

A Review of Trends and Crime Patterns of Arson Offences in India: 2009-2018

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Abstract

Crime statistics provide innate knowledge on different types of crimes, their jurisdictions, current status and future predictive trends in society. This research paper is based on the review of data available in the national open access publication of crime data in the country. It focuses on arson offences in India for the last decade from 2009 to 2018. It is important to study national crime statistics to enhance policing and criminological studies in different trends encountered through research. Explaining the trends of a crime in a country can help in establishing better policies, reporting systems, investigative methods and ultimately, a better criminal justice system. While Criminology studies have been generally focused on behavior, causes, etc. associated with violent crimes like offences against the body, violence against women, offences against children; this paper is aimed at discussing trends with respect to arson, a lesser known offence in our country.

Introduction

Criminology and Forensic science are important parts of the legal framework. They are needed to understand criminal behaviour, crime and provide scientific evidence for investigations. While fire and arson crime and research are prevalent globally, not much research exists on this area in the Indian context [17]. The Indian Penal Code (IPC) provides the legal framework for crimes and punishment detailed in various chapters according to classification of offences in India. Arson offences were originally classed under violent crimes, however, this was amended to offences against property and public safety later. Currently, it is also classed under “miscellaneous IPC crimes” corresponding to the timely changes in social dynamics of the country [1,3,13].

Crime studies are an important part of policy making. It is important to study trends and patterns from crime statistics for predictive policing and analysing and addressing future concerns proactively [2,16]. It can be used by various people like law enforcement officials, researchers, criminal justice professionals and politicians to gain insights into crime status in the community and safety aspects of the public [14]. When required, it can lead to amendments of existing laws for better safety and security reasons.

Cognizable crimes in India are registered under two procedures: Indian Penal Code (IPC) and Special & Local Laws (SLL) in the country. In India, arson is registered as a cognizable offence under Sections 435, 436 & 438 of the Indian Penal Code (IPC). While in the USA, the Uniform Crime Reporting (UCR) system is used by the FBI for collection of crime statistical data; in a similar manner, the National Crime Records Bureau uses a nationalised software entry system for collation of crime data from states and union territories in India [4,15]. *Crime in India* is a timely publication from the NCRB to provide information to the general public, researchers, professionals and policy makers, a comprehensive approach to public safety in relation to crimes in society [1,17]. It provides key statistics in terms of offences against women and

children, offences against the body, crimes against Scheduled Castes and Scheduled Tribes, etc. This data helps in establishing a crime chart for the country and its implications on the future trends [4-13].

Purpose/Aim of this study: This research paper is a review study of trends in arson crimes in India. The review has been conducted to assess crime statistics over the years in regards to Arson prevalence in the country. It provides information at a glance with respect to trends in arson crimes in India between 2009 and 2018; thus providing awareness to the readers. The paper focuses on the scope for further research on this topic for determination of future likelihood patterns of arson crimes in the state and the need to study the causes and motives for arson crimes in the Indian context, thereby developing a profile of offences and offenders across the country.

Materials And Methods

Sampling and Sampling technique: The study has collected data through Purposive Sampling technique for data collection using Non-Probability Sampling. The sampling was carried out for data available in a particular time frame i.e. Ten year duration from 2009 to 2018. There is no primary data in this paper as all data was collected from existing literature review.

Data collection: Secondary data was collected from the annual published crime reports of the National Crime Records Bureau (NCRB), New Delhi, India. The facts and numerical data regarding arson offences solely, were gathered from online and offline publications of the book titled "Crime in India" for the years from 2009 to 2018 [4-13]. Each book is published annually covering different data of crimes in India, after processing the data collected by the individual State Crime Record Bureau (SCRB). Each report is based on primary data collected for a calendar year i.e. 1st January to 31st December. The data is received in prescribed format as given by NCRB through software entry by the 36 States/Union Territories.

