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Impact of Covid-19 on Forests and Wildlife of India: Some Facts and Figures

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Abstract

Covid-19 pandemic and the resulting limitations have impacted nearly every aspect of life on earth, including environmental conditions and ecosystems. This study examines the impacts of the limitations imposed as result of pandemic on forests and animals of India. Using data collected between 2017–2020 the data analysis reveals mixed environmental consequences. Despite the improvement in air quality and reduction in pollution levels, the lockdowns led to an upsurge in poaching, deforestation, and biodiversity loss due to reduced human supervision and economic desperation among locals. Forest cover classifications showed a significant increase in open and scrub forests, but a decrease in moderately dense forests. Tree cover loss saw an upward trend during the pandemic, reversing the previous downward trend. Furthermore, there was a surge in forest fires and encroachments on forest land, accompanied by an increase in environment-related offenses. The decline in human activity has resulted in heightened poaching of animals and a decrease in confrontations between humans and wildlife. The study emphasizes the importance of implementing well-rounded conservation measures that take into account the requirements of both humans and the environment, particularly during times of crisis.

Keywords: *Covid-19, Forest, Wildlife, India, Human-wildlife Conflict, Environment*

1.0 Introduction

The COVID-19 pandemic has globally impacted the entire world, including everyday life, travel and trade. There have been different strategies to combat the epidemic, resulting in the imposition of lockdowns, masks, stay-at-home orders and no public gatherings. The number of people being affected is increasing day by day and the pandemic is now here near being over. The pandemic and the strategies used to combat it have had significant positive effects on the environment, such as improving air quality and reducing pollution levels in India and the world[1-3]. However, the same has adversely affected the biodiversity. Several studies have been conducted across the globe, which suggest that the loss of livelihood, increased confinement period and less manpower on the field have led to increased poaching incidents, accelerated deforestation and loss of tree cover[3-6].

India hosts some of the most biodiverse regions in the world, ranging from deserts to swamplands, mountains to plains, tropical to temperate forests. It also has four biodiversity hotspots: the Himalayas, Western Ghats, Indo-Burma region and the Sunderbans[7]. India is home to 7.6% mammalian, 12.6% avian, 6.2% reptilian, 4.4% amphibian, 11.7% fish and 6.0% of all flowering plant species[8].

In this context, we present novel insights into the forests and wildlife of India within the context of COVID-19 related restrictions. As the restrictions in India have ranged from partial to complete, India went into a nationwide lockdown on the evening of 24th March 2020 for 21 days.

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The pandemic provided a possibility to explore the progression of the forests and wildlife with the least human intervention. This study compared the reports related to forests and wildlife in 2020 with the statistics obtained during the years 2017-2019. This study investigates the significant impact of the pandemic and reflects on the lockdown measures implemented in the country.

2.0 Objectives

The objective of the study is to highlight the exceptional impact of COVID-19 on the forests and their wildlife. Local job losses prompted the poor local population to make some money out of desperation, by cutting trees, aiding and participating in poaching and also taking advantage of the lax supervision and security (as many forest workers were restricted from visiting the forests) in the forest areas. This further led to the diversion of forests, forest fires, encroachment and the connivance of different interest groups which collaborated to carry on the systemic exploitation of forests.

3.0 Methodology

The study included articles and reports published in major online databases (Science Direct, Google Scholar and Web of Science) and government reports. The search strategy used a combination of controlled vocabulary and free-term texts based on the following keywords: COVID-19 lockdown, biodiversity, animal, wildlife, forest and India. All the sites related to forests and government reports were searched for inclusion. The news briefs of reputed news agencies and organisations were also considered research fields.

4.0 Results and Discussions

4.1 Impact on the Forest Area in India

4.1.1 Forest Cover

According to the Forest Survey of India, forest cover can be classified based on the canopy density classes (Table 1)[9].

The Forest Survey of India carries out this survey every two years[10]. In comparison to 2017 and 2019, very dense forests, open forests, scrub areas and mangrove forests increased in the year 2021. The increase was significant in the former three but comparatively less in the Very dense Forests. The Moderately dense forest had a significant decrease in the year 2021 as compared to 2017 and 2019 (Table 2).

