International Journal of Science, Management and Advanced Research Technology
http://internationaljournalsmart.com/

Review Paper

Condition of Pakistan Wildlife during the COVID-19 Lockdown

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ABSTRACT

Wildlife population helps to maintain the ecological balance of nature. In the past, the wildlife population was declined rapidly. During COVID-19 lockdown, human activities are changed on large scale. This lockdown limits the humans in their houses and these restrictions restored the climate and wildlife to a significant degree. In this situation, we analyzed the conditions of the wildlife sector in Pakistan during the COVID-19 lockdown. The environmental conditions like the quality of air and water are improving and the wildlife population also increases in this environment during this lockdown. This study shows COVID-19 lockdown beneficial effects on wildlife like enhancement in species diversity in less disrupted areas, reduction of landscape fear, reduction in road killing of wildlife, and also the reproductive success of raptors birds. Instead of, highlighting a few beneficial impacts our study also explains some negative impacts of COVID-19 lockdown on wildlife. From the whole study we, conclude that the condition of Pakistan Wildlife during the COVID-19 Lockdown was favorable. Reduction in human disruption is favorable for exotic species, they can increase their population. However, the COVID-19 lockdown also caused an interruption in the conservational activities for globally threatened species and also a rise in the illegal killing of wild animals.

Keywords: Wildlife, Conservational activities, COVID-19 lockdown, Ecological balance, Human activities, Exotic species

Submitted: March 15, 2022

Published: March 24, 2022

ISSN: 2593-8339

DOI: 10.24018/ejmed.2022.1.1.3

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International Journal of Science, Management and Advanced Research Technology

I. Introduction

In 2019 COVID-19 arise as a pathogen of human beings from a virus SARS-COV-2, though it is considered that it has a zoonotic basis [1] On 30 January 2020 WHO proclaimed that COVID-19 is a globally pandemic disease 2 COVID-19 has claimed the lives of humans and animals in over 210 nations, resulting in 67 million confirmed cases and 1.5 million fatalities worldwide, including 1.5 million deaths in Pakistan. [3] COVID-19 holds adverse impacts on both climate and environment and causes global disturbance.

According to WHO, it is assessed that greater than 80% urban population bare unhealthy air, and about seven million people die due to open-air pollution [4] Due to this pandemic disease, all the activities are restricted globally, people are restricted to their homes. Lockdown was implemented to control the COVID-19 pandemic. The safety valves that are used globally for this disease include social distancing, limitations on elements that are used in daily life during quarantine periods. All these measures not only change our lifestyle also change the way to interrelate with other people and our surrounding environment [5]

There are both positive and negative concentrations in the atmosphere decrease [6] The concentration of PM 2.5

decreased 43% and the concentration of P10 decreased 31% in the atmosphere due to a decrease in traffic and construction activities that shows improvement in air quality [7] Lockdown causes a decrease in noise pollution to 60 even in highly populated cities [8] Due to isolationism, many birds, wild animals pets, street animals, and butterflies show many behavioral changes revealed to their ecosystem Leopards are a highly endangered species of big cats but these days ecologists have observed snow leopards in the hills of northern areas of Pakistan, it means that the endangered species are recovering because of less human disturbance to nature and high conservation efforts of wildlife organizations. [9]

Conversely, the negative effects of COVID-19 are viable too [10] so far very restricted data is present about this. Making an allowance that lockdown causes the decline of many practices that are usually done for the maintenance of natural wildlife (IAS). A decrease in administration and management has also increased the risk of wildlife crime menace [11] Many species increase in number due to non-interference of people that cause the increase of invasive species, it is a negative aspect of COVID-19 [12] The use of sterilizing chemicals causes the increase of waste volumes that also affect the wildlife, during lockdown the industries closed for a long period in Pakistan, which increases the population of wildlife. [13, 15]

Pakistan shares its border with China and Iran, having high travel and trade frequencies that increase the risk of viral transmission [14] On 23rd March 2020 first lockdown was implemented in the Sindh province of Pakistan. Later the lockdown was followed by other provinces and all activities in the country were stacked [16] Due to the restricted activities of people the wildlife of Pakistan was affected both positively and negatively.

