

# Human Mortality by Large Carnivora in Chandrapur District



© 2021 Bombay Natural History Society

### **Citation**

Karkare, S, Karkare, S.S, Ishmael, S. A. F, Dande, S, Ghogare S, and Paranjape, A (2021)  
Bombay Natural History Society

**Cover picture:** This tiger statue is installed near the Agarzari buffer village of Tadoba, to pay homage to the villager, who died in a tiger attack.

### **Project Team**

Project In-charge Sanjay Karkare, Assistant Director, Education Officer- Admin In-charge Sampada Karkare, Scientist A S Ashisdan Francis Ishmael, Community Officer Saurabh Dande, Education Assistant Suraj Ghogare, Education Assistant Ameya Paranjape, two members of Field- Assistant Jagdish Dharme, Sanjay Gohane, four members of Data Collectors Bharat Nihare, Rajkumar Tekam, Vivek Sahare, Rahul Sukhdeve and three Driver-cum-Field Assistants Charandas Shende, Rajpal Shrirame, and Mahesh Moharle. BNHS Mumbai head office Assistant Curator and scientists Sameer Bajar and Rohan Bhagat.

### **Report layout and design: Sanjay Karkare**

*About the pictures:* All the pictures in this report were captured by the BNHS team in the field when they accompanied villagers in the forest for resource collection. We took permission for the photographs, for the study.

### **Supported by**



National Payments Corporation of India-NPCI

## **ACKNOWLEDGMENT**

We thank the Principal Chief Conservator of Forests- PCCF(Wildlife) of Maharashtra, Mr. Sunil Limaye, and former PCCF (Wildlife) Mr. Nitin Kakodkar for permitting the project. We are also thankful to the Field Director of Tadoba, Pench, and Navegaon-Nagzira Tiger Reserve along with DCF of Gondia, Bhandra, Wardha, Nagpur, Bramhapuri, Central Chanda, Chandrapur forest divisions and Tadoba (Core, Buffer) for providing support for sensitization activities and the department's various data. We are thankful to BNHS's former core committee member Mr. Satish Pradhan and former Director Dr. Deepak Apte for his continuous guidance and support. We thank Dr. Girish Jathar (former Scientist-BNHS) for his guidance throughout the project.

# **Human Mortality by Large Carnivora in Chandrapur District**

**This study was conducted under the project title  
Human-Wildlife Coexistence in Central India Landscape:  
Challenges and opportunities**



## EXECUTIVE SUMMARY

The forested area of Chandrapur district is surrounded by 1745 villages. The villagers living on the fringe rely heavily on forest produce. According to data from the forest department of Tendu Patta collection, in a season, more than 50 thousand families collect patta from the forests which means more than one lakh individuals visit the forest in Chandrapur district alone for patta collection. Every year, one thousand metric tonnes of Mahua flowers are produced in the district. Thousands of villagers harvest these flowers from the forest during the 25 days of the summer season. Fuelwood is used for hot water bathing in every village. From December to June, this fuelwood is harvested from the fringe forest every year. The collection contributes a high percentage of women. In addition, many bamboo working communities collect bamboo from the Tadoba buffer as well as regular forests for livelihood. Grazing is the most significant activity in the human-animal interface. Around five thousand herders and cattle owners carry their livestock into the forest for grazing for more than 300 days a year. Other MFPs collected by the villagers include grass for brooms, wild vegetables, and small timber. In short, these locals visit the forest frequently for various reasons throughout the year.

The agricultural fields in the villages are near the forest, which is also a major issue as herbivores, followed by the tiger, invade these fields. The forest, village, and agriculture fields make the landscape like a honeycomb structure. The farmers must go to the agricultural fields through the forest which also creates a complex issue. On the contrary from the last decade, the tiger number is also increased in the Chandrapur district. The situation created a constant interface of humans and tigers in the district.

This conflict reaches its peak when 44 humans died (**Annexure**) in the district in a year (2021). Forest produce collection is one of the reasons that have been observed from the case study. Out of 164 incidences, from 2013, 52 incidents occurred when the victims were collecting forest produce. 33 incidences occurred in the agriculture field nearest to the forest. The proper strategy and long-term monitoring system are needed to tackle this complex issue.

The Bramhapuri forest division has 70 incidences, which is the highest from the year 2009 to 2021. Out of these deaths, 68% are in tiger and leopard attacks. The percentage of men being victims of wildlife attacks is higher than the percentage of women as men collect resources individually whereas women are in the groups which may avoid the attacks.

## INTRODUCTION

The Chandrapur district has four forest divisions: Bramhapuri, Central Chanda, Chandrapur, and a wildlife division of Tadoba Andhari Tiger Reserve (TATR) and a division of the Forest Development Corporation of Maharashtra (FDCM). The district has a total forest area of 9870 sq. km. and covers 47% of the total geographical area of the district. In the Chandrapur forest circle, there are 1,745 villages adjacent to the forest. The Bramhapuri division contributes around 25%, Central Chanda around 40% and Chandrapur division around 19%, and Tadoba Andhari Tiger Reserve 16% to the total forest cover of the district.

In recent years, the conflict situation in the Chandrapur district has worsened. The attacks by wild animals claimed the lives of 175 villagers from 2012 to 2021. The attacks reached their peak in 2021 when 44 villagers died as a result of large carnivore attacks from January to December. Given the district's human-wildlife conflict situation, the villagers' tolerance threshold appears to be high. Crop depredation, cattle-killing, human injuries, and human deaths are common incidences in peripheral villages. On the contrary, retaliation and criticism towards the forest department are moderate. The Forest Department's attempt to resolve the matter by providing compensation on an expedited basis influenced the villagers' positive attitudes. The Department implements several social fence projects that serve to reduce villagers' rage.



***THE BRAMHAPURI FOREST DIVISION HAS 70 INCIDENCES OF HUMAN DEATHS, WHICH IS THE HIGHEST AMONG ALL THE FOREST DIVISIONS***

## METHODOLOGY

### Data Collection

The BNHS team procured a human death *panchanama* copy from the forest department of 113 incidences from 2013 to 2020 to systematically assess the scenario. The supporting data for the total 164 cases were also obtained from the forest department in the form of an excel spreadsheet. In 2021, there were 44 human deaths in the district. This data was also collected through a respected forest division.

### Data Analysis

The data of a total of 164 cases from 2013 to 2020 was collected from the forest department, in which 113 human deaths *panchanama* copies were collected to study in detail the reasons for victim presence at the incidence location. All 164 mortality cases were studied thoroughly to understand the scenario of the conflict in the district. The gender, age group, area of incidence, season, and type of wild animals involved were studied in detail. The collected 113 *panchanama* were systematically analyzed to determine the justification for the attack and the location and purpose of the villagers who went to the forest or the attack site.