Table 1. Forest cover classification based on canopy density

Class	Description
Very Dense Forest	Tree canopy density of 70% and above
Moderately Dense Forest	Tree canopy density of 40% but less than 70%
Open Forest	Tree canopy density of 10% but less than 40%
Scrub	Tree canopy density of less than 10%

Table 2. Types of forest area in sq km

	2017	2019	2021
Very Dense Forest	98158	99278	99779
Moderately Dense Forest	308318	308472	306890
Open Forest	301797	304499	307120
Scrub	45979	46297	46539
Mangrove	4921	4975	4992

4.1.2 Tree Cover Loss

According to Global Forest Watch data[11], the downward trend of tree cover loss in India changed in 2020. The total tree cover loss in 2020 was reported as 137715.54 hectares, a total increase of 16561.1 hectares from 2019. On a similar note, tree cover loss in primary forest areas increased by 3461.83 hectares compared to the 2019 data (Figure 2).

The reported tree cover loss in the primary forests and entire India had a downward trend in the past few years, which saw a rising trend during the lockdown period (Figure 2). The primary reasons for the same can be attributed to human intervention such as deforestation and fewer instances of wildfires caused due to changing weather patterns[12].

4.1.3 Forest Fires

The total count of identified forest fires was minimal in the lockdown period as compared to the previous year, according to the Forest Report 2021 published by the

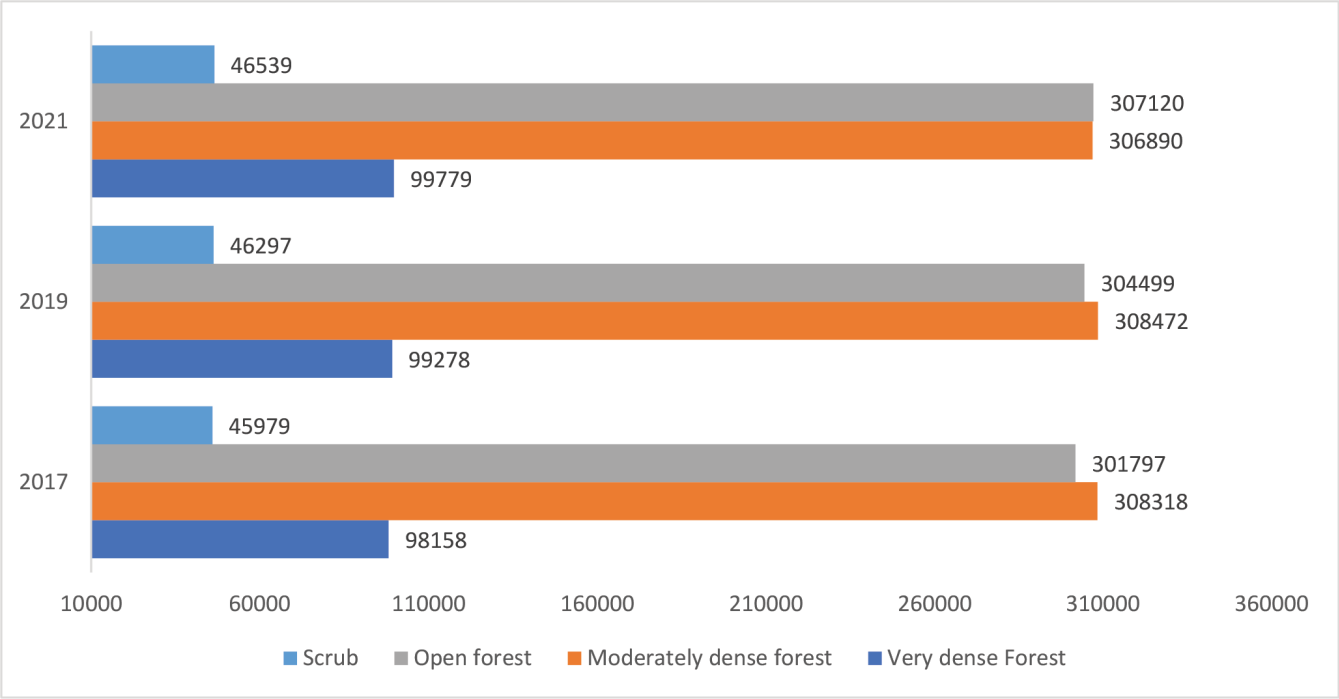


Figure 1. Forest area distribution (sq km).

