



UNREMITTING EFFECT OF HUMAN ACTIVITIES ON THE SURVIVING VULTURE POPULATION IN BUNDELKHAND REGION, INDIA

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ABSTRACT

Birds are an integral part of the whole system of life on this earth. There are endless incidences when animals suffered due to never-ending desires and thoughtlessness of human beings. A recent example is the decline in vulture population. This study was undertaken from 2014-2017 to present the overall view of the unremitting effect of human activities on the surviving vulture population in Bundelkhand Region. Field visits and questionnaire were undertaken to carry out the study. Two type of questionnaire were developed (Precise and Closed; Broad and Open ended). After the ban of Diclofenac for animals (the main suspect of vulture decline) in 2006 and the notification regarding the single unit dose pack of diclofenac for humans in 2015, there are several other reasons that are adversely affecting the vulture population. The foremost of these are pruning of the large nesting trees by the villagers, loss of the local profession of de-skinning dead cattle, their inappropriate dumping (burying, disposal in water bodies), no apt action for the uncontrolled population of feral dogs that hinder the feed of vultures, the unnecessary lightening of monuments where vultures are nesting, use of drones in such sites without permission, consent for shooting schedules in the monuments during breeding period. The mining activities are also a major threat to the vulture population residing in the rocky cliffs. These are causing unremitting effect on vulture population due to human activities. It is highly recommended to the concerned departments to take urgent actions and to co-ordinate amongst them so as to bring to a halt the dwindling vulture population.

KEYWORDS: Vultures, Bundelkhand region, Human, Population.

INTRODUCTION

Birds are an integral part of the whole system of life on this earth. There is no end of the incidences in which animals are suffering due to the never-ending desires and thoughtlessness of human beings. The decline in vulture population is one such example. The nature's best scavengers, once abundant in India started facing the population crash since 1980s. This went un-noticed until the mid 1990s when the Scientists and conservationists realized the irreversible losses. Various causes were identified for the acute fall in vulture population including use of diclofenac for cattle, habitat loss, droughts, change in cattle keeping pattern, destruction of feeding sites, decline in carnivore population, loss of de-skinning profession, urbanization leading to construction of highways, elimination by Avian authorities, electrocution, unintentional poisoning and many more.^[1,2,3] The efforts were then undertaken by the Government and Non-government organizations to purge the causes of the declining vulture population. With this came up the ban of diclofenac in 2006, captive breeding, the concept and setup of vulture restaurants, mass awareness programmes, regular vulture counts,

monitoring of breeding, feeding and roosting sites, collaborative efforts of various departments.^[4,5,6] The initiatives have resulted in the stability of vulture population in a number of sites in different parts of India. There have been reports of increase in vulture numbers by researchers and conservationists. However, the scavengers are still not out of harm's way due to human negligence. Human activities have a negative effect on breeding biology of many raptor species^[7,8] and the fall in parental care possibly will affect the growth of the nestlings.^[9] Thus, it is approved that the spatial and chronological restrictions should be undertaken to protect raptors during the extreme sensitive periods.^[10] Substantial studies are needed on the behavioral responses to how, when or what type of human activities may be damaging to wild flora and fauna so as to optimize the management and conservation actions.^[11,12,13]

METHODOLOGY

This study was undertaken from 2014-2017 to present the overall view of the unremitting affect of human activities on the surviving vulture population in 6

districts (Tikamgarh, Shivpuri and Sagar of Madhya Pradesh; Jhansi, Lalitpur and Jalaun of Uttar Pradesh) of Bundelkhand Region. Field visits and questionnaire were undertaken to carry out the study. Two type of questionnaire were developed (Precise and Closed; Broad and Open ended). Human activities were recorded during the usual monitoring of different vulture species in the Bundelkhand Region. The observations were done at >500m from the nests, with binoculars, without disturbing the scavengers. For analysis, activities were grouped in five categories according to the type of disturbance as potentially perceived by the vulture species, these include: tree destruction (pruning and cutting), inappropriate dumping of carcasses, complete capture of carcasses by feral dogs, disturbance at

monuments (lightening, shootings, use of drones and tourists) and mining activities at nesting/roosting sites.