## RESULTS

### Compensation and year-wise cases of conflicts in Chandrapur district

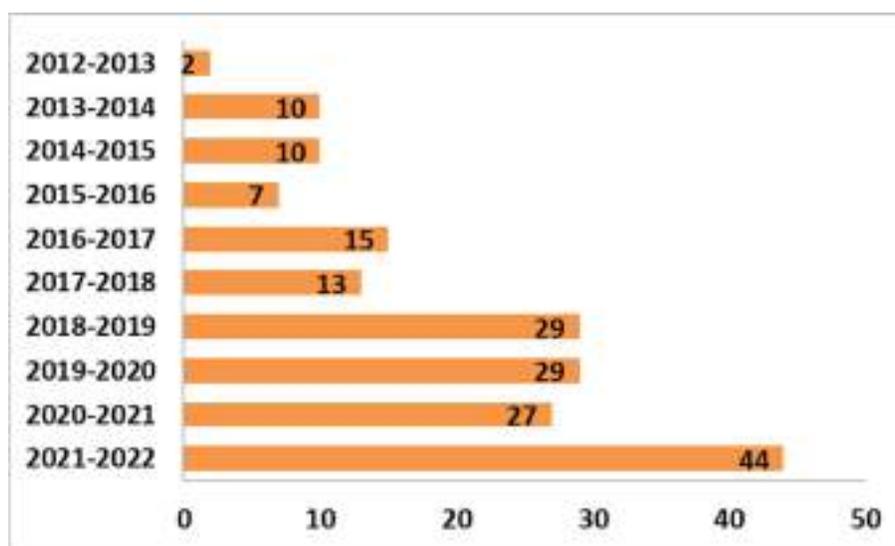
Forest divisions	Human				Cattle				Crop		Total	
	Death		Injury		Death		Injury		Depredation		No	Compensation
	No	Comp.	No	Comp.	No	Comp.	No	Comp.	No	Comp.		
<b>2012-2013</b>												
Chandrapur	0	0.00	42	12.50	583	38.11	0	0.00	270	6.36	<b>895</b>	<b>56.97</b>
Bramhapuri	1	2.00	43	6.91	523	30.62	21	0.19	514	22.21	<b>1102</b>	<b>61.93</b>
Central Chanda	0	0.00	15	5.64	142	12.02	2	0.02	927	16.93	<b>1086</b>	<b>34.61</b>
Tadoba buffer	1	2.00	27	7.83	596	40.93	5	0.04	216	6.45	<b>845</b>	<b>57.25</b>
<b>Total</b>	<b>2</b>	<b>4.00</b>	<b>127</b>	<b>32.88</b>	<b>1844</b>	<b>121.68</b>	<b>28</b>	<b>0.25</b>	<b>1927</b>	<b>51.95</b>	<b>3928</b>	<b>210.76</b>
<b>2013-2014</b>												
Chandrapur	5	22.00	16	7.14	221	15.76	0	0.00	853	18.61	<b>1095</b>	<b>63.51</b>
Bramhapuri	1	5.00	34	8.01	555	33.78	18	0.17	733	32.57	<b>1341</b>	<b>79.53</b>
Central Chanda	1	1.00	33	18.77	200	15.93	1	0.02	2019	36.24	<b>2254</b>	<b>71.96</b>
Tadoba buffer	3	15.00	6	30.13	505	41.31	1	0.01	189	8.02	<b>704</b>	<b>94.47</b>
<b>Total</b>	<b>10</b>	<b>43.00</b>	<b>89</b>	<b>64.05</b>	<b>1481</b>	<b>106.78</b>	<b>20</b>	<b>0.2</b>	<b>3794</b>	<b>95.44</b>	<b>5394</b>	<b>309.47</b>

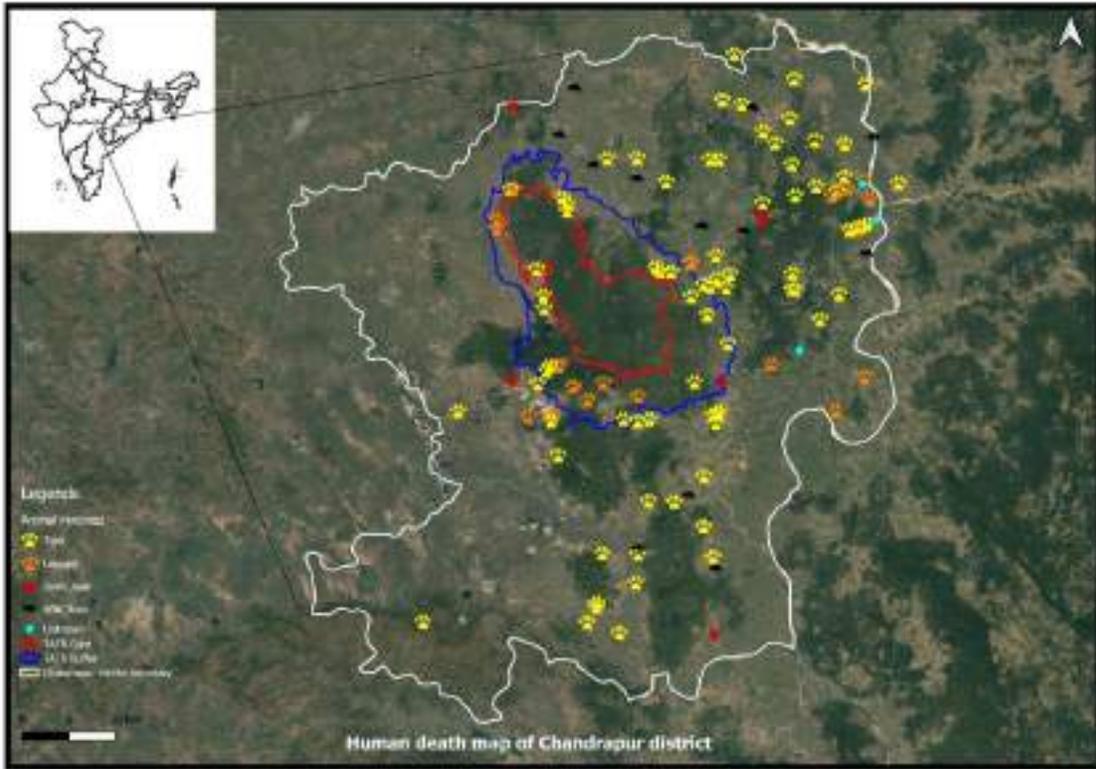
<b>2014-2015</b>												
Chandrapur	0	0.00	23	14.23	280	16.70	0	0.00	1854	38.73	<b>2157</b>	<b>69.66</b>
Bramhapuri	4	20.00	30	7.73	556	33.51	24	0.24	684	39.17	<b>1298</b>	<b>100.65</b>
Central Chanda	5	26.00	26	19.45	168	15.53	0	0.00	1477	31.70	<b>1676</b>	<b>92.68</b>
Tadoba buffer	1	5.00	10	6.12	329	26.15	2	0.02	201	7.18	<b>546</b>	<b>44.47</b>
<b>Total</b>	<b>10</b>	<b>51.00</b>	<b>89</b>	<b>47.53</b>	<b>1333</b>	<b>91.89</b>	<b>26</b>	<b>0.26</b>	<b>4216</b>	<b>116.78</b>	<b>5677</b>	<b>307.46</b>
<b>2015-2016</b>												
Chandrapur	2	16.00	16	10.03	341	20.06	0	0.00	2733	92.94	<b>3092</b>	<b>139.03</b>
Bramhapuri	3	24.00	93	22.57	880	50.71	119	1.01	3412	271.97	<b>4507</b>	<b>370.26</b>
Central Chanda	1	7.00	45	23.72	267	19.73	7	0.07	3328	66.53	<b>3648</b>	<b>117.05</b>
Tadoba buffer	1	5.00	10	5.14	671	50.95	14	0.13	1403	55.92	<b>2109</b>	<b>117.01</b>
<b>Total</b>	<b>7</b>	<b>52.00</b>	<b>164</b>	<b>61.46</b>	<b>2159</b>	<b>141.45</b>	<b>140</b>	<b>1.21</b>	<b>10876</b>	<b>487.36</b>	<b>13356</b>	<b>743.35</b>
<b>2016-2017</b>												
Chandrapur	2	15.00	66	9.30	490	31.96	0	0.00	3749	112.83	<b>4307</b>	<b>169.09</b>
Bramhapuri	7	56.00	43	8.93	855	56.31	20	0.23	4471	295.88	<b>5396</b>	<b>417.35</b>
Central Chanda	0	0.50	54	33.73	216	22.40	7	0.07	4118	123.38	<b>4395</b>	<b>180.08</b>
Tadoba buffer	6	48.00	8	6.12	452	35.21	4	0.04	557	27.42	<b>1027</b>	<b>116.79</b>
<b>Total</b>	<b>15</b>	<b>119.5</b>	<b>171</b>	<b>58.08</b>	<b>2013</b>	<b>145.88</b>	<b>31</b>	<b>0.34</b>	<b>12895</b>	<b>559.51</b>	<b>15125</b>	<b>883.31</b>
<b>2017-2018</b>												
Chandrapur	3	24.00	36	5.51	574	51.12	9	0.27	5466	175.44	<b>6088</b>	<b>256.34</b>
Bramhapuri	8	72.00	92	26.44	931	93.29	15	0.38	5323	346.04	<b>6369</b>	<b>538.15</b>
Central Chanda	1	7.50	42	27.18	151	21.64	12	0.12	7382	187.70	<b>7588</b>	<b>244.14</b>
Tadoba buffer	1	8.00	11	4.09	460	52.45	3	0.1	768	30.92	<b>1243</b>	<b>95.56</b>
<b>Total</b>	<b>13</b>	<b>111.5</b>	<b>181</b>	<b>63.22</b>	<b>2116</b>	<b>218.5</b>	<b>39</b>	<b>0.87</b>	<b>18939</b>	<b>740.1</b>	<b>21288</b>	<b>1134.2</b>
<b>2018-2019</b>												
Chandrapur	5	44.00	35	15.29	521	65.60	28	0.91	5713	154.49	<b>6302</b>	<b>280.29</b>
Bramhapuri	14	119.00	113	47.51	1123	128.16	60	0.60	7912	512.77	<b>9223</b>	<b>808.04</b>
Central Chanda	0	00.00	68	27.86	327	48.70	15	0.61	10999	206.83	<b>11398</b>	<b>284.00</b>
Tadoba buffer	10	116.10	18	7.85	606	73.84	9	0.11	492	16.41	<b>1135</b>	<b>214.31</b>
FDCM Ltd.	0	0.00	1	1.00	48	6.91	0	0.00	0	0.00	<b>49</b>	<b>7.91</b>
<b>Total</b>	<b>29</b>	<b>279.00</b>	<b>235</b>	<b>99.51</b>	<b>2625</b>	<b>323.21</b>	<b>112</b>	<b>2.23</b>	<b>25099</b>	<b>947.81</b>	<b>28107</b>	<b>1594.55</b>

