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Anthropogenic Activities And Conservation Plan For Vulture In Vindhya Region

By

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Abstract

Introduction - Diclofenac drugs being one of the most prominent reasons for declining the population of vultures in India. As when vultures feed characters of a livestock who are exposed by diclofenac, unfortunately it causes renal failure and is the reason for mortality of vultures within 72 hours.

Objective - The main purpose of the research is to generate an accurate amount of research on the Vindhyachal region which is a strong host of vulture species. The conservation plan prepared by MP and Indian government for vulture preservation and conservation in the Vindhya region is estimated. The study also highlights anthropogenic activities that are responsible for the downfall of these species and make them endangered.

Methodology -Qualitative research approach is chosen for this research because it is best suited to explore the contribution of humans and its influencing role in the environmental adversity specifically concerning the turn down number of Vulture with respect to the Vindhyan region of India.

Results - The finding indicates that the species of vultures is now fortunately growing in Rewa district lies under the Vindhya region. As estimated, 345 vultures have been found in the district, in which adults are 318 and minors are 27. Moreover, several major and minor efforts have been taken by the government and local population as a joint cooperation for this enhancement in the population of the vulture.

Keywords : Vulture in Vindhya region, Anthropogenic activities on vulture population, Conservation efforts for protecting vultures.

1. Introduction

Vultures play a prominent role in the ecosystem because of their scavenging role and the way they clean the environment through consumption of animal carcasses. As well as their socio- cultural and religious significance. The population of vultures was around 40 million in the 1980 's which declined to 90% in the mid 90s and reaching to the millennial world the number of vultures worsen upto 99 percent in 2007 of three prominent species of vulture *(Gyps)* found in India had been wiped out (Campbell & Radhika, 2020).

This turn down in vulture population came into limelight in the late 90s. The most vital reason behind the downslope number of vultures identified by the Indian government is the impact of a veterinary drug named diclofenac (McClure et al., 2021). It is a non-steroidal anti-inflammatory drug which is toxic to vulture and is widely spread in cattle carcasses, which was consumed by vultures and the carcass is contaminated with drugs which became the primary cause of vulture extinction.

Vultures in Indian Continent

In total nine species of vulture have been identified in the South Asian region out of which 8 are native and one belongs to migratory species. These are the "Oriental White-backed Vulture (*Gyps bengalensis*), Slender billed Vulture (*Gyps tenuirostris*), Long billed Vulture (*Gyps indicus*), EgyptianVulture (*Neophron percnopterus*), Red Headed Vulture (*Sarcogyps calvus*), Indian Griffon Vulture (*Gyps fulvus*), Himalayan Griffon (*Gyps himalayensis*), Cinereous Vulture *(Aegypius monachus*) and Bearded Vulture or Lammergeier (*Gypaetus barbatus*)" (Campbell & Radhika, 2020) . When it comes to previewing the Indian subcontinent, it embraces India, Nepal, and Pakistan. As already discussed, the rapid diminution of vultures took place in India in the decade of 90s. Although, the vulture found in Nepal also shows similar magnitude of wave with greater than 90% of a species gone extinct till 2001. As a result, these three *Gyps vulture* species got enlisted in IUCN in 2000 under the category of critically endangered (Biswas, D., & Krishnamurthy, 2023). The prominent reason behind making the species an endangered species in India, Nepal and Pakistan is the NSAID Diclofenac (McClure et al., 2021).

Vulture in Vindhya Region

Vindhya Region

Vindhya region is located in the North East part of central state Madhya Pradesh of India.t the location is significantly known for the connecting North India to South India. The region is well flourished with geographical rich biodiversity as it has a discontinuous chain of mountain range, hills, highlands, and plateau (Kumar, S et al., 2016). The Vindhaynachal mountain range is the source of several rivers such as Chambal, Betwa and Ken, and all

these rivers are part of Ganga- Yamuna river basin system, as well as a number of waterfalls like Bahuti, Kevati make this region an eco-friendly and enriched location for habitation of several species and establishing breeding centres. Because of its natural vegetation and eco-rich diversity famously known as the home of several species like *Kuno National park* which is presently known for conservation of extinct species of cheetah, *Bandhavgarh National Park* recognised for house of white tigers and for its flora and fauna Diversity. Except for preserving tigers and big cats, these range of bio-enriched locations are vital for conserving vultures.