First level data entry is done by concerned police officials in stations at the city or district level. Second level data validation and compilation in prescribed format is done by the State Crime Record Bureau or Criminal Investigation Department (CID). This data undergoes scrutiny for inconsistencies and discrepancies by the National Crime Records Bureau, which ultimately publishes a report on the trends of crime statistics in the country.

Legal disclaimer: This work is solely the original interpretation of the authors based on recorded data from the National Crime Records Bureau. It does not reflect any opinions or theories of the NCRB or SCRБ, or its personnel in any manner.

Observations And Analysis

Arson crime incidents are reported annually and registered under cognizable offences under the Indian Penal Code, 1860. Crime incidence is the number of First information Reports (FIR's) registered. Through the years from 1995 to 2008, arson crimes have shown a mixed trend which decreases towards the late 2000's as shown in **Figure 1**. The highest arson crimes were recorded in the year 1998 with 12913 offences being registered across the country. While the trend is exponentially directed, it can be seen that lowest arson offences were recorded in the year 2005 with 8451 offences.

In the next illustration seen as **Figure 2**, it can again be seen that there is a mixed trend in arson offences registered from 2009 to 2018 with sharp increases in the years 2012 and 2016 with 11836 and 11196 cases registered, respectively. Apart from these two years, the number of offences registered annually ranges between 8500 to 9800 cases, with the lowest number of cases being recorded in 2010 with 8508 incidents.

The break-up of arson offences registered yearly by the 29 states and 7 union territories of India has been compiled as seen in **Table 1**. The number of arson crimes are as per data recorded by NCRB based on data provided by the respective States/Union Territories. From the data, it can be observed that on an average, Maharashtra records the largest number of offences of arson as violent crimes under IPC. These figures can be due to large forest cover in the area and industrial economy of the state. Amongst the Union Territories, it can be observed that Delhi shows an increase in arson incidents every year and has the highest numbers amongst the others. An overall decreasing trend in arson crimes has been observed in the states of Andhra Pradesh, Bihar, Jharkhand, Manipur, Punjab and Rajasthan. An overall mixed pattern over the years has been observed in states of Arunachal Pradesh, Assam, Chattisgarh, Goa, Gujarat, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Meghalaya, Mizoram, Nagaland, Telangana, Tamil Nadu and Uttarakhand. Overall increasing trend is noticed amongst Haryana, Maharashtra, Odisha, Sikkim, Tripura, Uttar Pradesh and West Bengal.

Table 1: Number of arson incidents reported as violent crimes state-wise and year-wise in India from 2009 to 2018.

Number of incidence of Arson Crimes (Sec. 435, 436 & 438 IPC)										
STATE/UT	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Andhra Pradesh	1039	925	1021	980	932	450	516	519	426	468
Arunachal Pradesh	28	28	34	33	23	39	32	31	35	26
Assam	476	437	506	2830	793	743	826	664	571	615
Bihar	685	660	705	799	660	517	448	472	375	399
Chattisgarh	335	319	289	330	328	297	382	341	336	348
Goa	24	23	24	34	39	41	22	17	34	19
Gujarat	240	260	263	282	304	217	273	242	200	278
Haryana	153	221	166	191	189	203	234	1070	388	275
Himachal Pradesh	124	127	110	131	138	97	84	94	99	104
Jammu and Kashmir	217	224	205	190	221	159	148	268	183	192
Jharkhand	203	185	138	136	185	94	100	143	92	167
Karnataka	293	286	231	416	332	484	464	471	409	338
Kerala	503	374	450	568	479	453	562	554	405	341
Madhya Pradesh	741	748	784	814	671	865	834	800	833	721
Maharashtra	1105	1229	1255	1246	1197	1180	1299	1338	1184	1312
Manipur	81	86	99	74	38	43	75	59	40	27
Meghalaya	54	52	34	61	127	38	34	29	71	59
Mizoram	24	15	19	12	27	22	17	27	18	14
Nagaland	4	1	2	7	9	7	7	3	6	5
Odisha	413	430	423	469	416	477	505	524	604	555
Punjab	101	101	83	74	65	63	80	78	86	80
Rajasthan	556	478	473	475	484	523	472	370	477	438
Sikkim	9	7	4	20	19	40	4	17	8	13
Tamil Nadu	580	636	706	726	645	675	677	513	402	434
Telangana*	NA	NA	NA	NA	NA	482	436	451	430	512
Tripura	62	51	58	59	83	59	25	34	32	119
Uttar Pradesh	254	170	477	327	291	250	396	1325	604	726
Uttarakhand	17	17	17	17	17	8	9	9	16	10
West Bengal	344	331	413	396	495	544	503	523	640	511
Total (States)	8665	8421	8989	11697	9207	9070	9464	10986	9004	9106
Andaman and Nicobar Islands	12	12	6	4	2	5	4	9	4	4
Chandigarh	4	9	4	9	8	13	7	8	13	14
Dadra and Nagar Haveli	5	2	5	12	18	5	2	2	2	1
Daman and Diu	3	0	0	11	8	0	4	2	6	1
Delhi	34	52	42	79	97	190	224	183	148	126
Lakshadweep	2	2	3	3	1	5	5	5	5	0
Puducherry	11	10	10	21	16	1	0	1	4	0
Total (UT's)	71	87	70	139	150	219	246	210	182	146
Total number of incidents (States+UT's)	8736	8508	9059	11836	9357	9289	9710	11196	9186	9252