<b>2019-2020</b>												
Chandrapur	5	75.00	63	62.05	646	117.64	12	0.66	4547	174.39	<b>5273</b>	<b>429.74</b>
Bramhapuri	14	210.00	71	47.88	822	109.67	6	14.00	7853	565.15	<b>8766</b>	<b>946.95</b>
Central Chanda	5	75.00	71	33.66	378	71.07	3	0.97	7730	256.20	<b>8187</b>	<b>436.90</b>
Tadoba buffer	3	45.00	20	21.61	735	84.76	2	0.02	425	13.51	<b>1185</b>	<b>164.90</b>
FDCM Ltd.	2	23.00	5	3.91	0	0.00	0	0.00	0	0.00	<b>7</b>	<b>26.91</b>
<b>Total</b>	<b>29</b>	<b>428.00</b>	<b>230</b>	<b>169.12</b>	<b>2581</b>	<b>383.14</b>	<b>23</b>	<b>15.65</b>	<b>20555</b>	<b>1009.49</b>	<b>23418</b>	<b>2005.41</b>
<b>2020-2021</b>												
Chandrapur	4	60.00	43	28.52	641	106.59	0	0.00	4004	141.14	<b>4692</b>	<b>336.25</b>
Bramhapuri	9	135.00	109	61.90	1345	179.80	0	0.00	16923	871.69	<b>18386</b>	<b>1248.40</b>
Central Chanda	7	105.00	55	35.70	277	40.14	0	0.00	911	64.93	<b>1200</b>	<b>245.77</b>
Tadoba buffer	5	60.50	12	27.70	845	77.19	0	0.00	514	20.31	<b>1376</b>	<b>185.70</b>
FDCM Ltd,	2	30.0	2	1.45	0	0.00	0	0.00	0	0.00	<b>4</b>	<b>31.45</b>
<b>Total</b>	<b>27</b>	<b>390.50</b>	<b>221</b>	<b>155.27</b>	<b>3058</b>	<b>403.72</b>	<b>0</b>	<b>0.00</b>	<b>22352</b>	<b>1098.07</b>	<b>25658</b>	<b>2047.57</b>
<b>2021-2022</b>												

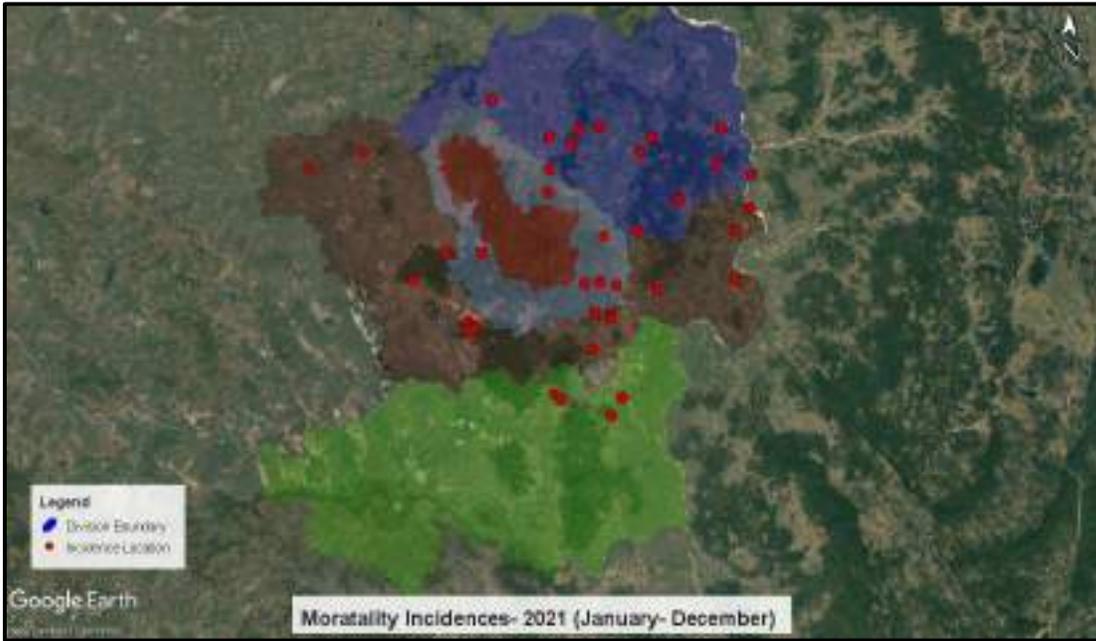
**Note:** In the above table, the compensation paid for the cases of death and injury of humans as well as cattle and crop depredation till 2021 were depicted. The total compensation paid for human deaths till the financial year of 2021 was around Rs. 15 crore.

### Human deaths from 2012 to 2021





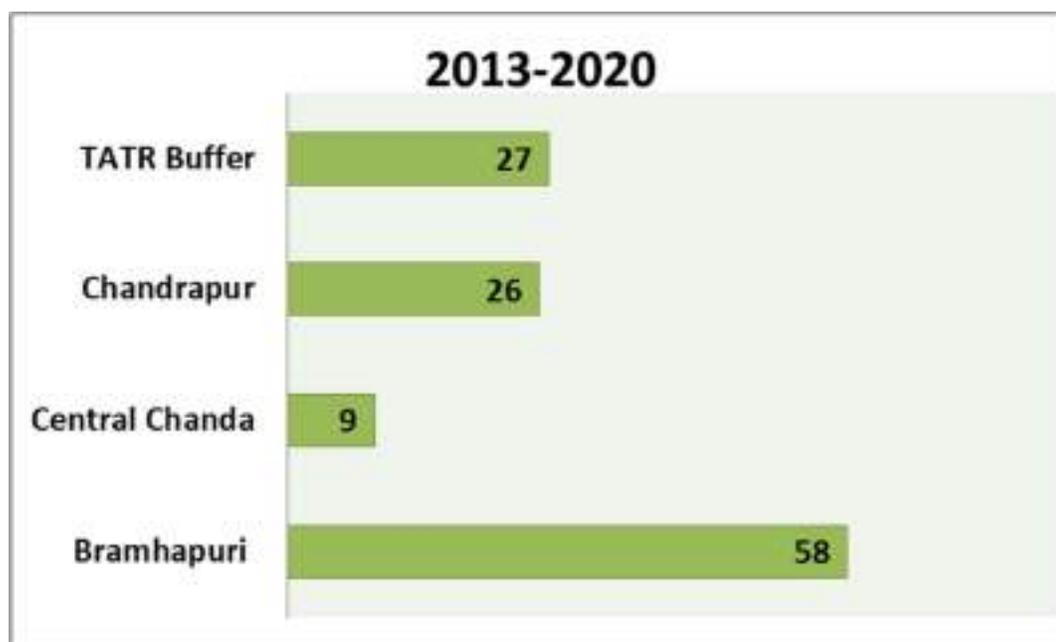
**Map1: Human mortality cases in wildlife attacks from 2013 to 2020 along with locations**