Vindhya region has a large vulture population because of its tropical and subtropical climatic zone, suitable forest cover mountain and valley, large cattle and wildlife population. Vultures' nests and roosts are on cliffs and in trees, subsequently formed in open forest area and open habitat specifically in grassland shrubs and open forest and hilly and mountain areas (McClure et al., 2021).

BNHS India identified win their region of Madhya Pradesh as a safe zone for vulture rehabilitation and conservation program. BNHS works to preserve and make vulture safe zones in the region of Madhya Pradesh prominently because of its rich ecological habitat. The long and big waterfalls are suitable places for breathing and need special attention because vultures are near to the doorstep of an extent in the wild and require rehabilitation immediately (Pandey, K. S. 2016).

2. Literature Reviews

Species of Indian vulture such as *Gyps* are enlisted in the critical endangered category of iucn, still unappropriate monitoring being the prominent cause for conserving the species. The motive of the study (McClure et al., 2021) is to identify the population of Indian vulture specifically focusing on Central India by covering two major states that is Rajasthan and Madhya Pradesh over a period of 2007 to 2016. The study tries to project the population trajectory of these years and identify the difference between populations based on the area. The finding indicates that the vulture population in Rajasthan is declining in comparison to the numbers of vulture found in Madhya Pradesh. The research suggests that long-term monitoring is essential to determine the conservation strategies and its impact on the number of vultures from India and others across their range.

The Indian vultures are significantly important from an ecological and socio-culture perspective and catastrophic dropdown in numbers. They protect ecosystems because of their scavenging role and the way they clean the environment through consumption of animal carcasses. The study emphasises on identifying how rehabilitation programs can take place for protecting vulture population in the Vindhyan region found in Madhya Pradesh by generating local capability of population through species monitoring, generating awareness, and conservation implementation plan (Pandey, 2016). The purpose of the research (Campbell et al., 2020) is to explore the presence, roosting and nesting habitats of vultures in specific regions based on their land cover. The study

choses qualitative and quantitative approach to accomplish the research. The finding indicates that specific species of vulture are found in summer and winter based on their habitat, more often they are present in high forest areas and nested in large trees and on cliffs in open land areas. The study examines average total number of vulture population is 7028 out of which largest species belongs to *long-billed vulture* which is 3351 in number and least species is rectified as *cinereous vulture* which is 39. Vulture protection, food tracking and human interference are manageable with the policies proposed and implemented by the government. The consequences of the research assisted to supervise and control vulture preservation in the central part of India.

Another research (Kumar, S et al., 2016) is focused on exploring Bandhavgarh tiger reserve (BTR) with the perspective of identifying vulture species. In BTR, there are four vulture species that belong to residential species and two species that come under the category of migratory are found in harbour. The study focuses on exploring the population of vulture found in and around BTR through monitoring their roosting and nesting places and exploring the capacity building program that encourages conservation of vulture species. The finding indicates that in all 541 Indian vultures, 222 of white-rumped vultures, 95 of red-headed vultures and 125 of Egyptian vultures are estimated in BTR region. The study also identified that vultures found competition from crow and feral dogs in that religion. The bandhavgarh reserve is very prominent from a vulture perspective as it is a home of 3 critically endangered and one globally endangered vulture species. Hence, effective management and conservation strategy implementation is needed of the hour to make one of the most suitable protective areas for vulture perspective.

Vultures are special species which use a wide habitat and forage niche and their survival rely on protection of their habitats. The study (Biswas & Krishnamurthy, 2023) explored the Greater Panna Landscape (GPL) found in the Central India region intended to identify the population of vultures and their habitats. In the Panna region study identified 30 nest sites, 31 roost sites and cliff nesting vultures that are used by four species of vulture. The finding indicates that one area comes under top 20 in terms of protection and conservation for nesting and roosting programs in India. This geographical location is responsible for 60 percent of critical habitat and long-term preservation of the population of vultures in the region.

2.1 Research Question

- Anthropogenic activities that are responsible for the downfall of Vulture species and make them endangered.
- To explore the efforts of the MP and Indian government for vulture preservation and conservation in the Vindhya region?

