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



Prepared by:

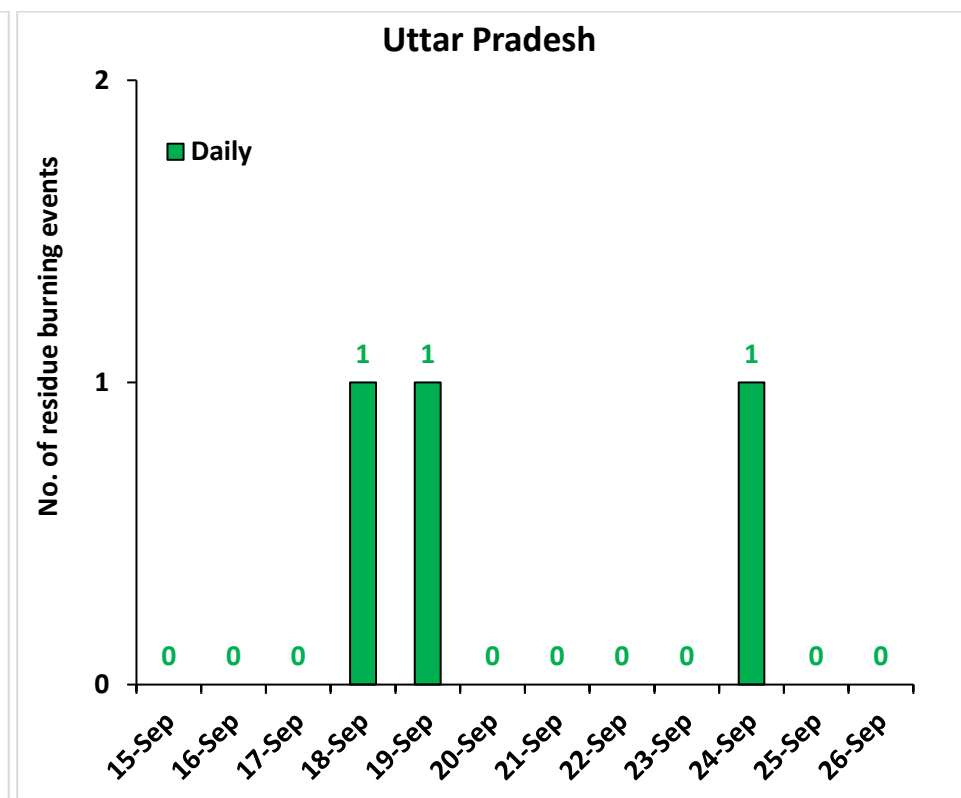
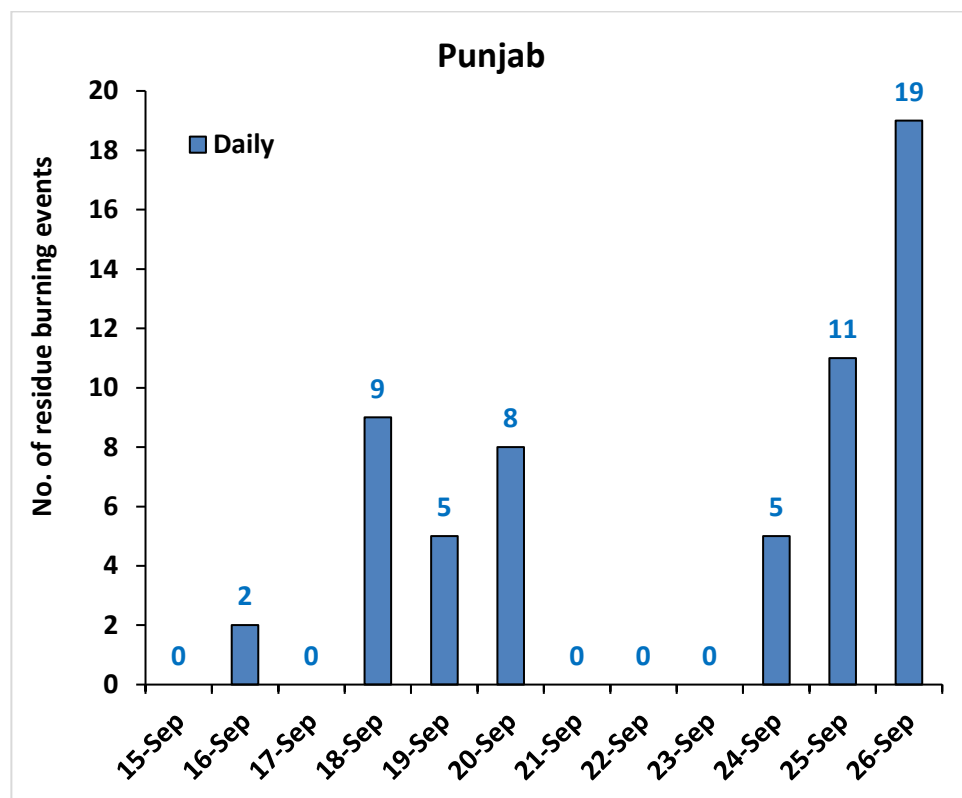
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<http://creams.iari.res.in>

