



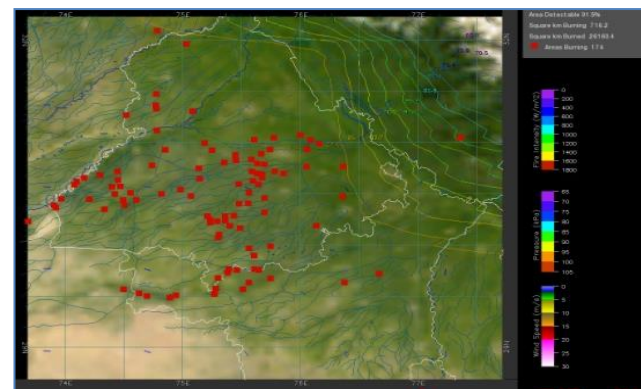
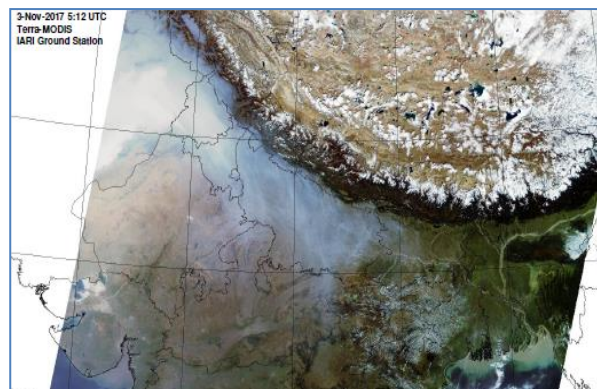
## Bulletin No. 13

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



Prepared by:

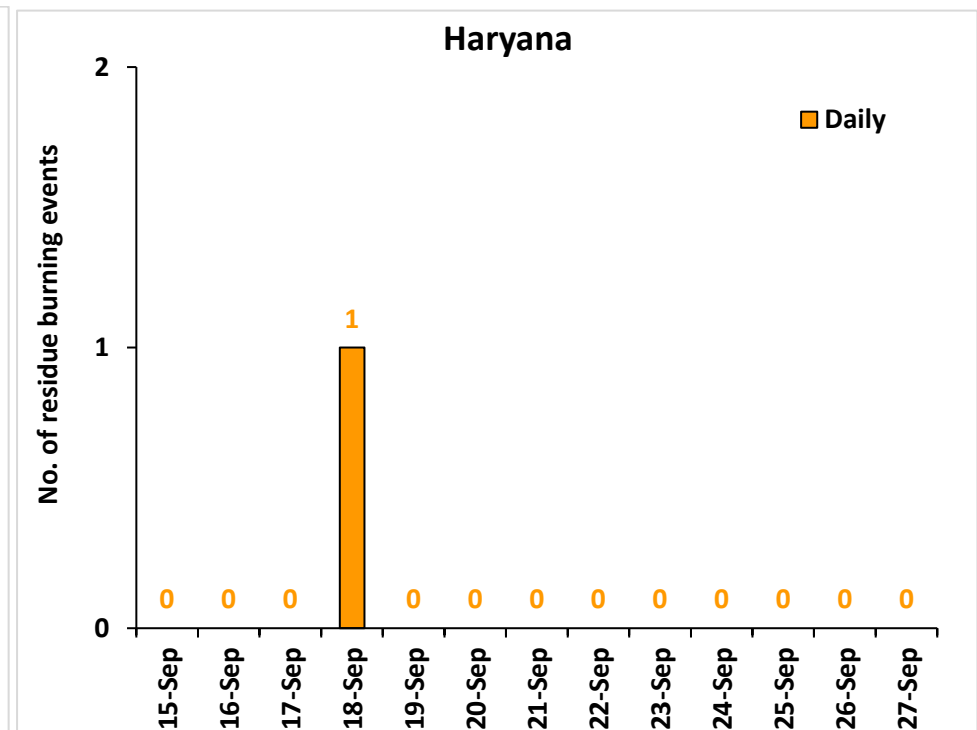
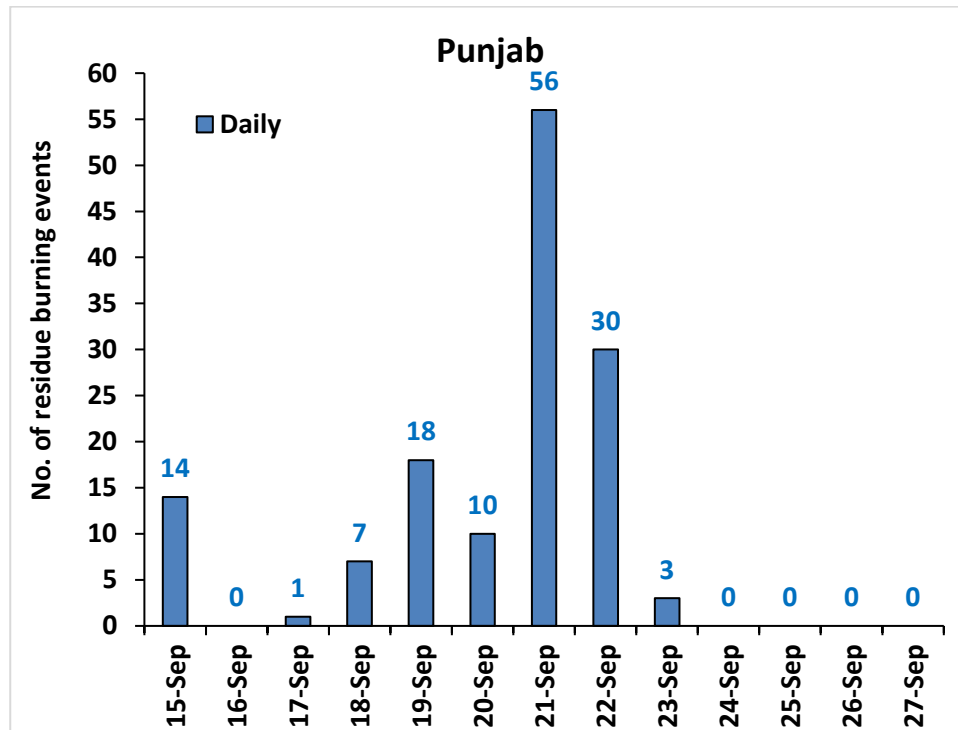
Consortium for Research on Agroecosystem Monitoring and Modeling from Space (CREAMS) Laboratory,  
Division of Agricultural Physics, ICAR – Indian Agricultural Research Institute, New Delhi – 110012