**Map 2: Division wise human mortality in wildlife attacks 2021**

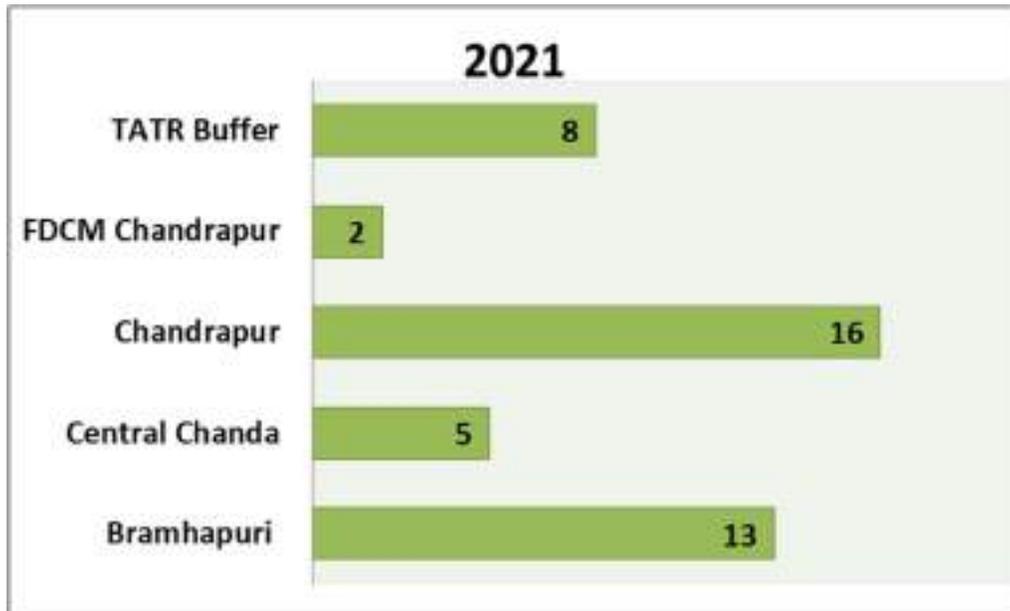
*A total of 164 cases were assessed and depicted below in the form of pie charts and bars. The data is divided into two parts. In the first part, the 120 cases from 2013 to 2020 were analysed and in the second part, the 44 death cases in 2021 were analysed*

- **Division-wise human deaths 2013-2020**



As portrayed the above figure shows the division-wise cases from 2013 to 2020. The numbers in the Bramhapuri division are higher than the other divisions. A total of 58 mortality cases were recorded in the Bramhapuri division in 2013–2020. TATR buffer stands in second place, whereas Chandrapur division is in third. The Central Chanda division recorded the lowest cases compared to other divisions.

- **Division-wise human deaths in 2021**

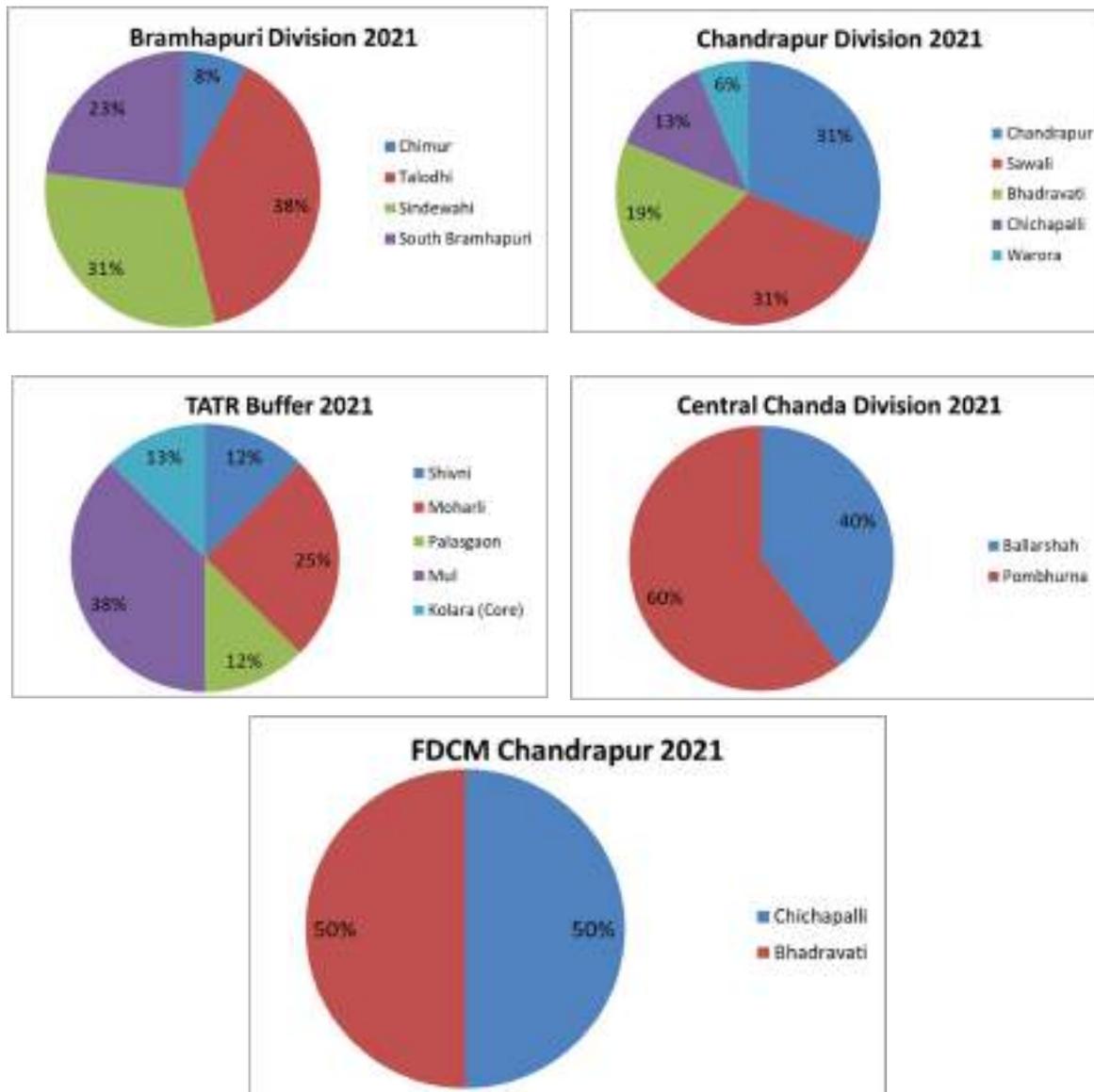


The numbers of deaths in 2021 in the Chandrapur division are higher than in the other divisions. Bramhapuri stands in second place, whereas TATR\_buffer is in third. The Central Chanda division recorded the lowest cases compared to other divisions. Compared to the 2013-2020 scenario, the Chandrapur division has emerged as the new hotspot in mortality cases. Still, the Bramhapuri division has the second-highest number. After collaborating with data, Bramhapuri has had the most mortality cases in recent years.



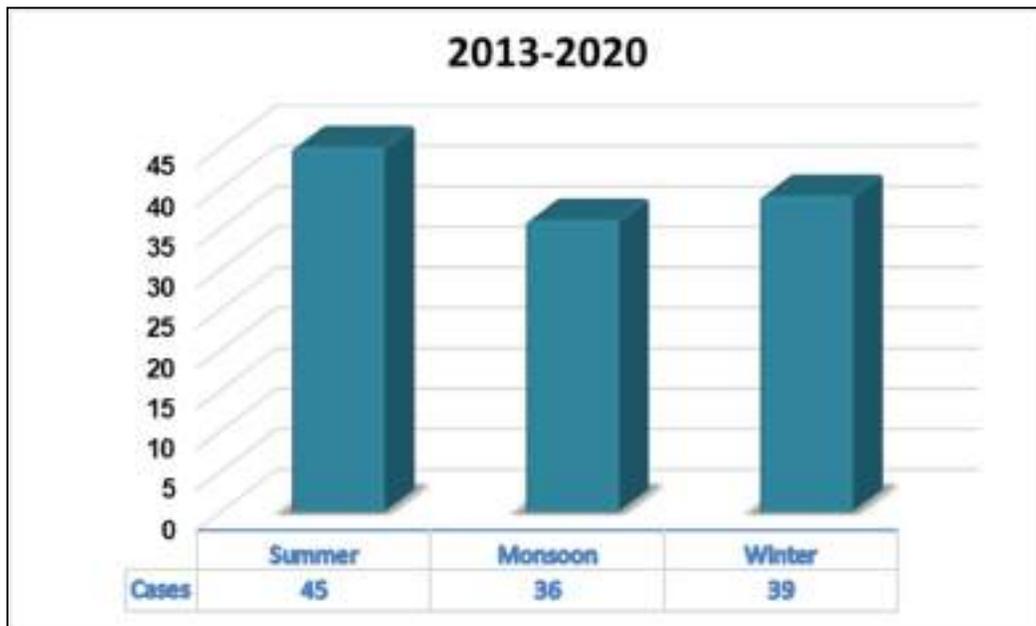
*THE AGRICULTURAL FIELDS NEAR THE FORESTS ARE ALSO A MAJOR ISSUE AS HERBIVORES, FOLLOWED BY TIGER, INVADE THESE FIELDS*