2.2 Importance of the Study

Vulture, one of the most affected species because of anthropogenic influence specifically in the Indian continent. The Government of India initiated a conservation program for protecting vultures and tried to take effective measures to improve its alarming declining numbers. Henceforth, an action plan for vulture conservation took place in the year 2006. There are several academic works present in the ecological research domain emphasising on conservation of vulture, their benefit, their concerning population, anthropogenic adverse effect among others. However, very few or no studies emphasise anthropogenic activities and conservation plans for vultures specifically focusing on Vidhya region. Thus, this piece of work acts as a noble study to identify the vulture population in the Vindhya region and a conservation program for protecting them.

2.3 Research Objectives

The main purpose of the research is to generate an accurate amount of research on the Vindhyachal region which is a strong host of vulture species. Along with the conservation plan prepared by MP and Indian government for vulture preservation and conservation in Vindhya region. The study also wants to highlight anthropogenic activities that are responsible for the downfall of these species and make them endangered. Moreover, the human activities in the present scenario and their role in promoting conservation vulture practice.

2.4 Scope and Limitation

The main intention of the research is to explore the Vidhya region with respect to vulture and conservation plan to protect the species. Henceforth, the scope of the research is how when they are a region they play a significant role in protecting and conserving vultures under the influence of anthropogenic activities . This scope also acts as a limitation because vultures are found in the Indian subcontinent and the study emphasises and concentrates its focus only in the Vindhya region that is located in Madhya Pradesh, while ignoring other prominent locations for the conservation of vulture that take place in India such as Haryana, Bihar and others.

3. Research Methodology

Qualitative research approach is chosen for this research because it is best suited to explore the contribution of humans and its influencing role in the environmental adversity specifically concerning the turn down number of Vulture with respect to the Vindhyan region of India. Qualitative methodology assists to profound understanding of the theme and the subject of the research in its natural manner such as impact of anthropogenic activities and how humans are negatively associated with worsening the habitat for vulture in their own land. Additionally the action plan proposed by the Indian Government to conserve the population of Vulture by interpreting the theoretical framework of statistical analysis of numbers. The design was employed to explore the subject through a distinct domain and its utility in the real-world within the bounded system and the author intended on using data from multiple sources to address the research question.

This type of research design assists resilience features that incorporate to expand beyond diverse drives and collect data from electronic resources such as government and international documents, govt websites, and existing literature related to the theme such as Vulture population,conservation plan for Vulture in India and Vindhya region, anthropogenic and its impact on environment.

4. Analysis of Study

Question 1 - To explore the efforts of the MP and Indian government for vulture preservation and conservation in the Vindhya region?

In order to explore the efforts taken by the Madhya Pradesh government and its forest department for conserving the extinct species of vultures. This study taken some prominent points of forest survey and illustrate the effective measures taken to protect one of the most vital species of ecosystem are as follow-

- This extinct species of birds is now increasing rapidly in Rewa district. According to the calculations, 345 vultures have been found in the district, in which adults are 318 and minors are 27. The enumeration took place in four enclaves of Rewa district, Semaria, Sirmour, Antaraila and Hanuman, in which 22 places were pre-marked.
- For estimation, the government takes initiative by conducting a monitoring process by sending some individuals to these places together, more than a hundred employees were employed for this calculation. The officers and employees of the Forest Department have expressed happiness over the increase in the number of vultures.
- Deputy Forest Officer Rishi Mishra, said that the census of the extinct vultures was conducted in the year 2019. Although, as proclaimed in the protocol, the provision of conducting a census takes place every two years. The last census indicates that the number of vultures in Rewa district was 137, of which 115 were adults and 12 were juveniles. There are eight enclaves in the district, but for counting the population in the Rewa region, only those areas are considered where vultures nest.
- This time counting was done at 22 places in four zones and the number has increased more than two times. According to the calculations, 245 vultures have been found in Semaria, three in Rewa, three in Antaraila, 38 in Sirmaur, 56 in Hanumana.
- Majorly, in the Vindhyan region specifically in Rewa district there are four species of vultures are found presently.
- Four species of vultures have been found in Rewa district. In which white vulture, Indian vulture, king vulture, chamar vulture are there. It has been indicated that Himalayan vultures also come here for some time. Forest Department employees have collected their feathers from many places, which are being identified.