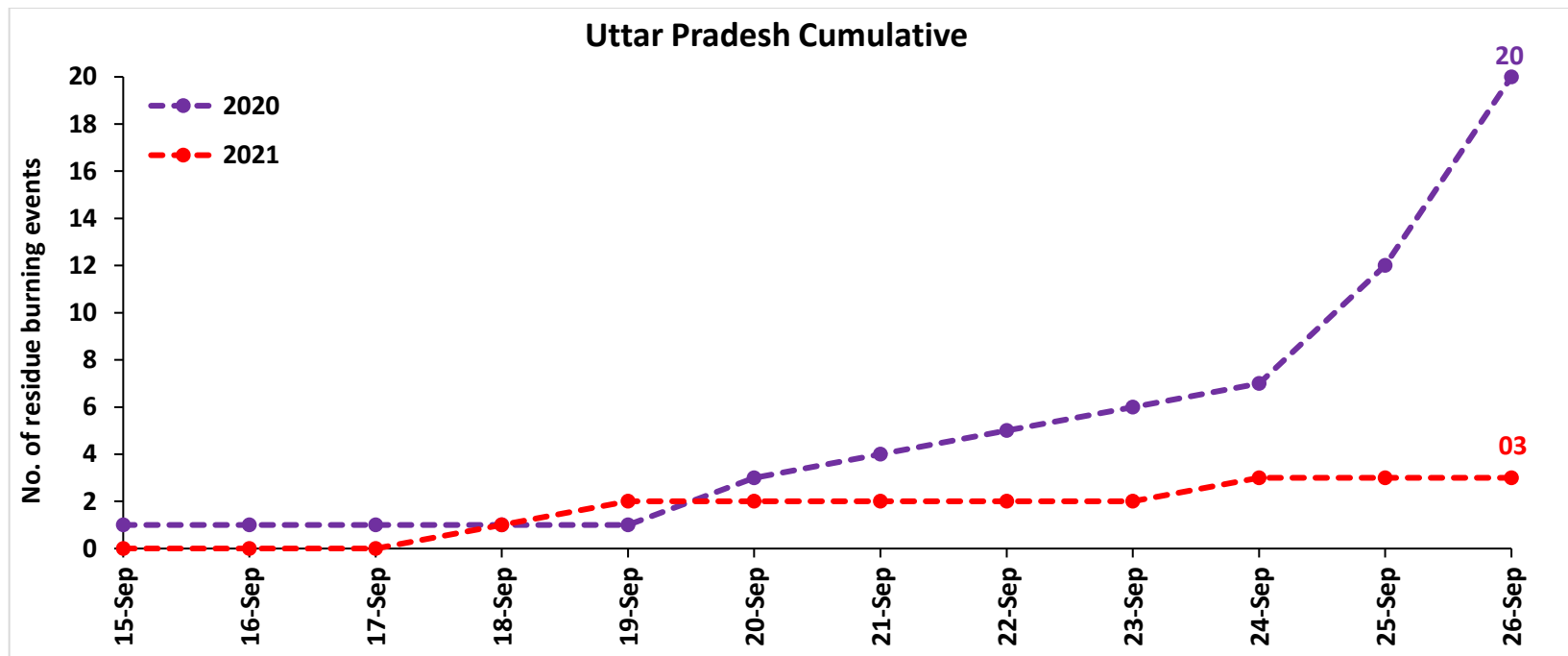
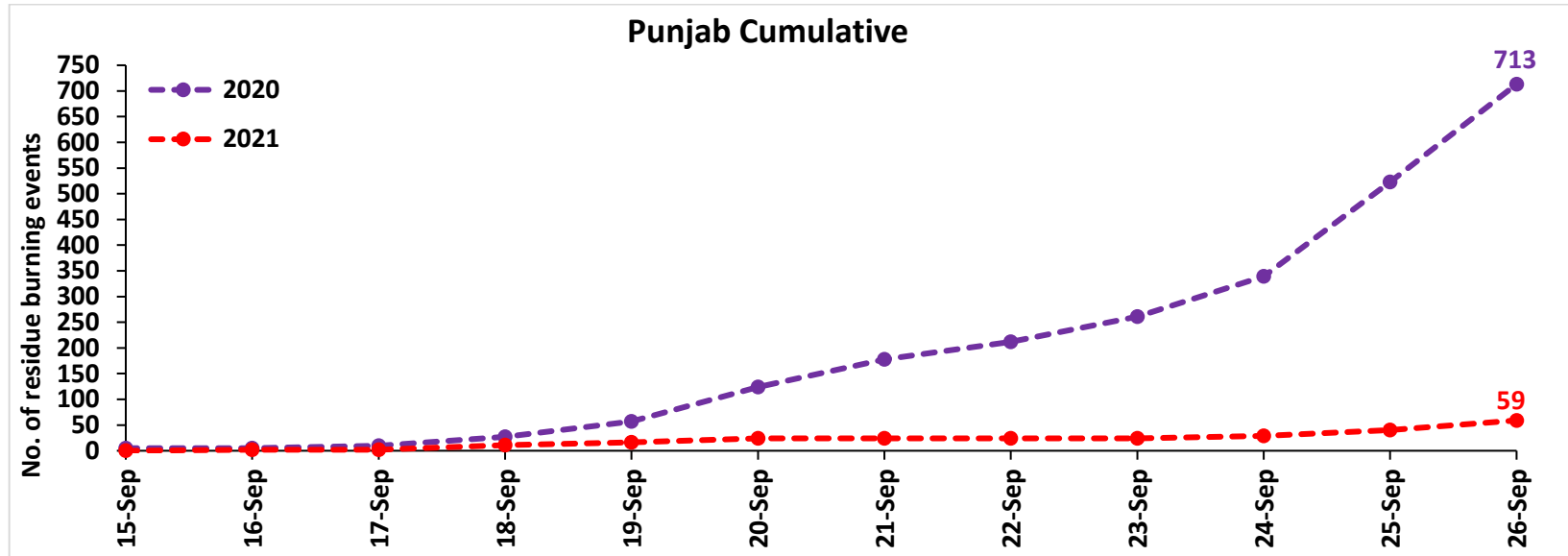
## Highlights for 26-September-2021