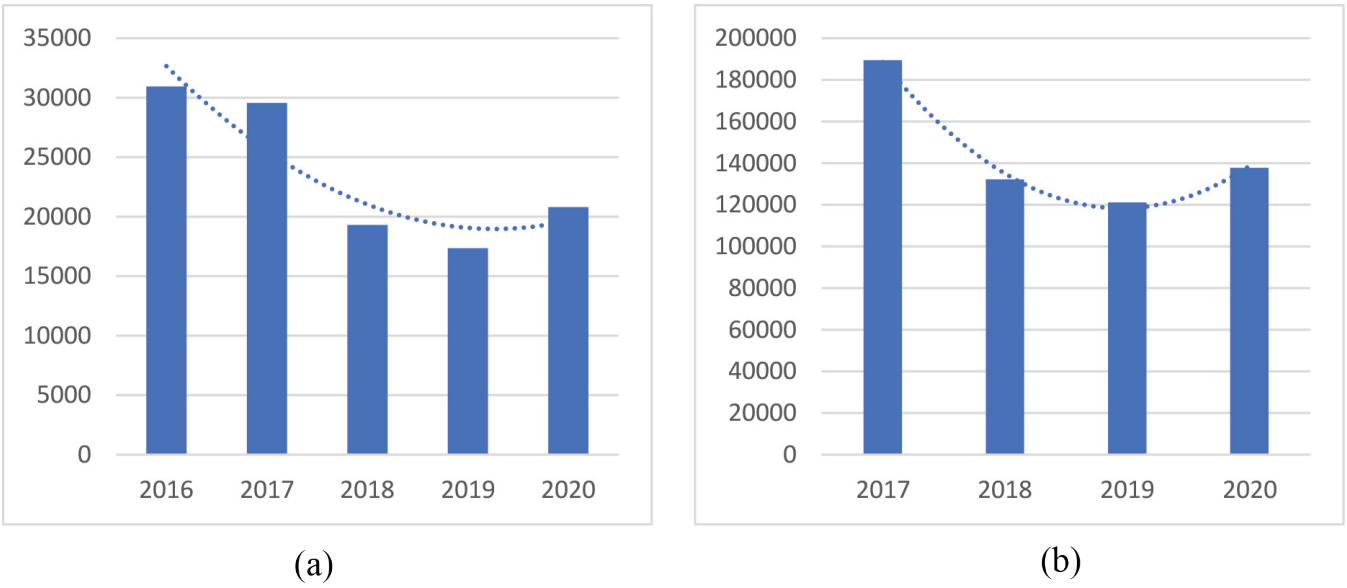


Figure 2. (a) Tree cover loss in primary forests (Ha) in India, (b) Total tree cover loss (Ha) in India.

Forest Survey of India[9]. The detected forest fires declined from nearly 240k to 75k during a similar period from 2019 to 2020 (Figure 3).

95% of forest fires are caused due to direct or indirect human intervention. The rest, 5%, can be due to natural reasons such as lightning and sudden increase in temperature, which are not common reasons[13]. During the lockdown restrictions, human intervention was minimal in the environment, which can be attributed to fewer alerts of forest fires, as seen in the Figure 3.

4.1.4 Diverted Land

The amount of forest land approved for non-forestry use under the Forest Conservation Act, of 1980 increased

significantly in 2020. A total of 30871 Ha of land was diverted in 2020, which is more than 2.5 times compared to 2019 (Figure 4)[14].

The land was approved for 3290 cases ranging from defence, industry, mining, irrigation, transportation, renewable and non-renewable power to irrigation, canals, approach access and forest village conversion.

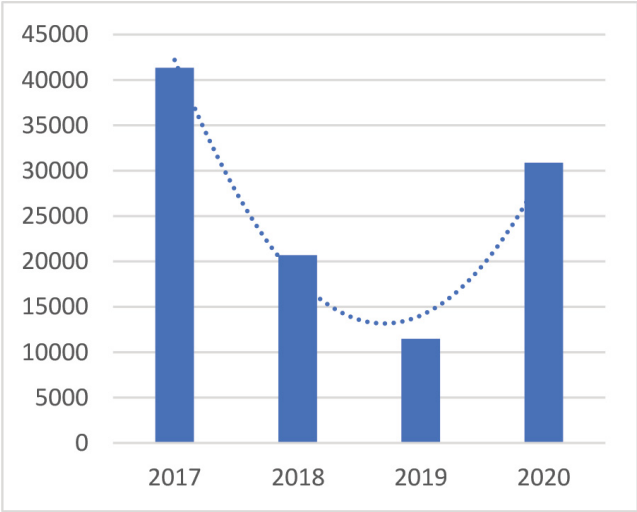


Figure 3. Total forest area approved for non-forestry use under FC Act 1980 in Ha.