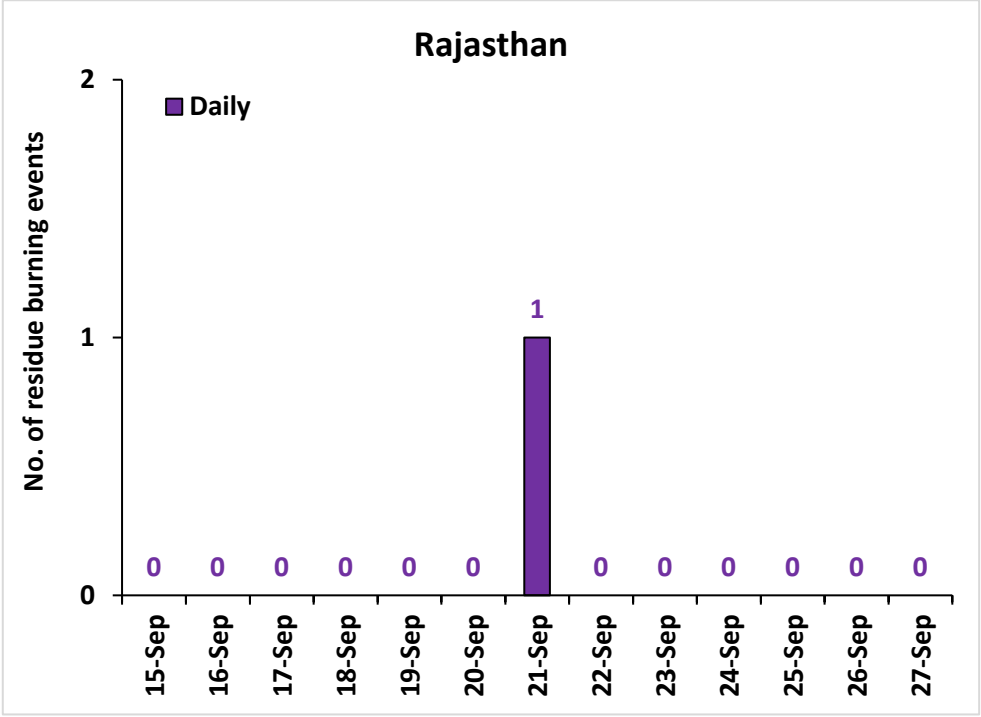
<http://creams.iari.res.in>

## Highlights for 27-Sep-2022

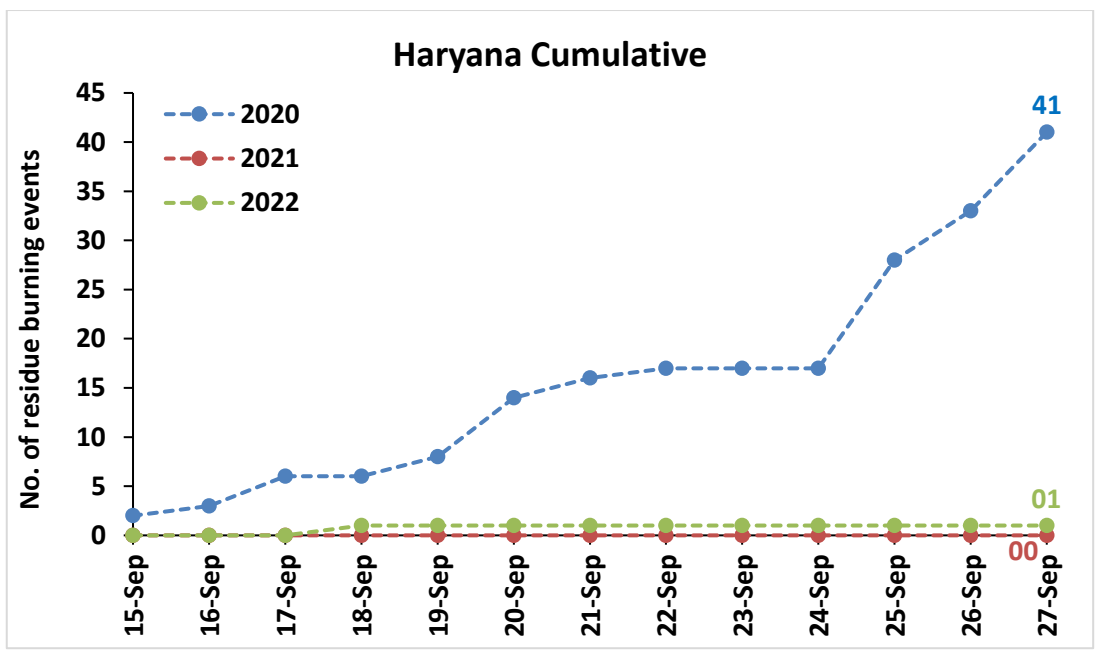
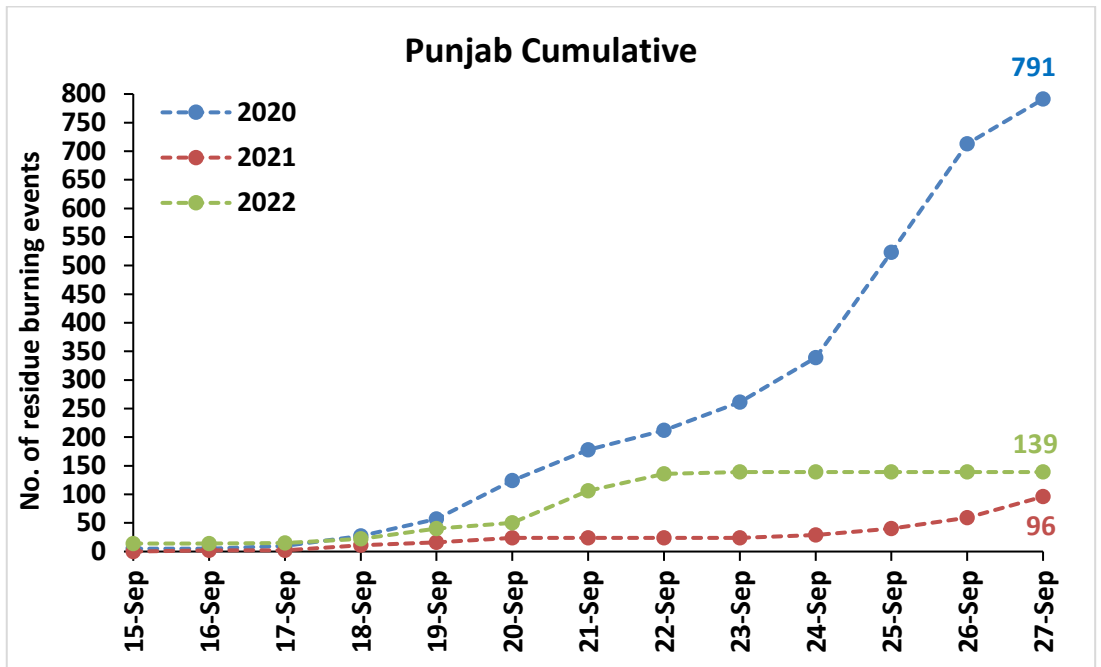
- The active fire events due to rice residue burning were monitored using satellite remote sensing, following the "Standard Protocol for Estimation of Crop Residue Burning Fire Events using Satellite Data".
- Satellites detected **00** residue burning events in the six study States on 27-Sep-2022.
- The state wise events detected on 27-Sep-2022 were **0** in Punjab, **0** in Haryana, **0** in UP, **0** in Delhi, **0** in Rajasthan and **0** in MP.
- Total **141** burning events were detected in the six states between 15-Sept-2022 and 27-Sep-2022, which are distributed as **139**, **1**, **0**, **0**, **1** and **0** in Punjab, Haryana, UP, Delhi, Rajasthan and MP, respectively.
- Detection of residue burning events was hampered by the presence of scattered clouds over all the six study states.