*Note:Telangana was incorporated into a State and formed the 29th state in India on 2nd June 2014. Hence, data collection before 2014 reflects Telangana as part of the State of Andhra Pradesh.

The number of arson crimes booked under sections 435-438 IPC shows a mixed trend for the years from 2009 to 2018. The number of arson offences to the total number of IPC crimes in the country has been shown in **Table 2**. From this, it can be observed that arson offences make up 0.3 to 0.4 percent of total IPC crimes yearly. The rate of arson crime has been recorded in the range of 0.7 to 0.9 annually (NCRB). Crime rate is calculated as the Crime Incidence per one lakh population. The population estimation is obtained from the Registrar General of India done annually and based on the 2001 population census.

Table 2: Total number of arson incidents recorded under Sections of IPC and the total number of IPC cases received annually from 2009 to 2018.

Arson cases registered to the Total IPC crimes in a year		
Year	Number of cases booked under Sections for arson (Sec.435-438 IPC)	Total number of crimes registered under IPC
2009	8736	230500
2010	8508	241986
2011	9064	256329
2012	11836	275165
2013	9357	300357
2014	9289	330754
2015	9710	335901
2016	11196	429299
2017	9186	426825
2018	9252	428134

Crimes against public safety record both riots and arson offences across the country. The trend seen in the case of “crimes against public safety” is a steady increase from 2009 to 2015 with the exception of 2012, wherein an unusual high was recorded as seen in **Figure 3**. The data for crimes against public safety was reorganized after the 2015 publication to include other elements and arson offences were further grouped into miscellaneous IPC offences and offences against public/government property reported by other institutions like Government Railways, Naxalite and insurgent attacks, Terrorist activity, etc. The upward linear trendline has been displayed in **Figure 3** defined by equation $2378*x + 73590$ and having R^2 value = 0.789. The percentage of crimes against public order comprises between 2.9 to 3.6 percent of total IPC crimes registered annually as seen in **Table 3**. While the state of Kerala showed the highest rates of such incidents for five years, Lakshadweep islands recorded the highest offences for two years. Kerala recorded the highest rates of crimes against public order for the years 2010, 2011, 2012, 2013 and 2015 with crime rates of 26, 33.6, 33, 30 and 19.6 respectively. Lakshadweep on the other hand showed crime rates of 64.8 and 20.3 which were highest for the years 2009 and 2014.

Table 3: Proportion of crimes against public safety to total IPC crimes recorded from 2009 to 2015. The state with the highest number of such crimes and its respective crime rate has also been listed.