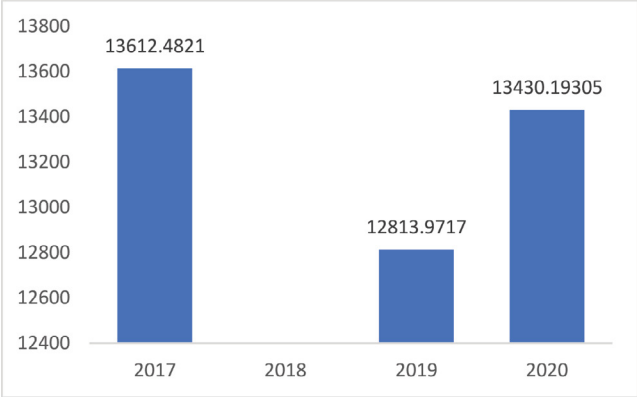


Figure 4. Area of forest land under encroachment (in sq km).

4.1.5 Encroachment on Forest Land

The encroachment on forest land saw a significant rise in the lockdown period[15]. No data could be procured for 2018. The encroachment could be attributed to the loss of livelihood.

4.1.6 Environment-related offences

Although the total number of cases registered in 2020 increased significantly compared to previous years (Table 3), the majority of them were related to The Cigarette and Other Tobacco Products Act (Table 4)[15]. The rest of the offences also increased albeit less significantly during the lockdown period.

4.2 Impact on the Wildlife of India

4.2.1 Wildlife Poaching Activities

Big cat poaching incidents were found to increase during the lockdown period compared to the previous years (Table 5)[16]. A study conducted across India showed a significant increase in the pangolin trade during the lockdown period[5].

The increased poaching instances can be attributed to the lesser on-field personnel and the loss of livelihood for most people. The Forest Department officials had to split their time between regular duties and help out with the COVID-19 outbreak, as a result of which vigilance inside the forests suffered. With less human intervention in the forests, wild animals explored the uncharted spaces in the human habitat. These scenarios helped the poachers to increase their poaching efforts[17]. The poaching incidents also increased for consumption purposes in the case

Table 3. Environment related offences

Crime Head	2017	2018	2019	2020
Total cases registered for investigation	44808	41441	40968	68921

Table 4. Offences as per acts

Crime Head	2017	2018	2019	2020
Noise Pollution Acts	8574	8075	8689	7482
The Cigarette and other Tobacco Products Act	30784	28282	27407	55251
The rest of the offences	5450	5084	4872	6188

Table 5. Poaching incidents across India

	2017	2018	2019	2020	2021
Tiger	38	34	38	31	56
Leopard	159	169	133	170	182
Pangolin		30	49	38*	-