- 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 26-Sep-2021.
- The state wise events detected on 26-Sep-2021 were **19** in Punjab, **0** 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 Southern Haryana, Delhi, Eastern Rajasthan, Central Uttar Pradesh and Madhya Pradesh.

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

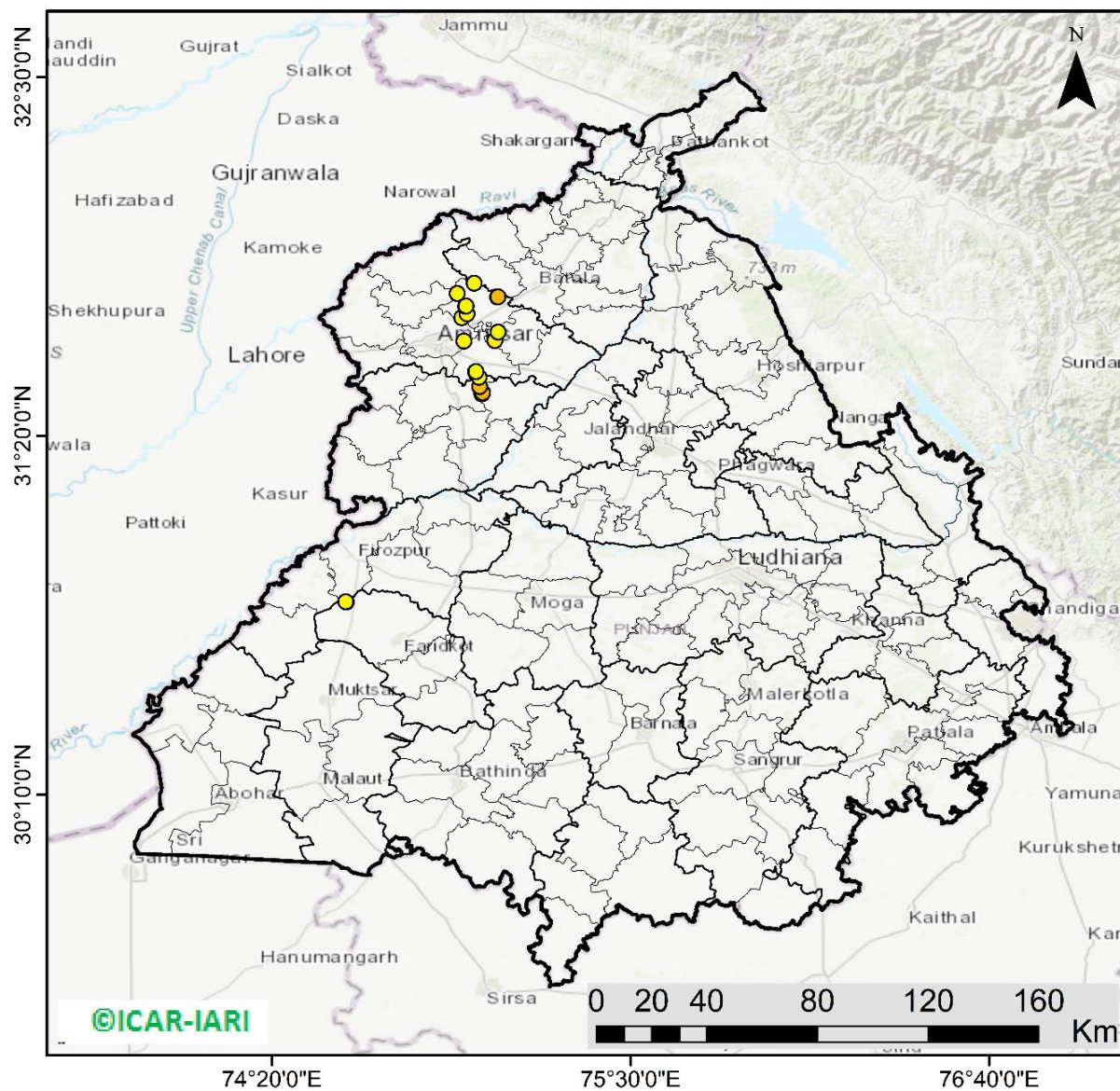


### Comparison of residue burning events in current year (2021) with previous year (2020) for the study