- Range-wise human cases in 2021



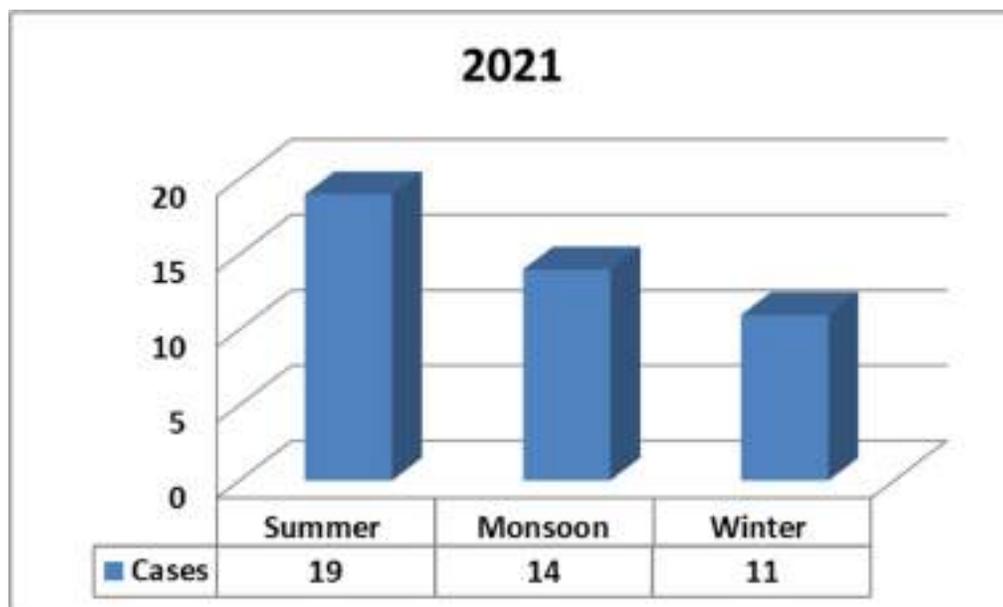
In the Chandrapur division, the highest cases were recorded in the Sawali and Chandrapur range, and the lowest was in the Warora range. In the Bramhapuri division, Talodhi range outnumbered the other ranges, where Chimur has the lowest cases in the division indicating 8% cases. TATR buffer division recorded the highest cases in the Mul range in which 38% of cases were recorded. In the Central Chanda division, only two ranges of mortality cases were recorded, in which 60% of cases were recorded in the Pombhurna range and the remaining in Ballarshaha. In the FDCM forest, only two deaths were recorded in Chichapalli and Bhadravati ranges.

- **Season-wise human deaths from 2013-2020**



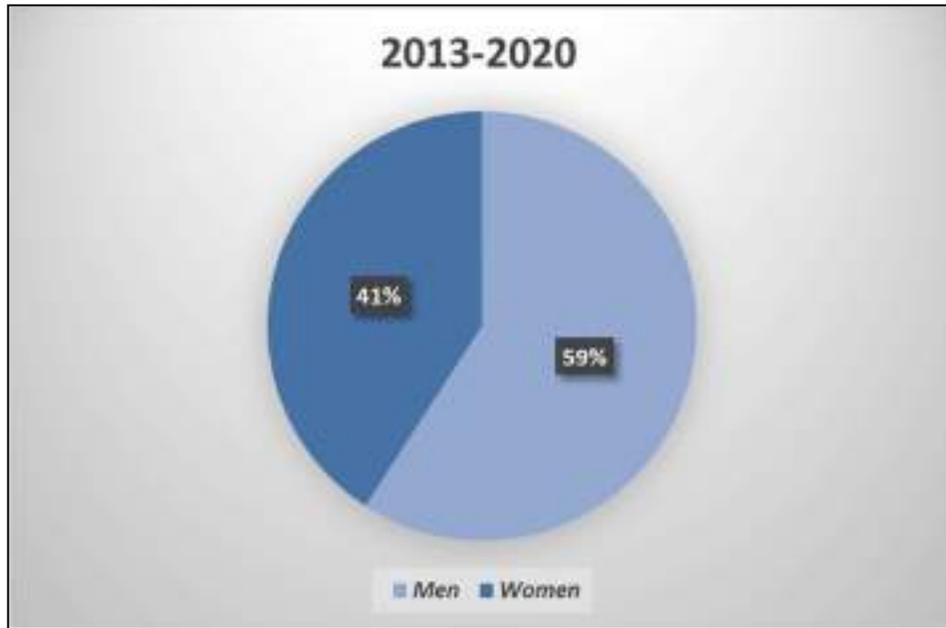
As shown in the above figure, in 2013-2020 highest cases of mortality were recorded in summer followed by the winter and monsoon. However, there is no such immense difference in the monsoon and winter seasons of mortality cases.

- **Season-wise human deaths in 2021**



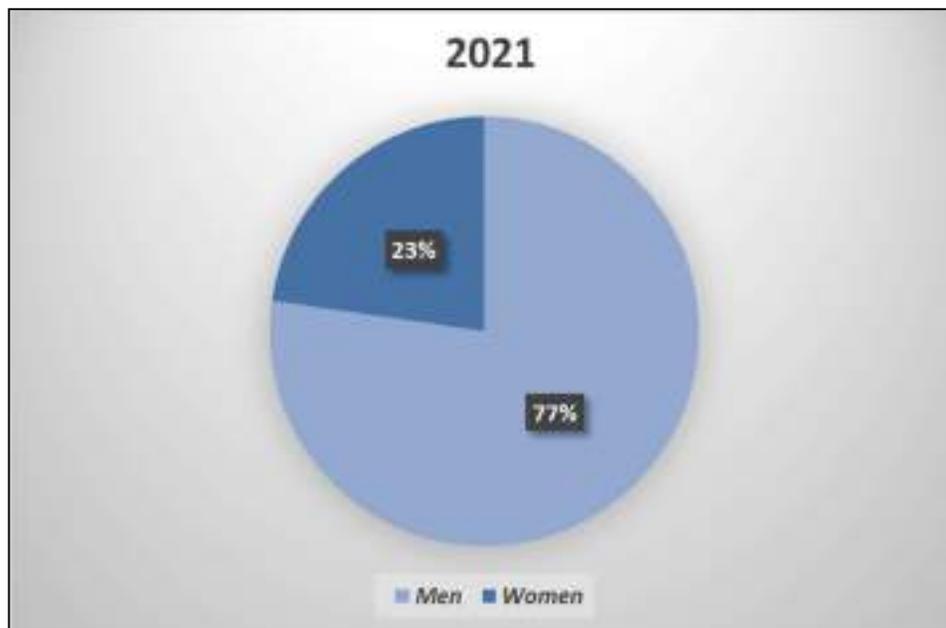
In 2021, 19 mortality cases were recorded in the summer, where 14 were in winter, and 13 in the monsoon. Again, there is no such massive difference in the season-wise cases. But compared to 2013-2020, again a large number of cases were in the summer of 2021.

- **Gender percentage in mortality from 2013-2020**



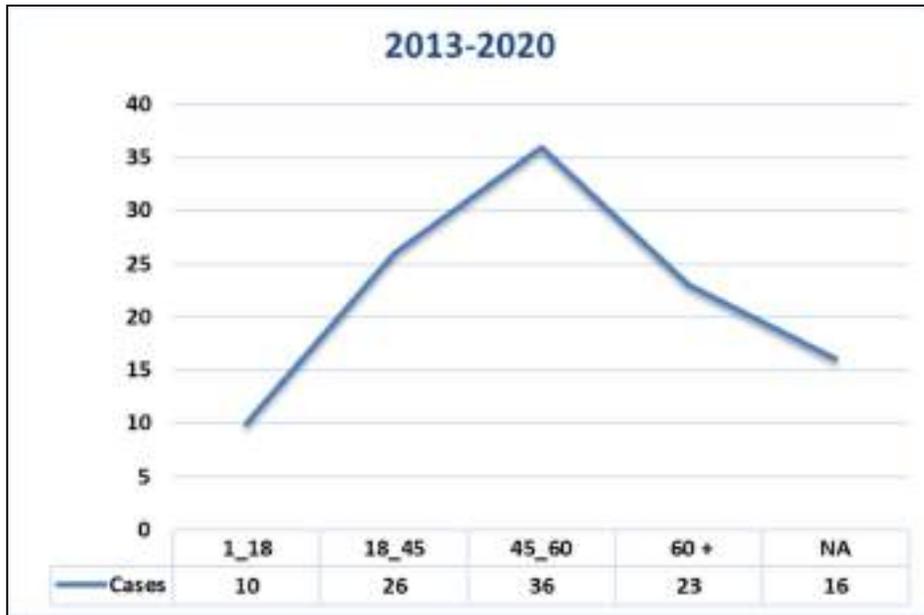
As shown in the pie chart, the percentage of men is higher than the number of women. In 2013-2020, 59% of men died in wildlife attacks whereas 41% of women had been recorded in these years. The gap between the percentages is not that greater, but noticeable.