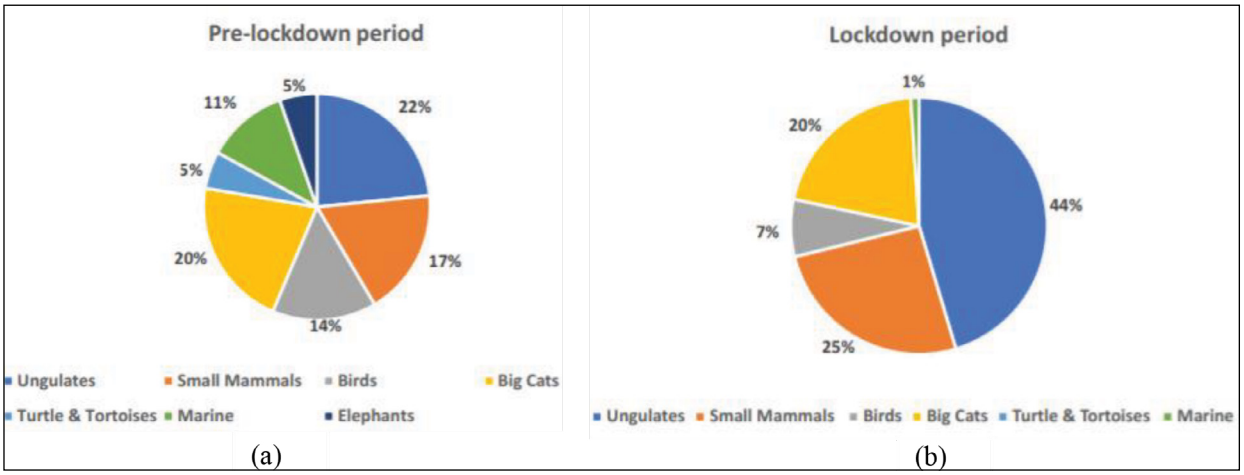


Figure 5. Shift in species poached during lockdown.

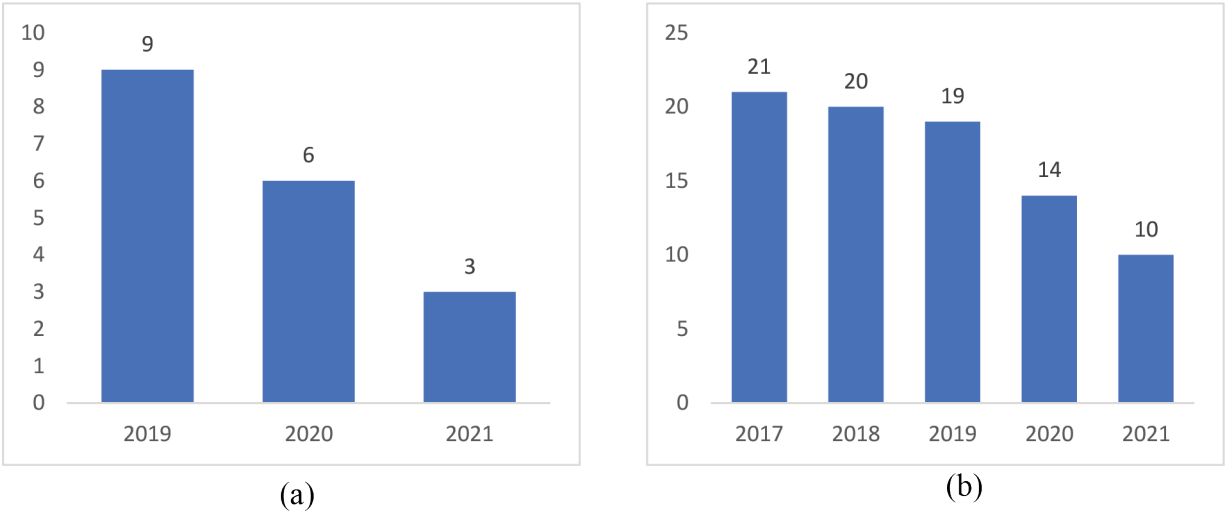


Figure 6. Wildlife vehicle collision, (a) Incidents in Sanjay Gandhi National Park, (b) Elephant casualties in train incidents.

of ungulates and small animals (Figure 6)[4]. Marine poaching incidents however were nearly zero due to the near-complete fishing activity ban[4].

4.2.2 Wildlife-Vehicle Collision

As transportation was limited during the lockdown period, the wildlife-vehicle collision cases were reduced (Figure 7).

4.2.3 Wildlife-Human Interaction

The cases of wildlife-human interaction decreased during the pandemic and led to fewer casualties of wild animals. Elephant deaths reduced from 115 in 2019 to 99 in 2020. The casualties by electrocution also fell from 76 to 65 in 2020.

On the contrary, human casualties in wildlife-human interaction increased during the lockdown period. The