Year	Percentage of crimes against public safety to total IPC crimes	Highest crime rate (riots + arson)	State with highest crime rate
2009	3.4	64.8	Lakshadweep
2010	3.4	26	Kerala
2011	3.3	33.6	Kerala
2012	3.6	33	Kerala
2013	3.1	30	Kerala
2014	3	20.3	Lakshadweep
2015	2.9	19.6	Kerala

In India, there is a typical category system wherein there exist the general quota (GN), Other Backward Classes (OBC), Scheduled Caste (SC) and Scheduled Tribe (ST), etc. General IPC offences are specially categorised for the SC and ST in the country to protect their interests. Hence, the trends of arson offences against these categories has also been analysed. The trends in arson offences against the Scheduled Castes (SC) and Scheduled Tribes (ST) for the years from 2009 to 2018 show a mixed trendline with offences crossing the 200 mark for against Scheduled Caste in the years 2012, 2014 and 2015 as seen in **Figure 4(a)**. While the number of offences against Scheduled Caste outnumber those against Scheduled Tribes, it can be seen that there was a sharp increase in the number of offences registered for years 2013 to 2015, followed by a drastic decline in numbers noticed from 2016 to 2018 as seen in **Figure 4(b)**. From 2016 onward, it can be observed that there is a decrease in arson crimes against both the categories.

It can also be observed that a comparison of yearly trends in percentage of arson crimes to other IPC offences registered against Scheduled Caste and Scheduled Tribes is seen as a downward trend as indicated in **Table 4**. This indicates that while other types of crimes are increasing, the number of arson offences against these categories is decreasing, which is a good trend for the future.

Table 4: Percentage of Arson crimes against Scheduled Castes (SC) and Scheduled Tribes (ST) to total IPC crimes against SC/ST between 2009 and 2018.

Percentage of Arson crimes to total crimes recorded annually against SC/ST		
Year	Incidents reported against SC	Incidents reported against ST
2009	0.58	0.53
2010	0.46	0.66
2011	0.50	0.42
2012	0.64	0.44
2013	0.48	0.49
2014	0.43	0.41
2015	0.46	0.58
2016	0.46	0.22
2017	0.35	0.15
2018	0.34	0.17

From 2009 to 2015, it can be seen that the crime rate for arson offences ranges between 0.7 to 1 while the average arrest rate is 0.985 for the same duration as shown in **Table 5**. Arrest rate is calculated as number of persons arrested per lakh population. The number of

arrests per case ranges between 1.1 to 1.6 arrests. The number of persons arrested shows a mixed trend over the period.

Table 5: Number of persons arrested for arson crimes and crime rate *versus* arrest rate for arson incidents in the country from 2009 to 2015.

Data of Crime rate and Arrest rate for IPC Arson crimes					
Year	Number of Persons arrested for Arson	Total number of Persons arrested	Crime rate	Arrest rate	Number of arrests per case
2009	11486	2849025	0.7	1	1.3
2010	10667	2947122	0.7	0.9	1.3
2011	12380	3145845	0.7	1	1.4
2012	12572	3270016	1	1	1.1
2013	11699	3523577	0.8	1	1.3
2014	14516	3790812	0.7	1.2	1.6
2015	10661	3636596	0.8	0.8	1.1

Results And Discussion

The paper reviewed annual crime statistics for a period of ten years from 2009 to 2018 with respect to arson crimes. The data obtained from the reports of the Crime Records Bureau were analysed for trends and patterns in arson offences across the country, in different states and groups of people.

The review paper found that arson offences showed a slight upward trend across the ten years studied from 2009 to 2018, if a linear trendline was plotted against the data. Cases recorded ranged from a maximum of 11836 cases in 2012 to a minimum of 8505 cases in 2010. Overall, there was a general decline and mixed trendline in arson offences as violent crimes from 1995 to 2018. This may be attributed to the fact that arson had been reclassified from violent crimes to offences against public safety and property. However, it was seen that offences were booked under Sections 435, 436 and 438 only of Indian Penal Code.