- **Gender percentage in mortality in 2021**



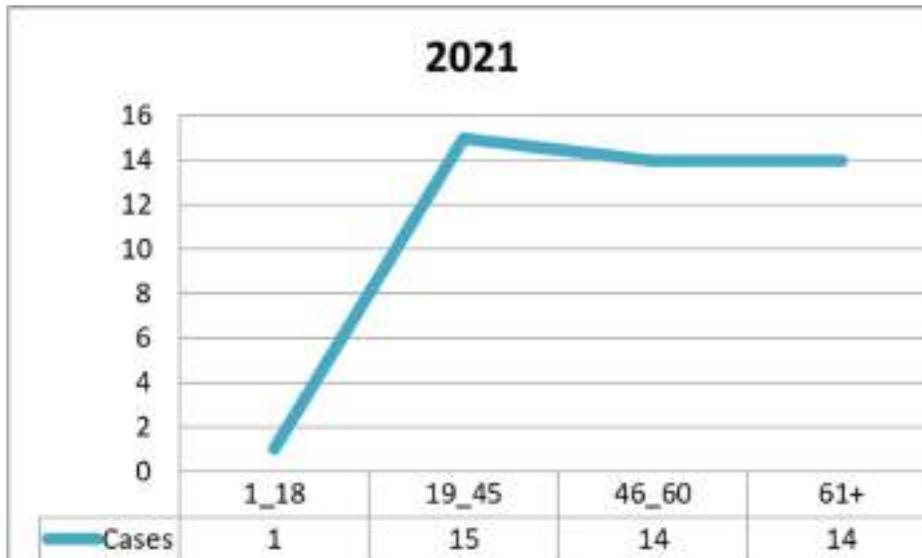
77% of men and 23% of women died in the year 2021. The percentage gap is notably higher than the previous year's records.

- **Age group in mortality from 2013-2020**



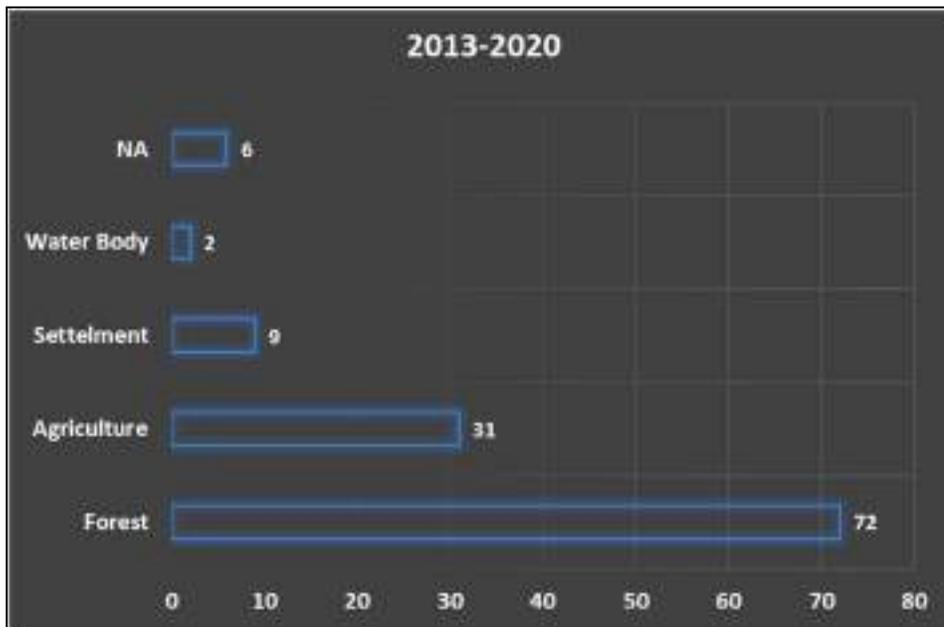
As shown in the above chart, the age group 45–60 has the highest number of cases recorded in 2013-2020, whereas the lowest is recorded in the age group 1–18. The numbers in the age group 18–45 stand on the second number whereas 60+ stands on the third number. As the results suggest that the mortality cases are higher in the mid-age group. The data about the age of victims in 16 cases was not available in the main data source. So, the age group for the 16 cases was unidentified.

- **Age group in mortality in 2021**



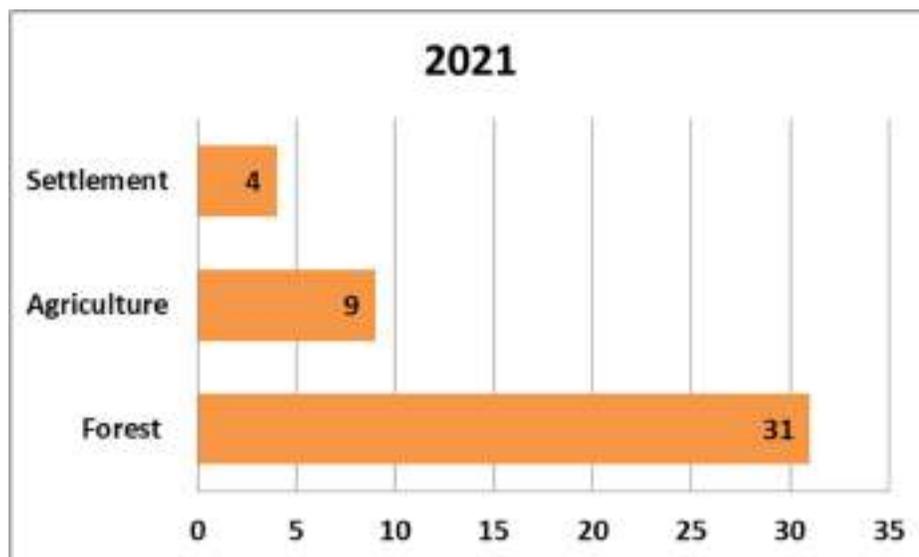
In 2021, the highest cases were recorded in the 19\_45 age group, with one less in the 45–60 and 61+ groups, whereas the 1–18 group has the lowest cases. The scenario has not changed much when compared to the previous year’s data.

- **Area of Incidences from 2013-2020**



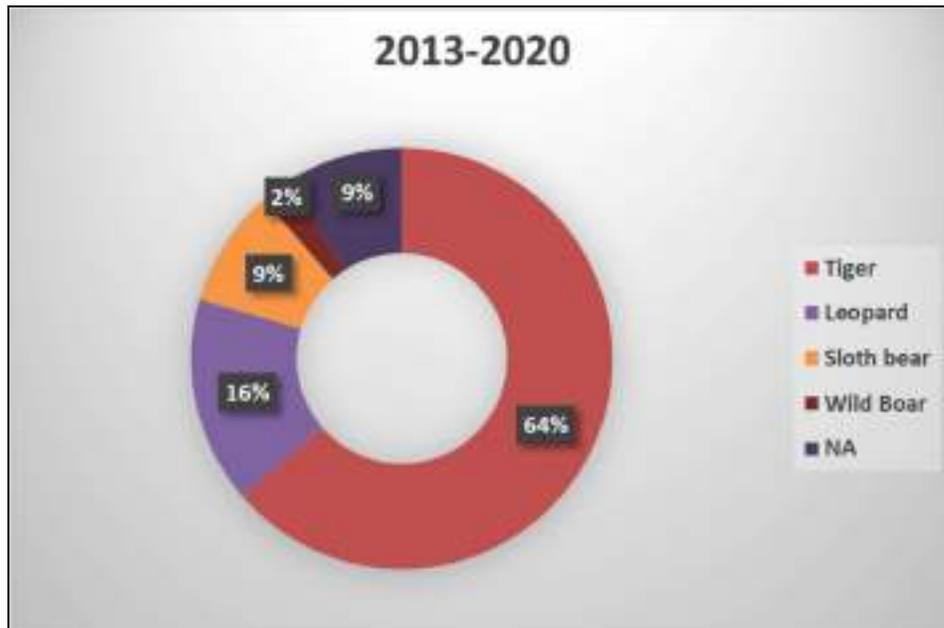
As shown in the above chart, in 2013-2020 the majority of the incidences occurred in the forests. On the other hand, the agricultural area reported the second-highest number of incidences. 9 incidents took place in the village and 2 near a water body. In 6 cases, the data about the area of incidence was not available in the forest department records.