States



# Punjab

## RICE RESIDUE BURNING IN PUNJAB



**19** burning events detected in Punjab on **26th September 2021**

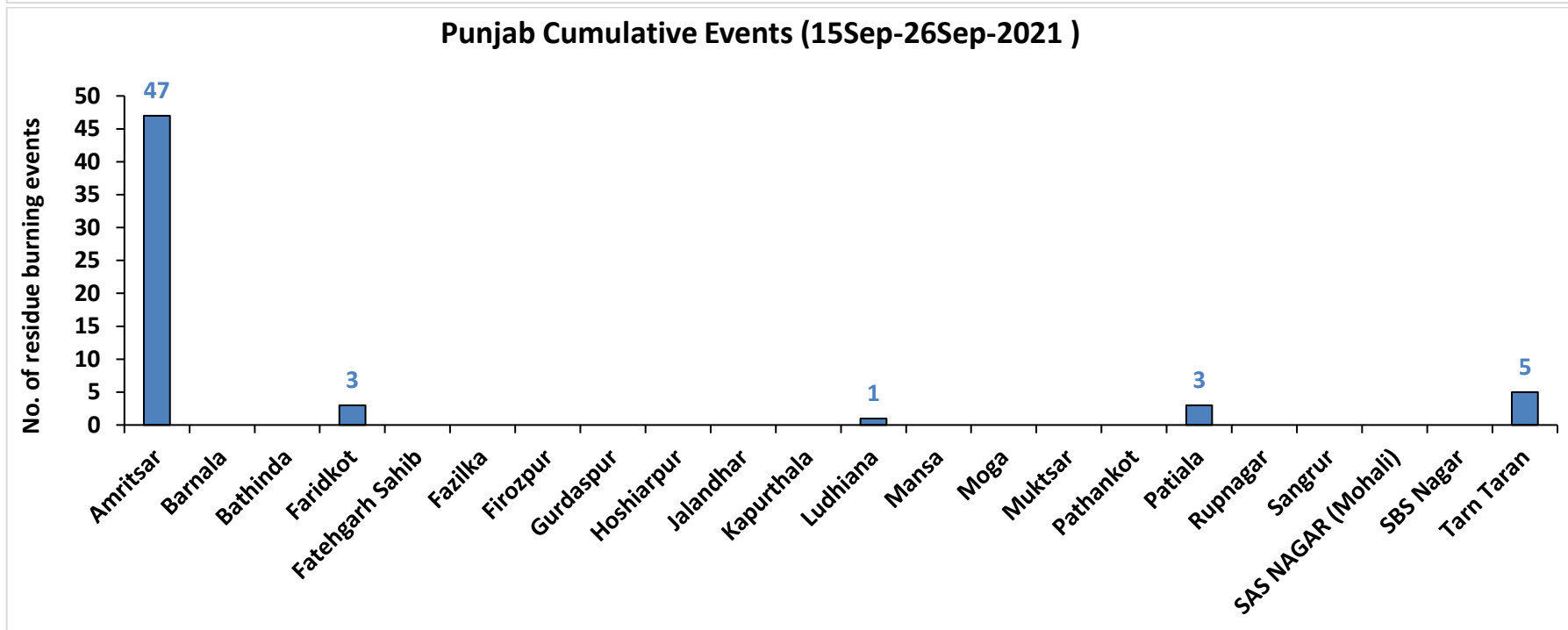
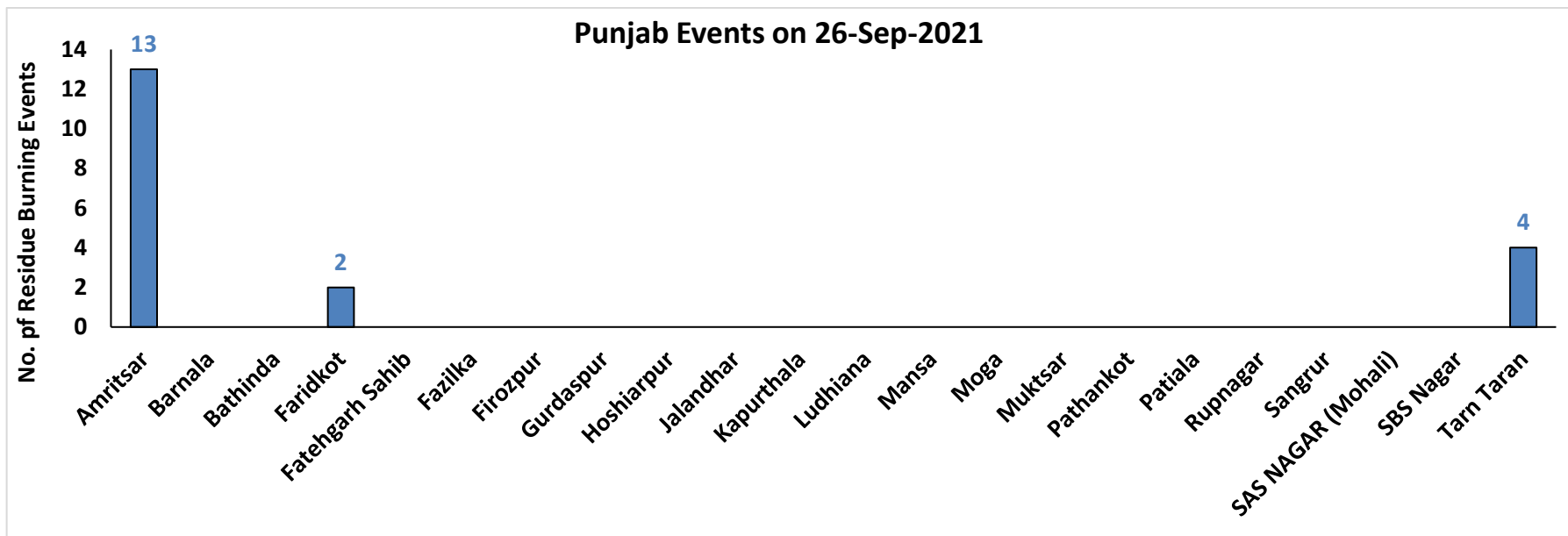
### Fire Intensity (W/m<sup>2</sup>)