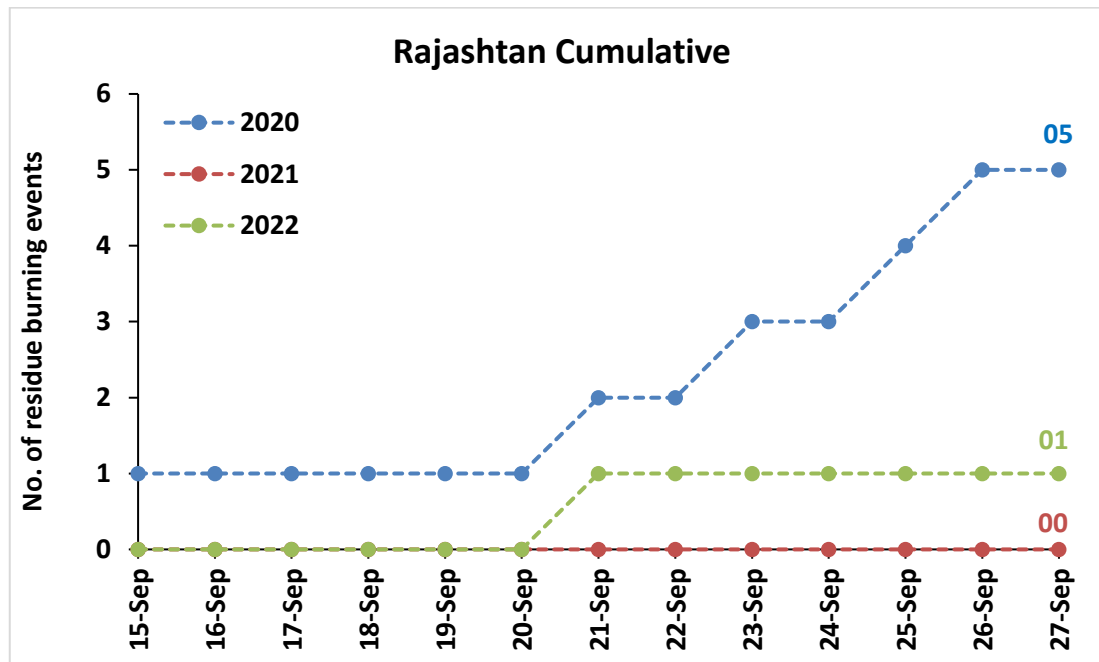
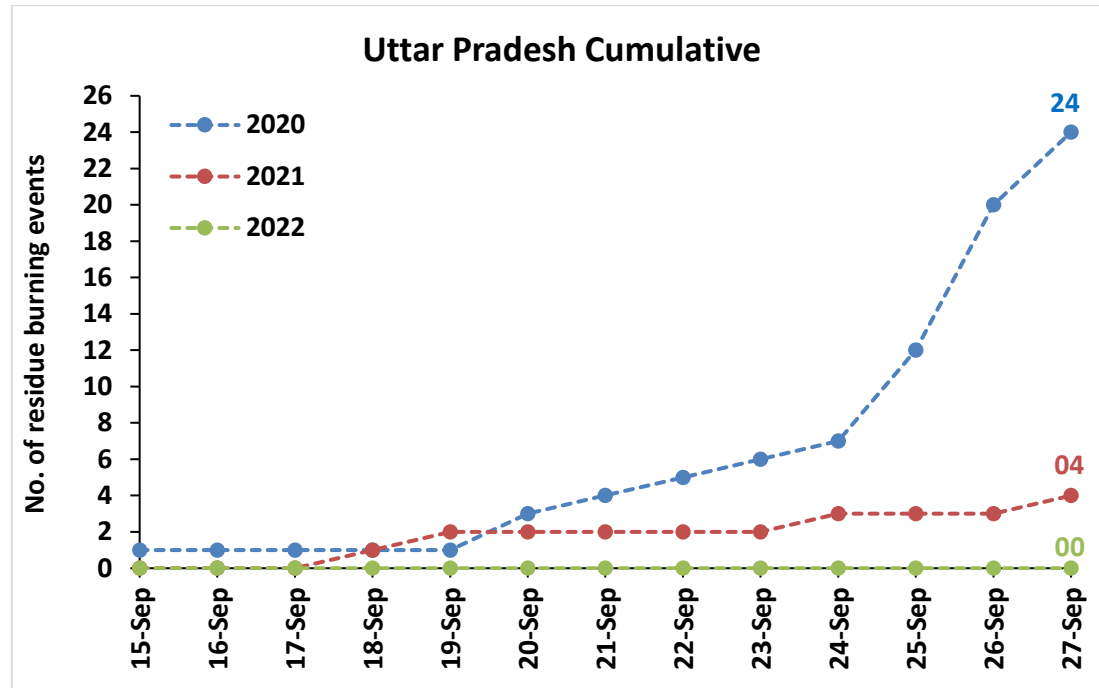
### Temporal distribution of rice residue burning events for the study States in 2022