RESULT AND DISCUSSION

The Government of India put a ban on Diclofenac for animals (the main suspect of vulture decline) in 2006 and issued the notification regarding the single unit dose pack of diclofenac for humans in 2015. Dealing with one cause for declining is not adequate to prevent the decline in vulture population. There are several other reasons persisting that are adversely affecting the scavengers in Bundelkhand Region. The analysis of 5 human activities in the 6 districts showed slight variation (Table 1).

Table 1: Five parameters taken to analyze the effect of human activities on vulture population.

S. No	Districts	Tree Destruction	Inappropriate Carcass Dumping	Feral Dogs At Carcass	Disturbance At Monuments/temples	Mining Activities
1.	Tikamgarh	+,***	+ ***	+ ***	+**	-
2.	Shivpuri	-	+ **	+ ***	-	-
3.	Sagar	+ **	+ ***	+ ***	-	-
4.	Jhansi	+ ***	+ ***	+ ***	-	+ ***
5.	Lalitpur	-	+ ***	+ ***	+*	+ **
6.	Jalaun	+**	+ ***	+ ***	-	+ **

+(present); -(absent), *** High, ** Moderate; *low

The foremost of these are pruning and cutting of the large nesting trees by the villagers, tree destruction was observed almost in all the districts except Shivpuri and Lalitpur. In Kotigulenda, a site in Tikamgarh district, the nests of *Gyps bengalensis* were on the Arjun (*Terminalia arjuna*) and peepal (*Ficus religiosa*) trees (Fig 1). The trees were pruned by the villagers of Digwaar, at a distance of 3-4 kms (Fig 2). Once disturbed the vultures do not reconstruct their nests at those sites. The nests on peepal trees in the village are also deserted or occupied by other raptors such as Short-toed snake eagle (*Circaetus gallicus*). The villagers are not aware of the consequences of cutting the tree branches for the livestock. The pruned branches are not suitable for the massive nests constructed by the White-backed vultures because they prefer “Chandelier” type of branch platform

for sustaining their nests i.e. a type of top of 3-5 branches arising from the similar spot of the trunk or from a branch of 1st order (rarely of 2nd order) in a vertical or sub-vertical direction. Thus the unintentional activities of villagers have made the nesting trees a limited factor for breeding opportunity. Nearly two decades back, in India, there were abundant nesting and roosting habitats for vultures.^[14] But the picture is very different now. In Rampur of Nepal, these habitats could have been limiting factors for the reason that the valley had sparse vegetation. Vultures mainly nested on kapok trees in the valley. These trees had commercial value for the Community Forest User Group (CFUG) regarding revenue collection, so logging of trees was suggested as a probable limiting factor for the availability of nest-site.^[15]



Fig. 1: Nest of Oriental White-backed vulture on Peepal tree.



Fig. 2: The pruned Arjun trees with no branches to hold the vulture nest.

In Sagar, Jhansi and Jalaun district, the situation was similar. Jhansi and Jalaun have lost a large number of big trees due to the highway constructions. The forest covers in these districts also lacks large trees suitable for nesting by vultures. The rural regions in addition have only a handful of large old trees, strong enough to hold the nest of vultures. The scavengers are seen resting and roosting on electricity towers and on fences in the agricultural fields (Fig.3 & 4). The habitat is lost due to urbanization as well as intensive agricultural practices. Habitat excellence is an important parameter that establishes the settlement pattern of raptor population.^[16] Therefore analysis of the locale necessities of endangered species is



Fig. 3: Egyptian vultures roosting on electricity towers.