- 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 (15-26 Sep-2021)





**District-wise and date wise cumulative number of residues burning events detected in 2020 and 2021**  
**(Period: 15-26 September)**

**(a) Punjab**

District	15 Sep - 26 Sep	
	2020	2021
AMRITSAR	560	47
BARNALA	1	0
BATHINDA	0	0
FARIDKOT	1	3
FATEHGARH SAHIB	0	0
FAZILKA	0	0
FIROZPUR	2	0
GURDASPUR	12	0
HOSHIARPUR	0	0
JALANDHAR	2	0
KAPURTHALA	7	0
LUDHIANA	6	1
MANSA	1	0
MOGA	4	0
MUKTSAR	1	0
PATHANKOT	0	0
PATIALA	13	3
RUPNAGAR	0	0
SANGRUR	2	0
SAS NAGAR (MOHALI)	3	0
SBS NAGAR	0	0
TARN TARAN	98	5
<b>TOTAL</b>	<b>713</b>	<b>59</b>

(b) Uttar Pradesh

District	15 Sep - 26 Sep							
	2020	2021	GAUTAMBUDHNAGAR	0	0	MUZAFARNAGAR	0	0
AGRA	0	0	GAZIPUR	0	0	PILHIBHIT	0	0
ALIGARH	1	0	GHAZIABAD	1	0	PRATAPGARH	0	0
ALLAHABAD	0	0	GONDA	0	0	RAIBEARELI	1	0
AMBEDKARNAGAR	0	0	GORAKHPUR	0	0	RAMPUR	0	1
AMETHI	0	0	HAMIRPUR	0	0	SAMBHAL	3	0
AMROHA	0	0	HAPUR	1	0	SANTKABIRNAGAR	0	0
AURAIYA	1	0	HARDOI	0	0	SANTRAVIDASNAGAR	0	0
AZAMGARH	0	0	HATHRAS	0	0	SHAHJAHANPUR	0	0
BADAUN	0	0	JALAUN	0	0	SHAMLI	6	0
BAGHPAT	1	0	JAUNPUR	0	0	SHARANPUR	1	0
BAHRAICH	0	0	JHANSI	2	0	SHRAWASTI	0	0
BALLIA	0	0	KANNAUJ	0	0	SIDDHARTHANAGAR	0	0
BALRAMPUR	0	0	KANPUR	0	1	SITAPUR	0	0
BANDA	0	0	KANPUR DEHAT	0	0	SONBHADRA	0	0
BARABANKI	0	0	KASGANJ	0	0	SULTANPUR	0	0
BAREILLY	0	0	KAUSHAMBI	0	0	UNNAO	0	0
BASTI	0	0	KHERI	0	0	VARANASI	0	0
BIJNOR	1	0	KUSHINAGAR	0	0	Total	20	3
BULANDSAHAR	0	0	LALITPUR	0	0			
CHANDAULI	0	0	LUCKNOW	0	0			
CHITRAKOOT	0	0	MAHARAJGANJ	0	0			
DEORIA	0	0	MAHOBA	0	0			
ETAH	0	0	MAINPURI	0	0			
ETAWAH	0	0	MATHURA	0	1			
FAIZABAD	0	0	MAU	0	0			
FARRUKHABAD	0	0	MEERUT	1	0			
FATEHPUR	0	0	MIRZAPUR	0	0			
FIROZABAD	0	0	MORADABAD	0	0			