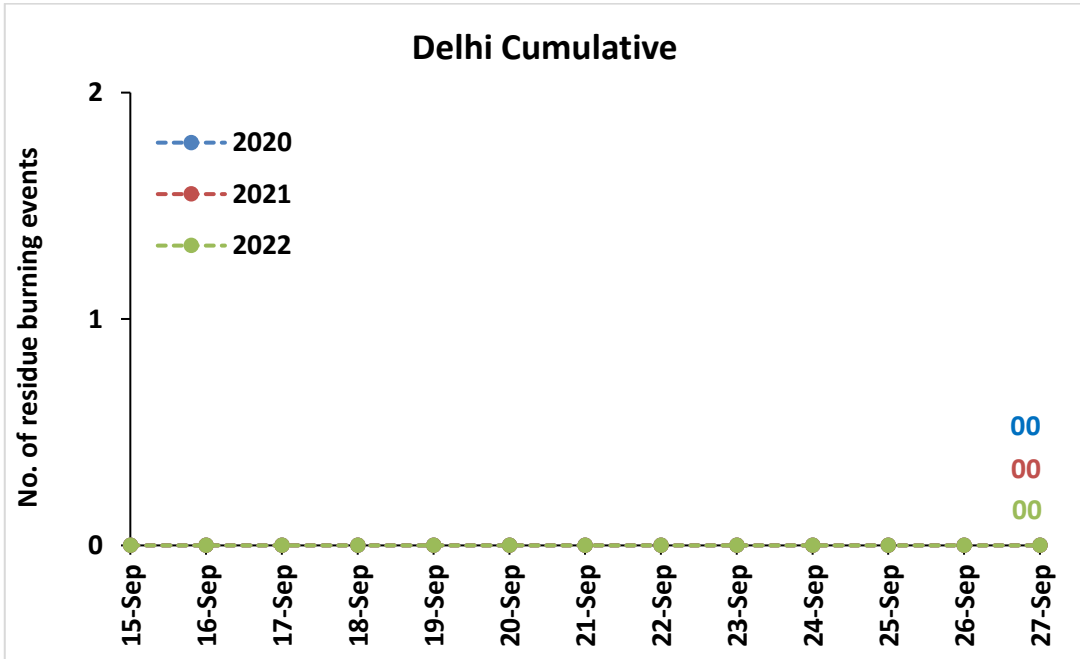
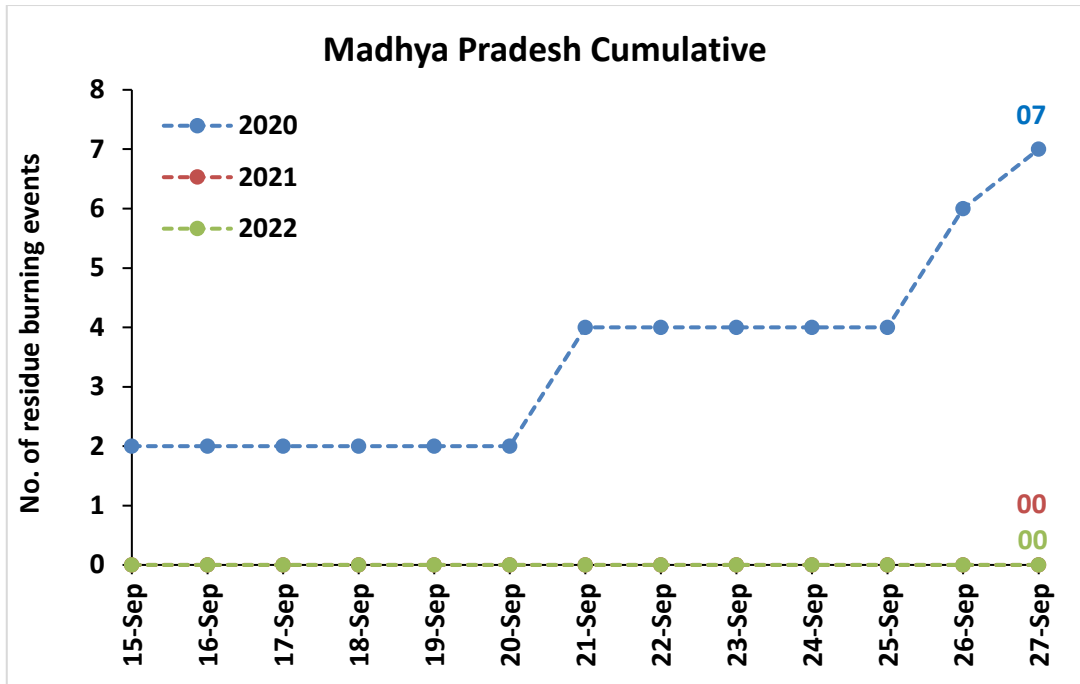