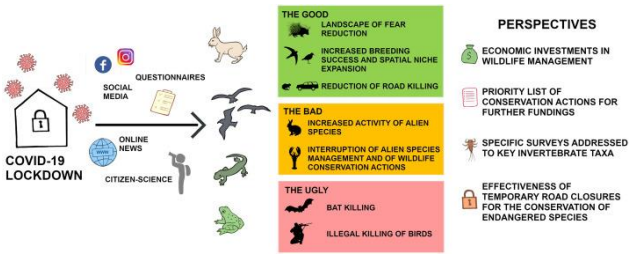

Fig. 1. Covid19 effects on wildlife (source: Manenti R (2020))

I.I Positive impact of covid-19 lockdown on wildlife

A. Enhancement of species diversity

The environment all around the globe is affected at a high level due to unexpected changes in the activities of humans, which also opens ways to recognize how these changes in human activities affect wildlife [53] However, numerous surveys have been used to check how variations in environmental and climate conditions affect wildlife [17] [46]

Countries affected with COVID-19 pandemic resulted in a decrease in water and air pollution is the result of the decline in human activities, transportation, and industries have crippled. The emission of greenhouse gases decreases in China from where the COVID-19 pandemics emerged [35] The decrease in human activities causes the huge spotting of wildlife in urban areas [53] Most economists affirm that "nature just regains its space". Due to the lockdown and confinement activities of humans, animals and birds have more space to utilize, prior it was unavailable animals and birds were because of human activities [59] Many animals are observed and getting attention during the pandemic, examples of these animals that are poster generally in higher numeral are peacocks, deer, birds, monkeys [59]

According to ecologists, during the period of lockdown birds spread their wings and breeding activities to the places that are used by humans during normal days. The migratory birds coming from Siberia to Pakistan are making hay during lockdown because the hunters are indoor the birds can easily fly to their destinations. Due to a decrease in vehicles, public transport, noise pollution depletes across the roads, it results in the reduction of mental disturbance, irritation, and fear of roadside wildlife [52] Due to prolonged and repeated noise, many animals can't perceive their sounds and alarms, these fickle and irregular noise situations resulted as a threat to these animals [59, 8] The lockdown period is the breeding season of Northern Temperate Zone's animals so that the lockdown provides these animals better consequences to breed without human interference [54] However, all these factors cause the increase of biodiversity of different species at different levels.

B. Reduction in road killing of wildlife

The construction of highways motorways and roads for the ease of humans affects wildlife badly by changing their residential places, hurdles of the roads restricted the contact of wildlife animals with each other and limited their movements which cause the impermanence of many animals The heavy traffic flow on roads devastates the natural environment [42]. The main cause of the slaying of animals, reptiles, birds, and amphibians is the accidents with vehicles, moving cars, and other public transport [13]. In the Dir Lower district of Khyber Pakhtunkhwa province of Pakistan, about 108 wild animals are killed on-road part of 22km in road accidents per year.[60] Every day a huge number of animals are killed on roads due to these accidents. These accidents become a major factor that influences the age, sexual relations, and fertility of animal populations [41] After the implementation of lockdown due to the COVID-19 pandemic in Pakistan, the total of vehicles decreased. Wildlife protection increase with a smaller number of transport vehicles on roads and people are also restricted to their homes during this COVID-19 pandemic situation also provides safety to wildlife from crashes and road accidents [1].