**State-wise and date-wise number of paddy residue burning events detected in 2020 and 2021**  
**(Period: 15 - 26 September)**

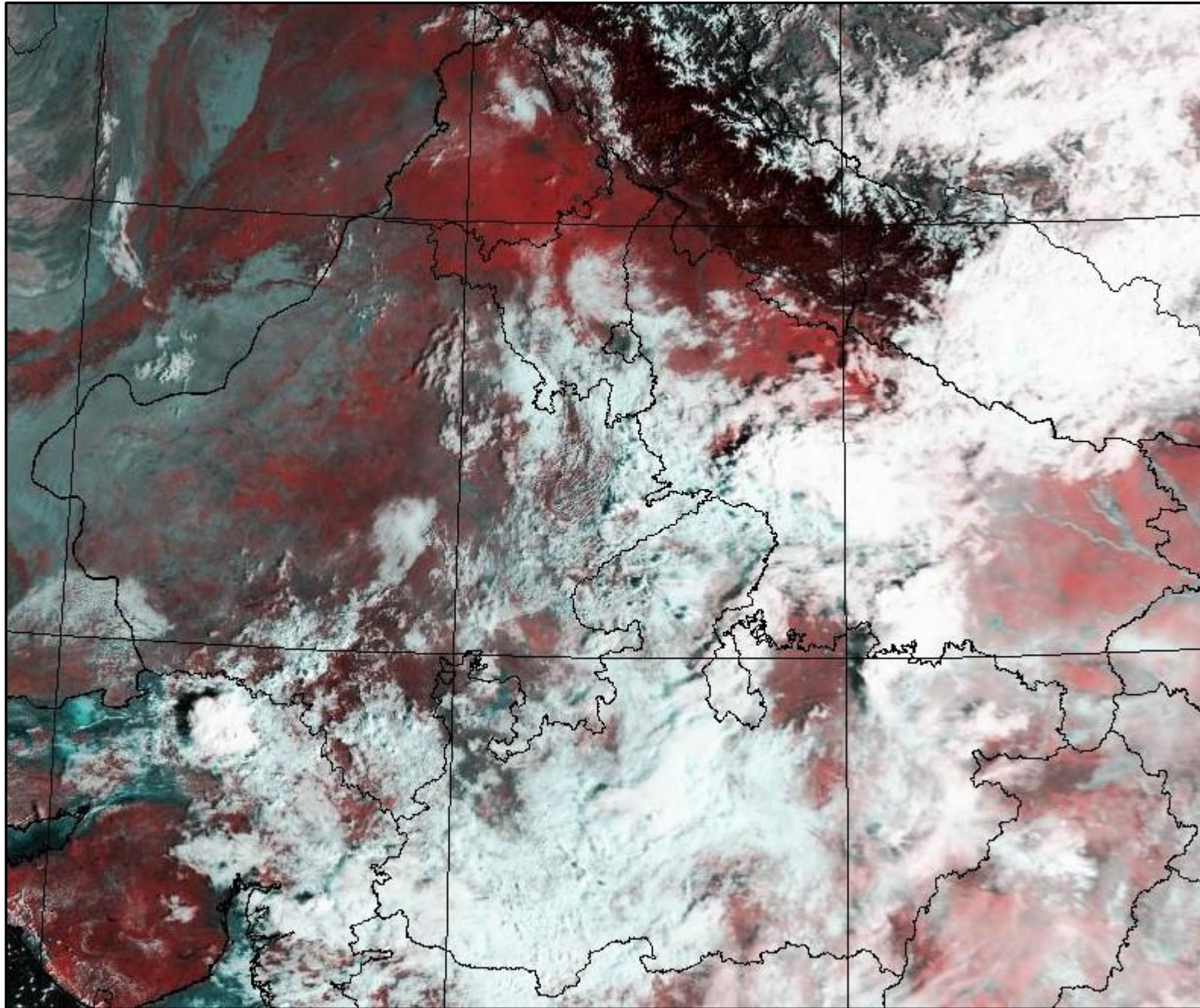
<b>Number of Paddy Residue Burning Events Detected</b>												
	<b>Punjab</b>		<b>Haryana</b>		<b>Uttar Pradesh</b>		<b>Delhi</b>		<b>Rajasthan</b>		<b>Madhya Pradesh</b>	
	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</b>	<b>2021</b>	<b>2020</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>Total</b>	<b>713</b>	<b>59</b>	<b>33</b>	<b>0</b>	<b>20</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>6</b>	<b>0</b>