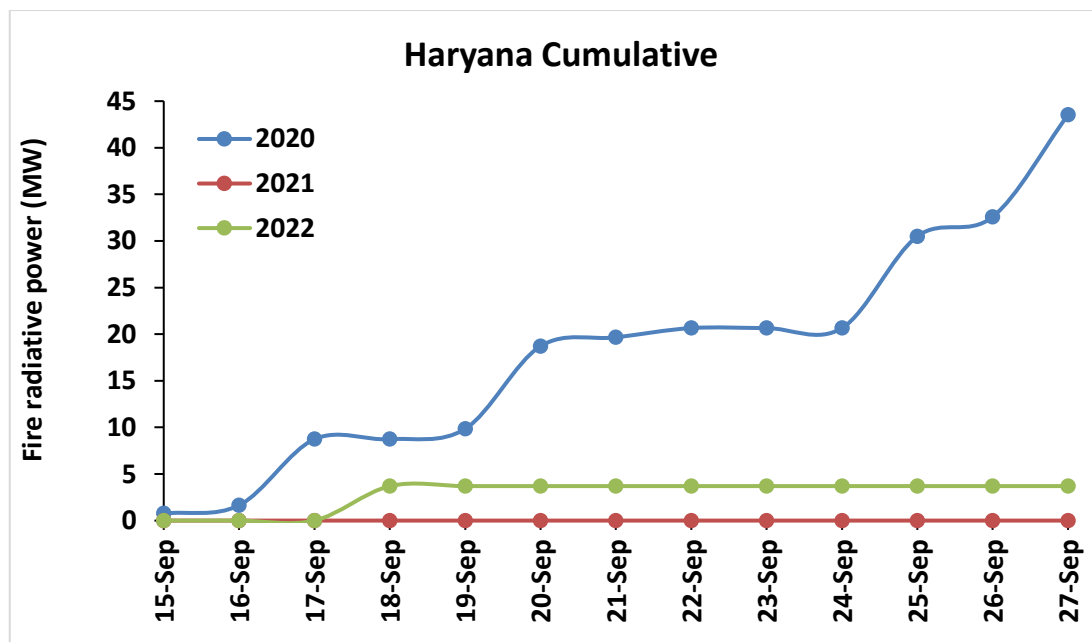
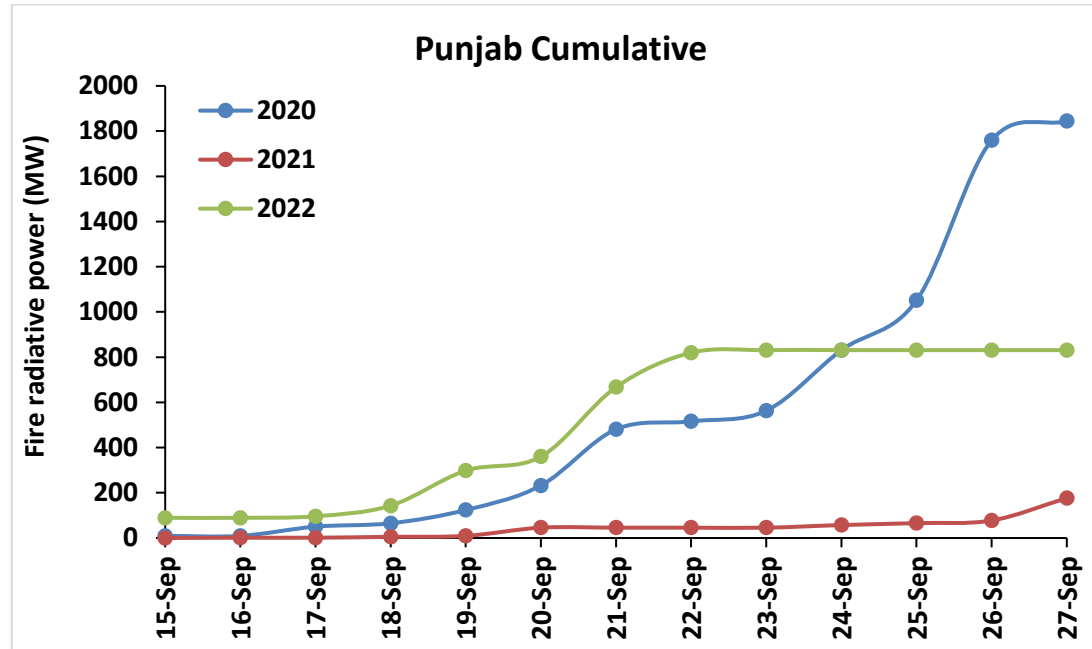
**Comparison of residue burning events in current year (2022) with previous year (2020 and 2021) for the study States**