C. Reproductive success of raptor

The raptors include orders Cariamiforms, Falconiformes, Accipetriforms, Strigiformes, and Cathartiforms [30, 39]. Raptors are different in their compliance to human activities; some raptors have specific responses to changes in the surrounding environment while some are not. Raptors

give perilous ecosystem service station [31, 36], and generally, these birds are used as a criterion of environment health [55] and biodiversity [57, 56] The decrease in denizens of predators causes harsh conditions to biodiversity {50] especially in those areas where humans are present in good numbers [50] Globally there are more than five hundred species of raptors are present, from which 19% are declared as threatened and 52% are warned [45, 39]. Humans cause the disturbance of raptors during holidays [54]. During holidays the Spanish imperial eagles and vultures are seen in less number on roads due to heavy traffic [58]. Human activities affect raptors that cause the rejection of their breeding territories, disturb nest care, productivity decline, change in energy resources, change habitation, and change foraging patterns [37, 49] The decline in human activities during the COVID19 pandemic leaves a positive impact on the raptor's reproductive success. Reduction in road traffic resulted in increases in the occurrence of more sensitive raptors to the roadsides and also increases their activity time [62]s

D. Depletion of landscape fear

The animals have a psychological state to escape and go to those places that have a smaller risk of predators in their habitat ecologists named it "landscape fear". Humans also act as predators to other animals and as creative killers that influence all their nutritional levels. Fears are of two types in animals first innate fear, for example, fear of ground squirrels for foxes, and second is learned of fear to perceive others or directly experience something [40] Human lives and maintenance are affected by large carnivorous animals; thus, they kill these animals [42] The killing of large carnivorous animals has changed nature [43] Some animals are more afraid of people than other animals, e.g badgers are more afraid of humans than bears and dogs. The loud noises of people and traffic cause them to get the baggers to their burrows and they never appeared out from their burrows due to the sound fear even they do not fulfill their nutritional requirements [63] Due to traffic and activities of hum Killing and that cause noise in the environment, the birds and animals can't hear their important calls and sounds from other animals and birds [11, 29] The decrease of outside noise due to traffic and other human activities during the COVID19 pandemic in Pakistan has a positive impact on wild animals and birds [11] But now the world has become less terrifying for wildlife due to stacked activities and COVID-19 spread. There are no crowds in parks, tourism places give animals some freedom and now animals have to see on local places. The depletion of landscape fear of humans also has positive effects on the wildlife of Pakistan, there is an increase in the daily activity of the wildlife species.

I.II Damaging effects of covid-19 lockdown on wildlife

It is observed through social media that COVID-19 lockdown also has some negative impacts on wildlife. All activities around the world are stuck during the lockdown, which introduces many problems for wild animals like scarcity of food conservation and illegal killing are increased during this period.

A. Interpretation of conservation activities for threatened species

Reduced activity to minimize the transmission of COVID-19 has resulted in the reduction of park revenues on a large scale around the world and reduced administration, as well as the human presence in protected areas, has contributed to an increase in illegal activities such as hunting and poaching [23] The decrease in tourism in Pakistan helps wildlife to grow more peacefully, but it hurts wildlife conservation. The loss of tourism earnings is signaling that tourism funds help a lot to protect and conserve wildlife [63, 52]. Due to the unavailability of funding sources, conservation and administrative management are disrupted in Pakistan, causing the degrading of parks, delaying monitoring and research operations, and vulnerable species protection that makes the situation more deceptive [33] The removal of charities and government financial ads and economic crises, as well as the failure of environmental rules, may exacerbate conservation efforts [60, 18] This pandemic caused the loss of jobs, food system disruption, and remittance decline [61, 44] COVID-19 affects the conservation of wild animals in different ways. For example, the endangered species of Indian pangolin is under more stress because of its killing due to the anti-pangolin assumption [20] The absence of staff in protected areas increases the illegal poaching and killing of wild animals. Some communities also allow the hunting of species for survival due to scarcity of food [21] The other cause of threat to wildlife is false assumptions, that as with coronavirus disease due to this reason peoples kill these animals. In Pakistan black bear is threatened due to illegal wild animal poaching, killing human-wildlife conflicts, and deforestation during COVID-19.