### Details of residue burning events in Punjab on 26-Sep-2021

S. No.	District	Block	Satellite	Latitude	Longitude	ACQ_DATE	ACQ_TIME	Day / Night	Fire Power (W/m2)
1	AMRITSAR	JANDIALA GURU	S-NPP	30.79240	74.57480	9/26/2021	14:18:59	D	3.40
2	AMRITSAR	JANDIALA GURU	S-NPP	30.79320	74.57340	9/26/2021	14:18:59	D	3.60
3	AMRITSAR	MAJITHA	S-NPP	31.46920	75.01610	9/26/2021	14:18:59	D	5.70
4	AMRITSAR	MAJITHA	S-NPP	31.47340	75.01860	9/26/2021	14:18:59	D	6.40
5	AMRITSAR	MAJITHA	S-NPP	31.49310	75.00920	9/26/2021	14:18:59	D	6.00
6	AMRITSAR	MAJITHA	S-NPP	31.52330	75.00700	9/26/2021	14:18:59	D	3.50
7	AMRITSAR	MAJITHA	S-NPP	31.54080	74.99540	9/26/2021	14:18:59	D	4.80
8	AMRITSAR	MAJITHA	S-NPP	31.54210	74.99690	9/26/2021	14:18:59	D	3.80
9	AMRITSAR	MAJITHA	S-NPP	31.64100	74.95800	9/26/2021	12:39:25	D	3.90
10	AMRITSAR	TARSIKKA	S-NPP	31.64270	75.05840	9/26/2021	14:18:59	D	4.90
11	AMRITSAR	TARSIKKA	S-NPP	31.67030	75.06940	9/26/2021	12:39:25	D	3.30
12	AMRITSAR	VERKA	S-NPP	31.71690	74.95060	9/26/2021	14:18:59	D	3.30
13	AMRITSAR	VERKA	S-NPP	31.72960	74.96820	9/26/2021	12:39:25	D	4.70
14	FARIDKOT	FARIDKOT	S-NPP	31.75400	74.96380	9/26/2021	14:18:59	D	5.60
15	FARIDKOT	FARIDKOT	S-NPP	31.75500	74.96500	9/26/2021	14:18:59	D	4.80
16	TARN TARAN	TARN TARAN	S-NPP	31.78440	75.06740	9/26/2021	14:18:59	D	5.20
17	TARN TARAN	TARN TARAN	S-NPP	31.78470	75.06870	9/26/2021	14:18:59	D	5.80
18	TARN TARAN	TARN TARAN	S-NPP	31.79580	74.93590	9/26/2021	14:18:59	D	1.70
19	TARN TARAN	TARN TARAN	S-NPP	31.82920	74.99140	9/26/2021	14:18:59	D	3.10

METOP-2 (VHRR) Satellite image (FCC) of North and Central India Acquired on 26-Sep-2021 at 08:51:33 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**

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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)

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