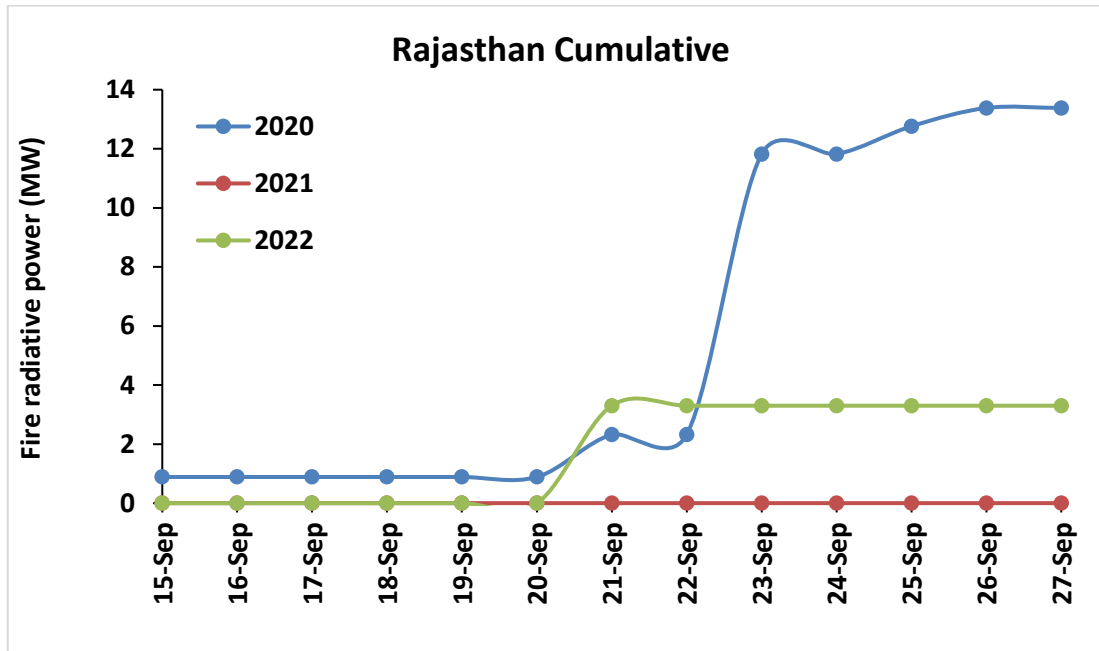
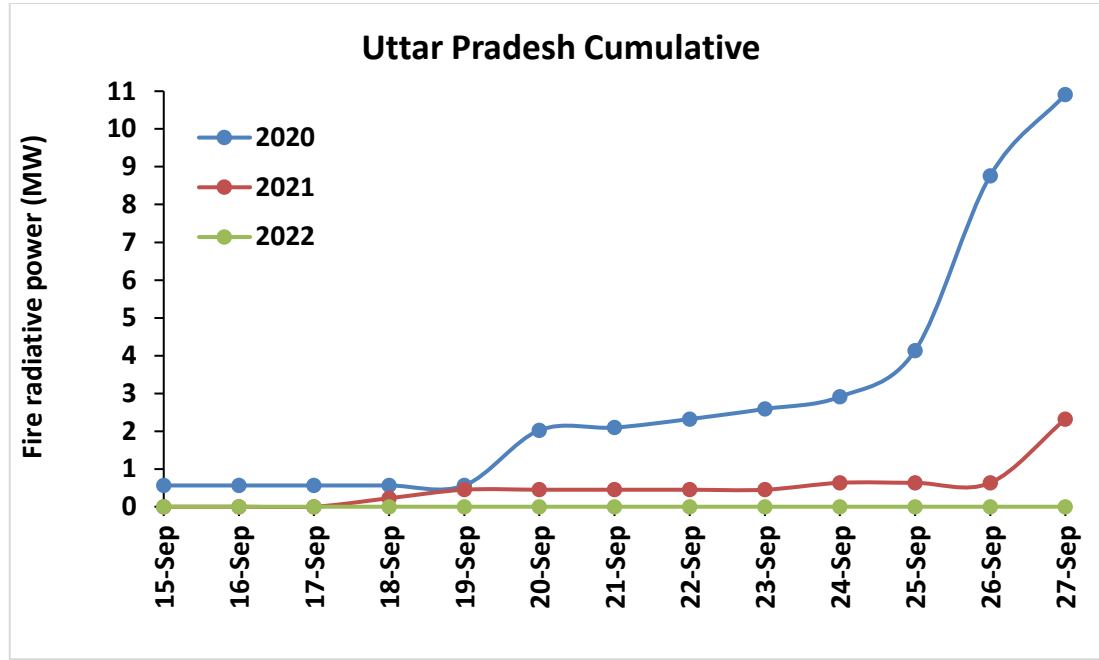




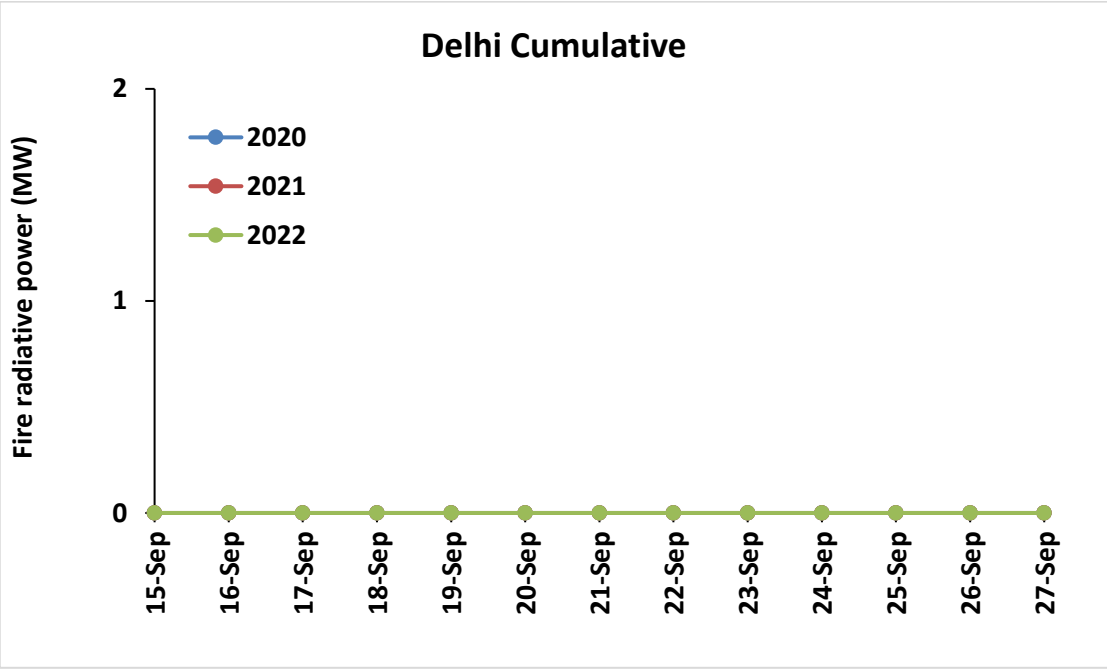
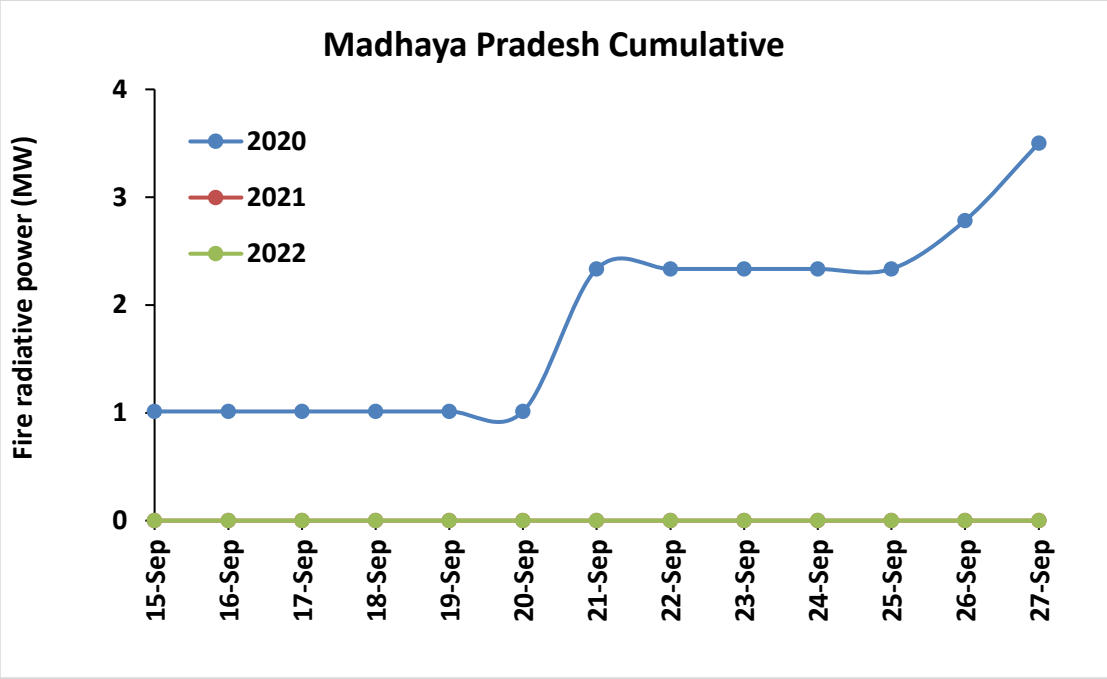