B. Illegal killing and poaching of wild animals

Pakistan has an act with the Agreement of Unlawful Trade of Rare Species (CITES) pact to protect the wildlife called the wildlife trade control act (2012). In Pakistan, a lot of efforts are done against illegal hunting and poaching of "wild animals" but despite all these efforts, many cases of illegal hunting of threatened species are reported [32, 47] Due to the illegal killing and poaching of many species of Panther Tigris, Snow leopard and rhinoceros become threatened [51]. At the time of lockdown, it was difficult for hikers, scientists, and rangers to keep an eye on and maintain the protection of wildlife species. This makes it impossible to notice the threats to wildlife [12] and it also increases the chances of illegal killing and poaching of threatened wildlife species. The illegal trade of wild animals increases to double during the lockdown. During April and May in lockdown, the cases of killing and poaching of animals and birds increase in Pakistan. A case of 65 cranes was found to transport illegally from D.I. Khan to Peshawar. There was an increase in the surge of illegal hunting and poaching in northern areas of Khyber Pakhtunkhwa. Despite the efforts of authorities to reduce the illegal killing of wild animals, it increases three times during lockdown in northern areas of Pakistan.[26, 38]

C. Increase in invasive species

The species that are introduced from outside and do not occur naturally in an area are known as Non-native or exotic species, and these species are scattered through humans active. In recent years, invasive species becomes a danger to biodiversity and wildlife. The increased number of invasive species becomes 2nd largest threat to wildlife (press). In past, the presence of non-native species in Pakistan was not taken as a serious problem, but now the presence of invasive species is taken seriously because these species cause harmful effects on biodiversity [28] The invasive species affect native wildlife by changing their food chain, affecting the availability of those species that give benefits to native wildlife. The invasive species also induce direct effects on native species by killing native animals to fulfill their nutritional requirement, carry disease, and compete with native species for food and shelter [19] The presence of invasive species out of their native environment causes the basic source of environmental change to aquatic and terrestrial animals [25] The invasive species also cause the emergence of pathogens in humans and other wildlife animals [22] Exotic species are also introduced in Pakistan, about 700 alien species are present in this area. Out of which some spices are more invader [27] Most of the worst invader plants in Pakistan include B. papyrifera and P. hysterophorus. [44, 48 34] The non-native species cause a global economic burden because non-native species are the source of emerging and reemerging zoonosis diseases [24] for example, fish parasites, forest pests, and insect crops. [1] Exotic species also cause variations in the genes of similar species [66] During lockdown besides the trade and other movements being closed, an increase in exotic species was noted that harms the biodiversity. The aggressive exotic species cause damage to native species.

II. CONCLUSION

In this study, we conclude that the wildlife of Pakistan is affected both positively and negatively by the restrictions imposed by the government. The decrease in human activities, and transportation during the lockdown, resulted in an increase in wildlife presence in a natural ecosystem. The decrease in tourism helps wildlife to grow more peacefully. Wildlife disturbance due to humans decrease during the lockdown and allows wildlife to enjoy their natural habitat. Many wildlife species are seen to move freely on roads and streets. The road killing of wildlife due to collisions with vehicles is also reduced. The increase in several threatened species is observed during this period. At the same time, the lockdown has some negative impacts on wildlife. Lockdown has reduced the activities that were normally performed for the maintenance of natural wildlife. A decrease in administration and management has also increased the risk of wildlife crime menace. Many species increase in number due to the non-interference of people. The increase in invasive species jeopardized the survival of native animals. COVID-19 affects the conservation of wild animals in different ways. The chances of food scarcity, illegal killing, and poaching of wild animals due to the absence of conservation authorities and lack of tourism affect the survival of wildlife.

ACKNOWLEDGMENT

I would like to thank Miss Quratulann Sattar for helping me in the publication process.

FUNDING

This research received no external funding

CONFLICT OF INTEREST

The authors declare that they do not have any conflict of interest.

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