The rate of crime for arson was seen to be between 0.7 to 0.9 indicating that these offences comprise 0.3 to 0.4 percent of total IPC offences registered in the country on an annual basis. This showed that there are still considerable cases being registered every year and hence, need for action is necessary. It also stressed the need for more efficient investigation into these offences. While comparing riots and arson offences registered as crimes against public safety, it was seen that riots were considerably higher than arson offences.

Studies on trends in arson offences against Scheduled Castes showed a relatively constant number of offences from 2009 to 2018. The highest number of offences were seen in 2012. The number of cases

registered showed a decreasing trend from 2016 to 2018, indicating that arson crimes are declining against the community. Studies on trends in arson offences against Scheduled Tribes showed a sharp decrease towards the latter half from 2016 to 2018; however the years from 2009 to 2013 showed about double the number of offences registered from 2016 to 2018. The lesser number of offences registered against the SC/ST community needs to be further investigated to determine if declining trends are due to actual reduction in offences or due to other factors.

Conclusion

This review paper was compiled with the objective to study patterns in arson crime statistics in the Indian scenario between 2009 and 2018. It can be noted that arson crimes show an overall mixed trend indicating that while number of offences may increase or decrease annually, this offence is still prevalent in society. Further research and study needs to be undertaken in this field especially in order to correlate the existing data for predictive policing and community safety engineering. Crime trend studies need further probe and deeper assessment to study the criminological traits associated with the offences and thus, offer the opportunity for predictive policing improving the criminal justice system [1,2]. There is also a need to create awareness and reach the concerned authorities through this review paper, highlighting the need for better investigation and research methods in the field of forensic fire investigation [3].

Declarations

Declaration of Interest: This paper is the original work of the authors and has not been influenced inappropriately by any financial or personal relationships. The study does not have any conflict of interest and hence, no declarations of interest have been made.

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Figures

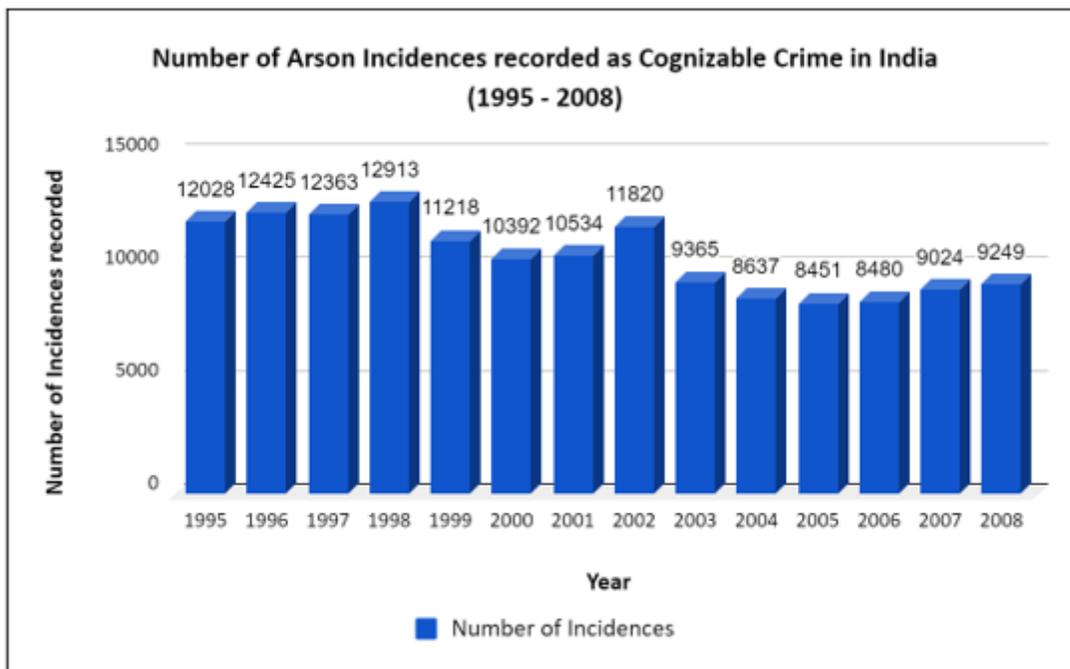


Figure 1

The number of arson incidents reported as cognizable crimes in India between 1995 and 2008.