**Comparison of residue burning fire power in current year (2022) with previous year (2021 and 2020) for the study States**









**District-wise cumulative number of residues burning events detected in 2020 ,2021 and 2022**  
**(Period: 15 September-27 September)**

**(a) Punjab**

District	15 Sep-27 Sep 2022		
	2020	2021	2022
Amritsar	606	79	121
Barnala	1	0	0
Bathinda	0	0	0
Faridkot	1	3	0
Fatehgarh Sahib	0	0	0
Fazilka	0	0	0
Firozpur	2	0	0
Gurdaspur	19	0	1
Hoshiarpur	0	0	0
Jalandhar	2	0	0
Kapurthala	8	0	0
Ludhiana	12	1	0
Mansa	1	0	0
Moga	4	0	0
Muktsar	1	0	0
Pathankot	0	0	0
Patiala	16	3	1
Rupnagar	0	0	0
Sangrur	3	1	0
SAS NAGAR (Mohali)	5	0	1
SBS Nagar	0	0	1
Tarn Taran	110	9	14
<b>Total</b>	<b>791</b>	<b>96</b>	<b>139</b>

**(b) Haryana**

District	15 Sep-27 Sep 2022		
	2020	2021	2022
AMBALA	3	0	0
BHIWANI	0	0	0
CHARKHI DADRI	0	0	0
FARIDABAD	0	0	0
FATEHABAD	4	0	0
GURGAON	0	0	0
HISAR	0	0	0
JHAJJAR	0	0	0
JIND	0	0	1
KAITHAL	3	0	0
KARNAL	19	0	0
KURUKSHETRA	8	0	0
MAHENDRAGARH	0	0	0
MEWAT	0	0	0
PALWAL	0	0	0
PANCHKULA	0	0	0
PANIPAT	3	0	0
REWARI	0	0	0
ROHTAK	0	0	0
SIRSA	1	0	0
SONIPAT	0	0	0
YAMUNANAGAR	0	0	0
<b>Total</b>	<b>41</b>	<b>0</b>	<b>1</b>

(c) Uttar Pradesh

District	15 Sep-27 Sep 2022										
	2020	2021	2022	GAUTAMBUDHNAGAR	0	0	0	MUZAFARNAGAR	0	0	0
AGRA	0	0	0	GAZIPUR	0	0	0	PILHIBHIT	1	0	0
ALIGARH	1	0	0	GHAZIABAD	1	0	0	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	0	1	0
AMETHI	0	0	0	HAMIRPUR	0	0	0	SAMBHAL	3	0	0
AMROHA	0	0	0	HAPUR	1	0	0	SANTKABIRNAGAR	0	0	0
AURAIYA	1	0	0	HARDOI	0	0	0	SANTRAVIDASNAGAR	0	0	0
AZAMGARH	0	0	0	HATHRAS	0	0	0	SHAHJAHANPUR	2	1	0
BADAUN	0	0	0	JALAUN	0	0	0	SHAMLI	6	0	0
BAGHPAT	1	0	0	JAUNPUR	0	0	0	SHARANPUR	1	0	0
BAHRAICH	0	0	0	JHANSI	2	0	0	SHRAWASTI	0	0	0
BALLIA	0	0	0	KANNAUJ	0	0	0	SIDDHARTHANAGAR	0	0	0
BALRAMPUR	0	0	0	KANPUR	0	1	0	SITAPUR	0	0	0
BANDA	0	0	0	KANPUR DEHAT	0	0	0	SONBHADRA	0	0	0
BARABANKI	0	0	0	KASGANJ	0	0	0	SULTANPUR	0	0	0
BAREILLY	0	0	0	KAUSHAMBI	0	0	0	UNNAO	0	0	0
BASTI	0	0	0	KHERI	0	0	0	VARANASI	0	0	0
BIJNOR	1	0	0	KUSHINAGAR	0	0	0	<b>Total</b>	<b>24</b>	<b>4</b>	<b>0</b>
BULANDSAHAR	0	0	0	LALITPUR	0	0	0				
CHANDAULI	0	0	0	LUCKNOW	0	0	0				
CHITRAKOOT	0	0	0	MAHARAJGANJ	0	0	0				
DEORIA	0	0	0	MAHOBA	0	0	0				
ETAH	0	0	0	MAINPURI	0	0	0				
ETAWAH	0	0	0	MATHURA	0	1	0				
FAIZABAD	0	0	0	MAU	0	0	0				
FARRUKHABAD	0	0	0	MEERUT	2	0	0				
FATEHPUR	0	0	0	MIRZAPUR	0	0	0				
FIROZABAD	0	0	0	MORADABAD	0	0	0				