The inappropriate carcass dumping is present in all 6 districts. There is no provision of a proper dumping site at any place that has a vulture colony nearby (Fig.5). The people dump the carcasses at any place that is feasible to them. The carcasses are not de-skinned, making it all the more difficult for the vultures to feed upon (Fig.6). The carcasses lying anywhere, attract a number of feral dogs. The diminution or complete loss of vultures has assisted in the speedy and uncontrolled increase in feral dog populations giving a way to amplified occurrence of dog attacks, dog bites and prevalence of rabies amongst humans.^[20] Markandya *et. al.*, estimated that the costs for dog bites alone amounted to Rs.13.1 to Rs.24.4 billion in total during the period 1993 to 2006. No apt action for the uncontrolled population of feral dogs that hinder the feed of vultures was also a major problem in all the districts. With the decline in vulture population, there was a striking enhancement in the number of dogs (Fig.7). They got the opportunity to feed on the carcasses without competitors (Fig.8). The scenario use to be just the reverse when the vulture population was flourishing in the Indian Sub-continent. The feral dogs not only dominate the carcasses now, they also chase away the vultures. This not only deprives the birds from getting the feed but also add to their stress level. In several locations, dogs are the dominant carnivores that

fundamental to multiple phases of conservation.^[17,18] Egyptian vultures are philopatric and known to exhibit prominent site-fidelity.^[19] The vulture nests are large platforms consisting of large number of twigs, for this reason also they are known to reuse their nests. The twigs commonly used for nest construction are those of surrounding flora consisting of salai (*Boswellia serrata*), seesham (*Dalbergia sissoo*), dhau (*Anogeissus latifolia*), kava (*Piper methysticum*) and teak in Bundelkhand region. As a consequence, the destroying of trees not only makes the trees unsuitable as nesting sites but also limits the accessibility of nesting material.^[6]



Fig. 4: Egyptian vultures resting on the fences in agricultural fields.

outnumber the other species and profuse negative consequences on bionetworks.^[21] Together with the noticeable direct killing of wildlife, various dogs in addition pester or hound endemic species, which amplifies the pressure and energy losses in the behavior of indigenous wild species.^[22] Recently, the observations in Bandhavgarh area of Madhya Pradesh disclose the intensive competition for food between the vultures and stray or community-owned domestic dogs and Indian Jungle Crows. The dogs chased away the vultures from the carcasses and consumed the complete carcass. This extreme competition for food with other scavengers is limiting the food availability for vultures and is expected to bring adverse effects on the breeding biology of vultures.^[23]



Fig. 5: No dumping sites in vulture inhabited areas.



Fig. 6: Vultures find difficult to feed on a skinned carcass.



Fig.7: Striking enhancement in the number of dogs.



Fig. 8: Dogs have the opportunity to feed on the carcasses without competitors.

The unnecessary lightening of monuments where vultures are nesting, use of drones in such sites without permission, consent for shooting schedules in the monuments during breeding period was observed in Tikamgarh district. The monuments are the potential breeding sites for the Critically Endangered Long-billed vultures and the Endangered Egyptian vultures. With continuous awareness and collaborative efforts, the vulture population is reasonably stable in Orchha, Tikamgarh. Despite of the fact that the bird needs utmost protect, there is unnecessary lightening at times in the cenotaphs that disturbs the breeding pairs (Fig.9). Due to the lights, the parent vultures are observed to stay away from the nest at night. The disturbance due to tourists was seen in Tikamgarh and Lalitpur (Fig.10). The local tourists often gather in large numbers in Orchha, particularly during the festive days. Some of them disturb the vultures purposely by hitting stones at them, just for fun. There are awareness boards in Hindi and English, but many of the local tourists are uneducated, they do not bother to realize the importance of the Nature's cleaners. The volunteers have rescued several vultures that were injured by such notorious tourists.^[24] According to Bachmayr (2004), when breeding sites are taken into account, tourism is problematic due to the strife by sporting activities (for example climbing, and

paragliding) and/or recreation/curiosity.^[25] This is a major problem on the Adriatic islands and other areas that have resulted in the drowning of juveniles and (at least in one case) caused extinction of an entire breeding colony.