- In MP, there is a huge decline found in selling diclofenac during 2014-2017.

Here are some pictures of the vulture roosting or nesting sides, found in and around Rewa district-

Figure 1: View of habitat preferred by vulture

Figure 2: The tree and vultures

Figure:3: Vulture fly near there roost

Figure 4: Nearby tree and surroundings.

Figure5: The tree suitable for vulture nesting.

Conservation efforts for protecting vultures and awareness programs have been conducted continuously for many years, now the number has increased, so it is a matter of pleasure for the department. To enhance the capacity and awareness level of local mass associated near the habitat region. The administration and village people are appropriately working together to improve the awareness regarding declining the number of vultures through several efforts such as quiz contest presentation communication programs and developing a number of study materials in English and Hindi that display in school and local community centres. These resources are embedded

such as the reason for declining and leading the vultures to extend, how to conserve the species, and what are the threats to them.

Question 2 Anthropogenic activities that are responsible for the downfall of Vulture species and make them endangered?

The scholar indicates (Jha & Jha., 2021) that forest cover rather than climate act as a major factor for forest dwelling and species for flourishing and distribution, although other components such as vegetation play influential roles in distribution of livestock and cattle in more than one region as the availability of land and food provide shelter for animals. The interaction of animal and vulture makes them suitable to formulate large areas for habitat rather than specific bio-environments. It is already well known that forest and water bodies play vital ingredients for habitat suitability rather than other components (Jalihal, S et al., 2022). But because of animal availability in open land vultures also form their shelter or habitat in nearby places. This is associated with anthropogenic activities such as human formulated cropland, pasture land, their dense populated arena, night time light, railways, roadways, waterways are some very common human made structures which acts an unfavourable environment for vultures and which was negatively associated because of anthropogenic disturbance (Campbell, M. O. N., 2015). All these are responsible for making vulture habitat near human habitat localities as a study indicates that some prefer to set up their colonies while others live near rural garbage dumps and surrounding areas. Other than that the major factor was the drug that acts as a toxic for vultures.

Diclofenac drugs being one of the most prominent reasons for declining the population of vultures in India (Taggart, et al., 2007). As when vultures feed characters of a livestock who are exposed by diclofenac, unfortunately it causes renal failure and is the reason for mortality of vultures within 72 hours.

After the government introduced an action plan for conservation of vulture in the year 2006 the drug was completely banned by the DCGI through measures like stopping its production, manufacturing and sales. The band was initiated in the year 2006 and became a law through proclaimed by the gazetted in 2008 (MoEFCC, 2020). Unfortunately, after a number of efforts taken by the government to restrict the use of diclofenac, it is still being used and species are dying because of poison (Cuthbert, et al., 2016). The main reason behind this is humans are continuously formulating the drug in various vial sizes (30, 50, and 100 ml) and used on cattles and livestock.

Other human activities which are responsible for declining and threatening the vulture species are-

- Deficiency of nesting sides for their breeding and habitats
- Declining in carcass availability because of shifting from conventional farming practice toward mechanical farming.
- Excessive use of pesticide and other chemicals to enhance the yield and production of crops which are responsible for declining the catastrophic.

- Global warming which is associated with anthropogenic factors has been responsible for threatening or dropping the number of species.

5. Results

The Indian vultures are significantly important from an ecological and socio-culture perspective and catastrophic dropdown in numbers. It was mentioned by the scholar (Santangeli, et al., 2019) that vultures perform a vital role as they are biological agents for waste management and public health maintenance. It is needed to understand the relationship between vulture and its role in the environment and their benefits in and around human and natures sustainability. Because distribution of vulture is critical for the preservation and effective management of the forest areas. They protect ecosystems because of their scavenging role and the way they clean the environment through consumption of animal carcasses.

The finding indicates that the species of vultures is now fortunately enhancing in Rewa district lies under the Vindhya region. According to the calculations, 345 vultures have been found in the district, in which adults are 318 and minors are 27. Moreover there are several efforts jointly taken by the government and local population for this enhancement in the population of the vulture. The administration and village people are effectively working together to improve the awareness regarding declining the number of vultures.