- **Area of Incidences in 2021**



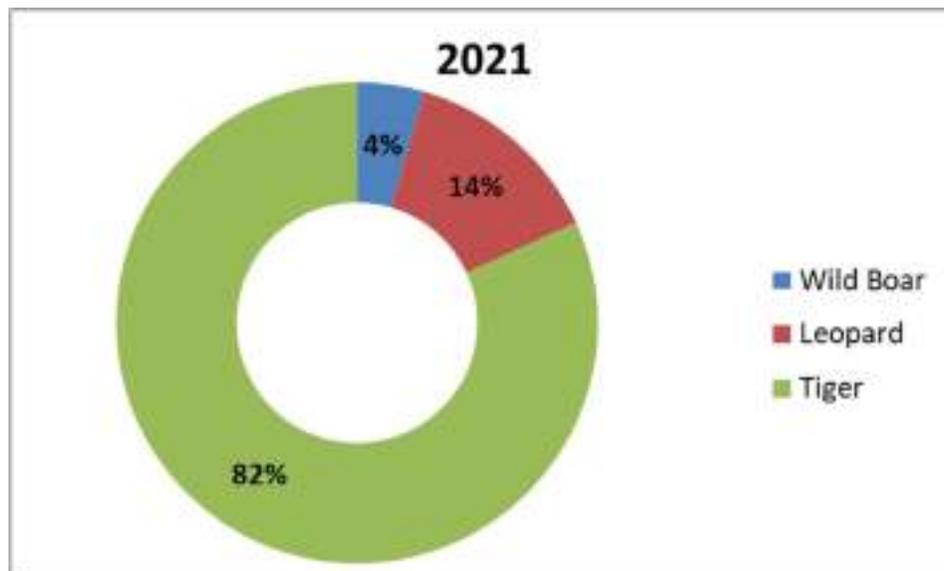
In 2021, again the highest number of cases occurred in the forest, where 9 cases occurred in agriculture and 4 cases occurred in the near settlement area.

- **Type of animal involved from 2013-2020**



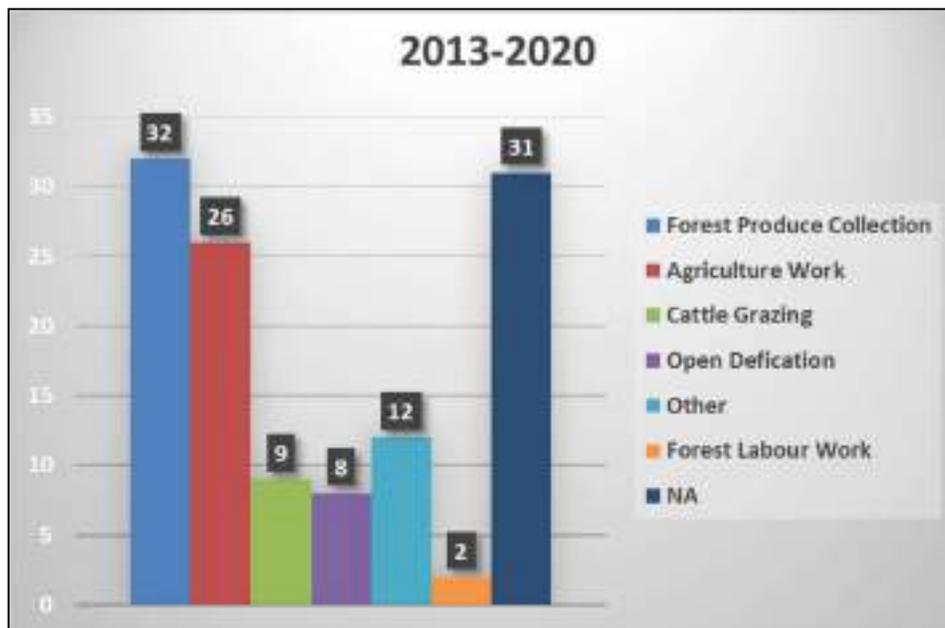
In the above chart, the tiger was involved in 64% of cases whereas Leopard was in 16% and the sloth bears in 9% of incidences. Wild boar was involved in 2% of cases. The animal involved in 9% of cases was unidentified.

- **Type of animal involved in 2021**



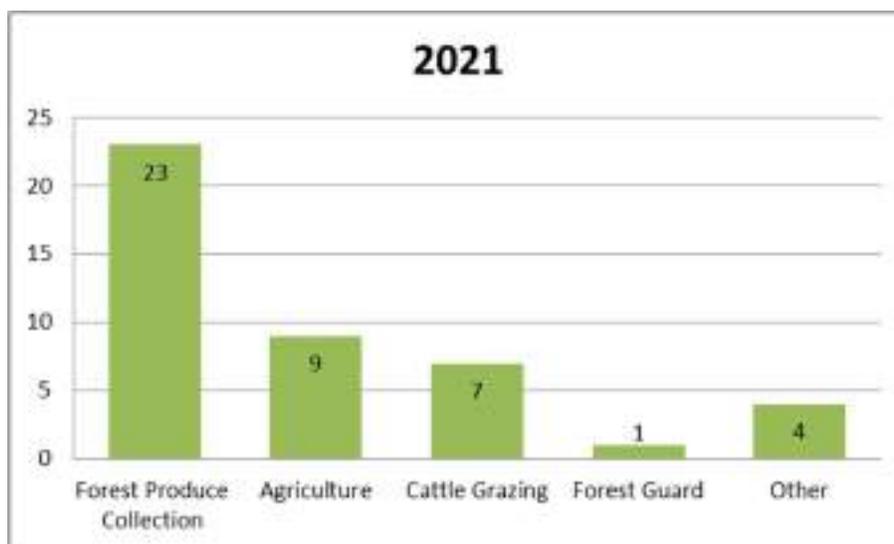
In 2021, the tiger was involved in 82% of incidences, whereas the leopard was in 13% of incidences. Wild boar is involved in 5% of cases. The number of cases in which the tiger was involved continued to be at the highest position compared to the last recorded data till 2020.

- **Victim's presence at the incident location from 2013-2020**



In 32 incidences the victims visited the area for the forest produce collection, whereas in 26 incidences the victim was working in the agriculture field. 9 incidences occurred during the cattle grazing activity. 8 incidences occurred at the time of open defecation. For other reasons 3 cases occurred when the victim was sleeping in the forest, 7 incidences occurred when the victim was walking near the forest and in 2 incidences the victim visited the forest for worship purposes. 2 incidences occurred at the time of labour work in the forest. The reasons for 31 incidences are unidentified as the location was not available in the main data source.

- **Victim's presence at the incident location in 2021**



In 23 incidences the victims visited the forest for the forest produce collection, whereas 9 incidences occurred at the time of agriculture work. 7 incidences occurred during the cattle grazing activity. For other reasons, 1 incidence occurred when the victim was sleeping in the forest, 2 when the victim was walking, and 1 at the time of coal collection from the mine area. In 1 unfortunate incident, the forest guard lady was killed while patrolling in the TATR core.

*HERDERS ARE  
MOST  
VULNERABLE IN  
HUMAN-  
WILDLIFE  
CONFLICT*



*FUELWOOD IS  
HARVESTED  
FROM THE  
FRINGE FOREST.  
IN THIS  
PROCESS, A  
LARGE NO OF  
WOMEN ARE AS  
VICTIMS*



*TENDU PATTA AND MAHUA FLOWER COLLECTION IN SUMMER CONTRIBUTED TO MOST OF THE FATEL ATTACKS*

## Forest produce collection and human deaths in Chandrapur district

Forest Produce collection	Incidences in 2013-2020	Incidences in 2021
Fuel Wood	11	10
Tendu Patta	5	6
Mahua Flowers	9	4
Bamboo	1	2
<i>Kusal/Zadani gawat</i> ( <i>Heteropogan contortus</i> )	3	1
Minor forest produce (MFP)	3	1
Cattle Grazing	10	7



*THE PRIMARY RESPONSE TEAM OF TADOBA BUFFER, RESISTED VILLAGERS TO ENTER INTO THE FOREST FOR MAHUA COLLECTION DUE TO THE PRESENCE OF TIGRESS WITH CUBS*

Pic source: PRT

## Recommendations

The Chandrapur district is home to over 200 individual tigers, a sizeable portion of which inhabit the areas outside the PAs in the human-dominated landscapes in the Territorial Forest Divisions of Bramhapuri, Chandrapur, and Central Chanda. The PAs of Chandrapur – Tadoba Andhari Tiger Reserve, Ghodazari, and the proposed WLS of Kanhargaon are embedded in this matrix of territorial forests. The proximity between tigers and humans has led to the district becoming a virtual hotspot for human-tiger conflict in the country in recent times.

