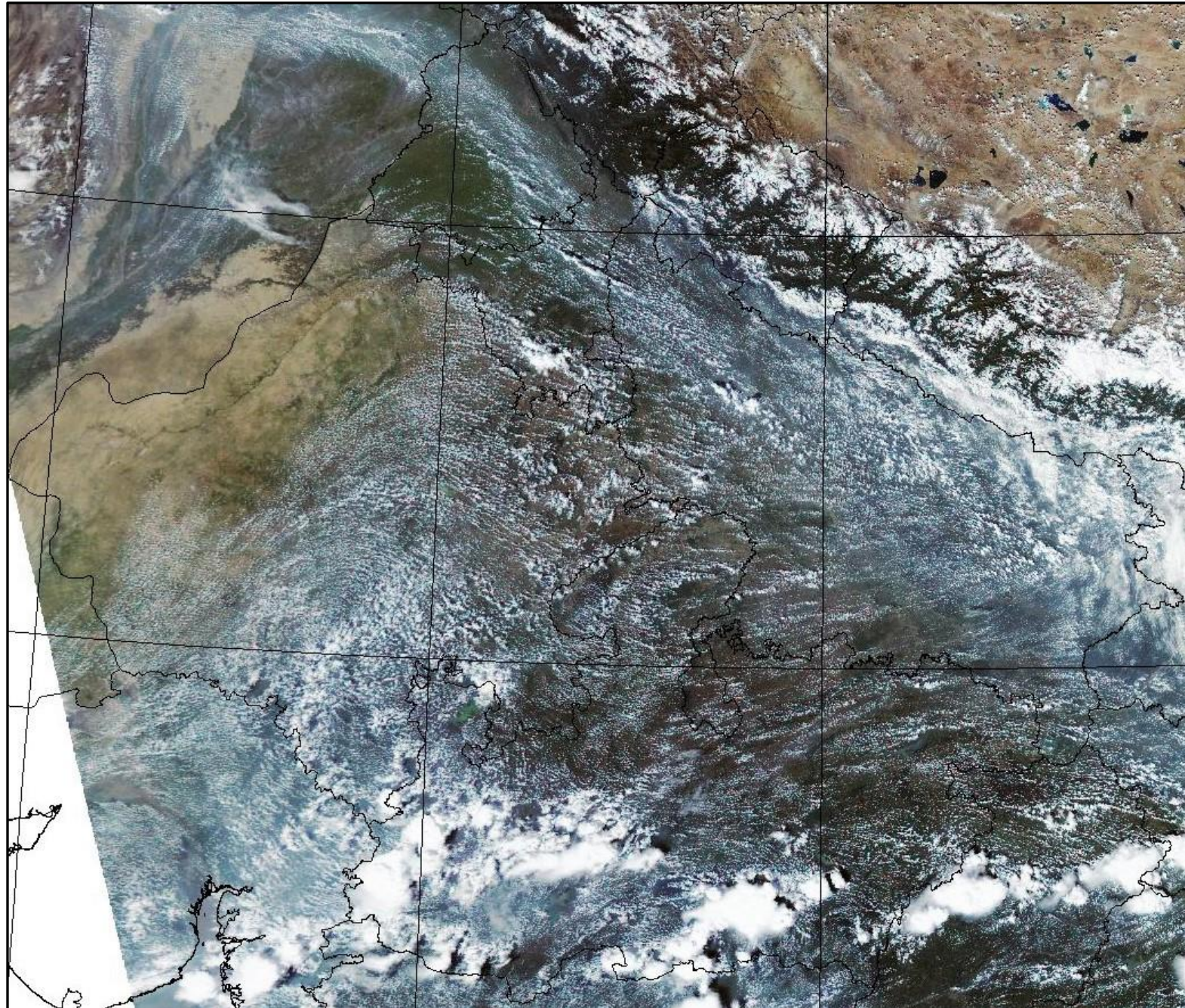
S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	SHAHJAHANPUR	SHAHJAHANPUR	S-NPP	27.99110	79.85430	10/3/2021	13:48:15	D	2.00
2	SHAMLI	KAIRANA	S-NPP	29.59720	77.24060	10/3/2021	13:48:15	D	4.80
3	SHAMLI	KAIRANA	S-NPP	29.59740	77.24010	10/3/2021	13:48:15	D	4.80

**Details of residue burning events in Madhya Pradesh on 03-Oct-2021**

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	HARDA	HARDA	S-NPP	22.31190	76.98900	10/3/2021	13:48:15	D	6.50



[AQUA \(MODIS\) Satellite image \(FCC\) of North and Central India Acquired on 03-Oct-2021 at 13:29:29 IST by IARI Ground Station](#)





**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 – HQ	Dr S.K. Chaudhari	DDG (AG. ENGG.)	<a href="mailto:ddgengg@icar.org.in">ddgengg@icar.org.in</a>
	Dr S. Bhasker	ADG (NRM)	<a href="mailto:adgagroandaf@gmail.com">adgagroandaf@gmail.com</a>
	Dr K.K. Singh	ADG (AG. ENGG.)	<a href="mailto:kanchansingh044@gmail.com">kanchansingh044@gmail.com</a>
ICAR - IARI	<b>Dr V.K. Sehgal</b>	Professor & Nodal Scientist	<a href="mailto:iaricreams@gmail.com">iaricreams@gmail.com</a>
	Dr Rajkumar Dhakar	Scientist	<a href="mailto:raidhakar.iari@gmail.com">raidhakar.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)

\*\*\*