The tourists staying in the resorts near the cenotaphs in Orchha have also started using Drones just for fun and adventures. Although drones or unmanned aerial vehicles (UAVs) are now being employed to monitor wildlife, the purpose here is directionless. UAV users are unaware how their operations are causing considerable and unnecessary disturbance and stress in the breeding vulture pairs. The parent bird may decide to stay near a drone/UAV even when stressed out since it is incubating its egg or shielding its hatchling.^[26] There are growing limitations that warns the drone users to follow the rules and regulations of drone handling to defined areas so that they avoid ethical or legal violations. In case the rules are violated, the users might be punished legally to pay for financial compensation or imprisonment for several days. By encouraging understanding and awareness towards the use of UAVs to influence wildlife, the users will be more conscious of the potential impacts and utilize the code to ensure their UAV operations are responsible.^[26]



Fig. 9: Lightening in the cenotaphs where Long-billed vultures nest.



Fig. 10: Pressure of local tourism close to nesting sites of vultures.

The mining activities are also a major threat to the vulture population residing in the rocky cliffs of Jhansi and Lalitpur. The rocky cliffs are very important habitat for the Long-billed and Egyptian vultures (Fig.11a). The cliffs are inaccessible and are safe nesting sites for them. Mining destroys the apt rock formations (*i.e.*, cavities, ledges) where vultures construct their nests. Mining is also a setback to the vulture population in Jalaun district. The mining activities at a large and unregulated level have direct and indirect effects on the vulture population in the region. Mining destroys the vegetative cover that has adverse consequences on the food chain as well as the nesting sites of these large raptors (Fig.11b). It has been recommended in several studies that alteration in the utilization of mountain regions can diminish the carrying capacity of the natural surroundings and the breeding success of the bearded vultures.^[27] Mining of hills for stones used in construction is a major source of deforestation on hills. A fact finding report by the Kashipur Solidarity Group (an association of activists, scientists and environmentalists) in May 2008 pointed

out mining at the core of all environmental degradation in the Bundelkhand region. Similar observations were made in Rajasthan where heavy mining and deforestation caused reduction in the availability of safe nesting sites thereby severely reducing the breeding success of Long-billed and White-backed vultures in the area.^[28] Likewise, rock and sand mining activities in close proximity to vulture colonies in Nepal (for example in Jyagdi and Khairini, Rampur) have distressed the vulture population.^[29] The noise pollution caused due to mining, also has adverse effects on the biodiversity in the forests and other areas surrounding the mines/industrial complexes. Wildlife is more sensitive to noise and vibrations than the human beings. Mining activities are not sustainable because besides taking advantage of the non-renewable resources, they leave behind them the ruined habitat and society, which is mostly irremediable. Therefore, due to its impacts, mining is one of those activities that need to be strictly controlled at all stages, from prospection and utilization to transportation, handing out and consumption.^[30]



Fig. 11a: Cliffs are inaccessible and safe nesting sites for vultures.



Fig.11b: The rocky cliffs after mining are inapt for nesting by the vultures.

CONCLUSION

The five parameters discussed in the research paper are causing unremitting affect on vulture population due to human activities. Various initiatives are being undertaken to reduce their devastating influence on the master scavengers, but somehow their influence persists. The activities that are causing the natural habitats to become a limiting factor should be taken into account. The uncontrolled population of feral dogs are not only a menace to the vulture population but also to the other

species particularly the ground dwelling birds. Human beings are also facing the fatal dog attacks. The problem is becoming a universal problem and needs urgent management. It is highly recommended to the concerned departments to take urgent actions and to co-ordinate amongst them so as to bring to a halt the dwindling vulture population. Continuous monitoring of such activities is needed. Conservation actions based on these results may reduce unfavorable consequences of human activities on vulture species in Bundelkhand Region.

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