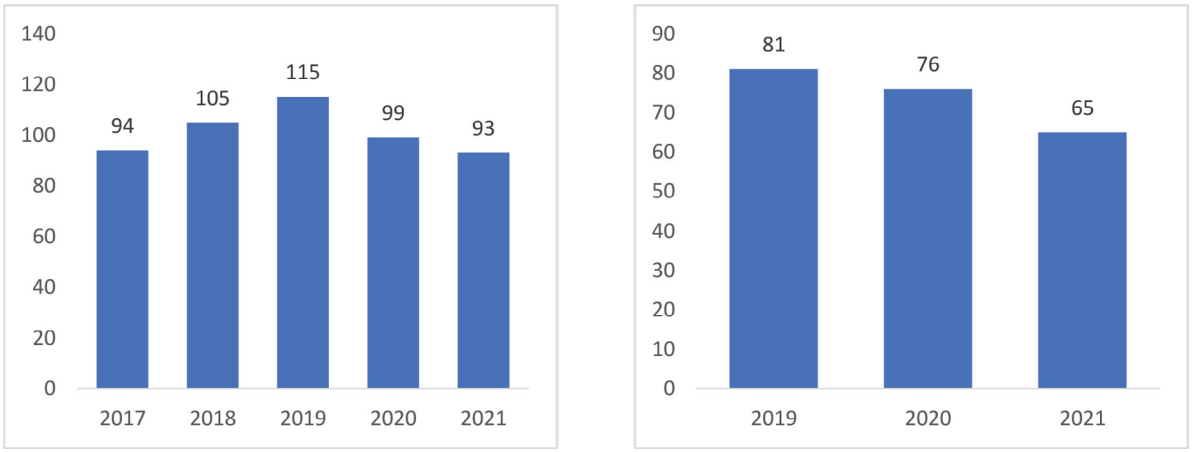


Figure 7. Elephant casualties due to (a) human conflict, (b) electrocution.

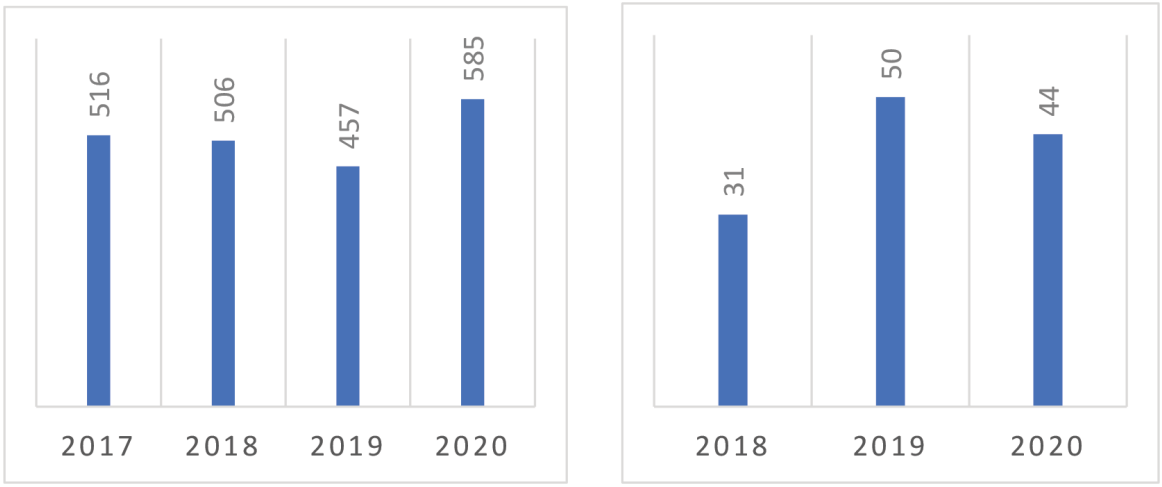


Figure 8. Human casualties due to (a) Elephant conflicts, (b) Tiger conflicts.

conflicts were mainly attributed to the wild animals roaming freely outside the core zones of the forest area as well as moving closer to the human-dominated areas during the lockdown period[18].

5.0 Conclusion

The COVID-19 pandemic has harmed the tree cover in forests and the poaching incidents in the country. The loss of tree cover can be attributed to forest fires. Although the detected forest fires were less, the amount of tree cover lost was more compared to the previous years. The poaching industry benefited from the lesser patrol of rangers and loss of livelihood.

There is also a marked reduction in the deaths of animals due to human intervention and a decrease in wildlife-vehicle collisions during the COVID-19 lockdown period, which is believed to be the result of the drop in traffic. This reduced number most likely led to the survival of many animals, who would have probably not survived in normal traffic circumstances. The human-animal conflict has also seen a reduction in the number due to the former's confinement during the lockdown period. As a result, fewer animals were killed for interfering with the human habitat area. Future efforts to limit human-animal interaction will benefit the conservation of wild animals and the safety of their human counterparts.

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