**(d) Delhi**

District	15 Sep-27 Sep 2022		
	2020	2021	2022
CENTRAL	0	0	0
EAST	0	0	0
NEW DELHI	0	0	0
NORTH	0	0	0
NORTH EAST	0	0	0
NORTH WEST DELHI	0	0	0
SHAHADRA	0	0	0
SOUTH	0	0	0
SOUTH EAST	0	0	0
SOUTH WEST DELHI	0	0	0
WEST DELHI	0	0	0
<b>Total</b>	<b>0</b>	<b>0</b>	<b>0</b>

**(e) Rajasthan**

District	15 Sep-27 Sep 2022		
	2020	2021	2022
AJMER	0	0	0
ALWAR	0	0	0
BANSWARA	0	0	0
BARAN	0	0	0
BARMER	1	0	0
BHARATPUR	0	0	0
BHILWARA	1	0	0
BIKANER	0	0	0
BUNDI	0	0	1
CHITTAURGARH	0	0	0
CHURU	0	0	0
DAUSA	0	0	0
DHOLPUR	0	0	0
DUNGARPUR	0	0	0
GANGANAGAR	1	0	0
HANUMANGARH	0	0	0
JAIPUR	0	0	0
JAISELMER	1	0	0
JALOR	0	0	0
JHALAWAR	0	0	0
JHUNJHUNUN	0	0	0
JODHPUR	1	0	0
KARALI	0	0	0
KOTA	0	0	0
NAGPUR	0	0	0
PALI	0	0	0
PRATAPGARH	0	0	0
RAJSMAND	0	0	0
SIKAR	0	0	0
SIROHI	0	0	0
SWAIMADHOPUR	0	0	0
TONK	0	0	0
UDAIPUR	0	0	0
<b>Total</b>	<b>5</b>	<b>0</b>	<b>1</b>

(f) Madhya Pradesh

District	15 Sep-27 Sep 2022						
	2020	2021	2022	PANNA	0	0	0
ALIRAJPUR	0	0	0	RAISEN	0	0	0
ANUPPUR	0	0	0	RAJGARH	0	0	0
ASHOKNAGAR	0	0	0	RATLAM	0	0	0
BALAGHAT	0	0	0	REWA	0	0	0
BARWANI	0	0	0	SAGAR	2	0	0
BETUL	0	0	0	SATNA	0	0	0
BHIND	0	0	0	SEHORE	0	0	0
BHOPAL	0	0	0	SEONI	0	0	0
BURHANPUR	0	0	0	SHAHDOL	0	0	0
CHHATARPUR	0	0	0	SHAJAPUR	0	0	0
CHHINDWARA	0	0	0	SHEOPUR	0	0	0
DAMOH	0	0	0	SHIVPURI	0	0	0
DATIA	0	0	0	SIDHI	0	0	0
DEWAS	0	0	0	SINGRAULI	0	0	0
DHAR	0	0	0	TIKAMGARH	0	0	0
DINDORI	0	0	0	UJJAIN	0	0	0
EAST NIMAR	0	0	0	UMARIA	0	0	0
GUNA	1	0	0	VIDESHA	0	0	0
GWALIOR	2	0	0	WEST NIMAR	0	0	0
HARDA	2	0	0	<b>Total</b>	<b>7</b>	<b>0</b>	<b>0</b>
HOSHANGABAD	0	0	0				
INDORE	0	0	0				
JABALPUR	0	0	0				
JHABUA	0	0	0				
KATNI	0	0	0				
MANDLA	0	0	0				
MANDSAUR	0	0	0				
MORENA	0	0	0				
NARSHIMAPURA	0	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- 27 September 2022)**

<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>2022</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
<b>15-Sep</b>	5	0	14	2	0	0	1	0	0	0	0	0	1	0	0	2	0	0
<b>16-Sep</b>	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>17-Sep</b>	5	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>18-Sep</b>	17	9	7	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
<b>19-Sep</b>	30	5	18	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0
<b>20-Sep</b>	67	8	10	6	0	0	2	0	0	0	0	0	0	0	0	0	0	0
<b>21-Sep</b>	54	0	56	2	0	0	1	0	0	0	0	0	1	0	1	2	0	0
<b>22-Sep</b>	34	0	30	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0
<b>23-Sep</b>	49	0	3	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0
<b>24-Sep</b>	78	5	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0
<b>25-Sep</b>	184	11	0	11	0	0	5	0	0	0	0	0	1	0	0	0	0	0
<b>26-Sep</b>	190	19	0	5	0	0	8	0	0	0	0	0	1	0	0	2	0	0
<b>27-Sep</b>	78	37	0	8	0	0	4	1	0	0	0	0	0	0	0	1	0	0
<b>Total</b>	<b>791</b>	<b>96</b>	<b>139</b>	<b>41</b>	<b>0</b>	<b>1</b>	<b>24</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>7</b>	<b>0</b>	<b>0</b>

## 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, Haryana, Uttar Pradesh and Madhya Pradesh were provided by MNCFC, MoA&FW, GoI  
The kharif crop mask for Delhi and Rajasthan 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>)

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