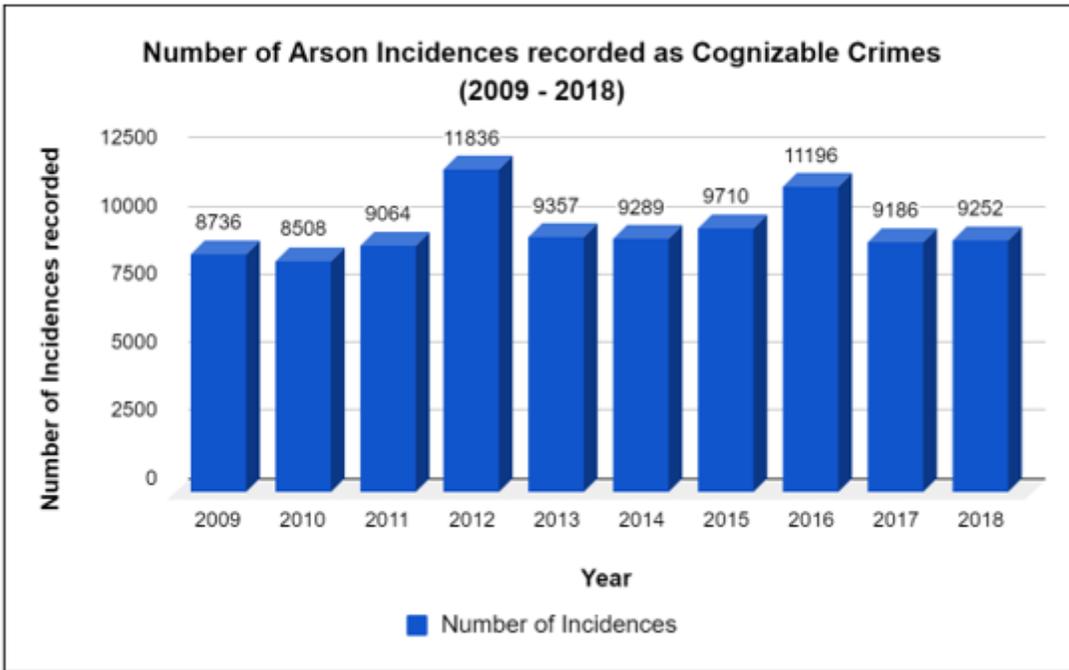


Figure 2

The number of arson incidents reported as cognizable crimes in India between 2009 and 2018.