The human activities mentioned in the analysis section are some other factors which are responsible for threatening the life of vultures not only in the Vindhya region but also in India. Such as nest disturbance, habitat destruction, drought and other natural disasters which are directly and indirectly influenced by anthropogenic activities. The species are widely threatened even today by enormous drives like drug, dietary toxins, collision of infrastructure, electrocution, disturbance and degradation.

6. Conclusion

Vulture, one of the most affected species because of anthropogenic influence specifically in the Indian continent. The Government of India and the MP government initiated a conservation program for protecting vultures and tried to take effective measures to improve its alarming declining numbers. Henceforth action plan for vulture conservation took place in the year 2006. There are several academic works present in the ecological research domain emphasising on conservation of vulture, their benefit, their concerning population, anthropogenic adverse effect among others.

This study provides a comprehensive overview of the diversity of vultures in the Vindhya region based on the data available by the forest department of MP. The main purpose of the research is to generate an accurate amount of research on the Vindhyachal region which is a strong host of vulture species. Along with the

conservation activities and steps taken by MP for conservation of this bird species in Vindhya region. The study also highlights anthropogenic activities that are responsible for the downfall of these species and make them endangered.

Human activities which are responsible for declining and threatening the vulture species are deficiency of nesting sides for their breeding and habitats, declining in carcass availability because of shifting from conventional farming practice toward mechanical farming. Excessive use of pesticide and other chemicals to enhance the yield and production of crops which are responsible for declining the catastrophic. Other than that the major factor was the drug that acts as a toxic for vultures. Diclofenac drugs being one of the most prominent reasons for declining the population of vultures in India

6.1 Suggestions

It is needed to understand the relationship between vulture and its role in the environment and their benefits in and around human and natures sustainability. Additionally, to enhance the population of vultures and awareness level of local mass there is a need of the day to find strengthening association between the administration and local people near the habitat region.

References

CAMPBELL, M. O., & Radhika, J. H. A. (2020). Vultures, their population status and some ecological aspects in an Indian stronghold. Notulae Scientia Biologicae, 12(1), 124-142.

McClure, C. J., Rolek, B. W., & Virani, M. Z. (2021). Contrasting Trends in Abundance of Indian Vultures (Gyps indicus) Between Two Study Sites in Neighboring Indian States. Frontiers in Ecology and Evolution, 9, 629482.

Kumar, S., Pandey, N., Gore, K. G., Rather, T. A., & Atri, K. S. (2016). Conservation of vultures in and around Bandhavgarh Tiger Reserve. Vulture News, 70, 42-68.

Biswas, D., & Krishnamurthy, R. (2023). Predictive Distribution Modelling of Critical Habitat Availability and Prioritization for the Vultures in the Greater Panna Landscape, India.

Jalihal, S., Rana, S., & Sharma, S. (2022). Systematic mapping on the importance of vultures in the Indian public health discourse. Environmental Sustainability, 5(2), 135-143.

Campbell, M. O. N. (2015). Vultures: their evolution, ecology and conservation. CRC Press.

Pandey, K. S. (2016). Vulture: need rehabilitation in Vindhyan eco region India. School of Environmental Biology, Centre for Biotechnology Studies, Awadhesh Pratap Singh University, Rewa. ESAIJ, 12(6), 239-242.

Santangeli, A., Girardello, M., Buechley, E., Botha, A., Minin, E. D., & Moilanen, A. (2019). Priority areas for conservation of Old World vultures. Conservation Biology, 33(5), 1056-1065.

Jha, K. K., & Jha, R. (2021). Study of vulture habitat suitability and impact of climate change in Central India using MaxEnt. Journal of Resources and Ecology, 12(1), 30-42.

Cuthbert, R. J., Taggart, M. A., Saini, M., Sharma, A., Das, A., Kulkarni, M. D., ... & Green, R. E. (2016). Continuing mortality of vultures in India associated with illegal veterinary use of diclofenac and a potential threat from nimesulide. Oryx, 50(1), 104-112.

Taggart, M. A., Senacha, K. R., Green, R. E., Jhala, Y. V., Raghavan, B., Rahmani, A. R., ... & Meharg, A. A. (2007). Diclofenac residues in carcasses of domestic ungulates available to vultures in India. Environment international, 33(6), 759-765.

MoEFCC (2020). Action Plan for Vulture Conservation in India, 2020-2025. Ministry of Environment, Forest and Climate Change. Government of India