The Government of Maharashtra has constituted a Technical Study group to suggest mitigation plans to reduce human-tiger conflict in the district of Chandrapur in 2020. This was in response to a directive from the 15<sup>th</sup> meeting of the State Wildlife Board held on 7<sup>th</sup> August 2020. The 11-member technical study group has members from different streams of wildlife conservation. Sanjay Karkare from BNHS is one of the members of this committee.

There are two vulnerable stakeholders for human deaths and injuries in this landscape. The first one is a herdsman and the second are the forest resource collectors. Both are linked with livelihoods. So, the state government should think about this as a priority to tackle these livelihood issues.

Other than this there are many issues to be tackled separately for Chandrapur district only.

1. There should be a special wing for the human-wildlife conflict of the forest department other than Tadoba Andhari Tiger Reserve in the district. The concerned person should be of DCF/DFO rank. He should be investigated the matter of all the divisions. The wing should handle crop compensation cases, and human and cattle attacks, effectively. The wing should monitor large carnivore movement independently. The primary Response Team (PRT) and Rapid Response Team (RRT) should be part of this wing.
2. The compensation given in human and cattle cases in Maharashtra is highest in India. But there is dissatisfaction with crop compensation of the villagers which ignites the anger of the community.
3. To reduce the gap between the forest department and the community, constant interaction with the people in the villages through this special wing is essential by implementing various programs.
4. Community Awareness activities and on-ground actions with the help of NGOs to improve the relationship between the forest department and local communities should be carried out continuously.
5. Capacity-building programs of the forest staff should be executed to effectively manage human-wildlife interactions, especially those concerning conflict.
6. All government departments that have direct interactions with people, police, revenue, tribal, electricity boards, irrigation, agriculture, fisheries, animal husbandry, district information office, etc. should be periodically sensitized. The programs involve their roles and responsibilities in helping to minimize human-wildlife conflict. There should be joint meetings with the village to district head and through various media support.

7. JFMCs and EDCs to be made more functional by decentralizing powers to the village committees so that decisions on the utilization of funds can be taken at the local level in consultation with respective DCFs.
8. Primary Response Teams (PRTs) are working in the Tadoba buffer very effectively. So, the formation of this team in the other forest divisions is necessary to address conflicts. And proper remuneration should be given to these youths.
9. Rapid Rescue Teams depute at three divisions in strategic locations. The RRT should have a well-trained and dedicated team of five to six individuals including a veterinary doctor, one wildlife biologist, one driver, and two assistants proficient in handling people as well as assisting in rescue operations.
10. Measures to reduce dependence on forest resources and regulation of NTFP is the most important issue. Controlling the villagers venturing into the core area should be restricted.
11. Promoting LPG cylinder usage for all families through existing schemes. All forest fringe villages should be covered by a subsidized refill scheme. This is important to reduce the dependence of people on the forest, which also helps in reducing human-tiger interaction.
12. Distribution of water-heating systems is the most important intervention. A large proportion of fuel wood is still being used for heating water irrespective of the season. There is a need to supply individual, in-house, water-heating systems to drastically reduce fuel wood usage.
13. There is a need to develop fodder plots closer to villages to increase the quality of nutrition of the livestock and to prevent cattle from entering deep inside forests. JFMC/EDC can be empowered to lease out the agricultural land available closer to the village for undertaking fodder development to fulfill the fodder demand of the villages and to facilitate stall feeding of cattle.
14. Inter-departmental coordination during the conflict, especially between the police and the forest department is very crucial. A protocol should be developed in consultation with the police department.
15. Promoting solar fencing is very essential. Individually owned, low-cost solar fencing apart from being reasonably priced is very successful, as it is comparatively easy to maintain.
16. Promote community-run tourism models in the district. There is a need to strengthen community-based tourism activities inside PAs such as Ghodazari and Kanhargaon Wildlife Sanctuaries and in large contiguous forest patches of territorial divisions.
17. Securing the degraded corridors by planting bamboo and native tree species, and through assisted natural regeneration.
18. Mitigation measures on linear infrastructure are very important. The government should take strong steps to address this issue.
19. Removal of problematic large carnivores on priority is also one of the main concerns in conflicts.

## REFERENCES

Bhagat, Rohan, Dhanwatey, P, Dhanwatey, H, Anthropogenic pressure on Tadoba Tiger Reserve: Socioeconomic Study of villages in the western periphery of Tadoba, Chandrapur, India December 2012

Human – Tiger conflict: Cause, Consequence and Mitigation, Dr. Ullas K Karanth, Article, Conservation India

Human-Tiger Conflicts a Current issue of Central India, Paradigm to Rethink the Consequences and Challenges of changing behaviour of Wild Animals in Human Dominated Landscape, Sanjeev Kumar, Department of Zoology, S. S. S. K. R. Innani Mahavidyalaya Karanja Lad. Washim. Maharashtra

Joshi, A., Vaidyanathan, S., Mondol, S., Edgaonkar, A., and U. Ramakrishnan. 2013. Connectivity of Tiger (*Panthera tigris*) Populations in the Human-Influenced Forest Mosaic of Central India. *PLoS ONE*.

Kumar, R. 2011. *Research Methodology: A step-by-step guide for beginners*. Sage Publication, New Delhi.

Karanth, K.K.; De Fries, R. Conservation and management in human-dominated landscapes: Case studies from India. *Biol. Conserv.* 2010

Maharashtra Technical Committee Report on mitigation plans to reduce human-tiger conflict in the district of Chandrapur, 2020

**Annexure****Human deaths in 2021 in Chandrapur district**

<b>Sr.No.</b>	<b>Name</b>	<b>Village</b>	<b>Age</b>
1	Manoj Janardhan Duryodhan	Palasgaon	41
2	Dattu Ramchandra Madavi	Manora	50
3	Naresh Vaman Sonvane	Durgapur	50
4	Moreshwar Shamrao Shrirame	Chicholi	36
5	Vasudev Ramaji Kondekar	Kojbi Mal	55
6	Purshottam Udhav Madavi	Chak Ashta	52
7	Dadaji Pandurang Maske	Dongargaon	65
8	Kalpana Namdev Wadhai	Agadi	55
9	Shridhar Ragho Attram	Sirkada	58
10	Kamlakar Undirwade	Pavanpar	60
11	Durvas Undirwade	Pavanpar	48
12	Vikrabai Pandurang Khobragade	Dhamangaon	65
13	Vanita Vasant Gedam	Janala	45
14	Kirtiram Devrao Kulmethe	Janala	35
15	Sitabai Gulab Chuke	Kokewada	63
16	Rajani Bhalerao Chikram	Ghot Nimbala	35
17	Rama Adku Marbhte	Niphandra	75
18	Manohar Adakuji Pradhane	Maroda	68
19	Bhaurao Dodku Jambhule	Chichkheda	42
20	Vaishali Vikas Mandade	Khushi Dabangaon	32
21	Bharat Ramaji Bavane	Mudholi	60
22	Khatu Bhanu Kumbhare	Aakapur	70
23	Shamrao Domaji Nanaware	Harni	68
24	Ramesh Jairam Waghade	Wadhona	42
25	Motiram Nagoji Garmade	Halda	62
26	Gangubai Ramdas Gedam	Vhahad Buj	61
27	Kashinath Pandurang Talande	Navigation	62
28	Ghatu Vadgu Bhojar	Tekade	65
29	Hiraman Zintu Kotgale	Ballarshah	68
30	Shravan Mahadev Jambhule	Shegaon Khurd	48
31	Madhukar Pikaji Kotgale	Mangli	55
32	Shalik Maniram Chaphale	Gevra Khurd	53
33	Anil Pandurang Sonule	Khandala	36
34	Jogeshwari Ratna Parkhi	Durgapur	68
35	Bablu Singh	Durgapur	25
36	Rajendra Namdev Thakre	Chicholi	41
37	Nayan Maroti Kodape	Pachgaon	10
38	Anil Jogeshwar Munhjamkar	Durgapur	49
39	Pithambar Godaru Tore	Moharli	65
40	Swati Nanaji Dhomne	Kolara	32
41	Babybai Hanuman Dhorde	Kasargatta	55
42	Sandhya Vilas Bavne	Velva	38
43	Devidas Mahadev Gaykwad	Sonegaon	40
44	Chandan Mahadev Nannavre	Bahmni	34