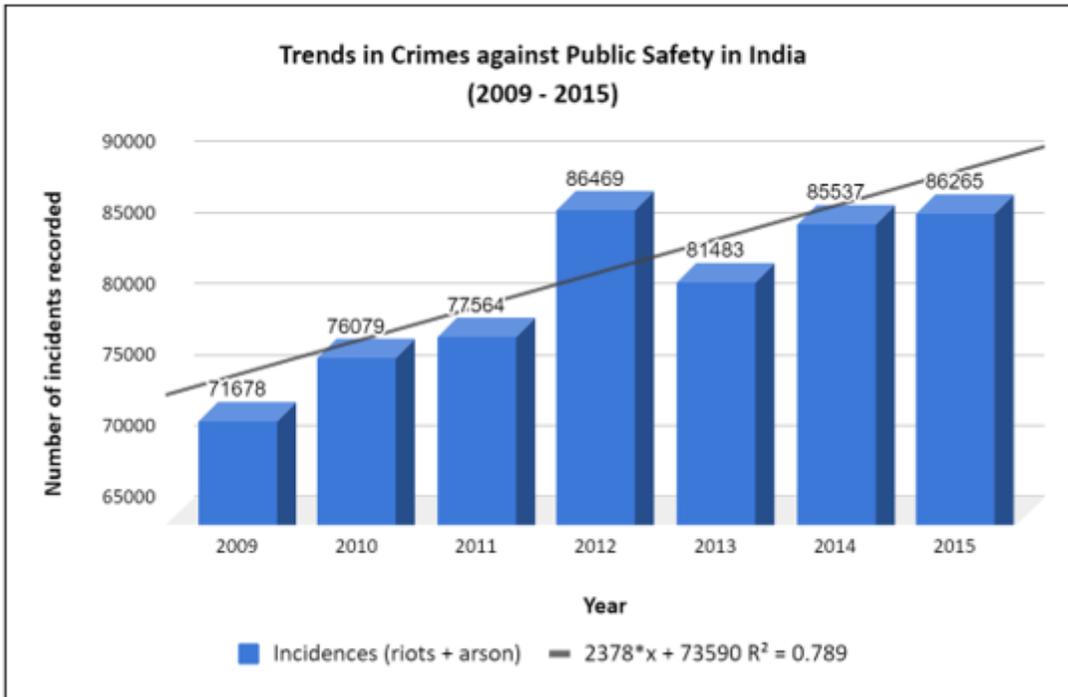


Figure 3

The Annual Trend in Crimes Against Public Safety comprising Riots and Arson cases across the country from 2009 to 2015.

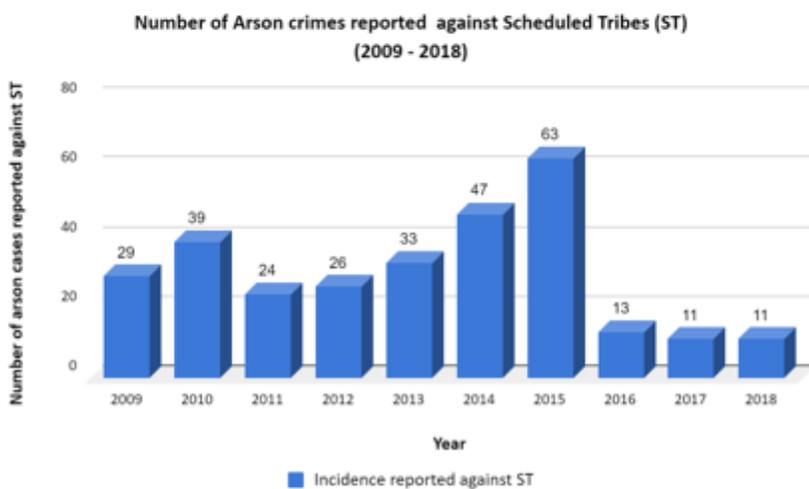
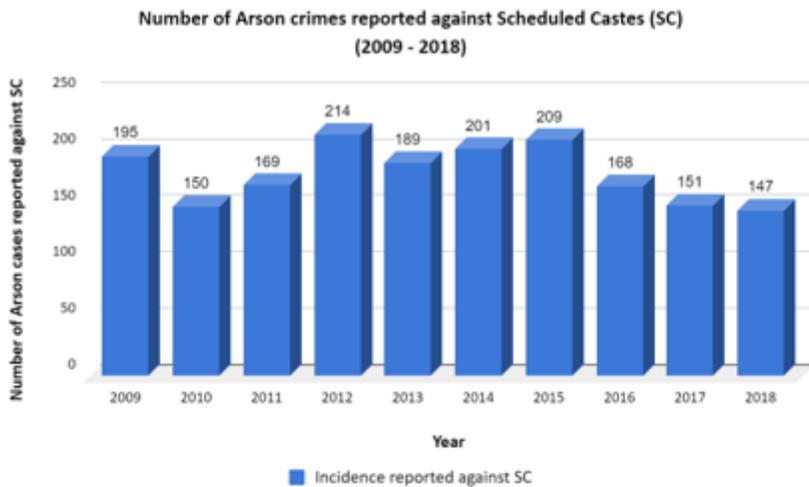


Figure 4

(a): The number of arson crimes recorded annually against the Scheduled Castes (SC) between 2009 and 2018. (b): The number of arson crimes recorded annually against the Scheduled Tribes (ST) between 2009 and 2018.